BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. UNDOCKETED

In the Matter of

ELECTRIC UTILITY INFRASTRUCTURE WORKSHOP.
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Tallahassee, Florida

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# I N D E X

P R O C E E D I N G S

CHAIRMAN EDGAR: Good morning. My name is Lisa Edgar. I'm the Chairwoman of the Public Service Commission here in Florida. I want to thank you all for coming and for joining us.

Just a few comments, and then we're going to jump right into our agenda. As, of course, everyone in this room and hopefully everyone that is participating across the state with us today is well aware, we have entered a period in the State of Florida of unprecedented hurricane storm activity. Unfortunately, the prognosticators tell us that the data indicates that instead of a period of maybe one storm at one area of the state every ten years or so, that over the next few years we will probably experience multiple intense storm activity across our state. We know, we have seen firsthand that this impacts our families, our businesses, our communities, economic development across the state. And we know here at the Public Service Commission, as do each of you, that this changes the analysis that we need to do; that we need to think differently about the costs, the benefit, the analysis of what we can do, what we should do, what we are able to do to better prepare our state and our families, our businesses and our communities to be ready and to withstand storm events.

In November, my colleagues and I had the discussion about this at a public meeting, and we decided to jump right into it and to try to do what we can in our role to gather together experts, to pull together data, to do some analysis and to put some ideas out there for further discussion and for further consideration.

Our purpose today is to take the next step in that effort, to take a hard look at our existing policies and procedures, to be able to make recommendations to help us minimize damage from future storms, to reduce outages and to reduce the restoration time and cost associated with outages.

I want you to know that I take this effort very seriously. I know that my colleagues here at the Commission take this effort very seriously. We do believe that we are in a unique position to help pull together efforts and to help frame the discussion that we need to continue to have in this state.

We need meaningful baseline assessment of our electric infrastructure and of our current practices, and we are really looking forward to benefitting from hearing the firsthand experience of our local government officials. Our goal here today is to put us in the best posture so that over the next few months we can help identify both short-term strategies and long-term strategies. We have a very tight time frame. We will be pulling together information over these next few weeks. We will be bringing together recommendations for consideration by the Commission at the end of February, and we will be putting that together then to present to the Legislature, the Governor and others early in March. We've directed our staff to move very quickly on this. And, again, I want to thank each of you for helping us as we move forward in this effort.

We have a very full day's work ahead of us and very full weeks ahead of us as well. So thank you again for your participation, thank you for helping to make this a very meaningful effort, and thank you for helping us move along here through the day.

With that, I would like to move on again into our agenda and to introduce to you Senator Ron Klein, who has joined us here today. Senator Klein represents District 30, which includes West Palm Beach, Boca Raton and Deerfield Beach. Senator Klein has an abiding long-term, acute interest in these issues, and I'm very pleased that he has joined us here this morning. Senator Klein.

SENATOR KLEIN: Thank you very much, Chair, and the members of the Commission and some of our local officials who have come up here, Mayor Slesnick and Commissioner Falcone. And all of you, I echo the Chair's gratitude for all of you participating in this cause of trying to figure out ways to better protect the grid in Florida and work on behalf of all of our consumers.

I think we all recognize it's been almost exactly three weeks -- three months to the day that Hurricane Wilma hit Florida. And in South Florida, those of us who live there, 6 million subscribers of electrical services lost their power during that period of time for a certain number of days. For many people in that area the loss of power was not a new experience necessarily but a new expansion of some of the problems that arise with a loss of power. It wasn't just a question of the normal electricity going out. This time we had gas stations that had gas in the ground but no ability to pump it out. We had substantial amounts of senior citizens living in multiple-story buildings, not necessarily high-rise, but even two- and three-story buildings, that unfortunately, although many of them normally can get around with wheelchairs and other apparatus, were stuck because the elevators weren't operating. And I think we all know many of the other experiences.

So I think that when we went through the hurricane experience last year, I was very interested, along with many other members of the Legislature -- and I commend Chairman Littlefield, who I know has been very active as well in this issue -- in trying to get underway as of last year's storms to figure out, try to bring the best and the brightest together, people that understand the science of transmission of energy, the infrastructure issues, the building, the financing and all those things, together so that we would be able to figure out ways to work together to help build that system a little more efficiently. And we did pass that bill in the Senate last year to set up this task force. It did not get all the way through the House, but there was some limited amount of activity last year to begin to look at this. But, unfortunately, at least in my view, we did not take it up very, very far.

This year, again, we are pursuing -- and we have filed a bill creating the Florida Utilities Task Force. It's not viewed to duplicate the efforts here. As a matter of fact, again, I want to acknowledge the House and the Senate -- President Lee and our Chairs Diaz de la Portilla and Constantine have already had some activities, we've had some hearings in the state to talk about hurricane responsiveness. But we're going to keep this issue out there as a means of making sure that we continue moving this along.

And, again, I guess the bottom line to this whole thing is this is all a matter of establishing an understanding of what shared responsibility there may be to make the grid more reliable. And when I say shared, we're talking obviously about utilities that provide the electricity, we're talking about municipal governments and county governments and state governments that have codes and ordinances that impact the ability to build, operate and even things like landscaping codes, we have shared responsibility with property owners, homeowners and others that plan things and build things and do things that sometimes create greater risks for destruction when you have a storm event.

But at the end of the day I think we all recognize, and many of you have studied this and you're far more expert than I am, but I at least know enough to know that there are places around the world that have figured out ways to make their systems work. I think that we need to do more if, in fact, our meteorologists are telling us that we may have a series or a cycle of storm events. This was a Category 2, this was not a Category 5. If we have one, two, three, four over the next number of years, we need to do whatever we can collectively as a state and as a local group of residents and businesses to make sure the system is operating a little more reliably. And to that end I look forward to working with the Public Service Commission and making sure that what comes out of this in the timetable that was established by the Chair -- and, again, I appreciate that, recognizing not all of this is going to be legislation, maybe none of it is legislation or maybe some of it is, but part of it is going to be an effort to do short-term things that can reasonably be accomplished between now and the time we have our next hurricane season. And some will take a little more thorough analysis and will take implementation over months and years, but we need to get on with it. And I again appreciate the fact that we're here today with a timetable as has been established by the Chair.

The Legislature will be working in cooperation with that and, to the extent necessary, will be advancing at the same time.

So thank you, Chair, for allowing me to be here with you today. And members of the Commission, I look forward to listening today and being part of finding some solutions. Thanks.

CHAIRMAN EDGAR: Thank you, Senator Klein. I would also like to take this opportunity to recognize Representative Ken Littlefield. Representative Littlefield, thank you for joining us today and thank you for your interest in support of our efforts here. Representative Littlefield is the Chair of the House Utilities and Telecommunications Committee and is also a Co-chair of the Joint Committee on Public Service Commission Oversight. He represents the Zephyrhills, Trinity and Dade City areas. And, again, thank you for joining us.

Well, I think we've set out a pretty aggressive agenda for the day and for the next few weeks ahead. I personally am excited once again about the opportunity that we have to contribute to this discussion. I believe firmly that there are some things that we can do over these next few months, as Senator Klein pointed out, to put this state in a better position for the next storm season; short-term strategies and long-term strategies, those are our goals.

And with that, I'll turn the agenda over to Mary Anne Helton, who is the Attorney Supervisor in our Economic

Regulation Section of our General Counsel's office, and she will be moving us through the agenda today. Thank you. Mary Anne.

MS. HELTON: Thank you, Madam Chairman. I'd also like to welcome all of you who have traveled to Tallahassee today, and I'd especially like to welcome and thank the speakers who have traveled here. I know that the staff and the Commission look forward to a meaningful day where we can actually gather some meaningful information so that we can move forward with some specific goals.

As Chairman Edgar mentioned, we have a busy, full schedule. My hope is that we can complete all of the presentations by 5:00 or 5:15 today, as is mentioned on the schedule. So to that end I hope that we can move, move quickly through all of the three sets of presentations that we do have.

For those of you who, like me, are interested, I do envision that we will break for lunch. I do envision that we will take a morning break and an afternoon break. I can't guarantee that it will be at the times specifically mentioned on the agenda, a lot of that has to do with how the day plays out, but we will break to do those things.

I do have a couple of changes to the agenda which hopefully should be on that back table there along with the presentations that have been provided by the speakers. And if you missed on, missed out on getting a copy there, you can get it from our Commission website at the Infrastructure Electric Workshop link.

The changes to the agenda are: Unfortunately, Mayor Don Slesnick from Coral Gables had travel difficulties and he was not able to come down from the Miami area -- or come up from the Miami area today. And Michael Osterhout with the Composite Technology Corporation will be added to the end of the morning speakers after Roy -- excuse me, I should have worked on this -- Jazowski and Mark Hammer from The Homac Companies.

We, as we said, have a busy schedule. So to accommodate us being able to finish everything today, we are not set up so that we can take specific questions from individuals in the audience. However, if you do have a question, if you would please write the question down on a note card there. Kathy Lewis is holding them up. There's a box there set up for your questions, drop the question in, and Tom Ballinger of our staff will be taking the questions and our staff will be asking them at the end of each panel.

Let me recognize now Connie Kummer and Bob Trapp. They are chairing this meeting or workshop with me today that was noticed last December. And as Chairman Edgar mentioned, it was after the Commission had voted in Internal Affairs for us to go forward and gather this information. Let me also acknowledge the staff who are sitting over at the side of the room. All of the staff who have been working on this workshop have nametags on. We've all been working very hard, and we appreciate your hard work very much. If you have any specific questions, please don't hesitate to ask Connie, Bob or me or any of the staff members sitting over here who have a nametag on.

We also have -- if we didn't get to you this morning and you're a speaker, we have name cards -- place cards and nametags for the speakers. I would ask if we weren't able to talk to you this morning, if you are on the first panel, if you could come sit over here. And then when it's your turn to speak, if you could please come up to the podium, and then sit back down over here so that you will be available to answer questions at the end of your panel's presentations. And then once your panel has finished, if you would move and sit wherever you feel comfortable in the audience, and then we'll move the second panel over.

And I'd also like to acknowledge before we get started that our Commissioners are here. They're not sitting up at the bench as they normally do. They're letting us have the fun today. They are out in the audience. Thank you, Commissioners Tew, Carter, Arriaga and Deason for being here. We hope that we will run a good workshop and that you can get some good information from it.

So with that, Mayor Castro, if I could turn it over to you, please.

MAYOR CASTRO: Good morning, everyone. First of all, it's a pleasure to be here today. I want to thank the Public Service Commission and certainly, most graciously, their staff for working so hard on putting this on. I need to put my disclaimer out front. I'm not at all an expert about electricity. I know when I flip the switch up, it's supposed to go on, and when I flip the switch down, it's supposed to go off. But I'm here to give you some firsthand accounts. And in particular most of my references will be to Florida Power & Light in my presentation only because that's who we deal with in South Florida.

To start with, I want to give you a little frame of reference for the comments. If you'd put the first slide on. I want to show you where Dania Beach is a little bit and give you an idea of what we're made up of. We're a very small city. We're located just south of the Fort Lauderdale-Hollywood International Airport right next to Port Everglades. We're the oldest city in Broward County. We just celebrated our centennial; hence, our infrastructure is probably one of the oldest ones you'll find in South Florida. We're six square miles and we have about 28,000 residents. We just acquired half of the city about five years ago through annexation, so we've kind of double sized in the last decade.

For reference also, I was born and raised in Broward

County. I was born in Fort Lauderdale. I was raised there until I went to college and came back home, and then I settled in Dania Beach and have been there the last 18 years. I'm a newly elected official, being elected a year ago. This is my first presentation of this type, so I'll appreciate it if you'll forgive me if I create any issues or faux pas and excuse me.

But this pattern of this last season was so devastating to us that we felt it was that important for somebody to come up here and talk about it. I don't want to get into the mix and mingle of the technicians and the experts, you know, about a lot of the issues about how wire should be, what they should be, but I do want to share with you our observations. Because if that helps you put their studies in a frame of reference again or a frame, that's what we're going to try to do.

Quickly before I proceed, I want to thank State Senator Ron Klein. I know he's mostly from the Palm Beach area, but taking point on this issue is helping all of South Florida. And we're a very high-density area and we very much appreciate it. And I think he'll understand too whether it's one storm a season or ten storms a season, there's something going on with the infrastructure.

As I alluded to, I was born in Broward County. I've lived through many hurricanes from Donna to Andrew to whatever.

And the reality is the response time in getting power turned back on is taking so much longer, and I can only assume from an outsider's point of view that's because the damage is greater each and every time. And it's not because the winds are different, but it must be because something is wrong with what the winds are hitting. That's what we hope the Public Service Commission, the experts and, yes, the electric company utilities will get into, help figure out a plan. And I will tell you my municipality in its little small way will help in any way that we can to do that.

If we could have the next slide. The most important thing also to remember about Wilma, and I can't emphasize this enough, is it was a late season hurricane and it was unseasonably cool the first week after the storm. So the fact that people didn't have power and water the first three or four days was unbearable but bearable in the fact that you had a lot of senior people, a lot of elderly people and a lot of people in high, tall buildings who really couldn't get down because they had no power for their elevators. So without water and electricity they were fairly stranded. Had the temperatures been ten degrees higher, I think you would have seen a worse catastrophe and I think this whole thing would have been moving so much faster and there would have been a lot more finger-pointing. And I'm not for that, but I think everybody would have thought of this as a huge crisis as opposed to let's get this problem solved and worked out. And that's what I'm concerned about in the next few hurricane seasons is what kind of storm is going to come when and what is it going to create? So when Senator Klein mentioned the other parts of not having power, electric power for gas stations, for food, for things like that, it became critical.

Broward County also lost their water supply for the first three or four days. My city was fortunate. We got it up in 24 hours by going back to our own wells. We disconnected from the Broward system and put our own pumps back up. That did a tremendous asset to give those people at least one of two major things back: Giving them their water back even though they didn't have electricity. So every bit helps. And, again, the length and duration of these power outages is longer and harder, so we need to look at that

Now getting into it, I know nothing about power grids, as I said. But I want to thank Lynn Shatas and Tom Gualtney (phonetic) of FPL. They're our Liaison and our Director of Ops who helped bring our city back on with a lot of others, and they took time to explain some things to me.

They start at the substations to get those up and running first because literally the whole grid went down. Then they said they're going to go out to the lateral lines, which I gather are the big, big, big, big high-tension wire lines, and then they get down into the neighborhoods and the lines and the poles. What I also understood is once they brought a lateral up, usually about 80 percent or 70 percent of the people got their power back on because lateral was the issue.

So my perspective is then start where you can get the most bang for your buck. If electric companies can do something to insulate and protect starting with the substation and working out the laterals, if that's the priority, I think what you'll do is keep more people from even going down in the first place.

So I bring that up for that reason. I don't know what happened at the substations, I don't know what happened at the laterals. I don't know if lines came down, I don't know if fuses got blown down, I don't know if there's a way to physically structurally protect them, but that would be my first suggestion or recommendation is you start there.

The second thing we want to look at, of course, are lines, lines and poles, and that's where a lot of the controversy gets in because that's what everybody keeps talking about are the lines and the poles.

Starting with the lines, you've got to figure out which are better for them. I don't know if concrete poles or wood poles are better. I don't know if underground versus aboveground. I understand some people's point that if you put a line underground, you get flooding. Dania has one particular part of our city that notoriously floods. Obviously, underground wiring wouldn't be a good thing for them because if it does go out, nobody could get to it.

But I will tell you other cities in Broward County like Weston and Davie who have underground lines had power. They never lost it. So there's something to be said for the underground wire issue.

But, again, I think you're right. From the utility's perspective you need to make sure that getting to those lines won't be interfered with by standing water. So that would be another thing I would take a look at.

Trees, trees and trees. I'm a tree hugger. I love trees. I love our canopy. We certainly need them in South Florida; otherwise, the humidity gets even worse. But we also put them in some of the darnedest places and we don't maintain them and we don't keep them. And this is something soon I'll talk about from our perspective as a municipality.

Now Florida Power & Light in our case comes through, and if they see an offensive tree, they do what everybody calls the V cut of the tree. If the tree is that offensive, I think if they could communicate with the City that maybe that tree needs to be removed, even if it's on private property, then it's a code enforcement issue that we were talking about earlier, that maybe we could do something about that. We could get the tree out and we'll have a program to replace the tree with another tree. But if we just keep V cutting them and you don't get your V cuts in the right time and the right order during the season, God forbid if that tree overgrows again and you lose a power line or a telephone pole. So trees are another issue.

The poles, I've heard all kinds of discussion about poles: Wood, concrete, age, no discernible patterns. I'm going to tell you from my experience there is no pattern either. If you have a concrete pole that's listing at 45 degrees, it probably has a higher probability of falling down than a wood pole that's standing up straight and is solid in the ground. And that's just a fact of physics, I think. I'm not even sure that's an electrical concept. So poles are a very individual thing from my perspective, and that's why they all need to be maintained, they all need to be reviewed. And we have all kinds in our city. We have wood poles that are probably older than me, some with cracks, some with rotting. We have concrete poles that are, you know, brand new but, as I said, they're kind of listing. And sometimes the crews will come through and tap them and stand them straight back up, and as the truck is driving away it's starting to fall over again. So all of that, I'm sure, pulls on the wires. And I don't know enough about wires if it makes a difference. If the wires are, you know, too tight, not tight enough, how they go from pole to pole, how they connect, how do they connect to a wood pole versus a concrete pole, that I'll leave to the experts. But that's something everybody should be paying attention to.

The poles, I understand from our FPL representatives the concrete poles did have less of a failure rate in Broward County than the wood poles. And that may speak to something. But, again, if it's not properly placed and it's not properly, you know, buried in the ground, it's still going to be a problem. And it doesn't matter to me about the microbursts of wind. You're going to catch a pole here and there no matter what. The point is does it pull all the other poles down the line with it? And maybe there's something engineering wise that if one pole goes, there's a breakaway or snap-away or some other thing that keeps the rest of the poles and lines standing up as opposed to running down the whole street. So that's what I want to talk to about poles. Poles is a matter for me of probability, not of a pattern. And I don't know if studies are going to bear any patterns out.

If we'll go to the next slide. What we have offered -- we offered FPL during the crisis -- this is the time when our City Manager decided he was going to withhold the City's payment to FPL until such time they got all of our residents back online. I myself was without power for 15 days. So that's the good thing about power outages; it knows no class or person or whatever, it's just out, it's out. We want to be the eyes and ears for FPL. We have offered them that we will go ahead and we will train or they will train our public service people, our public safety people, especially after a hurricane or even on an ongoing basis during the year, as to what to look for in their infrastructure. If they could teach us what to look for as far as poles being bad or wires being bad or fuses hanging or loose ends hanging, our folks, as they routinely do this through code enforcement, through the fire department, through the police department, are happy to go out there and take a look. Even our citizens on patrol, they turn in half of our code violators anyway. Tall trees, trees that are in the lines, they can report all of that, they can create a list.

We can then give the list over to Florida Power & Light on a monthly basis, a quarterly basis, a weekly basis, a daily basis, whatever they would like, and then what we would like them to do is address the issues on that list. And we think in that way local communities, without putting up a lot of dollars, because most of us don't have a lot of dollars to put up as far as putting in our own wires and poles, we can help the Power & Light Company find out what problems are out there and be proactive about fixing them.

If you can run down the rest of it, please. And we're happy to make sure that that report is available to anybody, including the Public Service Commission, so they know what it looks like and what the pattern looks like. And if that data also helps find future problems, we're happy to offer that solution. That's something we can contribute right away.

If our electric companies will take the time, as I said, to come out and train with us and work with us and then develop the process, we're on board with this, we're ready to go.

And then finally -- the next slide, please. In closing, I just want to tell you from our perspective there is no silver bullet. I appreciate everybody taking their time and the technical experts coming in. From our perspective, as I said, poles are a matter of probability, not pattern. Patterns are a matter of each and every storm and they're different. The reality is the infrastructure needs to be addressed; whether it's one hurricane or ten hurricanes, we need to really address it. And what we need from Florida Power & Light in our case, it's maybe not every utility, is a commitment.

We understand that there are stockholders for Florida Power & Light, and I've talked to everybody from the most liberal people in my city to the most conservative, including my 87-year-old mom who said, "You know what? We're tired of getting rate increases and not getting a return on them." They have to invest back in our infrastructure. And we understand they have an obligation to stockholders. But just like any company, like the company I work for, you know, performance and management performance is gauged by the value of your stock. And if you're not putting your money into your infrastructure and you're not protected from your losses, most companies like my company, we don't get to go to a state government agency or anybody else and say, gee, we didn't do a good job this year. We need you to raise our prices for us so that we can, you know, dig ourself out of this hole. You can't have that. And the sooner we can make it so that the stockholders of FPL understand they have to assume some of the risk, and I don't think their stockholders will go away because they're still a good bye, then I think the faster FPL will then be able to commit some of their resources.

The purchase recently of the other company from the northeast really aggravated a lot of people. They didn't understand it. You know, for them it's an $11 billion cash deal going out the door when we should be putting $11 billion into our infrastructure in South Florida, and it was very confusing to everyone.

And I understand some of the reasons for doing it, but we need a commitment from the utilities to come in and put the money where their mouth is. Let's fix the infrastructure. It has aged out. So whether it's a wood pole or concrete pole -- again, I know there are poles on my street that are older than me. Not that they're bad poles, they could be fine, but if they're not checked, nobody knows. So we really need that commitment.

And even my little town as small as it is, we're willing to put up what we can put up, whether it's resource, as I said, for helping code, public services right after a storm, year-round, we're happy to put those resources forward because we can't let our citizens go through what they did after Hurricane Wilma. It was a very difficult time. I can't emphasize that enough. And I can't tell you again, but for the cooler temperatures, it would have been a lot more devastating than what you were able to read about. And with that, I thank you very much for your time and your attention. Again, I thank the staff and the Public Service Commission for having us speak here today. Thank you.

MS. HELTON: Thank you very much, Mayor Castro. I think that was very informative.

Now we'll go to Commissioner Charles Falcone. He is on the Commission for the Town of Jupiter Island.

COMMISSIONER FALCONE: Good morning. It's a privilege to address you this morning.

Can we have the first slide, please. I come to you with a fair amount of town government experience, but a whole lot more of industry experience as an engineer, an executive with the utility industry, that's American Electric Power where I spent 30 years, as a regulator and a consultant for briefer periods in my life. I have a Ph.D. in electric power systems engineering from the best school in the country.

There are public policy issues that you all need, the Commission needs to address here, and a little history lesson. I see a few gray hairs out in the audience, not many. But back in 1965, the Great Northeast Blackout, Lyndon Johnson was president. It was only a couple of years after John F. Kennedy was assassinated. Lyndon Johnson responded with a request to the Federal Power Commission then at that time to do a massive study of what went wrong, make sure it doesn't happen again. The utility industry really noticed this, really began to respond and generate its thoughts about a response. The government continued to get active at the federal level: Started to institute programs, added staff, looking deeper and deeper into this. That was the mid '60s.

By the late '60s NERC was formed, the National Electric Reliability Council. Now it's the North American Electric Reliability Council. They brought in Canada. Also a massive investment in electric transmission; not distribution, transmission. If you look at the records, from 1965 to 1975 there was a huge increase across the entire country in the investment and transmission. It went from single contingency service to double basically. Now in the last 25 years it's been much tougher to build transmission, and thankfully that happened at the time. That was the last great opportunity to build transmission in the United States. But it was done in response to a threat. The utility industry wanted to get its own act together with NERC, that is, police itself, and with the building of transmission infrastructure so that the government didn't do it. There were three national power grid studies conducted by the government over those years. I was responsible for the third one in the mid '70s. I was Director of Power Supply and Reliability at the maturing of Lyndon Johnson's little seed, and it was in the Department of Energy because Jimmy Carter had reorganized FPC into FERC and DOE. But I learned quickly to get out of the government after I got a little experience and I went into the private sector and became a utility executive. I was responsible to AEP for all the transmission access and also the wholesale marketing. I was -- I had more monopoly power than FPL for 12 years.

Well, the blackout, the northeast blackout recovered in 24 hours. Amazing! It was widespread but in 24 hours, more or less, lights were all back on. Here in South Florida we've had three blackouts in my area in the last two years. And the last one after Wilma took, what, a couple of weeks for a full recovery. Serious? You bet. Not as widespread but very serious life, life and property threatening for Florida, for Southeast Florida.

Now we're a little town, talk about small towns, but we're geographically configured in such a way that undergrounding is very feasible. We want to do it. We've been wanting to do it for some years now. Our power supply is poor. We love our trees. We're willing to pay for it. But we -- no one wants to get ripped off; you don't, we don't. We don't want to overpay. And there are other obstacles.

I'm not really delighted with all my slides, so we're going to pass through them. So let's take the next one. We want to convert that -- the next slide -- to that. Notice the word "Please." It may give you the wrong impression about the attitude and style of the power company. They're polite folks. They're not easy to deal with. I know. I used to be one of them. I know what it's like. I used to be that. For that reason I'm probably a good person to deal with it. I don't get frustrated quite as fast as some other people might.

We want to convert this, that's a switch, to that. That's what an underground switch looks like in the next one. Why haven't we done it? Well, the cost -- and let me say a bit about that. Five years ago they told us it was going to be $17 million. When we did a so-called binding cost estimate last year, $8 million dollars. That's half. Now I don't know whether they were just misled when they gave us the $17 million figure or whether they were trying to discourage us from going forward, but it did discourage us from going forward.

So the next slide, if you would, I'm going to tell you some news, that things are getting better. But, here, hold that slide for a minute. We put it on the back burner after 2002 because of that high cost estimate. And we had meetings with the Chairman and President of FPL and they explained to us that any contribution in aid of construction would require, would represent a taxable event. It would be income to FPL and, therefore, taxable, so we had to gross it up for taxes. Well, that's why it was twice as much as it turns out to be.

It turns out with closer study of IRS law that if we're not a customer, the town is not a customer, I'm a customer but not the town, if the town gives them a check for $8 million, it's not taxable. It's a noncustomer contribution to capital and it's not taxable. And that's the big reason why the cost came down. Well, it's still too high. They're putting overheads into that. I don't see why they should put overheads into it, especially since we're talking about hiring our own contractor to do it. FPL simply is going to inspect the work, do some engineering ahead to say what kind of switches and so forth. But why they should put an overhead figure of a couple of millions dollars into that is unclear to me.

We got back off the back burner and onto the front burner after the hurricanes of 2004. You remember those. Right after those hurricanes, we said, whoa, we better get going, and we did. We got moving, we wrote letters to FPL. Sometimes we got an answer, never a satisfactory one, other times we didn't get answers. You write them a letter, you don't get an answer.

You know what Mel Brooks taught us? It's good to be the king, you know. Monopoly power is neat. You don't have to treat your customers the way competitive companies treat their customer. The customer isn't always right. We'll tell you what's right. That's the attitude of people like us, you know, ex-monopolists from AEP.

Well, then we really made a lot of headway. We even asked FPL to do a binding cost estimate in late 2005. It cost us $95,000. And we learned it would be about $8 million to do this, but that includes their overheads. Then Wilma, and FPL had an epiphany, much like the epiphany, I think -- and it's only the beginning, so it's too early to say, but the whole power industry got an epiphany back in 1965 after that blackout.

What's an epiphany? Let's take a look. Webster says that's what it is. It's an enlightening of what the reality is. Maybe it's a wake-up call.

One more slide. Caused the sea change. Hey, let's measure the sea change. There's Senator Klein, he's active on this. Why? It's the sea change. Wilma and the earlier hurricanes caused that. This conference, we wouldn't be sitting here today talking about this if there weren't a sea change happening. We've got towns looking at it, we've got newspapers, we've got the people in an outrage, towns and cities around Florida are upset about the response to the hurricane, about the destruction that took place that perhaps shouldn't have.

What's needed this time? Look, if the fix in 2000, I'm sorry, in the year 1965 after the blackout, if the fix was more transmission and the industry organizing so the government doesn't, what's the fix this time in South Florida? Move to New Jersey? No. No. It's distribution. And the industry, the utilities need to recognize that more investment and distribution is needed.

Let's flash forward. This is fine. Quickly I'll tell you that we see suddenly a new working relationship since Wilma with FPL. It looks like they may lower the cost because they are thinking about a cost incentive. I'll say more about it in a minute. But they're agreeing that we can use the right-of-way reluctantly where feasible. We're still going to need some easements. It's very important to our residents who own this beautiful property, they don't want to offer an easement across their property if it's not absolutely necessary. So we seem to have a collaborative arrangement for tailoring the new distribution system to meet our existing town. We'll work together on that. That's good.

We have a good understanding of hardening the feeders that come into the town. I won't dwell on it, but it's important not only to harden your town, but think about what's coming in. You don't want to have -- if your system is intact but your feeders aren't, you're not going to get the lights back on. We've got that licked too.

An evaluation of waterproof switchgear. We know that underground equipment can suffer from overwash, ocean/salt water, et cetera, deep water on underground switches can do real damage. You know, there's waterproof hardware available. It costs a little more. FPL doesn't support that technology right now. They're testing it, they're looking at it. Folks, it's in use all over the world. How do I know? I talked to S&C. They're the suppliers of this equipment. I know where these switches are installed, know what they look like, know what they cost.

Let's move on. I want to say a few words, and I don't want to take more than my time, about reliability. Is it more reliable? It certainly is. But I want to tell you, you can't find data -- skip forward two slides, if you will, one and then one more. I've read a dozen recent reports. Every one -- in the last five years. They're generally commissioned by state commissions when some kind of storm event forced it to happen, but the studies were all controlled by the local utilities. There is very little data about reliability. No data at all in the Florida reports. You can't find published data comparing underground with overhead reliability in Florida. It doesn't exist. Is it hard to get this data? It would seem so. It's easy to get it. We're collecting it ourselves. I won't spend time on it, but I can show you how easy it is to collect data. We're doing it. We have every outage recorded in a computer database on Jupiter Island for the last two years. It's automatically transported to that database with little devices that cost a few hundred dollars in each home. Four or five homes, four or five times a few hundred dollars, we'll have enough installations in your whole town to tell you what's going on. Now we can't so easily get data for every other town. How can we? FPL could. They don't want to do it. They've held it back. They don't want us to meddle in the design of their system. I understand that. A few years ago I didn't want anybody doing that to me either.

Let's move forward. I don't want to tell you why they have discouraged us from -- I don't want to spend much time, let's say, telling you why they have discouraged our investment in underground facilities. Let's just say it wasn't in their business interest until the epiphany.

Let's move forward. This is important. In Florida, unlike most other states, four things are more favorable to underground versus overhead distribution. Salt spray, most of our development is along the coast. You don't see that in central New Jersey. That salt spray causes momentaries. Fast vegetation growth. It doesn't grow a few inches a year. It grows a few feet a year right into the trees. We don't like them to chop down all our trees. We love our trees. So there's that tension. Much higher lightning frequency in Florida than any other place in the United States and nearly any place in the world. Lightning strikes overhead; doesn't do anything to underground. Underground utilities are out of harm's way. And hurricanes happen here. Oh, that's, that's the killer.

Okay. One more slide. Distribution all over the country is the stepchild. It's underinvested. It suffers from a lack of investment. That's not such a crisis in most places, but in Florida, as it turns out, it sure is because of the hurricanes.

Now this is good business for the utilities to have a cash cow. When you go ahead -- when we underground and pay for the cost of the underground utilities, FPL has to pay a component of that, pay the equivalent of what a new overhead line would cost. That's a capital infusion that does nothing for their bottom line because they already have those customers. Now for a new customer, they're delighted to have the new customers build underground, and two-thirds of all new, all new developments are underground served. And that's before Wilma. Now after Wilma I bet you it's going to scoot up to 80 or 90 percent.

When you say people aren't willing to pay for underground facilities, it's clearly not true because two-thirds of new developments are choosing to pay the higher price for underground facilities.

All right. What's needed? And here's where you, the Public Service Commission, can really and need to play a role.

Make sure there's going to be a customer-friendly environment for underground conversion for towns and communities and villages that want to do that conversion, are willing to pay it on their own, give them an incentive. Make it administratively easy to do. Don't, don't put obstacles in their way.

Why overheads? Well, if you must have overheads, and I'm no expert at it, on that, if there must be, then find another way to provide an economic incentive. Pay a small component of it. It's very expensive inherently. Make it a little cheaper. But expect that you can't -- we can't afford as a state to convert the entire state to underground, that's probably beyond reach, but you certainly can create an encouraging environment. Make it administratively simple. Answer the letters. Probably the power companies need to set up a little department that handles this. They're not organized to, to deal with the public in this way yet, and it wouldn't be hard for them to do it.

Facilitate the administrative processes. That's my message to you today. I thank you so much, and I'll be glad to answer questions, but I know that's not on the agenda for us at this time. Thank you so much.

MS. HELTON: Thank you, Commissioner Falcone.

Now we have Schef Wright, who represents the Town of Palm Beach.

MR. WRIGHT: Good morning. Thank you, Chairman

Edgar. Thank you, Public Service Commission. Thanks, Mary Anne, Bob and Connie.

I'm sure I know the vast majority of everybody in this room on a first-name basis because I've been working in energy in Florida for 25 years. I worked here for seven years when it was in the Fletcher Building.

I was born and raised in Florida. I have lived all but nine years of my 56 years in this wonderful state and I really love it. I lived through Donna and Betsy when I was a kid in Miami, I lived through Kate here, and I lived here, to my good fortune, through the near misses that we in the Tallahassee area experienced when the storms struck last year and this year.

My first exposure to the, actually my real first exposure was the undergrounding issue, to the undergrounding issue is when I worked on the CIAC rule back when I was on staff in the mid '80s. But after that the law firm that I was working with while I was in law school was engaged by the Town of Golden Beach, which is in the very northeast corner of Miami-Dade County in 1989 and 1990. They wanted their facilities put underground. We believed that the service was inadequate. The PSC, in fact, found that our service was not reasonably adequate, sufficient, et cetera, but that there was no willful failure and, accordingly, there was no penalty imposed on FPL.

But I wanted to share the following anecdote with you. My first experience going to Golden Beach was I drove into town from the south coming up A1A, and the first thing, I'm not making this up, the first thing I saw on the right-hand side about 100 feet inside the city was an FPL truck working on a rusted out transformer. It's a coastal area. As Commissioner Falcone said, salt spray wears these things out. The poles in Golden Beach were leaning every which way. We wanted underground. It didn't, it didn't happen. It didn't happen following the review of undergrounding mandated by the Legislature in 1989. Frankly, in my opinion, in my view of the world, in my experience it should have. Something a lot more than happened, which is essentially nothing, should have happened at the very least after Hurricane Andrew whacked our state in 1992.

I'm here to speak on behalf of the Town of Palm Beach. We are working with Senator Jeff Atwater and others sponsoring a bill that would encourage, not mandate, but encourage the undergrounding of electric distribution facilities in Florida. I know a lot of people in the room have seen the bill and have copies of it. There are copies right yonder on the staff table there.

How did we get here? We got here for a lot of the reasons Commissioner Falcone mentioned. There's a perception, and it's been Palm Beach's experience that it's somewhat difficult to get an undergrounding project done. It's difficult to get information on certain costs. We wanted information on the net book value which factors into the CIAC and we had a really hard time getting that.

There are other features of the utility's tariffs that, intended or not, discouraged the installation of underground facilities. For example, the requirement that the utility own the facilities even where a municipality might pay $10 or $35 million in a CIAC with no credit ever to be given if the utility, if the municipality subsequently decides to establish a municipal utility system. Basically Palm Beach's franchise expires, I believe, in March of 2011. If we pay $35 million this year for undergrounding and then we want to municipalize at the expiration of the franchise, FPL has made it very clear to us they will want to be paid the entire value of their system, including the underground system, most of which the cost we will have paid for.

There are questions, as Commissioner Falcone alluded to, about the proper application of overhead costs. And I mean in that context indirect and general costs that are allocated to jobs, and the general refusal by utilities in my experience to include differential O&M costs in the computation of the CIAC and their refusal to include the prospect of avoided hurricane restoration costs in the calculation of a CIAC.

Here's what the bill will do. It establishes underground as the presumptive, not fully mandatory, but the presumptive standard for new service for public utilities. The municipal utilities and the cooperatives are specifically excluded. It recognizes that underground is clearly the preferred standard of service, it is becoming the standard of service by choice, it's just not yet the prescribed or mandatory standard. It would be a presumptive standard. It would be rebuttable by a demonstration that overhead in a particular instance was not, was not the most cost-effective or best method.

The bill would encourage the public, it would actually direct the Public Service Commission to promulgate rules and the utilities to behave and govern themselves in such a way as to encourage the conversion of existing overhead to underground to the maximum extent feasible. It has specific provisions that would remove barriers and disincentives to municipalities and other local governments participating in underground projects. It would establish a utility obligation to maintain data and submit reports on costs and on reliability. Frankly, it is unfathomable that our utilities in Florida, with somewhere north of one-third of all their distribution facilities being underground and, correspondingly, a little bit less than, less than two-thirds being overhead, with all the reliability issues that are posed here, can't tell us what the relative reliability of underground versus overhead is. They can't tell us what percentage of the cost of restoration in 2004 and 2005 was attributable to underground and overhead. The only number I've ever seen on that subject was in Bernie Windham's testimony, a member of the PSC staff then and now, Bernie Windham's testimony in the 1990/91 investigation where he said he believes the proper number is probably around 97 percent of hurricane restoration costs should be allocated to overhead. If that's true, it should tell us something.

We need to know all the costs and benefits. We need to know what we would call the social costs and what we reformed economists like myself and currently practicing economists would call the external costs, the social cost, the cost of food that goes bad, the cost of medicine that goes bad, the cost of productivity that is not realized, the cost of lost wages and everything else. When you take these things into account, the numbers are staggering. If you looked at a utility, a conventional utility expected unserved energy analysis with a fairly high value that the utility would place on lost kilowatt hours delivered to customers, the numbers become on the benefits side of the equation staggering. They're very, very big numbers.

And I want to make one other point on this. This consideration was mandated by the Legislature in 1989. It didn't get much real consideration from the Commission other than Bernie's testimony, which addressed it very explicitly. But this is specifically consistent with what several of the panelists at the Governor's energy forum last month were talking about when they said we need to develop our state's energy policy. We need to develop Florida's energy policy with a goal toward maximizing the greater good. That was the catch phrase that was used.

There are also some interesting, and I haven't had a chance to look at them yet, but I'm trying to round up some consultants and some funding for them to take a look at, there are some very interesting and potentially complex cross-subsidization issues. People served by underground don't have to have the trees trimmed outside their house. They have to pay for everyone else's tree trimming. You know, if the number on hurricane restoration costs really is something like 97 percent overhead, the people served by underground generally speaking aren't causing those costs to be incurred. Now they are to a degree served in a number of instances by upstream, upcurrent overhead feeders. But in terms of what's sort of in their development, there isn't any overhead there, but they're paying for everybody else's overhead facilities to be restored.

One big issue that we have encountered -- and I also represent the Town of Jupiter Island on these same issues. One big issue that we have encountered is, as I mentioned, the utility's unwillingness to give us credit for CIACs that we would pay if we ever were hypothetically to decide to municipalize. This is a big barrier. It's one thing when a town council or a town commission is sitting there before its citizens and says, yeah, we're going to spend $30 million now, we're going to spend $10 million now, and if we ever decide to municipalize, we'll get a credit for that against what we have to pay. It's a real different thing when they have to say, yeah, we might spend $30 million now and then if we decide to municipalize in six years, we're going to have to pay that same $30 million plus whatever else the cost of the system we buy is however that may be determined. The bill would change that. It would give the municipalities either credit for what they paid or the opportunity to buy the system for the difference between what they paid and what it cost. Either way, in our view of the world, it is eminently fair, it's economically fair and equitable, and that's what the bill will do.

It gives local governments the opportunity to install underground systems and own them so that if they ever decide to municipalize, it's simply a matter of changing the connections in the building (phonetic). It would reinstate the municipal purchase option for, in utility franchises that was present in Florida law until 1973 for municipalities to buy the facilities of franchisees pursuant to arbitration rather than eminent domain. It will direct the PSC to ensure that overhead and, again, I mean indirect and general costs, overhead costs are appropriately considered and not overloaded in any proceedings before the Commission where undergrounding costs are an issue.

By the way, where this becomes an issue is where a utility wants to be paid all of its overhead costs even where, as Commissioner Falcone mentioned, the municipality pays for the work. We are completely on board with the general provision in the utility's tariffs that we should pay for review and inspection. They're certainly, they're going to be maintaining the facilities, they're certainly entitled to come inspect and maintain them. But they're not entitled to, in our view of the world, to the whole engineering cost. Because when they give us the binding cost estimate and give us our nice set of plans, they say, you can build from these plans. In my world that means that covers at least the engineering and all that remains is the inspection and evaluation, which is actually the language in the tariffs. It encourages -- the bill will encourage the use of rights-of-way versus easements and it will encourage, not mandate, the use of rear yard easements where they presently exist, and it will also in that regard allow correctly utilities to require that such easements be kept free of obstructions. For example, where there's an alley, there's not really much of a problem. Where there's a fence and five-foot wide hedge and you want to put underground underneath it, that's a problem. We recognize that, the bill recognizes that.

Our conclusion is this: It's time for more action towards encouraging undergrounding now. We strongly believe that if, after Hurricane Andrew struck Florida in 1992, the Florida Legislature had enacted a bill like this or we had voluntarily or with the Commission on its own initiative had moved toward a California Rule 20 type situation where all new distribution goes in underground with provisions for the orderly, timely conversion of overhead to underground had been adopted or enacted, we would be in much better shape today than we would, than we are, given the way things have evolved with the storms of 2004 and 2005.

I'll echo one thing that, actually something Commissioner Falcone touched on and also something that Mayor Castro touched on. We know that undergrounding is not a silver bullet. There will be some instances where it is not the most cost-effective alternative. The classic example is the fish camp out at the end of the Three Mile Run on the Withlacoochee River. You know, it ain't going to make sense to underground the wire running out there. But in many places, in many places -- probably, in my view of the world, probably in those places at least -- well, new -- putting new in underground is the way to go. And conversions, when all costs, hurricane restoration costs, O&M costs, the cost to the people who are without power for six to 18 days, when all costs are considered, the conversion of existing overhead to underground will be justified in many, many instances. Thank you.

MS. HELTON: Thank you, Mr. Wright. If you all could remain there, I think we have at least one question. And I guess I probably should have said earlier this morning, of course, if any of our bosses that are sitting in the room have any questions, we would be happy to hear you.

MR. BALLINGER: Mary Anne, this is Tom Ballinger with staff. We did get one question from the audience. It was for Commissioner Falcone. I believe you mentioned the current estimate is about $8 million to underground for Jupiter Island. And the question is this: How does that break down into an average cost per customer, if you will, on your island, and is the town doing anything to help funding or the assistance in funding of that cost?

COMMISSIONER FALCONE: Okay. I'll answer the question, but first I'll say that that figure could go up a little, if we choose, and we hope to put better hardware that is waterproof and actually goes into vaults under the ground, those are switches, might add a couple of mil. But then we're hoping it might come down a little if, indeed, FPL comes through with their flirtation and proposes some kind of cost contribution or if it simply backs off on the overheads. So it may end up around that figure. And it's $13,000 per customer, per home or home site, $13,000 per site.

Is the town going to do anything? The town will do this, it will -- as you know, the town doesn't have deep pockets. It gets its money from us, the residents, through taxes. What we're going to do though is float a bond and spread that cost over 15 or 20 years, probably 20, the life, at least the life of the facilities. They may actually go for 25 or 30 years. So we'll spread it out over time. We're still thinking about whether we'd put a little part of it on the electric bills because there is a tariff provision that the Commission has approved for that, and a little bit in taxes, half and half. We haven't decided, but those are the choices we're considering.

MR. BALLINGER: Thank you.

MS. HELTON: Mr. Trapp.

MR. TRAPP: I had a question for Mayor Castro actually.

You had mentioned in your presentation a proposal for a community action type of surveillance, if you would, between the city employees communicating with Florida Power & Light and sharing information on problem areas, trouble spots. Is that something that is in the proposal stage or have you received any type of concurrence from the company on that?

MAYOR CASTRO: We proposed it to them and they have not acknowledged or accepted the offer yet.

MR. TRAPP: So it's something that's under consideration by the company?

MAYOR CASTRO: As far as I know, that's correct.

MR. TRAPP: Thank you.

MS. HELTON: Mr. McNulty, did you have a question?

MR. McNULTY: Yes. I also had a question for Mayor Castro.

Mayor, could you tell me whether or not the City of Dania Beach maintains tree ordinances of any sort?

MAYOR CASTRO: Actually we do maintain some tree ordinances. But, again, because of some of the age of our town, a lot of trees were there long before a lot of the ordinances came along, so there are trees in places they don't need to be. Not an electrical issue, but a good example was years and years ago it was decided that black olives should be placed along the swales of some of the residential areas. Black olives don't do well in hurricane winds. They seem to fall over and take up your sidewalk and your street with it. So that's something we're also trying to correct. But, again, some of our properties were platted so long ago, they're 40 feet by 100 foot lots on our homes, and so a lot of the trees are literally decades old. And in South Florida where trees are a very protected species, as they should be, we don't go and just cut them all down. But FPL does come through to maintain.

I, again, love trees, I can't say that enough, but I think we have to be practical. And, again, I think if we can come up with a program that we encourage homeowners and property owners to move those trees by giving them another tree or FPL giving them another tree or somebody doing something, kind of like the canker program or whatever works, that's what we need to do. But these trees are usually quite old and have been there long before probably even some of the power lines went up.

MR. McNULTY: Thank you.

MS. HELTON: Okay. With that, I think that concludes the presentations by local government officials. Now we'll move on to the presentations by technical experts. Roy Jazowski and Mark Hammer with The Homac Companies.

MR. JAZOWSKI: Good morning, everybody. And I thank the Florida Public Commission to speak here today. I wanted to -- Mike, if you could bring up the presentation. Okay. If you could move the slide forward to the next one.

Since Homac is a Florida-based manufacturing company and since we are a major connector, supplier of connectors for the overhead market and also the underground distribution, we were approached by EPRI in the Year 2005 to help develop a connector that would break away during storm conditions. We feel that our, our infrastructure, both underground and overhead, is, is, is way too -- is not pliable, it doesn't move. So we are looking at trying to control the break situation, that if a tree does come down, we can actually supply and we can break the device free from the energy line.

Next slide. The goal of the project was to first mitigate any damage to the power line structures and systems. Second is we wanted to restore the power quickly, we wanted a device that we could actually plug right back in again. And, third, we also wanted to eliminate any damage to the service customers, service entrance power line system.

Next slide. Additional goals of the project is that we wanted to improve the SAIFI and the SAIDI. Just a little brief overview. For SAIFI, that is looking at the average interruption frequency, and also for the SAIDI, the average interruption duration. That was the goal for this project.

Additional other goals -- next slide, Mike -- was to improve safety to the public and the repair crews by insuring that when the lines are de-energized, when the lines are hit by an object, a tree or a branch, that they would come down to the ground safely and they would not be energized on the ground. And then last but not least we wanted to restore the power quickly with no cost or repair charges to both the utility and the customer.

Next slide. This is a typical picture of the service entrance of our customers, our end, our end-users. In this instance you can see the service entrance connections. Normally in a severe storm these service entrances will be damaged, they will bend over, they'll break, and they could be in the area of costly repair of $500 to $250 -- $2,500.

Next slide. The picture here is actually the Storm Safe device in place up on an overhead device. It is designed to break away. There is a fuse link that's connected to the pole. In this picture here there's actually two service entrances feeding two power -- two houses coming off the secondary or the transformer.

I have the device here, and when a tree or object actually hits the service entrance, it literally pulls away and it disconnects. Now this is not a 50-cent device. This is an area that we are going to have to overcome. Are the utilities going to be willing to pay for extra monies for a device like this?

Next slide. Benefits, of course, are faster restoration time; improved SAIFI and SAIDI; O&M costs, no damage to terminal poles; customer satisfaction where both customer satisfaction is at the homeowners where we mitigate any transients that go into the line where we actually destroy computers, TVs, radios; the safety to the public so that lines are de-energized; and end result are the crews.

This is a -- we wanted to get some field experience of this device. And in conjunction with TVA and also with -- this was -- we had a beta site at Tullahoma out in Tennessee and we actually installed three devices on the system. And believe it or not, within three to four months we actually did have a storm and a tree did come down on the device. The bottom picture there is the tree that did come down. In this instance, the crew was able to come right back in again, cut down a tree, get the line up and basically just plug the line back in again.

The fuse link, there is a mechanical fuse link that is attached to this device. The fuse link can be set at 500 pounds, 800 pounds, 1,000 pounds. It depends on wind loading and, of course, if there's any ice storm conditions if we're looking at other areas of the country.

Next slide. This is also another test we did. This was with Kansas City. Unfortunately, we do have a video that goes along with this but we could not get the video going. I'm going to sort of simulate this to you. Under this condition the pole is actually released by the truck, the bucket truck. And you can see there's two, there's two service entrances with the device up on the power pole. The pole comes down, it cleanly breaks the two service devices, there are no damages to the pole and there is no damage to the service entrance connector.

Last slide. The project results, it can be applied in any overhead service drop condition. It's adaptable to, to any existing new services or existing services. We can supply a three drop service or a single drop service, and we can basically just put the fuse link back in and plug the device back in and energize. This device will be available in the third quarter, so we are working very hard to try and bring some solution to the power companies.

To Mark Hammer. Thank you.

MR. HAMMER: Thank you, Roy. Good morning. Just a little bit about Homac. We're a Florida-based manufacturer. We started in 1963 and actually moved to the State of Florida in Ormond Beach in 1972. So just like everyone here, we have a vested interest in doing our part to come up with ways or solutions that we can mitigate some of these storm issues and problems.

We are, in fact, the leading producer of electrical connectors. We've got about 425 employees and three manufacturing locations; two in Ormond Beach and one out in California.

Next, please. We were recognized recently also as "Manufacturer of the Year" in Volusia County by the Volusia Manufacturers Association. This is our main campus in Ormond Beach.

Next, please. And a few miles down the road, another several facilities that we also have in Ormond Beach, Florida.

Next please. Our, our niche, if you will, is service to the distribution sector of the electric utility industry. And I think Commissioner Falcone mentioned from his perspective that that's been somewhat the stepchild in our infrastructure.

I concur with that. But anyway, that's the area that we, we service in the electrical industry.

Our customers, obviously, are the utilities themselves: IOUs, RECs, as well as municipal utilities. And, in fact, we service customers across the United States as well as 40-plus countries across the world.

A little bit about our history. In the early '60s, that's when the transition began from overhead distribution to underground installations. And as a matter of fact, that time period coincides with really the birth of our company. Our founder in 1964, in fact, invented, patented and developed the first connector designed specifically for what's called URD, underground residential distribution, that device on the bottom there.

Next, Mike. We also pioneered the use of EPDM rubber in our industry for insulating and waterproofing these underground joints. Now, again, these are, these are part of our heritage as a company. These basically contribute to sealed underground connections that give the whole system integrity. Obviously, the cable itself is underground cable, but it also has to be sealed when a connection is made whether it's a splice or a tap. And through the use of EPDM rubber technology, what we call our Flood-Seal technology -- years and years ago we, in fact, provided an economical, cost-effective solution for sealing these submersible cable joints.

Next, please. This is an underground cable connector device. As a matter of fact, we sell quite a few of these locally to Florida Power & Light across the state. But this would be an example of our connectors and sealing capability utilizing the interference-fit rubber's stretch and memory characteristics. Now that's important because when this formulation of rubber that we use in our products to seal our connectors is stretched, it does have a memory. It basically bounces back. We have these installed underground across the state, across the country that have been in place for decades. URD cable itself is basically designed to last 30 years. Our connectors have to last at least as long as the cable itself.

Today, Homac has grown to become the leader in design and manufacture of electric power delivery connector solutions. And, in fact, we're the largest manufacturer of secondary underground distribution connectors. We are the experts in making these type of connections for underground. We're also a recognized leader in overhead, as you saw with Roy's portion of the presentation, as well as substation connectors.

A little bit about our products. Next, please. Some of our family of products. This is specifically for a substation.

Next, please. And as a few of the gentlemen before us mentioned, I've got to also, from our perspective, convey that underground distribution, even though we presented a potential solution that Roy just walked through on the overhead side, underground distribution without question is the way to go. Some facts, obviously improving reliability is -- should be our main concern as far as why go underground. Obviously the underground electric system does, in fact, mitigate outages, it improves the aesthetics. And post-9/11, obviously security concerns are going to help drive additional growth for underground. Today underground cable placement is growing eight times the rate of overhead, but that's only because of new installations. It's not because of conversions.

We had some statistics shared about the State of Florida or Florida Power & Light specifically, but across the country underground is growing eight times the rate of overhead. But, once again, not because a lot of utilities are converting their systems, it's to accommodate new installations. So right now across the country less than 15 percent of distribution cable is, in fact, underground. There's a tremendous opportunity to improve our reliability across this nation. So we, in fact, support any initiative that focuses on improving our electric power delivery infrastructure, our system reliability and certainly customer and lineman safety. Thank you.

MS. HELTON: Thank you, Mr. Hammer and Mr. Jazowski.

Next we have Michael Osterhout, who is with the Composite Technology Corporation. We've given him about five minutes to conclude this section.

MR. OSTERHOUT: Thank you very much. Yes. I'm Michael Osterhout from Composite Technology Corporation. Our company is a manufacturer of a new conductor product. I'm going to talk about those issues aboveground. The distribution site underground is, is certainly something that needs to be prioritized. But in those instances where it cannot be prioritized, our company is working with General Cable Corporation and a number of utilities around the country, as well as with Florida Power & Light currently. I think we have some dialogue going with them at this point to see what we can do to reinforce and strengthen and harden the bare overhead transmission conductor that comes from the substation into the feeders and is all around your state.

The composite technology is a bit different in that the core of this particular conductor manufactured by General Cable is not steel. It's made out of a variety of composite components. The composite components tend to be a lot stronger than steel, about 25 to 30 percent, and yet lighter weight than steel.

Consequently, that combination, like the Defense Department's submarines and aircraft and NASA, allows for a great deal of environmental robustness and flexibility. What we find is that we have usually 30 percent to 40 percent greater strength capability in the overhead conductors that can withstand winds in excess of 200 miles an hour. These are engineered products, so we also are working on a side -- the line side and the pole side as well. The pole side, working to engineer some structures out of a variety of composite materials that can likewise withstand those high winds and water.

One of the characteristics of this particular conductor is that it has -- with General Cable's help, it's called aluminum conductor, aluminum conductor composite core, ACCC/TW, trapezoidal wire. Its mechanical performance is exceptional, but its electrical performance is even better. The composite material doesn't have the same temperature constraints that steel does, so you're going to increase the current over a particular line which increases the temperature. As temperature increases in your traditional steel, you have a tendency for the steel to expand and the conductor to sag.

Composites are made so that they can withstand greater temperatures. Typically you might run 100°C for your current conventional conductor before it begins to sag beyond that limit where it hits the trees or where it becomes unusable. With a composite core within your standard conductor, same weight, same outside diameter, you can go up to about 200°, 220° with no sag. These are the kinds of things that are happening. Because that will allow you to take a conductor that is now made of this particular material, you can reconductor existing structures and double your impacity. So you don't have to build new structures, you don't have to worry about that.

If you have priority areas, the islands, the outer portion, the shorelines, utilizing a combination of composite structures with the conductor that we currently have can give you not only future growth, but something we think is extremely reliable, sustainable. The composite also, it reduces the electromagnetic field at the core, reduces the heat, you have no hysteresis, there's not the reaction of dissimilar metals that you have with steel and aluminum when you run it at a higher temperature, and salt water corrosion is mitigated substantially.

We're working with -- before the hurricane in New Orleans we were working with ENERGY to do a project across Lake Pontchartrain because they had consistently corrosive conditions on the different spans of conductors. With the composite core you eliminate a lot of that corrosion as well. So there are some issues coming out here that -- we've been in business since 2002. Actually the conductor has been operable since 2004. We have about nine installations now. Commissioner Falcone's old alma mater, AEP, has just concluded a pretty substantial installation of this down in South Texas. PacifiCorp also has concluded that it's a very beneficial product for them in the Pacific Northwest out of Salt Lake

City, and we have a number of other projects underway.

My message today is more informational and to make you aware that there are new technologies that are addressing many of the issues of strength, durability, sustainability and reliability.

We do have -- the conductor sizes are about ten different sizes, so we address low voltage, not the distribution size cable at this point. You can use it, but the lowest is about what they call a 336 linet (phonetic) size. If any of you from the utility industry, transmission areas are here and understand what I'm talking about, but that would be the smaller-sized conductor. Conventionally we are in the transmission side where you have the bare overhead. That still is an issue because those things have a tendency to blow down and the poles have a tendency to fall down during traumatic events which you have experienced and apparently may experience again more frequently than you desire here in Florida.

So our goal, by the way, is to not only work with what we have, but because we're an engineered product, is to work with the utilities and municipalities and the co-ops in designing specific products, whether it's structures or conductor, that may withstand those issues that you're dealing with and can do so very effectively and cost-effectively as well.

I'm going to have to say, because I have five minutes

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MS. HELTON: Which I have to say is just about up.

MR. OSTERHOUT: -- which my time is about up, is please leave me business cards if you have any interest in what we're doing. We will put, I think, something on the website, you've invited to do that, so you can have a look at all the technical aspects of what I'm talking about. I do have some cards and samples of the type of conductor here if anyone is interested who would like to pursue more questions and discussion on this. Thank you very much for the opportunity to present a solution potential.

MS. HELTON: Thank you, Mr. Osterhout. Let's take a break now until 10:45. And if I could ask during the break if the next set of speakers could come and set up here so that we can move quickly through the next stage. Thank you.

(Recess taken.)

MS. HELTON: Let's go ahead and start our next section, or actually I guess continue the next section with presentations from technical experts. We have with us Mary Glass and Dr. Martin Skeer, who are with New Stratagem Consulting, and they are going to be next.

MS. GLASS: Thank you very much. We're very pleased to be invited to participate in this workshop. I think it's going to be something that's useful not only to Florida, but I think the data you're gathering will be of benefit to people across the country. So I applaud your efforts.

MS. HELTON: Thank you.

MS. GLASS: New Stratagem Consulting does management consulting to electric utilities, both public and investor-owned, across the country. As part of our work we've looked at joint use pole loading in a number of aspects for our customers, and we've also pursued our own independent research on this topic because we feel it's a very critical one that has not necessarily been fully explored.

We have been looking at this from a different perspective than the engineers. We are looking at this from a policy, safety and risk approach, trying to come up with what are remediation techniques and other mitigation measures that can be taken to avoid the problem of overloading due to joint use.

And let me just step back. For those of you who aren't in the utility community, joint use simply refers to any multiple use of a pole by different parties. That could include the utility, but it also could include telecommunications, it could include streetlights, traffic lights, a number of other uses that utility poles ultimately end up getting tapped for because of the ubiquitousness of the facilities.

And what we've done is try to pull together the parts of this research in a very simple way for you all today, the parts that we think are most applicable to the problems that you're facing with regard to hurricane loadings.

And so we're looking again primarily at existing poles, not new infrastructure. In most cases when a utility puts in new infrastructure, full engineering design goes in. For some of the facilities that are already there and have been there for 50 years, no real formal design has been done. And that makes good sense because safety factors were quite large 50 years ago.

But looking at one of your concerns, the number of poles that broke as a result of the hurricanes, I think you have to step back and look at all of the root causes of structural failures of poles, not just the hurricane winds, because frequently what you'll see is several different factors come together to actually cause a pole to fall down. So if you focus only on one of the factors, you may be missing another opportunity to harden your system in a simple, less expensive way. So obviously there are aging and maintenance factors, there are extreme weather factors such as hurricanes, there are accidental factors, and that could include tree limbs falling, natural, other natural factors, but also cars hitting poles and things like that, so human-made factors. And finally overloading factors, and this has really become a major issue because of the number of communications attachments that have gone on poles over the last, especially the last 20 years and particularly the last ten years. As the communications industry is expanding and we're demanding much greater service, and as the FCC has been promoting competition in communications, you're just seeing an incredible proliferation of these facilities on utility poles. So we understand that that's going to interact.

Can we have the next slide? We've done some study and we'd just like to share some of our views from this large mass of study in talking to literally dozens of joint use managers across the country.

First of all, we believe that about 5 percent of current poles are overloaded. Obviously this is more likely -- and it may be higher in urban areas than in rural areas, but we think that's a conservative number. And then another 10 percent of the poles are approaching overloading or are in a situation where in really extreme weather conditions they could come down as well. Urban areas and areas where you see a confluence of communications facilities, what you call backbone areas where you have very large conductors going down attached to the poles, those are the cases in which you're most likely to see the overloading. And this is going to continue. I think this is one of the most critical factors. Yes, we're finding it in existing poles, but with, again, the push for more wireless, more fiber, overbuilds on systems, these poles are just continuing to get more and more loaded up, and it's something that we have an opportunity to deal with before the problem gets worse.

Looking -- next slide. Looking at the evolution of this, I think everyone in the room is pretty familiar with the fact that, you know, this has been building for a long time. The utilities know it and they've been concerned about it and watching it. And really it's some of the FCC policies that have caused this to get worse. They have set policies that are not tough enough on unauthorized attachments. We estimate that 10 to 20 percent of the communications attachments in any typical territory are unauthorized, meaning they've been unreported, which makes it much more difficult for the utilities to track what the loading situation is on their poles. In addition, the FCC allows, specifically allows overbuilding, overlashing of cable. So if a cable company wants to come in and do a whole new overbuild, they do not need to inform the utility before they do it, they do not need to do any kind of loading studies. And in many cases the additional conductors that they're attaching are quite large and the cumulative load on the pole is significant.

And, finally, because the FCC was pushing after the Telecom Act of 1996 for all the building and the new competitive facilities to get out there quickly, they put very short time frames on how long the utilities had to review what was going up and a lot of things got pushed through without, I know for some utilities, the time they would have liked to have had to review the loading situation before it went up.

This FCC situation is now showing the potential of getting worse again. There are two petitions in front of the FCC right now, one of which would attempt to lower the rates paid to utilities for attachments. And the other is looking for free, unfettered, unmonitored access to conduits and vaults, underground facilities, which obviously is going to make it more difficult for the utilities to control and be responsible for those assets that they're operating.

Next slide. Now for us I want just to define this carefully. We're talking about pole overloading in a very specific sense when we do our studies and the analyses we've done. Again, we're not construction designers. We're looking at this from the point of view of what are the established safety factors and engineering design thresholds that have been set either by the utility itself or by the regulatory agency in their state? And so what we're doing is comparing the performance of poles against whatever the applicable standard is there. We're not assuming that there's some magical number that's right for everybody.

And what we found is that in order to simplify our model, make it work better, we looked at the predominant stresses which are the horizontal stresses or the bending stresses primarily from the wires, the conductors and the guys that are used to hold up the poles.

You will find -- next slide. You will find that there are many companies out there that do have much more detailed models for doing pole design. Ours does not do that. As I say, we only consider conductors and guys. We are only looking at it from the standpoint of safety: Are we exceeding standards? And we are looking at it from the standpoint of, okay, depending on what we find, the nature of the overloading, what's causing it, where is it occurring, what are the best mitigation tactics and remediation steps that can be taken to solve the problem? And we run our model in two conditions. One we call the measured condition where we look at a pole just as it's standing in the field on a regular day, no unusual storm conditions, and measure what's happening on that pole. Is it being overstressed? Does it have lots of capacity on it? Then we go and look at the design standards for that particular utility for that particular area if there were a major storm, what they call a designed storm, and see how that same pole would fare under those conditions. And from that try to pull out what kinds of characteristics we can use to design remediation programs.

So let me give you a couple of fairly quick examples. The first is, what I think as kind of a typical urban pole, it's got a lot of electrical conductors, it's got a lot of telephone, at least two telephone conductors on there, you've got cable down at the bottom, you've got a streetlight attached to it and a bunch of other smaller ancillary facilities. There is also some pole-to-pole guying on this pole.

Let's go to the next slide. Okay. Now let me just take a minute to explain this so you can understand what you're seeing. The horizontal axis is the height of the pole going up to the right. So it's as if we laid the pole on its side. And we took measurements every three inches along the height -- did calculations every three inches along the pole.

The vertical axis is the pounds per square inch being exerted, bending force on that pole. The blue line at the top is the maximum design standard for that pole under that utility's criteria, and the yellow line is a calculation of what the stresses are on the wood at the various heights of the pole. Now the little hash marks at the bottom are actually the location of the various conductors. So it's interesting to see that the peak forces are where the lowest conductors, the communications and the telephone conductors are located on that pole, and it obviously drops off to about zero at the top of the pole. Well, that calculation is done assuming that the pole is new. That's the way it's usually done.

But we went ahead and added some aging factors and two basic factors: One, rotting at the bottom of the pole, which is where you'll usually see the most significant rotting; and then just plain aging of the fibers of the wood so that they can carry less stress. And when you do that calculation and also look at a lower threshold, you can see that blue line has come down because we're assuming that the maximum safe threshold is lower, you see that now even standing in a normal day in a measured condition that pole runs the risk of coming down. Do they always? No. There are lots of extra safety factors built in. And there are poles that look terrible from the output model and for one reason or another stand up for a long time after they should. But these are indicators of where you have serious problems and indicators of how you can do something about it.

Next slide, please. Here are the design conditions. And, again, obviously the threshold is the same, but the scale has changed on the left-hand axis. And what you're seeing is under design load conditions the bending stresses are much, much higher. In this case, this was a utility that did have ice and snow and wind loading, and so you see that any large conductors are going to be that much more influenced by increases in icing and in wind speed. They're move heavily influenced than a very small conductor which doesn't pick it up.

So, again, you can see with and without aging effects, it's basically the same story, but this is a pole that's going to come down if you have a designed storm. Pretty much you can be sure that that's going to happen unless you make changes to it.

Next slide. Then we thought it would be interesting to look at what are the contributing parties. Let's break it apart and not look at all the stresses on the pole. Let's look at who's putting what stress on the pole. And as you can see, both the teleco and the cable alone on that pole would exceed the allowable standard. So they're obviously a significant part of the problem.

The electric alone is getting close, but probably at the time it was designed and not really taking into consideration that there would be such an increase in communications attachments, it probably was a fine loading. And it still would be now, but you can't assume that they're going to be alone on that pole anymore.

Let's keep going. Next slide. So what's the takeaway from all of this? Well, first of all, we know aging is going to be a significant factor in pole failure. Obviously we can see that just from the measured condition.

The other thing is that the cumulative stresses as you can see in the designed storm condition are definitely going to take that pole down if they hit that pole.

But I think the third is one of the more interesting. When you combine all of the loading from electric, telecom and cabling, as it turns out, that first combined slide looked better than the individual slides for the telecom and cable.

And what you're seeing is a balancing effect. The stress from one is counteracting the stress from another, and so overall standing in the field it's not quite as bad as you thought. But the reason that those stresses are so high, and this is important to think about with remediation, is that the telecom and cable conductors were extremely taut, unlike electric. Sometimes for clearance purposes or whatever they're pulling those conductors very tight, and that significantly increases the potential of pole failure. Something to keep in mind.

But it isn't like there isn't anything you can do and you have to replace every pole. In many cases you can reconfigure the guying. This pole had very little guying on it, and guying is relatively inexpensive to fix the problem. You can increase the cable conductor sag. Again, rather than it being so taut, loosen it a little bit. That will relieve and balance the stresses. The balance between poles is very important to the calculation. And then if none of those work, you can go and replace a pole. But that's sort of the, the last, last-case option. You really don't want to do that unless you have to because obviously it's very, very expensive.

MS. HELTON: Ms. Glass, with great trepidation I have to tell you that your time is up, so if I could ask you to conclude. This is all very interesting and informative, but unfortunately I think we do need to try to stay on schedule today.

MS. GLASS: I was just going to jump to that.

MS. HELTON: Okay. I'm sorry.

MS. GLASS: Coming out of all of this we found that there are a number of factors with regard to communications attachments that should be considered along with whether another loading. And so what can the regulatory agencies do? I think this is one of the key things, what can you do, because that's your inquiry.

You need to get out and assess the nature and the extent of overloading here in Florida. We know it happens everywhere, but to what extent is it happening here where there is a concentration of communications attachments? What are the root causes? Do some of the kinds of studies we've done. Set up remediation programs that balance the cost to the customer with the benefits that are going to come to them as far as reliability and safety from the these poles not falling down. And then develop a load monitoring program criteria that can be used by the utilities and provide them the funds that they need to be able to carry this out. This is a problem that's built over time and it's going to take some time to remediate it and it's going to take some money that needs to be set aside for that. And then some kind of database on direct and indirect costs. Because these situations are causing the utilities to experience significantly higher costs and those go to the rate base. And as someone earlier was talking about cross subsidization, it's really critical that the electric customers are not subsidizing the telecom customers. Thank you.

MS. HELTON: Thank you very much, Ms. Glass. And next we'll hear from Dr. Kurtis Gurley with the University of Florida.

DR. GURLEY: Good morning, and thank you for inviting me to speak today. To give you a perspective of where I'm coming from, I'm a civil engineer working at the University of Florida. The three other folks listed on that slide are also civil engineers. So none of us are atmospheric scientists or meteorologists. We don't deal with storm tracking or predicting where it's going to go. Our concern is what it's going to do to the infrastructure when it gets to wherever it's going to go.

And most of my focus is on residential construction, but I think you'll see there's a strong overlap with what we're learning about residential construction and utility infrastructure.

Next slide, please. What I'm going to do today is give you a very quick overview of the various aspects of the hurricane damage mitigation research we've been conducting since the late '90s in five different components, the first of which is measuring in-field hurricane ground level winds and reporting them to researchers in real-time as the hurricane is making landfall.

The second is then to measure the resulting pressures from those winds from real occupied residential structures along the coast of Florida. Those first two bullets help to define what the wind is actually doing to the things we build.

The next two bullets, testing the capacity of building components and statistical assessments of structural damage post event, help us to quantify the structure's ability to resist the wind and the loads.

And, finally, bringing in some computational modeling to put all those uncertainties together and try to predict how much it would cost to mitigate the effects of winds on a typical older or newer home in the State of Florida.

Next slide, please. Before I go on, I should also acknowledge the majority of the research that I'll be talking about has been sponsored by the Florida Department of Community Affairs since 1999, and with some recent help from NOAA.

Okay. So the motivation in a couple of different parts. Atmospheric scientists have been using the data we take to help develop some of the theories about boundary layer transition. This is a fancy way of saying they know a lot about what the hurricane is doing over water but we know very little about what happens when it hits land. So when they tell you a hurricane is a Category 3 hurricane, that means by their definition it's somewhere between 111 and 130 miles an hour over a one-minute average over the ocean. That tells you very little about what your home five miles inland is going to actually physically feel from that hurricane. So our job is to sort of try to whittle down that uncertainty and what's happening to your house, knowing what the Hurricane Center says the category is. And, of course, emergency managers can use our information to help get a sense of expectation for what the physical damage is and so on.

Next slide, please. Also the civil and wind engineers, people like myself, will take the wind speeds at higher levels, these are the hurricane hunter aircraft that drop the devices through the hurricane, then they use that to estimate ground level wind speeds. We're the ones actually collecting the ground level wind speeds at the ground, sort of the horse's mouth information, and the wind pressures and so on. Ultimately our job is to quantify what the wind is doing and come up with cost-effective ways of reducing that, and then enforcing that through building code measures and wind tunnel modeling and so on. So a lot of the information we've been collecting is showing up on the desks of the people that sit on the building code commissions and decide what needs to be done to make homes stronger and not cost a fortune.

Next slide, please. So here's the, the, the heart of the program are these portable weather stations that are ten meters tall when they're erected, they're stiff, they're designed for hurricanes, they're designed to take a 200 mile an hour wind. They're self-powered so we start them up, we leave, we come back when the hurricane is over, we take them down and we go away. It takes us about a half-hour to set up one of these towers. We've got five now and we'll have six for the next season.

Next slide, please. This is an example, a better look at one of these when it's set up. The instrumentation is located at a five-meter elevation and ten-meter elevation, redundant systems up here, giving us essentially a rooftop, average rooftop height, and then ten meters is a common reference point used by wind engineers and meteorologists. And that's just an aerial view of where we put that particular tower for Hurricane Isabel in the southern part of North Carolina along the shore. Then we also put a tower further inland and compared the statistics to tell us how that transition is taking place.

Yes, please. This is a better view of what it typically looks like when we're setting up one of these towers. This is in Navarre in the panhandle. This is the Navarre Causeway that goes out to Santa Rosa Beach. The peak wind measured at this tower was about 120 miles an hour, but we try to wait until several hours before the high winds start coming in so we can get a good sense of where to put these things down, and the weather tends to be pretty lousy at that point.

Next slide, please. What we're getting from these towers is time histories of the way the wind is behaving as it makes transition into land. So we sample 100 data points every second, so very high resolution. What we're looking at is five minutes worth of wind. This happens to be something I picked from Hurricane Irene when we put up a tower along Melbourne Beach in Florida on the east coast. And if you'll notice, this is mile per hour scale here and this is in seconds, about five minutes worth of data. The mean seems to be somewhere around 60 miles an hour. But over that five-minute period the winds were gusting up to 80 miles an hour and were as low as 40 miles an hour. So the wind isn't grabbing onto a utility pole and pulling with 60-miles-an-hour worth of force. It's pulling with 60-miles-an-hour worth of force and then it's shaking the heck out of it. The amount of shaking that it's doing goes a long way towards us learning how to design to resist failure, and that goes for residential structures as well.

Next slide, please. These towers were outfitted in 2003 with the ability to transmit the data in real-time. NOAA liked this so much that they agreed to give us some bandwidth on their satellites. So for this next year the data is going to be transmitted real-time through the satellite network and onto a public access website, which I'll put up in a second. But as the wind is coming ashore you can get a map of where our instruments are and exactly what the wind speeds are at that moment at that location.

Next slide, please. What NOAA will do with this information is to produce these contours of their peak wind maps over Florida. And you can see these contours basically represent different levels of wind speed as it transitions from over water, over land. You see the change in color because they're acknowledging there's a big change in wind speed as it comes over land. Again, that's a big uncertainty as to how much transition and what affects that transition, and this is one of the holes we're trying to fill.

Next slide, please. Real quick, we have five towers functioning now and we intend to have six operational for the 2006 season.

Next slide, please. There's the web site. If you simply Google FCMP, it'll take you to Florida Coastal Monitoring Program. This is the repository for the data that we collect, both real-time and then archiving what we've learned from previous storms. You'll get maps of exactly where the instruments were, including GPS coordinates, and then time histories of the information that we collected.

Next one, please. The other critical component of the research is measuring the wind loads on the structures themselves. Each one of these little pans contains a pressure sensor and tells us pound per square foot. Again, 100 samples every second. This happens to be a house that was set up in Jupiter, Florida, for Hurricane Floyd, which you may recall skimmed Florida and did quite a bit of damage up in North Carolina. About 28 sensors or so we put per house.

Next slide, please. This is a map of where we currently have homes that have been outfitted to take instrumentation. So for Wilma, for example, we had a home that took a direct hit on Marco Island. We're still doing the data conversion for that. But we're now able to for the first time ever have basically a full-scale wind tunnel of what specifically were the loads on the roof of that house as the hurricane came through.

Next one, please. This house was set up for Hurricane Frances along Jensen Beach. You can see the house has a little anemometer at the top. What we do then is build a little model of these houses and put it in a wind tunnel and recreate what we experienced full scale. The reason this is important is because the wind load provisions in ASCE 7 that are used for design come from wind tunnel studies. So our job is to try and see how big a difference is there between wind tunnel studies and what's happening in real life.

Next slide, please. That little anemometer on top of that house registered a 90-mile-an-hour peak three-second gust as Frances passed.

Next one. Again, sticking with Frances, each of these stars represents where we had one of our towers as it came ashore. There's the eye wall. So we have one right in the center of the eye wall, one in the north eye wall and a couple further north. These are the peak three-second gusts measured by those instruments. You can see the one right in the center saw an 83-mile-an-hour peak three-second gust. The one in this portion of the eye wall saw 109-mile-an-hour. It's a big difference in wind speed. If you double wind speed, the amount of force it causes goes up by a factor of four.

Next one, please. And this is a more detailed time history of that tower. You can get this kind of information again at the website.

Next one, please. Getting back to the difference between what the Hurricane Center says a hurricane category is and what's happening on land, this is a good example. They categorized Ivan as a three, and that's what it was doing over water as it came across land. Each one of these numbers represents a different piece of instrumentation. Either ourselves or colleagues at Texas Tech could do similar work. None of these numbers get anywhere near a Category 3 level wind. It doesn't say anything about the level of damage. What it says is it takes less wind to do the amount of damage that we're seeing than we'd like to believe, and that's significant.

Next one, please. Skip through this one and get to Wilma. That was just one from Jeanne, but it's kind of repetitive. It's in the handout. This is Hurricane Wilma. We set up our towers south of the eye wall. This is where we expected the stronger winds to come through. Again, if you look at one minute sustained wind, this is what they use to categorize a hurricane over open water, nothing got past Category 1 where we put our instruments. It doesn't say anything about where we didn't put the instruments, so I'm not saying it was a Category 1. It was definitely higher than that in other regions of the state. But because the Hurricane Center says something is a Category 3 doesn't mean what broke your stuff was Category 3 level winds. It may be significantly lower.

Next one, please. Okay. Very quickly, I just want to talk about the other segments of the research. That stuff I talked about previously is categorizing what the wind is doing to our structures. We also have ways of going in and trying to figure out how the structures are going to respond or that is how much can they take before they break. So we have a grant through the DCA again to go into homes that have been bought out and are going to be -- bought out by the state and FEMA and are going to be demolished. We literally tear apart the house nail by nail, piece by piece, and measure how much it takes to do that. So, for example, we pull off a piece of sheathing and we measure how much force it takes to pull it away from the trusses.

Here we're doing a test on the connection between the rafters and the walls. So we test the structure as built. And then -- next slide, please -- we'll go in afterwards and retrofit a different part of the house with modern hurricane straps to quantify how much difference does it make if you put these straps in your house. In this case it was a factor of five stronger just by using a couple of dollars' worth of metal.

If you have a home that's built to current standards, they have to have these in there anyway. But how much would it cost to go in and retrofit an old structure to make it much more resistant? That's what we're trying to get at with this kind of research. By putting -- we can back out the wind speeds that would have resulted in this kind of damage and tell you if you did the following $300 worth of work to your home, you can go from a Category 1 resistance to a Category 3 or whatever the numbers wind up being.

We also go and quantify the damage caused by real hurricanes. So next slide, please. Going -- we went to over 200 individual homes after the 2004 season in all the impacted areas in Florida and spent a lot of time with the homeowners and went over it with a fine-tooth comb and documented exactly what happened to each one of those houses. And we also had a good idea of what the wind speeds were that caused that damage.

So next one, please. Very briefly, the way we do this, rather than just getting anecdotal, I saw this one house that this happened to -- we have hundreds of houses that we look at the same things on each one of those houses and we're able to say, for example, that if you were in the highest wind zones in Hurricane Charley and you did not protect your windows and you lived in a neighborhood that had tile roof cover, you had a 50 percent likelihood of having window damage, at least one window damaged. If you put shutters over your windows, you cut your chances of losing windows in half. If you happened to live in a neighborhood that was all shingles, you had a 15 percent chance of getting your windows broken. Because put a shingle in your hand and put a tile in your hand and tell me which is more likely to break a window when it comes off the neighbor's house.

Next one, please. Finally, just the last two slides, we're able to take the research on what the wind is doing and how it's loading structures and the research on the capacity of those structures from laboratory experiments, breaking old houses and so on, and observing after damage, coming up with computational models. So we can build a model of how a home, what the home's capacity is to wind by breaking it down in its various components. We then apply a computer simulation of thousands of hurricanes to these different types of homes. In the long run, forget about the numbers, this is just concept-wise, what this tells us is, for example, if you had a new roof cover installed on your house and the peak three-second gust you saw was 150 miles an hour, you're likely to lose about 25 percent of your shingles.

Why is this important? Next slide. Because we can then -- in a computational model it's very easy to say what happens if I use more nails over here or what happens if I had hurricane shutters? How is the vulnerability curve here going to shift to the right, which is what you want it to do. It takes more wind to cause damage. We can, of course, very easily through contractors put a price tag on it. If you put shutters on your house, you reduce your vulnerability by 20 percent and it's going to cost you this many thousand dollars.

So in summary -- of course, this concept can be applied to things other than residential structures. We do commercial structures and so on.

In summary, what we're trying to do is put numbers to all these big uncertainties swirling around, just starting with what is a Category 3 hurricane, what does that mean to a structure that's five miles inland? What does that mean to your ability to resist that wind if your home was built in the '50s versus your home was built in the '90s or to the modern Florida building code.

Next slide, please. So with that I'll finish my presentation. I know questions are later, so I'll leave that. This is, by the way, a fake. That's one of my students, he's a gymnast. I don't put them in those situations. Thank you very much.

MS. HELTON: Thank you very much, Dr. Gurley. That was -- I definitely learned some new things there.

Next we have Dr. Alexander Domijan with the University of South Florida.

DR. DOMIJAN: Thank you all for being here this morning, and I especially appreciate the organization of this conference by the Public Service Commission, Bob, for your invitation, and I see many faces out there that I've worked with over the years, and I'm glad to have you here for this very important subject.

Many of you have spoken about the decoupling between the investment and transmission and distribution, that is transmission and distribution from generation assets. Many of you may not know that this is true for the very first time in the history of our business for the last 100 years. This is a very important issue that we need to address. And the center that I'm responsible for at USF is dealing with infrastructure issues.

I've been at UF for about 20 years, and recently I changed to USF and we're developing the center on looking at infrastructure issues. The FRIENDS group was not in response to this decoupling of generation and transmission assets but was formed before this happened. A number of people recognized that this is -- in a way one might look at it as a train wreck that's already happened but the passengers don't know what's going on. It's very fortunate that the industry has much momentum associated with it so we can prevent many of the things that are, are happening in our system and hopefully make the system more reliable.

FRIENDS is an international group that I formed with about 30 or 40 researchers 15 or so years ago addressing the needs of reliability. It stands for Flexible Reliable Intelligent Electrical Energy Delivery Systems.

And -- next slide, please. And our exploration is regarding, for this conference, looking at damage and outage mitigation techniques, and we've been working on that for about 15 years. Techniques that have to take into account present and next generation systems. Because as our system evolves, it's going to transform itself into another entity in order to make sense for customers, in order to make business sense for utilities. Also we have to look at economic, flexible and reliable systems for not just Band-Aid solutions but for several decades out. So our systems are here to stay for the long-term. But it's important to also recognize that we shouldn't look at Band-Aid solutions. We need to harmonize the short-term solutions with long-term solutions.

Next slide, please. Our traditional grid structure served us well and it will continue to serve us well for the long-term. People have seen this decoupling again between the generation and transmission assets and have tried to develop philosophies to perhaps make the system more reliable by developing distributor generation philosophies, that is bypassing the wire side of the business. And you see that on the right-hand side of this slide looking at trying to bring the generation assets, mitigation techniques, power quality devices, CHP systems closer to the customer sites. And, indeed, that may make the system more reliable. But you have to worry about how these things coordinate. It's taken many years for our traditional grid structure to be able to coordinate correctly, handling reverse power flows and so forth.

Next slide, please. So our suggested objectives that I would encourage the Public Service Commission and others to consider would be certainly in hardening the system for weather and reliable operation. But more than that, you need to have a system that enables real-time monitoring and control. You know, I've heard a lot about underground systems, but you also need to be able to locate the source of the problem quickly and be able to restore the system quickly. Also you need to enable reverse power flows to happen in order for that futuristic system 20, 30 years from now to be realizable.

Next slide, please. This is a typical diagram that we've been working on for a while that illustrate a FRIENDS system that's highly reliable. The purple circles indicate advanced substations. I know from the previous talks that substations are a very important part that people want to consider because they're up at the, at the source end of the feeder. So this is a part that we need to look at very carefully. And also if you have an outage occur in one part of that system, we need to be able to reroute that energy around that system. Also these quality control centers or advanced substations need to be able to have perhaps some form of energy storage associated with them so that they'll provide reliable service to the customers.

Next slide, please. This is a little more detail indicating the complexity of the issues that we need to address. You're not only looking at hardening the system against weather, but you're also looking at operational characteristics that need to coordinate in a harmonious way with all the system operations from economic dispatch, demand response, looking at state estimation, looking at SCADA functions. And all of those systems have to be survivable and dynamic and robust in order to operate quickly.

Next slide, please. Here's an example of a quality control center or advanced substation. And I would encourage the PSC and others to look at, now that we have the interest, to develop the substations not in the old way, but develop them in new ways that enable reverse power flows to occur, that enable different types of power quality services to come out, but enable also storage elements to occur so that when an outage does occur, we can supply that system that's fed by that substation.

Next slide, please. Another program I've been working on for about four years is WAR, and it's a very appropriate name. It stands for Weather And Reliability. It's a unique investigation into the effects of weather on power system reliability. I've had about 100 people involved in this effort over the four-year period. We've done ongoing monitoring and database development. The database development itself took about one year to accomplish. And we monitor not only wind speeds through the Florida Power & Light system that we're working with, but also look at temperature information, lightning, pressure, humidity. All these factors have an important role in the reliability of a system and its ability to survive events. And we've taken this system and now also put in a neural network simulation. So we have a very robust solution, and it's a capability that I think would be a very great benefit to our state in order to make the system more reliable.

Next slide, please. That's the system that we've been considering and developing a database for. And now we have more importantly tools that enable us to look at how the system can behave in terms of perhaps equipment reliability, looking at maintenance issues, how much equipment you should have on backlog to make the system survive, also looking at system hot spots.

Next slide, please. Here's how good we are in predicting. We're very, very good on this. And I would respectfully suggest that we expand the system of this capability to our state, not just to one portion of our state.

Next slide, please. Again, this is just one sample of many hundreds of runs that we've done. We can now do combinations, wind and rain, wind and temperature, see what affects the system more, looking at corrosion effects, flooding effects and so forth.

Next slide, please. So some of the big points that I would suggest would be not all weather parameters have a major contribution towards interruptions. The determination of hot spots is feasible. Harden the hot spots first. Our system is really, really big and it's going to take many years. You don't just fix a power system in a year. It takes a long-term viewpoint. Fix the hot spots first. You can determine the hot spots from looking at the stressors in the system due to the various weather effects.

The contribution of weather parameters towards interruptions depends on geographical conditions of the area under consideration. And certainly when you look at strategies of tree trimming, grid equipment design, backup equipment, crew allocation strategies are all factors that we can use this tool for.

And I would again suggest that we use this analysis capability that we have in our existing lab here in Florida to help our citizens and help the utilities in our state.

Next slide, please. This is the laboratory that I transferred down to USF with me. It was the first laboratory with the capability of generating three-phase voltages and currents in an unbalanced fashion to apply to devices under test. We can monitor systems real-time in our state and analyze these systems.

Next slide, please. Here's a premium power park example that we've monitored at American Electric Power for a couple of years, and here's basically an example of how to improve reliability using advanced power electronics consisting of dynamic voltage restorers, high response breakers, capacitor banks. And so you also maybe want to strengthen the system with looking at these devices and how they are strengthened with appropriate apologies for substations as well.

Next slide, please. Yes, you can click through a couple of these. These show the various ways, forms and stuff that we don't need to go through.

Another barrier -- you know, the transmission infrastructure, distribution infrastructure has not been invested in, and so a bypass of that is this concept of distributor energy systems. One of the barriers to that is the interface. So if we want to go down that road, we have to look at interface issues.

Next slide, please. Here's an interface that I looked at in Hawaii with an electronic shock absorber, and, see, this was the basic problem. A lot of these distributed power sources are nondispatchable, and that means that you can't really count on them. So you also have variability in the power and the frequency that connects to the system. You do not want to connect something like that to your system -- next slide, please -- unless you have a means of interfacing properly.

So there's a lot of hurdles that still need to be overcome and need to be done very carefully in order to make these things kind of feasible. Thank you very much.

MS. HELTON: Thank you very much, Dr. Domijan. Next we'll hear from Charles Fisher with James Lee Witt Associates, LLC.

MR. FISHER: Good afternoon. I guess it's still morning. Good morning. If could you go to the next slide, thank you.

I want to just talk a little bit about our business. Our company, of course, was founded by the former FEMA director Mr. Witt, and during his tenure he convinced Congress to create Project Impact, which promoted mitigation efforts to reduce the impact of future disasters. And I congratulate the Commission for looking, looking at this issue today within that spirit. I also have been very impressed with the presentations today and will pass these on to Mr. Witt. He'll be very interested in the work that's being done here at the universities.

Our -- we created a utility and critical infrastructure practice a few years ago after working with utilities in the mid-Atlantic area after Hurricane Isabel. And my personal background is I was the -- served as Executive Director of the Illinois Commission. I commented that we didn't have nearly as nice a facility as you do here, so I have, I have great envy for your facility but a great empathy for your challenge here today.

I would recall that the mixed results that we had in Illinois when we were trying to develop reliability measures in the late '90s, early 2000 for developing new rules and regulations for reliability caused -- and the results of that caused one of our commissioners to refer to them as "perverse incentives." So I, I welcome the, what you're taking up here today.

Just in the interest of disclosure, we have worked here in Florida with the Kissimmee Utility Authority and we have worked in North Carolina with Progress Energy. We do not represent either of them here today. And I guess I should also disclose that, and I hope you won't hold this against me, but I do live in Chapel Hill, so.

We understand that the primary focus of the workshop, of this workshop today is to discuss mitigation. And given the apparent new phase of intense hurricane activity, this is certainly an important subject for the PSC and for the state and, I think, for all the coastal areas. But we also note that it is as important for utilities and their infrastructure to be, as to be hardened, it is important for them to be tough and resilient as well. And, therefore, we recommend that you focus on other critical components of the emergency management cycle as well -- if could you go to the next slide -- including preparedness, planning, response and recovery.

Let me make three -- go ahead -- brief comments on mitigation. Vegetation management is an issue that every community that we worked on, we worked in around the country is a major problem. Where we have seen real progress is where there has been community leadership from the local government level to work between the, the neighborhoods and the individual homeowners and the utility to allow for reasonable, reasonable cutting back on trees. It's, it's too bad that often times we see that is resolved very quickly after a major event. After the significant ice storm in 2002 in North Carolina, Duke, Duke Power was able to cut back in a lot of areas where they had not been allowed to do so by the municipalities and neighborhoods before.

Secondly, regarding pole assessments, we have in our experiences recommended that utilities keep very detailed data on the poles, age, condition, et cetera, and after an event correlate that relationship with, between those poles which failed and the characteristics and to look for correlations of it as a result. And I have to say that in some cases we have seen strong correlations, in others we have not.

What we have recommended regarding underground, undergrounding or putting wires underground is that utilities, again, continue to work very closely with the communities that they serve, discuss the tradeoffs of underground versus overhead wires and to approach whatever solution is arrived at from a true public and private partnership. Easy to say, but it's a community-by-community basis is where you have to, you have to address this.

We have also recommended and in some cases it's been implemented that utilities consider setting aside a fund for relocating wires on worst performing circuits, especially where there's a correlation with strong wind events. And from a regulatory perspective you might want to consider the impact of your decisions and policies on these decisions.

Just a couple of things that we promote in the, the other aspects of emergency management from a preparation standpoint. We highly recommend that utilities adopt an emergency management culture. I think that the event of the last two years here in Florida certainly has proven that your utilities are, in fact, doing that.

A very significant thing happening nationwide is the adoption of the National Instant Management System or NIMS, which is based on a concept of instant command structure. Instant command is what is being adopted by the federal, state and local governments for managing major emergencies, and increasingly we've been recommending and we've seen utilities adopt that system as well so that they can facilitate the relationship and work much more smoothly with local emergency management and local officials during, in response.

Joint planning, development of joint restoration priorities between the communities and the utilities. Exercise, I was speaking to a utility the other day who say they think that they've had enough practice over the last couple of years, they don't need to be exercising this year. But exercises are very important. And certainly an all hands culture; all employees of the utilities need to be focused, need to have a second job during a major, a major response event.

And finally response and recovery -- damage assessment. We recommend that utilities develop and adopt much more sophisticated methods to quickly assess the scope of damage within, within the first several hours after, after the passage of the storm or the event. We have seen that this can very positively impact the overall length of the outage.

Joint operations, we have recommended and have seen some very successful efforts where utilities have worked together with community public works departments, community transportation departments to, in fact, jointly address and work to clear the trees and the wires at the same time to deal with the downed wire issues. By working together, having these groups that can go out and do that they, in fact, again can help reduce the overall time of outage.

And finally I just want to comment on mutual assistance. The Electric Utility Mutual Assistance System is the envy of the country. Every industry, local governments are very envious of the system that's been developed by the utility industry and how they shift resources from one to the other. But I would note from talking with utilities over the last couple of years that this system has been greatly stressed over the past three years with this great number of hurricane activity that we've had. And I guess I would just close by saying that that system is well worth watching and making sure that it continues to operate as effectively as it has. Thank you.

MS. HELTON: Thank you, Mr. Fisher.

Next we'll have Bill Mayer with the Edison Electric Institute.

MR. MAYER: Good morning. My name is Bill Mayer.

I'm an engineer with the Edison Electric Institute. Edison Electric Institute is also known as EEI. EEI is the association of investor-owned utilities in the United States. We're located in Washington, DC.

Next slide. Our members serve 71 percent of the electric utility customers in the U.S., and the four major investor-owned utilities in the State of Florida belong to Edison Electric Institute.

I thank Mr. Fisher for introducing the topic of mutual assistance and putting in a good word for the activity that takes place. But part of my discussion this morning is why are we involved in mutual assistance.

In 1954, Hurricane Hazel hit the Carolina coast, worked its way up through Virginia, the middle of Pennsylvania, western New York, all hurricane force winds all the way up to Ontario. Prior to this point in time there had been handshake agreements between neighboring utilities that I'll help you if you'll help me. A situation like this with this large a storm across that many different service territories, the handshake agreements kind of broke down and there was a call for a national response.

Next slide. In 1955, EEI initiated the National Emergency Assistance Plan and Roster, which is basically contact lists and getting people together so that they would know what sort of resources were available.

Next slide. Certainly we've come a long way from that point in the time and our system is much more robust with contacts, names, numbers. There have been principles developed that try to address each and every issue that you could experience out in the field as far as agreements that need to be made between the utilities that are helping each other out, both from the utility's perspective that is requesting the relief and the utility perspective that's providing that relief.

One of the most recent activities in this area is actually to come up with some model agreements, contracts that are agreed to ahead of time so that those principles, those operating principles can be held in a contract, and the process of providing the mutual assistance can go on much smoother without a lot of negotiating back and forth and trying to finalize contract terms.

Next slide. The utilities present today could do a better job of describing exactly how they access mutual assistance, but this is somewhat how the hierarchy works. As a storm approached -- as a storm approaches or as a sudden storm impacts a service territory, the utility looks at their resources, looks at the resources available locally and then also regionally and then through contractors to see if they can meet that need. Now where the national plan comes into effect is, such as these last couple of years, 2004, 2005, where the resources have been stretched in those first three categories and companies have to look outside their typical responders.

Next slide, please. This is a graphic of where the utility companies came from to help with Hurricanes Jeanne and Charley, and you can see we're talking about the west coast of the United States.

Next slide. Our mechanism for providing this information is our website, RestorePower.com. It's password protected. Utilities can sign on, find out what kind of resources are available or offer up resources, if they have resources available. Again, on a national scale the people experiencing the disaster or working for the restoration may not know what kind of resources are available in Arizona or Nevada, and this is one opportunity for people to provide that.

We have 86 utilities signed up and participating with Restore Power. Six of those are Florida utilities, and we also have 33 contractors and vendors. So it is a good system and growing every day.

Next slide. Part of the mutual assistance program is the recognition. After the fact we try to provide recognition to those companies that we feel have done an outstanding job in restoration activities. We call these awards the Emergency Response and the Emergency Assistance Awards. The Florida utilities have won 17 of these awards since the inception of the program in 1998, and those utilities are listed on this chart. Before I go on into this additional resources, I really want to thank those utilities and commend them for their dedication, especially across these last two storm seasons which have really, as Mr. Fisher pointed out, have really stressed not just their system but the entire mutual assistance network.

Some of the additional resources that EEI has provided that are applicable today, one is a 2004 report on "Out of Sight, Out of Mind," the overhead to underground conversion study. It's a summary of those studies that have been performed around the globe, and those express the global interest in this topic. Again, as we've heard this morning, no magic silver bullet to solve that problem, but it is a great topic with a lot of interest out there, and I think that provides a good resource.

The other resource is the 2005 EEI report "After the Disaster," which is our cost recovery piece. What we're calling for there is some sort of consistency across the U.S., not just in Florida, not just on the Gulf Coast, but some sort of consistency across the industry for cost recovery so that the utilities that have worked through that restoration phase don't face the uncertainty of how those storms will be paid for.

This is a piece of data from that study, and it shows a number of storms and the customers that were restored per day during those storms. An important point on this slide is that that trend line, the black trend line in the middle, is increasing. So our companies out there are doing a better job mobilizing the resources and trying to get those lights back on to the customers. That's a very positive chart.

Next slide, please. This chart shows the customers out per lineman working that particular restoration effort. The positive part of this is the trend line is flat, which means we have been able to provide through this mutual assistance program enough linemen out there to consistently work on the programs, work on the restorations. But as was mentioned before, the system is stressed between the aging work force and the number of storms that we've experienced over the last couple of years. We'll be paying a lot of attention to this trend line.

Now our next speaker is the expert on broken poles, so I will, I will leave this topic to him, other than to point out that hurricanes are not the only danger to those poles. As we've heard earlier today as well, the blue line to the far right is a major ice storm which took out almost 16,000 poles. So there are other utilities experiencing pole breakage issues as well. So hopefully some of this research can help them.

Well, in summary I would like to thank the utilities that participate in our mutual assistance program, and I would like to thank the Commission for their cooperation and their recognition of the importance of this program to keeping the lights on for the people in Florida and across the U.S. Thank you.

MS. HELTON: Thank you, Mr. Mayer.

Finally, the last speaker for this section, Dr. Richard Brown with KEMA.

DR. BROWN: Thank you. I guess I stand between you and lunch, so I'll try to read the crowd here. So what I'm going to do today is give you some of my personal opinions about hurricane hardening, which is honestly a pretty new topic in the last couple of years for obvious reasons. So to do that -- go ahead two slides. First I'm going to talk a little bit about how you might go about deciding how strong to build your system. And then after we talk about that, we're going to talk a little bit about how hurricanes of different strength may cause damage to your system. And given that, how you might, if you choose to go down that road, some tactics and strategies to actually cost-effectively harden your system against potential future hurricanes.

But before we really go there, I want to make a distinction. We've been throwing around some terms -- next slide, please -- and I want to define the difference between transmission and distribution, because when we're talking about hardening, they're very distinct topics. And by transmission, what I'm talking about is high voltage, tall structures which almost always are overhead. And when I'm talking about distribution, I'm talking about lower voltage, shorter structures that are usually a mix between overhead and underground. And there's some fuzziness sometimes at most utilities between the, what's transmission and what's distribution. But for the purposes of this talk, transmission is the big tall towers and distribution is generally the shorter wood poles.

Okay. So given that, you can ask yourself the question: So we're designing a system, and how strong are we going to make it? For example, are we going to build our system so that it is going to be able to withstand something like this, a tornado? We could do it, but it would be pretty expensive to do it. And so most people say, no, we're not even going to attempt to address the worst-case situation. And so the question is, well, if we're not going to design it to withstand the worst-case situation, what are we going to design it to withstand? And there are actually some different answers to that.

The minimum strength that you want to design a system to is so that you ensure public safety. So people have talked in previous presentations about the National Electrical Safety Code, and most states have actually adopted this as their safety standard, meaning that when you build a system, you are required for safety reasons to meet this standard.

And the National Electric Safety Code actually has two ways that it goes about this. One is based on the general characteristics of construction: For example, where it's being built. Is it a specific safety concern or not? And then in certain situations it actually gives you guidance on designing your system to be safe during extreme wind conditions such as hurricanes. But, remember, this is strictly for safety. How do we go about designing the system if we choose to exceed minimum safety requirements?

And there's really, I think, two primary reasons why you may choose to do this. The first one is for reliability. We choose to spend more money to build a stronger system so that our customers are less likely to experience interruptions in power, this is a cost benefit call, but we're actively choosing to spend more money above minimum safety requirements. Another might be purely economic. Well, it's actually less expensive for us in the long run to build a system that is stronger than minimum safety requirements. Then it's pretty much a no-brainer; right? You spend money to save money and you actually get a stronger system to boot. So that would be a good reason too. But it's important to keep in mind the distinctions between safety, reliability and economics. They're separate and distinct.

Next slide. Okay. So I'll bore you for a second here with the National Electric Safety Code because these are terms that, if people follow this, you're going to see.

Grades of construction. For distribution systems generally the National Electric Safety Code will tell a utility how strong they should build the distribution system by assigning a grade of construction. For most distribution applications it's something called Grade C. That is in most situations you have to build your system to Grade C strength so that it is a safe system.

Now areas of particular safety concern like where power lines are crossing a railroad track, they say, well, there's additional special safety concerns in this particular case, and so we're going to require you for safety reasons to build a somewhat stronger system, which is Grade B. Now we're talking about wind here, so it's of interest to note that both Grade B and Grade C are based on 60-mile-per-hour winds. Okay. They're not really clear whether they're talking about gusts or sustained winds, but they do say 60 miles per hour, and the difference in strength comes from margins of safety. The code uses different terms, but essentially they say both we're designing for 60-mile-per-hour winds, but Grade C is going to have a certain margin of safety and Grade B is going to have a higher margin of safety.

Remember, the National Electric Safety Code also addresses extreme wind. So let's go to the next slide and actually compare the relative strength of poles that are built to different grades of construction.

Distribution systems generally are required to be built to Grade C, so I'm going to give that a relative strength of 1.0. So if you wanted to move from Grade C to Grade B, how much stronger is it going to have to be? Well, about 50 percent is the answer. Practically what does this mean if you're driving down the streets and don't really deal with this on a day-to-day basis? You're probably not going to notice the difference visually between Grade C and Grade B construction. A little bit stronger poles, a little bit shorter spacing between poles. But unless you have a really fine-tuned eye, you're probably not going to notice.

However, if we actually want to design a system to extreme wind conditions in southern Florida, which is 145-mile-per-hour gusts, we're talking about something different entirely. This requires about three times as strong of a system as the minimum safety requirements, and so probably you're going to notice if there are three times as many poles on the street or if you have big concrete structures that are significantly larger than the wooden poles that you're using now. So, practically, going from Grade C to Grade B you're not going to notice, but going from Grade C to extreme wind, at least where you experience strong hurricane force winds, you would probably notice a difference.

Next slide. So now let's talk about hurricanes. I just put this slide because it's my favorite picture of Wilma as it's approaching Florida; you can see how big it is. But specifically we're going to talk about hurricanes and the types of damage that hurricanes inflict on distribution systems specifically.

Next slide. Those are the basic categories here, so it's important to keep in mind when you're trying to harden a system what you're trying to harden it against. The first category, of course, is just wind only. The wind is so strong that it exceeds the design strength of the system itself. And somebody mentioned, you know, cascading failures before, and let me explain this a little bit.

Say you have a series of poles like you see in the picture here, and in the middle you have one pole that is just sort of teetering on the edge. Okay? And the poles next to it, they're strong enough to handle the wind forces that are being blown on it. But now all of the sudden the middle pole breaks. Okay? All of the wind that was being blown on the conductors used to be transmitted to three poles. It's now being transmitted to only two poles, and so the two adjacent poles which used to be okay, because the center pole broke, now may not be okay. So it's possible to get sort of a cascading effect where you get multiple poles falling at the same time. So it's not just analyzing each pole in isolation necessarily, but it's analyzing the physical system of physically linked poles when you're dealing with hurricane issues.

Okay. Next slide. Why don't we just replace our wood poles with concrete poles? Right? You hear this, but really this doesn't make a whole lot of sense because what you do is you specify a pole of a certain strength. And so if you would have specified a wood pole of a certain strength and you're going to concrete poles, based on the design standards you would specify a concrete pole of the same strength. And so you can see here in Hurricane Wilma, hurricanes are an equal opportunity destroyer. They will blow over concrete poles just like they will blow over wood poles.

One of the differences though is that when you purchase a wood pole, there is natural variation in wood fiber strength. So when you buy a pole, you're not absolutely sure how strong it is. Concrete though is an engineered material, so you know precisely how strong that pole is, which is of interest because when it blows over, you pretty much know exactly how strong the wind was at least. So just to show you that concrete poles certainly are not immune from hurricanes. They're equivalent to the strength of an equivalent class wooden pole.

Next slide. Trees. So if a tree gets blown over by a hurricane, which is common, tall trees very easily can fall into power lines, and at a minimum is going to cause an interruption as it pushes the lines together. And likely, if it's a large tree, it's going to bring down the poles or snap the conductors. But maybe of more interest is that these tall trees are outside of the control of the utility because the utilities only have, say, on a distribution system the right to trim back trees maybe ten or 12 feet from the lines. And you can see, tall trees are easily much taller than ten or 12 feet higher than the lines. And so a lot of trees that the utilities have no control over can fall into power lines and cause you problems; not just in hurricanes, but any time you get some strong wind conditions.

Next slide. Flying debris. That right there, I believe, is the roof of something, a metal roof that blew off. You get all sorts of stuff that fly around during hurricanes that can fly into poles. And, again, the utility has very little control over damage that occurs due to flying debris such as roofs and fences and things like this.

Next slide. And flooding. Of course, a lot of hurricanes bring a lot of water with them. And flooding isn't typically as much of a damage issue during a hurricane as a restoration issue. When you have flood waters, even if the wind has passed, you're very limited in how quickly you can get power back on, particularly for underground systems. So though underground systems are a lot less subject especially to wind damage, if you do go out and you're on an underground system and there's flooding, you'll probably be the last ones back on.

So something to keep in mind.

And go back one slide. I just have to say I love the picture of the scuba diver. That's post Katrina. So maybe a new skill for your utility crews.

So now the question, given all of this, are you ready to start digging up your streets? Right? More generally, are you prepared to investigate the possibility of hardening your system? Clearly in Florida the answer is, yes, we're at least willing to explore the possibilities. But how might you go about doing this? Is undergrounding the option? Are there other options? Should we harden everything? Should we harden nothing? They're all important questions, and there's no silver bullet, there are no easy answers. But at least we can better understand the question.

And the way I go about this at least, what's helpful for me is, next page, is I think about, okay, what would it take to actually harden the system that we have now, which is, you know, 85 percent overhead? Because even if we started burying everything, most stuff is overhead now. So just to be clear, let's understand actually what blows down poles. Because it's important when we talk about what can be done so that poles don't blow over. Of course, there are the poles -- the wind that acts on the pole itself. But it's important to understand that most of the force that occurs on a pole is not due to the wind blowing on the pole itself. It's due to wind blowing on the conductors and the attachments. Okay? So when you are dealing with hardening, a big consideration is what conductors are up there and what attachments are on the poles? Okay. Because the poles themselves really don't experience a large force due to the hurricanes because of their shape and their low surface area.

So given this -- next slide -- how might we actually go about designing for extreme winds, and how good is the design criteria that we are using now against extreme winds? Well, first of all, this was mentioned before, when you talk about hurricane forces, you're typically talking about sustained winds, and hopefully you're getting one-minute average values. But when you're actually doing damage to something, it only takes about three seconds to cause damage. So you need to make a distinction between three-second gusts which actually break things and the one-minute averages which hurricanes are categorized on. Okay?

Now the National Electric Safety Code, Grade B and Grade C, is not designed for extreme winds. But if you actually come up with equivalent extreme wind ratings for these, here are what they would be effective against. If you're designing to the minimum grade, Grade C, they're good to about 85-mile-per-hour gusts. And if you're designing to Grade B, for example, across a freeway, it would be good to about 104-mile-per-hour gusts.

Now let's compare this to the actual gusts that you're supposed to design habitable structures to in Florida. Along the coastal areas this is 145 miles per hour. So you can see for minimum safety requirements, if you're building your systems to Grade B and Grade C, there is a big difference between the actual gusts that you can expect in Florida. In fact, Florida is the state with the biggest discrepancy in this area between what you're required to design your system to and during hurricanes what your system will actually be exposed to.

The next slide is sort of a graphic that shows -- this is the ASCE map that you referred to in your slide here, which shows that pretty much Southern Florida can experience the strongest hurricane force winds of any place in the country. Is guess this is no surprise.

Next slide. So hurricane categories and damage. The blue lines here are the wind ranges for one-minute averages that define hurricanes. What I've done then is I've actually put the red lines here, which are the equivalent gust values. Now this is just an approximation. I used a 25 percent value for increased gust speed, but the science here is a little bit shaky. This is a rule of thumb. But given this rule of thumb, you can look and you can see where the different design criteria map to hurricanes of different strength. I think this is the easiest way to understand it for most people.

So you look at 85 miles per hour, which would be what typical distribution systems are required to be designed to, and any hurricane Category 1 is going to exceed this. If you had areas where you built to Grade B like railroads or freeway crossings, still a Category 1, a strong Category 1 is going to exceed this 104-mile-an-hour rating. If you actually even built to the 145-mile-an-hour gusts that could be experienced in many parts of Florida, what does this do? This sort of builds you to about moderate Category 3 storm. So even strong Category 3s still will exceed what the National Electrical Safety Code requires structures to be built against. Okay?

So hardening, even if you're following the code and you're building distribution to transmission level requirements, which you wouldn't be doing for safety but for reliability, still you're in trouble if a Category 5 hurricane comes through.

Next slide. So how might we go about hardening? First is to understand that there are many different potential approaches, and it's not obvious which approach is the best, but here are some, what I call a tool kit for hardening.

The first one, of course, you can build stronger poles. You know, if you were using a pole that's this size, you could use a pole that was that size, and that would be less likely to break, of course.

More guying. Now a lot of poles are built, are built in a straight line. And when they're in a straight line, the conductors will actually support those poles in the direction of the power lines. But when hurricanes come through, it's blowing perpendicular to this. So they're very weak in precisely the direction that hurricanes are going to blow them over. And so if you actually secure a couple of steel cables and bring them down in a direction perpendicular to the power lines, then you can very effectively strengthen these poles against the types of forces that hurricanes are going to put on these poles. But, of course, it's a little bit ugly.

Shorter spans. This is sort of equivalent to stronger poles. What you're doing is you're putting them closer together so that the wind forces on the conductors are transmitted to more poles. You're effectively loading the poles less from a wind perspective.

Anti-cascading devices. We saw one from Homac that was an anti -- that was sort of a mechanical fuse for service drops. Here's a great business idea: Identify a mechanical fuse for the actual distribution poles that are in a line so when one pole falls over, it doesn't take down other poles with it. It's easier said than done.

Conductor size. This is a, this is a tough one because in normal conditions if you have a pole that breaks, like an auto accident, big strong wires are going to allow adjacent poles to keep up the pole that otherwise would have fallen. Okay? So it makes it more safe. But during a hurricane big wire is going to catch more wind and make poles more likely to fall over. So what makes you actually more safe during nonstorm conditions actually hurts you a little bit during hurricane conditions. So there's no easy answers. Attachments or covered, and certainly fewer attachments would mean you would do better in hurricanes, but it's not as simple as that.

Undergrounding has been talked about a lot. And vegetation management, this is just a fancy term for cutting down trees and trimming back trees. But this is the tool kit.

Cost. It all boils down to how much money are you going to expend if you're going to go beyond the minimum safety standards and you're willing to spend money to improve reliability? These are -- it's always going to differ based on the application, but these are reasonable rules of thumb.

Okay. You have a typical overhead feeder that's going down, say, a major arterial in one of your cities. Okay? Say you wanted to harden that so that it would meet the 145-mile-per-hour gust criteria that's in the safety code. How much is that going to cost if you were building it from scratch, new construction? Well, based on my estimates it's going to be about, what did I say, two to four times the cost hardening an overhead system to hurricane force winds. Okay? If you were going to take that and you were going to build it underground and it was new construction, you're looking at about five to ten times.

So I'm not saying what the right answer is. What I am saying is that it is cheaper to harden a system to hurricane winds, keeping it overhead, than it is to going underground. Of course, there are other reasons to go underground, aesthetic reasons and perhaps others, but I'm just saying that it is certainly cheaper to harden an overhead system.

The story changes a little bit from an economic perspective if you're dealing with the existing system. It is more expensive to harden an existing system than it is to harden a system that's being built from scratch. It's also much more complicated because you're dealing with all sorts of zoning issues and easement issues, and so logistically it can be sort of a nightmare. And also we're talking about much longer time horizons to truly do systematic hardening for your existing infrastructure. So even if you're building everything new to hardened conditions, it does nothing for everything that's in the ground now, and most of it's overhead from at least the distribution system.

So last, if you were to pursue hardening using some of these tactics, what are some of the strategies that you could envision? Harden the entire system? You could do this, but from a financial perspective it probably doesn't make sense. So if this doesn't make sense, well, what about just new construction? Well, that's easier. In fact, a lot of new construction now is going in underground, but that's probably not a great answer anyway because a vast majority of your customers aren't going to be -- they're not going to receive any benefit from this.

So what about just our critical facilities like hospitals, 911 call centers? Certainly a great idea, but I bet you this has probably already been done in some fashion.

Customer driven, what about the customers that are willing to cost share or pay? This also is a great option, but maybe there are some equity issues that are involved here, at least if this is done on a widespread basis. Why should just the rich customers, you know, be immune to hurricane damage? I'm just envisioning some of the potential objections here.

And then last, probably the sane approach is to take what I would call a targeted hardening where you take your toolbox and you look and you say where can we spend about 20 percent of the money to get about 80 percent of the benefit for our customers within a reasonable time schedule, including quick winds and low hanging fruit that is compatible with more of a long-term reliability road map? So the way to think of it is examine where you are today. That would be where you are now. Examine where you want to be long-term, ten-to-20-year time horizon, and then think hard and do a systematic study that comes with a detailed, what I would call, hardening road map that allows you to transition from your present state to your desired future state in a cost-effective manner. Thank you very much.

MS. HELTON: Thank you, Dr. Brown. At this point in time I think there are a few questions. I know Mr. Trapp has some.

MR. TRAPP: These are not necessarily in order, but if you'll bear with me.

First, Dr. Gurley, I think during your presentation you said that most of the data that you have been collecting is winding up on the desks of county commissioners and is eventually winding its way into building codes.

My question is is any of that data finding its way to utility executive desks and winding its way into building standards?

DR. GURLEY: I can't say that I have any knowledge of it going into the building standards. I'll say that the people who have been working with us more directly, the sponsors of the program, have been making sure the data showed up. And, again, since our program stressed residential construction, the people that I deal with sit on, for example, the Florida Building Commission, which make recommendations to the building code people to what they can do for future changes to the building codes in the State of Florida. So in that sense -- for example, the statistical studies we have done of damage, physical damage to homes after the 2004 storms, that produced a report that is being circulated and used by the people in the building commission to make recommendations.

MR. TRAPP: Well, Dr. Domijan, you mentioned that your program is collecting data that is used by the utility. Is there, is there any joint cooperation between the two programs or is there room for kind of joint use in collecting and sharing this data?

DR. DOMIJAN: Yes. We've been working for about four years with Florida Power & Light. And I would certainly encourage the expansion of the program to look at hardening hot spots, such as Dr. Brown mentioned, targeted areas that we can cover the most important parts of the system on. And I would expand the program to look at the rest of our staff, not just the portions that we've examined.

MR. TRAPP: You did mention in your presentation that we should try to harden hot spots first, and I was curious to what extent -- the limits of your program to date, have you identified such hot spots?

DR. DOMIJAN: We've looked at a broad cross section of the territory of that power company and have identified correlations, a range of characteristics that affect the reliability of the system from wind, rain. You know, if you have wind, the wind is much more effective in, in producing outages if it's accompanied by rain because it's just much more heavier. So there's certainly much more correlations that need to be examined and looked at to repair or improve parts of the system that, that can increase the reliability of the overall at a smaller cost. So you crystallize by -- you crystallize the system by looking at those important points, and then you start growing it in a way that makes economic sense both from the customer's point of view and the utility's point of view.

MR. TRAPP: I wanted to ask -- let's see, Dr. Fisher, you had observed that the most success can be gleaned where local community support exists and there's interaction between local governments and utilities, particularly with regard to vegetation management. Mayor Castro, I think, this morning suggested a possible joint cooperation between her community. Is that something that you were, is that something you were referring to, that type of where they identify problem areas and communicate that with the utilities and there's a cooperation between the local utility and the local community?

MR. FISHER: First of all, Mr. Trapp, it's not Dr. Fisher, but I appreciate that.

MR. TRAPP: I'm sorry.

MR. FISHER: And I unfortunately was not able to hear the presentation by the mayor. But, yeah, from what I glean from your question, the -- where the utilities sit down and work with the individual -- and you have to do it -- you can't do it territory wide because you're going to have different situations with different communities. But to sit down and to identify the details in terms of who's going to pay for what, we recommend and have seen some successful pilot projects around the country, especially up in the mid-Atlantic area after Hurricane Isabel.

MR. TRAPP: And Mary Glass, I wanted to ask you about the joint facility agreements the utilities have with each other. Could you kind of explain to me who's responsible in those joint use agreements for the initial analysis of stress, and then for the ongoing review and assessment of stress; if there's age on the facilities or if there may be new attachments?

DR. SKEER: Hi. I'm Martin Skeer. I'm working with Mary on these issues.

MR. TRAPP: You are a doctor, as I understand it.

DR. SKEER: I'm a real doctor. The issue is complicated as time goes on in the sense that each new connection or attachment has an incremental cost associated with it, and the attaching entity is most familiar with that. However, there's a lot of stuff there to begin with. And the utility is the only one that has all the information in theory. However, there's a great deal of permissiveness on the part of attaching entities. We found that in one study 20 to 25 percent of the attachments were unreported. There are also issues, as Mary had mentioned, where overlashing is done with a minimum of communication between the attaching entity.

So in answer to the question, in theory the utility is the only one that can gather all the information to fuse the incremental costs with the embedded -- I should say the incremental impact with the embedded impact. There's a lot of coordination involved. And if the history of the attachments is incomplete or manual as distinct from mechanized, and if the new information is not compatible with some of the old information because the geometry has changed, guys have gone up and are unreported as well as attachments, it becomes a quagmire. And the challenge is to approach it at the right level; not sinking the ship by asking for too much, but at the same time making sure that there are no significant oversights that could result in safety and engineering problems.

MR. TRAPP: Is that something that would require more contract work or enforcement of contract work?

DR. SKEER: Enforcement is a critical element to that. And some of the utilities are making demands on attaching entities that the information be properly reported, and the issue of who pays for what, and also critical transition points where this additional attachment is going to require a pole replacement. It's not a smooth transition necessarily. But all of these factors really have to be built into agreements and contractual arrangements which are being enforced more and more by utilities.

MR. TRAPP: Let's see. Dr. Brown, my last question.

You indicated in your presentation that in order to go from basically Class 3 construction to meet extreme wind conditions it would require three times the strength or result in three times the strength. On a generic basis did I pick up though that the cost would be somewhere between two to four times to get to that level?

DR. BROWN: Yeah. This is, this is my personal estimate, but, yeah. To make something three times as strong, you could imagine that roughly you're going to -- one way to do it would be to just put three times as many poles in the ground. There are other ways to do it. But generally, depending upon the situation and whether you need, say, for example, heavy cranes rather than bucket trucks to install the system, it could be somewhere between two to four times is my estimate for new construction.

MR. TRAPP: So your sense is there may be some economies. I mean, if three times stronger is only two times the cost, it implies some type of economies in the scale. Or if it's four times, it may not.

DR. BROWN: That's right. If it was just incremental changes that allowed you to get this, then you could potentially get three times the strength for two times the cost. But if you had to go to heavy construction equipment, then it could be four times the cost for three times the strength. It's going to depend on the particular situation.

MR. TRAPP: To the extent that the Commission pursued a "Domijan hot spot philosophy" though, if that did cost more, with respect to undergrounding -- I'm trying to understand relationships here. To the extent that you have an area that wants to go to undergrounding that's also an area that's a hot spot that needs attention, under the Commission's current CIAC policy, you kind of, to me, get a bonus there. Because if the Commission requires hot spot treatment that reduces the URD differential the developer or community would have to pay, then they may very well want to take on without burdening the remaining ratepayers that CIAC to get to that final solution. Does that make any sense?

DR. BROWN: I guess it sort of makes sense. Was there a question or --

MR. TRAPP: No. Just, probably just some rambling on my part.

DR. BROWN: Yes, that makes sense.

MR. TRAPP: I think it's time for me to turn it over to my staff.

MS. HELTON: Mr. Ballinger, did we get any questions from the audience?

MR. BALLINGER: We had one from the audience. This is for Dr. Gurley. Apparently within the last week or so the National Weather Service or Hurricane Center reported that Wilma was mostly a Category 1 when it crossed, but possibly a

Category 2. And they were wondering, do you know if they used the Florida Coastal Monitoring Program data to come up with that conclusion?

DR. GURLEY: The Florida Coastal Monitoring Program data is a part of the information they use to, usually to do revisions of their initial forecast. So once they have the opportunity to gather ground level observations from ourselves and other programs that are available, that does get put into the final solution. It's not, it's not the only information they use, but it's in there.

MR. BALLINGER: Okay. So it's part of the whole puzzle?

DR. GURLEY: Yes.

MR. BALLINGER: And the second part of the question is do you agree with those conclusions that possibly it was a Category 2 in areas?

DR. GURLEY: I mean, based on our measurements, I would say it's probably reasonable. But, again, what I specifically focus on are those point measurements, and the Hurricane Center focuses on a much bigger picture and more specifically what's happening over the water. So I would defer to their expertise generally for that question.

MR. BALLINGER: Thank you. I have a question for Dr. Brown actually, if you don't mind, Bob.

On one of your slides you have Class B and Class C poles. The wood poles, and you didn't mention in your presentation, but on the right you had the concrete Class B and Class C, and I noticed that their strength didn't come up even to the Class C wood poles. Is that correct?

DR. BROWN: Yeah. The issue was for the same grade of construction the strength of the concrete poles are lower. And there's -- generally what's going on is this. First of all, you're able to specify concrete at a little bit of a lower strength because it's an engineered material and there's less inherent variability in the strength of the structure you're purchasing. And the second thing is that you don't have to allow for deterioration in strength over time when you put in the concrete pole. So there's two factors involved in there.

MR. BALLINGER: Okay. Thank you.

DR. BROWN: Very nice catch though.

MS. HELTON: Mr. McNulty, did you have some questions?

MR. McNULTY: Yes. I just had two questions; one for Ms. Glass. My question basically gets to the -- one of your slides had indicated that the FCC sanctioned overlashing, and I was curious about the intersection of what's required when a pole attachment occurs, that is, that is the intersection with the National Electric Safety Code and any requirements that might exist within the code for establishing what level of stress is happening at that point. Does the National Electric

Safety Code bear in this, and is it also an authority in the issue of pole attachments the same way that the FCC may be sanctioning some level of overlashing? Does the National Electric Safety Code limit it in some way?

MS. GLASS: The way it works is when you apply for a permit, you're going to be reviewed by the local utility, and that is regulated either by its own rules or by state rules. But usually most states incorporate NESC as part of their requirements.

The problem comes with the overlashing, that you do not need to apply for a permit as you do with any other new attachment. In order to speed the overbuild process, FCC said that you don't need to tell the utility that you're even going to be on their poles. Afterwards it would be nice if you gave them a notification. Well, obviously when that happens you can be exceeding the loading requirements very quickly. And unless the telecom company is very scrupulous about doing its loading calculations, and in these cases they usually don't have the information, then you can get into a situation where basically the people who are owning and controlling the poles don't know exactly what's up there. And after it's up there, it's much harder and more expensive to remediate if they were to go back and do a full loading analysis. Did that answer your question?

MR. McNULTY: Yes, it does, and it adds one follow-up. Does that -- would that indicate a deficiency of any kind in the pole attachment agreements that may exist between various utilities operating on the same pole?

MS. GLASS: No. It's really not the agreements. It's the overriding FCC regulations.

MR. McNULTY: Okay. Great. The other question I had was also for Mr. Brown. Mr. Brown, you had indicated that a toolbox kit should perhaps be used, that type of approach should perhaps be used for a hardening of the electrical transmission distribution system if it was found to be so warranted. I'm wondering if you have in mind any models of that approach having been used in the U.S. that was responded to by a particular jurisdictional entity, anything that you could point to to say that that sort of approach has worked before or is in progress today.

DR. BROWN: For hurricanes I would say no, but for general levels of reliability improvement, absolutely, yes. There are many case studies where utilities have been mandated by their regulators to do large shifts in, I would say, nonstorm reliability performance. And in these cases most utilities have developed reliability groups or divisions within their company that pull together all of the formerly separate functions or departments that impact reliability, come up with cost of benefit ratios, application guidelines so that they can try to achieve non-storm reliability performance improvement targets in the most cost-effective way, which implies sort of targeted application. The right tool for the right situation. But it's a little bit uncharted territory when you're dealing with hurricanes.

MR. McNULTY: Thank you.

MS. HELTON: Well, it looks like we have no other questions from the audience or from staff, so at this point we can break for lunch.

Before we break though, I forgot to mention that there's a sign-up sheet in the corner of the room back here. If you want us to know that you're here today, if you could please sign up on the sign-up sheet. And let's return at 1:35. And if the speakers, the utility speakers could set up over here so we can start right up after lunch. Thank you.

(Transcript continues in sequence with Volume 2.)

STATE OF FLORIDA )
: CERTIFICATE OF REPORTER
COUNTY OF LEON )

I, LINDA BOLES, CRR, RPR, Official Commission Reporter, do hereby certify that the foregoing proceeding was heard at the time and place herein stated.

IT IS FURTHER CERTIFIED that I stenographically reported the said proceedings; that the same has been transcribed under my direct supervision; and that this transcript constitutes a true transcription of my notes of said proceedings.

I FURTHER CERTIFY that I am not a relative, employee, attorney or counsel of any of the parties, nor am I a relative or employee of any of the parties' attorneys or counsel connected with the action, nor am I financially interested in the action.

DATED THIS 26th DAY OF JANUARY, 2006.

Linda Boles

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