ORIGINAL

TECO
TAMPA ELECTRIC

BEFORE THE

FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 070193-EI

IN RE: PETITION FOR DETERMINATION OF NEED

FOR WILLOW OAK-DAVIS 230 KV TRANSMISSION LINE

IN POLK AND HILLSBOROUGH COUNTIES

TESTIMONY AND EXHIBIT

OF

PAUL M. DAVIS

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TAMPA ELECTRIC COMPANY
DOCKET NO. 070193-EI
FILED: APRIL 27, 2007

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

PREPARED DIRECT TESTIMONY

OF

PAUL M. DAVIS

Q. Please state your name, address, occupation and employer.

A. My name is Paul M. Davis. My business address is 702 North Franklin Street, Tampa, Florida 33602. I am the Director of the Energy Control Center at Tampa Electric Company ("Tampa Electric" or "company").

Q. Please provide a brief outline of your educational background and business experience.

A. I received a Bachelor of Science degree in Electrical Engineering in 1988 from the University of Houston. In December 1989, I joined Tampa Electric as a distribution system planner. I earned my professional engineers license in the State of Florida in 1994 and I have worked in the operations area since. In October 2002, I was promoted to Director, Energy Control Center. My present responsibilities include the areas of day to day distribution outage restoration, transmission system operations, system reliability tracking and reporting,

Energy Delivery emergency response and planning, energy accounting and billing and Tampa Electric's long term transmission and distribution infrastructure planning.

Q. Are you sponsoring an Exhibit to support and demonstrate Tampa Electric's need for the Willow Oak – Davis 230 kV Project?

A. Yes. Exhibit No. __ (PMD-1) entitled "Tampa Electric Company's Willow Oak to Davis 230 kV Transmission Line Siting Act Determination of Need Documentation", consisting of 10 attachments, was prepared under my direction and supervision.

Q. Please describe the purpose and scope of your testimony.

A. The purpose of my testimony is to sponsor and support Tampa Electric's Petition for a Determination of the Need for the Willow Oak to Davis 230 kV Project ("Project"). My testimony presents the following information in support of the Project:

1. A general description of the existing load and electric characteristics of Tampa Electric's electrical transmission grid;

2. A general description of the Project including the design and operating voltage of the proposed transmission line, the starting and ending points of the line, the approximate cost of the Project and the projected in-service date;

3. The specific conditions, contingencies and factors which demonstrate the need for the Project including a discussion of Tampa Electric's transmission planning process and the reliability benefits of the Project;

4. The major alternatives to the Project that were evaluated and rejected by Tampa Electric in favor of the Project; and

5. The adverse consequences to Tampa Electric's electric system and customers if the Project is delayed or denied.

Q. Provide a synopsis of your testimony.

A. First, I will provide an overview of Tampa Electric and the existing load characteristics and composition of its transmission network. Second, I will describe the Project, as well as the need and benefits and the estimated capital cost of the Project. Third, I will explain Tampa Electric's transmission planning process.

Fourth, I will discuss the evaluation and analyses conducted to demonstrate the need and benefits of the Project. Fifth, I will discuss the alternatives considered and explain why they were rejected in favor of the Project. Finally, I will address the adverse consequences to Tampa Electric's customers if the Project is denied or not timely approved.

OVERVIEW OF TAMPA ELECTRIC AND ITS TRANSMISSION NETWORK

Q. Please provide a brief description of Tampa Electric.

A. Tampa Electric provides electric service to over 650,000 customers in four Florida counties within its 2,200 square mile service area. In general terms, the company's service territory is located in west central Florida and it provides retail electric service to Hillsborough County and portions of Polk, Pasco and Pinellas Counties as well as wholesale electric service to several utilities within the state.

Q. Please provide a general description of the existing load and electric characteristics of Tampa Electric's electrical transmission grid.

A. Tampa Electric's existing load characteristics consists

of residential, commercial, industrial and governmental retail customers as well as a small percentage of wholesale load. A listing of historic and forecasted Tampa Electric peak demand is provided in Attachment 2 of Exhibit No. __ (PMD-1). An overview of the company's existing electrical transmission network indicating the general location of generating plants, substations, and transmission lines are shown in Attachment 1 of Exhibit No. __ (PMD-1).

DESCRIPTION OF THE PROJECT

Q. Describe the proposed Project.

A. As shown in Attachment 1 of Exhibit No. __ (PMD-1), the Project primarily consists of 30 miles of 230 kV construction that will provide a geographically separate path from Polk County to Hillsborough County to relieve the existing transmission network. There is a need for a 230 kV transmission line connecting the Willow Oak, Wheeler Road and Davis Substations, which is the Project Area. Specifically, construction will be performed in two phases: the Davis to Wheeler Road 230 kV line, including the Wheeler Road 230/69 kV and Davis 230 kV Substations, and the Willow Oak to Wheeler Road 230 kV line.

The Project will also provide electric service to planned Tampa Electric distribution substations located east and north of the existing common transmission right-of-ways ("ROW") in the next five to nine years. The proposed in-service date for the Project is March 2012.

Q. Please describe the two phases of construction in more detail.

A. The first phase, Davis to Wheeler Road will consist of the construction of the Davis 230 kV substation adjacent to the existing River Substation and a 12.3 mile 230 kV transmission line to a new 230/69 kV substation at the existing Wheeler Road 69 kV substation site. The second phase, Wheeler Road to Willow Oak, will consist of the construction of a 17.1 mile 230 kV transmission line from the new Wheeler Road Substation in Hillsborough County to the existing Willow Oak Substation in Polk County. When complete, the Project will consist of a 230 kV line connecting three 230 kV substations: Willow Oak, Wheeler Road and Davis. The transmission line will be constructed with a single steel pole design and will have a design and operating voltage of 230 kV.

Q. Please describe the location of the transmission line.

A. The electrical map included as Attachment 1 of Exhibit No. __ (PMD-1) shows the electrical facilities that currently exist and a conceptual electrical connection for the Project. The locations on the map of facilities not yet in-service are approximate. In particular, the line depicting the Project is intended to indicate conceptually an electrical connection from the Willow Oak to Wheeler Road Substations and the Wheeler Road Substation to the proposed Davis Substation, strictly from an engineering and planning perspective. The final length and routing of the line will be determined in certification proceedings in accordance with the Transmission Line Siting Act ("TLSA").

Q. What is Tampa Electric's timetable for licensing, design and construction of the Project?

A. Presently, Tampa Electric is evaluating corridors in anticipation of submitting an application to the Florida Department of Environmental Protection under the TLSA in August 2007. A final decision by the Siting Board is expected in April 2008. Detailed design of the Project will begin as soon as a final corridor is approved.

Construction on the Davis to Wheeler Road phase is expected to begin in June 2009 and is expected to be completed by June 2010. Construction of the Willow Oak to Wheeler Road phase is expected to begin in March 2011 and is expected to be complete in March 2012.

Q. What is the company's estimated capital cost of the Project?

A. The final route has not been selected; therefore, final costs will be subject to a number of factors including the final length and route of the line as determined under the TLSA. Specifically, the length and route of the line, and other conditions that could be imposed through the TLSA process, will affect land acquisition costs, line construction costs, environmental permitting and mitigation costs, ROW preparation costs, and other compliance costs. Subject to these types of cost variances that could arise through the TLSA process, the current estimated capital cost of the Project is $71.2 million in 2007 dollars. The corresponding present value revenue requirement in 2010 dollars is $99.5 million.

TAMPA ELECTRIC'S PLANNING PROCESS

Q. How does Tampa Electric determine the need for new

transmission lines?

A. Planning for the company's transmission system follows practices and criteria that are consistent with the North American Electric Reliability Council ("NERC"), the Florida Reliability Coordinating Council ("FRCC") and with other applicable standards. The NERC reliability standards specify transmission system operating conditions that should be evaluated, and the levels of system performance that should be attained. The NERC reliability standards are provided in Attachment 5 of Exhibit No. __ (PMD-1).

As detailed in Attachment 6 of Exhibit No. __ (PMD-1), Tampa Electric's transmission planning process considers its annual forecasted future load growth effects on the transmission system, the need to serve new load areas or large new customers, future interconnections with neighboring utilities, integration of new generation facilities and firm contractual transmission service obligations. The changes in system performance due to these factors is simulated and analyzed for the present and future to identify system limitations. Alternative solutions to these limitations are then developed, analyzed, and screened on the basis of their electrical

performance. The merits of viable technical alternatives are compared with consideration of reliability, voltage, capacity, economics, and constructability. Transmission facility additions such as a new transmission line are implemented as a result of this process when they provide the best overall solution.

Q. What studies did Tampa Electric perform to determine the need for the Project?

A. Transmission assessment studies conducted by the company during 2006 identified regional transmission system limitations in Polk County and northeast Hillsborough County. These studies showed that by the 2012/2013 winter, the existing 230 kV and 69 kV transmission networks will not have sufficient capability to provide reliable service to existing and proposed substations. Additionally, the studies revealed that some of the projected load to be served by proposed future distribution substations will be located further north and east of the existing 230 kV transmission network.

NEED FOR THE PROJECT

Q. Explain the need for the Project.

A. The need for the Project is based on the following considerations:

1. The need to provide additional transmission capability to the existing north-south 230 kV network in Hillsborough County and to the east-west 230 kV network between Polk County and the load centers in Hillsborough County in a reliable manner consistent with NERC, FRCC and other applicable standards;
2. The need to provide additional capability to the existing 69 kV sub-transmission network in the Brandon area and northeastern Hillsborough County in a reliable manner consistent with NERC, FRCC and other applicable standards;
3. The need to serve the increasing load and customer base in the Project Area;
4. The opportunity to efficiently and effectively loop radial 230/69 kV substations and to serve new 69/13 kV distribution substations east of I-75 and north of State Road ("S.R.") 60 that are needed to serve the projected load growth by providing new 230/69 kV sources into the Project Area; and
5. The opportunity to establish another electrical source from Polk County west to the Brandon and North Tampa areas via a separate ROW path, thereby reducing the impact of the loss of existing transmission facilities

on common ROWs.

The above considerations can be categorized as needs and opportunities. The first three items listed above are required to meet the NERC and FRCC planning criteria while the last two items are opportunities to improve the reliability of the bulk electric system for both Tampa Electric and the Central Florida region of the state.

Q. Please explain the benefits of this Project.

A. The Project provides Tampa Electric with the best alternative to improve reliability to the transmission network in Hillsborough and Polk Counties. Specifically, the Project will allow Tampa Electric to:

1. Improve area reliability by providing a geographically, separate path to the existing transmission network in Hillsborough and Polk Counties;
2. Serve new customer load in the Project Area;
3. Reduce transmission losses by approximately four MW which represents a present value savings of $12.6M in 2010 dollars; and
4. Meet the Project Area's long term growth requirements for at least the next ten years, based on the regional

customer and energy sales growth forecast as found in Attachment 3 of Exhibit No. __ (PMD-1).

Q. Please describe the evaluation and analyses conducted to demonstrate the need and benefits of the Project.

A. As referenced in Attachment 9 of Exhibit No. __ (PMD-1) these analyses indicate that for nine different single contingency events, a variety of overloads ranging from 101 percent to 160 percent of thermal MVA facility ratings and low voltages as low as 0.89 per unit ("pu") could be experienced within and near the Project Area. The NERC reliability standards require that facility ratings not exceed 100 percent of the applicable thermal MVA facility rating and voltage levels remain within 0.95 pu and 1.07 pu for 230 kV stations. Without the Project, mitigation of these overloads would require the interruption of service to numerous customers, depending on the specific outage, in order to continue to operate the facilities in accordance with NERC reliability standards

Q. Regarding Tampa Electric's concerns with the loss of the existing 230 kV corridors, please explain the planning of a separate path from Polk County to Hillsborough County.

A. As described earlier, Tampa Electric reviews its transmission plans in the context of long term needs of its service area. Various alternative solutions were developed to solve the contingency overloads and low voltages identified for the winter 2012/2013. When weighing the alternatives, improvement for corridor outages was included in the assessment. It was determined that the Project would cost effectively solve the bulk and sub-transmission overloads and low voltages, and also solve the corridor outage issue. In addition, it provides 230/69 kV sources to the new load being added in the Project Area east of the north-south corridor and north of the east-west corridor. The Project achieves these benefits by extending the existing 230 kV network from Polk County (Willow Oak) in 2012 on a geographically separate ROW path to interconnect with the 230 kV network in Hillsborough County (Wheeler Road and Davis). This is in lieu of serving the Project Area from the existing 230 kV networks in Hillsborough and Polk Counties.

Q. Are there other reliability and strategic benefits associated with the Project?

A. Yes, there are two additional benefits: looping 230 kV

substations and providing service to new distribution substations in the Project Area. The Project will loop the existing Willow Oak and Wheeler Road Substations in 2012. Until that time, the loss of the Willow Oak 230 kV source will require the station to be backed up by the underlying 69 kV transmission network which will be stressed due to load growth expected by 2012.

As previously discussed, several distribution substations are needed east and north of the existing 230 kV networks in Polk and Hillsborough Counties. As shown in Attachment 8 of Exhibit No. __ (PMD-1) Tampa Electric is planning for new distribution substations in the five to nine year time frame in this Project Area.

In summary, the establishment of a new ROW from Willow Oak to Wheeler Road to Davis provides an opportunity for the more efficient and cost-effective integration of the 230/69 kV and 69/13 kV substations into Tampa Electric's transmission system to meet expected load growth in the Project Area.

DISCUSSION OF ALTERNATIVES

Q. Did Tampa Electric consider alternatives to the Project?

A. Yes. The company considered three alternatives to the proposed Project to address the needs and opportunities described earlier in my testimony.

Alternative 1 - This alternative includes an upgrade of the north and south S.R. 60 transformers to 448 MVA and purchasing a 448 MVA spare transformer. It includes re-rating circuits 66019 and 66035 to 160 MVA, adding air core reactors to each circuit and the addition of a 50.4 MVAR capacitor bank at Wheeler Road in 2010. It also includes rebuilding 23 miles of 230 KV line (circuit 230021), constructing 11 miles of 230 kV line from Willow Oak to Hampton, upgrading the Bell Creek 230/69 kV transformer to 336 MVA and installing a new 230 kV ring bus at Hampton Substation. The estimated capital cost of Alternative 1 is $80.5 million.

Alternative 1 was rejected for the following reasons:

1. The capital cost of Alternative 1 was higher than the Project. The major reason for the higher cost is the need to construct 11 miles of 230 kV line and the rebuild of 23 miles of 230 kV line. Another reason for the higher cost is the need to purchase a spare autotransformer for the new 448 MVA S.R. 60 transformers. This new spare autotransformer would

only be used at S.R. 60 due to its physical dimensions;

2. Alternative 1 does not provide a long term solution for the voltage problems in the high load growth area north of S.R. 60 and east of I-75. The addition of the capacitor bank at Wheeler Road mitigates the contingency voltage violations until 2014. Currently, the only other solution identified would be the addition of a new 230 kV source in the area; and
3. Alternative 1 does not mitigate the east-west or north-south corridor outages.

Alternative 2 - This alternative includes the same series of projects as Alternative 1 to address the sub-transmission system issues. In addition to the upgrade of the Bell Creek transformer to 336 MVA, Alternative 2 includes the following set of projects to address the bulk electric system issues: construct a new nine mile 230 kV circuit from Willow Oak to FishHawk and rebuild 23 miles of 230 kV line from FishHawk to Bell Creek and Gannon. The estimated capital cost of Alternative 2 is $74.5 million.

Alternative 2 was rejected for the following reasons:

1. The capital cost of Alternative 2 was higher than the

proposed Project. The drivers of the higher cost are the construction of nine miles of 230 kV line and the rebuild of 23 miles of 230 kV line. Another reason for the higher cost was due to the purchase of a spare autotransformer for the new 448 MVA S.R. 60 transformers. The new spare autotransformer could only be used at S.R. 60 due to its physical dimensions;

2. Alternative 2 does not provide a long term solution for the voltage problems in the high load growth area north of S.R. 60 and east of I-75. The addition of the capacitor bank at Wheeler Road mitigates the contingency voltage violations until 2014. Currently, the only other alternative would be the addition of a new 230 kV source in the area;
3. Alternative 2 does not provide looped transmission service to the heavily loaded Hampton 230/69 kV Substation. Without a Wheeler Road 230/69 Substation, Hampton is the only 230 kV source in the densely loaded Brandon area; and
4. Alternative 2 does not mitigate the east to west or north to south corridor outages.

Alternative 3 - This alternative includes the same series of projects as Alternative 1 to address the sub-

transmission system issues and it includes the following set of projects to address the bulk issues: construct a new nine mile 230 kV circuit from Willow Oak to FishHawk and a 30 mile 230 kV circuit from Griffin to Dale Mabry Substation. The estimated capital cost of Alternative 3 is $89.5 million.

Alternative 3 was rejected for the following reasons:

1. The capital cost of this project was the highest of all the alternatives. The major reason for the higher cost is the construction of 39 miles of 230 kV line. Another reason for the increased cost was due to the purchase of a spare autotransformer for the new 448 MVA north S.R. 60 transformer. As previously discussed, the new spare autotransformer could only be used at S.R. 60 due to its physical dimensions;
2. Alternative 3 does not provide a long term solution for the voltage problems in the high load growth area north of S.R. 60 and east of I-75. The addition of the capacitor bank at Wheeler Road mitigates the contingency voltage violations until 2014. Currently, the only other alternative is the addition of a new 230 kV source in the area; and
3. Alternative 3 does not provide looped transmission service to the heavily loaded Hampton 230/69 kV

Substation as Alternative 1. Without a Wheeler Road 230/69 kV substation, Hampton is the only 230 kV source in the densely loaded Brandon area.

Q. What are your conclusions regarding the evaluation of alternatives to the proposed Project?

A. All three alternatives represent higher capital investment than the proposed Project and no alternative resolves both the long term issue of looping the 230/69 kV substations and the mitigation for the loss of either the east-west or north-south 230 kV corridors. Additionally, some of the alternatives are marginal in resolving expected overload and low voltage conditions. The selection of the Willow Oak to Davis 230 kV project resolves all of these issues at a lower capital investment and represents a long term solution of providing needed improvements to the 230 kV transmission and 69 kV sub-transmission networks for both Tampa Electric and the Central Florida region of the state.

ADVERSE CONSEQUENCES OF DELAY OR DENIAL OF THE PROJECT

Q. Would there be adverse consequences to Tampa Electric's customers in the Project Area if the Project is not timely approved?

A. Yes. If the Project is not timely approved and no other alternative is built, inadequate transmission capability would result, therefore jeopardizing reliable service to existing and future customers in the Project Area. The inability to serve additional load could lead to rolling outages to prevent system degradation.

Q. Should the Commission approve the need for the Project?

A. Yes. The Commission should determine that there is a need for the Willow Oak to Davis 230 kV Line consisting of needed 230 kV and 69 kV improvements to best serve the Project Area.

Q. Does this conclude your testimony?

A. Yes.

TAMPA ELECTRIC COMPANY
DOCKET NO. 070193-EI
(PMD-1)

EXHIBIT TO THE TESTIMONY OF
PAUL M. DAVIS

WILLOW OAK TO DAVIS 230 KV TRANSMISSION LINE

SITING ACT DETERMINATION OF NEED DOCUMENTATION

Table of Contents:

Executive Summary

The Willow Oak to Davis 230 kV line Project ("Project") consists of the construction of approximately 30 miles of 230 kV line in two phases or segments. The first phase, Davis to Wheeler Road consists of the construction of a new 230 kV substation adjacent to the existing River Substation in Hillsborough County and 12.3 miles of a single circuit 230 kV line to a new 230/69 kV substation at the existing Wheeler Road 69 kV substation site in Hillsborough County. The second phase consists of the construction of approximately 17.1 miles of 230 kV line from the existing Willow Oak Substation in Polk County to the new 230/69 kV Wheeler Road Substation in Hillsborough County. The Project improves system reliability, increases power transfer capability and meets the local load requirements by serving existing and future distribution substations east of I-75 and north of State Road ("S.R.") 60 in Hillsborough County while minimizing costs to customers. The geographical area described above in which 230 and 69 kV improvements are required is the "Project Area". Both phases which make up the Transmission Line Siting Act ("TLSA") petition for the Project are linked and justified individually, and in combination. The need for the Project is based on the following considerations.

1. The need to provide additional transmission capability to the existing north-south 230 kV network in Hillsborough County and to the existing east-west 230 kV network between Polk County and the load centers in Hillsborough County in a reliable manner consistent with North American Electric Reliability Council

("NERC"), Florida Reliability Coordinating Council ("FRCC") and other applicable standards.

2. The need to provide additional capability to the existing 69 kV sub-transmission network in the Brandon area and northeastern Hillsborough and Polk Counties in a reliable manner consistent with NERC, FRCC and other applicable standards.
3. The need to serve the increasing load and customer base in the Project Area.
4. The opportunity to efficiently and effectively: (1) loop radial 230/69 kV substations and (2) serve new 69/13 kV distribution substations east of I-75 and north of S.R. 60 that are needed to serve the projected load growth by providing new 230/69 kV sources into the Project Area
5. The opportunity to establish another electrical source from Polk County west to the Brandon and north Tampa areas via a separate right-of-way ("ROW") path, thereby reducing the impact of any loss of the existing transmission facilities on common ROWs.

Over the past five years from 2002-2006 customer growth in Tampa Electric Company's ("Tampa Electric" or "company") service area has been increasing at a 2.6 percent Average Annual Growth Rate ("AAGR"). Similarly, for the same period, the customer AAGR in the Project Area was 3.2 percent, 0.6 percent higher than the entire service territory. For the same five-year period, the residential AAGR in the Project Area was 3.3 percent, which was 0.7 percent higher than the overall service territory AAGR of 2.6 percent. Tampa Electric is forecasting its overall service area customers to grow at an 2.2 percent AAGR over the next five years from 2007-2011 and the Project Area is

expected to continue the recent trend of higher than overall customer AAGR.

Transmission assessment studies conducted by Tampa Electric during 2006 have identified regional transmission system limitations in northeast Hillsborough and Polk Counties. These studies show that by the winter of 2012/2013, the existing 230 kV transmission and 69 kV sub-transmission networks will not have sufficient capacity to provide reliable service to existing and proposed substations in that area. Additionally, some of the projected load to be served by the proposed future distribution substations will be located further north and east of the existing 230 kV transmission network.

The Project consists of approximately 30 miles of a new 230 kV transmission line constructed in two segments that will provide a geographically separate path from Polk County to relieve the existing transmission network. The Project will also provide electric service to planned Tampa Electric distribution substations in the next five to nine years located east and north of the existing common transmission ROWs. The proposed in-service date for the Project is March 2012.

A study of transmission improvements needed for the Project Area evaluated various alternatives which resulted in the selection of the Project as the most cost-effective and efficient means to increase the capability of the existing 230 kV and 69 kV networks, provide electrical service to the new load areas and substations, and increase transfer capability from generation in the Polk County and Central Florida area.

I. Description of Tampa Electric Electrical Facilities

In order to provide an overview of Tampa Electric's existing electrical transmission system, a map of Tampa Electric's high voltage transmission network showing the general location of generating plants, major substations, and transmission lines is shown in Attachment 1. As shown on Attachment 1, the majority of the load in Hillsborough County (greater Tampa area) is served by five north-south 230 kV circuits, three of which are sited on one common ROW and the remaining two on another common ROW. The terminals of the north-south ROWs are the Big Bend, Gannon and River substations. Substantial load growth is projected around this corridor. As shown in Attachment 1, there are no direct 230 kV circuit ties to the load centers in Tampa, New Tampa, and Temple Terrace that do not rely on the north-south corridor along I-75. There are three east-west 230 kV circuits that transfer power from Polk County to Hillsborough County and serve load predominately south of S.R. 60. Two of the circuits are on a common ROW. The terminals of the east-west ROW are the Gannon, Big Bend and Pebbledale substations.

There are three 230 kV circuits that tie Polk Power Station and Central Florida interconnections to substations within Tampa Electric's service territory. Circuit 230401 picks up the Mines Substation and terminates at Big Bend Power Station. Circuits 230605 and 230606 terminate at Pebbledale Substation where two circuits, 230021 and 230625, then head west into Tampa Electric's service territory. Circuit 230021 picks up Bell Creek substation and terminates at Gannon Power Station. Circuit 230625 picks up FishHawk and Hampton substations and also terminates at Gannon Power Station.

Circuits 230021 and 230625 are on a common corridor for their entire 32 mile length and by 2013 load projections show that each overload as a result of the outage of the other one.

Underlying the 230 kV network is the 69 kV sub-transmission network throughout the Tampa Electric service territory. The 69 kV sub-transmission network serves a dual role in providing service to 69/13 kV distribution substations and network transfer capability to mitigate outages of 69 kV and 230 kV facilities. As mentioned before, the Project Area is a high growth area. There are multiple contingencies in this area that would result in overloading existing sub-transmission facilities and voltage violations. The siting of new facilities is challenging, reinforcing the need to use existing stations where possible to support load growth. The only 230/69 kV source in the Project Area is the Hampton Substation.

A listing of the history and forecast of Tampa Electric's peak demand is provided in Schedules 3.1 and 3.2 of Tampa Electric's Ten-Year Power Plant Site Plan for 2006-2015, which was submitted on April 1, 2006 to the Florida Public Service Commission and incorporated herein as Attachment 2.

II. The Willow Oak to Davis 230 kV Project

Further information and costs are provided in this section on the two construction phases or segments of the Project. The Davis to Wheeler Road segment consists of the construction of a new 230 kV substation named Davis adjacent to Tampa Electric's

existing River substation, a 230 kV transmission line from Davis to a new 230/69 kV substation at the existing Wheeler Road 69 kV substation, and a 230 kV tie between the River and Davis substations. The Willow Oak to Wheeler Road 230 kV segment consists of a single 230 kV transmission line from the existing Willow Oak substation in Polk County to the new Wheeler Road substation in Hillsborough County. In addition to providing a looped transmission circuit to both 230/69 kV substations, the proposed construction enhances reliability and power transfer capability by providing a new parallel 230 kV transmission line that increases the capability of the existing transmission network. The Project transmission line is estimated to be approximately 30 miles in length (subject to final certification under the TLSA) and will connect Tampa Electric's Willow Oak substation to Tampa Electric's Davis substation. Both segments will provide 230/69 kV sources to enable service to new 69/13 kV distribution substations in the Hillsborough County area and will provide additional capability to the existing 230 kV and 69 kV transmission networks. This Project will allow Tampa Electric to improve reliability to all customers within the Project Area consistent with NERC and FRCC planning standards. The proposed in-service date for the Project is March 2012.

Attachment 4 is a map showing the Project alternate routes along with the existing electrical facilities in the area. The line routes are conceptual and for illustrative purposes only.

A summary of the major Project components is outlined below. Construction costs include design, engineering, ROW preparation and land acquisition in nominal 2007

dollars.

Table 1: Estimated Project Costs

In Service Year	Segment Name	Description	Cost
June 2010	Davis to Wheeler Road 230 kV Circuit	Davis 230 kV switching substation, 230 kV tap from Davis to River, Wheeler Road 230/69 kV substation, 12.3 mile long single structure 230 kV line from Davis to Wheeler Road substations	$30.9 Million
March 2012	Wheeler Road to Willow Oak 230 kV Circuit	17.1 mile single structure 230 kV line, from Wheeler Road to Willow Oak substations	$40.3 Million
Total			$71.2 Million

Estimated transmission line construction costs shown in this report are based on the circuit length shown. Estimated circuit lengths are based on a direct, plausible line routing between substations, but does not reflect all possible constraints. Changes in line length due to constraints imposed on line routing through the certification process of the TLSA will result in variations in construction costs.

III. Discussion of Need and Benefits

The need for the Project is based on the following considerations:

1. The need to provide additional transmission capability to the existing north-south 230 kV network in Hillsborough County and to the east-west 230 kV network between Polk County and the load centers in Hillsborough County in a reliable manner consistent with NERC, FRCC and other applicable standards;
2. The need to provide additional capability to the existing 69 kV sub-transmission network in the Brandon area and northeastern Hillsborough County in a reliable manner consistent with NERC, FRCC and other applicable standards;
3. The need to serve the increasing load and customer base in the Project Area;
4. The opportunity to efficiently and effectively: (1) loop radical 230/69 kV substations; and (2) serve new 69/13 kV distribution substations east of I-75 and north of S.R. 60 that are needed to serve the projected load growth by providing new 230/69 kV sources into the Project Area; and
5. The opportunity to establish another electrical source from Polk County west to the Brandon and North Tampa areas via a separate ROW path, thereby reducing the impact of a loss of the existing transmission facilities on common ROWs.

The above considerations can be categorized as needs and opportunities. Items 1-3 above are needs to meet the NERC and FRCC planning criteria. Items 4 and 5 are opportunities Tampa Electric has identified to improve the reliability of the Bulk Electric System for both Tampa Electric and the Central Florida region of the state.

These two sub-projects fulfill the requirements to serve the new load in the Project Areas as well as to increase the capability of the existing 230 kV and 69 kV networks.

The Project resolves several issues:

1. New load development has been identified to the east of the existing north-south 230 kV transmission corridors and north of the existing east-west corridor/ROW which will require new electrical service within the next five to nine years. Attachment 7 contains a brief description of Tampa Electric's Distribution Planning process and methodology. Attachment 8 is a table listing proposed future substations and transformer upgrades needed to serve the Project Area including proposed in-service dates and forecasted peak loadings;

2. The load served by the existing 230 kV and 69 kV transmission networks has grown to the point where an increase in the network's capability is required to maintain adequate and reliable electric service. This need is being driven by the load growth, electrical service requirements to the new load areas and substations, and by increased power transfer requirements from generation in the Polk County and Central Florida area;

3. Longer term, the Willow Oak or Hampton and Wheeler Road 230/69 kV substations will need to be looped (two 230 kV sources);

4. The selection of the Project has the additional benefit of improving reliability levels for the loss of an entire corridor. The loss of one of the existing 230 kV corridors results in unacceptable loading and voltage levels. The north-south corridor provides power from the Big Bend and Gannon power plants to the greater Tampa area load centers. The loss of this corridor results in power flowing through the 69 kV sub-transmission system at unacceptable levels. The east-west corridor provides power from the Polk Power plant and Central Florida interconnections to the greater Tampa

area. The loss of this corridor results in unacceptable voltage and loading levels for the 69 kV and 230 kV networks. The selection of the Project provides for a separate ROW path to protect for the loss of the critical north-south or the east-west common ROW; and

5. Finally, the Willow Oak to Davis 230 kV and 69 kV improvements will meet the Project Area's long term growth requirements for at least the next 10 years, based on the regional load forecast.

IV. Evaluation Based on NERC and FRCC Planning Standards

The determination of the above Project need and requirements were established through the evaluation of Tampa Electric's system based on NERC and FRCC Planning Standards. Planning for the Tampa Electric transmission system follows practices and criteria that are consistent with the NERC and FRCC and other applicable standards. Tampa Electric's transmission planning process involves four major steps:

1. The preparation of system models;
2. The assessment of the transmission system;
3. The development and evaluation of alternatives; and
4. The selection of an alternative in consideration of reliability, voltage, capacity, economics and constructability.

A more detailed discussion of these steps is provided in Attachment 6.

The NERC Reliability Standards, which have been adopted by the FRCC, specify transmission contingency and system operating scenarios that should be evaluated, and the attendant levels of system performance that should be attained. The NERC Reliability Standards are provided in Attachment 5. The following describes the loadflow and contingency analysis used to evaluate the NERC and FRCC Reliability Standards.

V. Loadflow Results

As referenced in Attachment 9 these analyses indicate that for nine different single contingency events, a variety of overloads ranging from 101 percent to 160 percent of thermal MVA facility ratings and low voltages as low as 0.89 per unit ("pu"), could be experienced within and near the Project Area. The NERC reliability standards require that facility ratings not exceed 100 percent of the applicable thermal MVA facility rating and voltage levels remain within 0.95 pu and 1.07 pu for 230 kV stations. Without the Project, mitigation of these overloads would require the interruption of service to numerous customers, depending on the specific outage, in order to continue to operate the facilities in accordance with NERC reliability standards.

VI. Discussion of Project Alternatives

The company considered three alternatives to the proposed Project to address the needs and opportunities described earlier.

Alternative 1

Alternative 1 includes an upgrade of the north and south S.R. 60 transformers to 448 MVA and purchasing a 448 MVA spare transformer. It includes re-rating circuits 66019 and 66035 to 160 MVA, adding air core reactors to each circuit and the addition of a 50.4 MVAR capacitor bank at Wheeler Road in 2010. It also includes rebuilding 23 miles of 230 kV line FishHawk to Bell Creek and FishHawk to Gannon, constructing 11 miles of 230 kV line from Willow Oak to Hampton, upgrading the Bell Creek 230/69 kV transformer to 336 MVA and installing a new 230 kV ring bus at Hampton Substation. The estimated capital cost of Alternative 1 is $ 80.5 million.

Alternative 1 was rejected for the following reasons:

1. The capital cost of this project was higher than the proposed project. The major reason for the higher cost is the construction of 11 miles of 230 kV line and the rebuild of 23 miles of 230 kV line. Another reason for the higher cost was due to the purchase of a spare autotransformer for the new 448 MVA S.R. 60 transformers. This new spare autotransformer would only be used at S.R. 60 due to its physical dimensions.

2. Alternative 1 does not provide a long term solution for the voltage problems in the high load growth area north of S.R. 60 and east of I-75. The addition of the capacitor bank at Wheeler Road mitigates the contingency voltage violations until 2014. The only other solution found at that point is the addition of a new 230 kV source in the area.

3. Alternative 1 does not mitigate the east to west or north to south corridor outages.

Alternative 2

Alternative 2 includes the same series of sub-projects as Alternative 1 to address the sub-transmission system issues. In addition to the upgrade of the Bell Creek transformer to 336 MVA, it includes the following set of sub-projects to address the bulk issues: construction of a new 9 mile long Willow Oak to FishHawk 230 kV circuit and rebuild 23 miles of 230 kV line from FishHawk to Bell Creek and FishHawk to Gannon. The estimated capital cost of Alternative 2 is $74.5 million.

Alternative 2 was rejected for the following reasons:

1. The capital cost of Alternative 2 was higher than the proposed Project. The main reasons for the higher cost are the construction of nine miles of 230 kV line and the rebuild of 23 miles of 230 kV line. Another reason for the higher cost was due to the purchase of a spare autotransformer for the new 448 MVA S.R. 60 transformers. This new spare autotransformer would only be used at S.R. 60 due to its physical dimensions
2. Alternative 2 does not provide a long term solution for the voltage problems in the high load growth area north of S.R. 60 and east of I-75. The addition of the capacitor bank at Wheeler Road mitigates the contingency voltage violations until 2014. The only other solution found at that point is the addition of a new 230 kV source in the area.
3. Alternative 2 does not provide looped transmission service to the heavily loaded Hampton 230/69 kV Substation as Alternative 1. Without a Wheeler Road 230/69 Substation Hampton is the only 230 kV source in the densely loaded Brandon area.
4. Alternative 2 does not mitigate the east to west or north to south corridor outages.

Alternative 3

Alternative 3 includes the same series of sub-projects as Alternative 1 to address the sub-transmission system issues. It includes the following set of projects to address the bulk issues: construct a new nine mile long Willow Oak to FishHawk 230 kV circuit and a new 30 mile 230 kV circuit from Griffin to Dale Mabry Substation. The estimated capital cost of Alternative 3 is $89.5 million.

Alternative 3 was rejected for the following reasons:

1. The capital cost of Alternative 3 was the highest of all the alternatives. The major reason for the higher cost is the construction of 39 miles of 230 kV line. Another reason for the higher cost was due to the purchase of a spare autotransformer for the new 448 MVA north S.R. 60 transformer. This new spare autotransformer would only be used at S.R. 60 due to its physical dimensions

2. Alternative 3 does not provide a long term solution for the voltage problems in the high load growth area north of S.R. 60 and east of I-75. The addition of the capacitor bank at Wheeler Road mitigates the contingency voltage violations until 2014. The only other solution found at that point is the addition of a new 230 kV source in the area.

3. Alternative 3 does not provide looped transmission service to the heavily loaded Hampton 230/69 kV substation as Alternative 1. Without a Wheeler Road 230/69 substation Hampton is the only 230 source in the densely loaded Brandon area.

Summary of Alternatives

All three alternatives represent a higher capital investment than the preferred Project and none of the alternatives resolve both the issue of looping the 230/69 kV substations

and the mitigation for the loss of either the east-west or north-south 230 kV corridors. Additionally, some of the alternatives are marginal in resolving expected overload and low voltage conditions. The selection of the Project resolves all of these issues at a lower capital investment and represents a long term solution of providing needed improvements to the 230 kV transmission and 69 kV sub-transmission networks.

VII. Adverse Consequences of Not Constructing Project

As stated earlier, the two phases or segments of the Project were justified individually and in combination to improve system reliability and were compatible with long range area requirements and in providing operating flexibility. In this section the adverse consequences are addressed for the total Project scope.

The adverse consequences of not constructing the Project are listed below:

1. Reliability will not be maintained for approximately 65,000 customers in the Project Area.
2. Contingency bulk power flows will continue to compromise the underlying 69 kV system forcing additional mitigation measures to be taken.
3. The overall cost to address short term contingency and long term growth rate will be higher.
4. Both Hampton and Willow Oak 230/69 kV substations serving Hillsborough and Polk counties north of S.R. 60 will be subject to loss of load for single line outages.

5. An east-west corridor outage will leave only one 230 kV circuit from Polk County to Tampa Electric's load center limiting import capability and Polk generation.
6. A north-south corridor outage will overload the sub-transmission system.
7. There will be increased system losses of 4 MW.

VIII. Conclusion

The Project corrects contingency overloads and voltage violations, provides a new 230 kV path from Polk County to Tampa Electric's load center independent of existing corridors, enhances Tampa Electric's import and export capability and is the most cost effective solution that compliments state wide transmission plans.

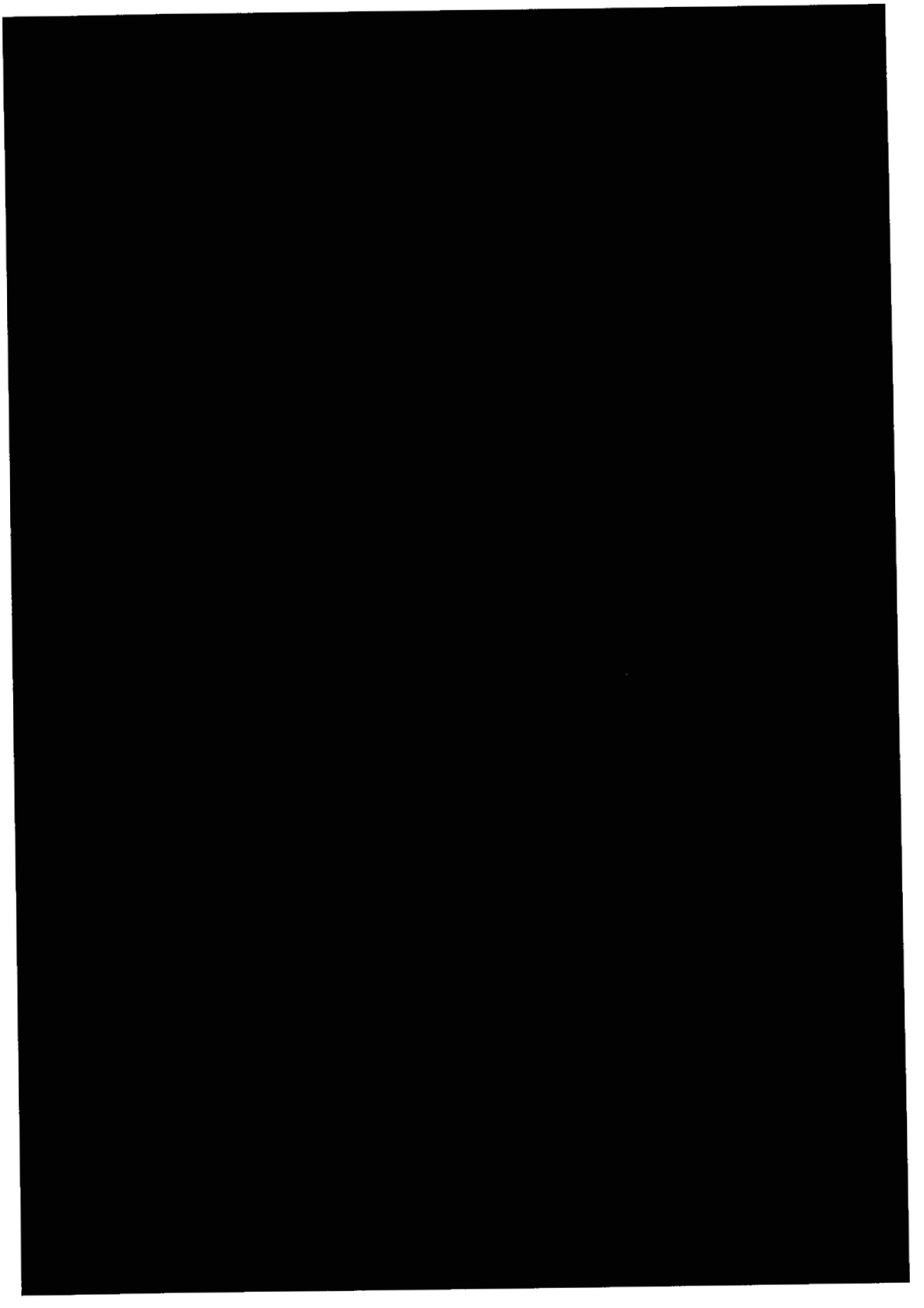
IX. Attachments

ATTACHMENT 1

TAMPA ELECTRIC COMPANY

ELECTRIC FACILITIES MAP

(GENERAL MAP)



ATTACHMENT 2

TAMPA ELECTRIC COMPANY

HISTORY AND FORECAST OF WINTER PEAK DEMAND

Schedule 3.2

History and Forecast of Winter Peak Demand
Base Case

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	Total *	Wholesale **	Retail *	Interruptible	Residential Load Management	Residential Conservation	Comm./Ind. Load Management	Comm./Ind. Conservation	Net Firm Demand
1996/97	3,632	109	3,523	228	164	353	21	38	2,719
1997/98	3,231	99	3,132	210	160	370	21	39	2,332
1998/99	3,985	131	3,854	152	266	388	18	40	2,990
1999/00	4,019	125	3,894	212	209	402	19	43	3,009
2000/01	4,405	136	4,269	191	196	410	21	44	3,407
2001/02	4,217	127	4,090	168	176	419	22	46	3,259
2002/03	4,484	129	4,355	195	210	428	21	46	3,455
2003/04	3,949	120	3,829	254	136	437	18	48	2,936
2004/05	4,308	129	4,179	194	189	444	16	49	3,287
2005/06	4,404	171	4,233	51	144	447	18	50	3,523
2006/07	5,057	191	4,866	160	143	452	16	50	4,046
2007/08	5,185	191	4,994	160	134	455	16	51	4,178
2008/09	5,303	178	5,124	160	131	458	17	51	4,308
2009/10	5,436	178	5,257	160	128	461	17	52	4,440
2010/11	5,565	178	5,387	160	126	463	18	52	4,568
2011/12	5,627	107	5,520	160	124	465	18	52	4,700
2012/13	5,752	91	5,660	160	123	467	19	52	4,839
2013/14	5,887	77	5,810	160	121	469	19	53	4,988
2014/15	6,043	77	5,967	161	120	470	20	53	5,143
2015/16	6,203	77	6,126	160	118	471	20	53	5,304

December 31, 2006 Status

* Includes cumulative conservation.
** Includes sales to Progress Energy Florida, Wauchula, Fort Meade, St. Cloud and Reedy Creek.
Note: Values shown may be affected due to rounding.

ATTACHMENT 3
TAMPA ELECTRIC COMPANY
HISTORY AND FORECAST OF CUSTOMER AND ENERGY SALES GROWTH

CUSTOMERS GROWTH:

Over the past five years (2002-2006), the number of Customers in the East Region has grown by an average annual growth rate (AAGR) of 3.2 percent, 0.6 percent higher than Tampa Electric's entire service area (2.6 percent). Tampa Electric is forecasting service area customers to grow an AAGR of 2.2 percent over the next five years (2007-2011).

RESIDENTIAL CUSTOMERS:

Over the past five years (2002-2006), residential Customers in the East Region have grown by an average annual growth rate (AAGR) of 3.3 percent, 0.7 percent higher than Tampa Electric's entire service area (2.6 percent). Tampa Electric is forecasting service area residential Customers to grow an AAGR of 2.3 percent over the next five years (2007-2011).

SALES:

Over the past five years (2002-2006), energy sales in the East Region have grown by an average annual growth rate (AAGR) of 2.7 percent, 1.2 percent higher than Tampa Electric's entire service area (1.5 percent). Tampa Electric is

forecasting service area sales to grow an AAGR of 2.8 percent over the next five years (2007-2011).

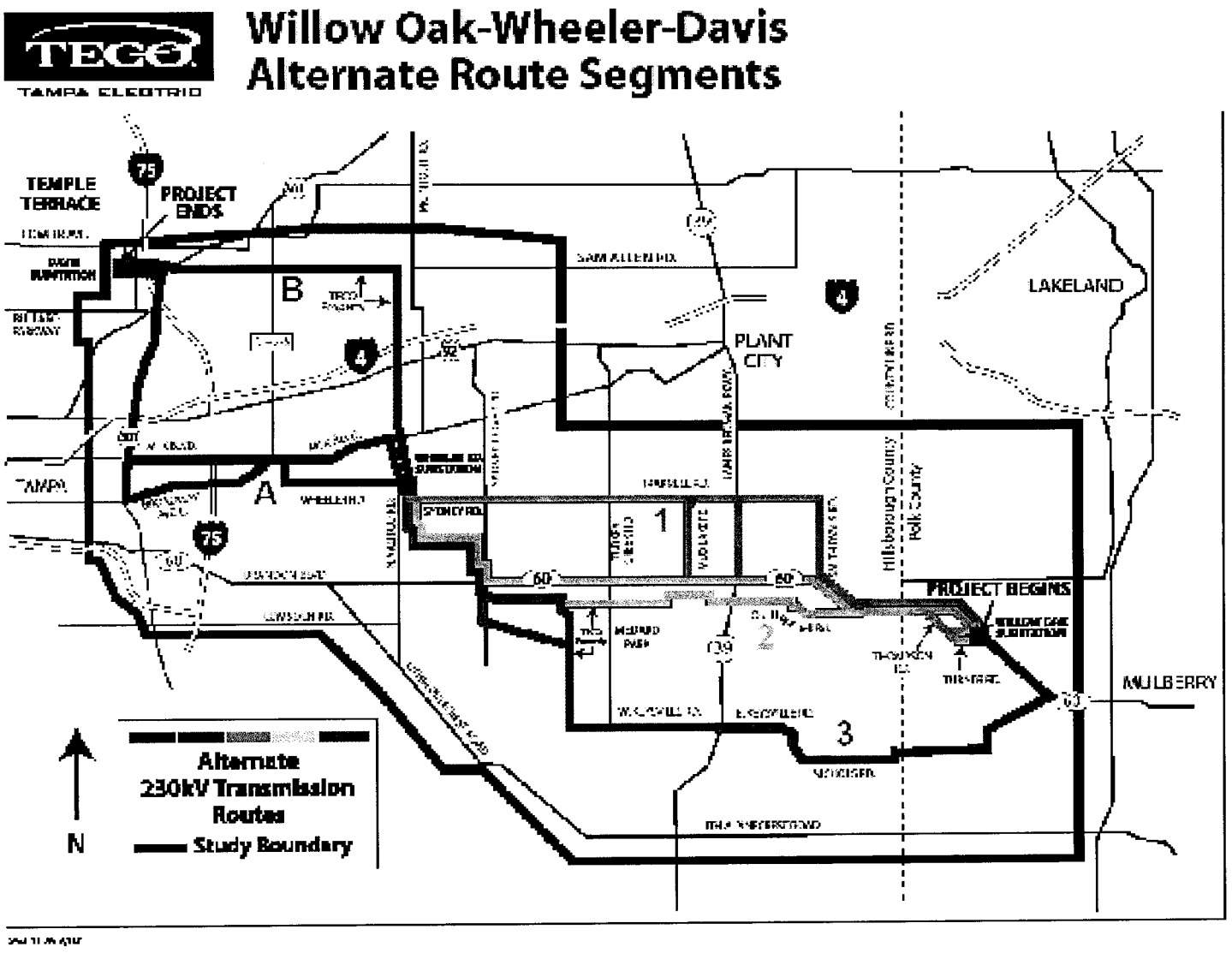
RESIDENTIAL SALES:

Over the past five years (2002-2006), residential energy sales in the East Region have grown by an average annual growth rate (AAGR) of 2.4 percent, 0.4 percent higher than Tampa Electric's entire service area (2.0 percent). Tampa Electric is forecasting service area sales to grow an AAGR of 3.2 percent over the next five years (2007-2011).

ATTACHMENT 4

MAP OF STUDY AREA WITH EXISTING FACILITIES AND PROPOSED PROJECTS

Attachment 4: Map of Study Area with Existing Facilities and Proposed Projects



ATTACHMENT 5
NERC TRANSMISSION PLANNING CRITERIA

The NERC Reliability Standards under Transmission Planning are divided into categories A, B, C and D and Tampa Electric Company uses these Standards as its planning criteria. Category A addresses normal system conditions with all facilities in service. Category B addresses system conditions following the loss of a single facility. Category C addresses system conditions following the loss of two or more facilities. Finally, Category D addresses system conditions following an extreme event where multiple facilities are removed from service. The primary need for transmission system upgrades is most frequently based on potential overload conditions associated with the Category B contingencies (single contingency) listed in Table 1 of this Attachment 5. Generally, Category C and D multiple contingency analysis is used to identify potential situations of cascading interruptions or instability. The planned transmission system with its expected loads and transfers must be stable and within applicable ratings for all Category A, and B contingency scenarios. The effect of Category C and D contingencies on system stability is also evaluated. The design of new transmission connections should take into account and minimize, to the extent practical, the adverse consequences of Category C and D contingencies. Lower probability Category C and D contingencies, when they occur in combination with forecasted demand levels and firm interchange transactions, must not result in uncontrolled, cascading interruptions. While controlled interruption of load or opening of transmission circuits may be needed, the system should be within its emergency limits and capable of rapid restoration after operation of automatic controls.

ATTACHMENT 6
TRANSMISSION PLANNING PROCESS

Step 1: Preparation of System Models

To prepare system models[1], load profiles must be developed for the current year and for representative years of the ten-year planning horizon. These profiles incorporate the most recent substation load information available. Thus, Distribution Planning is asked to provide Transmission Planning with projected substation loads and future distribution substation data.

Once the load profiles have been developed, they are used as input into the load flow, fault analysis and stability programs, which simulate and study the behavior of the transmission system. Other major inputs into these programs are the generation dispatch and the base transmission system representation including expected line and equipment performance data. Firm long-term transmission service obligations are incorporated into the programs. The base transmission system representation incorporates existing and planned facilities. In addition, appropriate operating criteria involving voltage limits, generator reactive limits, and transformer taps are observed. All major utilities within the FRCC Regions are also represented.

[1] The models used for this analysis are the Florida Reliability Coordinating Council's year 2006 winter load flow databank cases modeling expected system conditions in the winter of 2012/13. These models are run on Power Tampa Electric Company technologies Incorporated (PTI) load flow programs which are commonly used and accepted in the electric industry.

Step 2: Transmission System Assessment

Using the system models developed in Step 1, outage contingencies are simulated using load flow programs. These outage contingencies consist of two types as discussed in Attachment *5:* (1) single events with a higher probability of occurrence such as the loss of one transmission line section or autotransformer and (2) multiple events such as the loss of all transmission lines in a common transmission row. Generally, the latter event has a lower probability of occurrence but can result in consequences that are more severe. All single and credible multiple contingencies are analyzed. For each of these contingencies, the response of the power system is analyzed and violations of the planning criteria are evaluated

Step 3: Development and Evaluation of Alternatives

This step addresses potential criteria violations. First, switching Tampa Electric Company techniques and other operational procedures are tested to determine if such actions resolve the problems. If satisfactory operational procedures cannot be implemented, several alternatives for transmission system reinforcements are developed. Cost estimates for the viable alternatives are then determined. Subsequently these alternatives are evaluated looking at reliability, voltage, capacity, economics, and constructability (See Attachment 10). After evaluating the transmission system project alternatives, the project that best meets the requirements listed above is selected.

ATTACHMENT 7
DISTRIBUTION PLANNING PROCESS AND METHODOLOGY

Distribution Load Forecast

System Planning develops a load forecasting model for its seven service areas for 10 years which begins with the previous year's system instantaneous summer peak load. The load on each feeder circuit at the time of the system peak is downloaded into the model as the base load. The planner reviews each circuit and adds future known loads based on Service Alerts from Customer service requests. The planner also increments the load by a percentage growth rate based on the potential load growth in the area and publication of potential future projects. The feeder loads are totaled for each year and equal the forecasted peak load developed by Economic Planning and Forecasting.

Distribution System Assessment

The distribution planner reviews circuit loading, distribution transformer loading and distribution reactive power loading on an annual basis for the next five years. Thermal overloads and/or voltage violations are identified at this time.

Development and Evaluation of Alternatives

Once it has been determined that additional distribution capacity is required in an area, System Planning develops various alternatives for meeting the system growth for both the short term and long term. Cost estimates are developed for

each alternative. The alternatives are then evaluated based on the impact to reliability, voltage, capacity, economics, and constructability. The best overall solution is chosen to accommodate system growth.

ATTACHMENT 8
PROPOSED FUTURE SUBSTATIONS AND LOADS IN THE PROJECT SERVICE AREAS

PROPOSED FUTURE SUBSTATIONS AND LOADS

In-Service	Substation	County	Long Term Load (MW)
2008	Hampton S Tx Upgrade to 37 MW	Hillsborough	74
2009	Plant City 2nd Tx	Hillsborough	56
2009	Cass Street	Hillsborough	56
2010	Chapman	Hillsborough	28
2010	Compark	Hillsborough	28
2010	Wilderness	Hillsborough	28
2011	Alexander W Tx Upgrade to 37MW	Hillsborough	74
2011	Tampa Palms E Tx	Hillsborough	65
2015	Imperial Lakes 2nd Tx	Hillsborough	56

ATTACHMENT 9
LOAD FLOW SUMMARY TABLE

ATTACHMENT 9
LOAD FLOW SUMMARY TABLE

Contingency	Without Project		With Project	
	Overload	Voltage Violation	Overload	Voltage Violation
1 SR 60 North 230/69 kV transformer	[redacted]		None	None
2 SR 60 South 230/69 kV transformer			None	None
3 Circuit 66016 SR 60 to SR 574			None	None
4 Wheeler Road 69 kV bus tie breaker			None	None
6 Pebbledale-FishHawk Circuit 2			None	None
7 Pebbledale-FishHawk Circuit 1			None	None

ATTACHMENT 9
LOAD FLOW SUMMARY TABLE

Contingency	Without Project		With Project	
	Overload	Voltage Violation	Overload	Voltage Violation
8 Pebbledale to FishHawk Corridor Outage	[redacted]	[redacted]	None Circuit 66419 Hopewell to Mulberry - 100.2% None None None	None
9 Ruskin 230/69 kV Transformer			Circuit 66088 - S Gib to East Bay 101.7%	None

ATTACHMENT 10
TRANSMISSION ALTERNATIVE DECISION MAKING ANALYSIS

ATTACHMENT 10
TRANSMISSION ALTERNATIVE DECISION MAKING ANALYSIS

Alternative Evaluation for: **Wheeler Road 230/69 kV Substation and Wheeler Road to Willow Oak 230 kV Circuit**

Planner:
Date:

Alternative	Description of Alternative
Proposed Project	Wheeler Road 230/69 kV Substation, Davis - Wheeler Road - Willow Oak 230 kV Circuit
Alternative 1	Willow Oak to Hampton
Alternative 2	Willow Oak to FishHawk
Alternative 3	Griffin to Dale Mabry

Evaluation Components and Sub Components	Proposed project			Alternative 1			Alternative 2			Alternative 3		
	Score (0-3) B	Weight Factor C	Weighted score BXC	Score (0-3) E	Weight Factor C	Weighted score EXF	Score (0-3) E	Weight Factor C	Weighted score EXF	Score (0-3) E	Weight Factor C	Weighted score EXF
Reliability Sub Component												
SAIDI	2.0	0.5	1.0	1.0	0.5	0.5	1.0	0.5	0.5	1.0	0.5	0.5
MAIFI	2.0	0.5	1.0	1.0	0.5	0.5	1.0	0.5	0.5	1.0	0.5	0.5
Sub Component Average			1.0			0.5			0.5			0.5
Fixed Reliability Component Weight Factor = 4												
Reliability Component Score 4XSub Component Average			4.0			2.0			2.0			2.0
Comments:												
Voltage Sub Component												
Steady State Voltage	3.0	0.33	1.0	2.0	0.33	0.7	2.0	0.33	0.7	2.0	0.33	0.7
Steady State Voltage Variation	3.0	0.33	1.0	2.0	0.33	0.7	2.0	0.33	0.7	2.0	0.33	0.7
Transient Voltage	1.0	0.33	0.3	1.0	0.33	0.3	1.0	0.33	0.3	1.0	0.33	0.3
Sub Component Average			0.8			0.6			0.6			0.6
Fixed Voltage Component Weight Factor = 3												
Voltage Component Score 3XSub Component Average			2.3			1.7			1.7			1.7
Comments:												
Capacity Sub Component												
Load Growth	3.0	0.33	1.0	1.0	0.33	0.3	1.0	0.33	0.3	1.0	0.33	0.3
Relay Service	0.0	0.33	0.0	0.0	0.33	0.0	0.0	0.33	0.0	0.0	0.33	0.0
Capacity Expansion	3.0	0.33	1.0	1.0	0.33	0.3	3.0	0.33	1.0	1.0	0.33	0.3
Sub Component Average			0.7			0.2			0.4			0.2
Fixed Capacity Component Weight Factor = 3												
Capacity Component Score 3XSub Component Average			2.0			0.7			1.3			0.7
Comments:												
Construction Sub Component												
Lead Time	2.0	0.33	0.7	3.0	0.33	1.0	3.0	0.33	1.0	3.0	0.33	1.0
Ease/safety	2.0	0.33	0.7	2.0	0.33	0.7	2.0	0.33	0.7	2.0	0.33	0.7
Environmental Impact	2.0	0.33	0.7	2.0	0.33	0.7	2.0	0.33	0.7	2.0	0.33	0.7
Sub Component Average			0.7			0.8			0.8			0.8
Fixed Construction Component Weight Factor = 1												
Construction Component Score 1XSub Component Average			0.7			0.8			0.8			0.8
Comments:												
Transmission Sub Component												
Complements Long Range Expansic	3.0	0.5	1.5	1.0	0.5	0.5	1.0	0.5	0.5	1.0	0.5	0.5
Capacity	3.0	0.5	1.5	1.0	0.5	0.5	1.0	0.5	0.5	1.0	0.5	0.5
Sub Component Average			1.5			0.5			0.5			0.5

ATTACHMENT 10

TRANSMISSION ALTERNATIVE DECISION MAKING ANALYSIS

Alternative Evaluation for: **Wheeler Road 230/69 kV Substation and Wheeler Road to Willow Oak 230 kV Circuit**

Planner:

Date:

Alternative	Description of Alternative
Proposed Project	Wheeler Road 230/69 kV Substation, Davis - Wheeler Road - Willow Oak 230 kV Circuit
Alternative 1	Willow Oak to Hampton
Alternative 2	Willow Oak to FishHawk
Alternative 3	Griffin to Dale Mabry

	Proposed project			Alternative 1			Alternative 2			Alternative 3		
Evaluation Components and Sub Components	**Score (0-3) B**	**Weight Factor C**	**Weighted score BXC**	**Score (0-3) E**	**Weight Factor C**	**Weighted score EXF**	**Score (0-3) E**	**Weight Factor C**	**Weighted score EXF**	**Score (0-3) E**	**Weight Factor C**	**Weighted score EXF**
Fixed Transmission Component Weight Factor = 2 Transmission Component Score 2XSub Component Average			3.0			1.0			1.0			1.0
Comments:												
Economics Sub Component												
Initial Cost	3	0.5	1.5	1	0.5	0.5	2	0.5	1	0	0.5	0
Time Value	3	0.5	1.5	1	0.5	0.5	2	0.5	1	0	0.5	0
Sub Component Average			1		1	0.5		1	1		1	0
Fixed Economics Component Weight Factor = 5 Economics Component Score 5XSub Component Average			5			2.5			5			0
Comments:												
Other Sub Component												
Enhanced Import Capability	3	1	3	1	1	1	1	1	1	2	1	2
Sub Component Average			3			1			1			2
Fixed Other Component Weight Factor = 2 Other Component Score 2XSub Component Average			6			2			2			4
Comments:												

ATTACHMENT 10

TRANSMISSION ALTERNATIVE DECISION MAKING ANALYSIS

Alternative Evaluation for: **Wheeler Road 230/69 kV Substation and Wheeler Road to Willow Oak 230 kV Circuit**

Planner:

Date:

Alternative	Description of Alternative
Proposed Project	Wheeler Road 230/69 kV Substation, Davis - Wheeler Road - Willow Oak 230 kV Circuit
Alternative 1	Willow Oak to Hampton
Alternative 2	Willow Oak to FishHawk
Alternative 3	Griffin to Dale Mabry

	Proposed project			Alternative 1		
Evaluation Components and Sub Components	**Score (0-3) B**	**Weight Factor C**	**Weighted score BXC**	**Score (0-3) E**	**Weight Factor C**	**Weighted score EXF**

Major Components of Comparison

	Proposed	Alternative 1	Alternative 2	Alternative 3	Alternative 4
RELIABILITY	4	2	2.0	2.0	
VOLTAGE	2.31	1.65	1.7	1.7	
CAPACITY	1.98	0.66	1.3	0.7	
CONSTRUCTION/ LEAD TIME	0.7	0.825	0.8	0.8	
TRANSMISSION	3.0	1	1.0	1.0	
ECONOMICS	5	2.5	5	0	
OTHER	6	2	2	4	
GRAND TOTAL	23.0	10.6	13.8	10.1	
Preferred Project: Higher Score Better					