South Carolina Regional Transmission Planning

Stakeholder Meeting

Lake Murray Training Center – Room 100

Lexington, SC 29072

December 12, 2017 10:00 AM – 1:00 PM

SCE&G SM
A SCANA COMPANY

santee cooper

Purpose and Goals for Today's Meeting

- Review and discuss key data and assumptions for the next planning cycle
- Update on Regional Planning Process
- Review and discuss current major transmission plans
- Discussion on Multi-Party Studies

SCE&G SM
A SCANA COMPANY

santee cooper

SCE&G

Transmission Planning Key Assumptions and Data

Phil Kleckley

SCE&G SM
A SCANA COMPANY

santee cooper

Modeling Assumptions and Data

Dispersed Substation Load Forecast

- Summer/Winter Peak, Off-Peak and Seasonal Load Levels
- Resource Planning provides 10 Year system load forecasts
- Transmission Planning creates dispersed substation load forecasts

Load Forecast Process

Resource Planning Input

- Develop 10 year projected forecast based on:
  - 10 year historical summer and winter loads
  - Load factors by customer class
  - Considers weather, personal income, population growth, economic conditions, load management, energy efficiency, etc
  - Applies regression analysis to historical data to develop models
  - Applies forecasted growth rates to develop future projections

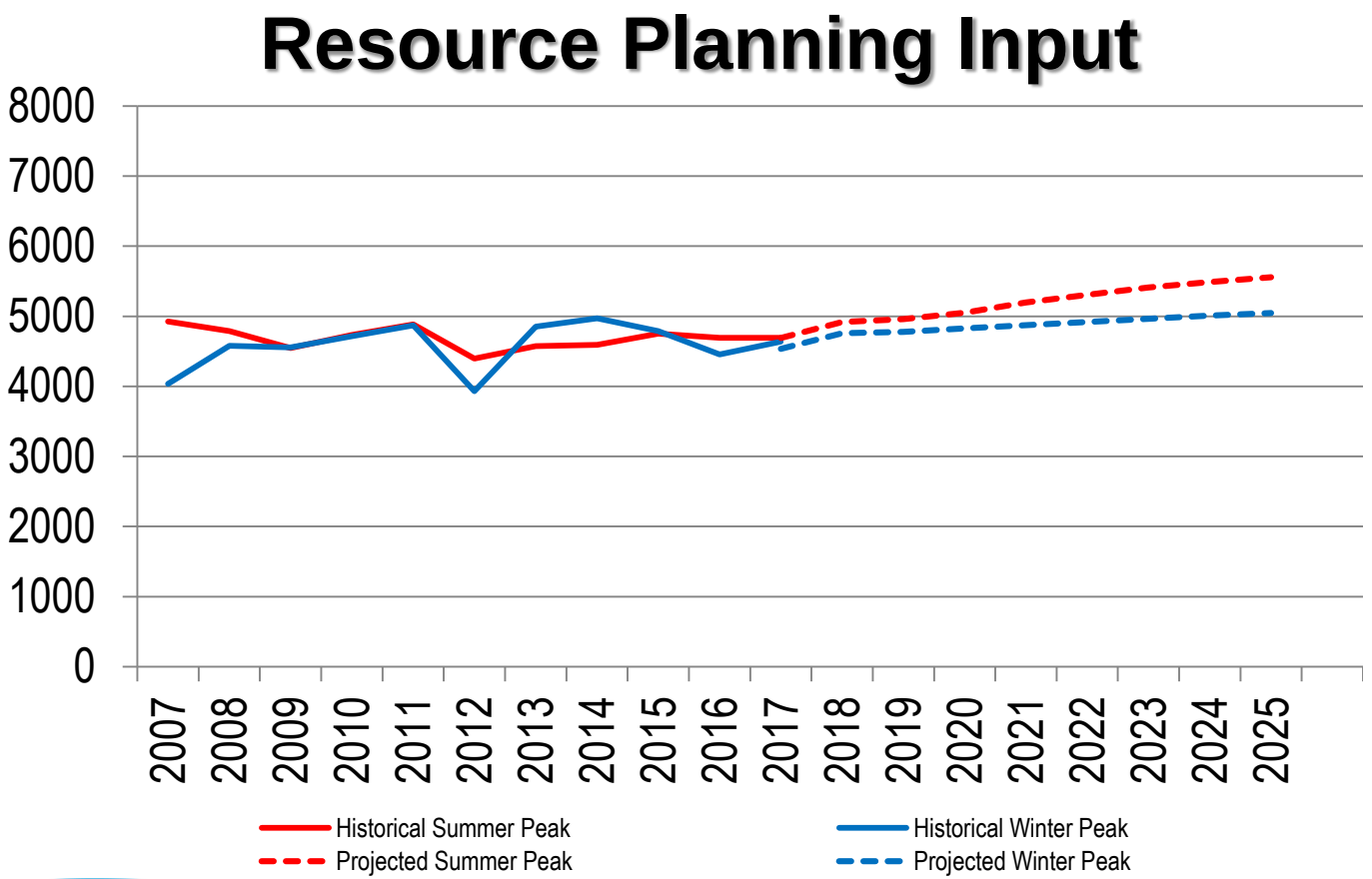
SCE&G 10 Year Load Forecast

	Summer		Winter
2017	4,457 MW	2017/2018	4,636 MW
2018	4,914 MW	2018/2019	4,757 MW
2019	4,959 MW	2019/2020	4,779 MW
2020	5,053 MW	2020/2021	4,767 MW
2021	5,198 MW	2021/2022	4,875 MW
2022	5,308 MW	2022/2023	4,920 MW
2023	5,410 MW	2023/2024	4,966 MW
2024	5,489 MW	2024/2025	5,008 MW
2025	5,552 MW	2025/2026	5,046 MW
2026	5,612 MW	2026/2027	5,083 MW

SCE&G SM
A SCANA COMPANY

santee cooper

Load Forecast Process



SCE&G SM
A SCANA COMPANY

santee cooper

Load Forecast Process

Transmission Planning Input

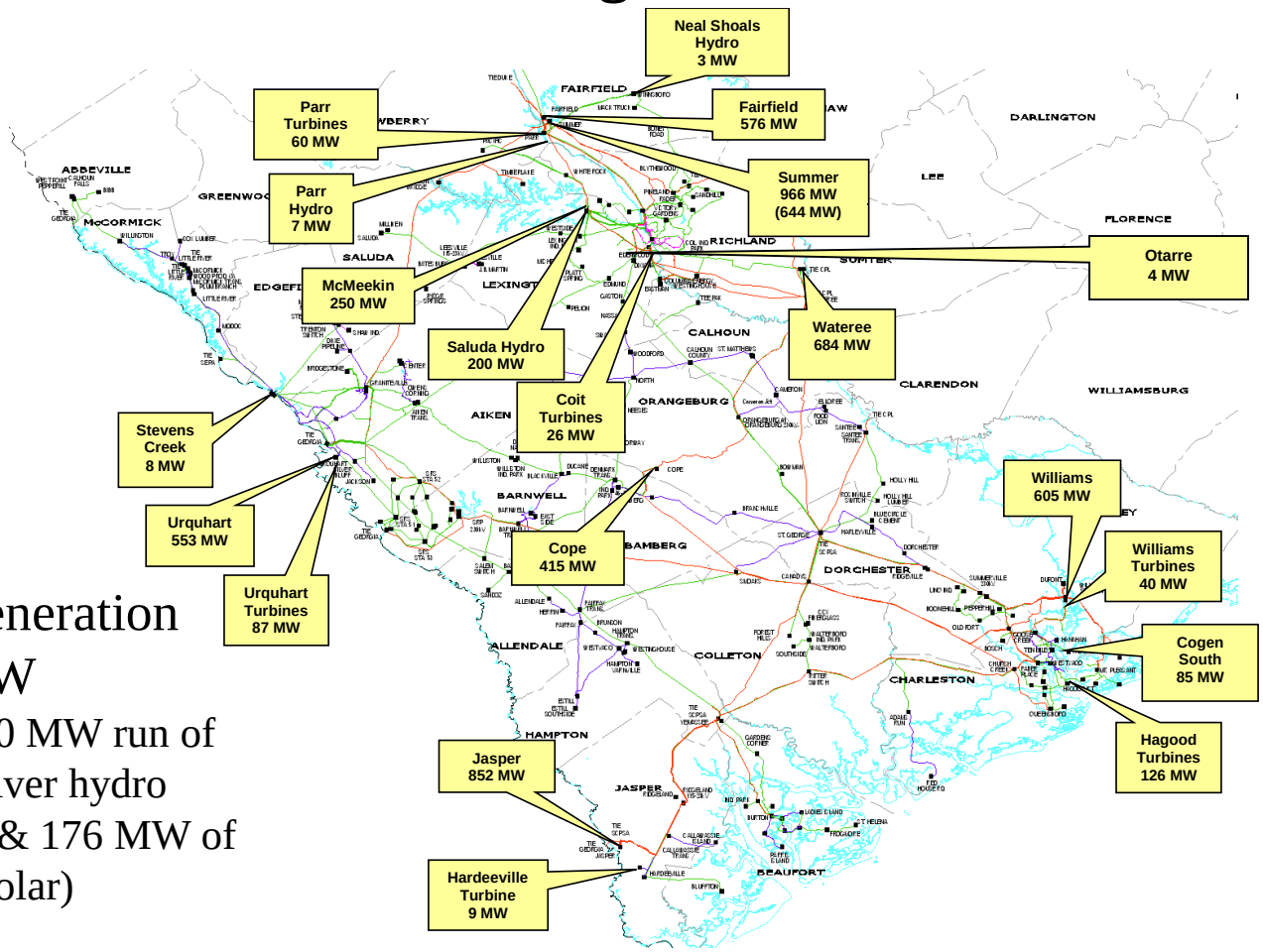
- Obtain summer and winter snapshot meter data from most recent seasons and adjust for load switching
- Develop 10 year projected forecast based on:
  - 10 year historical loading
  - Feedback from Distribution Planning, Local Managers, Large Industrial Group and Transmission Services Manager
- Wholesale loads are modeled as provided by the customer
- Dispersed forecasted load points are integrated into Corporate forecasted load

Modeling Assumptions and Data

Generation

- Annual generator ratings used
- Input from Generation Expansion Plan – Reductions/Additions
- Input from Generation Maintenance Schedule
- Generators dispatched economically
- Merchant Generators included, modeled at contracted output

Existing Generation

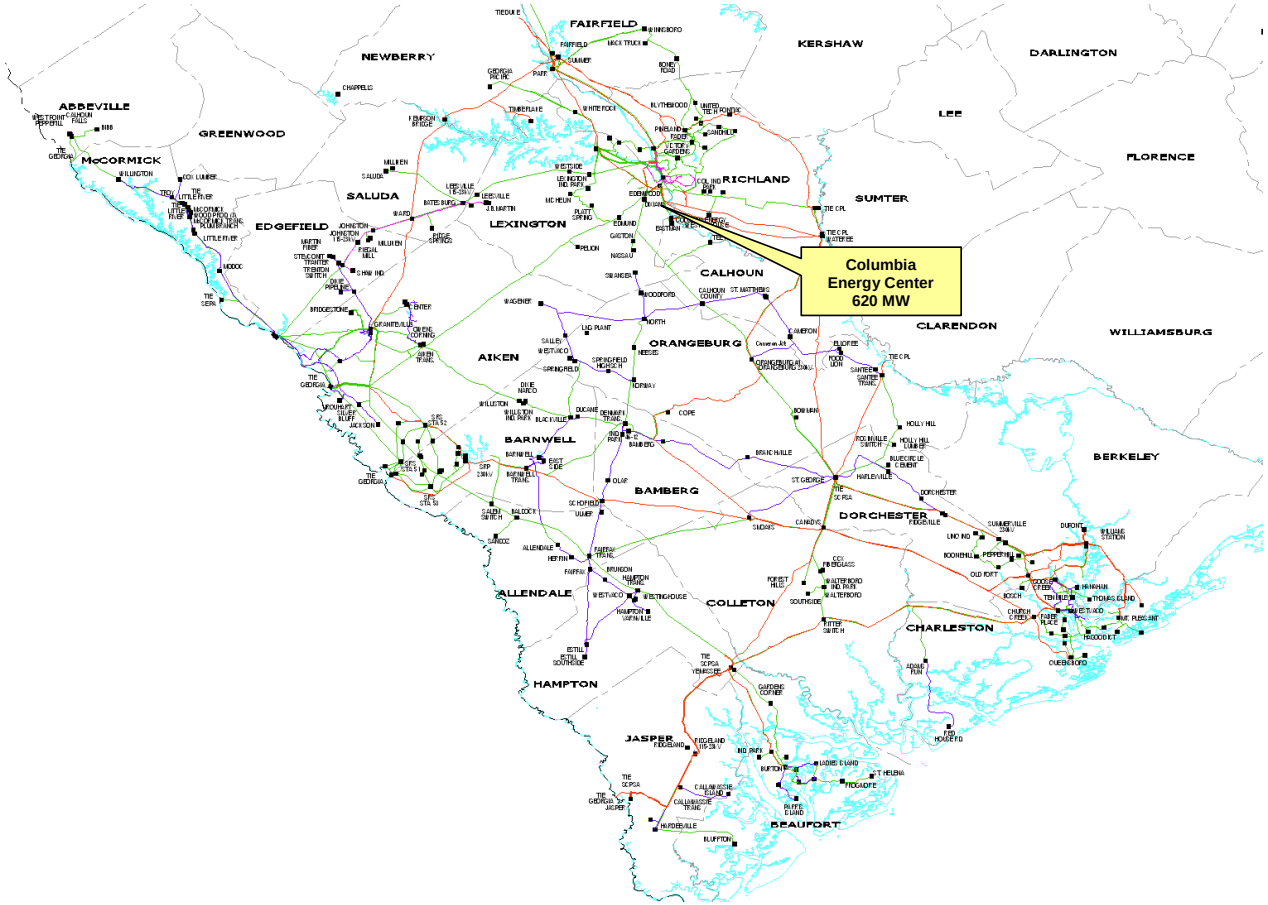


Rated Generation
5,417 MW
(includes 10 MW run of dispersed river hydro generation & 176 MW of dispersed solar)

SCE&G SM
A SCANA COMPANY

santee cooper

Merchant Generation



SCE&G SM
A SCANA COMPANY

santee cooper

Generation Plan

Additions

- 270 MW solar under construction for 2017-2018
- 392 MW future solar both Interconnection & Purchase Power Agreements

Modeling Assumptions and Data

Transmission Network

- Input from Transmission Plan
- Neighboring Transmission Systems Modeled

Modeling Assumptions and Data

Planned Transmission Facilities

7/21/2017

South Carolina Electric & Gas Planned Transmission Facilities	
Planned Project	**Tentative Completion Date**
Blythewood 115 kV Switching Station: Construct	Feb-17
Ward Sub: 230/115 kV Back up Bank & Bus Tie Breakers	Mar-17
Summerville 230 kV: Replace 224 MVA transformer with 336 MVA	Mar-17
Jack Primus 115 kV Line Construct	May-17
Okatie - Hardeeville 115 kV #2 Line Construct	May-17
Cainhoy 230/115kV Sub: Construct and Line Upgrades	May-17
Toolebeck 115 kV Switching Station: Construct	May-17
Okatie 115 kV Sub Construct and Line Upgrades	Jun-17
Wateree - Orangeburg 230 kV & Eastover - Orangeburg 115 kV: Rebuild	Sep-17
Queensboro 115 kV Switching Station: Construct	Sep-17
Faber Place - Charlotte St 115 kV Rebuild & Faber Place-Hagood 115 kV #2 Construct	Dec-17
Orangeburg 230kV Sub: 2 230 kV Terminals to VCS2 & St. George	Dec-17
Thomas Island - Jack Primus 115 kV Line: Acquire R/W & Construct	Dec-17
Hopkins 230/115 kV Substation: Install 2nd Autobank	May-18
St George - Summerville 230 kV #2 B1272: Construct	Dec-18
VCS2 - St. George 230 kV Lines #1 & #2: Construct	Dec-18

SCE&G SM A SCANA COMPANY

santee cooper

Modeling Assumptions and Data

System Interchange

- Firm scheduled transfers included
- Coordinated with Neighbors

Questions?

Santee Cooper

Transmission Planning Key Assumptions and Data

Weijian Cong

SCE&G SM
A SCANA COMPANY

santee cooper

Components

- Demand Forecast
- Transmission Network
- Generation Resources
- Actual System Operations

Demand Forecast

Load forecast is developed with contributions from:

- Santee Cooper (retail, industrial)
- Central Electric Power Cooperative, Inc. (retail, industrial)
- Cities of Bamberg and Georgetown (municipal)

Transmission Network

Models include:

- Existing transmission system as well as committed Santee Cooper additions (uncommitted facilities are subject to change in scope or date).
- Confirmed firm PTP transmission service reservations
- Neighboring transmission system representations
- All facilities assumed to be available for service
- Normal operating status (in-service or OOS) of facilities

Transmission Network

- Uniform rating methodology is applied to transmission facilities.
- Base case models are updated annually (beginning of the year).
- Study models may be updated prior to any study effort.

Committed Transmission Facilities in the study Cases

Richburg-Flat Creek 230 kV Line	12/31/2017
Carnes Crossroads-Harleys Bridge 115 kV Line Phase 1	12/31/2017
Harleys Bridge 115-69 kV Substation	12/31/2017
Bucksville-Myrtle Beach 115 kV Line	05/01/2018
Perry Road-Myrtle Beach #3 115 kV Line	12/31/2018
Pinelevel-Allen 115 kV Line #2	04/23/2019
Sandy Run 230-115 kV Substation	12/15/2019
BUCKSVILLE 230-115 SUBSTATION: Add Transformer	12/31/2019
Pomaria-Orangeburg 230 kV Line	12/15/2020

Generation Resources

Existing Transmission Connected Generation

Cross 1- 4

Winyah 1- 4

Hilton Head Turbines 1- 3

Myrtle Beach Turbines 1-5

Jefferies 1, 2, 3, 4, 6 (Hydro)

Allendale (biomass)

Dorchester (biomass)

J.S. Rainey Power Block 1

J.S. Rainey 2A, 2B

J.S. Rainey 3-5

Spillway (Hydro)

St. Stephen 1-3 (Hydro)

V.C. Summer #1

Domtar (co-gen)

SCE&G SM A SCANA COMPANY

santee cooper

Generation Resources

- V. C. Summer #2 & #3 are removed and changes have been updated in the LTSG and MMWG models
- Current projections show that Santee Cooper has the sufficient capacity in the near term while long term capacity need is being evaluated by generation planning

Actual System Operations

- 69 kV Transmission Lines Operated Split (Dec, 2017)
  - Richburg-Flat Creek 69 kV Line
  - Winnsboro-Blythewood 69 kV line
  - Winnsboro-Richburg 69 kV Line #2

Key Data and Assumptions for the Next Planning Cycle

Stakeholder Input, Comments and Questions

SCRTP Regional and Inter-regional Processes

Clay Young

SCE&G SM
A SCANA COMPANY

santee cooper

SCRTP Regional and Public Policy Planning

- Biennial Process (currently in year 2, Meeting #5)
- Restarts in 4th quarter of even years
- Regional Projects – Proposed, Evaluation and Selection
  - **Must be submitted by January 15 of odd years**
  - None received in current Regional Planning cycle

During this meeting:

- Local and Regional Transmission Plans Presented
- Stakeholders have the opportunity to ask questions and discuss the current Local and Regional Transmission Plans
- The Transmission Providers' announce which Transmission Needs driven by Public Policy Requirements for which transmission solutions will be evaluated

SCE&G SM A SCANA COMPANY

santee cooper

Current Major Transmission Plans

Wade Richards and Weijian Cong

SCE&G SM
A SCANA COMPANY

santee cooper

Disclaimer

- These projects represent the current transmission plans within the SCRTP footprint
- The expansion plan is continuously reviewed and may change due to changes in key data and assumptions
- This presentation does not represent a commitment to build

Current Transmission Expansion Plans

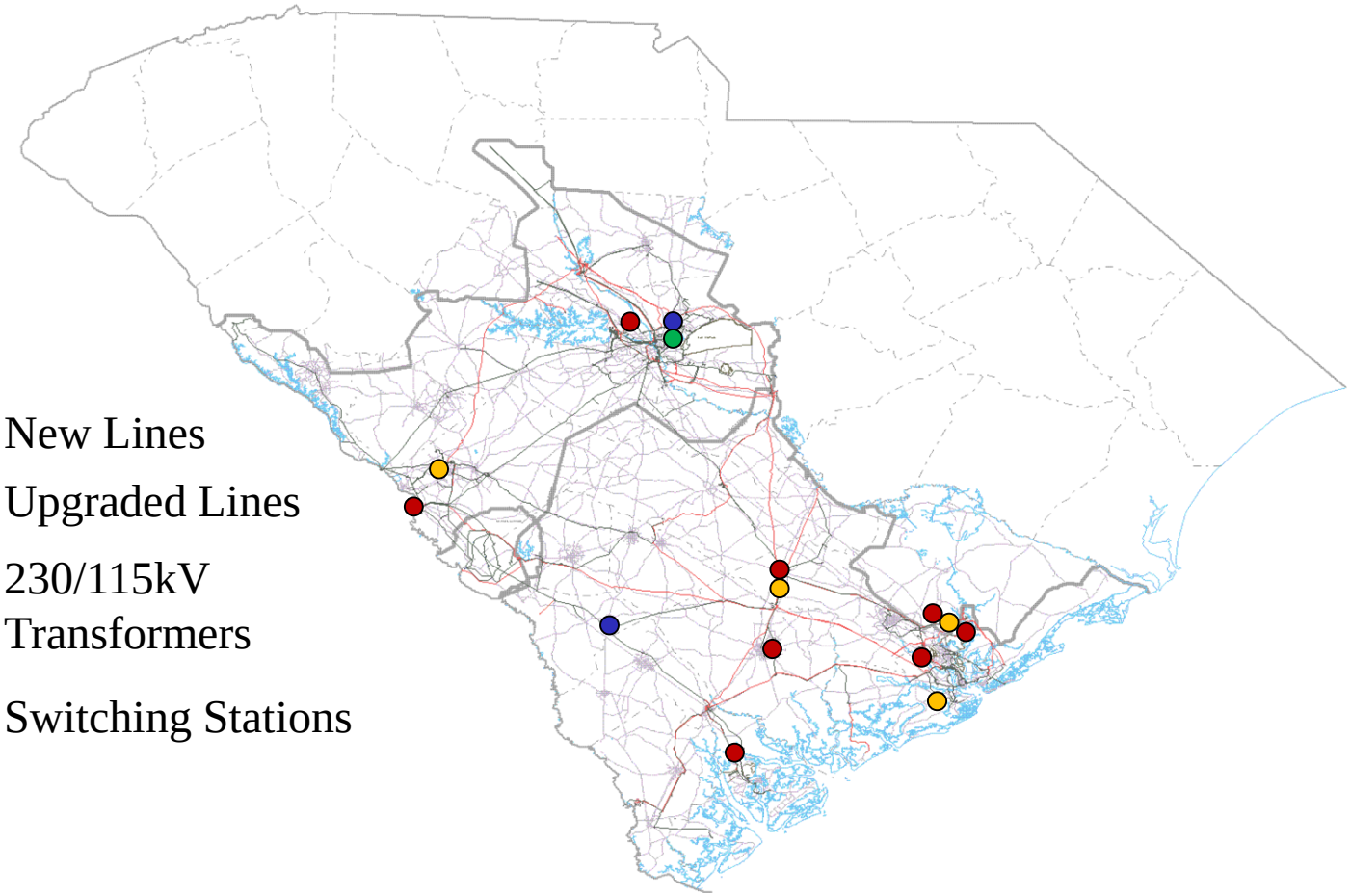
SCE&G

Wade Richards

SCE&G SM
A SCANA COMPANY

santee cooper

SCE&G Planned Projects



- New Lines
- Upgraded Lines
- 230/115kV Transformers
- Switching Stations

SCE&G SM
A SCANA COMPANY

santee cooper

SCE&G Current Projects

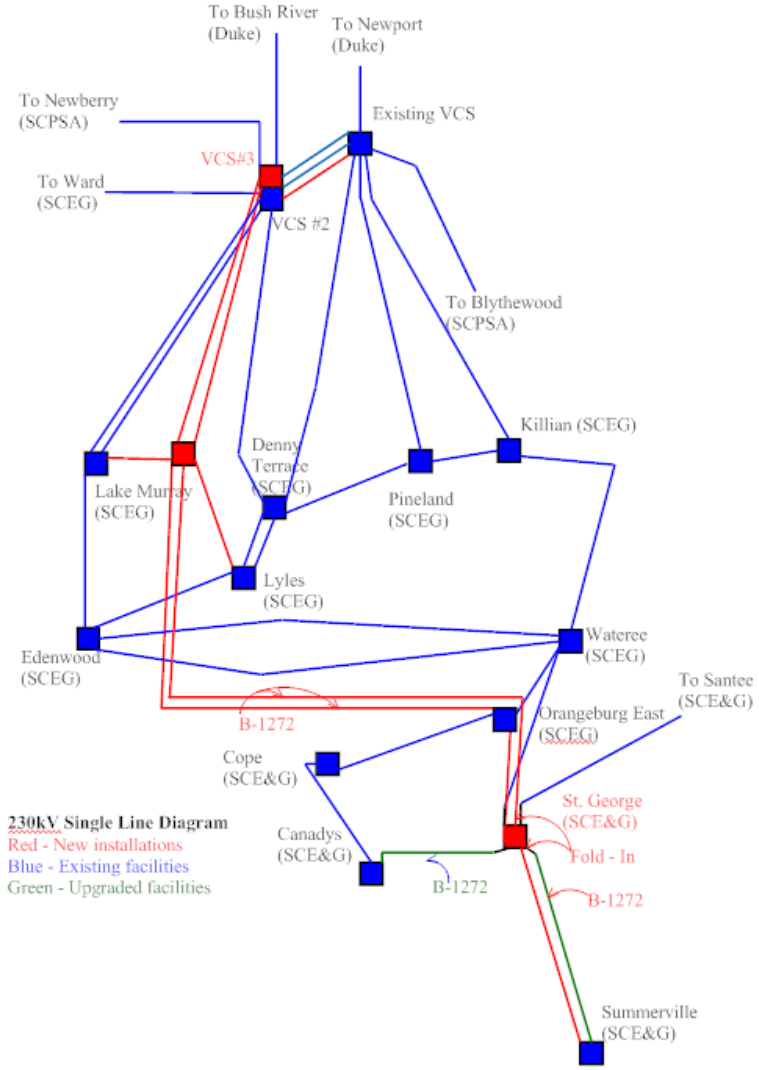
- **Active Projects**
  - VCS2 – St. George 230 kV Fold-in to Orangeburg
  - St. George – Summerville 230 kV #1&2
  - Williams – Mt. Pleasant/Cainhoy 115 kV Rebuild
  - Queensboro 115 kV Construction
- **Future Projects**
  - Pepperhill – Summerville 230 kV
  - Burton – Yemassee 115kV #2 Rebuild
  - Canadys – Ritter 115 kV Rebuild SPDC 230/115 kV
  - SRS – Vogtle 230 kV Series Reactor Install
  - South Augusta – Graniteville 230 & 115 kV Tie lines
  - Saluda Hydro – Harbison 115 kV Rebuild as Double Circuit
  - Hopkins – Fold in Wateree – CIP 230 kV and Add Second 230/115 kV Transformer
  - Fairfax – Salem SS 115 kV Reconductor With Low Sag Conductor

SCE&G SM A SCANA COMPANY

santee cooper

Active Projects

- VCS2 – St. George 230 kV #1 & #2
  - Approximately 85% complete
  - Final segment of 13 miles into Orangeburg complete by December 2018
- St. George – Summerville #1 & #2 230 kV
  - Placed in service over summer periods
  - Scheduled for completion May 2018



SCE&G SM
A SCANA COMPANY

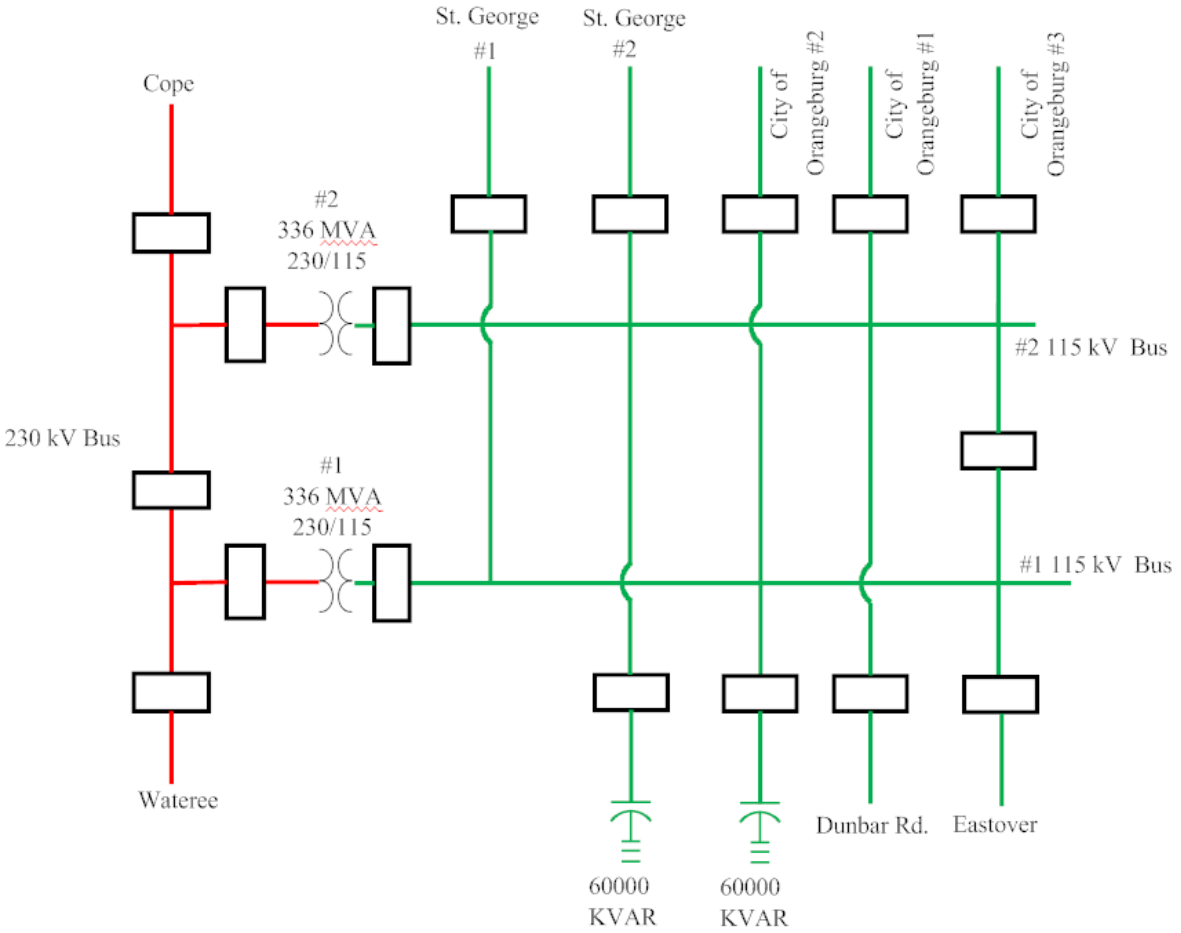
santee cooper

VCS2 – St. George 230 kV Fold-In to Orangeburg

- Add two 230 kV terminals on #1 & #2 230 kV buses
- Fold in the VCS2 – St. George 230 kV line at the Orangeburg 230/115 kV Transmission substation
- Replace 2000-Amp bus-tie breaker with 3000-Amp breaker
- Project required to alleviate potential N-2 contingency overload associated with retirement of Canadys coal fired generators
- Increased support of Orangeburg 230 kV will decrease the burden of the 115 kV system in Orangeburg/St. George areas
- Scheduled for completion by December 2017

SCE&G SM
A SCANA COMPANY

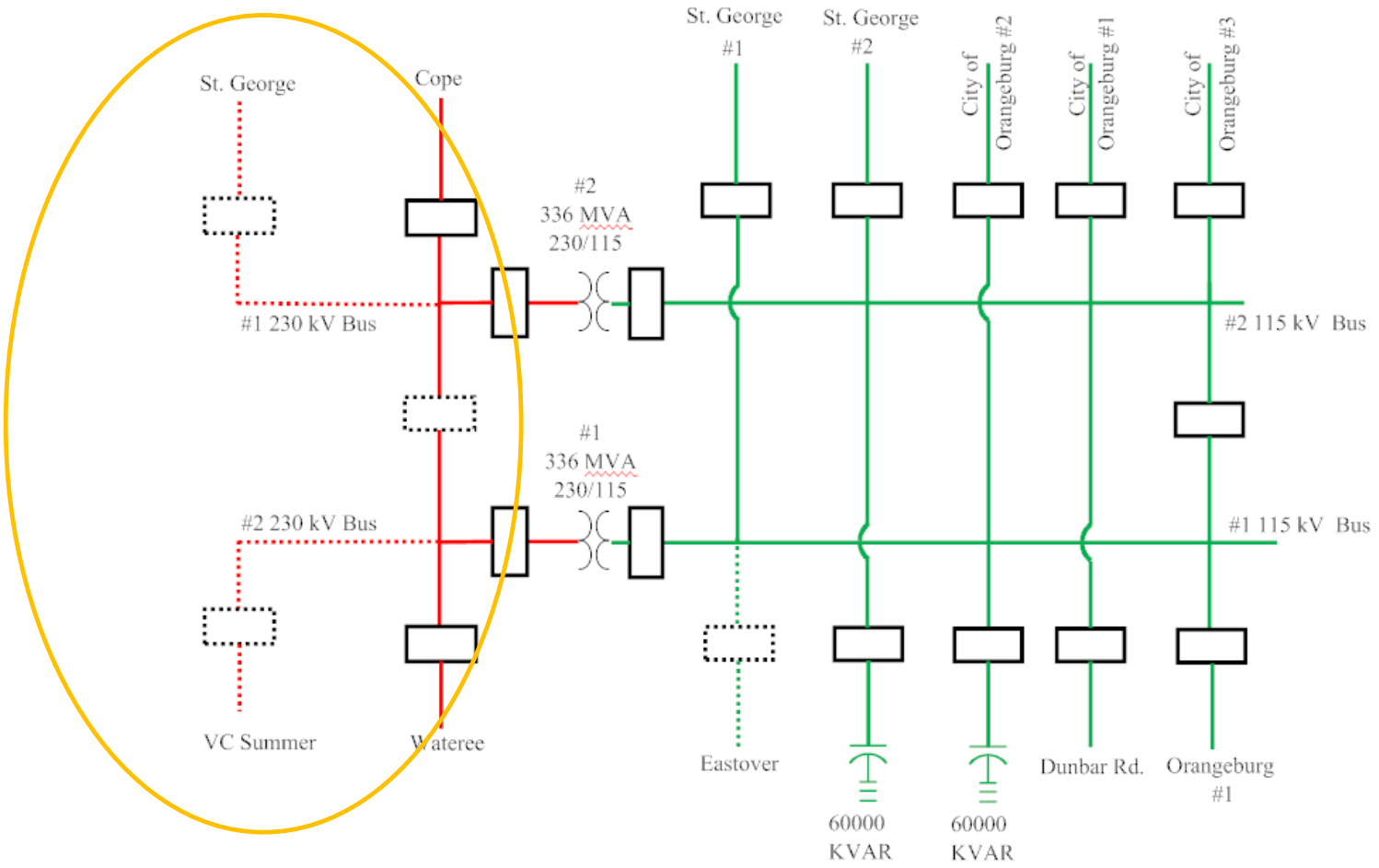
santee cooper



Orangeburg East 230/115 kV Substation
Present

SCE&G SM
A SCANA COMPANY

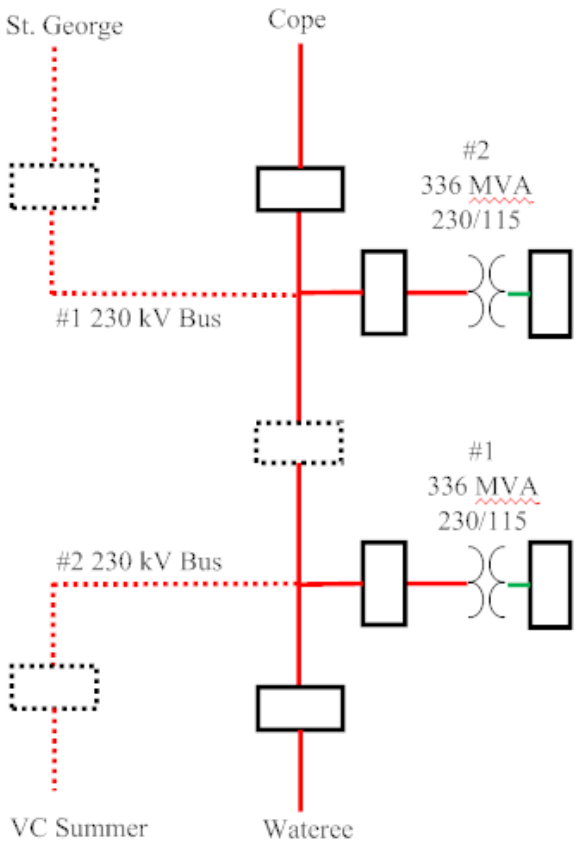
santee cooper



Orangeburg East 230/115 kV Substation
Future

SCE&G SM A SCANA COMPANY

santee cooper

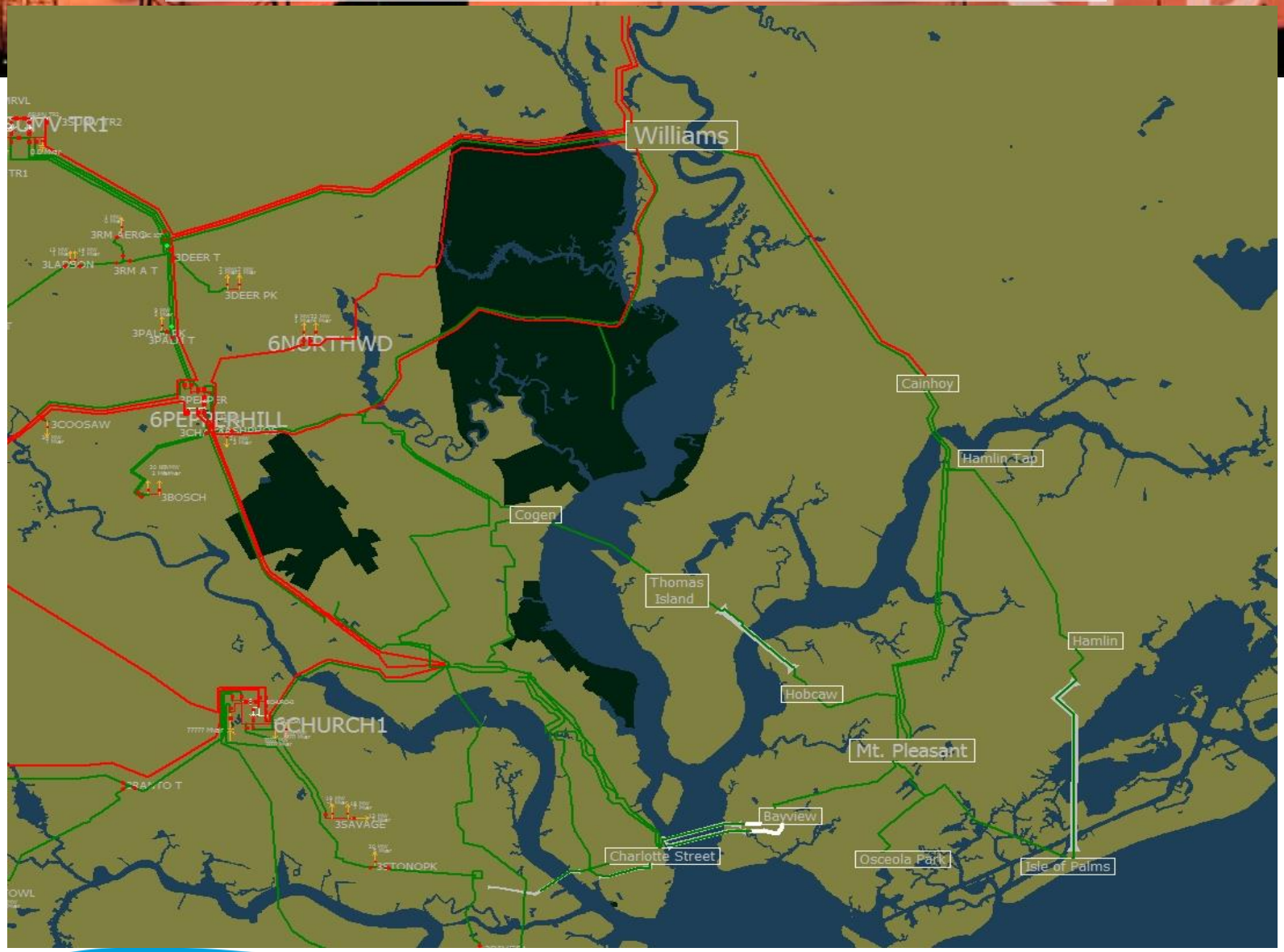


Orangeburg East 230/115 kV Substation
Future 230 kV Fold-In

SCE&G SM
A SCANA COMPANY

santee cooper

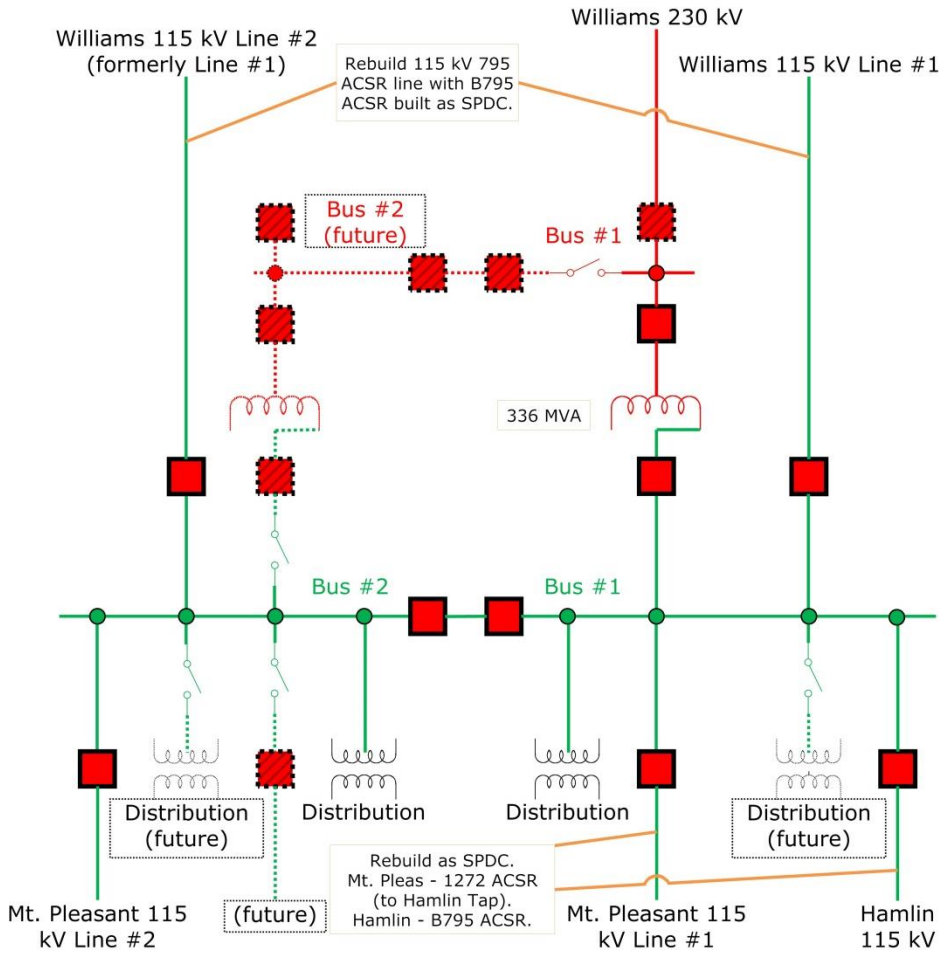
Cainhoy 230/115 kV Transmission



SCE&G SM A SCANA COMPANY

santee cooper

Cainhoy 230/115 kV Transmission



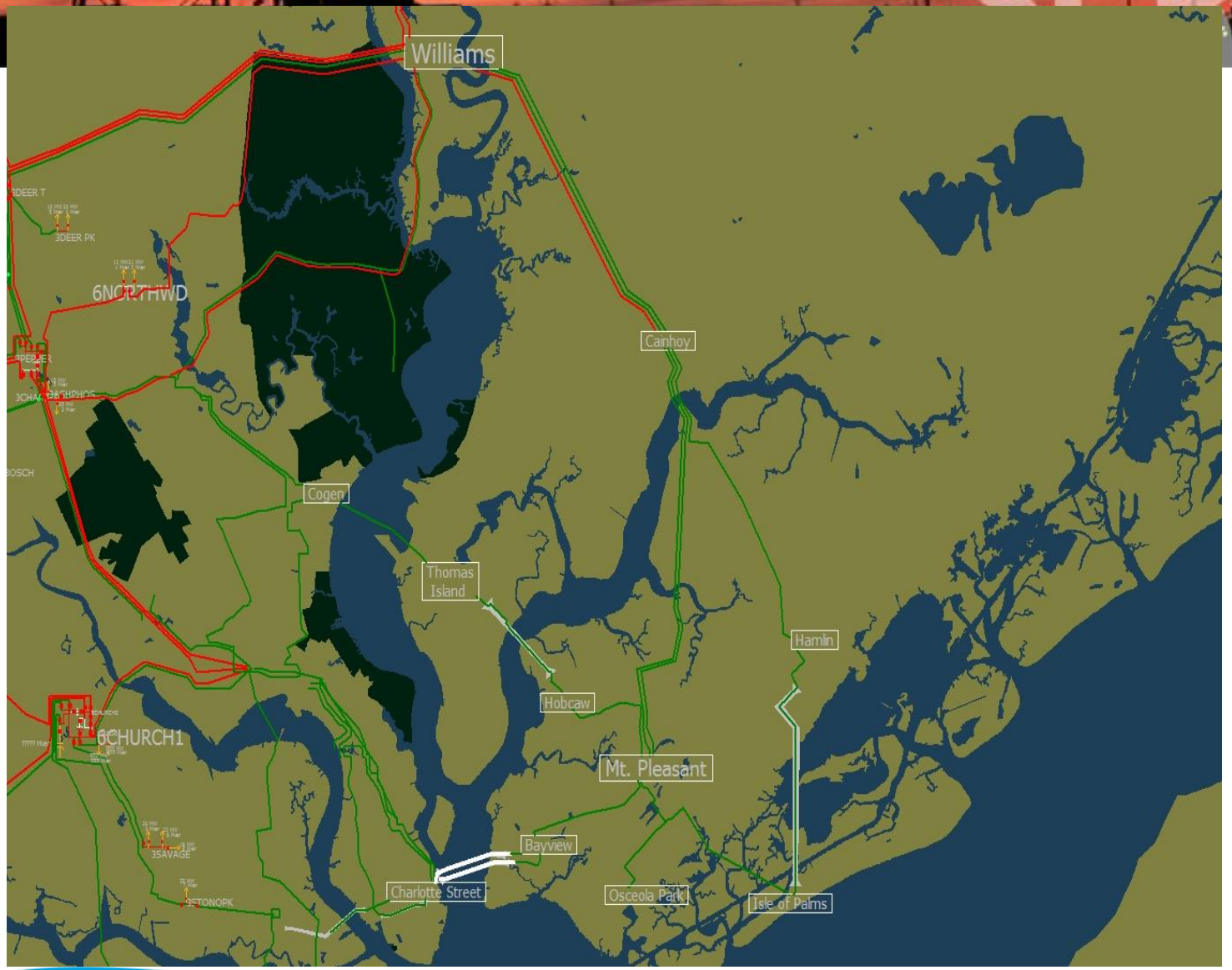
Phase II (Completed by December 2018)

- Rebuild Cainhoy – Hamlin 115 kV to SPDC
  - **Creates Cainhoy – Mt. Pleasant 115 kV partially 1272 ACSR & Cainhoy – Hamlin 115 kV B795 ACSR**
- Add 115 kV Hamlin terminal
- Rebuild Williams – Cainhoy 230 kV SPDC
  - **Creates Williams – Cainhoy 115 kV #1 &#2 B795 ACSR**
- Upgrade terminals at Williams to 2000A for Cainhoy 115 kV circuits

SCE&G SM A SCANA COMPANY

santee cooper

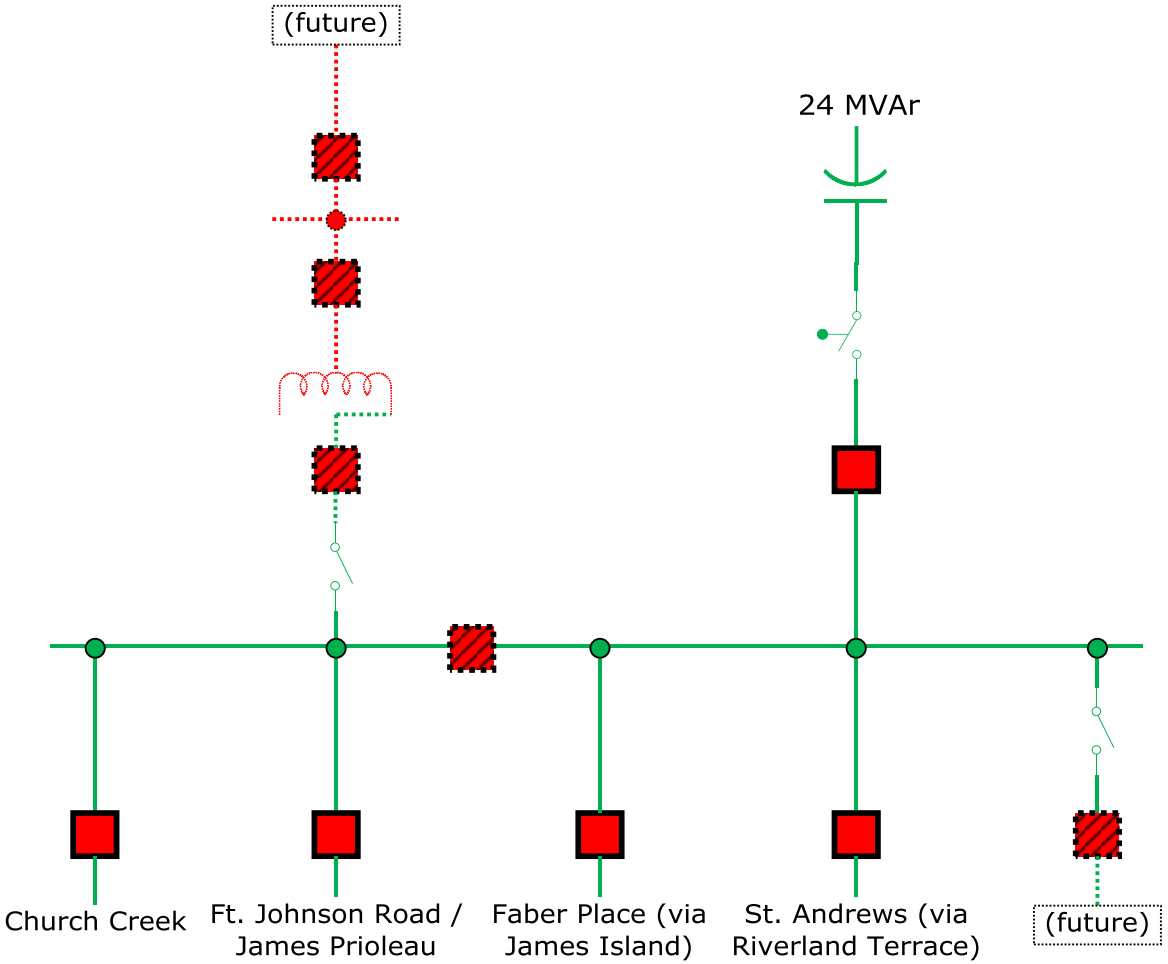
Cainhoy 230/115 kV Transmission



SCE&G SM
A SCANA COMPANY

santee cooper

Queensboro 115 kV SS

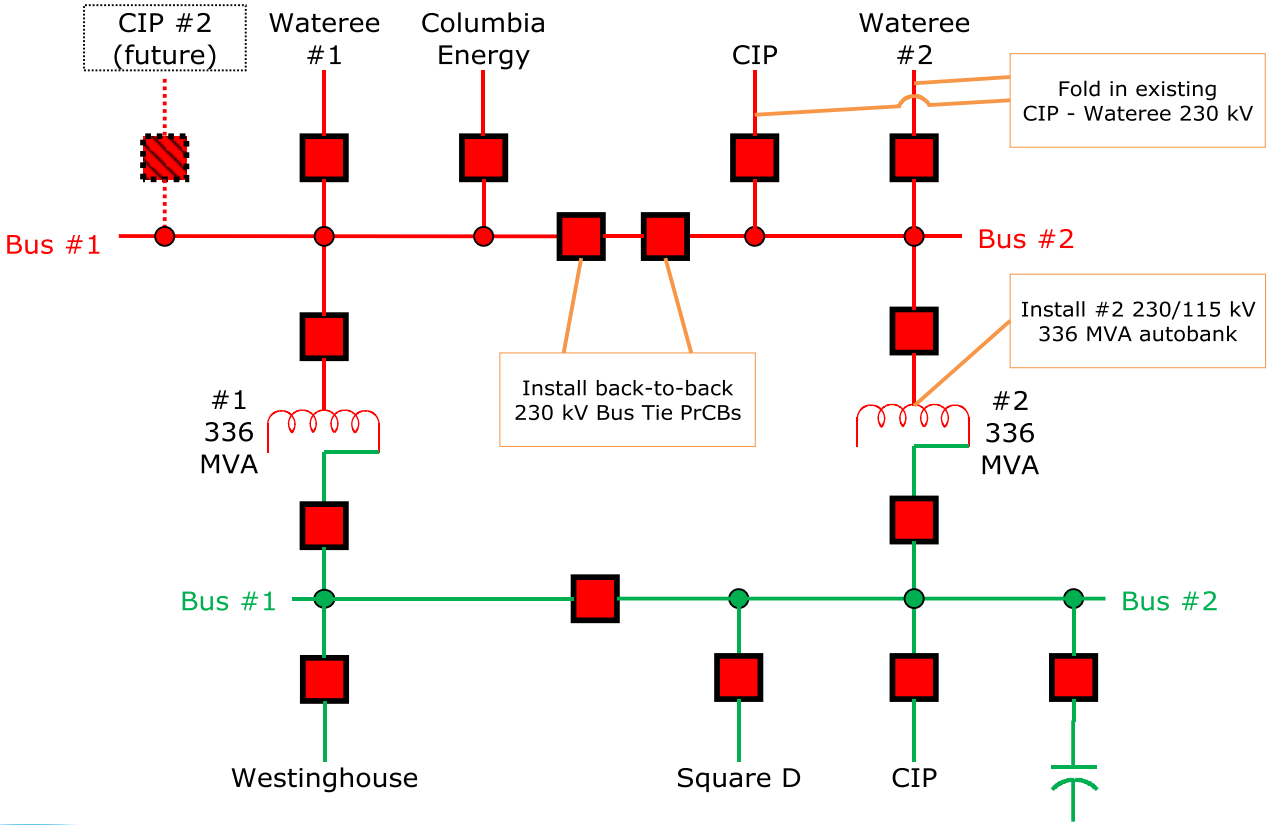


Future Projects

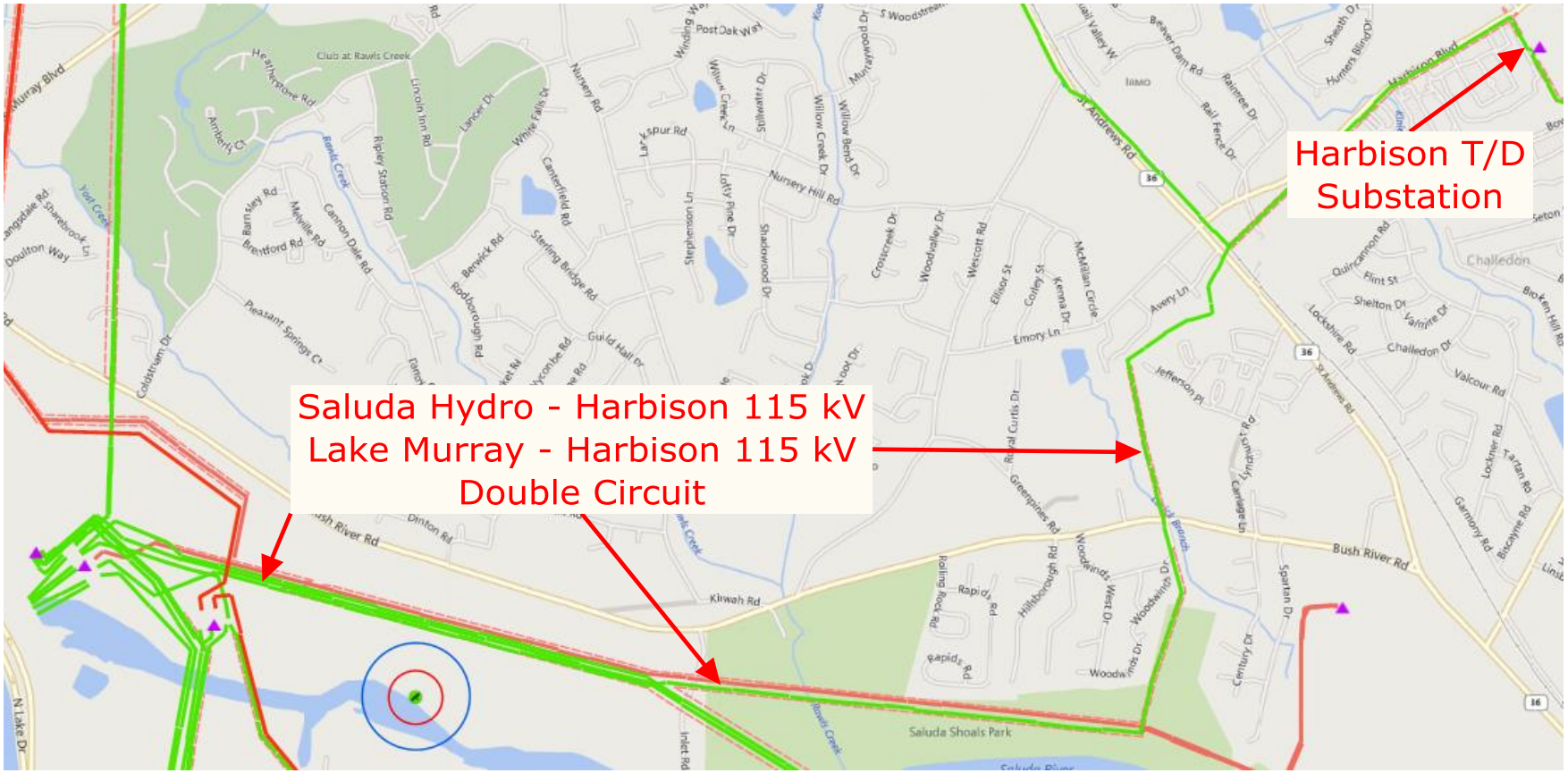
Fold Wateree – CIP 230 kV into Hopkins and Install 230/115 kV Transformer

- Fold in Wateree – CIP 230 kV
  - 0.48 miles
- Install necessary equipment for fold-in
- Install second 230/115 kV autotransformer
- Completion date May, 2018

Fold Wateree – CIP 230 kV into Hopkins and Install 230/115 kV Transformer



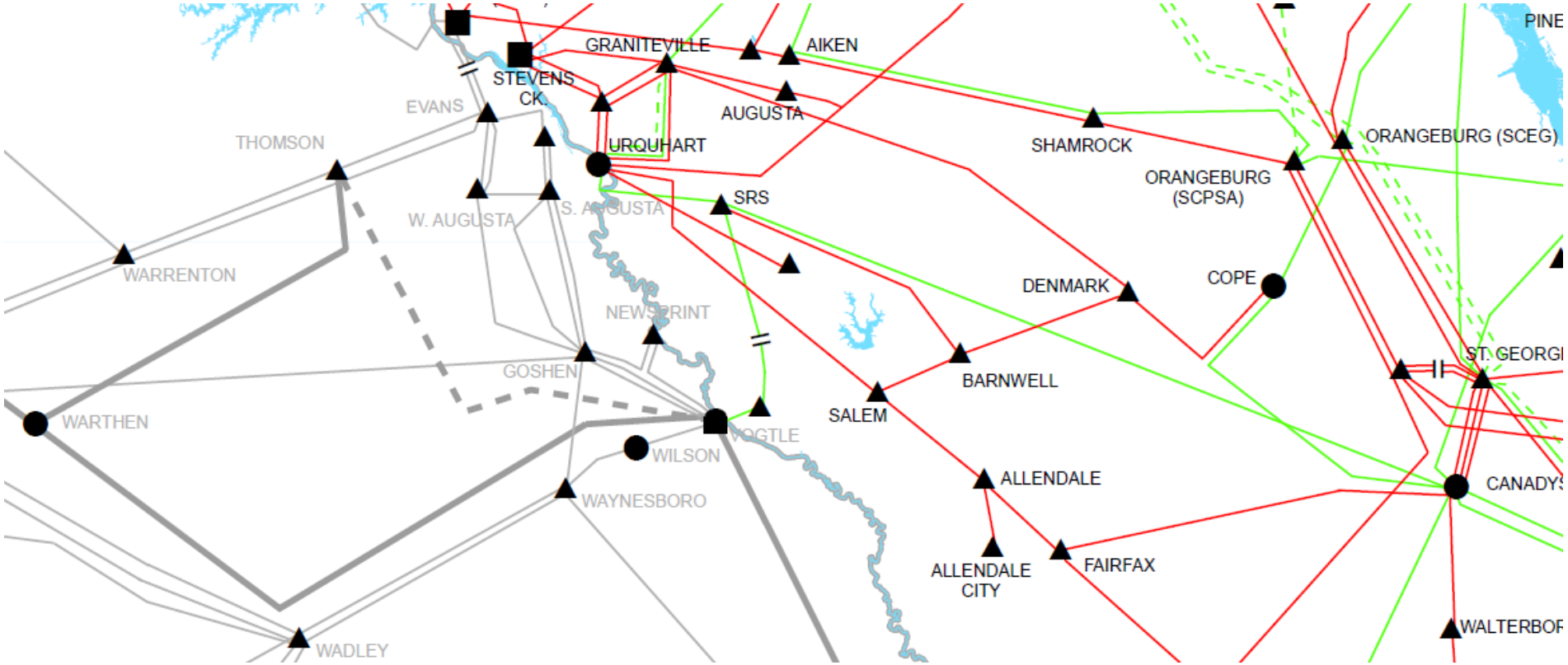
Saluda Hydro – Harbison 115 kV Rebuild as Double Circuit



SCE&G SM A SCANA COMPANY

santee cooper

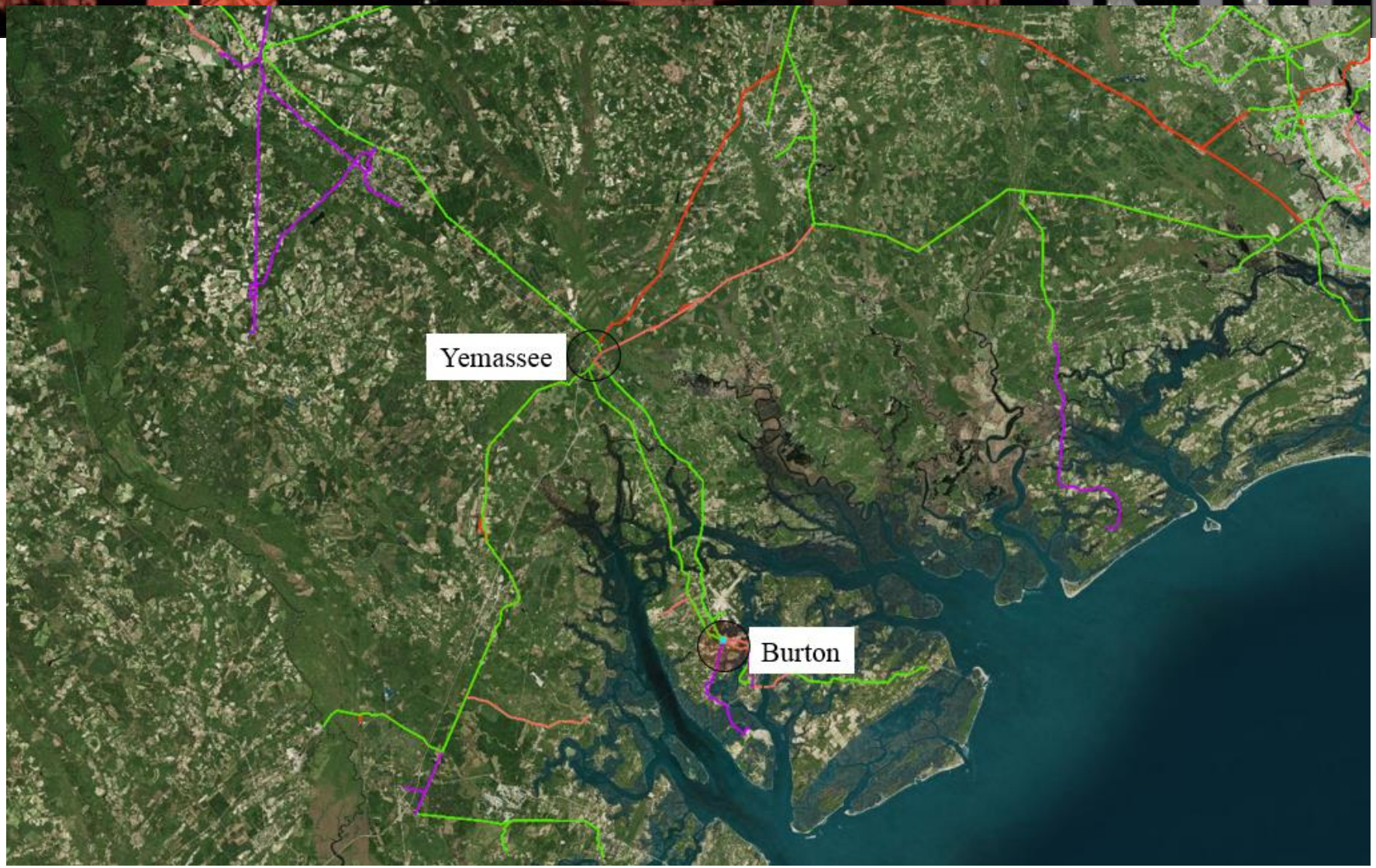
Fairfax – Salem SS 115 kV Reconductor



Burton – Yemassee 115 kV #2 Rebuild

- Remove existing H-Frame 477 ACSR 115 kV line, rebuild approximately 21 miles SPDC B795 ACSR
  - Burton – Yemassee 115 kV #2 upgraded
  - Burton – Yemassee 115 kV #3 created
- Upgrade/Add 115 kV terminals at Yemassee & Burton
- Project required to alleviate potential N-1-1 contingency overload that requires load shedding under peak conditions
  - Radial load shed only, does not have any adverse effects on BES
- Completion date delayed to June 2020 (Tentative)

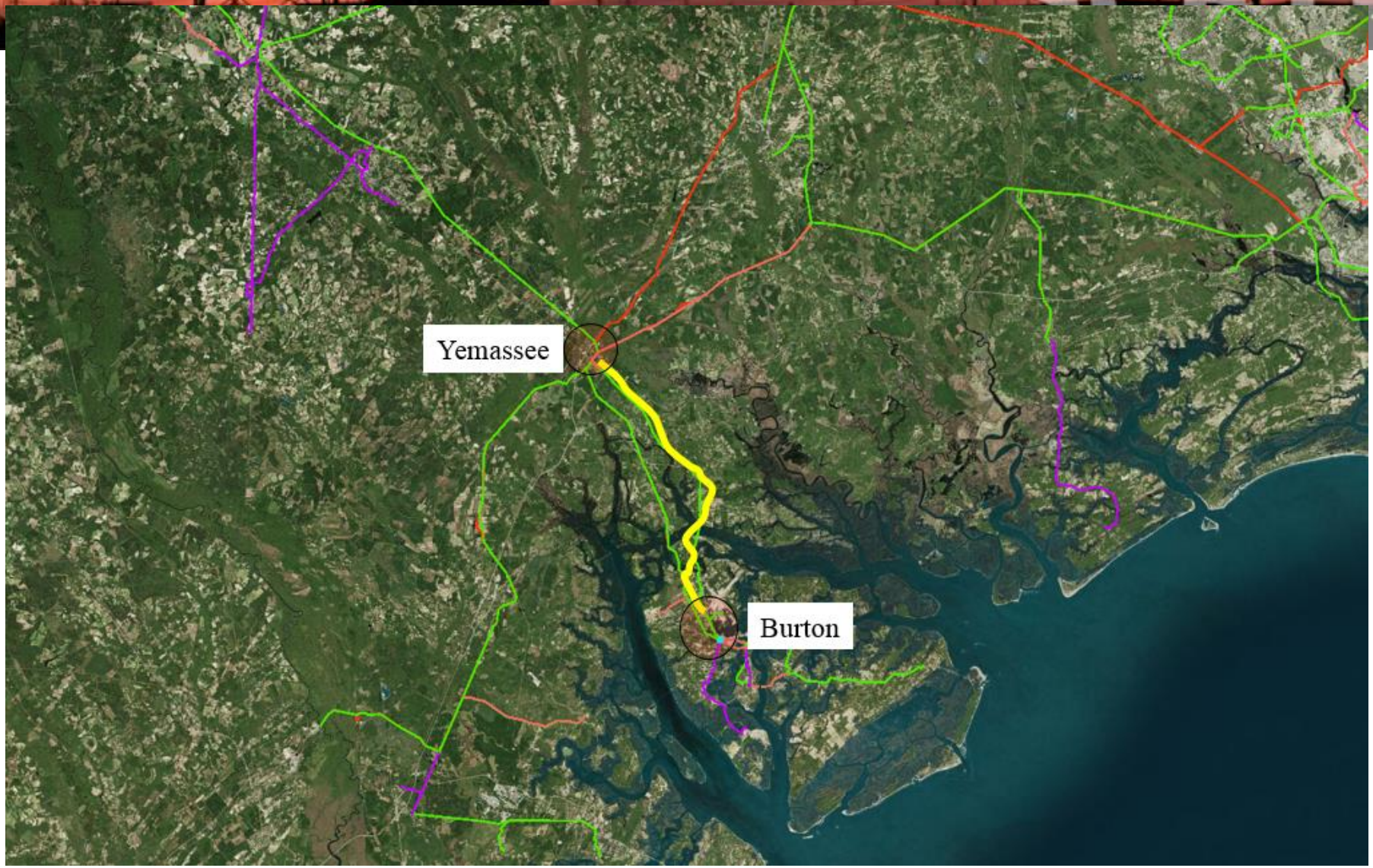
Burton – Yemassee 115 kV #2 Rebuild



SCE&G SM
A SCANA COMPANY

santee cooper

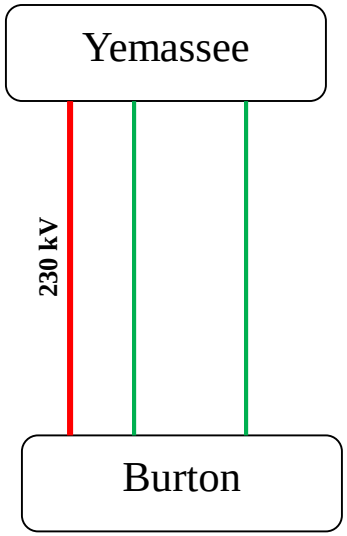
Burton – Yemassee 115 kV #2 Rebuild

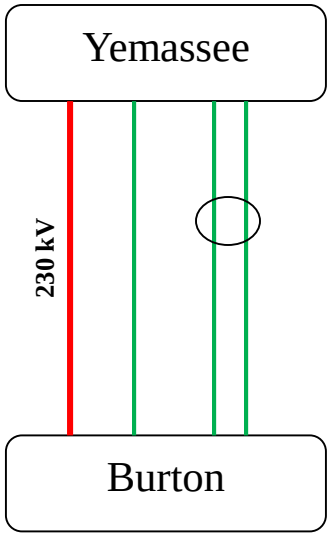


SCE&G SM
A SCANA COMPANY

santee cooper

Burton – Yemassee 115 kV #2 Rebuild





Current Configuration:
1-230 kV 1272 ACSR
2-115 kV 477 ACSR

Total Capacity: 500 MVA

Future Configuration:
1-230 kV 1272 ACSR
1-115 kV 477 ACSR
2-115 kV B795 ACSR

Total Capacity: 1,074 MVA

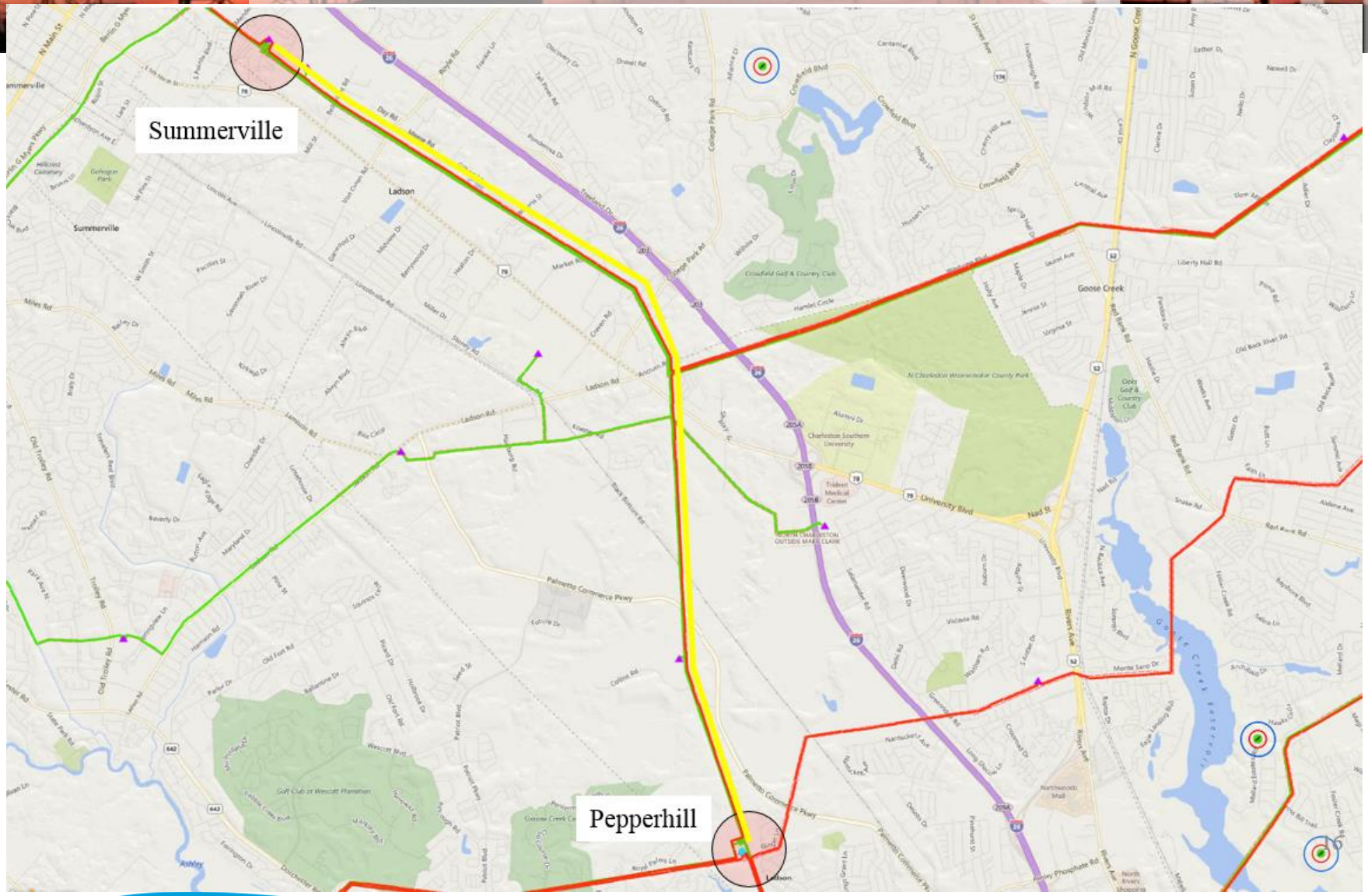
SCE&G A SCANA COMPANY

santee cooper

Pepperhill – Summerville 230 kV

- Rebuild existing portions of Williams – Canadys 230 kV and Williams – Summerville 230 kV lines SPDC between Pepperhill and Summerville, adding new Pepperhill – Summerville 230 kV B1272 ACSR line
- Project originated back in 2005. Various delays due to new construction
- Project now required to alleviate potential N-2 contingency overload associated with new transmission lines into Summerville
- Scheduled for completion by May 2022

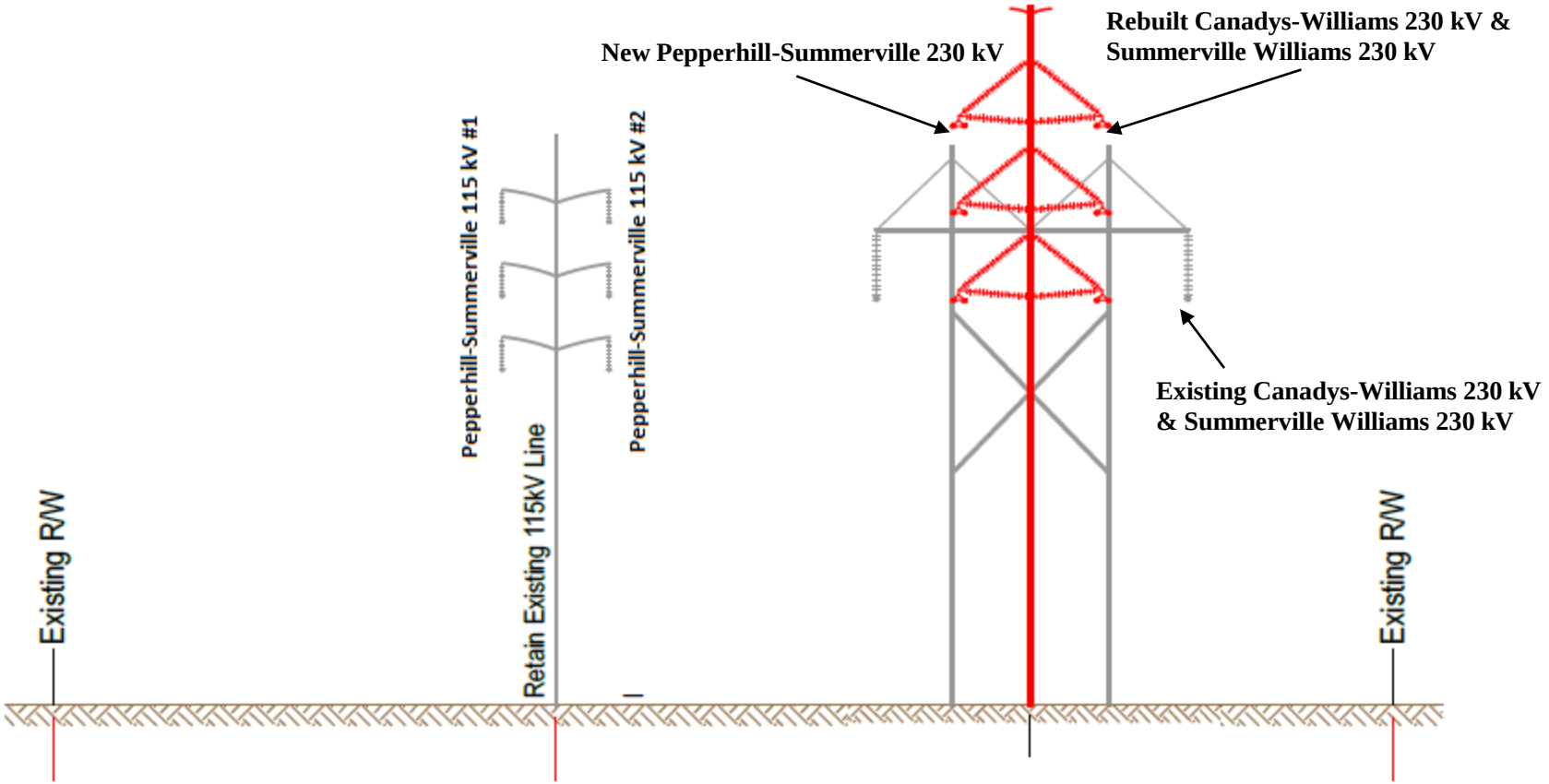
Pepperhill – Summerville 230 kV



SCE&G SM
A SCANA COMPANY

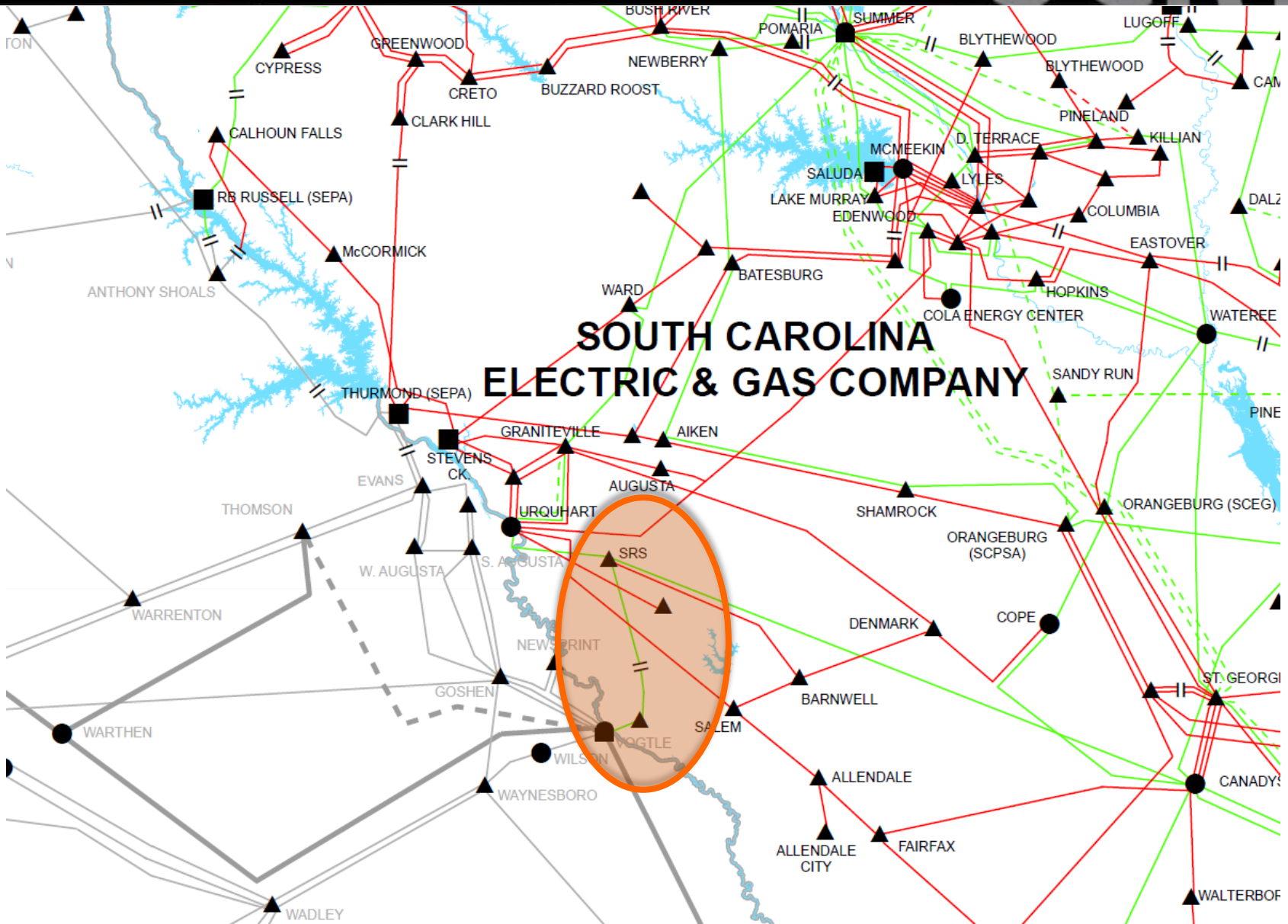
santee cooper

Pepperhill – Summerville 230 kV



EXISTING R / W CORRIDOR

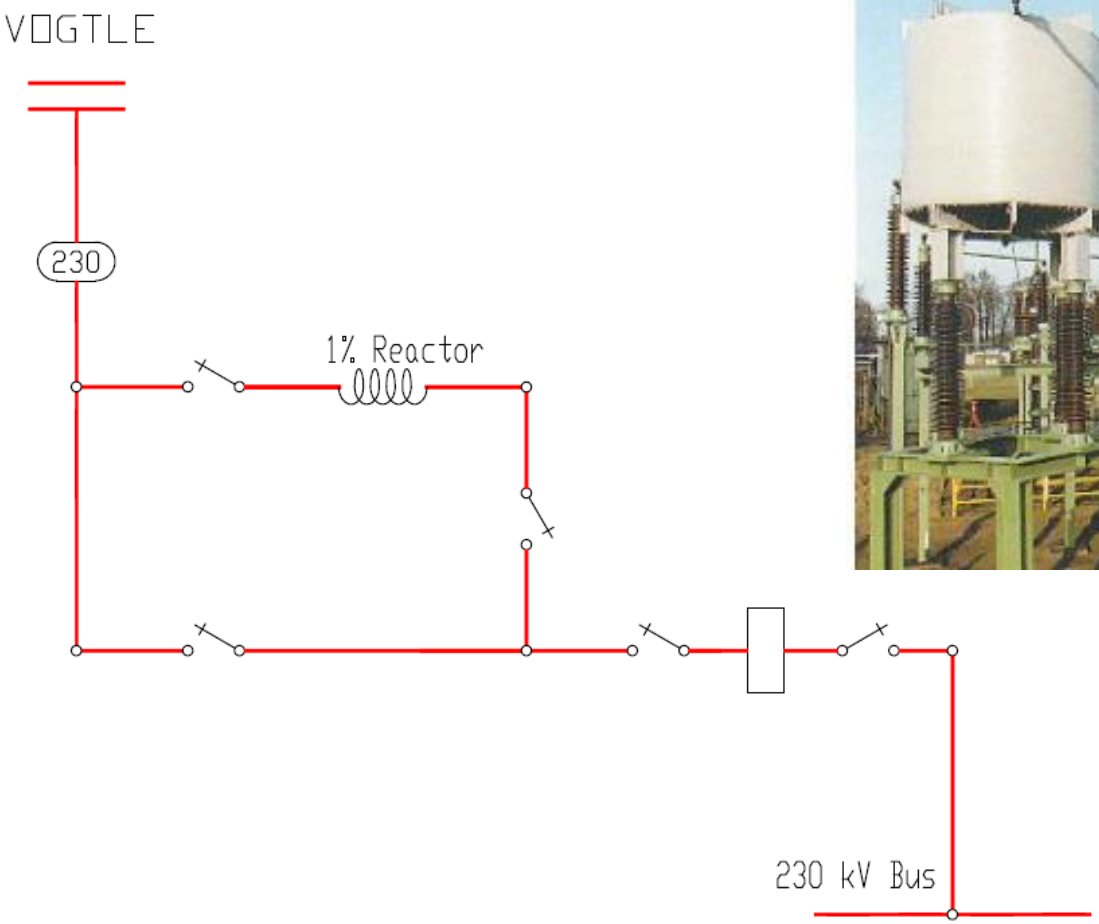
SRS – Vogtle 230 kV Series Reactor Install

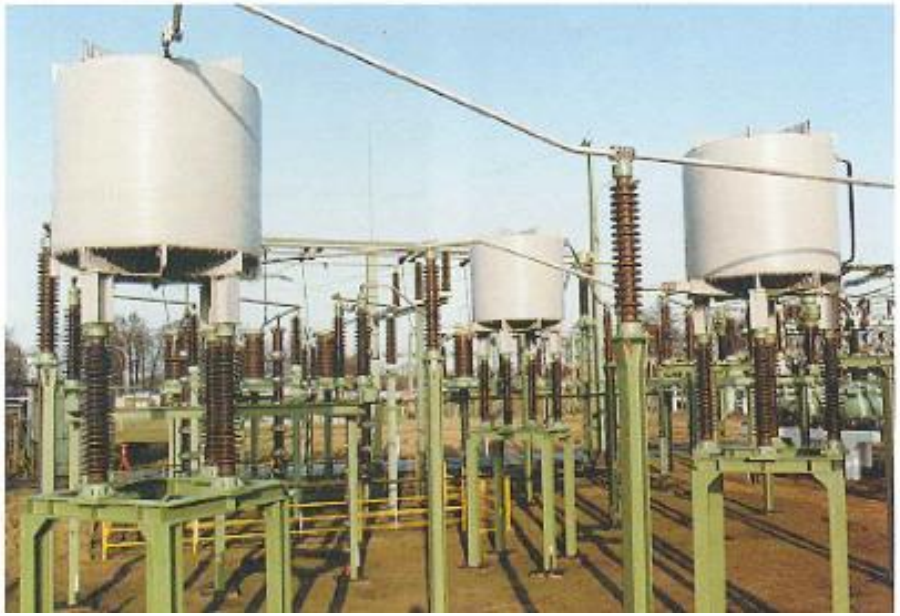


SRS – Vogtle 230 kV Series Reactor Install

- Phase I of Joint Study Results Assessment agreed upon between SCE&G and Southern Company.
- Install 1% Series Reactor at SRS end of SRS – Vogtle 230 kV (SCE&G/SOCO) Tie
- Required to alleviate high loading due to market flows and loop flows, and/or potential overloading due to certain contingencies
- Long lead times associated with the specific design, engineering, and construction of reactors. Scheduled to be in service by early 2018

SRS – Vogtle 230 kV Series Reactor Install

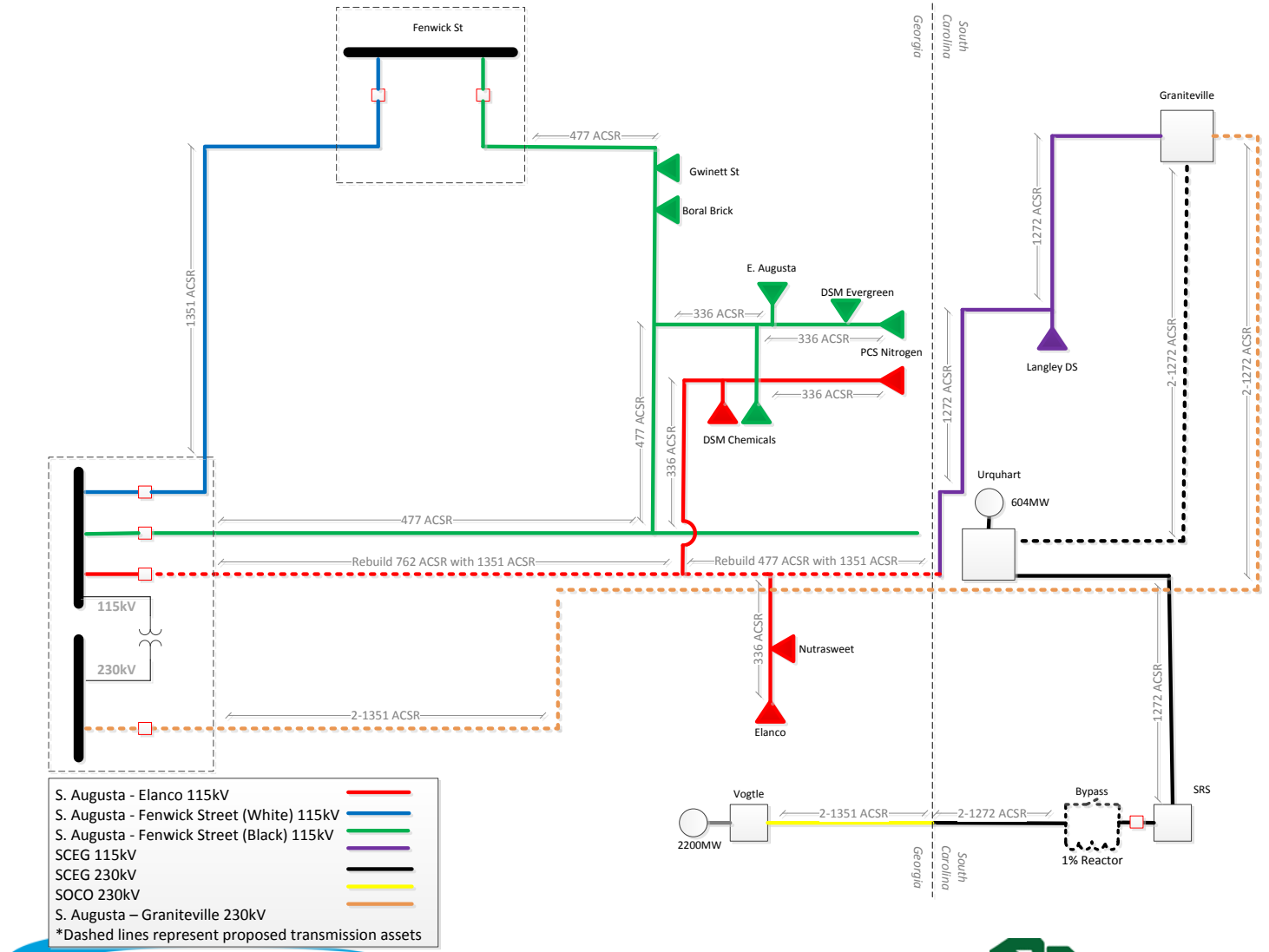




South Augusta – Graniteville 230 & 115 kV Tie Lines

- Phase II of Joint Study Results Assessment agreed upon between SCE&G and Southern Company
- Construct a 230 & 115 kV double circuit line from SOCO South Augusta substation to SCE&G Graniteville substation
  - Rebuild current Urquhart – Graniteville 115 kV line to SPDC B1272 ACSR 230 kV lines
  - Creates Graniteville – South Augusta 230 kV Tie & Urquhart – Graniteville #2 230 kV
  - Existing Urquhart – Graniteville #2 230 kV line will be converted to 115 kV and become Graniteville – South Augusta 115 kV Tie (1272 ACSR)
- Mitigates high loading and/or potential overloading seen in future cases on the SRS – Vogtle 230 kV line by increasing the transfer capability on the SCE&G and SOCO interface
- Replaces project "Urquhart – Graniteville 230 kV #2 Line Construct" previously in queue for SCE&G

South Augusta – Graniteville 230 & 115 kV Tie Lines



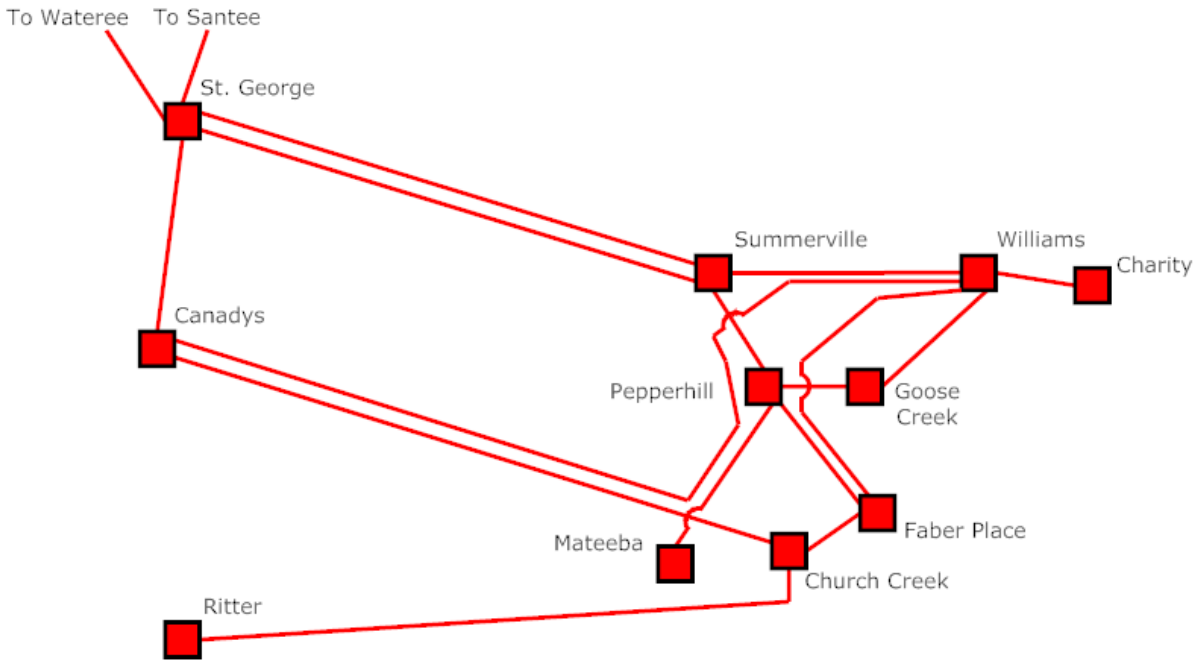
SCE&G SM
A SCANA COMPANY

santee cooper

Canadys – Ritter 115 kV Rebuild as SPDC 230/115 kV

- Project required to alleviate several potential NERC TPL-001-4 contingencies that will cause the loading/overload of transmission system facilities in SCE&G's southern region
- Two phase project:
  1. Fold the Williams – Canadys 230 kV line into Pepperhill (2020)
  2. Rebuild approximately 18-mile Canadys – Ritter 115 kV line as SPDC with Canadys – Ritter 230 kV B1272 ACSR and Canadys – Ritter 115 kV 1272 ACSR (2022)

Canadys – Ritter 115 kV Rebuild as SPDC 230/115 kV



Charleston Region 230 kV Transmission
(>2017, <2020)

SCE&G SM
A SCANA COMPANY

santee cooper

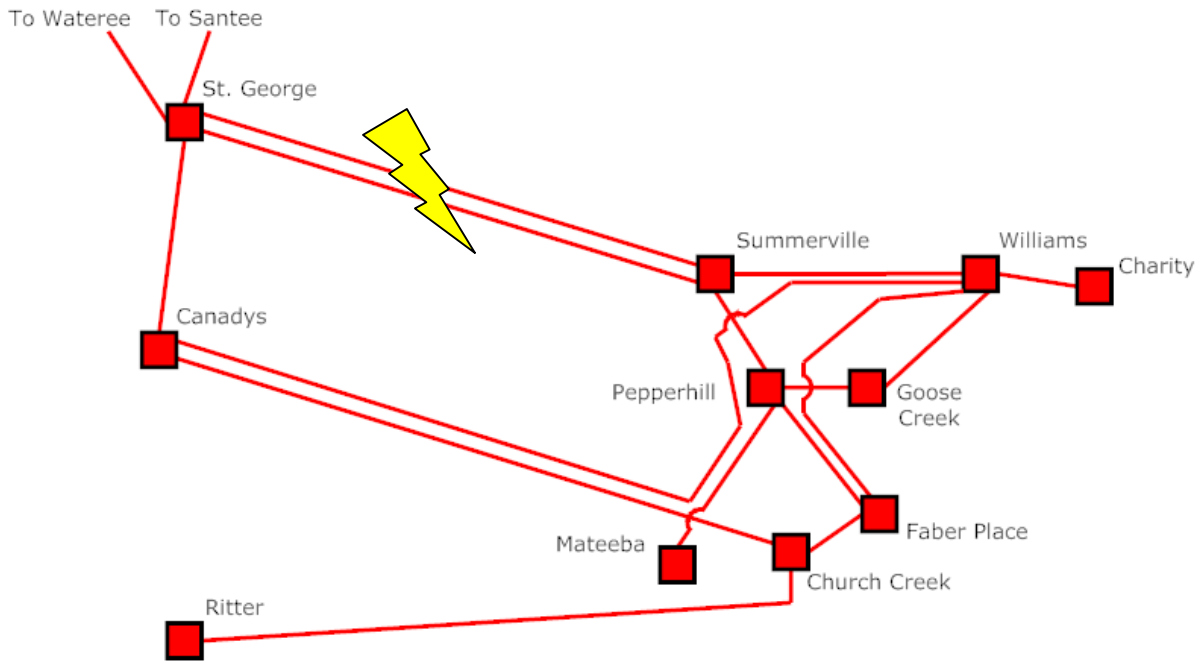
Canadys – Ritter 115 kV Rebuild as SPDC 230/115 kV

Year/Season	Contingency	Monitored Element	Flow (Rating)
2019S	**C5:** St. George – Summerville 230 kV #1 and St. George – Summerville 230 kV #2 SPDC	Canadys – Church Creek 230 kV	94% (376.3 MVA)
2019S	**C3:** Pepperhill – Summerville 230 kV and Summerville 230/115 kV Transformer 1/2	Summerville 230/115 kV Transformer 2/1	94% (336 MVA)
2019S	**C3:** Church Creek – Faber Place 230 kV and Church Creek 230/115 kV Transformer 1/2	Church Creek 230/115 kV Transformer 2/1	95% (336 MVA)
2020S	**C5:** St. George – Summerville 230 kV #1 and St. George – Summerville 230 kV #2 (SPDC)	Canadys – Church Creek 230 kV	103% (376.3 MVA)
2020S	**C3:** Pepperhill – Summerville 230 kV and Summerville 230/115 kV Transformer 1/2	Summerville 230/115 kV Transformer 2/1	99% (336 MVA)
2020S	**C3:** Church Creek – Faber Place 230 kV and Church Creek 230/115 kV Transformer 1/2	Church Creek 230/115 kV Transformer 2/1	100% (336 MVA)

SCE&G SM
A SCANA COMPANY

santee cooper

Canadys – Ritter 115 kV Rebuild as SPDC 230/115 kV

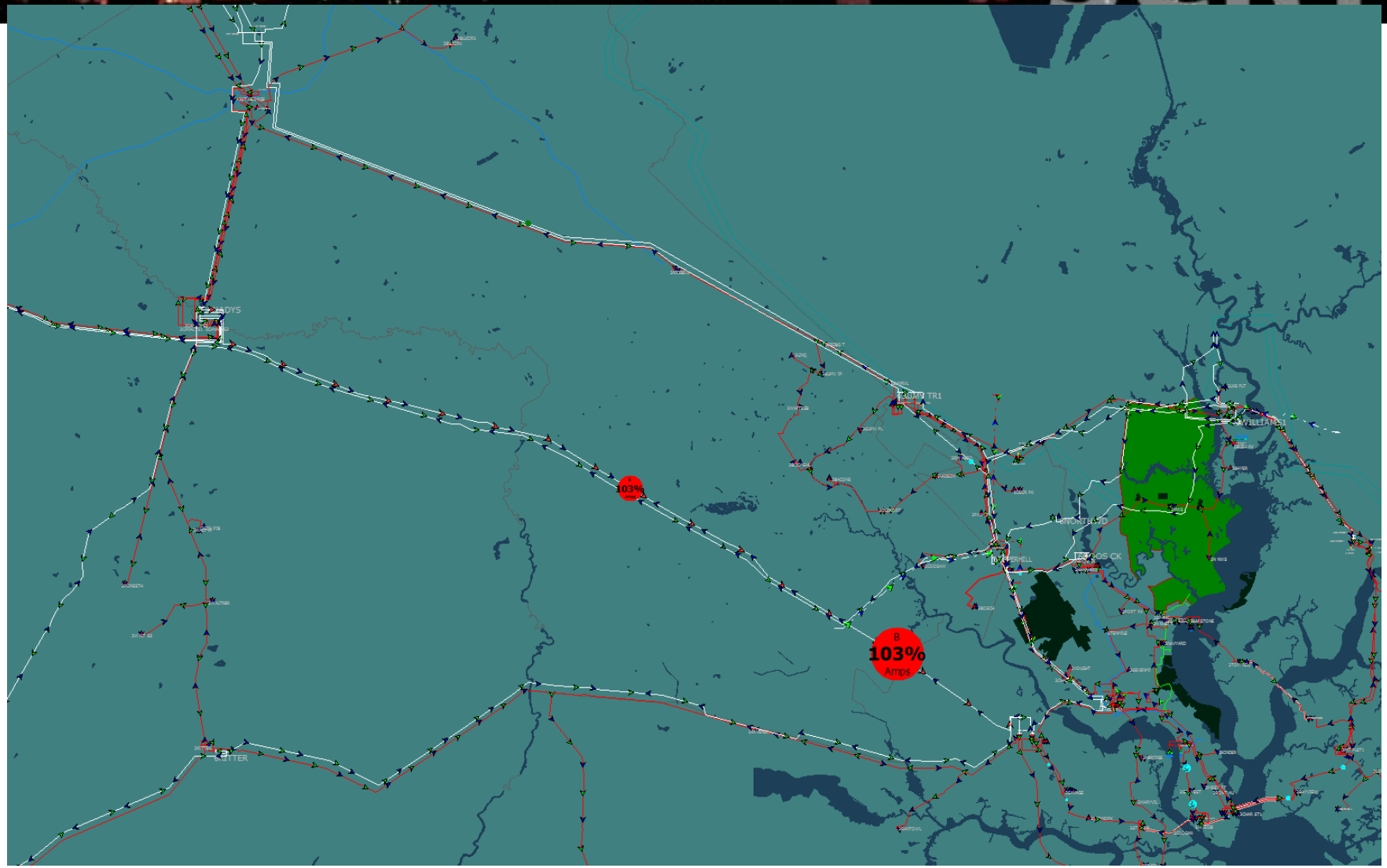


Loss of Common Structure - St. George – Summerville 230 kV #1&2

SCE&G SM A SCANA COMPANY

santee cooper

Canadys – Ritter 115 kV Rebuild as SPDC 230/115 kV

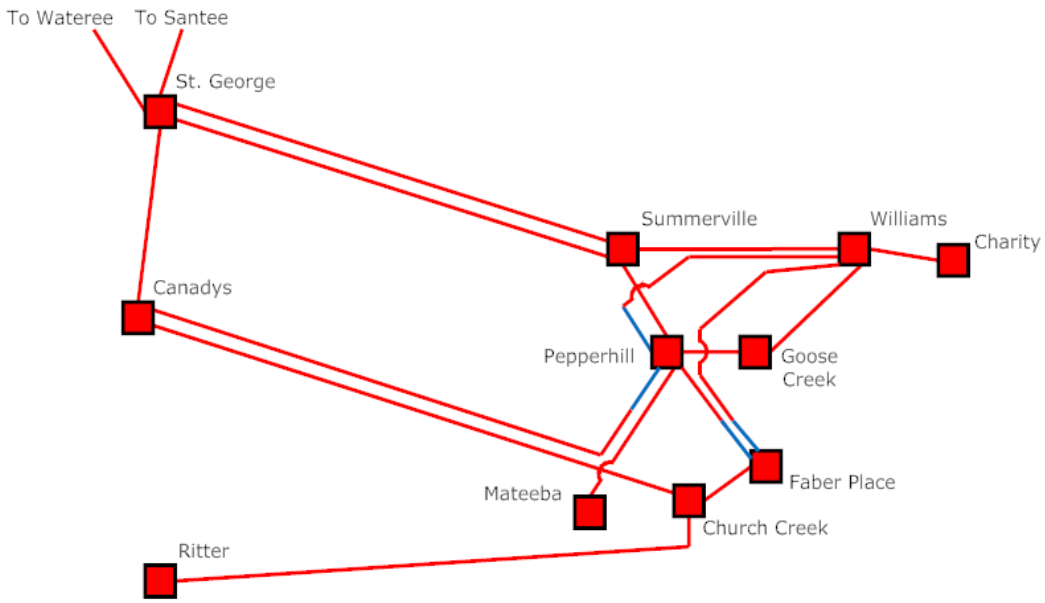


SCE&G SM
A SCANA COMPANY

santee cooper

Canadys – Ritter 115 kV Rebuild as SPDC 230/115 kV

Phase I: Fold Williams – Canadys 230 kV line into Pepperhill



Charleston Region 230 kV Transmission (>2019, <2022)

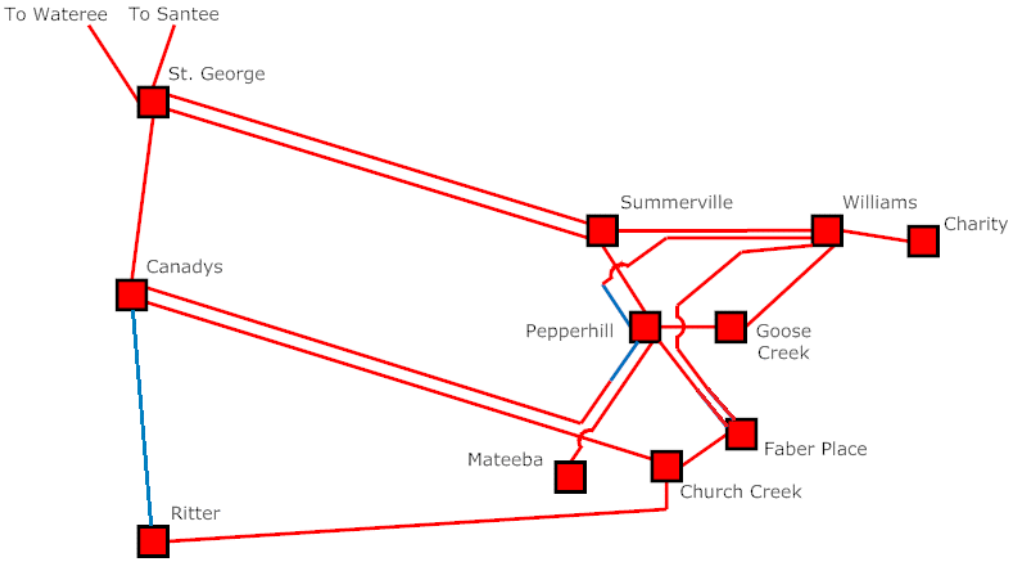
- Causes flow to be more evenly split from Canadys to Church Creek and Williams
- Breaks 49 mile line into two segments of 30 miles and 19 miles
- Allows for 2 year delay of Canadys – Ritter 230 kV construction

SCE&G SM A SCANA COMPANY

santee cooper

Canadys – Ritter 115 kV Rebuild as SPDC 230/115 kV

Phase II: Rebuild Canadys – Ritter 115 kV to SPDC 230/115 kV



Charleston Region 230 kV Transmission (>2021)

Contingency	Monitored Element	Pre-Flow (Rating)	Post-Flow (Rating)
C5: St. George – Summerville 230 kV #1 and St. George – Summerville 230 kV #2 SPDC	Canadys – Church Creek 230 kV	103% (376.3 MVA)	91% (376.3 MVA)
C3: Pepperhill – Summerville 230 kV and Summerville 230/115 kV Transformer 1/2	Summerville 230/115 kV Transformer 2/1	99% (336 MVA)	92% (336 MVA)
C3: Church Creek – Faber Place 230 kV and Church Creek 230/115 kV Transformer 1/2	Church Creek 230/115 kV Transformer 2/1	100% (336 MVA)	107% (336 MVA)

Questions?

Proposed Transmission Expansion Plan

Santee Cooper

Weijian Cong

Transmission Network

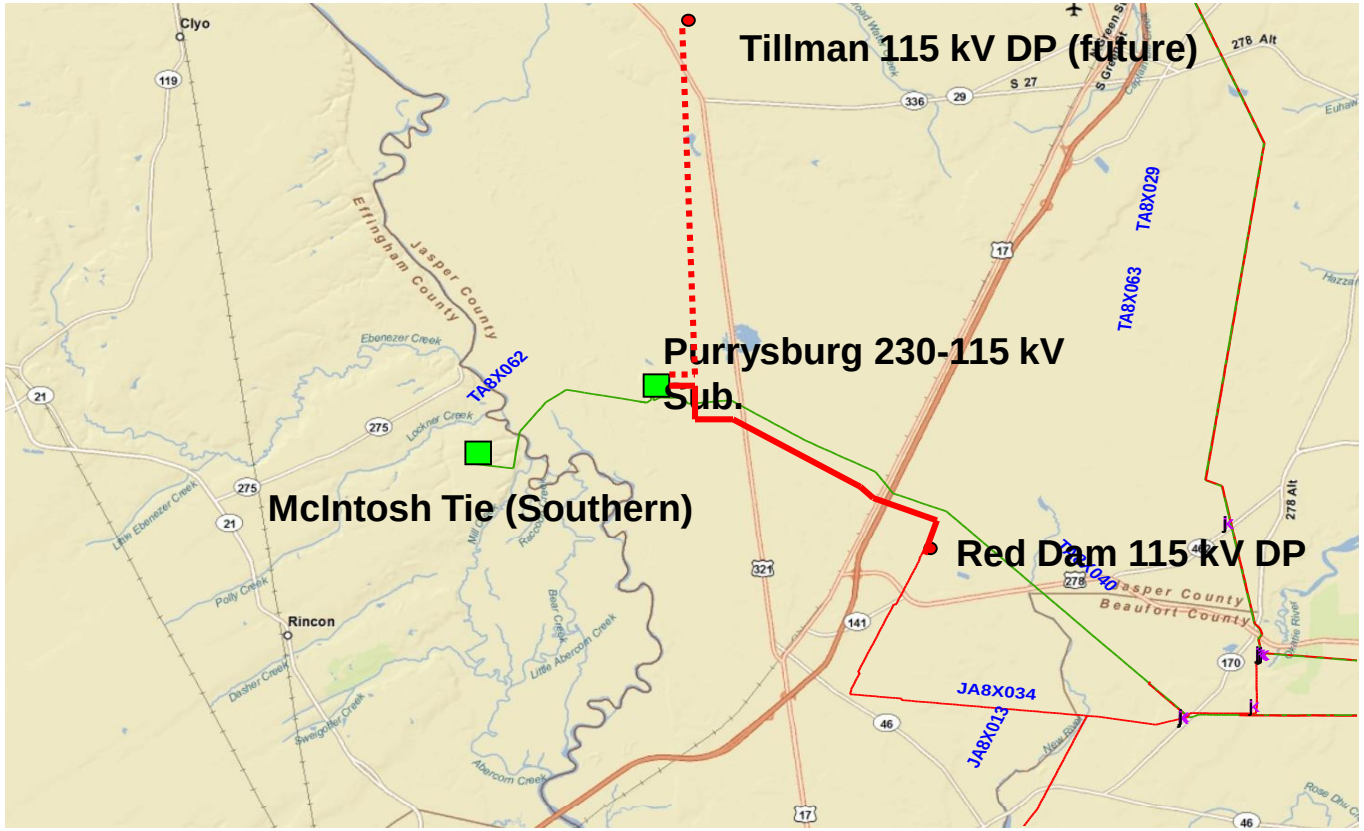
Completed Projects

• Purrysburg 230-115 kV sub & Purrysburg-Red Dam 115 kV	07/2017
• Richburg-Flat Creek 230 kV Line	12/2017
• Harleys Bridge 115-69 kV Substation	12/2017
• Carnes Crossroads-Harleys Bridge 115 kV Line Phase I	12/2017

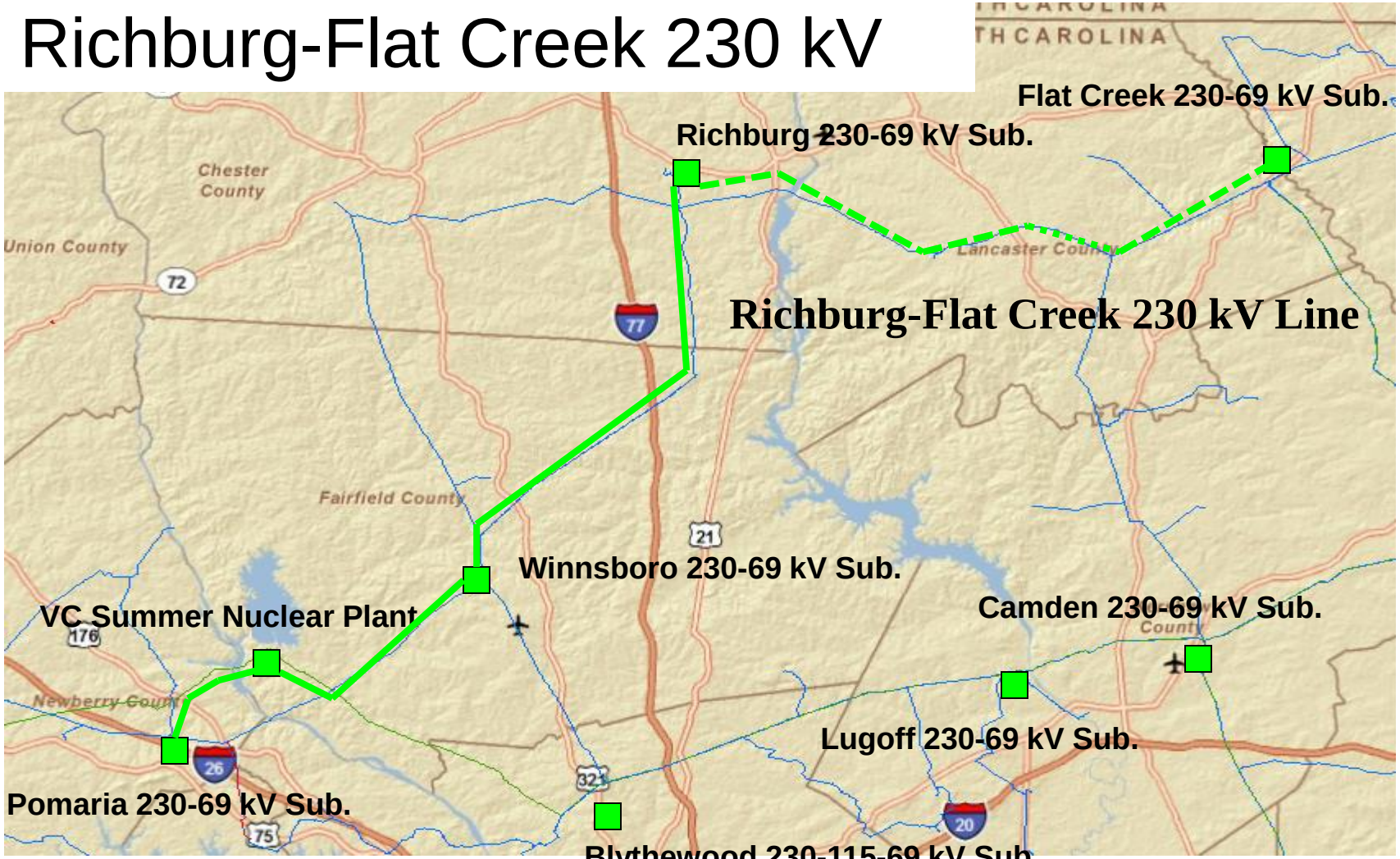
SCE&G SM
A SCANA COMPANY

santee cooper

Purrysburg-Red Dam (Bluffton) 115 kV



Richburg-Flat Creek 230 kV



SCE&G SM
A SCANA COMPANY

santee cooper

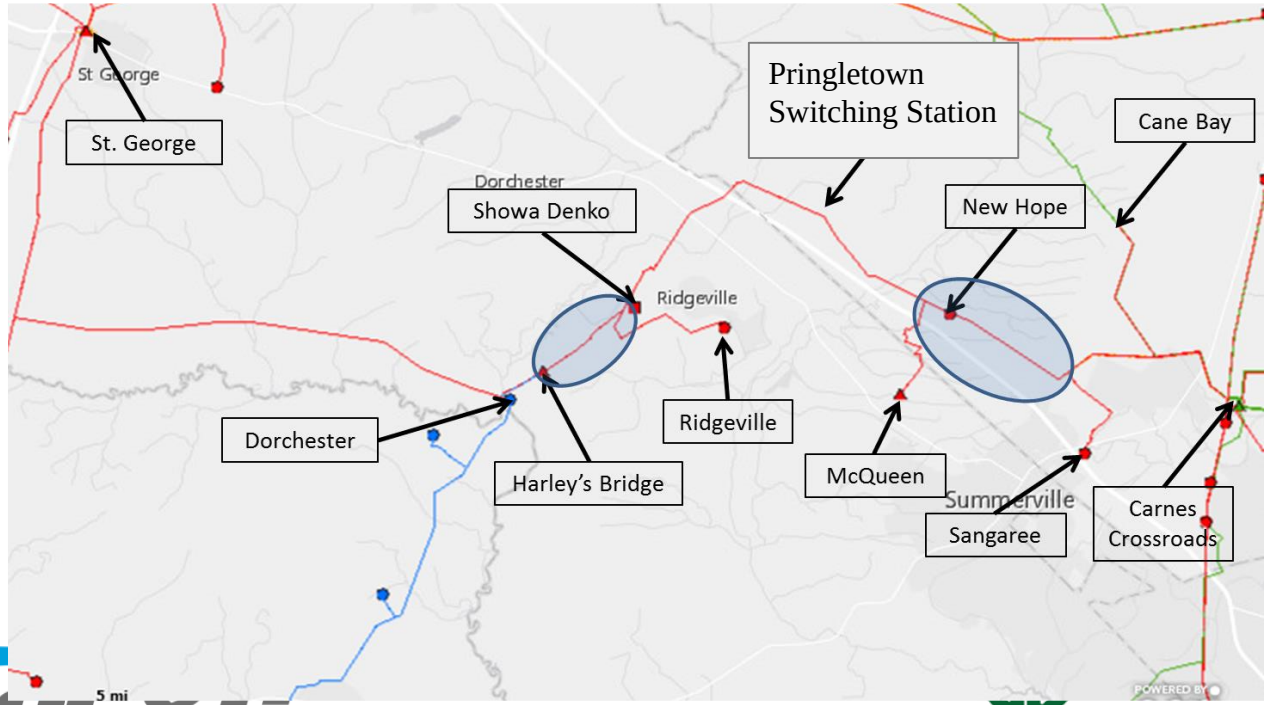
Richburg-Flat Creek 230 kV Line

- Approx. 32 miles of 230 kV line
- At Flat Creek 230-69 kV Substation:
  - Add a new 230 kV Bay
  - Add a 230 kV bus tie breaker
- Completion of this project would loop the 230 kV network that will connect V.C. Summer to existing 230 kV line at Flat Creek via Winnsboro and Richburg

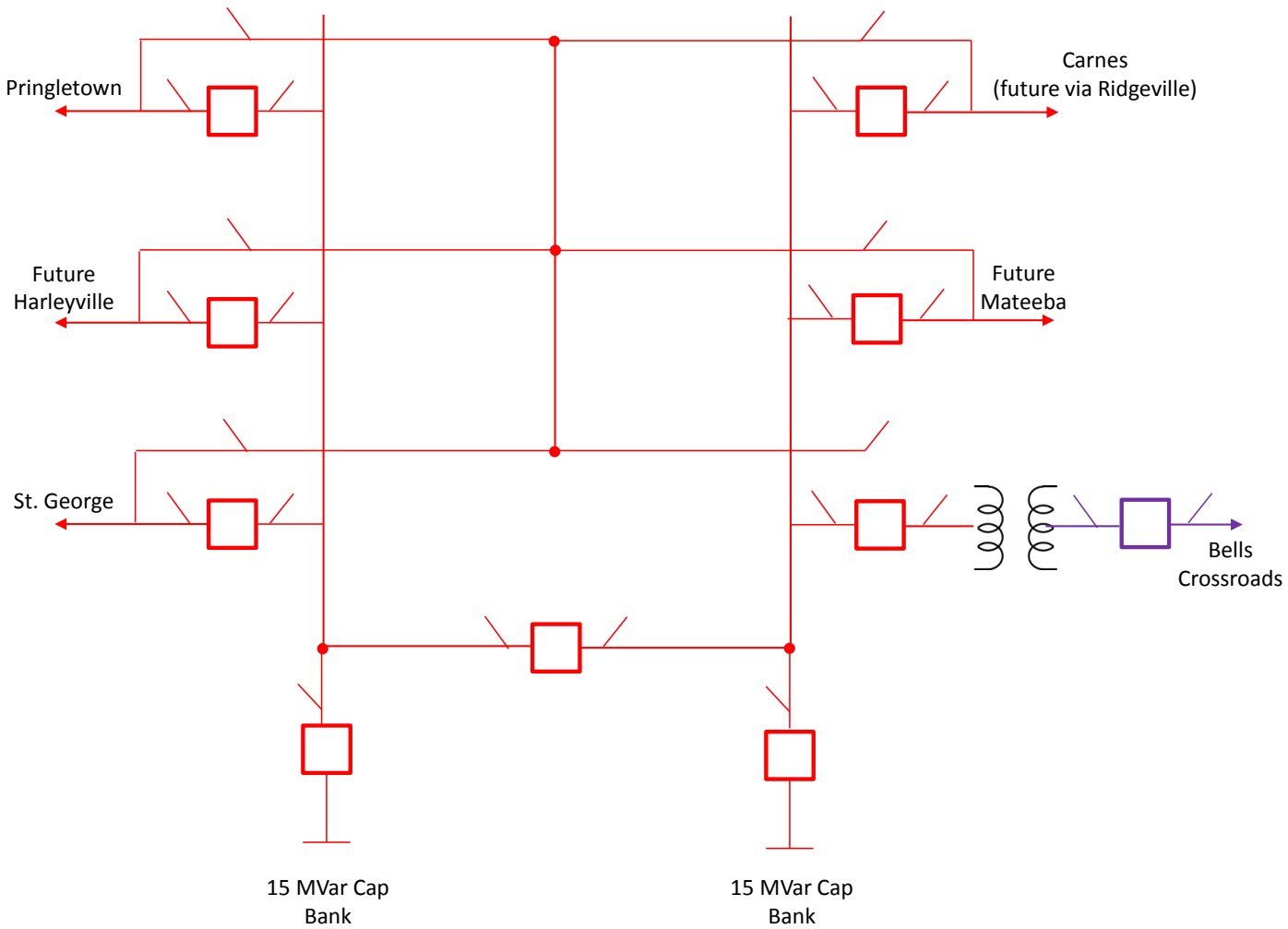
New Harleys Bridge 115-69 kV sub

Carnes-Harleys Bridge 115 kV line phase I

- Fold-in of St. George-Carnes 115 kV line
- Carnes-Harleys Bridge 115 kV line via Ridgeville-McQueen phase I



NEW HARLEYS BRIDGE 115-69 kV SUBSTATION



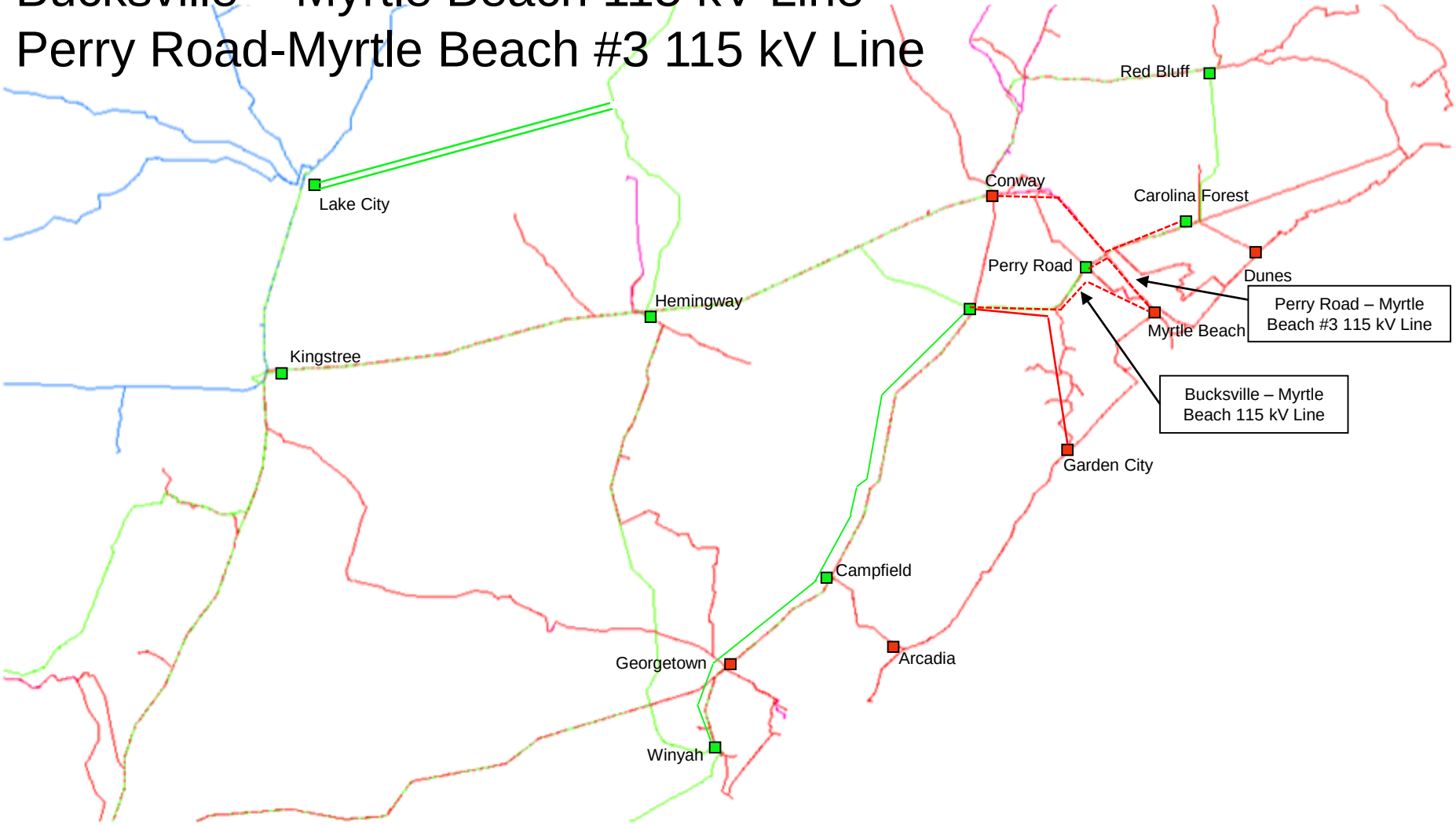
SCE&G SM
A SCANA COMPANY

santee cooper

Transmission Network Active Projects

Bucksville-Myrtle Beach 115 kV Line	05/01/2018
Perry Road-Myrtle Beach #3 115 kV Line	12/31/2018
Pine Level-Allen #2 115 kV Line	04/23/2019
Sandy Run 230-115 kV Substation	12/15/2019
Add Bucksville 230-115 kV Transformer #2	12/31/2019
Pomaria-Orangeburg 230 kV Line	12/15/2020

Bucksville – Myrtle Beach 115 kV Line
Perry Road-Myrtle Beach #3 115 kV Line



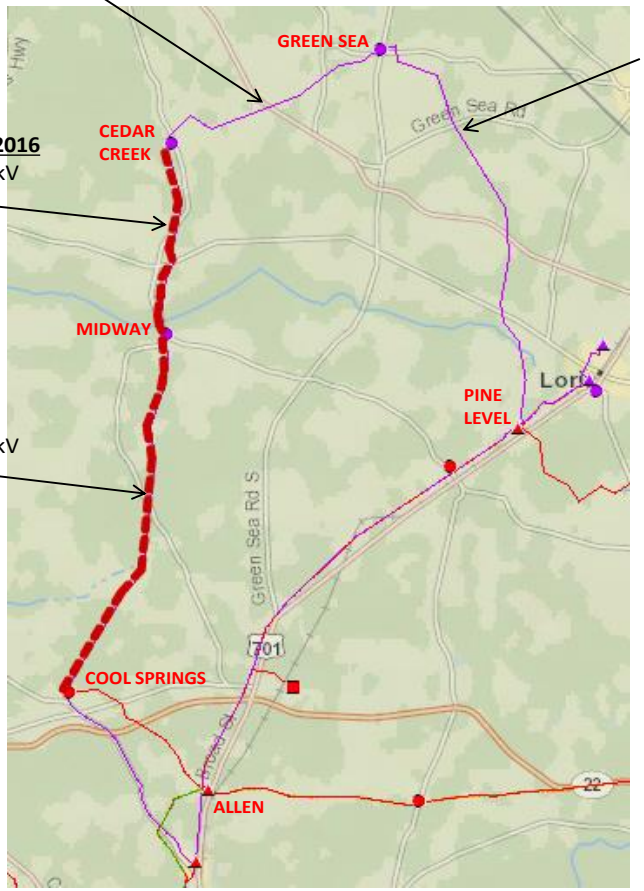
Pine Level-Allen #2 115 kV Line

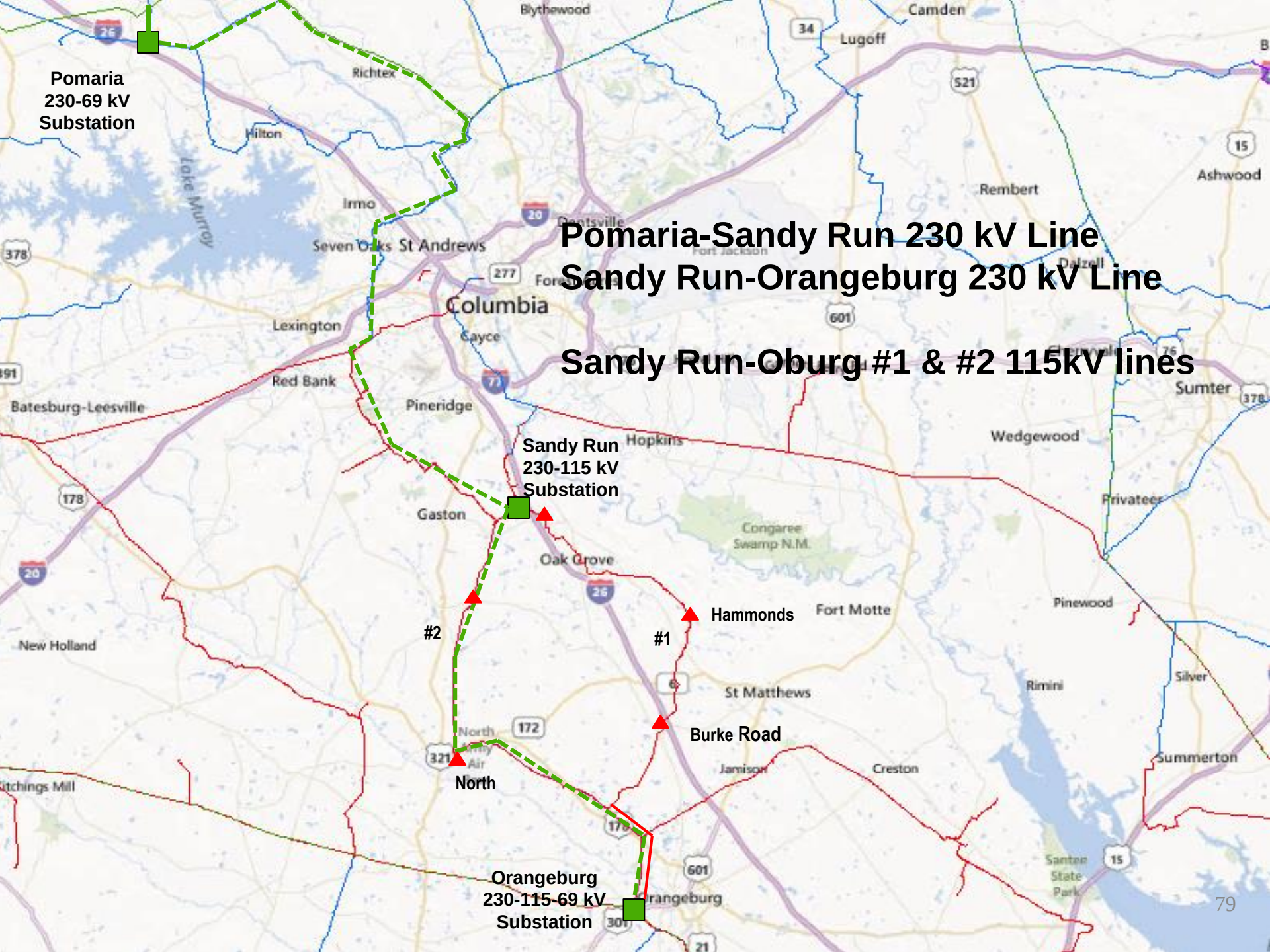
Changed to 3/1/2017
OPERATE AT 115kV
(ALREADY 477 ACSR
BUILT FOR 115kV)

Changed to 3/1/2017
OPERATE AT 115kV
(ALREADY 477 ACSR
BUILT FOR 115kV)

Changed to 5/1/2016
REBUILD FOR 115kV
795 ACSR

BY 11/30/2015
REBUILD FOR 115kV
795 ACSR



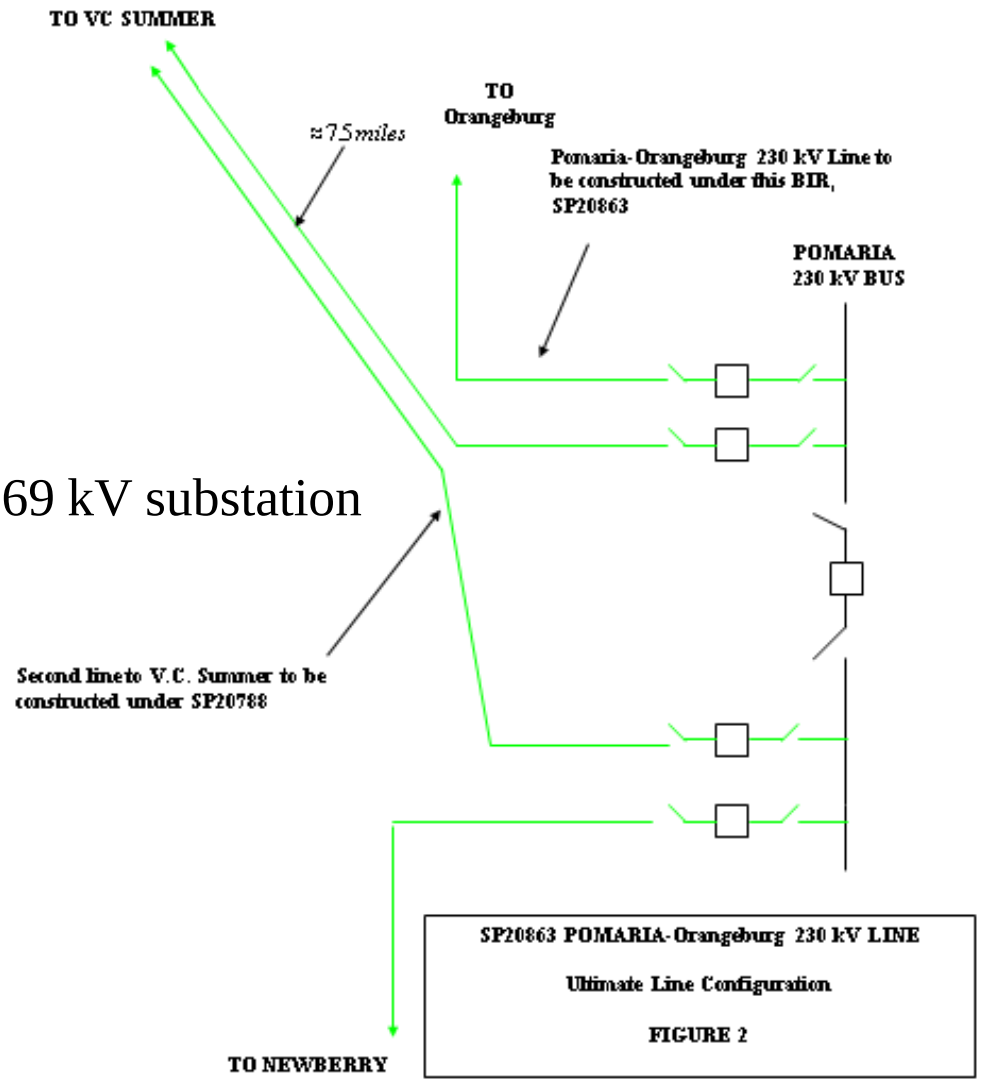

Pomaria
230-69 kV
Substation
Pomaria-Sandy Run 230 kV Line
Sandy Run-Orangeburg 230 kV Line
Sandy Run-Oburg #1 & #2 115kV lines
Sandy Run
230-115 kV
Substation
#2
#1
Hammonds
Burke Road
North
Orangeburg
230-115-69 kV
Substation
Columbia
Lexington
Irmo
Seven Oaks
St Andrews
Richtex
Hilton
Lake Murray
Blythewood
Camden
Lugoff
Rembert
Ashwood
Dentsville
Fort Jackson
Dalzell
Sumter
Wedgewood
Hopkins
Pineridge
Red Bank
Batesburg-Leesville
Cayce
Gaston
Oak Grove
Congaree
Swamp N.M.
Fort Motte
Pinewood
Privateer
Rimini
Silver
Summerton
St Matthews
Jamison
Creston
New Holland
Santee
State
Park

Pomaria-Orangeburg 230 kV Line

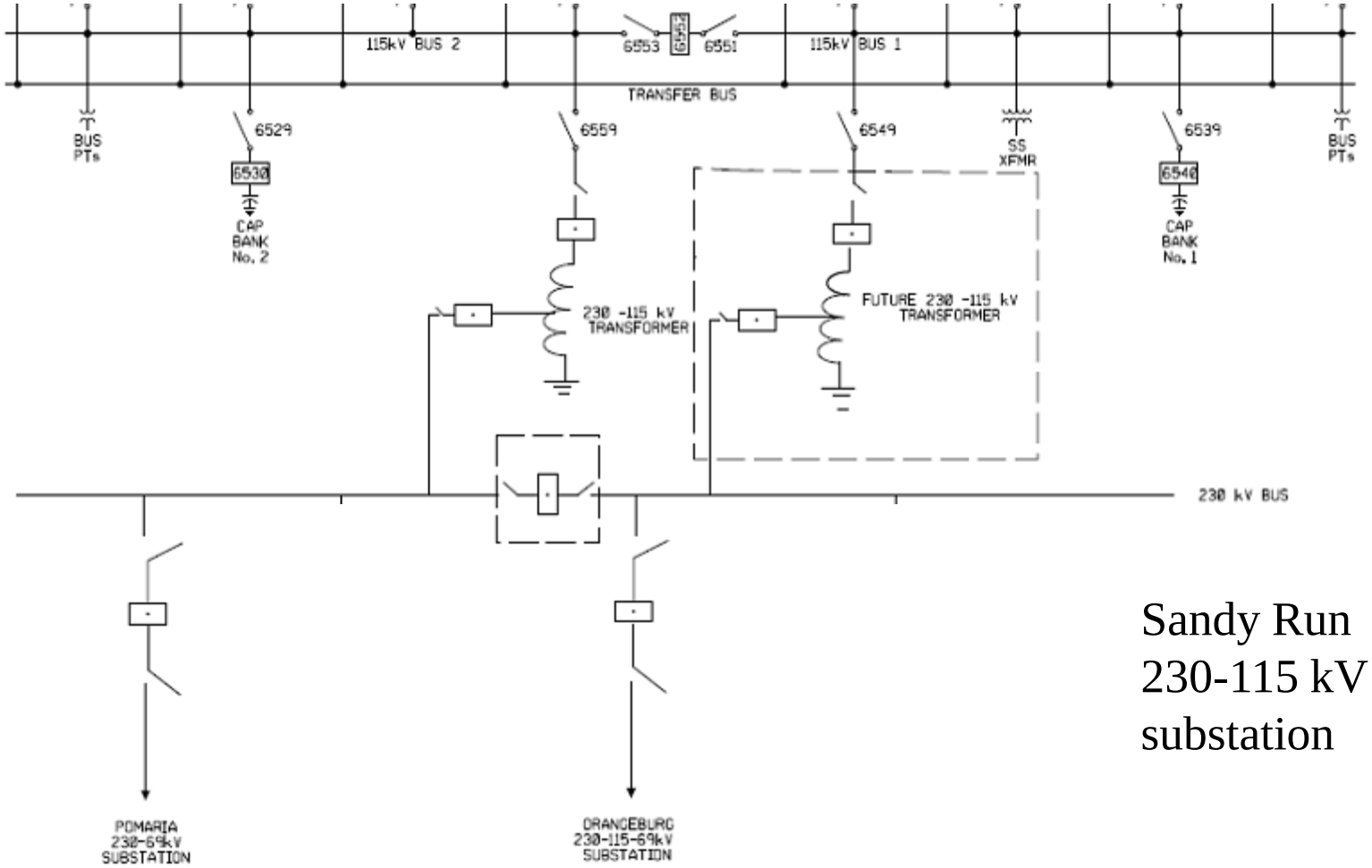
- Approx. 90 miles of transmission line will be built from Pomaria to Sandy Run 115 kV Switching Station and then to Orangeburg substation. Sandy Run will become a 230-115 kV substation
- At Orangeburg: one new 230 kV terminal will be added. New 115 kV line from Orangeburg to Sandy Run has been completed (total of two Orangburg-Sandy Run 115 kV circuits in-service)

Pomaria-Orangeburg 230 kV Line

Pomaria 230-69 kV substation



Pomaria-Orangeburg 230 kV Line



Sandy Run 230-115 kV substation

SCE&G SM A SCANA COMPANY

santee cooper

Transmission Network Planned Projects

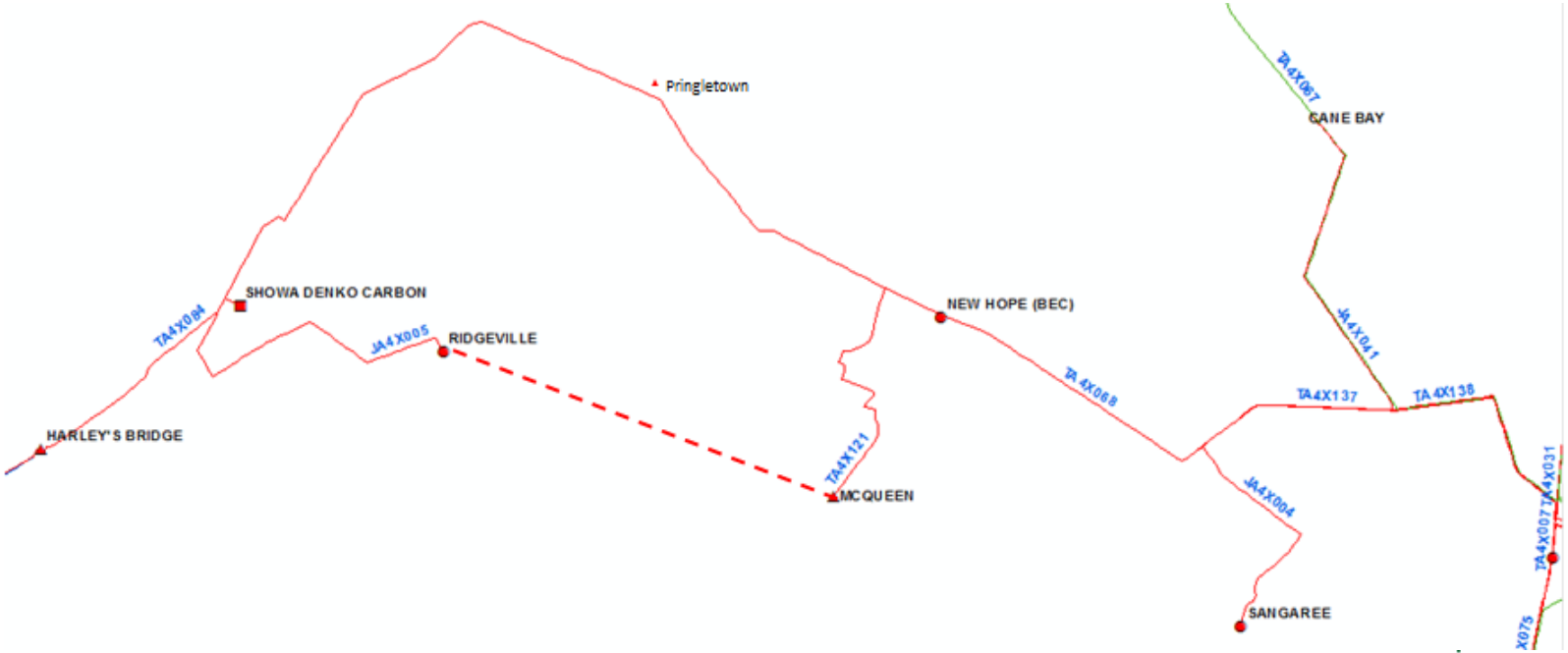
• Georgetown-Campfield 115 kV line switches replacement	12/2018
• Carnes-Harleys Bridge 115 kV Line via McQueen phase II	12/2019
• Bluffton-Market Place #2 115 kV line-Phase I	12/2019
• Add Bluffton 230 kV series bus tie breaker	12/2019
• Red Bluff-Nixons Crossroads #1 115 kV	06/2023
• Georgetown-Arcadia 115 kV	06/2023
• Conway 230 kV Switching Station	06/2025
• Marion-Conway 230 kV line	06/2025

SCE&G SM
A SCANA COMPANY

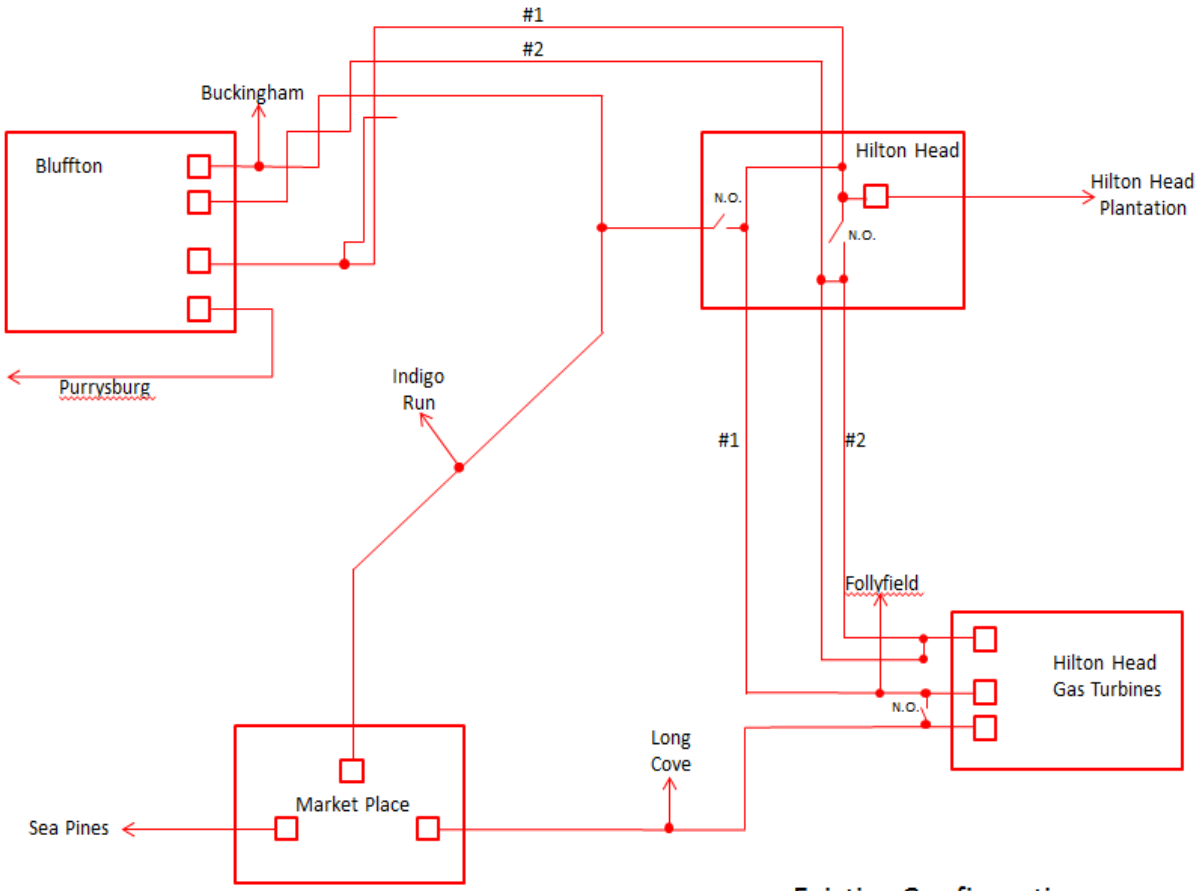
santee cooper

Carnes-Harleys Bridge 115 kV Line via McQueen phase II

- Central plans to build a 115 kV line from McQueen DP to Ridgeville DP
- Phase I of Carnes-Harleys Bridge 115 kV line has Ridgeville Tap operated as a radial circuit out of the new Harleys Bridge 115-69 kV substation
- Reconfigure transmission line connections at Carnes Crossroads 230-115 kV sub and Cane Bay tap to establish:
  - Carnes-Pringletown 115 kV
  - Carnes-Cane Bay 115 kV Tap
  - Carnes-Harleys Bridge 115 kV via McQueen and Ridgeville



Bluffton-Market Place #2 115 kV phase I
Bluffton-Buckingham section

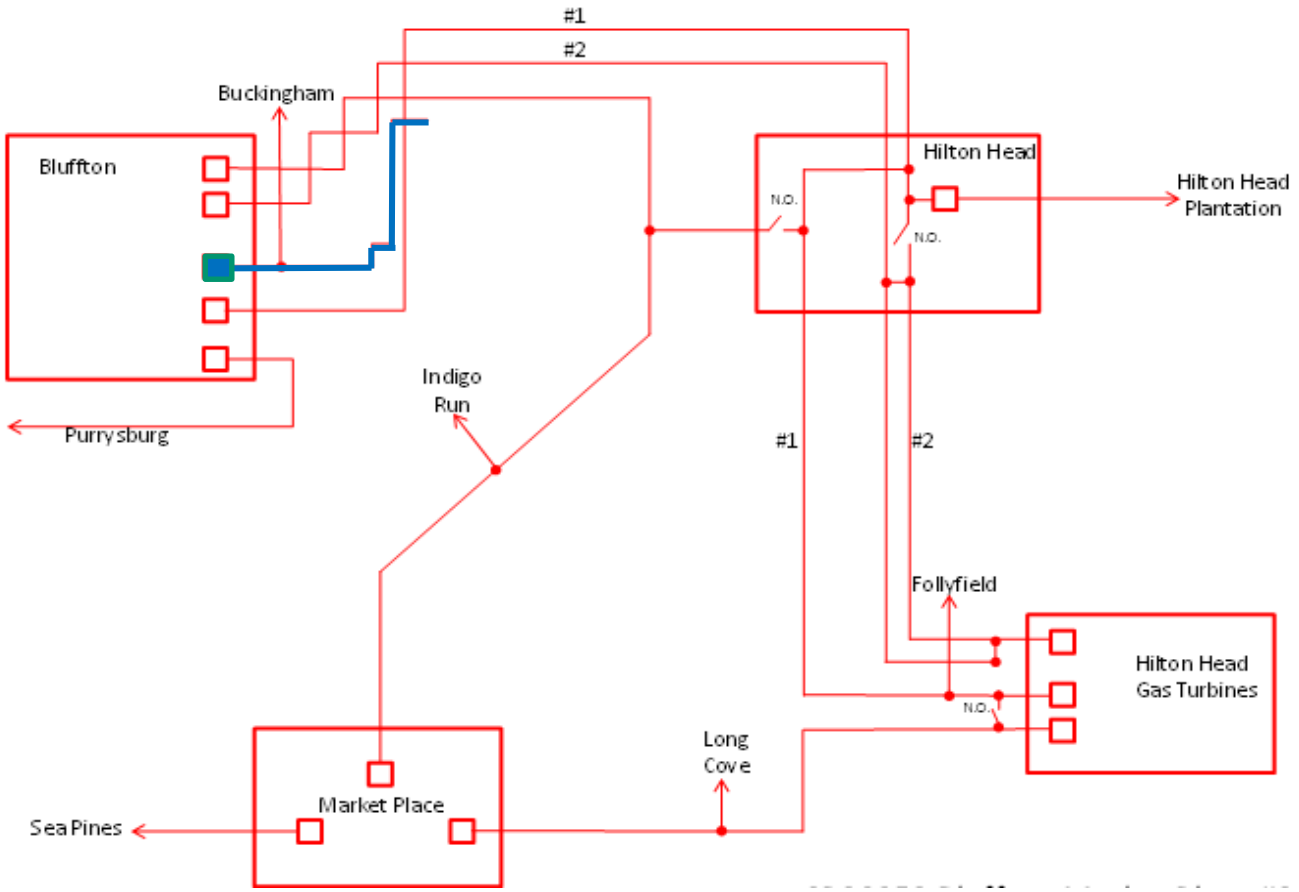


Existing Configuration

SCE&G SM
A SCANA COMPANY

santee cooper

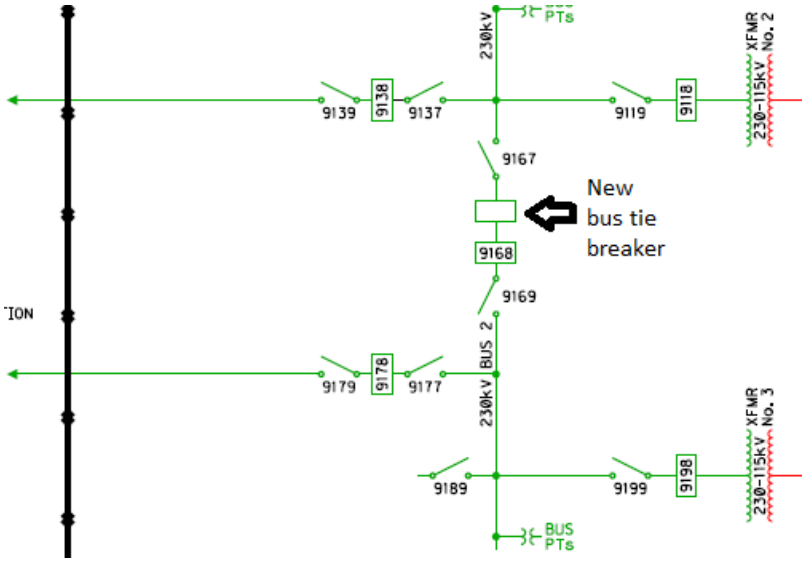
Bluffton-Market Place #2 115 kV phase I
Bluffton-Buckingham section



SCE&G SM
A SCANA COMPANY

santee cooper

Bluffton 230 kV series bus tie breaker



- Single contingency can lose the Bluffton/HH area
- Increase reliability to the customers
- Improve reliability to transmission system

SCE&G SM
A SCANA COMPANY

santee cooper

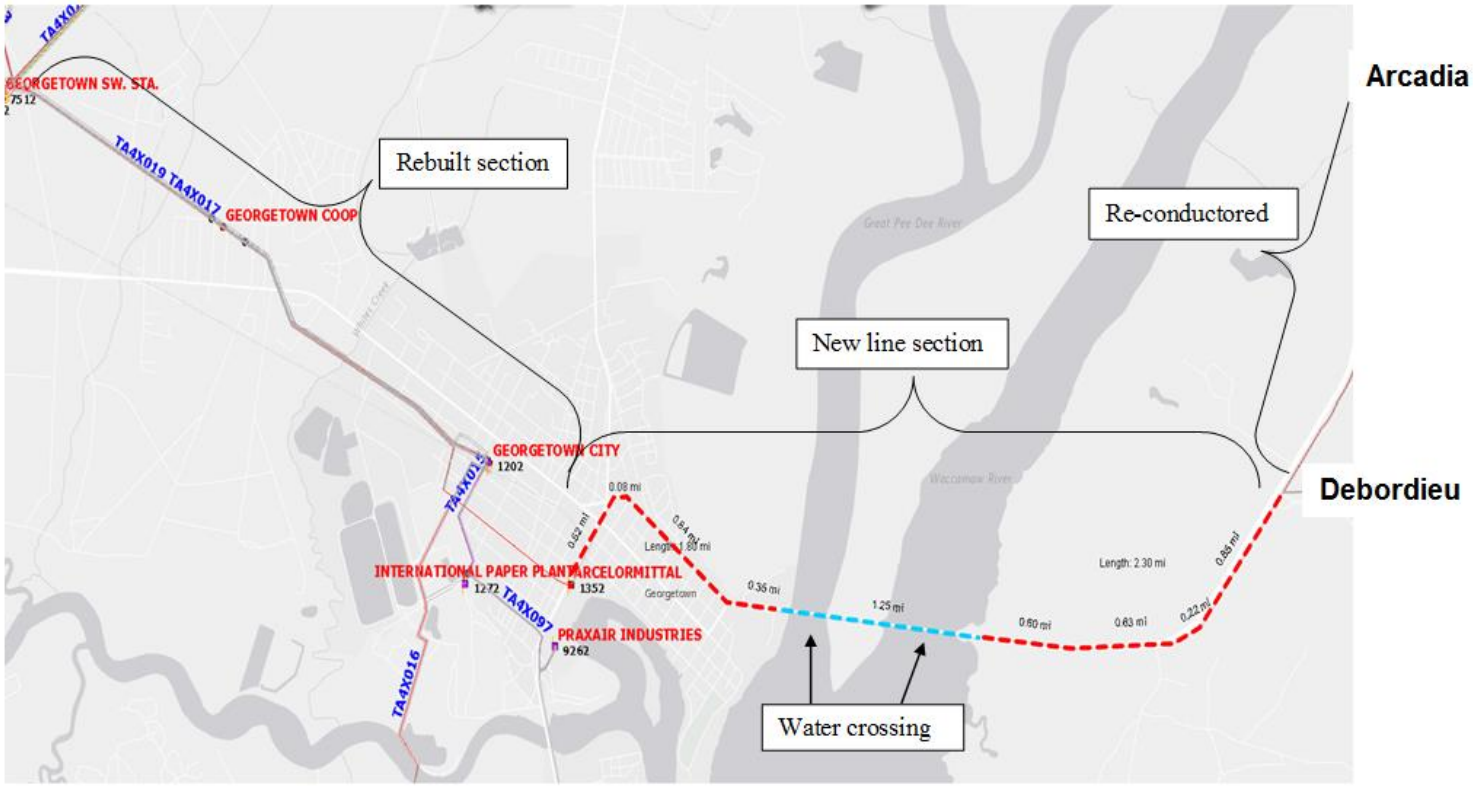
Red Bluff-Nixons Crossroads #1 115 kV Line

- ~4 miles of 115 kV line section from Nixons Crossroads substation to Brooksville
- Improves transmission network reliability for the area
- Allows Brooksville and Little River fed from alternate source
- Increases network flexibility

SCE&G SM A SCANA COMPANY

santee cooper

Georgetown-Arcadia 115 kV Line

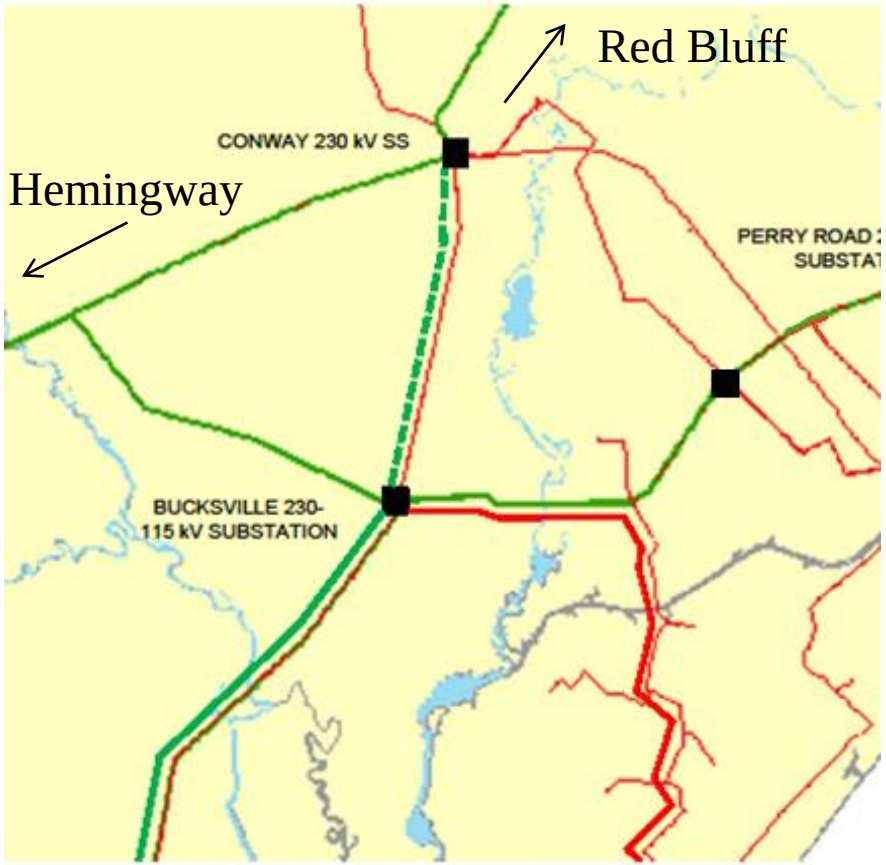


- Existing Georgetown-Campfield 115 kV line reliability concerns
- Provide alternate 115 kV source for support
- Arcadia-Campfield 115 kV cable failure

SCE&G SM A SCANA COMPANY

santee cooper

Conway 230 kV Switching Station

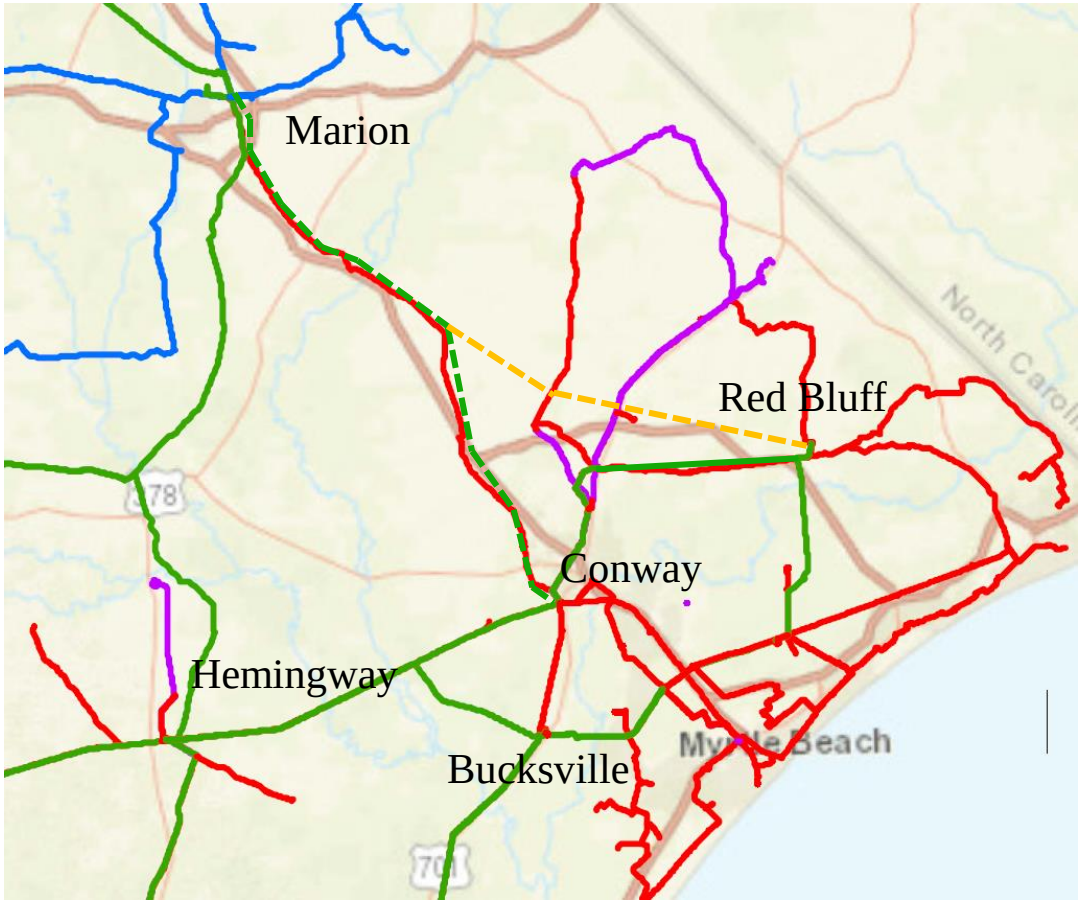


- Fold-in existing 230 kV line on existing site
- Marion-Conway 230 kV line ready
- Future Bucksville-Conway 230 kV

SCE&G SM
A SCANA COMPANY

santee cooper

Marion-Red Bluff → Marion-Conway 230 kV (2025)



- Construction is expected to be faster to meet system needs
- Utilize existing ROW to rebuild as double circuit 230/115 kV
- ~34 miles
- Rebuild Marion-Conway 115 kV line to 795 ACSR

SCE&G SM
A SCANA COMPANY

santee cooper

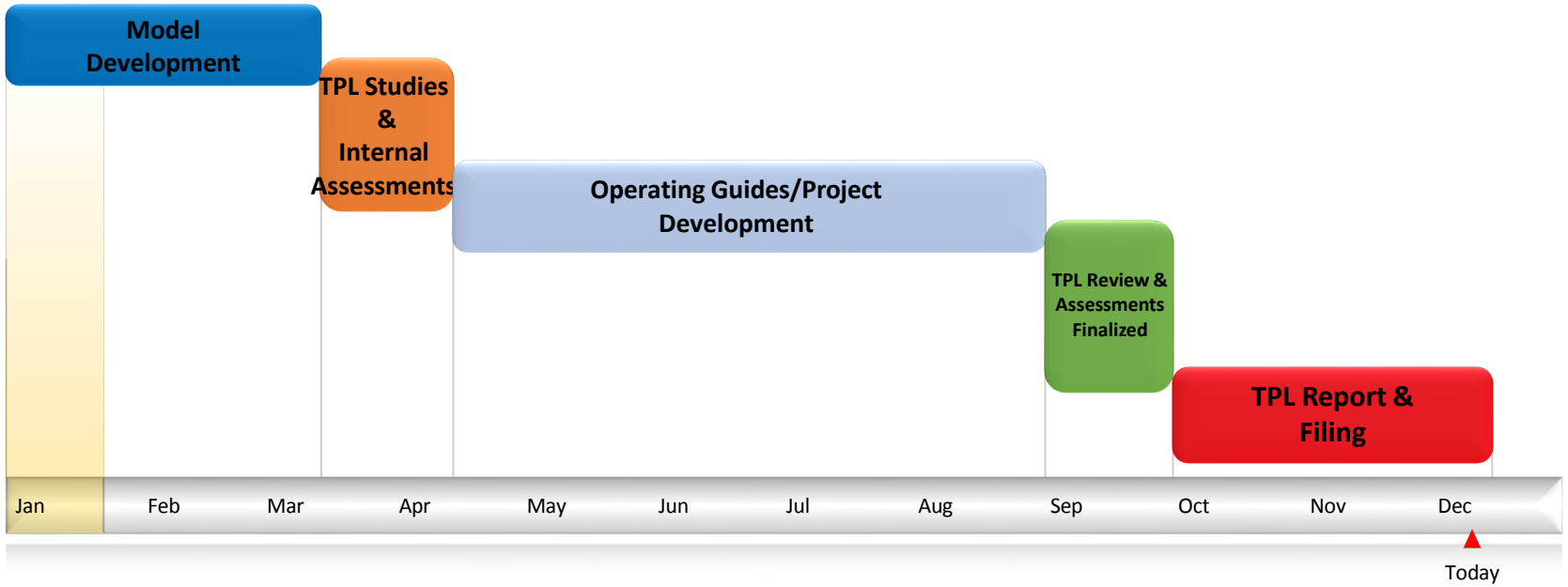
Current Major Transmission Plans

Stakeholder Input, Comments and Questions

Reliability Planning Studies Schedule

Clay Young

Reliability Transmission Planning Studies Timeline



SCE&G SM A SCANA COMPANY

santee cooper

Reliability Assessment Studies

Weijian Cong

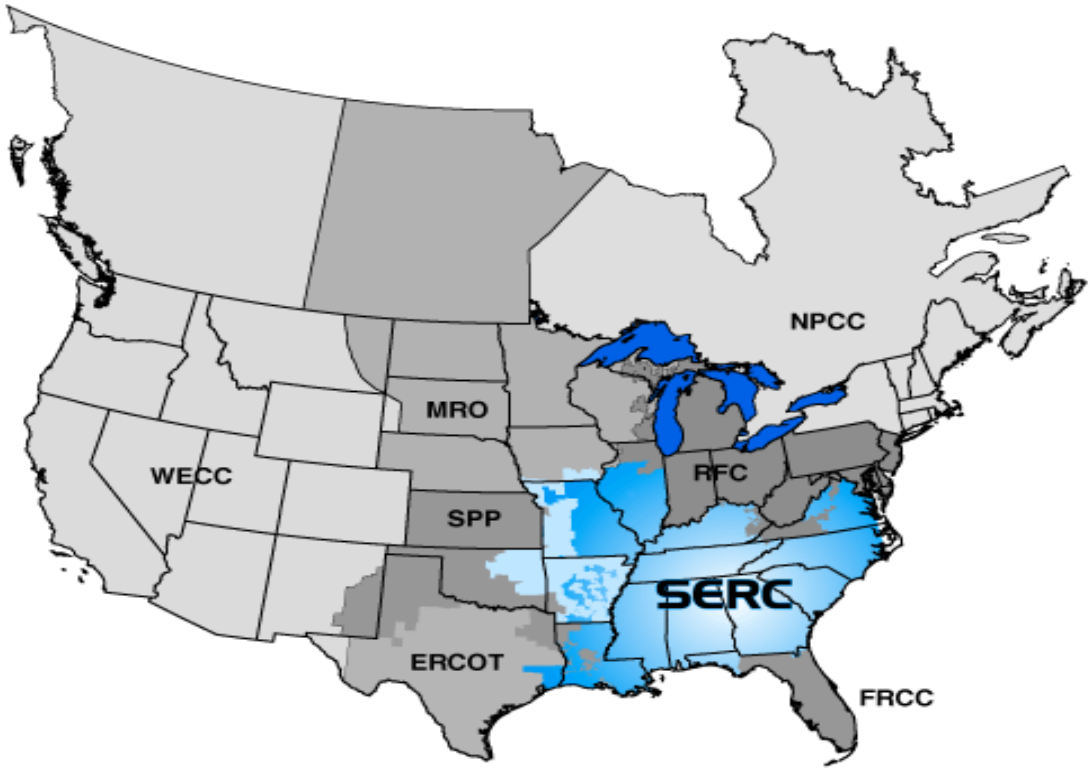
Multi-Party Assessments

- Southeastern Electric Reliability Corporation (SERC) Assessments
- Eastern Interconnection Reliability Assessment Group (ERAG)
- Carolina Transmission Coordination Arrangement (CTCA) Assessments

SCE&G SM
A SCANA COMPANY

santee cooper

SERC Future Year Assessments
Long Term Study Group (LTSG)



SERC LTSG Study
Purpose

- Analyze the performance of the members' transmission systems and identify limits to power transfers occurring non-simultaneously among the SERC members.
- Evaluate the performance of bulk power supply facilities under both normal and contingency conditions for future years.
- Focus on the evaluation of sub-regional and company-to-company transfer capability.

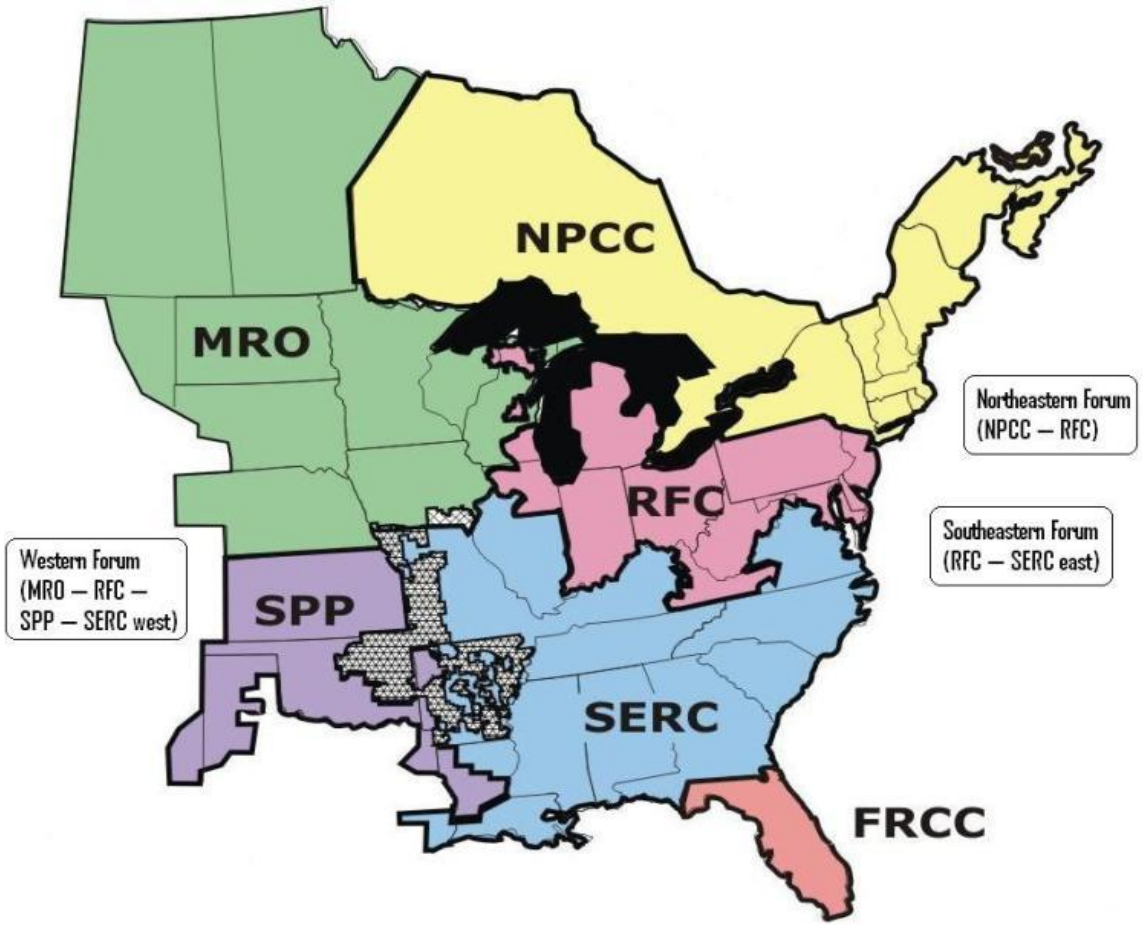
SERC Long Term Study Group
2017 Work Schedule

- Power flow cases finalized on June 14, 2017
  - Revised power flow cases based on V.C. Summer update (8/10)
- Future Study Year Case: 2022 Summer Peak Load
- Study and report to be completed by LTSG June thru October
- Final Report approved in December, 2017
- 2018 DBU kickoff is scheduled in January, 2018

SCE&G SM
A SCANA COMPANY

santee cooper

Eastern Interconnection Reliability Assessment Group (ERAG) Assessments



- ReliabilityFirst Corporation (RF)
- Midwest Reliability Organization (MRO)
- Florida Reliability Coordinating Council (FRCC)
- Northeast Power Coordinating Council (NPCC)
- Southeastern Electric Reliability Council (SERC)
- Southwest Power Pool Regional Entity (SPP RE)

ERAG MMWG

The Multiregional Modeling Working Group (MMWG) is responsible for developing a library of solved power flow models and associated dynamics simulation models of the Eastern Interconnection.

The models are for use by the Regions and their member systems in planning future performance and evaluating current operating conditions of the interconnected bulk electric systems.

ERAG MMWG 2017 activity

- Model update from August – September 2017
- MMWG power flow cases finalized October 2017

ERAG Assessments

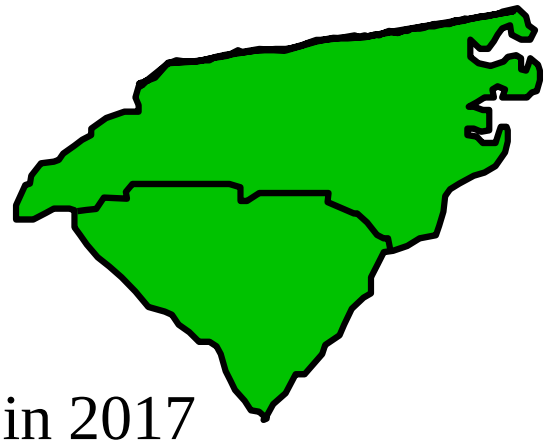
- The purpose of the Eastern Interconnection Reliability Assessment Group (ERAG) is to further augment the reliability of the bulk-power system in the Eastern Interconnection through periodic studies of seasonal and longer-term forecasted transmission system conditions.

- No Long Term Study Performed in 2017

CTCA Purpose

- Collection of agreements developed concurrently by the Principals, Planning Representatives, and Operating Representatives of multiple two-party Interchange Agreements
- Establishes a forum for coordinating certain transmission planning assessment and operating activities among the specific parties associated with the CTCA
- Participating entities:
  - Duke Energy Carolinas
  - Duke Energy Progress
  - South Carolina Electric & Gas
  - Santee Cooper

CTCA Future Year Assessments



- No study for Power Flow or Stability Group in 2017
- Study files coordinated for 2017 TPL analysis

Questions?

Next SCRTP Meeting

- Stakeholders will identify and request economic power transfer sensitivities to be studied
- Up to five sensitivities will be selected for study
- Review and discuss Multi-Party Assessment Studies
- SCRTP Email Distribution List will be notified
- Register online

SCE&G SM
A SCANA COMPANY

santee cooper

South Carolina Regional Transmission Planning

Stakeholder Meeting

Lake Murray Training Center – Room 100
Lexington, SC 29072

December 12, 2017 10:00 AM – 1:00 PM

SCE&G SM
A SCANA COMPANY

santee cooper