BEFORE THE

FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 100304-EU

DIRECT TESTIMONY AND EXHIBITS

OF

W. MIKE FEAZELL

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GULF POWER

A SOUTHERN COMPANY

GULF POWER COMPANY

Before the Florida Public Service Commission
Prepared Direct Testimony of
W. Mike Feazell
Docket No. 100304-EU
Date of Filing: March 3, 2011

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

A. My name is W. Mike Feazell. My business address is 140 Hollywood Boulevard, Fort Walton Beach, Florida, 32548. I am the District Operations Manager in Fort Walton Beach for Gulf Power Company.

Q. Please summarize your educational and professional background.

A. I hold a Bachelor of Science degree in Industrial Engineering Technology from the University of Southern Mississippi. I have been employed with Gulf Power Company for 25 years in various capacities. I began my employment with Gulf Power as a Distribution Engineering representative. In that role, I designed service to residential, commercial and industrial customers as well as ensured the reliability of the distribution system in the area which I worked. Thereafter, I held a position in Commercial and Industrial Marketing, in which I addressed the various energy and electrical needs associated with the City of Pensacola and Emerald Coast Utility Authority. Following my employment in Commercial and Industrial Marketing, I held the position of Transmission Lines Supervisor wherein my responsibilities included the design, construction and maintenance associated with Gulf's transmission lines system. I currently serve as the District Operations Manager in Fort Walton Beach. In my current role, I

oversee the engineering design, line construction, maintenance and service to the roughly 100,000 customers in the Fort Walton Beach, Destin, Crestview, Niceville, and DeFuniak Springs areas. This job entails the management of 58 employees in the Line/Service, Engineering field. We provide safe, reliable electric service to the customers we serve.

Q. What is the purpose of your testimony in this proceeding?

A. My testimony addresses the necessary facilities and associated costs for Gulf Power and Choctawhatchee Electric Cooperative, Inc., (CHELCO) to provide adequate and reliable service to and within the Freedom Walk development. I also briefly address each utility's ability to provide adequate and reliable service to the Freedom Walk development.

Q. Have you prepared any exhibits that contain information to which you will refer in your testimony?

A. Yes. I have four separate exhibits that I am sponsoring as part of my testimony. The first exhibit (WMF-1) I am sponsoring consists of two maps, one showing CHELCO's three-phase circuits near the Freedom Walk development and one showing Gulf Power Company's three-phase circuits near the Freedom Walk development. The second exhibit (WMF-2) attached to my testimony is comprised of the original engineering study performed by Patterson & Dewar Engineers, Inc. on CHELCO's behalf dated July 7, 2010, and two subsequent revisions to the study dated November 19, 2010, and February 1, 2011, respectively. The third exhibit (WMF-3) I am sponsoring consists of a Job Summary for the Normandy

Road upgrade submitted by CHELCO in its response to question number five of Gulf Power Company's First Request for Production of Documents. The fourth exhibit (WMF-4) attached to my testimony contains CHELCO's 2011-2014 Construction Work Plan (CWP) completed in May 2010.

Counsel: We ask that Mr. Feazell's four exhibits as just described be marked for identification as Exhibit Nos. ___ (WMF-1), ___ (WMF-2), ___ (WMF-3), and ___ (WMF-4), respectively.

Q. Are you personally familiar with the Freedom Walk development?

A. Yes. I first became involved with the Freedom Walk development in April 2008. My initial involvement centered on meeting with the developer, Emerald Coast Partners, L.L.C., to discuss service requirements. Since that time, I have been involved in one other meeting with the developer at which we discussed the construction of the Freedom Walk Subdivision and the developer's desire that Gulf Power provide electrical service to the development. I have made several site visits to review the location of the development in order to better evaluate the area. At my direction, other Gulf Power engineers have also made site visits to the location of the development in order to evaluate existing circuits and develop the cost estimate associated with the extension of the line to serve the customer.

Q. What is your understanding of the reason for the present territorial dispute?

A. As discussed more fully by Witness Johnson, the developer of Freedom Walk has requested that Gulf Power serve the development. CHELCO has disregarded this request and is attempting to overturn the customer's choice.

Q. What information have you considered in developing your testimony?

A. I have reviewed and considered a wide variety of information and data in developing my testimony. In addition to my general experience as an engineer for the Company, I have relied upon Gulf Power's 2010 Overhead/Underground Residential Differential Cost Data, public records and load and plat information obtained from Witness Johnson. I have also used engineering estimates that were calculated through Gulf Power's Job Estimation and Tracking system, load studies for the general area, and information regarding the total number of single family and multi-family units at build-out as provided by Witness Johnson.

I have also relied upon numerous documents produced by CHELCO during the course of discovery. Such documents include detailed engineering studies, responses to interrogatories and requests for admission, maps of CHELCO's Auburn Substation Circuit, engineering studies developed on CHELCO's behalf by Patterson & Dewar Engineers, Inc. and CHELCO's 2011-2014 Construction Work Plan (CWP) completed in May 2010.

Q. What are the necessary facilities for CHELCO to extend adequate and reliable service to the Freedom Walk development?

A. CHELCO presently owns a three-phase feeder extending from its Auburn Substation that, in its extremities, abuts a boundary of the Freedom Walk development. However, in order to adequately and reliably serve the projected Freedom Walk load of 4,700 kilowatts, CHELCO will be required to upgrade substantial segments of that feeder. As shown on page 1 of Exhibit WMF-1, a 1.3 mile span of the feeder -- that segment of Auburn Circuit 03 between points "A" and "B" and point "C" -- will need to have the electrical conductor replaced with a larger size conductor. It also appears that CHELCO will be required to convert 1,500 feet of an existing single-phase tap on Normandy Road to a three-phase circuit extension as shown on page 1 of my Exhibit WMF-1, between points "E" and "F".

Finally, CHELCO will need to perform extensive work at its existing Auburn Substation, or construct an entirely new substation, in order to adequately serve the projected Freedom Walk load.

Q. What is the basis for your conclusions?

A. My conclusions are based upon CHELCO's planned load assumptions for the Freedom Walk development, which are consistent with those of Witness Johnson. They are also based upon a review of Patterson & Dewar Engineers, Inc.'s engineering study which was commissioned by CHELCO for the specific purpose of determining whether CHELCO's existing electric system is capable of handling the load associated with the Freedom Walk development. A copy of this study is attached to my

testimony as Exhibit WMF-2. As can be seen from my Exhibit WMF-2, Patterson & Dewar issued its original study on July 7, 2010, and revisions to the original study on November 19, 2010 and February 1, 2011.

This study clearly demonstrates that serving the projected load for Freedom Walk will cause the 394 AAAC (size and type) and 750 MCM UG conductor segments of the feeder to significantly exceed CHELCO's own System Design & Operating Criteria (SDOC). At page 4 of the original study (page 4 of my Exhibit WMF-2) under the heading titled "**2009 Summer Model; Base System w/New Load**", the study identifies the loading for the above-referenced conductor segments assuming a projected load for Freedom Walk of 3,700 kilowatts. According to the document, the 394 AAAC segment would be loaded to 87 percent of its operating capacity (or 27 percent above CHELCO's SDOC) and the 750 MCM UG segment would be loaded to 66 percent of its operating capacity (or 6 percent above CHELCO's SDOC). As stated on page 1 (page 1 of my Exhibit WMF-2) of the original study, CHELCO's SDOC provide that "primary conductors are not to be loaded for long periods of time, over 60% of operating capacity for summer loading conditions." The study's reference to CHELCO's SDOC is consistent with CHELCO's description of the SDOC at page 2 of Exhibit K to its 2011-2014 CWP (page 30 of my Exhibit WMF-4). At page 2 of my Exhibit WMF-2, the original study confirms that "[s]ome of the conductor, mainly the 394 AAAC will be loaded more than the SDOC recommends" and concludes that, if CHELCO serves Freedom Walk, CHELCO should upgrade the 394 AAAC segment to 741 AAAC a full three years before originally planned. The

same conclusion appears at page 2 of the November 19, 2010, revision found on page 10 of my Exhibit WMF-2.

As noted previously, CHELCO also provided a second revision to its study which is dated February 1, 2011. The original study and the November 19, 2010, revision were based on the assumption that the load of Freedom Walk upon full build-out would equal 3,700 kilowatts. The February 1, 2011, revision assumes a load of 4,700 kilowatts upon full build-out. Predictably, the increase in the projected load for the development causes the loading for the above-referenced conductor segments to further exceed CHELCO's SDOC. As can be seen on Page 1 (page 14 of Exhibit WMF-2) of the February 1, 2011, revision under the heading **"2009 Summer Model BSI; Base System w/New Load"**, the 394 AAAC segment will be loaded to 95 percent of its operating capacity (or 35 percent above CHELCO's SDOC) and the 750 MCM UG segment will be loaded to 75 percent of its operating capacity (or 15 percent above CHELCO's SDOC). This data clearly reveals that CHELCO cannot adequately serve the Freedom Walk development with its existing conductor.

My conclusion regarding CHELCO's need to convert a segment of its circuit on Normandy Road is based upon a Job Summary dated May 17, 2010. This document was produced by CHELCO in response to question number five of Gulf Power's First Request for Production of Documents and is attached to my testimony as Exhibit WMF-3. Question number five sought "[c]opies of all documents upon which Chelco relied in developing the cost estimates included as Exhibit "F" to Chelco's petition

in this matter." This Job Summary indicates that there is a need to retire 1,500 feet of the single-phase #2 AAAC OH Primary and install new three-phase #1/0 AAAC OH Primary, along with the replacement of eight existing poles with taller and larger poles, as well as the installation of two new larger poles.

Finally, with respect to the need to upgrade the Auburn Substation, page 2 of the February 1, 2011, revision to the engineering study clearly states that "[f]or both the summer and winter 2014 ASI, the Auburn substation power transformer is carried to maximum capacity." This information is found on page 15 of my Exhibit WMF-2. The document further states that "[t]he lowside buswork at Auburn Substation circuit 03 is carried to its maximum capacity of 600A." For these reasons, CHELCO's consultant recommends "[t]hat CHELCO and their G&T provider, PowerSouth EC evaluate substation options should Freedom Walk development be served by CHELCO and should it reach this estimated load of 4,700 kW." These options include an "[u]pgrade [to] the substation transformer at Auburn sub to a larger transformer or add a 2nd bank if there is room inside the substation or perhaps add a new delivery point to relieve the load on Auburn sub." The study also recommends "[t]hat a 2nd circuit be constructed to help serve the load south of Auburn substation (if a new delivery point is not added nearby) to help serve the load south of Auburn substation and not exceed the rating on the lowside buswork and the circuit breakers at the substation."

Q. What will be CHELCO's cost to perform these required upgrades of its facilities?

A. The cost for CHELCO to perform the required upgrade to the 394 AAAC segment of the feeder, will be $227,404. This cost figure was provided by CHELCO in response to discovery issued by Gulf Power and also appears in Exhibit Q (page 31 of 37) to CHELCO's 2011-2014 CWP. The cost for CHELCO to perform the required upgrade to the Normandy Road conductor, will be $29,063. This cost figure appears at the bottom of page 1 of my Exhibit WMF-3. CHECLO has not provided costs estimates for the upgrade of the 750 MCM UG segment of its feeder or for the upgrades to the Auburn Substation.

Q. What do you estimate will be CHELCO's cost to perform the necessary substation upgrade work?

A. Based on my knowledge of transmission construction, the cost of a power transformer replacement ranges from $700,000 to $1.2 million. The addition of another delivery point as discussed at page 2 of the February 1, 2011, revision to the engineering study, ranges between $1.0 million to $4.0 million.

Q. What are the necessary facilities and associated costs for Gulf Power to extend adequate and reliable service to the Freedom Walk development?

A. In order to extend adequate and reliable service to the Freedom Walk development, Gulf Power will extend its existing three-phase line approximately 2,130 feet at a cost of only $89,738. That short extension

is depicted on page 2 of my Exhibit WMF-1, beginning at point "D" and extending westerly to what will be the point of service for the Freedom Walk development. Gulf's existing line presently serves a variety of customers, including Crestview High School, the Winn Dixie Market Place, and Davidson Middle School, which are located a short distance to the east of the Freedom Walk development. The cost to construct this short feeder section was estimated using Gulf Power's Job Estimating and Tracking system which calculates labor and material costs. The 2,130 foot line extension consists of 5,900 pounds of 477 AAC conductor, 45 insulators, 16 poles, six anchors, and 18 lightning arresters.

Q. Other than simply extending Gulf Power's existing three-phase line 2, 130 feet, would Gulf Power need to make any other investments or upgrades to its facilities in order to provide adequate and reliable service to the Freedom Walk development?

A. No. The projected loads associated with the Freedom Walk development will be adequately handled through service from Gulf Power's Airport Road Substation, located only two miles from the development.

Similarly, Gulf's existing conductor up to the point of the line extension will adequately handle the projected load.

Q. Are you aware of any engineering or other operational reason why CHELCO should be awarded service to Freedom Walk in lieu of Gulf Power?

A. No. There are no engineering, operational or other reasons why CHELCO should be awarded service to Freedom Walk. Moreover, as I previously indicated, in order to reliably serve the development, CHELCO would be required to install more facilities at a much higher cost than Gulf Power.

Q. Other than serving the Freedom Walk development, would Gulf Power and its customers realize any additional benefits from the extension of three-phase service to the development?

A. Yes. Extension of the existing three-phase feeder would also enable Gulf Power to provide adequate, reliable service to reasonably expected new developments that ensue along Old Bethel Road between Davidson Middle School and the Freedom Walk development.

Q. What are the necessary facilities and associated costs for Gulf Power to provide adequate and reliable service within the Freedom Walk development?

A. The estimated cost for Gulf Power to install overhead facilities within the development, including material and labor, is $752,778. The estimated cost for Gulf Power to install underground facilities within the development, including material and labor, is $844,935. These estimates were developed using the material and labor per-lot costs for "Low Density" subdivisions contained in Gulf Power's 2010

Overhead/Underground Residential Differential Cost Data, approved by the Commission on August 31, 2010. These estimates are based upon the assumption that the development will contain 489 single family homes, 272 multi-family homes, and are subject to change pending the approval of final subdivision plans.

Q. What are the necessary facilities and associated costs for CHELCO to provide adequate and reliable service within the Freedom Walk development?

A. On February 15, 2011, CHELCO supplemented its previous discovery responses to Gulf Power. The supplemental production included a revision to CHELCO's July 2010 engineering study indicating that CHELCO has changed its load assumptions for the development. Specifically, it appears that CHELCO is now projecting that the load of the development, upon full build-out, will be 4,700 kilowatts. This is a significant change from CHELCO's previous load projection of 3,700 kilowatts. Given the timing of this change, Gulf has not yet been able to determine CHELCO's cost to provide service within the development.

Q. Do you anticipate that the necessary facilities and associated costs for CHELCO to provide adequate and reliable service within the Freedom Walk development will be substantially different from Gulf Power's?

A. No. I would expect Gulf Power's facilities and related costs for service within the development to be similar to CHELCO's. As Gulf's District Operations Manager, it has been my experience that there is not a high

degree of variation among utilities in terms of the types of facilities and costs for providing service within developments of this nature.

Q. Is each utility capable of providing adequate and reliable electric service to the Freedom Walk development?

A. As explained by Witness Spangenberg, CHELCO is legally prohibited from serving the Freedom Walk development by virtue of the development's non-rural character. Nevertheless, from a physical standpoint, I believe that each utility is capable of providing adequate and reliable electric service to the Freedom Walk development. However, as described above, CHELCO would need to expend approximately $227,404 just for one section of feeder upgrade – and much more for substation improvements and other facility upgrades – to provide service to the development. These costs far exceed Gulf's estimated expenditure of only $89,738. Gulf Power's ability to provide adequate and reliable electric service is demonstrated by Gulf's rich history of satisfactory service to the residents in Crestview and surrounding areas.

Gulf Power would have at least one additional advantage over CHELCO in the provision of reliable service to Freedom Walk: the availability of resources to quickly respond to outages. Gulf Power has a fully-staffed line service headquarters, with multi-truck, pole yard and warehouse resources, which is located in Crestview only 4.5 highway miles away from Freedom Walk. CHELCO's nearest similar facility is over 30 miles away in DeFuniak Springs.

Q. Mr. Feazell, does this conclude your testimony?

A. Yes. This concludes my testimony.

AFFIDAVIT

STATE OF FLORIDA)
)
COUNTY OF ESCAMBIA)

Docket No. 100304-EU

BEFORE me, the undersigned authority, personally appeared W. Mike Feazell, who being first duly sworn, deposes and says that he is the District Operations Manager for Gulf Power Company, a Florida corporation, that the foregoing is true and correct to the best of his knowledge, information and belief. He is personally known to me.

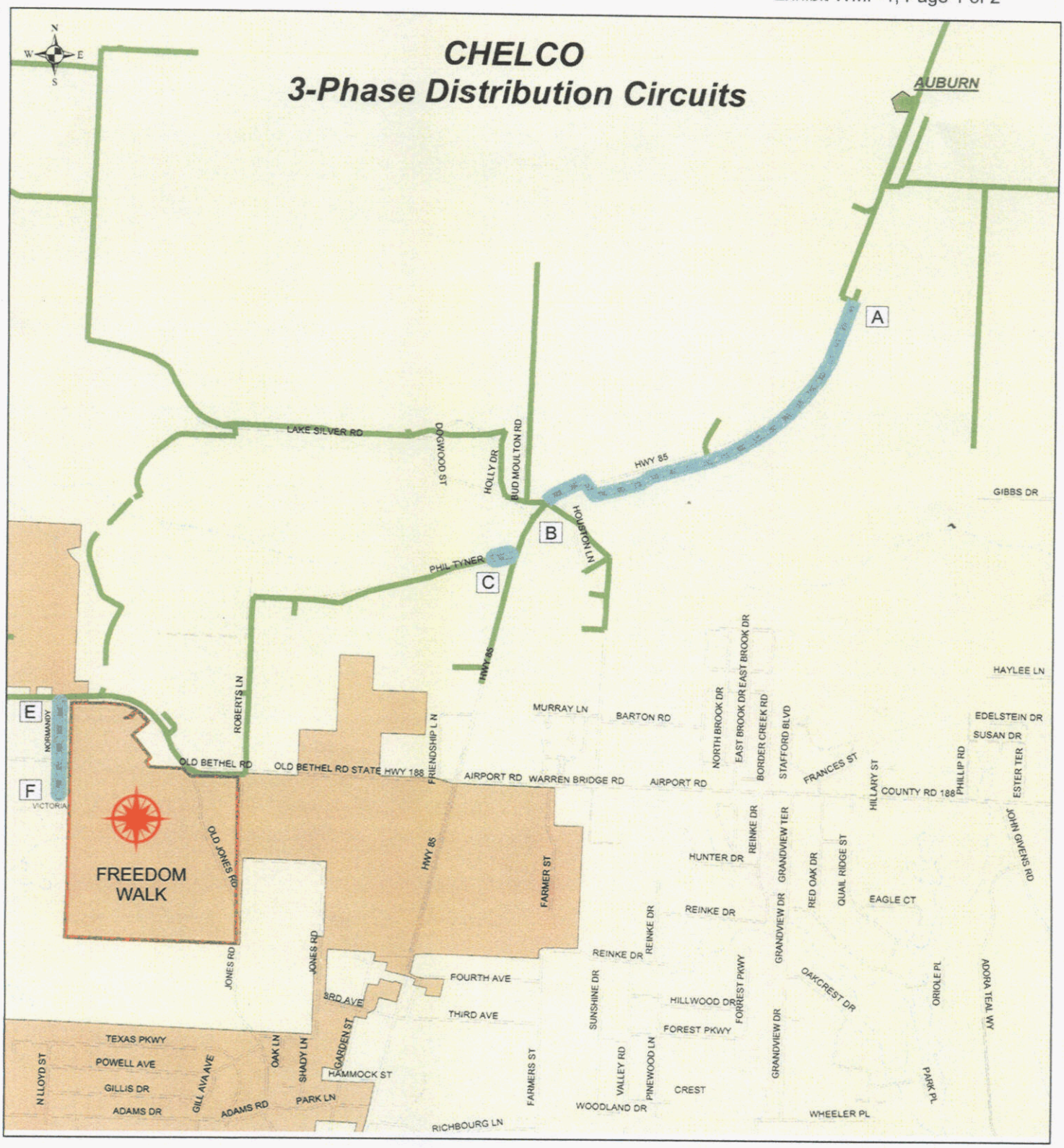
W. Mike Feazell
District Operations Manager

Sworn to and subscribed before me
this 1st day of March, 2011.

Notary Public, State of Florida at Large

(SEAL)

ROMONA L. ARRASMITH
Commission # DD 846135
Expires February 16, 2013
Bonded Thru Troy Fain Insurance 800-385-7019



Legend

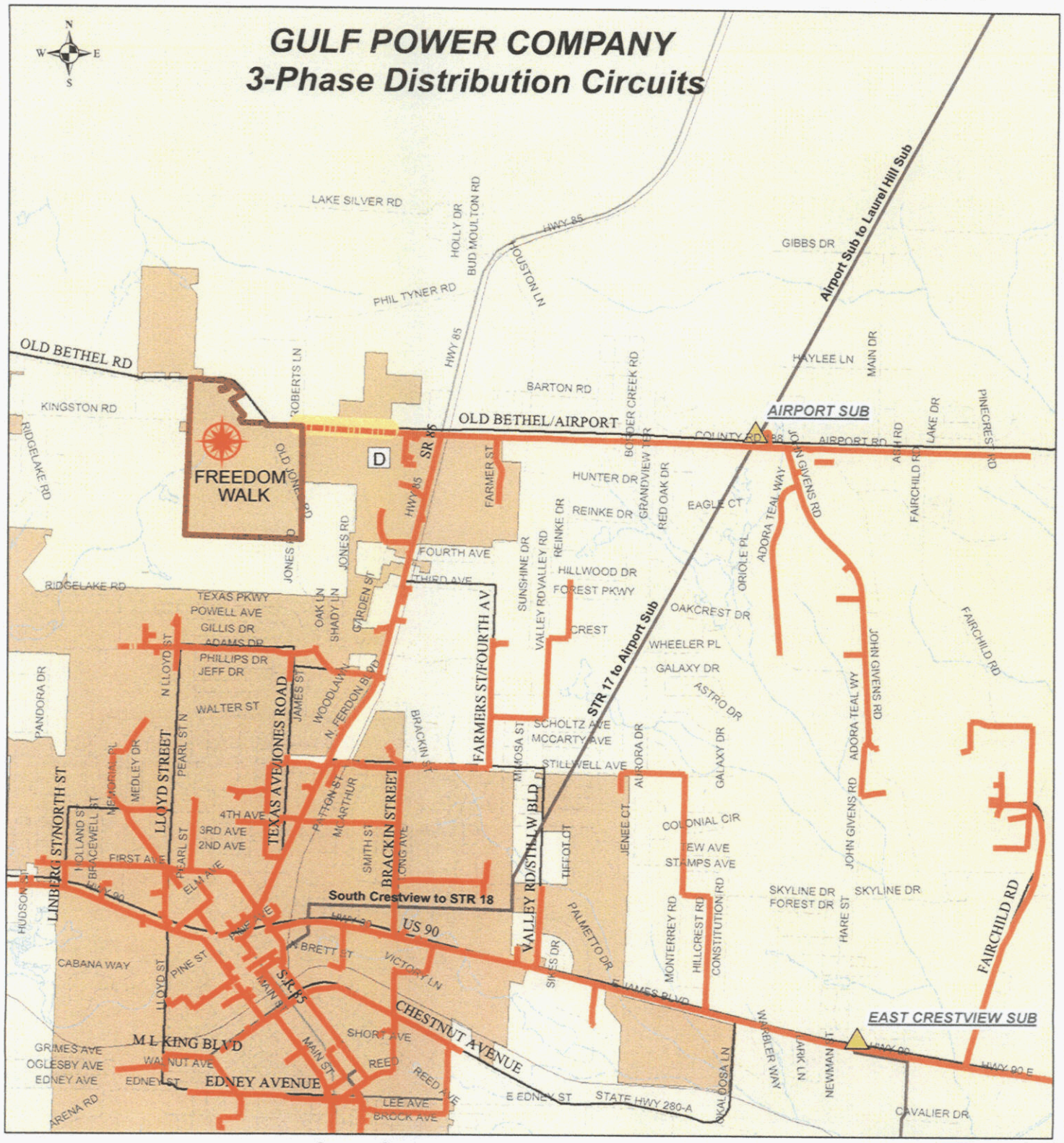
- CHELCO Primary Conductor
- CHELCO Primary Reconductor Area
- Crestview City Limits
- Railroad
- Water
- Roads

Scale

0 750 1,500 3,000 Feet

target ZERO
Every day, every job, safely.

GULF POWER
A SOUTHERN COMPANY



Legend

- Gulf Power Primary Conductor
- Gulf Power Transmission Lines
- Gulf Power Conductor Extension
- Crestview City Limits
- Railroad
- Water
- Roads

Scale
0 1,000 2,000 4,000 Feet

target ZERO every day, every job, safely.

GULF POWER
A SOUTHERN COMPANY

Choctawhatchee Electric Cooperative, Inc.
DeFuniak Springs, Florida

Engineering Study for New Subdivision
Substation Recommendations

July 7, 2010

Results of Analysis: The analysis shows that CHELCO's existing electric system is capable of handling the additional 3,700 kW of load if it were added today. Should this additional load be added to CHELCO's system, it is recommended that CHELCO complete all Auburn Substation 2011-2014 Construction Work Plans in 2011 instead of 2014 to prepare for further growth in the area.

Data Used:
- The 2014 peak summer and 2014 peak winter Milsoft Windmil software models from CHELCO's 2011-2014 Construction Work Plan (CWP)
- The 2009 peak summer and 2009 peak winter Milsoft Windmil software base system models
- CHELCO's System Design & Operating Criteria

Details of Analysis:

A new subdivision with an anticipated load of 3,700 kW is to be located at the intersection of Roberts Avenue and Old Bethel Road. Should CHELCO serve this new load, Auburn Substation, circuit #3 would be the substation and circuit the new load would be served from.

Is CHELCO's system capable of serving this load today and into the future?

If so, what, if any, improvements would be necessary to serve this new load?

Patterson & Dewar (P&D) worked with CHELCO on their 2011-2014 Construction Work Plan, completed in May 2010. The 2014 peak summer and winter Milsoft Windmil models were used in this analysis along with CHELCO's existing base 2009 peak summer and winter models. CHELCO's System Design and Operating Criteria (SDOC) was also used. The portion of the SDOC that applies to this study is included below.

Substations:
The following maximum loading conditions as a percent of the full equipment nameplate ratings based on CHELCO's extreme load forecasts, are recommended. When these levels are projected to be exceeded, plans for uprating are to be scheduled:

Power Transformers - Summer loading – 100% continuous loading at 55° rating
Winter loading – 124% continuous loading at 55° rating

Conductor:
Primary conductors are not to be loaded for long periods of time, over 60% of operating capacity for summer loading conditions and 75% for winter.

Voltage Drop:

Voltage Ranges ANSI Standard C84.1 (120 volt base)

Range	Minimum			Maximum
	Utilization Voltage*		Service Voltage	Utilization & Service Voltage
	Non-lighting loads	Loads including lighting		
A	108	110	114	126
B	104	106	110	127

Where this new subdivision will be located, CHELCO already has a main 3-phase line that is presently serving customers on Roberts Avenue and Old Bethel Road. Adding this new 3,700 kW load would not require any additional 3-phase overhead construction to reach the new load. The only construction necessary would be for the new development itself.

Referring to the Excel document "new load analysis.xlsx", the 2009 peak summer and winter Windmil models:

Voltage Drop:
With the new load, there will be more voltage drop than without the new load (which is to be expected) but the additional drop in voltage is still within CHELCO's SDOC[1].

Conductor:
Some of the conductor, mainly the 394 AAAC will be loaded more than the SDOC recommends. In CHELCO's CWP that was completed in May 2010, it was already recommended (project 300-RU10-01) to upgrade this 394 AAAC to 741 AAAC; however, this recommendation was for 2014. Should CHELCO serve this new load, it is recommended that the CWP project 300-RU10-01 be completed in 2011 instead of 2014.

Substations:
Auburn substation will not exceed the SDOC for subs.

Referring to the Excel document "new load analysis.xlsx", the 2014[2] peak summer and winter Windmil models:

Voltage Drop:
With the new load, there will be more voltage drop than without the new load (which is to be expected) but the additional drop in voltage is still within CHELCO's SDOC. The voltage drop is not as low as with the 2009 models because the 2014 model includes capacitor recommendations and reconductoring recommendations from the CWP.

[1] The 2009 winter model shows one section of single phase conductor downline from the new load at 114 V. This is not unusual for winter peak conditions and typically only occurs for a short duration. Voltage drops that do not meet the SDOC, especially during winter peaks could happen anywhere on the system. Voltage drops that last for extended periods of time are easily addressed by adding voltage regulators.

[2] The 2014 peak summer and winter models include projected system growth for 2014 along with all recommended projects in the 2011-2014 CWP as if they were completed.

Conductor:
Some of the three phase 741 AAAC and 750 MCM UG conductor will be loaded more than the SDOC recommends but only by a small percentage (4%-8% more than the SDOC recommends). It should be noted that the SDOC is a guideline and is used as such. So, though the loading on the conductor is greater than the guideline, because it's only a small percentage greater, it is recommended that CHELCO not upgrade the conductor. Similar recommendations by P&D were made for other parts of CHELCO's system during the completion of their 2011-2014 CWP.

Substations:
Using 2014 grown loads, Auburn substation exceeds the SDOC for both the winter and summer models. While exceeding the SDOC guidelines for conductor is acceptable (within reason), doing so for substations is not recommended because substations can take up to a year or two before they are energized from the time the decision is made to add a new delivery point. Some things that a cooperative can do to relieve a heavily loaded substation; however, is switch load to nearby substations, uprate the existing power transformer or add a second power transformer.

In the case here, it is recommended to switch load to Laurel Hill substation to relieve Auburn sub and bring it back to within the SDOC guidelines. This is not an uncommon recommendation or approach for CHELCO as they used this very same approach with Santa Rosa Beach substation in an effort to delay the new substation, Hewett, for a few years.

Looking beyond 2014 and thus beyond the period of the 2011-2014 CWP, there may one day be a need to uprate the existing transformer in Auburn Substation or add a new delivery point, but with a projected load of 84% in the summer of 2014 and 105% in the winter of 2014 (not including the new 3,700 kW load), the possibility of adding a new delivery point nearby Auburn sub would have been evaluated regardless of this new load.

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
Florida 30
DeFuniak Springs, Florida

Engineering Study for New Subdivision
July 7, 2010

General Information

Description: New subdivision with an estimated load of 3,700 kW to be served in 2010
Location: Near the intersection of Roberts Ave., & Old Bethel Road
Substation/circuit: Auburn substation, circuit 03

Analysis Results[1]

	2009 Peak Summer Model	2014 Peak Summer Model	2009 Peak Winter Model	2014 Peak Winter Model
Base System	Auburn Sub: 14,570 kW or 73% loaded Laurel Hill Sub: 4,550 kW or 61% loaded Conductor: 741 AAAC loaded to 291 A or 37% and 394 AAAC loaded to 55% and small section of 750 MCM UG (along Phil Tyner Road) loaded to 122 A or 27%. Voltage drop: Auburn sub ckt 03 meets CHELCO's SDOC[2]	Auburn Sub: 16,717 kW or 84% loaded Laurel Hill Sub: 4,919 kW or 66% loaded Conductor: 741 AAAC loaded to 335 A or 42%, and small section of 750 MCM UG (along Phil Tyner Road) loaded to 137 A or 30% Voltage drop on Auburn sub ckt 03 meets CHELCO's SDOC[2]	Auburn Sub: 18,240 kW or 91% loaded Laurel Hill Sub: 5,800 kW or 77% loaded Conductor: 741 AAAC loaded to 327 A or 41% and 394 AAAC loaded to 61% and small section of 750 MCM UG (along Phil Tyner Road) loaded to 314 A or 69% Voltage drop on Auburn sub ckt 03 meets CHELCO's SDOC[2]	Auburn Sub: 20,641 kW or 105% loaded Laurel Hill Sub: 6,223 kW or 84% loaded Conductor: 741 AAAC loaded to 377 A or 48%, and small section of 750 MCM UG (along Phil Tyner Road) loaded to 155 A or 34% Voltage drop on Auburn sub ckt. 03 meets CHELCO's SDOC[2]
Base System w/ New Load	Auburn Sub: 18,066 kW or 90% loaded Laurel Hill Sub: 4,550 kW or 61% loaded Conductor: 741 AAAC loaded to 463 A or 59% and 394 AAAC loaded to 87% and 750 MCM UG loaded to 300 A or 66% Voltage drop: Though still within SDOC, there is 115 V at the end of Auburn ckt 3, beyond new load on single phase line	Auburn Sub: 20,225 kW or 101% loaded Laurel Hill Sub: 4,919 kW or 66% loaded Conductor: 741 AAAC loaded to 508 A or 64% and 750 MCM UG loaded to 313 A or 68% Voltage drop: Meets CHELCO's system design and operating criteria.	Auburn Sub: 21,736 kW or 109% loaded Laurel Hill Sub: 5,800 kW or 77% loaded Conductor: 741 AAAC loaded to 500 A or 63% and 394 AAAC loaded to 94% and 750 MCM UG loaded to 316 A or 69% Voltage drop. On one single phase tap on Auburn ckt 03 is 114 V, beyond new load. Everything else meets SDOC	Auburn Sub: 24,124 kW or 121% loaded Laurel Hill Sub: 6,223 kW or 84% loaded Conductor: 741 AAAC loaded to 554 A or 70% and 750 MCM UG loaded to 335 A or 73% Voltage drop: On one single phase tap on Auburn ckt 03 is 114 V, beyond new load. Everything else meets SDOC
Recommendations	Follow the capacitor placement recommendations in the 2011-2014 CWP, but do the recommendations in 2011 and complete project 300-RU10-01 from the 2011 2014 CWP in 2011 instead of 2014	Switch 1,050 kW from Auburn ckt. 01 to Laurel Hill ckt. 03 (making new open point near the intersection of Hwy 85 and Georgia Road) After load swap, on Laurel Hill ckt. 3, add 100 A voltage regulators on main 3 phase line near the intersection of Hwy 85 & Campton Street. In addition, on Auburn ckt. 3, it may be necessary to add capacitor banks upstream from the new load and/or voltage regulators downstream from the load; however, it's recommended that CHELCO monitor the circuit before doing this.	Follow recommendations for Summer 2009. In addition, on Auburn ckt. 3, it may be necessary to add capacitor banks upstream from the new load and/or voltage regulators downstream from the load; however, it's recommended that CHELCO monitor the circuit before doing this.	Follow recommendations for Summer 2014 model.
Results of Recommendations	Auburn Sub: 18,261 kW or 91% loaded Laurel Hill Sub: 4,550 kW or 61% loaded Conductor: 741 AAAC loaded to 465 A or 59% and 750 MCM UG loaded to 300 A or 66%. Voltage drop: Meets CHELCO's SDOC	Auburn Sub: 19,263 kW or 96% loaded Laurel Hill Sub: 5,595 kW or 75% loaded Conductor: No changes from 'Base System w/ New Load'. Voltage drop: Meets CHELCO's SDOC	Auburn Sub: 21,736 kW or 109% loaded Laurel Hill Sub: 5,800 kW or 77% loaded Conductor: 741 AAAC loaded to 500 A or 63% and 750 MCM UG loaded to 316 A or 69% Voltage drop: Meets CHELCO's SDOC	Auburn Sub: 22,732 kW or 114% loaded Laurel Hill Sub: 7,525kW or 100% loaded Conductor: No changes from 'Base System w/ New Load'. Voltage drop: Meets CHELCO's SDOC

[1] 2009 base and 2014 grown models from CHELCO's 2011-2014 Construction Work Plan (CWP) completed in May 2010

[2] System Design and Operating Criteria

General Information
New residential subdivision with estimated load of 3,700 kW
Substation: Auburn
Circuit: 03
Location: near the intersection of Roberts Ave. and Old Bethel Road

2009 Summer Model

Base System
Auburn Sub: 14,570 kW or 73%
Laurel Hill Sub: 4,550 kW or 61%
Conductor Loading: 741 AAAC loaded to 291 A or 37% and 394 AAAC loaded to 55% and small section of 750 MCM UG (along Phil Tyner Road) loaded to 122 A or 27%
Voltage drop on Auburn sub ckt 03 meets CHELCO's system design and operating criteria

Base System w/ New Load
Auburn Sub: 18,066 kW or 90%
Conductor loading: 741 AAAC loaded to 463 A or 59% and 394 AAAC loaded to 87% and 750 MCM UG loaded to 300 A or 66%
Voltage drop at extremes as low as 115 V at the end of ckt 3

Recommendations:
Follow the CWP for the capacitor placements (do this in 2011 to help voltage) and do project 300-RU10-01 in 2011 instead of 2014.

Results of Recommendations:
Auburn Sub: 18,261 kW or 91%
Laurel Hill Sub: 4,550 kW or 61%
Conductor Loading: 741 AAAC will be loaded to 465 A or 59% and 750 MCM UG loaded to 300 A or 66%.
Voltage meets CHELCO's system design and operating criteria.

2014 Summer Model after CWP projects have been completed

Base Model
Auburn Substation: 16,717 kW or 84%
Laurel Hill Substation: 4,919 kW or 66%
Conductor Loading: 741 AAAC loaded to 335 A or 42%, and small section of 750 MCM UG (along Phil Tyner Road) loaded to 137 A or 30%
Voltage drop on Auburn sub ckt 03 meets CHELCO's system design and operating criteria

Base Model w/ New Load
Auburn Substation: 20,225 kW or 101%
Laurel Hill Substation: 4,919 kW or 66%
Conductor Loading: 741 AAAC loaded to 508 A or 64% and 750 MCM UG loaded to 313 A or 68%
Voltage drop meets CHELCO's system design and operating criteria.

Recommendations:
Switch 1,050 kW from Auburn ckt. 01 to Laurel Hill ckt. 03 (making new open point near the intersection of Hwy 85 and Georgia Road?). After load swap, on Laurel Hill ckt. 3, add 100 A voltage regulators on main 3 phase line near the intersection of Hwy 85 & Campton Street. In addition, on Auburn ckt. 3, it may be necessary to add capacitor banks upstream from the new load and/or voltage regulators downstream from the load; however, it's recommended that CHELCO monitor the circuit before doing this.

Results of Recommendations:
Auburn Sub: 19,263 kW or 96%
Laurel Hill Sub: 5,595 kW or 75%
Conductor Loading: no changes. 741 AAAC will be loaded to 64% and 750 MCM UG loaded to 68%.
Voltage meets CHELCO's system design and operating criteria.

2009 Winter Model

Base System
Auburn Sub: 18,240 kW or 91%
Laurel Hill Sub: 5,800 kW or 77%
Conductor Loading: 741 AAAC loaded to 327 A or 41% and 394 AAAC loaded to 61% and small section of 750 MCM UG (along Phil Tyner Road) loaded to 314 A or 69%
Voltage drop on Auburn sub ckt 03 meets CHELCO's system design and operating criteria

Base System w/ New Load
Auburn Sub: 21,736 kW or 109%
Conductor loading: 741 AAAC loaded to 500 A or 63% and 394 AAAC loaded to 94% and 750 MCM UG loaded to 316 A or 69%
Voltage drop on one single phase tap on Auburn ckt 03 is 114 V. Everything else looks good.

Recommendations:
Follow recommendations for Summer 2009. In addition, on Auburn ckt. 3, it may be necessary to add capacitor banks upstream from the new load and/or voltage regulators downstream from the load; however, it's recommended that CHELCO monitor the circuit before doing this.

Results of Recommendations:
Auburn Sub: 21,736 kW or 109%
Laurel Hill Sub: 5,800 kW or 77%
Conductor Loading: 741 AAAC will be loaded to 500 A or 63% and 750 MCM UG loaded to 316 A or 69%.
Voltage on Auburn ckt. 3 meets CHELCO's system design and operating criteria.

2014 Winter Model after CWP projects have been completed

Base Model
Auburn Substation: 20,641 kW or 105%
Laurel Hill Substation: 6,223 kW or 84%
Conductor Loading: 741 AAAC loaded to 377 A or 48%, and small section of 750 MCM UG (along Phil Tyner Road) loaded to 155 A or 34%
Voltage drop on Auburn sub ckt. 03 meets CHELCO's system design and operating criteria

Base Model w/ New Load
Auburn Substation: 24,124 kW or 121%
Conductor Loading: 741 AAAC loaded to 554 A or 70% and 750 MCM UG loaded to 335 A or 73%
Voltage drop on one single phase tap on Auburn ckt 03 is 114 V. Everything else looks good.

Recommendations:
Follow recommendations for Summer 2014 model.

Results of Recommendations:
Auburn Sub: 22,732 kW or 114%
Laurel Hill Sub: 7,525kW or 100%
Conductor Loading: no changes. 741 AAAC will be loaded to 70% and 750 MCM UG loaded to 73%.
Voltage on Auburn ckt. 3 meets CHELCO's design criteria.

Choctawhatchee Electric Cooperative, Inc.
DeFuniak Springs, Florida

Engineering Study for Freedom Walk Development
Substation Recommendations

July 7, 2010
Revised November 19, 2010[1]

Results of Analysis: The analysis shows that CHELCO's existing electric system is capable of handling the additional 3,700 kW of load if it were added today. Should this additional load be added to CHELCO's system, it is recommended that CHELCO complete all Auburn Substation 2011-2014 Construction Work Plans in 2011 instead of 2014 to prepare for further growth in the area.

Data Used:
- The 2014 peak summer and 2014 peak winter Milsoft Windmil software models from CHELCO's 2011-2014 Construction Work Plan (CWP)[2]
- The 2009 peak summer and 2009 peak winter Milsoft Windmil software base system models
- CHELCO's System Design & Operating Criteria (SDOC) that was approved by CHELCO staff on January 12, 2010.

Attachments:
- CHELCO's SDOC
- Chart of the results of this engineering study for Freedom Walk development – 2 pages (new load analysis.xlsx)
- The Distribution Line Construction Project Review for project 300-RU10-01 (page 31 of exhibit Q from the 2011-2014 CWP).

Details of Analysis:

A new development, Freedom Walk, with an anticipated load of 3,700 kW is to be located at the intersection of Roberts Avenue and Old Bethel Road. Should CHELCO serve this new load, Auburn Substation, circuit #3 would be the substation and circuit the new load would be served from.

Is CHELCO's system capable of serving this load today and into the future?

If so, what, if any, improvements would be necessary to serve this new load?

Patterson & Dewar (P&D) worked with CHELCO on their 2011-2014 Construction Work Plan, completed in May 2010. The 2014 peak summer and winter Milsoft Windmil models were used in this analysis along with CHELCO's existing base 2009 peak summer and winter models. CHELCO's System Design and Operating Criteria (SDOC) was also used. The portion of the SDOC that applies to this study is included below.

[1] All Revisions are in red. These revisions are NOT due to engineering changes to the original document but are in response to Gulf Power's 3rd Interrogatories request dated November 5, 2010 for further information that supports the original engineering results.
[2] CHELCO's 2009 Load Forecast was used to grow the loads for CHELCO's 2011-2014 Construction Work Plan.

Substations:
The following maximum loading conditions as a percent of the full equipment nameplate ratings based on CHELCO's extreme load forecasts, are recommended. When these levels are projected to be exceeded, plans for uprating are to be scheduled:

Power Transformers - Summer loading – 100% continuous loading at 55° rating
Winter loading – 124% continuous loading at 55° rating

Conductor:
Primary conductors are not to be loaded for long periods of time, over 60% of operating capacity for summer loading conditions and 75% for winter.

Voltage Drop:

Voltage Ranges ANSI Standard C84.1 (120 volt base)

Range	Minimum			Maximum
	Utilization Voltage*		Service Voltage	Utilization & Service Voltage
	Non-lighting loads	Loads including lighting		
A	108	110	114	126
B	104	106	110	127

Where Freedom Walk will be located, CHELCO already has a main 3-phase line that is presently serving customers on Roberts Avenue and Old Bethel Road. Adding this new 3,700 kW load would not require any additional 3-phase overhead construction to reach the new load. The only construction necessary would be for the new development itself.

Referring to the Excel document "new load analysis.xlsx", the 2009 peak summer and winter Windmil models:

Voltage Drop:
With the new load, there will be more voltage drop than without the new load (which is to be expected) but the additional drop in voltage is still within CHELCO's SDOC[3].

Conductor:
Some of the conductor, mainly the 394 AAAC will be loaded more than the SDOC recommends. In CHELCO's CWP that was completed in May 2010, it was already recommended (project 300-RU10-01) to upgrade this 394 AAAC to 741 AAAC; however, this recommendation was for 2014. Should CHELCO serve this new load, it is recommended that the CWP project 300-RU10-01 be completed in 2011 instead of 2014.

[3] The 2009 winter model shows one section of single phase conductor downline from the new load at 114 V. This is not unusual for winter peak conditions and typically only occurs for a short duration. Voltage drops that do not meet the SDOC, especially *during winter peaks could happen anywhere on the system. Voltage drops that last for extended periods of time are easily* addressed by adding voltage regulators.

Substations:
Auburn substation will not exceed the SDOC for subs.

Referring to the Excel document "new load analysis.xlsx", the 2014[4] peak summer and winter Windmil models:

Voltage Drop:
With the new load, there will be more voltage drop than without the new load (which is to be expected) but the additional drop in voltage is still within CHELCO's SDOC. The voltage drop is not as low as with the 2009 models because the 2014 model includes capacitor recommendations and reconductoring recommendations from the CWP.

Conductor:
Some of the three phase 741 AAAC and 750 MCM UG conductor will be loaded more than the SDOC recommends but only by a small percentage (4%-8% more than the SDOC recommends). It should be noted that the SDOC is a guideline and is used as such. So, though the loading on the conductor is greater than the guideline, because it's only a small percentage greater, it is recommended that CHELCO not upgrade the conductor at present but instead monitor the loads on the feeder and re-evaluate if the loads exceed the calculated loads with this new development, as noted in this study. Similar recommendations by P&D were made for other parts of CHELCO's system during the completion of their 2011-2014 CWP.

Substations:
Using 2014 grown loads, Auburn substation exceeds the SDOC for both the winter and summer models. While exceeding the SDOC guidelines for conductor is acceptable (within reason), doing so for substations is not recommended because substations can take up to a year or two before they are energized from the time the decision is made to add a new delivery point. Some things that a cooperative can do to relieve a heavily loaded substation; however, is switch load to nearby substations, uprate the existing power transformer or add a second power transformer.

In the case here, it is recommended to switch load to Laurel Hill substation to relieve Auburn sub and bring it back to within the SDOC guidelines. This is not an uncommon recommendation or approach for CHELCO as they used this very same approach with Santa Rosa Beach substation in an effort to delay the new substation, Hewett, for a few years.

Looking beyond 2014 and thus beyond the period of the 2011-2014 CWP, there may one day be a need to uprate the existing transformer in Auburn Substation or add a new delivery point, but with a projected load of 84% in the summer of 2014 and 105% in the winter of 2014 (not including the new 3,700 kW load), the possibility of adding a new delivery point nearby Auburn sub would have been evaluated regardless of this new load.

[4] The 2014 peak summer and winter models include projected system growth for 2014 along with all recommended projects in the 2011-2014 CWP as if they were completed.

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
Florida 30
DeFuniak Springs, Florida

Engineering Study for Freedom Walk Development
July 7, 2010
Revised 11/19/2010'
Page 1 of 2

General Information
Description: New subdivision with an estimated load of 3,700 kW to be served in 2010
Location: Near the intersection of Roberts Ave., & Old Bethel Road
Substation/circuit: Auburn substation, circuit 03

Analysis Results[1]

	2009 Peak Summer Model BSI[2]	2014 Peak Summer Model ASI[2]	2009 Peak Winter Model BSI[2]	2014 Peak Winter Model ASI[2]
Base System	Auburn Sub: 14,570 kW or 73% loaded Laurel Hill Sub: 4,550 kW or 61% loaded Conductor: 741 AAAC loaded to 291 A or 37% and 394 AAAC loaded to 55% and small section of 750 MCM UG (along Phil Tyner Road) loaded to 122 A or 27%. Voltage drop: Auburn sub ckt 03 meets CHELCO's SDOC[2].	Auburn Sub: 16,717 kW or 84% loaded Laurel Hill Sub: 4,919 kW or 66% loaded Conductor: 741 AAAC loaded to 335 A or 42%, and small section of 750 MCM UG (along Phil Tyner Road) loaded to 137 A or 30% Voltage drop on Auburn sub ckt 03 meets CHELCO's SDOC[2]	Auburn Sub: 18,240 kW or 91% loaded Laurel Hill Sub: 5,800 kW or 77% loaded Conductor: 741 AAAC loaded to 327 A or 41% and 394 AAAC loaded to 61% and small section of 750 MCM UG (along Phil Tyner Road) loaded to 314 A or 69% Voltage drop on Auburn sub ckt 03 meets CHELCO's SDOC[2]	Auburn Sub: 20,641 kW or 105% loaded Laurel Hill Sub: 6,223 kW or 84% loaded Conductor: 741 AAAC loaded to 377 A or 48%, and small section of 750 MCM UG (along Phil Tyner Road) loaded to 155 A or 34% Voltage drop on Auburn sub ckt. 03 meets CHELCO's SDOC[2]
Base System w/ New Load	Auburn Sub: 18,066 kW or 90% loaded Laurel Hill Sub: 4,550 kW or 61% loaded Conductor: 741 AAAC loaded to 463 A or 59% and 394 AAAC loaded to 87% and 750 MCM UG loaded to 300 A or 66% Voltage drop: Though still within SDOC, there is 115 V at the end of Auburn ckt 3, beyond new load on single phase line.	Auburn Sub: 20,225 kW or 101% loaded Laurel Hill Sub: 4,919 kW or 66% loaded Conductor: 741 AAAC loaded to 508 A or 64% and 750 MCM UG loaded to 313 A or 68% Voltage drop: Meets CHELCO's system design and operating criteria.	Auburn Sub: 21,736 kW or 109% loaded Laurel Hill Sub: 5,800 kW or 77% loaded Conductor: 741 AAAC loaded to 500 A or 63% and 394 AAAC loaded to 94% and 750 MCM UG loaded to 316 A or 69% Voltage drop: On one single phase tap on Auburn ckt 03 is 114 V, beyond new load. Everything else meets SDOC	Auburn Sub: 24,124 kW or 121% loaded Laurel Hill Sub: 6,223 kW or 84% loaded Conductor: 741 AAAC loaded to 554 A or 70% and 750 MCM UG loaded to 335 A or 73% Voltage drop: On one single phase tap on Auburn ckt 03 is 114 V, beyond new load. Everything else meets SDOC.
Recommendations	Follow the capacitor placement recommendations in the 2011-2014 CWP, but do the recommendations in 2011 and complete project 300-RU10-01 from the 2011-2014 CWP in 2011 instead of 2014.	Switch 1,050 kW from Auburn ckt. 01 to Laurel Hill ckt. 03 (making new open point near the intersection of Hwy 85 and Georgia Road). After load swap, on Laurel Hill ckt. 3, add 100 A voltage regulators on main 3 phase line near the intersection of Hwy 85 & Campton Street. In addition, on Auburn ckt. 3, it may be necessary to add capacitor banks upstream from the new load and/or voltage regulators downstream from the load; however, it's recommended that CHELCO monitor the circuit before doing this.	Follow recommendations for Summer 2009. In addition, on Auburn ckt. 3, it may be necessary to add capacitor banks upstream from the new load and/or voltage regulators downstream from the load; however, it's recommended that CHELCO monitor the circuit before doing this.	Follow recommendations for Summer 2014 model.
Results of Recommendations	Auburn Sub: 18,261 kW or 91% loaded Laurel Hill Sub: 4,550 kW or 61% loaded Conductor: 741 AAAC loaded to 465 A or 59% and 750 MCM UG loaded to 300 A or 66%. Voltage drop: Meets CHELCO's SDOC	Auburn Sub: 19,263 kW or 96% loaded Laurel Hill Sub: 5,595 kW or 75% loaded Conductor: No changes from 'Base System w/ New Load'. Voltage drop: Meets CHELCO's SDOC	Auburn Sub: 21,736 kW or 109% loaded Laurel Hill Sub: 5,800 kW or 77% loaded Conductor: 741 AAAC loaded to 500 A or 63% and 750 MCM UG loaded to 316 A or 69%. Voltage drop: Meets CHELCO's SDOC	Auburn Sub: 22,732 kW or 114% loaded Laurel Hill Sub: 7,525kW or 100% loaded Conductor: No changes from 'Base System w/ New Load'. Voltage drop: Meets CHELCO's SDOC

[1] 2009 base, before CWP system improvements and 2014 grown models after CWP system improvements from CHELCO's 2011-2014 CWP completed in May 2010
[2] System Design and Operating Criteria (SDOC) that was approved by CHELCO staff on January 12, 2010

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
Florida 30
DeFuniak Springs, Florida

Engineering Study for Freedom Walk Development
July 7, 2010
Revised 11/19/2010[3]
Page 2 of 2

Auburn Substation, Circuit #3 Forecast Loading Chart					
Year		Summer System Model w/o Freedom Walk	Summer System Model w/ Freedom Walk	Winter System Model w/o Freedom Walk	Winter System Model w/ Freedom Walk
2010	Amps	295	468	330	507
	kW	6,230	9,930	6,900	10,600
2011	Amps	305	478	340	517
	kW	6,460	10,160	7,170	10,870
2012	Amps	315	488	350	527
	kW	6,640	10,340	7,410	11,110
2013	Amps	325	498	360	537
	kW	6,860	10,560	7,690	11,390
2014	Amps	335	508	377	554
	kW	7,090	10,790	8,000	11,700

Notes:

1) This load growth follows the 2009 Load Forecast that was also used in the 2011-2014 CWP.

2) This chart does not factor in any load swapping with Laurel Hill as recommended in the chart on page 1.

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
Florida 30
DeFuniak Springs, Florida

Engineering Study for Freedom Walk Development
Modeled Using 4,700 kW
February 1, 2011

General Information

Description: New subdivision with an estimated load of 4,700 kW to be served in 2011
Location: Near the intersection of Roberts Ave., & Old Bethel Road
Substation/circuit: Auburn substation, circuit 03

Analysis Results[1]

	2009 Peak Summer Model BSI[2]	2014 Peak Summer Model BSI[3]	2014 Peak Summer Model ASI[4]	2009 Peak Winter Model BSI[5]	2014 Peak Winter Model BSI[7]	2014 Peak Winter Model ASI[8]
Base System	Auburn Sub: 14,970 kW or 73% loaded Laurel Hill Sub: 4,550 kW or 61% loaded Conductor: 741 AAAC loaded to 291 A or 37% and 394 AAAC loaded to 55% and small section of 750 MCM UG (along Phil Tyner Road) loaded to 122 A or 27%. Voltage drop: Auburn sub ckt 03 meets CHELCO's SDOC[6].	Auburn Sub: 16,717 kW or 84% loaded Laurel Hill Sub: 4,919 kW or 66% loaded Conductor: 741 AAAC loaded to 333 A or 42%, 394 AAAC loaded to 63% and small section of 750 MCM UG (along Phil Tyner Road) loaded to 137 A or 30% Voltage drop on Auburn sub ckt 03 meets CHELCO's SDOC[6]	Auburn Sub: 16,717 kW or 84% loaded Laurel Hill Sub: 4,919 kW or 66% loaded Conductor: 741 AAAC loaded to 335 A or 42%, and small section of 750 MCM UG (along Phil Tyner Road) loaded to 137 A or 30% Voltage drop on Auburn sub ckt 03 meets CHELCO's SDOC[6]	Auburn Sub: 18,340 kW or 91% loaded Laurel Hill Sub: 5,800 kW or 77% loaded Conductor: 741 AAAC loaded to 327 A or 41% and 394 AAAC loaded to 61% and small section of 750 MCM UG (along Phil Tyner Road) loaded to 314 A or 69% Voltage drop on Auburn sub ckt 03 meets CHELCO's SDOC[6]	Auburn Sub: 20,641 kW or 105% loaded Laurel Hill Sub: 6,223 kW or 84% loaded Conductor: 741 AAAC loaded to 377 A or 48%, 394 AAAC loaded to 71% and small section of 750 MCM UG (along Phil Tyner Road) loaded to 155 A or 34% Voltage drop on Auburn sub ckt. 03 meets CHELCO's SDOC[6]	Auburn Sub: 20,641 kW or 105% loaded Laurel Hill Sub: 6,223 kW or 84% loaded Conductor: 741 AAAC loaded to 377 A or 48%, and small section of 750 MCM UG (along Phil Tyner Road) loaded to 155 A or 34% Voltage drop on Auburn sub ckt. 03 meets CHELCO's SDOC[6]
2011-2014 CWP Recommendations	This is referred to as the Base model for the CWP. The base model is grown to a future 2014 load (per the 2009 Load Forecast) and *CWP projects are recommended based on* the grown loads. See next column for summer 2014 recommendations.	Follow the capacitor placement recommendations in the 2011-2014 CWP and complete project 300-RU10-01 from the 2011-2014 CWP in 2014. Project 300-RU10-01 was recommended because the load on the 394 AAAC exceeds the SDOC and because it makes engineering sense to carry the 741 AAAC down to where the load splits almost 50/50.	No additional recommendations. The purpose of this column is to show how the system looks as a result of completing the recommended projects in the previous column, 2014 Peak Summer Model BSI.	This is referred to as the Base model for the CWP. The base model is grown to a future 2014 load (per the 2009 Load Forecast) and CWP projects are recommended based on the grown loads. See next column for winter 2014 recommendations.	No additional recommendations due to 2014 winter peak loads. Only recommendation is to follow the recommendations for 2014 Peak Summer Model BSI.	No additional recommendations. The purpose of this column is to show how the system looks as a result of completing the recommended projects in the previous column, 2014 Peak Winter Model BSI.
Base System w/ New Load	Auburn Sub: 19,226 kW or 98% loaded Laurel Hill Sub: 4,550 kW or 61% loaded Conductor: *741 AAAC loaded to 307 A or* 66% and 394 AAAC loaded to 95% and 750 MCM UG loaded to 344 A or 75% Voltage drop: 114 V at the end of Auburn ckt 3, beyond new load. CWP project 300-RU10-01 will improve the voltage or add voltage regulators.	Auburn Sub: 21,223 kW or 108% loaded Laurel Hill Sub: 4,919 kW or 66% loaded Conductor: *741 AAAC loaded to 349 A or* 69%, 394 AAAC loaded to 103% and 750 MCM UG loaded to 361 A or 78% Voltage drop: 113 V at the end of Auburn ckt 3, beyond new load. CWP project 300-RU10-01 will improve the voltage.	Auburn Sub: 21,398 kW or 107% loaded Laurel Hill Sub: 4,919 kW or 66% loaded Conductor: 741 AAAC loaded to 353 A or 70% and 750 MCM UG loaded to 358 A or 78% Voltage drop: Meets CHELCO's system design and operating criteria.	Auburn Sub: 22,926 kW or 115% loaded Laurel Hill Sub: 5,800 kW or 77% loaded Conductor: 741 AAAC loaded to 345 A or 69% and 394 AAAC loaded to 102% and 750 MCM UG loaded to 359 A or 79% Voltage drop: 113 V at the new load and downstream from it. CWP project 300-RU10-01 will improve most of the low voltage, with voltage regulators needed downline from the new load. Also, the project is needed b/c the 394 will be overloaded with the development at full capacity.	Auburn Sub: 23,270 kW or 128% loaded Laurel Hill Sub: 6,223 kW or 84% loaded Conductor: 741 AAAC loaded to 389 A or 75%, 394 AAAC loaded to 111% *and 750 MCM* UG loaded to 377 A or 82% Voltage drop: 119 V at the end of Auburn ckt 3, beyond new load. CWP project 300-RU10-01 will improve the voltage and also the capacitor placement recommendations in the CWP. May need to add additional capacitors.	Auburn Sub. 25,823 kW or 127% loaded Laurel Hill Sub. 6,223 kW or 84% loaded Conductor: 741 AAAC loaded to 398 A or 79% *and 750 MCM UG loaded to* 378 A or 83% Voltage drop: On some single phase taps on Auburn ckt 03 is 114 V, beyond new load. Everything else meets SDOC.
Results of All Recommendations (CWP and recommendations as a result of new load)	Auburn Sub: 19,226 kW or 98% loaded Laurel Hill Sub: 4,550 kW or 61% loaded Conductor: 741 AAAC loaded to 307 A or 66% and 750 MCM UG loaded to 344 A or 75% Voltage drop: Meets CHELCO's SDOC once voltage regulators are added downline from new load or project 300-RU10-01 is	Auburn Sub: 19,970 kW or 100% loaded Laurel Hill Sub: 6,332 kW or 84% loaded Conductor: Auburn ckt. 03: 741 AAAC loaded to 342 A or 69% *and 750 MCM UG loaded to 358 A or 78%. Auburn ckt. 02:* 394 AAAC loaded to 342 A or 64%. Laurel Hill ckt. 08: 1/0 AAAC loaded to 144 A or 62% Voltage drop: Meets CHELCO's SDOC Additional Recommendations/Comments: See Note below.	see note above	Auburn Sub: 23,081 kW or 115% loaded Laurel Hill Sub: 5,800 kW or 77% loaded Conductor: 741 AAAC loaded to 352 A or 70% and 750 MCM UG loaded to 368 A or 80%. Voltage drop: Meets CHELCO's SDOC once voltage regulators are added downline from new load and project 300-RU10-01 is completed	Auburn Sub: 23,463 kW or 117% loaded Laurel Hill Sub: 7,952kW or 107% loaded Conductor: 741 AAAC loaded to 384 A or 74% and 750 MCM UG loaded to 378 A or 83% Voltage drop: Meets CHELCO's SDOC Additional Recommendations/Comments: See Note below	see note above

[1] 2009 base, before CWP system improvements and 2014 grown models, both before and after CWP system improvements from CHELCO's 2011-2014 CWP completed in May 2010
[2] System Design and Operating Criteria (SDOC) that was approved by CHELCO staff on January 12, 2010.
[3] Before system improvements (BSI) and After System Improvements (ASI) are typical terms in CWPs. BSI is how the electric system is presently. ASI is how the electric system will be after the CWP projects are complete.

NOTE: For both the summer and winter 2014 ASI, the Auburn substation power transformer is carried to maximum capacity. Also, the loveside buswork at Auburn Substation circuit 09 is carried to its maximum capacity of 600A. It is for this reason that it is recommended that CHELCO and their G&T provider, PowerSouth EC evaluate substation options should Freedom Wall development be served by CHELCO and should it reach the estimated load of 4,700 kW. Options could be to upgrade the substation transformer at Auburn sub to a larger transformer or add a 2nd bank if there is room inside the substation or perhaps add a new delivery point to relieve the load on Auburn sub. Also, it is recommended that a 2nd circuit be constructed to help serve the load south of Auburn substation (if a new delivery point is not added nearby) to help serve the load south of Auburn substation and not exceed the rating on the loveside buswork and circuit breakers at the substation

Job Summary

Unit Cost Summary

Assembly Name	Description	Status	Quantity	Installed	Removed	Material
Project ID: Normandy Road Upgrade						
New						
A5	1 PH	New	3	69.52	0.00	81.12
A5-2	1 PH;INSULATOR STRING	New	1	23.18	0.00	35.56
C1	3 PH	New	6	278.10	0.00	574.02
C5	3 PH VERTICAL DEADEND	New	1	46.35	0.00	68.54
C7	3 PH	New	3	278.10	0.00	507.12
C8	3 PH;CROSSARM DOUBLE DEADEND	New	1	92.70	0.00	251.59
E1-2	DOWN GUY,8M	New	9	166.86	0.00	202.77
E2-2	OVERHEAD GUY,8M	New	1	18.54	0.00	20.84
E3-10	GUY GUARD	New	9	208.58	0.00	30.06
F1-2S	ANCHOR,12in POWER INSTALL SCREW	New	9	208.58	0.00	480.87
M2-1	POLE GROUND ONE ROD	New	7	165.47	0.00	260.40
M25-L-100	THREE-SINGLE-PHASE, 100 AMP	New	1	139.05	0.00	7518.46
P45/3	POLE	New	10	2317.50	0.00	2638.20
W1/0AAAC	1/0 AAAC OH PRIMARY	New	10084	5608.72	0.00	2789.44
				9621.24	**0.00**	**15458.99**
		Total				**25080.23**
Retire						
A1	SINGLE PHASE	Retire	7	0.00	81.11	0.00
A5-1	1 PH;INSULATOR STRING	Retire	1	0.00	23.18	0.00
M23-4H-50	1- SINGLE-PHASE, 50 AMP	Retire	1	0.00	46.35	0.00
P40/4	POLE	Retire	8	0.00	1112.40	0.00
W2AAAC	2AAAC OH PRIMARY	Retire	4890	0.00	2719.82	0.00
				0.00	**3982.86**	**0.00**
		Total				**3982.86**
		Grand Total				**29063.08**

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.

FLORIDA 30
DEFUNIAK SPRINGS, FLORIDA

2011-2014 CONSTRUCTION WORK PLAN

May 2010

Prepared by:

Patterson & Dewar Engineers, Inc.
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Norcross, Georgia 30071
(770) 453-1410 Fax (770) 453-1411
www.pd-engineers.com

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EXHIBITS

MISCELLANEOUS TAB

(For future CWP amendments, correspondences, etc.)

MAPS

Circuit Diagram – Proposed Peak 2014 System After Improvements

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.

FLORIDA 30
DEFUNIAK SPRINGS, FLORIDA

CONSTRUCTION WORK PLAN (CWP)
January 1, 2011 – December 31, 2014

ENGINEERING CERTIFICATION

Upon completion of the construction proposed herein, the above indicated electric distribution system can provide adequate and dependable service to approximately 49,500 consumers with the residential consumers using an average of 1,222 kilowatt-hours per month. The most probable winter peak demand is estimated to be approximately 219,000 kW in the year 2014. The most probable 2014 summer peak is projected at approximately 211,000 kW.

The loads estimated for the next four years are consistent with the 2009 Load Forecast when including the two large power loads as discussed herein.

I certify that this 2011-2014 Construction Work Plan was prepared by me or under my direct supervision, and that I am a duly registered professional engineer under the laws of the State of Florida.

Patterson & Dewar Engineers, Inc.

Jacquelyn Nicole Mabe
Florida P.E. No. 68589

FLORIDA COOPERATIVES

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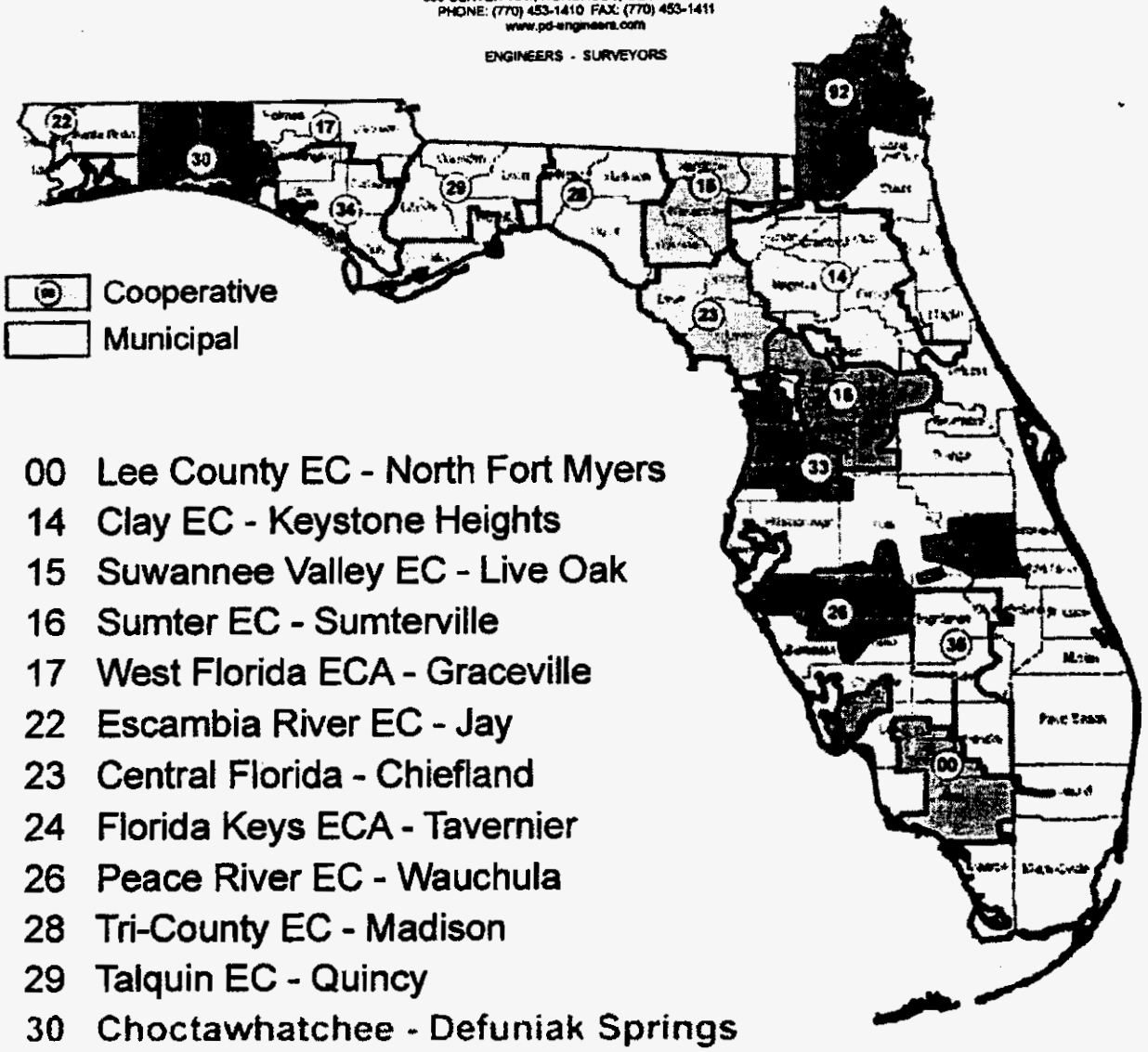
ENGINEERS - SURVEYORS



00 Lee County EC - North Fort Myers
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Choctawhatchee Electric Cooperative, Inc.
Florida 30
DeFuniak Springs, Florida

2011-2014 CONSTRUCTION WORK PLAN

May 2010

I. EXECUTIVE SUMMARY

A. Purpose, Results and General Basis of Study

This report documents the summer 2009 engineering analysis of, and summarizes the proposed construction for Choctawhatchee Electric Cooperative, Inc. (CHELCO's) electric distribution system for the four-year period of January 1, 2011 through December 31, 2014.

The proposed construction program is to be financed by a supplemental lender. This report provides engineering support, in the form of descriptions, costs, and the justification of required new facilities.

Upon construction completion of the proposed facilities, the CHELCO distribution system will provide adequate and dependable service to approximately 49,500 consumers with the residential consumers using an average of 1,222 kWh per month.

The 2014 projected number of consumers is taken directly from the Cooperative's 2009 Load Forecast (LF). The 2009 LF is also used for the total peak system load. The summer most probable kW demand and the winter most probable kW demand are used for the distribution line loading conditions and evaluation of adequate substation capacity for the next four years. These loading levels were agreed to by CHELCO's engineering staff.

CHELCO's 2004 Long Range System Study (LRSS) was based on the 2004 LF. Comparing the 2004 LF to the most current 2009 LF, the annual load projections through 2023 are higher in the 2004 LF. The 2004 LF used CHELCO's historical growth that at that time was growing more quickly because of a stronger and faster growing economy. Economic growth has slowed considerably over the last few years (as shown in the 2009 LF) which has affected CHELCO's system growth and therefore many of the recommendations in the 2004 LRSS have been postponed.

An analysis of thermal loading, voltage drops, physical conditions and reliability, has been performed on all substations, distribution lines, and major equipment of the existing system subjected to the peak summer 2009 and winter 2008/09 conditions. CHELCO provided two system models one allocated with the summer peak 2009 loads and the other allocated with the peak winter 2008/09 loads. These existing system models have been grown to the projected summer peak 2014 loading and projected winter peak 2013/14 loading to develop two future system models. The projected future loadings for both models are in agreement with the 2009 LF. The basis of the system analysis is CHELCO's System Design and Operational Criteria (SDOC). The analysis, utilizing Milsoft Integrated Solution's Distribution Primary Analysis, Windmil® software, is presented for each loading condition and is included herein on CD.

The 2014 load projections indicate that the following power supply problems need to be addressed.

- Overloaded Black Creek substation
- Overloaded Santa Rosa Beach and Grayton Beach substations

The first point noted above is presently being addressed. PowerSouth EC will complete the construction of a new substation, Hammock Bay, by the first quarter of 2011. Once this substation is complete, this CWP calls for load from Black Creek and Freeport substation to be switched to Hammock Bay.

The second point above is addressed in this CWP.

B. Service Area, Distribution System and Power Supply

CHELCO's corporate office is located in DeFuniak Springs, FL. The cooperative provides electric service to a portion of the northwestern part of Florida. The service area encompasses most of Walton, the northern portion of Okaloosa, western Holmes and eastern Santa Rosa counties. Rural residential accounts make up the majority of CHELCO's system. CHELCO provides electric service to rural homes, villages, small commercial and industrial consumers.

The northern area generally consists of flatlands with slightly rolling hills and sandy farmland along small streams and tributaries. The chief sources of income are from Eglin Air Force Base, agriculture and agricultural products, forestry and forestry products. The southern area includes approximately 20 miles of coastline and frontage on Choctawhatchee Bay. This coastal area, referred to as "south of the bay," consists of resorts and condominiums and presently experiences steady growth.

The following data was taken from CHELCO's 2009 bills from PowerSouth EC and 2009 Cost Analysis (dated 2/3/2010):

Number of Consumers	=	42,571
kWh Purchased	=	773,939,660
kWh Sold	=	734,815,389
Maximum kW Demand[1]	=	200,136
Total Utility Plant	=	$143,846,953
Miles of Distribution	=	3,856
Consumers per Mile	=	11.04

The following data was taken from CHELCO's 2009 LF[2]:

Annual Load Factor	=	45.3%
kWh Losses	=	5.27%

Service is provided to CHELCO members through 19 delivery points.

[1] CHELCO reached a new system peak on January 11, 2010 of 228,593 kW.

[2] Data shown is for year-end 2008 which was the most recent historical information available at the time the 2009 LF was completed.

PowerSouth Energy Cooperative (PowerSouth EC), CHELCO's power supplier, is an RUS financed generation and transmission cooperative with its office headquarters located in Andalusia, Alabama. As power supplier, PowerSouth EC accommodates all the generation and transmission requirements of CHELCO and other cooperatives located in South Alabama and the panhandle of West Florida. PowerSouth EC has contracts with Gulf Power Company (GPC) for five of CHELCO's current delivery points; Santa Rosa Beach, South Walton, Grayton Beach, Eastern Lake and Holt. These five substations at these off site delivery points are owned by PowerSouth EC. This implies that PowerSouth EC has full responsibility for the substations when the source requires extensive modification or uprating except for the feeder reclosers, the associated isolating switches and capacitor racks. CHELCO owns these devices.

CHELCO takes delivery from PowerSouth EC at a distribution voltage level of 12,470 Volts, grounded-wye.

C. System Organization and Operation

CHELCO's headquarters is located in DeFuniak Springs, Florida, in the central part of their electric system. All engineering and management decisions come through this office. The system is operated and maintained under the leadership of the Vice President of Engineering and Vice President of Operations. An additional support staff of engineers, technicians, linemen, administrators and aides compliments the system operations.

District offices are maintained at Auburn, Bluewater Bay, Baker, Freeport and Santa Rosa Beach. These offices serve as local consumer service centers for new services and bill collections.

CHELCO Services Inc. is a subsidiary, for profit, contract company that does work for CHELCO. P&D performs regular work order inspections for CHELCO.

D. Summary of Construction Program and Costs

This work plan presents the costs of the recommended construction program over the next four years. The annual cost itemization is as follows:

2011	$7,772,074
2012	$7,562,622
2013	$8,208,099
2014	$8,517,851
Total	$32,060,645

By comparison, the annual totals for distribution plant additions and replacements during the four previous years[3] are as follows:

2006	$6,684,924
2007	$11,104,158
2008	$7,063,122
2009	$6,061,101

Four-Year Average = $7,728,326

A further breakdown of the construction program cost is summarized as follows:

	New Construction	System Improvements
2011	$3,388,323	$4,383,751
2012	$3,959,728	$3,602,894
2013	$4,720,977	$3,487,122
2014	$3,778,934	$4,738,917
Subtotal =	$15,847,962	$16,212,684

Total = $32,060,645

The total amount above is subject to loan funds. Each item recommended was reviewed with engineering and management staff prior to inclusion in this CWP. Approximately 49% of the capital required in the CWP is needed for new services and approximately 51% is for system improvements.

System losses for 2008 were 5.27% which is reasonable for an electric system of CHELCO's size and geographical scope. These losses are valued at approximately 40,958,000 kilowatt-hours or $1,975,404 based on an average wholesale kilowatt-hour cost of $0.04823.

The system improvements recommended in this CWP are estimated to reduce the primary line losses by approximately $179,000 per year (e.g. $721,500 for future system **without** improvements versus $542,500 for future system **with** improvements). This is if the projected most probable summer 2014 peak conditions are served.

[3] Data provided by CHELCO. 2010 data is not available at the time of this writing, so data from 2006-2009 is used.

II. BASIS OF STUDY AND PROPOSED CONSTRUCTION

A. Design and Operational Criteria

Exhibit K presents CHELCO's System Design and Operational Criteria (SDOC). On January 12, 2010, CHELCO reviewed and concurred with the criteria. The proposed construction as outlined in the 2010 CWP is necessary for meeting the minimum standards set forth in the SDOC.

The criteria presented herein is for use in design and operational guidelines only. System conditions may result in a breach of a specific criterion. Such occurrences are considered only temporary and not for long term operations.

B. Equipment Cost Estimates

Exhibit B presents the projected unit cost averages for new services and new construction. The estimates were provided by CHELCO and were based on their 2010 cost estimates. These cost estimates are grown 2.54% per year for years 2011 through 2014. The 2.54% is the average of the years 2001 through 2009 from the "US Department of Labor, Bureau of Labor Statistics, CPI for All Urban Consumers".

C. Analysis of Current System Studies

1. 2009 Load Forecast (LF)

A new 2009 Load Forecast (LF) was approved in July 2009. The study was prepared by PowerSouth EC in cooperation with CHELCO. The study utilizes statistical modeling techniques and reflects moderate growth patterns for future system conditions through 2028.

The LF offers three (3) projection scenarios for planning purposes and they are as follow:

Scenario 1 - Most Probable
Scenario 2 - Mild Weather
Scenario 3 - Extreme Weather

The 2009 LF does not include Emerald Coast Middle School that is to be added in 2010 with a load of 3 MW. Also not included in the 2009 LF is Mossyhead Industrial Park and Water Treatment Plant scheduled for 2011 with a load of 500 kVA.

For this work plan, Scenario 1 is utilized for both the four-year system distribution line conditions and for determining the improvements needed for substation capacity.

The 2009 LF projects the 2014 system summer conditions to have approximately 49,416 consumers creating a summer system peak demand of 207,451 kW. The summer system is projected to have an annual load factor of 48.9%.

For the 2014 system winter conditions, the 2009 LF projects approximately 49,416 consumers creating a winter system peak demand of 216,760 kW and an annual load factor of 46.8%.

2. 2004 Long Range System Study (LRSS)

R. W. Beck completed CHELCO's most recent LRSS in 2004. The LRSS was based on the 2004 LF. Comparing the 2004 LF, 2009 LF and actual peak data:

	Summer (NCP kW)			Winter (NCP kW)		
Year	2004 LF	2009 LF	Actual Peak	2004 LF	2009 LF	Actual Peak
2005	170,460		174,120	181,190		166,860
2006	177,980		181,990	189,170		168,800
2007	186,140		188,320	197,850		185,140
2008	193,850		183,240	206,040		203,030
2009	202,400	185,380		215,140		201,010
2010	210,580	189,470		223,830	197,970	229,263
2011	218,470	194,120		232,210	202,830	
2012	226,870	198,050		241,140	206,940	
2013	235,100	202,630		249,880	211,730	
2014	243,210	207,450		258,510	216,760	

Comparing the 2004 LF to the 2009 LF, it is clear that the 2009 LF has dropped for both summer and winter projections. Further comparing the actual peak kW to the 2004 LF shows that the actual winter peak is consistently less than the projected winter peak with the exception of the 2010 peak. For the summer, the 2004 LF and actual peak are close until 2008. The actual summer 2008 system peak is less than the 2004 LF.

The LRSS detailed the addition of three new distribution substations, two of which will be included in this CWP; Seagrove Substation in 2006, West Hewett Substation in 2009 and Dorcas Substation in 2013. In this CWP, Pt. Washington (referred to as Seagrove Substation in the 2004 LRSS) is recommended to be energized in 2013, Hewett Substation (referred to as West Hewett in the 2004 LRSS) is called for in 2012. Dorcas Substation is not recommended during the CWP's 2011-2014 planning period.

In summary, due to changes in the load forecasts from 2004 to 2009, the CWP primarily is based on the 2009 LF with consideration given to the recommendations in the 2004 LRSS. This explains the reason for delaying the substations, as noted above.

D. Historical and Projected System Data

1. Annual Consumer, Load and Losses Data

Exhibit A tabulates the annual system data for consumers, system peak demand, losses, and annual load factor. The exhibit provides both data and graphs for the actual conditions for 1993 through 2008 and for the projected years of 2009 through 2028.

The distribution system exhibits a growth in winter peak demand from 90,030 kW in 1993 to 200,136 kW in 2009. This represents approximately a 5.12% per year growth rate. The summer peak grew from 92,758 kW in 1993 to 182,401 kW in 2008 (an approximately 4.61% per year growth rate for the 16 year period).

The system is experiencing an annual 3.7% growth in consumers. There were 23,897 consumers in 1993, increasing to 42,747 in 2008. The 2014 projection is approximately 49,500 total consumers.

The annual distribution non-coincident peak (NCP) load factor was 45.3% for 2009. CHELCO's distribution load factor has ranged from a low of 37.3% to a high of 48.9% over the past twenty years depending on the severity of the summer and winter peaks. A 48.9% load factor is used in the LF most probable summer and a 46.8% load factor is used for the most probable winter. Though typically all of CHELCO's system is winter peaking with the exception of their system that serves the coastal area known as "south of the bay," which is typically summer peaking, it was agreed upon by CHELCO's engineering staff to use the summer most probable LF for the following reasons:

- The winter peaks experienced by CHELCO are usually short in duration, lasting no more than a few days.
- Problems experienced during such a peak can be handled reasonably well by CHELCO's staff with the use of line voltage regulators.
- System design for such a load level requires less system improvement capital than the projected most probable winter conditions, enabling CHELCO to be more competitive with neighboring electric distributors.

Substation upgrade recommendations to PowerSouth EC are based on both the most probable summer and winter conditions projected in the current Load Forecast. This policy was decided as substation construction and upratings usually take 18 to 24 months to complete, requiring extensive budgetary arrangements and planning.

The annual distribution system losses were 5.27% for 2008 and 5.06% for 2009. System improvements included herein should contribute significantly to reducing system losses.

2. Special Loads

Special loads included in the plan are Emerald Coast Middle school, scheduled for 2010 and Mossyhead Industrial Park & Water Treatment Plant, scheduled for 2011. Both of these new loads will be located in CHELCO's service territory.

There are two more special loads that should be noted. The new Panama City-Bay County International Airport, located east of CHELCO's electric system, is scheduled to be open

in May 2010. The other is additional military presence with the 7th Special Forces and Joint Strike Fighters scheduled for 2011. Any load that may result from the new airport and the 7th Special Forces and Joint Strike Fighters is not included in this CWP because the impact each will have on CHELCO's service territory is uncertain at this time.

3. Substation Load Data

Exhibit N summarizes the substation loading and capacities for both existing summer 2009 as well as winter 2008/2009 system peak conditions. The projected future conditions both with and without the recommended system improvements are presented for the most probable summer 2014 and winter 2013/14 system peak conditions. The exhibit identifies each substation, winding capacity, percent of full load, percent power factor, and total peak demand. The loading is given in percent of full load rating of the substation transformer as provided by PowerSouth EC.

All substations are owned and operated by PowerSouth EC. PowerSouth EC bills CHELCO at each substation by kVA demand resulting in a penalty cost to CHELCO if near unity power factor is not maintained. With such a strong incentive, CHELCO tries to maintain unity power factor by using capacitors on its system.

CHELCO's SDOC allows for loading a substation power transformer to 100% for the summer conditions and 124% for the winter. When these levels are reached, plans should be commenced for handling the overloaded conditions.

For the peak summer 2009 conditions, no substations exceed 100% loading; however, Grayton Beach comes close at 93.5% loaded.

For the proposed summer 2014 peak conditions, two substations exceed the 100% loading level. The two subs are Grayton Beach at 119.6% (which includes the new Emerald Coast Middle School load) and Santa Rosa Beach at 107.4%. Eastern Lake Substation, though not projected to be overloaded in 2014, has an estimated loading of 93.4%. A new delivery point, Hewett Substation, being called for in this CWP, will relieve the loading on Santa Rosa Beach. To lessen the loading on Grayton Beach and Eastern Lake subs, a new delivery point, Pt. Washington, is called for in this CWP.

For the peak winter 2008/09 conditions no substation exceeds the 124% loading limit. However, CHELCO reached a new system peak in January 2010 and Black Creek Substation did exceed the 124% loading limit with a loading of 125.7%. In fact, the individual substation loadings for winter 2010 exceeds all but three of the proposed winter 2013/14 substation projections.

For the proposed winter 2013/14 peak conditions, no substations exceed the 124% loading level; however, Black Creek substation comes close to its limit at 117.7 % and as stated above, has already exceeded its limit in January 2010. PowerSouth EC is presently adding a new delivery point, Hammock Bay, that will relieve the loading on Black Creek. It's estimated to be energized the first quarter of 2011.

Specific recommendations concerning substations are presented in Exhibit G.

4. Circuit Loading and Voltage Conditions

The 2009 summer non-coincidental substation peaks along with the corresponding kWh consumer billing data for each substation was used to develop the summer system model. Likewise, the 2008/2009 winter non-coincidental substation peaks and corresponding kWh consumer billing data for those substations was used in the winter system model. These two models represent the base existing system for this CWP. For both models, the system serves approximately 42,747 consumers with each residential consumer averaging 1,199 kilowatt-hours monthly.

In anticipation of future system loading conditions, line voltage regulators and capacitor changes will be necessary to maintain adequate voltage. Those select areas are listed in detail in Exhibits H & I.

5. System Outages and Reliability

CHELCO maintains daily outage reports and prepares monthly and annual summaries. Exhibit L presents a summary of the consumer outage hours for the five previous years. The five year consumer outage average is 5.40 hours per consumer per year. This average is due much in part to Hurricane Dennis in 2005. Excluding Hurricane Dennis, the five year consumer outage average is 2.26 hours per consumer per year.

III. REQUIRED CONSTRUCTION ITEMS

A. Service to New Consumers

Using 2010 budget estimates, CHELCO estimates installing 286 overhead services per year for new consumers at an average cost of $1,658 per service. CHELCO estimates installing 532 underground services per year for new consumers at an average cost of $2,802 per installation. Extending the overhead and underground costs on a per unit basis, and using the per year cost increase of 2.54%, it is estimated that over the next four years $8,371,319 in capital will be required to construct the new services. This calculates to be an average of $2,092,830 per year.

Exhibit B summarizes the projected cost estimates for the new services. Transformer, poles, and outdoor light quantities and costs are also given in this exhibit. Exhibit D summarizes the costs on an annual basis. Approximately 49% of the capital required for this work plan is estimated to be for new consumer services.

B. Service Changes to Existing Customers

Using 2010 budget estimates of $186,282 grown 2.54% per year, CHELCO expects a capital requirement of $793,661 for the CWP period.

C. Work Plans - Additions and Changes

The recommended CWP line changes and improvements are generally for the following reasons:

Excessive Voltage Drops
Excessive Load Currents (or Overloaded Lines)
Poor Service Reliability

Increasing conductor size, increasing the number of phases, reducing distances of feeds, and installing voltage regulators and capacitors are the methods of correction for excessive voltage drops. Excessive load current is an undesirable situation normally corrected by the same methods used for excessive voltage drops; however, the improvement is recommended in most cases to assure proper coordination of line reclosers or sectionalizing devices.

Right-of-way clearing often results in improved service reliability. However, if specific line components are causing outages, then priority is given to rebuilding the line to replace old and worn-out equipment. Rebuilding a line may include conductor, pole or crossarm replacement, replacing defective insulators, etc. Also the construction of tie lines may improve service reliability. Tie lines shorten the circuit feed distance thereby reducing line exposure and also providing loop feed capability. The loop feed capability is very beneficial during outages and line maintenance.

Reviewing the summer 2009 primary analysis and considering the load growth estimates of the peak summer and winter system 2014, the four year CWP work plan estimate for code 300 work plans is $5,180,195 including line conversions and changes.

Each recommendation of the CWP has been reviewed with CHELCO's engineering and management staff prior to inclusion in this report. Exhibit F presents a summary of the work plan distribution line construction recommendations.

Please note the following explanation for the construction reference numbers for accounting code 300:

XXX-XXYY-ZZ	=	Construction Item Number
XXX-XX	=	Accounting Code
YY	=	CHELCO Substation Number
ZZ	=	Consecutive Number Under Each Substation

Exhibit F also presents construction justification codes for each recommendation. Quantitative information regarding the system benefits of each code 300 construction item is presented in Exhibit Q. This information can also be found in the summer and winter Milsoft models used in this CWP that are included herein on CD.

D. Substation - Additions and Changes

The SDOC, Exhibit K, establishes that a substation's projected future loading condition is not to exceed 100% of its full nameplate kVA capacity in the summer and 124% of its full nameplate kVA capacity during the winter without planning its uprating. A review of the substation summer loading conditions in Exhibit N without improvements reveals that two substations, Grayton Beach and Santa Rosa Beach, are projected to exceed these maximum summer loading levels in the next four years. Referring to Exhibit N – winter, the substation conditions show that though none of the substations in the 2014 projected loads without improvements, exceed the SDOC winter loading of 124% of full nameplate, the actual 2010 winter peak did exceed the maximum winter loading level for one substation, Black Creek. CHELCO reached a new system peak in January 2010. Substation peaks for winter 2010 exceed the 2014 LF projections for all of CHELCO's substations except Auburn, Mossyhead and Grayton Beach (see Exhibit N – winter).

Exhibit G documents the need for two substations that are called for in this CWP; Hewett and Pt. Washington substations. Both substations are necessary in order to relieve the loading on neighboring substations. The addition of these two new substations will also relieve overloaded conductor, reduce voltage drop and reduce kW losses.

While coordinating CHELCO's CWP needs with PowerSouth EC, the following system transmission line and power supply needs are identified:

- Tap the Bluewater Bay to Santa Rosa Beach Gulf Power 115 kV transmission line for a new 12.5 kV delivery point, Hewett substation.

- Build approximately 1.8 miles of 115 kV transmission line to a new 12.5 kV delivery point, Pt. Washington substation, by tapping the Grayton Beach to Eastern Lake Gulf Power 115 kV line.

E. Line Regulators - Additions and Changes

Exhibit H itemizes the location of the new regulators and CHELCO is recommended to add the regulators only as system problems are field measured and verified. Several regulators are recommended to be installed and removed to maintain adequate system voltage. Only seven 36.1 kVA (50 Amp) single phase regulators will need to be purchased during this work plan due to the reuse of existing regulators at new locations. The CWP total cost estimate for voltage regulators is $59,221, which includes labor.

F. Capacitor Equipment - Additions and Changes

All capacitor recommendations are based on the computer output of the Windmil® software of Milsoft Integrated Solutions, Inc. Capacitor locations and kVAR bank size recommendations are based on minimizing line loss. The capacitor recommendations can be found in Exhibit I. The cost of capacitor changes is also categorized by Code 604 and the cost estimate is $469,513, including labor.

G. Sectionalizing Equipment - Additions and Changes

A sectionalizing review was completed as part of the CWP. PowerSouth EC provided CHELCO's low-side source impedance data so that available fault currents at each substation and delivery point can be determined. A sectionalizing review, as opposed to a complete sectionalizing study, reviews the existing hydraulic and electronic reclosers and makes recommendations using the future 2014 system model, after the CWP recommended system improvements. These recommendations are based on the following criteria:

a. Maximum fault at device location exceeds device's maximum pickup rating
b. Minimum fault at device location is below device's minimum pickup rating
c. Load current at device location exceeds device's continuous current rating
d. Coordination[4]
e. Recommended line open change
f. Conversion from single phase to multi phase line

Sectionalizing cost estimates can be found in Exhibit J. The total cost included in the work plan, for Code 603-4, recloser replacement upgrade, is $329,828.

[4] Coordination with fuses and upstream switchgear or substation relay equipment is not part of the sectionalizing review. Coordination as noted above is only with other reclosers and is done in part due to recommendations in the sectionalizing review. CHELCO's engineering staff should review coordination with all upline and downline devices prior to making any changes.

H. Ordinary Replacements

The physical condition of CHELCO's electric plant is satisfactory according to quarterly work order reviews by Patterson & Dewar Engineers. CHELCO uses Osmose to do their pole inspections. CHELCO is on an eight year cycle program and they are presently in their 4th year.

Current estimates for pole replacements can be found in Exhibit B. Based on 2010 budget costs, the total CWP projected costs for pole replacements is $378,016, for unexpected replacements the cost estimate is $852,107 and for concrete pole upgrades the estimate is $63,908.

IV. CONCLUSION

The recommendations included in this CWP are moderate. CHELCO's management and engineering/operating personnel are encouraged to continue monitoring system conditions over the next four years, and when and if problems do arise, CWP amendments should be timely generated to assure system conditions are maintained in accordance with the SDOC specified.

The recommendations set forth in this construction work plan will enable CHELCO to serve the projected 2014 peak loading conditions. The construction recommendations are in accordance with economic criteria established by CHELCO's load forecast. Any questions or comments regarding this report should be directed to Nicole Mabe of Patterson & Dewar Engineers. Her email address is nmabe@pdengineers.com.

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
Florida 30
DeFuniak Springs, Florida

2011-2014 CONSTRUCTION WORK PLAN (CWP)
Distribution Line Construction Recommendations and
Cost Estimates

Construction Justification Codes

1. Overload Single-Phase Line
2. Overload Multi-phase Line
3. Excessive Voltage Drop
4. Balance Phase Loading
5. Improve Service Reliability
6. New Feeders (New or Existing Sub)
7. New Load Development
8. Establish Main Tie Between Sub/Circuit
9. Highway Relocation Project

REF. NOS.	Nearest Device	Line Section	Miles	Existing Construction	Proposed Construction	Year 2011	2012	2013	2014	Construction Justification Code
Substation 1 - Laurel Hill										
none										

2011-2014 CONSTRUCTION WORK PLAN (CWP)
Distribution Line Construction Recommendations and
Cost Estimates

(Continued)

REF. NOS.	Nearest Device	Line Section	Miles	Existing Construction	Proposed Construction	Year 2011	2012	2013	2014	Construction Justification Code
Substation 10 - Auburn										
300-RU10-01	10614S18	123563 to 122293	1.3	3Ø - 394 AAAC	3Ø - 740.8 AAAC				$227,404	2
200-10-01	10906S01	122498	0.2		1Ø - 2 AAAC				$12,663	1
Substation 11 - Bluewater Bay										

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
Florida 30
DeFuniak Springs, Florida

2011-2014 CONSTRUCTION WORK PLAN (CWP)

Voltage Regulator Recommendations and Cost Estimates
Code 604

Remarks

A - Overloaded
B - Improved Circuit Regulation
C - Excessive Voltage Drop
D - Unneeded
ASI - After System Improvements

Voltage Regulator Descriptions

kVA Rating	Amp Rating
38.1	50
76.2	100
114.3	150
167	219
250	328

Substation/Circuit	Device	Existing	2014 Summer Peak Current	2013/14 Winter Peak Current	Recommendations	Remarks
Substation 1 - Laurel Hill						
0104	REG01-01	-	21a	32a	Add 1-50a	C
0102	REG01-02	-	47a	66a	Add 1-150a	C

2011-2014 CONSTRUCTION WORK PLAN (CWP)
Voltage Regulator Recommendations and Cost Estimates
(Continued)

Substation/Circuit	Device	Existing	2014 Summer Peak Current	2013/14 Winter Peak Current	Recommendations	Remarks
Substation 18 - Auburn						
1002	REG028	1-219a	142a	198a	-	
1002	REG0Z2	1-100a	31a	48a	-	
1002	REG10-01	-	22a	36a	Add 1-50a	C

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
Florida 30
DeFuniak Springs, Florida

2011-2014 CONSTRUCTION WORK PLAN (CWP)
Capacitor Recommendations and Cost Estimates
Code 604

Substation	Device	Line Section	Existing	Recommendations
#1. Laurel Hill	CAP080	146377	300 F	Remove
	CAP072	125006	300 F	Replace w/ Switched
	CAP079	145523	300 F	-
	CAP01-01-F	125810	-	Add 300 Fixed
	CAP01-02-F	125459	-	Add 300 Fixed

2011-2014 CONSTRUCTION WORK PLAN (CWP)
Capacitor Recommendations and Cost Estimates (Continued)
Code 604

Substation	Device	Line Section	Existing	Recommendations
#10. Auburn	CAP97	123106	300 F	-
	CAP069	123590	300 F	Replace w/ Switched
	CAP093	123935	600 F	Replace w/ 300 Switched
	CAP029	122129	1200 F	Remove
	CAP068	123542	300 F	Remove
	CAP070	122675	300 F	-
	CAP015	123582	1200 F	Remove
	CAP071	131947	300 F	Remove
	CAP087	136487	600 F	Remove
	CAP10-01-F	123639	-	Add 300 Fixed
	CAP10-02-S	123175	-	Add 300 Switched
	CAP10-03-F	122377	-	Add 300 Fixed
	CAP10-04-S	122753	-	Add 300 Switched
	CAP10-05-F	123088	-	Add 300 Fixed
	CAP10-06-S	123100	-	Add 300 Switched
	CAP10-07-F	145005	-	Add 300 Fixed
	CAP10-08-F	123671	-	Add 300 Fixed
	CAP10-09-S	149868	-	Add 300 Switched
	CAP10-10-S	123804	-	Add 300 Switched
	CAP10-11-F	123806	-	Add 300 Fixed
	CAP10-12-S	149345	-	Add 300 Switched
	CAP10-13-F	123515	-	Add 300 Fixed
	CAP10-14-S	145330	-	Add 300 Switched
	CAP10-15-F	123507	-	Add 300 Fixed

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
Florida 30
DeFuniak Springs, Florida

2011-2014 CONSTRUCTION WORK PLAN (CWP)
Sectionalizing Summary and Cost Estimates

Code 603-4

Remarks

1 - Maximum Fault
2 - Minimum Fault
3 - Load Current
4 - Min. Fault not protected by existing or proposed device
5 - Coordination
6- Change in Line Open
7 - Conversion to Multi-Phase
8- Projected 2014 continuous load exceeds existing or proposed device

Substation	Circuit	Model Ref. #	Existing Ø	Existing Device	Device Cont. Rating	Device Max. Amps	Device Min. Amps	2014 Cont. Load Amps	2014 Fault Currents Max. Amps	2014 Fault Currents Min. Amps	Proposed Ø	Proposed Device	Remarks
Laurel Hill	0102	04906S06	1Ø	15 H	15	375	30	9	634	150	1Ø	25 4H	1
		04906S05	3Ø	35 H	35	875	70	46	772	116	3Ø	50 H	3, 5
		02911S04	1Ø	35 H	35	875	70	25	483	125		-	
		02802S01	1Ø	25 H	25	625	50	9	320	114		-	
		02815S01	1Ø	15 H	15	375	30	9	438	139	1Ø	25 H	1
		04919S03	1Ø	50 H	50	1250	100	25	548	122		-	
		08909S01	1Ø	25 H	25	625	50	9	310	116		-	
		04814S01	1Ø	50 H	50	1250	100	7	931	145		-	
		04714S03	3Ø	70-4H	70	2500	140	56	2147	143		-	
		04706S02	1Ø	35 H	35	875	70	40	980	144	1Ø	50 H	1, 3, 5
		02821S01	1Ø	15 H	15	375	30	12	813	140	1Ø	25 4H	1
		02722S02	1Ø	50 H	50	1250	100	39	847	139		-	
		02707S01	1Ø	35 H	35	875	70	33	484	121		-	
		00718S01	1Ø	15 H	15	375	30	10	343	114		-	
		04703S06	1Ø	15 H	15	375	30	2	697	145	1Ø	25 4H	1
	0103	06723S05	1Ø	15 H	15	375	30	8	754	152	1Ø	25 4H	1
		06723S06	1Ø	25 H	25	625	50	21	750	140	1Ø	25 4H	1
		06719S03	1Ø	50 H	50	1250	100	5	892	155		-	
		06714S01	1Ø	35 H	35	875	70	25	953	143	1Ø	35 4H	1
		04723S01	1Ø	50-L	50	3000	100	74	1653	147	1Ø	100 4H	3, 4
	0104	04813S05	1Ø	50 H	50	1250	100	24	1221	152	1Ø	70 4H	5
		02822S01	1Ø	25 H	25	625	50	20	692	125	1Ø	35 H	1, 5
		00619S01	1Ø	15 H	15	375	30	16	356	117	1Ø	25 H	3
		04511S08	1Ø	35 H	35	875	70	32	678	122		-	
		04320S01	1Ø	15 H	15	375	30	8	389	121	1Ø	15 4H	1
		04414S01	1Ø	15 H	15	375	30	12	527	128	1Ø	15 4H	1
		04511S07	3Ø	70-L	70	4200	140	70	811	128		-	4
		02304S04	1Ø	35 H	35	875	70	19	315	119		-	
		02305S03	1Ø	35 H	35	875	70	10	317	121		-	
		02403S03	1Ø	35 H	35	875	70	32	365	114		-	
		02515S02	1Ø	15 H	15	375	30	16	447	134	1Ø	25 H	1, 3
		02506S01	1Ø	35 H	35	875	70	15	451	129		-	
		02512S01	1Ø	35 H	35	875	70	37	496	124	1Ø	50 H	3
		02517S01	1Ø	15 H	15	375	30	13	514	138	1Ø	25 H	1
		04502S01	1Ø	25 H	25	625	50	20	614	133		-	
		04811S02	1Ø	70-4H	70	2500	140	32	1008	149		-	
		02621S02	1Ø	35 H	35	875	70	25	623	135		-	
		02506S02	1Ø	15 H	15	375	30	8	500	120	1Ø	15 4H	1
		04813S08	3Ø	70-4H	70	2500	140	14	1258	156		-	
		06606S01	1Ø	50 H	50	1250	100	26	693	138		-	
		06524S01	1Ø	15 H	15	375	30	13	486	132	1Ø	25 H	1

2011-2014 CONSTRUCTION WORK PLAN (CWP)
Sectionalizing Summary and Cost Estimates

(Continued)

Substation	Circuit	Model Ref. #	Existing Ø	Existing Device	Device Cont. Rating	Device Max. Amps	Device Min. Amps	2014 Cont. Load Amps	2014 Fault Currents Max. Amps	2014 Fault Currents Min. Amps	Proposed Ø	Proposed Device	Remarks
Auburn	1001	08717S12	3Ø	NOVA	630	12500	140	65	3153	173		-	
		10704S07	vØ	100-4H	100	2500	200	48	1820	158		-	4
		08707S03	1Ø	35 H	35	875	70	22	1784	160	1Ø	35 L	1
		08707S06	3Ø	70-L	70	4200	140	43	2402	158		-	
		08610S07	1Ø	25 H	25	625	50	5	1276	161	1Ø	25 L	1
		08603S02	1Ø	35 H	35	875	70	40	902	143	1Ø	50 H	1, 3
		08614S02	1Ø	15 H	15	375	30	13	539	129	1Ø	25 H	1
		08614S01	1Ø	15 H	15	375	30	3	539	136	1Ø	25 H	1
		08604S04	1Ø	25-L	25	1500	50	14	973	157		-	
		08722S02	1Ø	70-L	70	4200	140	17	3751	173		-	
		08722S07	1Ø	70-L	70	4200	140	58	4108	171		-	

2011-2014 CONSTRUCTION WORK PLAN (CWP)
Sectionalizing Summary and Cost Estimates

(Continued)

Substation	Circuit	Model Ref. #	Existing Ø	Existing Device	Device Cont. Rating	Device Max. Amps	Device Min. Amps	2014 Cont. Load Amps	2014 Fault Currents Max. Amps	2014 Fault Currents Min. Amps	Proposed Ø	Proposed Device	Remarks
Auburn (cont.)	1002	10707S03	3Ø	50-L	50	3000	100	29	3927	171	3Ø	70 L	1
		10709S07	1Ø	70-L	70	4200	140	81	2083	166	1Ø	100 L	3, 4
		10811S07	3Ø	WE	560	10000	140	192	1849	152		-	
		10811S03	1Ø	70-4H	70	2500	140	45	1320	151		-	
		10906S01	1Ø	35 H	35	875	70	6	617	149		-	
		10913S02	1Ø	70-4H	70	2500	140	50	671	138		-	4
		08921S02	1Ø	35 H	35	875	70	8	440	129		-	
		10913S01	3Ø	100-4H	100	2500	200	32	918	148		-	4
		08919S01	1Ø	50 H	50	1250	100	22	539	146		-	
		10904S02	1Ø	50 H	50	1250	100	25	575	148		-	
		10918S02	1Ø	35 H	35	875	70	17	652	146		-	
		10918S01	1Ø	35 H	35	875	70	35	655	139	1Ø	50 H	3
		10814S04	1Ø	50 H	50	1250	100	59	947	150	1Ø	70 4H	3
		10813S01	1Ø	25 H	25	625	50	27	1004	150	1Ø	35 4H	1, 3
		10812S06	1Ø	50 H	50	1250	100	48	1258	162	1Ø	50 4H	1
		10705S01	1Ø	35-4H	35	1400	70	0	1883	174	1Ø	35 L	1
		10709S08	1Ø	70-L	70	4200	140	71	1966	169	1Ø	100 4H	3, 4
		10709S03	1Ø	35-L	35	2100	70	21	2014	170		-	
		10709S13	3Ø	70-L	70	4200	140	36	2756	171		-	
		10713S01	1Ø	35-L	35	2100	70	35	1715	169		-	
		10702S06	1Ø	50-L	50	3000	100	18	3746	176	1Ø	70 L	1
	1003	10615S12	3Ø	100-L	100	5000	200	162	2714	170	3Ø	VWE	2, 3, 5
		10621S01	3Ø	50-4H	50	2000	100	36	1653	169		-	
		10616S03	1Ø	35-L	35	2100	70	34	1101	157		-	
		10616S01	1Ø	25 H	25	625	50	22	1192	165	1Ø	25 L	1
		10618S01	1Ø	50 H	50	1250	100	80	1371	164	1Ø	100 4H	1, 3, 4
		10623S02	1Ø	15 H	15	375	30	11	1597	169	1Ø	35 L	1
		10615S16	3Ø	70-L	70	4200	140	9	2792	169		-	
		10614S18	3Ø	NOVA	630	12500	140	161	2792	166		-	
		10614S07	1Ø	50-L	50	3000	100	28	2106	170		-	
		10601S04	1Ø	15 H	15	375	30	11	1060	166	1Ø	25 L	1
		10601S05	1Ø	50-4H	50	2000	100	80	1064	160	1Ø	100 L	3, 4
		08621S09	1Ø	25 H	25	625	50	24	905	160	1Ø	25 4H	1
		08621S03	1Ø	25 H	25	625	50	15	905	156	1Ø	25 4H	1
		10603S05	3Ø	50-4H	50	2000	100	10	1690	168		-	
		10614S06	1Ø	50-L	50	3000	100	35	2046	168		-	
		10614S13	3Ø	50-L	50	3000	100	27	2756	170		-	
		10609S03	1Ø	25-L	25	1500	50	32	1755	170	1Ø	35 L	1, 3
		10701S02	1Ø	VXE	400	8000	150	41	4480	169		-	

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
(CHELCO)
Florida 30
DeFuniak Springs, Florida

2011-2014 CONSTRUCTION WORK PLAN (CWP)
System Design and Operational Criteria

Each of the criteria items listed below were reviewed and concurred by CHELCO staff on January 12, 2010.

Construction proposed in this construction work plan (CWP) is required to meet the following minimum standards of adequacy for voltages, thermal loading, safety and reliability on the system. Note that references to future conditions imply the current CWP projections.

It is further understood that the criteria given herein is considered to be a guideline and not a mandate. Oftentimes system conditions will occur which may result in a breach of a specific criteria. Such a condition is considered to be only temporary and is not intended for long range operations.

SYSTEM DESIGN CRITERIA

Substations:

1. CHELCO's power supplier, PowerSouth Energy Cooperative (PowerSouth EC), has the primary responsibility for providing the substation transformer capacity including regulation. It is PowerSouth EC's responsibility to provide CHELCO the requested delivery voltage to CHELCO's low side switching structure for power distribution.

The following maximum loading conditions as a percent of the **full** equipment nameplate ratings based on CHELCO's extreme load forecasts, are recommended. When these levels are projected to be exceeded, plans for uprating are to be scheduled:

Power Transformers -	Summer loading – 100% continuous loading at 55° rating Winter loading – 124% continuous loading at 55° rating
Voltage Regulators -	Summer loading - 100% at the 10% buck or boost rating Winter loading – 124% at the 10% buck or boost rating (these loading recommendations could change depending on the voltage regulator rating)
Circuit Breakers and Reclosers -	Summer or winter - continuous rating = 100% Interrupting rating = 100%
Busses and Switches -	Summer or winter – continuous rating = 100%

2. All new substations and/or delivery points will be justified per the current Long Range System Study as well as power supply studies following the format required by power supplier.
3. CHELCO's power supplier shall provide firm spare substation power transformer capacity for each delivery point by way of a replacement bank having the proper high side and low side voltage levels. Mobile substations or transformers are not considered as firm spare transformer capacity and are considered as tools for emergency short term service .
4. Feeder current balance will be maintained at plus or minus 20% of the average per phase loading at peak conditions.
5. Substation feeder protection will be accomplished per the following criteria based on power transformer capacity:

a) Phase pickup levels will be such to protect feeder conductors as well as to be approximately 1.5 times full load continuous current levels.

2011-2014 CONSTRUCTION WORK PLAN
System Design and Operational Criteria (continued)

SYSTEM DESIGN CRITERIA (continued)

Substations: (continued)

b) Ground pickup will be set to respond to the minimum downline calculated fault current level based on a 40 ohm high impedance primary fault.

c) The number of reclosings, intervals and reset times varies and should be addressed on a case by case basis.

6. New substation designs and construction from the high side transmission tap point to the low side regulated bus will be accomplished and paid for by CHELCO's power supplier, PowerSouth EC. The low side switching structure will be designed and constructed by CHELCO. The new low side structure will be constructed to include the following:

a. A structure that includes a transfer bus.
b. Three phase feeder reclosers will be used in lieu of feeder breakers when the available bus fault current is below 12,500 amperes or the load current is less than 800 amperes. Three phase breakers will be used in all other duty conditions that exceed the above indicated levels.
c. Feeder protection will utilize static or electronic means in lieu of electro-mechanical.
d. Outgoing phasing for the feeders will be A-B-C and consistent with PowerSouth EC's phasing of 1-2-3.
e. New substations with power transformers larger than 5.0 MVA will utilize feeder regulation. All others will utilize bus regulation.

Distribution Lines:

1. All new distribution lines are to be designed and built according to CHELCO's standard construction specifications and guidelines for the appropriate NESC loading district.
2. All new primary construction is to be overhead except where underground is required to comply with governmental or environmental regulations, local restrictions or favorable economics.
3. New lines and line conversions are to be built according to the standard primary voltage levels as recommended in the current Long Range System Study.
4. A minimum of #2 AAAC is to be used on main lines and tap lines.
5. Primary conductors are not to be loaded for long periods of time, over 60% of operating capacity for summer loading conditions and 75% for winter. Operating capacity is defined as the manufacturer's ratings at the conductor maximum operating temperature of 75°C (167°F), with 25°C (77°F) ambient and with 2 mph wind. Major tie lines between substations can be loaded to 100% to include backfeed.
6. The maximum voltage drop from the substation on primary distribution lines using a 120 V base is normally not to exceed 6 volts unregulated, 12 volts with one bank of line voltage regulators, and 18 volts with two banks of line voltage regulators. Ordinarily, lines will be limited to one bank of line regulators.
7. Single-phase taps will be multi-phased if conditions are present that meet all of the following criteria:
   a. Serve more than 60 consumers @ 12.47 kV.
   b. Have a projected future system load over 432 KW @ 12.47 kV (60 amps).
   c. The tap serves an area that is growing.

8. Primary lines are to be rebuilt if they are found to be unsafe or in violation (when constructed) of the National Electrical Safety Code or other applicable code clearances.

2011-2014 CONSTRUCTION WORK PLAN
System Design and Operational Criteria (continued)

SYSTEM DESIGN CRITERIA (continued)

Distribution Lines: (continued)

9. Poles and crossarms are to be replaced as soon as practicable if found to be physically deteriorated by inspection.
10. Conductors are to be replaced if AAAC has caused four or more outages in a given year. Similarly, if copper conductor has become brittle and dangerous, and has caused at least four outages in a given year, the line will be replaced.

Distribution Line Equipment:

1. Distribution class MOV arresters and related pole grounds are to be installed a minimum of every 1320 feet of line.
2. Line voltage regulator projected future loading will be limited to 100% of nameplate rating at 10% buck or boost or 95% at 5% buck or boost.
3. Line sectionalizing devices (e.g. circuit reclosers - CR, sectionalizers, fuses, etc.) are to be applied per the following guidelines:

- No sectionalizing device will be located such that its rated nameplate maximum fault interrupting capacity is exceeded.
- The sectionalizing system shall be designed such that any 40 ohm primary fault will be detected, interrupted and isolated.
- Sectionalizing devices are to be loaded to no more than 100% of continuous nameplate conditions.
- CR to CR coordination is to be based on a required 3 cycle separation between lock-out curves at the maximum fault on the downline device or 12 cycles separation between lock-out curves, if possible.
- Line reclosers shall operate on the time current characteristics curves equivalent to the Cooper Power System's "2A2B".
- Line reclosers are to be maintained systematically based on the number of years since last maintenance. The number of years between maintenance is to be based on data compiled actual maintenance records and is determined for each recloser type.

****The following design criteria is presently under review****

4. Since wholesale power billing is on metered peak substation KVA, capacitor banks will be installed on distribution lines as required to maintain unity power factor at peak loading conditions. Capacitor switching will be utilized as required, to maintain off peak power factor to greater than 90% leading. Capacitors will be located based upon KW loss reduction.
5. Switched capacitors are to utililize controls that operate on temperature with a voltage override except for banks that are to support power factor correction on industrial and/or commercial loads. At those locations kVAR controls are to be used.

2011-2014 CONSTRUCTION WORK PLAN
System Design and Operational Criteria (continued)

SYSTEM DESIGN CRITERIA (continued)

Distribution Line Equipment: (continued)

When temperature controls with a voltage override are utilized, the following guidelines are to be applied (based on the Energyline IntelliCAP automatic controls that are used currently by CHELCO):

- The controls are to be pole-mounted such that they are on the northeast side of the pole, if at all possible. (Note: If such can not be accomplished, the temperature setting levels may have to be raised since the controls will be in direct sunlight a part of the day).
- Set the summer period for May through October and the winter period from November through April.
- Utilize the following ten degree Fahrenheit "on/off" temperature range setting for the seasons indicated:

Winter:	On - 30°F	Off - 40°F
Summer:	On - 85°F	Off - 75°F

Note: It is recommended that for each substation service area that:

1. Bank switching be staggered by varying the temperature on and off settings by 5°F, if possible, or 3°F otherwise.
2. Capacitor banks located on the heaviest loaded feeder and located fartherest from the sub, should be set to come on first.
3. A fixed level of capacitors be established for each season, winter and summer, rather than have all banks switched. This may require some banks to be manually switched on and off during a season.

- Set the data logging to the 30 minute intervals.
- Set the maximum automatic control cycles to four per day.
- Set the voltage override levels to 115 volts for banks to be switched on and 130 volts for banks to be switched off.
- When downloading data from a control, the physical location field should be completed to reflect a) substation name; b) line section location; c) control serial number; d) capacitor bank size; and e) pole or location number.

OPERATIONAL CRITERIA

Service Reliability:

1. System wide consumer outages are to be limited to less than 2.33 consumer outage hours (140 minutes) average per year.
2. Efforts, where practical, shall be made to provide alternative feeds to critical loads and substation feeders.
3. Outages will be evaluated and classified as to cause. The outages will then be evaluated for any reduction efforts that may be possible.
4. Every effort is encouraged to maintain a power supplier outage average per year of 1.0 hour per consumer. For averages above this level will be reviewed and evaluated with CHELCO's power supplier, PowerSouth EC.
6. Delivery points fed by radial taps that have a load-distance factor of more than 100 MW-miles will be evaluated for outages. If outages are in the supplier's top ten percent worse reliable sources, efforts will be reviewed for construction of a loop to that delivery point.

OPERATIONAL CRITERIA (Continued)

Voltage Conditions:

1. Voltage levels will be maintained in accordance with the latest edition of the American National Standards Institute (ANSI) Standard C84.1. The ANSI Standard defines "Range A" and "Range B" voltage limits as follows:

Range A - Service Voltage

Electric supply systems shall be so designed and operated that most service voltages are within the limits specified for this range. The occurrence of service voltages outside these limits is to be infrequent.

Range A - Utilization Voltage

User systems shall be so designed and operated such that, with service voltages within Range A limits, most utilization voltages are within the limits specified for this range. Utilization equipment shall be so designed and rated to give fully satisfactory performance throughout this range.

Range B - Service and Utilization Voltages

This range includes voltages above and below Range A limits that necessarily result from practical design and operating conditions on supply and/or user systems. Although such conditions are a part of practical operations, they shall be limited in extent, frequency and duration. When they occur, corrective measures shall be undertaken within a reasonable time to improve voltages to meet Range A requirements.

Insofar as practicable, utilization equipment shall be designed to give acceptable performances in the extremes of this range of utilization voltage, although not necessarily as good performance as in Range A.

Table 1. **Voltage Ranges ANSI Standard C84.1 (120 volt base)**

Range	Minimum			Maximum
	Utilization Voltage*			
	Non-lighting loads	Loads including lighting	Service Voltage	Utilization & Service Voltage
A	108	110	114	126
B	104	106	110	127

*Note: Caution should be exercised in using minimum utilization voltage as in some cases they may not be satisfactory for the equipment served. For example, where existing 220-volt motors are used on 208-volt circuits, the minimum utilization voltage permitted would not be adequate for the operation or motors.

2011-2014 CONSTRUCTION WORK PLAN
System Design and Operational Criteria (continued)

OPERATIONAL CRITERIA (continued)

Voltage Conditions: (Continued)

2. CHELCO's Recommended Design Criteria:

a. Rural electric distributions systems should be designed and operated to meet the voltage level requirements of "Range A" in ANSI C84.1-1970. Users' utilization electrical equipment of all types will generally be designed to give satisfactory performance in this range.
b. It is recognized that maintaining voltage levels within "Range A" on all parts of the system at all times cannot be assured. Due to the economics of operation, there may be some system voltages that fall in extremes of "Range B" and even beyond. This may occasionally occur as the feeder reaches its design loading limit at annual or semi-annual peak loads.
c. When voltages frequently extend into "Range B", they should be corrected to conform to "Range A" requirements within a reasonable time. If voltages on any part of the system fall outside the limits of "Range B", corrective actions should be taken immediately to bring these voltages within "Range B" requirements within a reasonable time.

Some types of utilization equipment will not perform satisfactorily or efficiently at the extremes of "Range B" voltages. Outside "Range B" voltage limits, many types of utilization equipment may fail to operate and may be seriously damaged or suffer shortened operating life. Voltages above these limits of Range B may be especially damaging to the users' equipment.

Table 2. Voltage Drops for Rural Electric Distribution System Design (120 volt base)

	Maximum Volts Drop	Percent Volts Drop
Substation regulated bus (output) to last distribution transformer (primary)	6	5 %
Distribution transformer (primary) to service delivery connection to consumers' wiring (meter or entrance switch)	4	3.33 %
Utility service delivery point (meter or entrance switch) to consumers' utilization terminal (outlet):		
Loads including Lights	4	3.33 %
Non-lighting Loads	6	5.00 %

3. CHELCO's recommended operating voltage level and limit values are based on the following:

a. The outgoing substation voltage is regulated by a suitable voltage regulator as defined in Section A, Substations, of this exhibit.
b. The regulator voltage band width setting does not exceed two volts on a 120-volt base.
c. Voltage values used are at the center of the voltage regulator band width.
d. All voltage regulators, whether at the substation or out on the line, have properly set and functioning line drop compensation (LDC).
e. Only sustained voltages apply to these levels and limits. The flicker and variations caused by motor starting, equipment switching, variation of voltage within the voltage regulator band width, and similar short duration variations are not considered.

2011-2014 CONSTRUCTION WORK PLAN
System Design and Operational Criteria (continued)

OPERATIONAL CRITERIA (continued)

Voltage Conditions: (Continued)

4. Voltage input to Distribution Substations
The voltage input to distribution substations should be kept within limits as follows:

a. Substation voltages are kept within the design limits of the substation transformers and other equipment.

Annual System Losses:

1. Efforts will be made to limit the annual system losses to 5.0% or less.
2. When there is a more than 1.0% change in losses from one year to the next, efforts are to be made to evaluate the cause. Such efforts should include the following to assure that there is not a metering error with the power supplier or a large power consumer resulting in incorrect charges and/or revenue:

- Check all substations that have had a change in metering equipment over the last 12 - 24 months.
- Check all new substations that were constructed over the last 12 - 24 months and verify correctness of metering.
- Check all new or recently revised large power load metering over the last 12 - 24 months and verify correctness.

3. Line drop compensation will be utilized on all system regulators to reduce voltage levels and losses during off-peak conditions.

Annual Load Factor:

1. The annual load factor for the system will be monitored on a twelve month basis and efforts will be made to maintain a level of 45% or higher. Efforts to maintain such could be as follows:

- Develop retail rates to encourage consumers to use and rely on electric power for their needs.
- Regularly evaluate the use of load management switches for generators, air conditioning and hot water heater loads and implement such when the economics are present justifying such.
- Encourage low load factor large power load consumers towards interruptible service using another source of energy during peak loading conditions.

2. Purchase the following distribution equipment on an evaluated losses basis to reduce system losses and to contribute to a higher annual load factor:

- Capacitors
- Voltage regulators

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
Florida 30
DeFuniak Springs, Florida

2011-2014 CONSTRUCTION WORK PLAN (CWP)

LARGE POWER LOADS
(Loads greater than 150 KW)
Summer 2009 & Winter 2008/09

Account #	Name	Substation	Circuit	Map Number	Large Power #	Large Power $	KW Summer	KWH Summer	KW Winter	KWH Winter
204060925	Okaloosa County BCC	Auburn	10014	08723009	145010	LP25	129	6,920	170	3,760

EXHIBIT M

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
Florida 30
DeFuniak Springs, Florida

2011-2014 CONSTRUCTION WORK PLAN (CWP)

SUBSTATION LOAD DATA
Probable Summer Loading Conditions (2009 Base)

Sub No.	Substation Name	Existing Capacity kVA *1	Proposed Capacity kVA *1	2009 - Base Summer System Peak				Projected Summer 2014 System Peak W/O Improvements *2				Projected Summer 2014 System Peak After Improvements			
				Power Factor	Actual kW	Actual kVA	Percent Loaded	Power Factor	Projected kW	Projected kVA	Percent Loaded	Power Factor	Projected kW	Projected kVA	Percent Loaded
1	Laurel Hill	7,500		100.0%	4,550	4,550	60.7%	100.0%	4,912	4,912	65.5%	100.0%	4,919	4,919	65.6%
2															
3															
4															
5															
6															
7															
8															
9															
10	Auburn	20,000		100.0%	14,570	14,570	72.9%	100.0%	16,593	16,593	83.0%	100.0%	16,717	16,717	83.6%
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															
	Totals				191,200	191,200			211,106	211,644			211,645	211,645	

*1 Maximum continuous loading 65° rating as provided by PowerSouth Energy Cooperative (PowerSouth EC).
*2 Includes 2010 system improvements and Large Power loads not included in 2009 LF (Emerald Coast Middle School & Mossyhead Industrial Park)

Summer

EXHIBIT N
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CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
Florida 30
DeFuniak Springs, Florida

2011-2014 CONSTRUCTION WORK PLAN (CWP)

SUBSTATION LOAD DATA
Probable Winter Loading Conditions (2008/09 Base)

Sub No.	Substation Name	Existing Capacity kVA *1	Proposed Capacity kVA *1	2008/09 - Base Winter System Peak Power Factor	Actual kW	Actual kVA	Percent Loaded	2009/10 Winter System Peak Power Factor	Actual kW	Actual kVA	Percent Loaded	Projected Winter 2013/14 System Peak W/O Improvements *2 Power Factor	Projected kW	Projected kVA	Percent Loaded	Projected Winter 2013/14 System Peak After Improvements Power Factor	Projected kW	Projected kVA	Percent Loaded
1	Laurel Hill	7,500		100.0%	5,800	5,800	77.3%	100.0%	6,463	6,463	86.2%	99.0%	6,206	6,268	83.6%	99.0%	6,223	6,286	83.8%
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10	Auburn	20,000		100.0%	18,240	18,240	91.2%	100.0%	20,495	20,495	102.5%	99.0%	20,589	20,797	104.0%	98.0%	20,641	21,062	105.3%
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21																			
22																			
	Totals				201,030	201,030			229,263	229,263			218,910	220,025			216,501	222,533	

*1 Maximum continuous loading 55° rating as provided by PowerSouth Energy Cooperative (PowerSouth EC).
*2 Includes 2010 system improvements and Large Power loads not included in 2009 LF (Emerald Coast Middle School & Mossyhead Industrial Park)

EXHIBIT N
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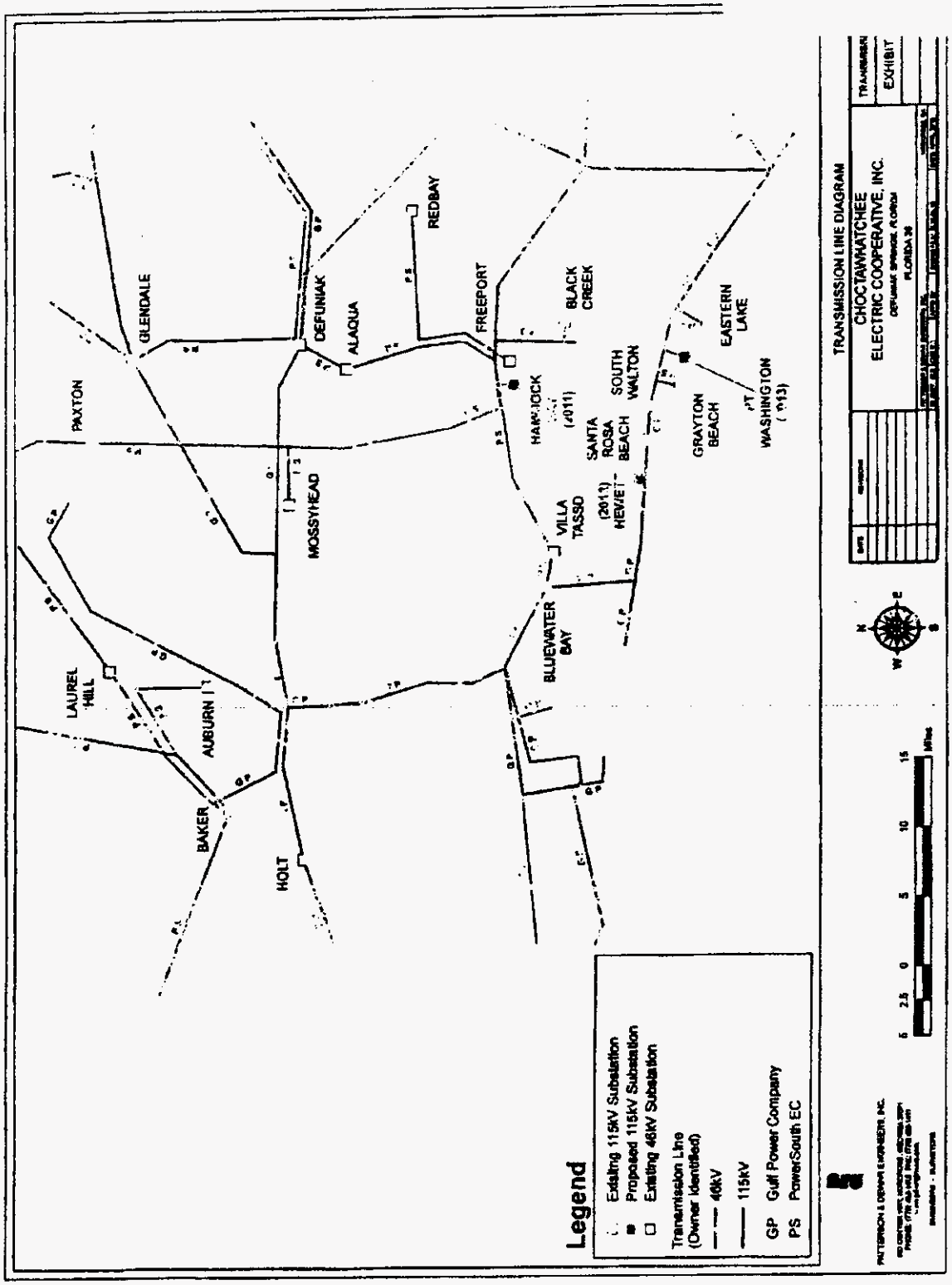
Winter

CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
Florida 30
DeFuniak Springs, Florida

2011-2014 CONSTRUCTION WORK PLAN (CWP)
Distribution Line Open Changes

ASAP - Change open as soon as possible
ASI - Change open after indicated system improvement
+ See CWP Map for general locations

Substation	Circuit	Nearest Switch or Device Close Location +	Substation	Circuit	Nearest Switch or Device Open Location +	Priority
Auburn	1002	new tie point	Auburn	1002	10906S01	ASI - 200-10-01


TRANSMISSION LINE DIAGRAM
CHOCTAWHATCHEE ELECTRIC COOPERATIVE, INC.
EXHIBIT
Legend
Existing 115kV Substation
Proposed 115kV Substation
Existing 46kV Substation
Transmission Line (Owner Identified)
46kV
115kV
GP Gulf Power Company
PS PowerSouth EC
Miles
GLENDALE
DEFUNIAK
ALAQUA
REDBAY
FREEPORT
BLACK CREEK
EASTERN LAKE
PAXTON
MOSSYHEAD
HAMMOCK
SOUTH WALTON
SANTA ROSA BEACH
GRAYTON BEACH
VILLA TASSO
BLUEWATER BAY
LAUREL HILL
AUBURN
BAKER
HOLT

2011-2014 CONSTRUCTION WORK PLAN

DISTRIBUTION LINE CONSTRUCTION PROJECT REVIEW *(Continued)*

Reference Number: 200-10-01

Estimated Cost: $12,663

Proposed Year: 2014

Description of Proposed Construction

Build 0.2 miles of 1ø 2 AAAC conductor along John Nix Road.

Substation	Circuit	Nearest Device	Miles	Existing Phase-Wire	Proposed Phase-Wire
Auburn	1002	10906S01	0.2	N/A	1ø 2 AAAC

Reason for Proposed Construction

The above work is required to improve system reliability and relieve loading on the single phase conductor which will be loaded to 87 Amps in the winter. The design criteria used recommends single phase lines to not be loaded with more than 60 Amps under normal operating conditions.

Results of Proposed Construction

Winter Future System W/O Improvements			Winter Future System After Improvements		
Load Amps	Voltage Drop	Losses ($/year)	Load Amps	Voltage Drop	Losses ($/year)
87	9.8	$77,658	50	9.6	$74,794

After this project is complete, the load will be swapped to another single phase tap. The losses will be reduced by $2,864 per year. The load on the single phase tap will be reduced to 50 Amps after the switching is complete.

Alternate Corrective Plans Investigated

Multiphase the single phase line. This is not preferred because the right-of-way is heavily wooded and along a narrow dirt road.

2011-2014 CONSTRUCTION WORK PLAN

DISTRIBUTION LINE CONSTRUCTION PROJECT REVIEW (Continued)

Reference Number: 300-RU10-01

Estimated Cost: $227,404

Proposed Year: 2014

Description of Proposed Construction

Replace 1.3 miles of 3ø 394 AAAC conductor with 3ø 740.8 AAAC conductor along Highway 85. Replace poles and equipment as required.

Substation	Circuit	Nearest Device	Miles	Existing Phase-Wire	Proposed Phase-Wire
Auburn	1003	10614S18	1.3	3ø 394 AAAC	3ø 740.8 AAAC

Reason for Proposed Construction

The above work is required to improve system reliability and relieve overloading of the conductor which will be loaded to 61% of operating capacity in the summer. The design criteria used recommends conductor loading not to exceed 60% of its operating capacity for summer loads.

Results of Proposed Construction

Summer Future System W/O Improvements			Summer Future System After Improvements		
Load Amps	Voltage Drop	Losses ($/year)	Load Amps	Voltage Drop	Losses ($/year)
325	6.6	$31,838	325	5.7	$23,921

The losses will be reduced by $7,917 per year. Loading on the circuit will be reduced to 41% in the summer.

Alternate Corrective Plans Investigated

Possible alternative corrective plans were reviewed, and no suitable alternatives were found.