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Southwest
Transmission
COOPERATIVE, INC

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50TP

January 31, 2006

Mr. Ernest Johnson
Director, Utilities Division
Arizona Corporation Commission
1200 West Washington
Phoenix, AZ 85007

RE: Docket No. E-00000D-05-0040

Dear Mr. Johnson:

Enclosed is the Southwest Transmission Cooperative, Inc. ("SWTC") Ten Year Plan for the period 2006 – 2015. I have enclosed an original plus thirteen (13) copies pursuant to A.R.S. Section 40-360-02.

Sincerely,

James Rein
Manager of Transmission Planning

enclosures

c/ L. Huff w/o enclosures

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SOUTHWEST TRANSMISSION COOPERATIVE, INC.

TEN YEAR PLAN

2006 – 2015

Prepared for the

ARIZONA CORPORATION COMMISSION

TRANSMISSION PLANNING

JANUARY 2006

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SOUTHWEST TRANSMISSION COOPERATIVE, INC.

TEN YEAR PLAN

GENERAL INFORMATION

This report is submitted to the Arizona Corporation Commission (“Commission”) to satisfy the requirements of section 40-360.02 of the Arizona Revised Statutes (“A.R.S.”), relating to power plant and transmission line siting requirements. It outlines the plans of Southwest Transmission Cooperative, Inc. (“SWTC”) to install electric facilities required to meet anticipated system growth.

This report contains projects that SWTC anticipates may be constructed over the next ten-year period. As noted in A.R.S. section 40-360.02.F, the plans contained in this report are tentative information only and are subject to change at any time at the discretion of SWTC. SWTC anticipates that any changes to this plan will likely be due to changes in load forecasts, environmental constraints, and/or regulatory and legal developments. Changes of any significance that occur prior to the next Ten Year Plan filing, will be discussed with the Commission staff.

The report is divided into three sections, as outlined in the Table of Contents on page 2. Section I describes planned transmission lines SWTC may construct over the ten-year plan period, whose nominal rating is equal to or greater than one hundred fifteen thousand volts (115 kV). Section II contains SWTC’s internal planning criteria and facility ratings, pursuant to Commission Decision #63876, dated July 25, 2001. Section III is a Technical Study Report of the planned transmission projects contained in Section I, to satisfy the requirements of paragraph C.7 of A.R.S. Section 40-360.02.

The planned transmission lines that are listed in Section I are needed to serve load in the load areas of the SWTC Member Distribution Cooperatives. Because of the proximity of the new lines to the Member load being served, initial studies show little impact to the overall interconnected system.

A comparison of last year's 2005-2014 plan with this new 2006-2015 plan yields several changes. There are four new transmission projects contemplated by SWTC:

- **Pinal West to the Santa Rosa 500 kV Line Project.** SWTC plans participation in the Pinal West to Santa Rosa 500 kV line project. Salt River Project ("SRP") is acting as project manager for the project, which is a component in the Palo Verde to Pinal West and Pinal West to Southeast Valley Project, whose participants include SWTC, Tucson Electric Power Company ("TEP"), Electrical District #2 ("ED2"), Electrical District #3 ("ED3") and Electrical District #4 ("ED4"). SRP received a Certificate of Environmental Compatibility (Case 126) for the single circuit 500 kV transmission line from Pinal West Substation to the Santa Rosa Substation. This line has a planned in service date of 2008. SWTC's participation in the Pinal West to Santa Rosa Project will provide additional transfer capability to SWTC's customers in Southeast Arizona. For additional detail regarding this project refer to the SRP 2006-2015 Ten Year Plan.
- **Red Rock to Picture Rocks 115 kV Line.** As further described, the Saguaro to Red Rock 115 kV line project represents a change from SWTC's 2005-2014 Ten Year Plan Filing. SWTC studied the need to reinforce the existing 115 kV system from Marana to Bicknell by extending a 115 kV line from Red Rock to a new substation called Picture Rocks and from Picture Rocks to the Central Arizona Project (CAP) Twin Peaks Substation. The study also confirmed the need to extend 115 kV from the existing Valencia Substation to Bopp Road and from Valencia to the CAP Black Mountain Substation, as noted in the 2005-2014 Ten Year Plan Filing, as well as extend 115 kV from Bopp Road to Sandario.
- **Picture Rocks to CAP Twin Peaks 115 kV Line.** As noted above, this project takes 115 kV from Picture Rocks to the CAP Twin Peaks Substation, as part of SWTC's overall plan to reinforce its 115 kV system in the area.
- **Sandario to Bopp Road 115 kV Line.** Also, as noted above, this project takes 115 kV from Sandario to Bopp Road as part of SWTC's overall plan to reinforce its 115 kV system in the area.

SWTC has modified the following projects from 2005-2014 Plan:

- **Saguaro to Red Rock 115 kV Line.** This project was originally planned to add a new 230 kV line from the existing Saguaro Substation to a new substation called Red Rock that is located near the Pinal/Pima County line, northwest of Tucson, Arizona in 2007. Studies show that 115 kV is adequate to meet SWTC needs in the area for the foreseeable future. The addition of this new line will enhance the ability of SWTC to serve continued load growth in the Trico Electric Cooperative, Inc. certificated system. It also is the first in a series of transmission projects, as noted above, to reinforce SWTC's existing 115 kV system between Marana and Bicknell.
- **Riviera Two Substation to Riviera 230 kV Line Project.** This project as filed in the 2005-2014 Plan envisioned the construction of a new 230 kV switching station off of Western's Davis to Topock No. 1 230 kV line with construction of a new 230 kV line from this switching station to the existing Riviera Substation. This new switching station is projected to be built in 2008 by Mohave Electric Cooperative, Inc. (MEC) which also includes the construction of two new 69 kV lines from this switching station to tie into MEC's existing 69 kV system. Studies have shown that the construction of these new 69 kV lines defer the Riviera Two Substation to Riviera 230 kV Line Project beyond this Ten Year Plan horizon and therefore it has been removed from this plan.
- **Hassayampa to Pinal West 500 kV Line.** The in-service date of this project has changed from 2007 to 2008.

Additional studies are being performed to determine the exact timing of the following 115 kV transmission line projects that are proposed for construction south of Red Rock:

- 1) Red Rock to Picture Rocks 115 kV Line
- 2) Picture Rocks to CAP Twin Peaks 115 kV Line
- 3) Valencia to Bopp 115 kV Line
- 4) Sandario to Bopp 115 kV Line

5) Valencia to CAP Black Mountain 115 kV Line

SWTC expects that the timing of the above projects will fall within the ten year planning horizon. However, as noted above, SWTC plans to discuss with Commission staff any modifications to this Ten Year Plan.

SWTC continues to participate in the various subcommittees of the Southwest Area Transmission ("SWAT") Planning Group, along with electric utilities and other interested parties in the Desert Southwest. These subcommittees include the SWAT Central Arizona Transmission EHV("CATS-EHV"), SWAT Central Arizona Transmission HV ("CATS-HV") , SWAT Colorado River Transmission Subcommittee ("CRT") and the SWAT Arizona-New Mexico EHV Subcommittee ("AZNM"). Each of these subcommittees has been involved in various study efforts such as investigating wind energy, coal generation, and transmission studies to enhance and utilize existing transmission. A SWAT Cats-HV Saturated Load and Transmission Interim Study report has been filed with the SRP 2006-2015 Ten Year Plan submittal as Appendix 1.

SECTION I

SWTC PLANNED TRANSMISSION LINES

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

10 YEAR PLAN

PLANNED TRANSMISSION FACILITIES

Line Designation	Sandario Substation loop-in of Avra Valley to Three Points 115 kV line
Size	
a) Voltage	115 kV
b) Capacity	72 MVA
c) Point of Origin	Avra Valley to Three Points 115 kV line Sec. 26 T13S R10E
d) Point of Termination	Sandario Substation Sec. 5 T14S R11E
e) Length	Approximately 5 miles of double circuit 115 kV line
Routing	Due East of the Avra Valley to Three Points 115 kV line and then following the El Paso Natural Gas line to proposed sub site
Purpose	To provide for anticipated load growth in the certificated service area of Trico Electric Cooperative, Inc. in Northwest Tucson
Date	
a) Construction Start	September 2005
b) In-Service Date	Proposed February 2006
Is Certificate Necessary?	Yes. The Commission in Case 125 issued a Certificate of Environmental Compatibility for the project (Decision No. 67432) on December 3, 2004

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

10 YEAR PLAN

PLANNED TRANSMISSION FACILITIES

Line Designation	Saddlebrooke Ranch 115 kV Substation
Size	
a) Voltage	115 kV
b) Capacity	50 MVA
c) Point of Origin	APS 115 kV line Sec. 33 T9S R15E
d) Point of Termination	Saddlebrooke Ranch Substation Sec. 33 T9S R15E
e) Length	0 miles
Routing	Substation to be located on the APS Oracle to San Manual 115 kV line approximately 4 miles east of Oracle Substation, and approximately 16 miles west of San Manual Substation
Purpose	To provide for anticipated load growth in the certificated service area of Trico Electric Cooperative, Inc. in Southern Pinal County
Date	
a) Construction Start	Proposed May 2006
b) In-Service Date	Proposed October 2006
Is Certificate Necessary?	No

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

10 YEAR PLAN

PLANNED TRANSMISSION FACILITIES

Line Designation	Marana 115 kV Line Upgrade
Size	
a) Voltage	115 kV
b) Capacity	To be determined
c) Point of Origin	Marana Tap Sec. 26 T11S R10E
d) Point of Termination	Marana Substation Sec. 26 T11S R10E
e) Length	Approximately 0.2 miles. Proposed loop-in to the Marana Substation
Routing	Same R.O.W. as existing Marana Tap to Marana 115 kV Line
Purpose	To mitigate various thermal overloads and/or voltage criteria violations due to N-1 outages on the 115 kV system between Bicknell and Marana and to provide for anticipated load growth in the certificated service area of Trico Electric Cooperative, Inc.
Date	
a) Construction Start	Proposed January 2007
b) In-Service Date	Proposed May 2007
Is Certificate Necessary?	Yes

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

10 YEAR PLAN

PLANNED TRANSMISSION FACILITIES

Line Designation	Hassayampa to Pinal West
Size	
a) Voltage	500 kV
b) Capacity	1200 MVA
c) Point of Origin	Hassayampa Switchyard Sec. 15 T1S R6W
e) Point of Termination	Pinal West Substation Sec. 18 T5S R5E
f) Length	Approximately 52 miles
Routing	South and east of the Hassayampa Switchyard along the existing Palo Verde-Kyrene 500 kV line to a point where the gas pipeline splits from the transmission line, then generally along the pipeline (except in the Maricopa County Mobile Planning Area) to the new Pinal West Substation
Purpose	Identified by SWAT as necessary to accommodate load growth and access to energy sources in the central AZ area. The project provides for increased transfer capability to SWTC loads in Southeast Arizona
Date	
a) Construction Start	2006
b) In-Service Date	2008
Is Certificate Necessary?	Yes. The Commission in Case 124 issued a Certificate of Environmental Compatibility (Decision No. 67012) on May 24, 2004. SWTC is a participant; SRP is the project manager

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

10 YEAR PLAN

PLANNED TRANSMISSION FACILITIES

Line Designation	Pinal West to Santa Rosa
Size	
a) Voltage	500 kV
b) Capacity	1200 MVA
c) Point of Origin	Pinal West Substation Sec. 18 T5S R2E
e) Point of Termination	Santa Rosa Substation Sec. 30 T5S R4E
f) Length	Approximately 14.5 miles
Routing	South and east from the Pinal West substation to approximately Teel Road, then east to the Santa Rosa substation.
Purpose	Identified by SWAT as necessary to accommodate load growth and access to energy sources in the central AZ area. The project provides for increased transfer capability to SWTC loads in Southeast Arizona
Date	
a) Construction Start	2006
b) In-Service Date	2008
Is Certificate Necessary?	Yes. The Commission in Case 126 issued a Certificate of Environmental Compatibility (Decision No. 68093) on August 25, 2005. SWTC is a participant; SRP is the project manager

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

10 YEAR PLAN

PLANNED TRANSMISSION FACILITIES

Line Designation	Red Rock to Saguaro 115 kV
Size	
a) Voltage	115 kV
b) Capacity	167 MVA
c) Point of Origin	Red Rock Substation Sec. 5 T11S R11E
d) Point of Termination	Saguaro Substation Sec. 14 T10S R10E
e) Length	Approximately 4.4 miles
Routing	Northwest from Red Rock Substation to the APS Saguaro Substation paralleling existing transmission lines
Purpose	To provide for anticipated load growth in the certificated service area of Trico Electric Cooperative, Inc. in Northern Pima and Southern Pinal Counties
Date	
a) Construction Start	Proposed August 2007
b) In-Service Date	Proposed December 2007
Is Certificate Necessary?	Yes

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

10 YEAR PLAN

PLANNED TRANSMISSION FACILITIES

Line Designation	Apache to Hayden 115 kV line to APS San Manual Substation
Size	
a) Voltage	115 kV
b) Capacity	To be determined
c) Point of Origin	Apache-Hayden 115 kV line near San Manual Sec. 19 T9S R18E
d) Point of Termination	APS San Manual Substation Sec. 29 T9S R17E
e) Length	Approximately 4.5 miles of double circuit 115 kV line
Routing	Apache-Hayden 115 kV line, heading generally West then Southwest to San Manual Substation
Purpose	Provide for increased transfer capability and voltage support in Southern Pinal County and to provide for anticipated load growth in the certificated service area of Trico Electric Cooperative, Inc.
Date	
a) Construction Start	Proposed January 2008
b) In-Service Date	Proposed May 2008
Is Certificate Necessary?	Yes

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

10 YEAR PLAN

PLANNED TRANSMISSION FACILITIES

Line Designation	Valencia to CAP Black Mountain 115 kV Line
Size	
a) Voltage	115 kV
b) Capacity	167 MVA
c) Point of Origin	Valencia Substation Sec. 17 T15S R12E
d) Point of Termination	CAP Black Mountain Substation Sec. 2 T15S R12E
e) Length	Approximately 4.5 miles
Routing	From Valencia Substation heading North and East to the CAP Black Mountain Substation
Purpose	To provide an additional source to the SWTC 115 kV system and for the Valencia Substation which is currently served by a radial 115 kV line from Three Points Substation
Date	
a) Construction Start	Proposed 2008
b) In-Service Date	Proposed 2008
Is Certificate Necessary?	Yes

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

10 YEAR PLAN

PLANNED TRANSMISSION FACILITIES

Line Designation	Valencia to Bopp Road 115 kV Line
Size	
a) Voltage	115 kV
b) Capacity	167 MVA
c) Point of Origin	Valencia Substation Sec. 17 T15S R12E
d) Point of Termination	Bopp Road Substation Sec. 29 T14S R12E
e) Length	Approximately 3.2 miles
Routing	North from Valencia Substation to Bopp Road Substation
Purpose	Provide for increased transfer capability and voltage support in Southern Pima County and to provide for anticipated load growth in the certificated service area of Trico Electric Cooperative, Inc.
Date	
a) Construction Start	Proposed September 2008
b) In-Service Date	Proposed February 2009
Is Certificate Necessary?	Yes

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

10 YEAR PLAN

PLANNED TRANSMISSION FACILITIES

Line Designation	Sandario to Bopp Road 115 kV Line
Size	
a) Voltage	115 kV
b) Capacity	167 MVA
c) Point of Origin	Sandario Substation Sec. 5 T14S R11E
d) Point of Termination	Bopp Road Substation Sec. 29 T14S R12E
e) Length	Approximately 11.5 miles
Routing	From Sandario Substation heading Southeast to Bopp Road Substation
Purpose	Provide for increased transfer capability and voltage support in Southern Pima County and to provide for anticipated load growth in the certificated service area of Trico Electric Cooperative, Inc.
Date	
a) Construction Start	Proposed 2009
b) In-Service Date	Proposed 2010
Is Certificate Necessary?	Yes

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

10 YEAR PLAN

PLANNED TRANSMISSION FACILITIES

Line Designation	Red Rock to Picture Rocks 115 kV Line
Size	
a) Voltage	115 kV
b) Capacity	167 MVA
c) Point of Origin	Red Rock Substation Sec. 5 T11S R11E
d) Point of Termination	Picture Rocks Substation Sec. 14 T12S R11E
e) Length	Approximately 12 miles
Routing	North from Valencia Substation to Bopp Road Substation
Purpose	Provide for increased transfer capability and voltage support in Southern Pima County and to provide for anticipated load growth in the certificated service area of Trico Electric Cooperative, Inc.
Date	
a) Construction Start	Proposed 2012
b) In-Service Date	Proposed 2013
Is Certificate Necessary?	Yes

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

10 YEAR PLAN

PLANNED TRANSMISSION FACILITIES

Line Designation	Picture Rocks to CAP Twin Peaks 115 kV Line	
Size		
a) Voltage		115 kV
b) Capacity		167 MVA
c) Point of Origin		Picture Rocks Substation Sec. 14 T12S R11E
d) Point of Termination		CAP Twin Peaks Substation Sec. 14 T12S R11E
e) Length		Approximately 2 miles
Routing	North from Valencia Substation to Bopp Road Substation	
Purpose	Provide for increased transfer capability and voltage support in Southern Pima County and to provide for anticipated load growth in the certificated service area of Trico Electric Cooperative, Inc.	
Date		
a) Construction Start		Proposed 2012
b) In-Service Date		Proposed 2013
Is Certificate Necessary?		Yes

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

10 YEAR PLAN

PLANNED TRANSMISSION FACILITIES

Line Designation	Upgrade of Marana to Avra Valley 115 kV Line
Size	
a) Voltage	115 kV
b) Capacity	167 MVA
c) Point of Origin	Marana Substation Sec. 26 T11S R10E
d) Point of Termination	Avra Valley Substation Sec. 11 T13S R10E
e) Length	Approximately 8.75 miles
Routing	Same R.O.W. as existing Marana to Avra Valley 115 kV line
Purpose	To mitigate various thermal overloads and/or voltage criteria violations due to N-1 outages on the 115 kV system between Bicknell and Marana and to provide for anticipated load growth in the certificated service area of Trico Electric Cooperative, Inc.
Date	
a) Construction Start	Proposed 2015
b) In-Service Date	Proposed 2015
Is Certificate Necessary?	Yes

SECTION II

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

INTERNAL PLANNING CRITERIA AND FACILITY RATINGS

The following represents the internal planning criteria of Southwest Transmission Cooperative, Inc. ("SWTC") and also identifies the assumptions and methodologies used by SWTC to determine electrical facility ratings. This criteria is published in the FERC FORM #715 Filing that is made annually by the Western Electricity Coordinating Council ("WECC") for its members.

The assumptions used below represent criteria that SWTC has used for a number of years, to meet requirements of the North American Electric Reliability Council ("NERC"), the Federal Energy Regulatory Commission ("FERC") and the WECC.

1) Nominal Operating Limit

- Transmission lines should not be loaded greater than 100% of the thermal rating of the conductors.
- Transformers, circuit breakers, current transformers, and other equipment should not be loaded above their continuous nameplate rating.
- Transmission system voltages should not fall below 0.9 per unit (p.u.) of nominal nor rise above 1.05 p.u. of nominal

2) Emergency Operating Limit

- Transmission lines should not be loaded greater than 110% of the thermal rating of the conductors.
- Transformers, circuit breakers, current transformers, and other equipment should not be loaded above their continuous nameplate rating.
- Transmission system voltages should not fall below 0.90 p.u. of nominal nor rise above 1.10 p.u. of nominal.

3) Transformer Loading Criteria

For study purposes, transformers are generally considered in nominal operating conditions at the maximum of their 55°C rise; and represented at the maximum of their 65°C rise under emergency operating conditions.

4) Conductor Loading Criteria

Ampacities for the bulk of SWTC's transmission lines have been developed, using the House and Tuttle formula for Aluminum Conductor Steel Reinforced (ACSR) overhead conductors as developed by the Western Area Power Administration (Power System Bulletin 510, dated January 14, 1992).

The Conductor type and Ampacities are listed below at 75 degrees Celsius conductor operating temperature, 2 foot per second wind velocity and 40 degrees Celsius ambient air temperature:

Type	Amps
#2 CU	240
#4 ACSR	120
1/0 ACSR	240
3/0 ACSR	310
4/0 ACSR	360
266.8 ACSR	380
336.4 ACSR	500
477 ACSR	620
795 ACSR	840
954 ACSR	920
1272 ACSR	1100
2-954 ACSR	1370

5) The following table summarizes the conditions establishing limits for SWTC.

Circuit Feature	Nominal Limit	Emergency Limit
Power Circuit Breaker	100% rating	100% rating
Bushing CT	100% connection	100% connection
Wound CT	100% thermal	100% thermal rating
Switches	100% rating	100% rating
Conductor	100% thermal rating	110% thermal rating
Regulator	100% rating	100% rating
Transformer	100% rating @ 55°C rise	100% rating @ 65°C rise
Reactor	100% rating	100% rating
Relay Setting	80% of setting	80% of setting

- 6) Table 1 below describes the electrical load limits of SWTC's facilities under nominal and emergency conditions. The methodology for determining the path was to pass through the from-bus and stop just before the to-bus. Transformers, jumpers, and other equipment were considered when determining the limiting element for the from-bus only.

Table 1: Load Limits

Station A From	Station B To	Voltage KV	Nominal Limit Amps	Emergency Limit Amps	Nominal Limit MVA	Emergency Limit MVA	Limiting Equipment
BICKNELL	VAIL	345	251	323	150	193	Transformer
VAIL	BICKNELL	345	1370	1507	819	901	Conductor
GREEN-SW	GREENLEE	345	586	698	350	417	Transformer
GREENLEE	GREEN-SW	345	1370	1507	819	901	Conductor
APACHE	BUTERFLD	230	840	924	335	368	Conductor
BUTERFLD	APACHE	230	840	924	335	368	Conductor
APACHE	RED TAIL	230	1100	1210	438	482	Conductor
RED TAIL	APACHE	230	1100	1210	438	482	Conductor
BUTERFLD	PANTANO	230	840	924	335	368	Conductor
PANTANO	BUTERFLD	230	251	281	100	110	Transformer
BUTERFLD	SAN RAF	230	920	1012	367	403	Conductor
MORENCI	GREEN-SW	230	1100	1210	438	482	Conductor
GREEN-SW	MORENCI	230	251	323	150	193	Transformer
DOSCONDO	MORENCI	230	1100	1210	438	482	Conductor
MORENCI	DOSCONDO	230	1100	1210	438	482	Conductor
MORENCI	PD-MORNC	230	920	1012	367	403	Conductor
PD-MORNC	MORENCI	230	753	843	300	336	Transformer
PANTANO	SAHUARITA	230	251	281	100	110	Transformer
SAHUARITA	PANTANO	230	840	924	335	368	Conductor
SAHUARITA	BICKNELL	230	840	924	335	368	Conductor
BICKNELL	SAHUARITA	230	251	323	150	193	Transformer
RED TAIL	DOSCONDO	230	1100	1210	438	482	Conductor
DOSCONDO	RED TAIL	230	1100	1210	438	482	Conductor
DAVIS	RIVIERA	230	1100	1210	438	482	Conductor
APACHE	WINCHSTR	230	1100	1210	438	482	Conductor
WINCHSTR	APACHE	230	702	773	420	462	Transformer
APACHE	HAYDENAZ	115	620	682	123	136	Conductor
HAYDENAZ	APACHE	115	620	682	123	136	Conductor
AVRA	MARANA	115	360	396	72	79	Conductor
MARANA	AVRA	115	360	396	72	79	Conductor
BICKNELL	THREEPNT	115	251	281	100	112	Transformer
THREEPNT	BICKNELL	115	620	682	123	136	Conductor
BICKNELL	MILLSITE	115	251	281	100	112	Transformer
MILLSITE	BICKNELL	115	620	682	123	136	Conductor
BICKNELL	OXIDEPLT	115	251	281	100	112	Transformer
OXIDEPLT	BICKNELL	115	620	682	123	136	Conductor
MARANA	MARANATP	115	500	550	100	110	Jumpers
MARANATP	MARANA	115	500	550	100	110	Jumpers
PANTANO	KARTCHNR	115	251	281	100	112	Transformer
AVRA	SANDARIO	115	360	396	72	79	Conductor
SANDARIO	AVRA	115	360	396	72	79	Conductor
THREEPNT	SANDARIO	115	360	396	72	79	Conductor
SANDARIO	THREEPNT	115	360	396	72	79	Conductor
THREEPNT	VALENCIA	115	620	682	123	136	Conductor

SECTION III

SOUTHWEST TRANSMISSION COOPERATIVE, INC.

TEN YEAR PLAN

2006 – 2015

TECHNICAL STUDY REPORT

**SUBMITTED TO THE ARIZONA CORPORATION COMMISSION
IN FULFILLMENT OF A.R.S. §40-360.02 ¶C.7**

**TRANSMISSION PLANNING
JANUARY 2006**

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SOUTHWEST TRANSMISSION COOPERATIVE, INC.
TEN YEAR PLAN
2006 – 2015
TECHNICAL STUDY REPORT

INTRODUCTION

This technical report is submitted to the Arizona Corporation Commission (“Commission”) pursuant to the Arizona Revised Statutes (“ARS”) §40-360.02 ¶C.7, and Decision No. 63876, dated July 25, 2001, regarding the Biennial Transmission Assessment prepared by Commission Utilities Division Staff.

Power flow analyses performed for this report looked at N-0 and N-1 conditions for each year from 2006 to 2013 and for the year 2015, the final year of this Ten Year Plan. Details of these analyses are found below.

The last stability analyses completed by SWTC were included in the SWTC 2002 Ten Year Plan Filing for the Winchester Project. These studies were performed on the system using summer of 2004 conditions, which was reported in the 2002 SWTC Ten Year Plan filing to the Commission. Stability studies for the expanded systems of 2006 and later have not been performed.

POWER FLOW ANALYSIS

Power flow studies were performed using General Electric’s Positive Sequence Load Flow (“PSLF”) program. Power flow cases were created for the years 2006-2013 and the year 2015 of the study plan using the latest base cases from the Western Electricity Coordinating Council (“WECC”). The base cases from WECC were updated with the latest load projections of SWTC and other entities participating in the Southwest Area Transmission (“SWAT”) Planning Group. Representations of the sub-transmission systems of SWTC’s member-owners were added to the cases as necessary. Base case and single contingency conditions were evaluated using PSLF to determine system impacts and timing of transmission facilities needed to mitigate those system impacts.

Although numerous outage simulations were performed for most of the years of the study period, the power flow analysis included in this report is a representative, rather than an exhaustive, analysis of how the system might perform. The analyses looked at the impact of projected member system load growth to the interconnected transmission system, and also determined where facilities would be placed to most economically serve projected member system load. As a result of these studies, SWTC will be assured of maintaining reliability and quality of service for its interconnected transmission system and for the customers of its member-owners.

With the planned projects of this Ten Year Plan included, the N-1 analyses for the years 2006-2010, 2013 and 2015 showed no violations of SWTC's internal planning criteria under normal and emergency conditions.

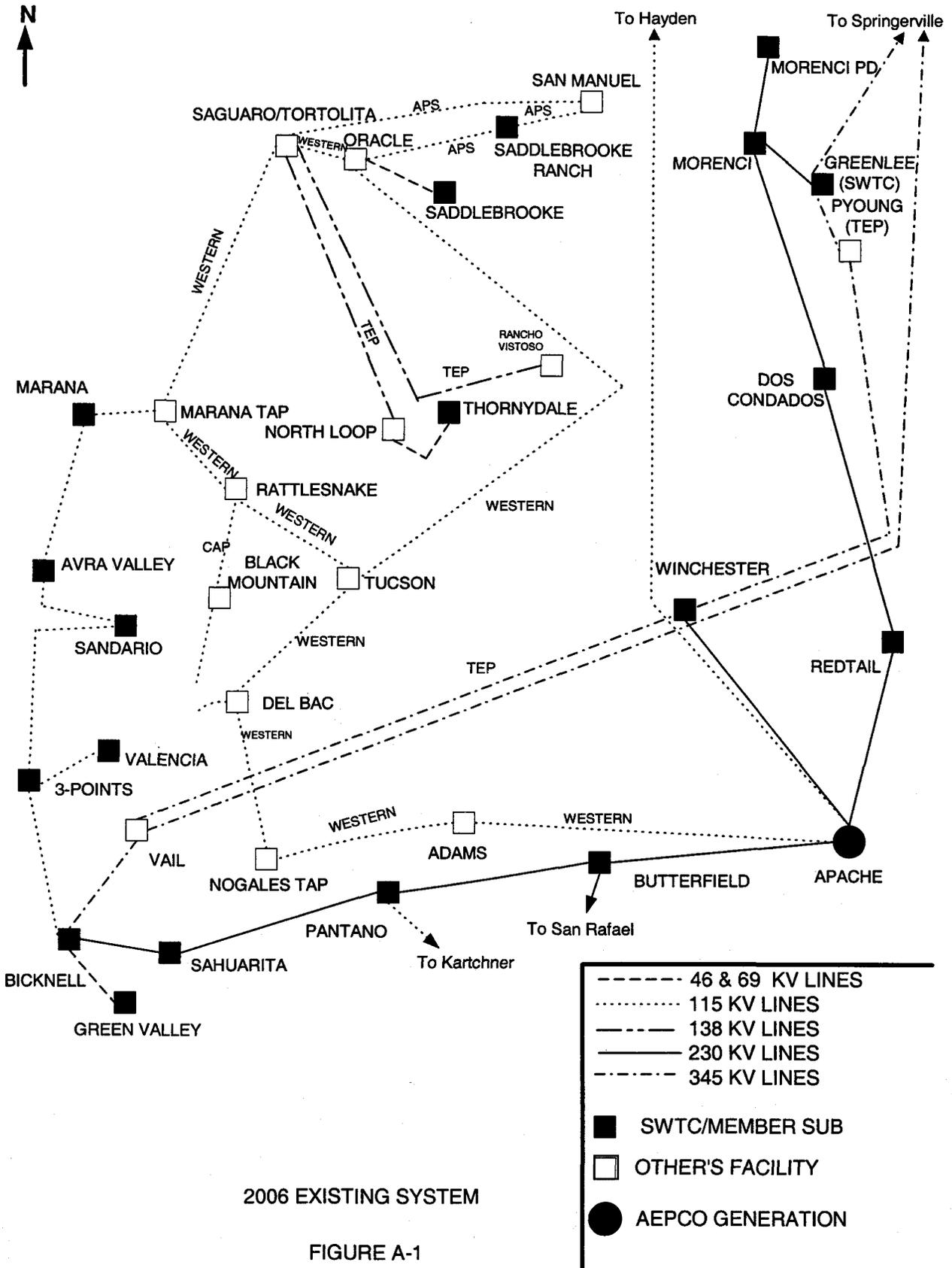
SWTC's existing and proposed transmission system maps are included in Appendix A, which starts on page 29. Power flow one-line diagrams are included in Appendix B, which starts on page 32. The power flow diagrams show the entire SWTC system for selected years of the Ten Year Plan.

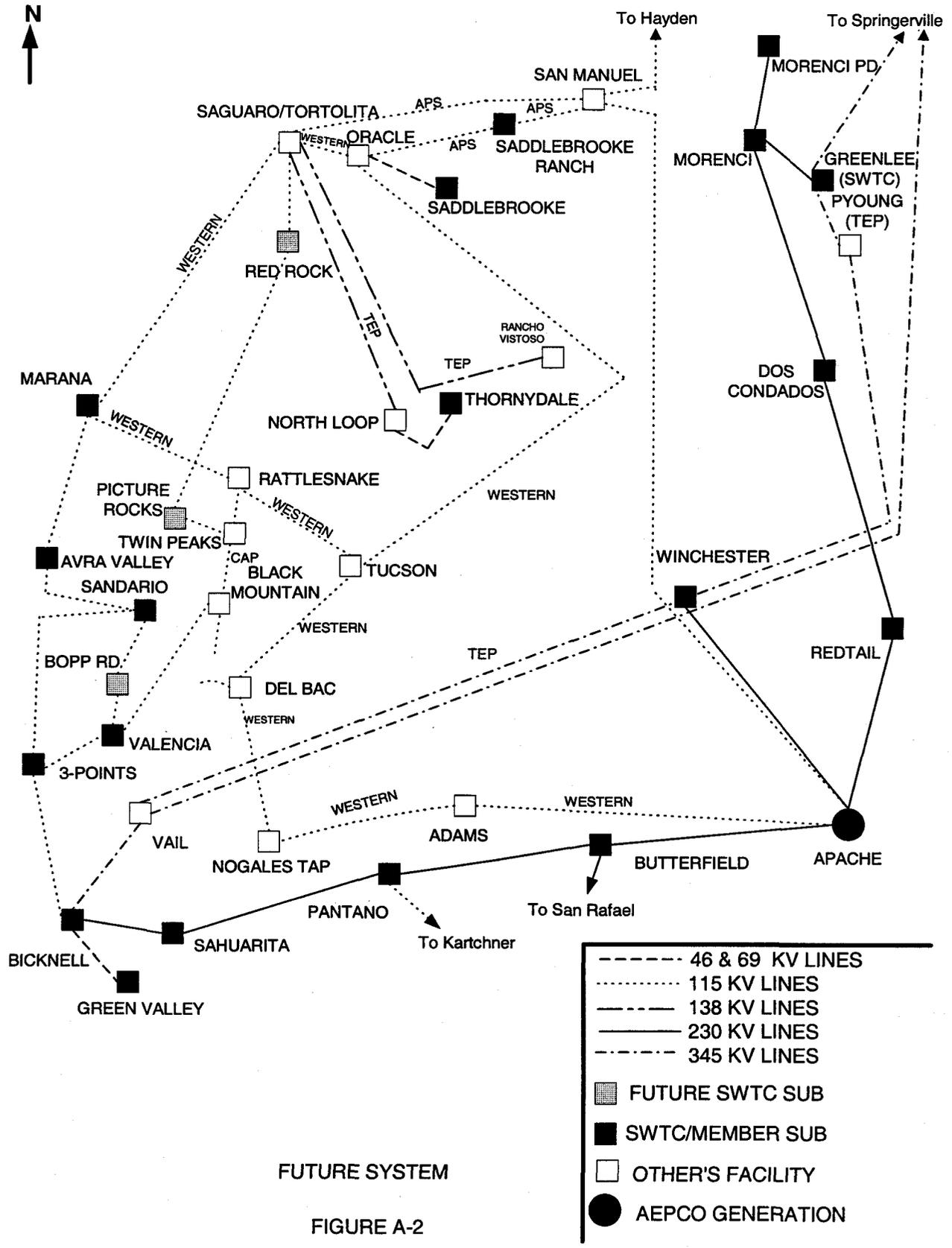
STABILITY ANALYSIS

Extensive stability studies were performed for the Winchester Interconnect Project as reported in the 2002 SWTC Ten Year Plan filing to the Commission. SWTC has not performed any stability analyses for the expanded systems of 2006 and beyond.

APPENDIX A

EXISTING AND PROPOSED TRANSMISSION SYSTEM MAPS



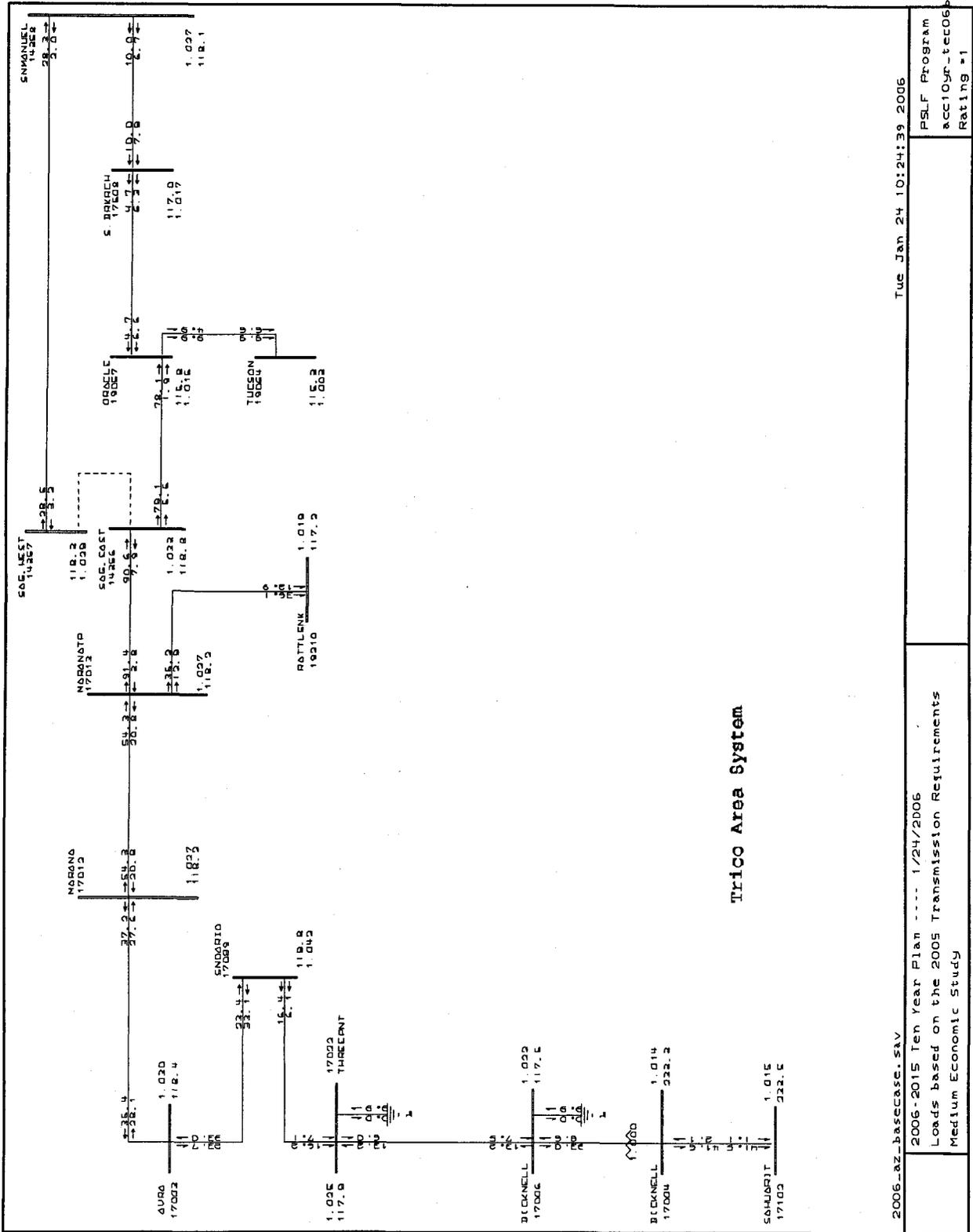


FUTURE SYSTEM

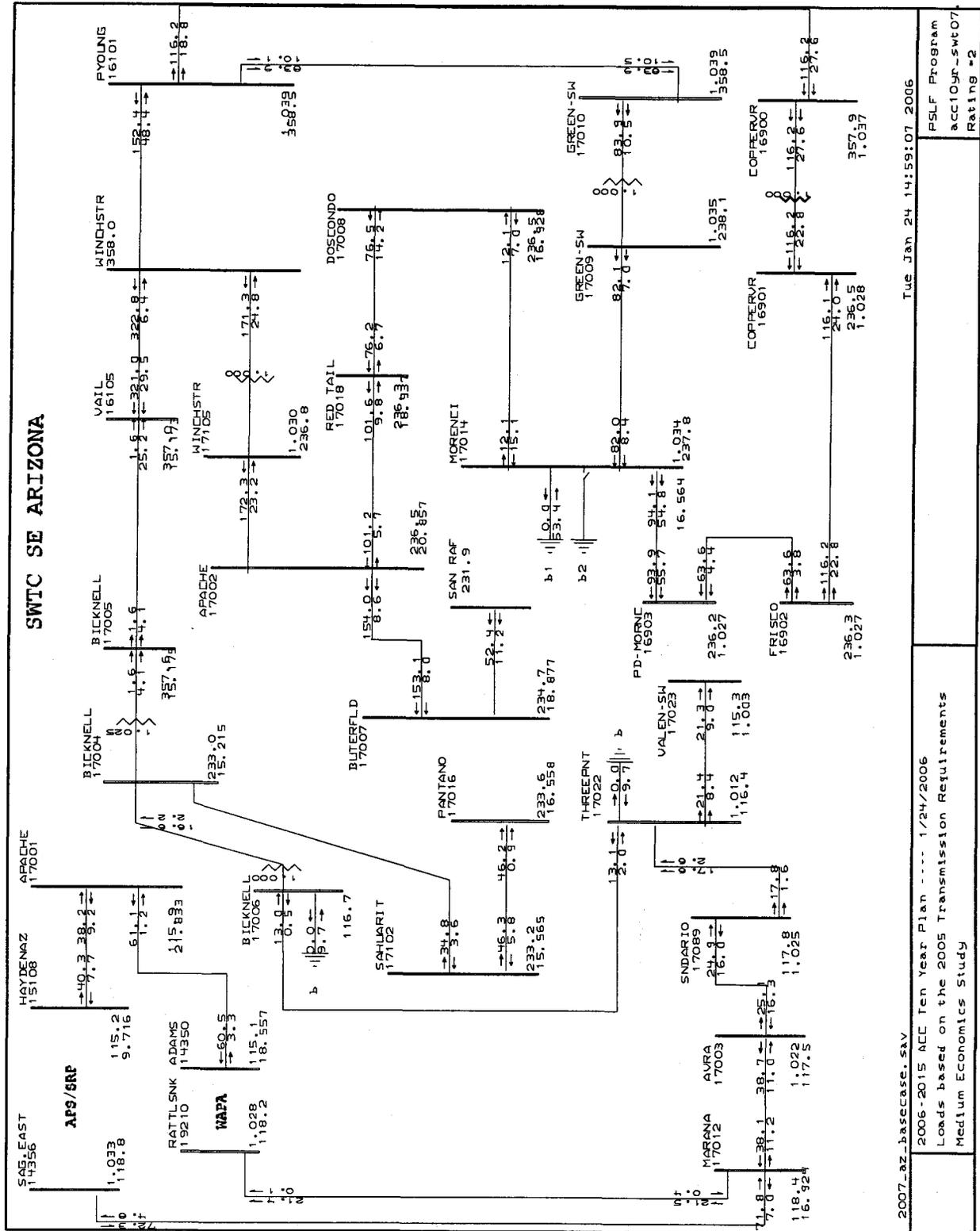
FIGURE A-2

APPENDIX B
POWER FLOW ONE LINE DIAGRAMS

2006 Southwest Transmission Cooperative detail of Trico Electric Cooperative Area Base with Sandario and Saddlebrooke Ranch Substations



2007 Southwest Transmission Cooperative System with a new interconnection at Red Rock and the Marana Line Upgrade



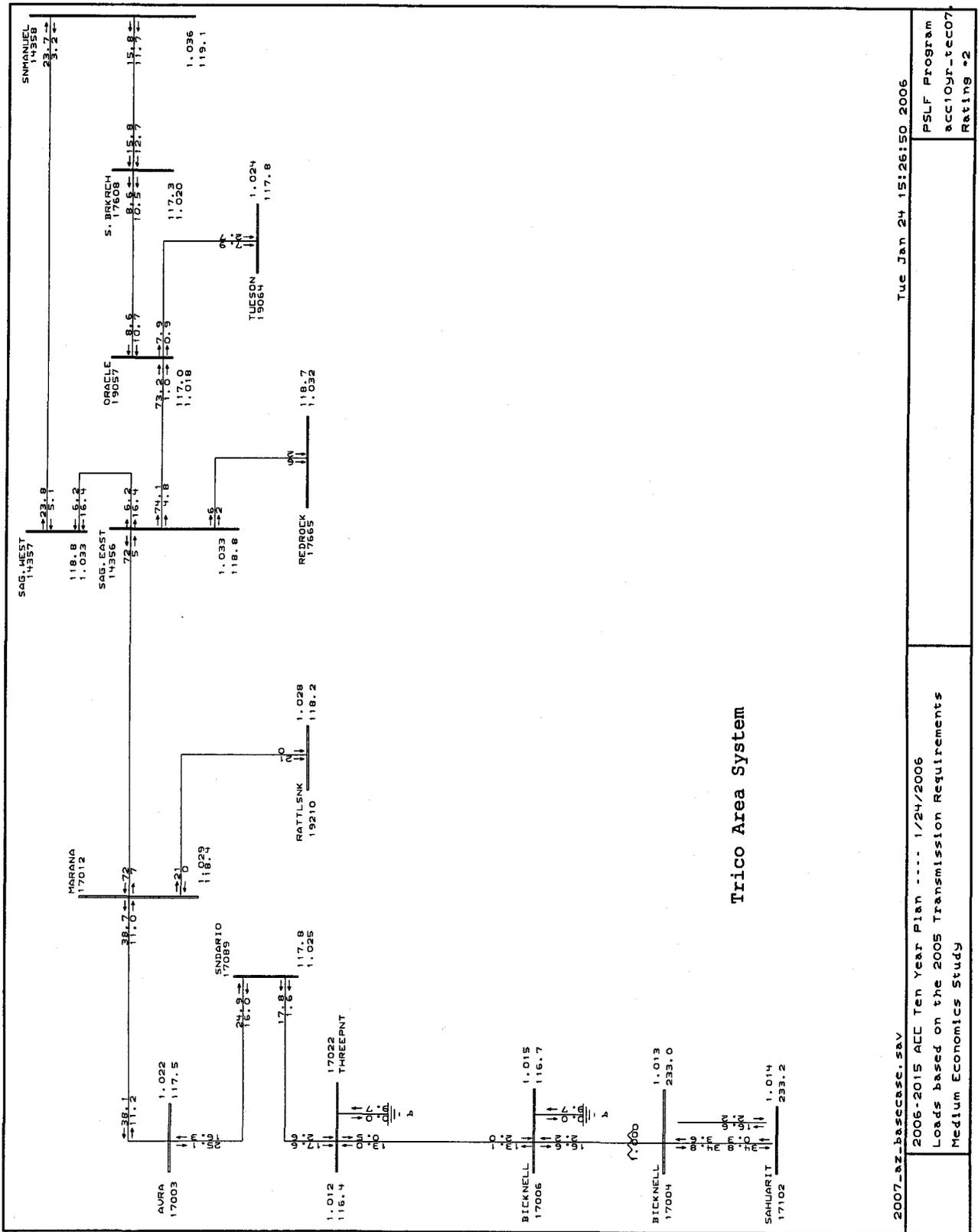
Tue Jan 24 14:59:07 2006

2007_AZ_basecase.sav

2006-2015 ACC Ten Year Plan --- 1/24/2006
 Loads based on the 2005 Transmission Requirements
 Medium Economics Study

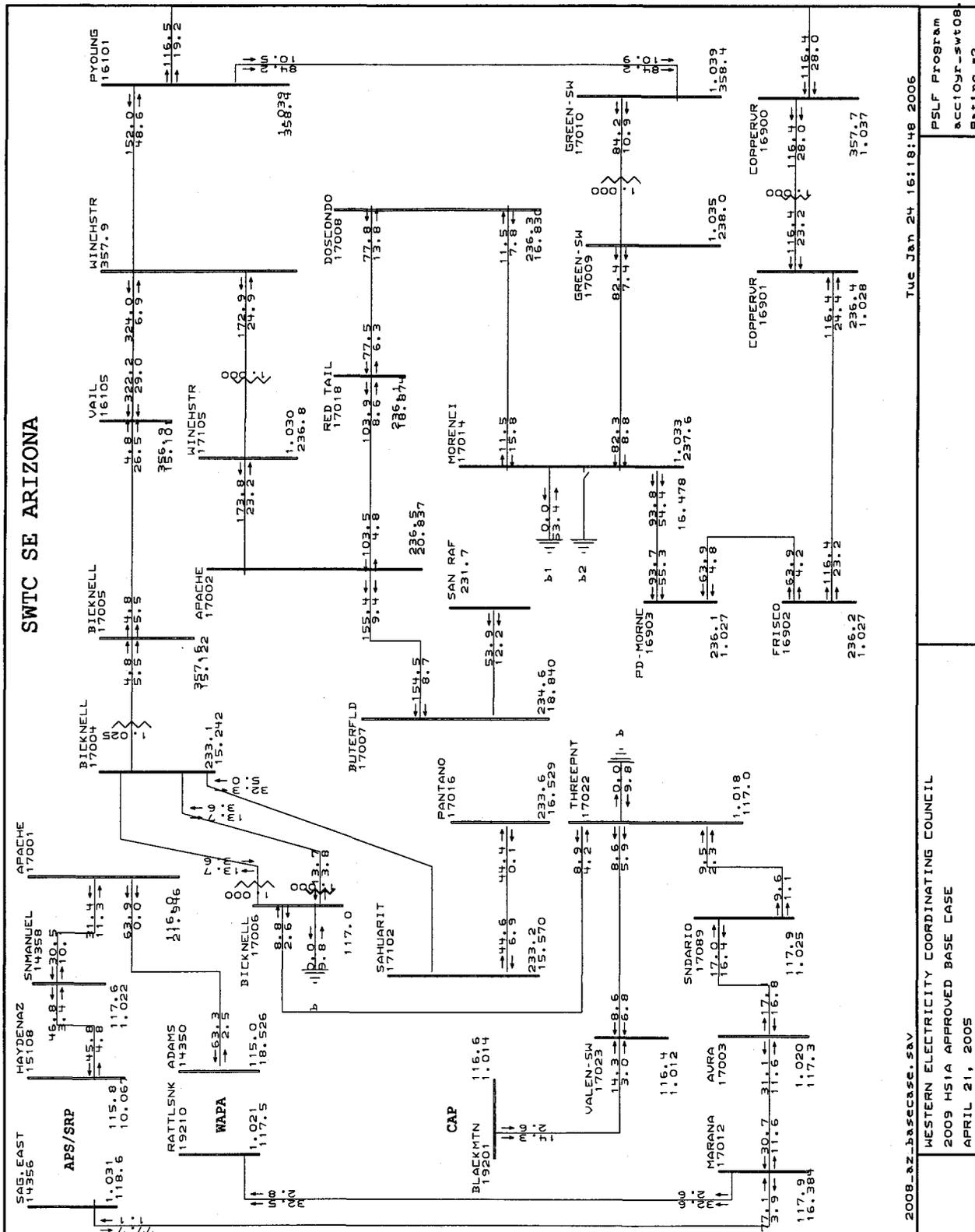
PSLF Program
 acc10yr_swt07.drw
 Rating #2

2007 Southwest Transmission Cooperative detail of Trico Electric Cooperative Area with a new interconnection at Red Rock and Marana Line Upgrade



2007-az-basecase.sav	Tue Jan 24 15:26:50 2006
2006-2015 ALL Ten Year Plan --- 1/24/2006	PSLF Program
Loads based on the 2005 Transmission Requirements	acc10yr-tec07.drw
Medium Economics Study	Rating =2

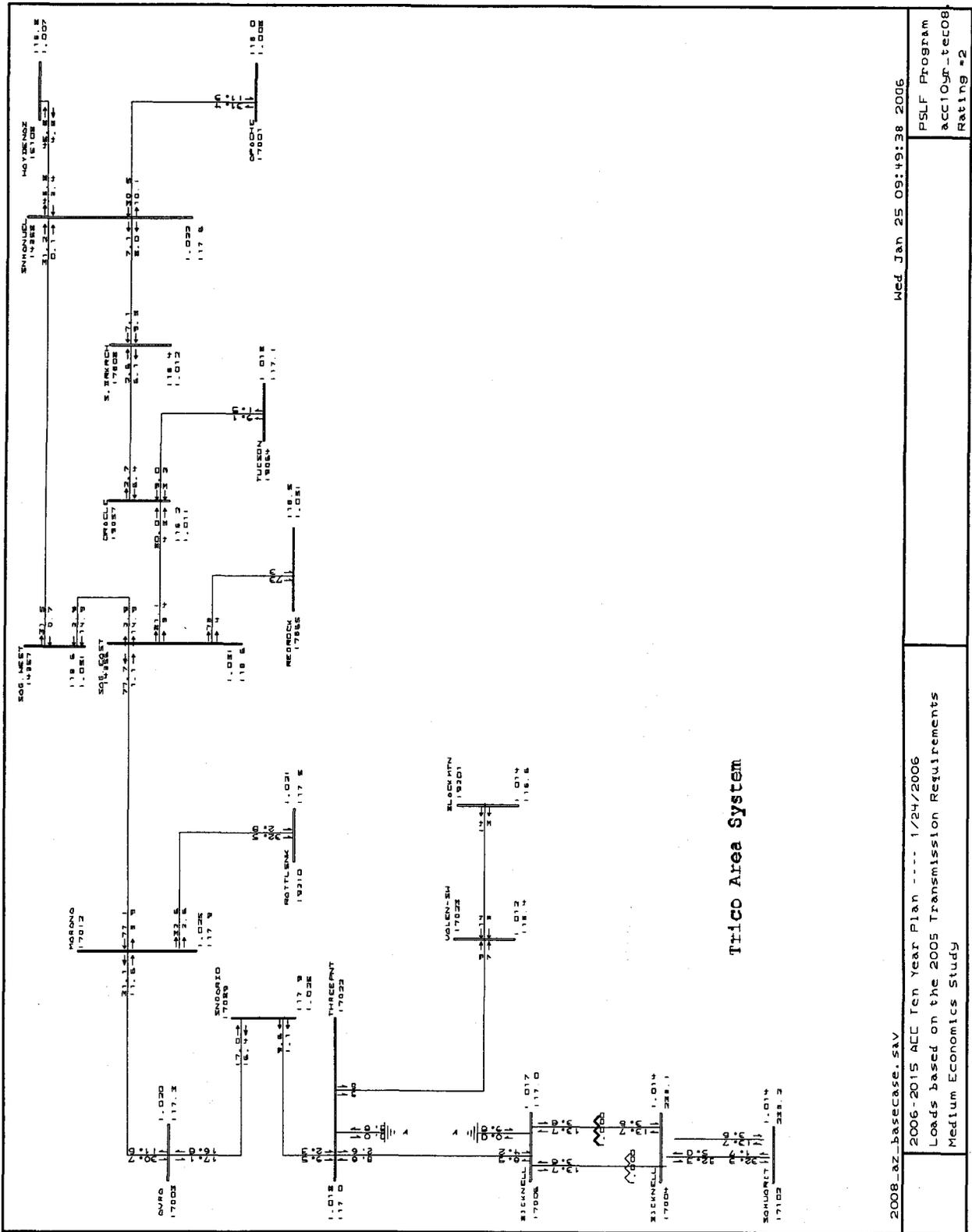
2008 Southwest Transmission Cooperative System with a new interconnection at San Manuel



SWTC SE ARIZONA

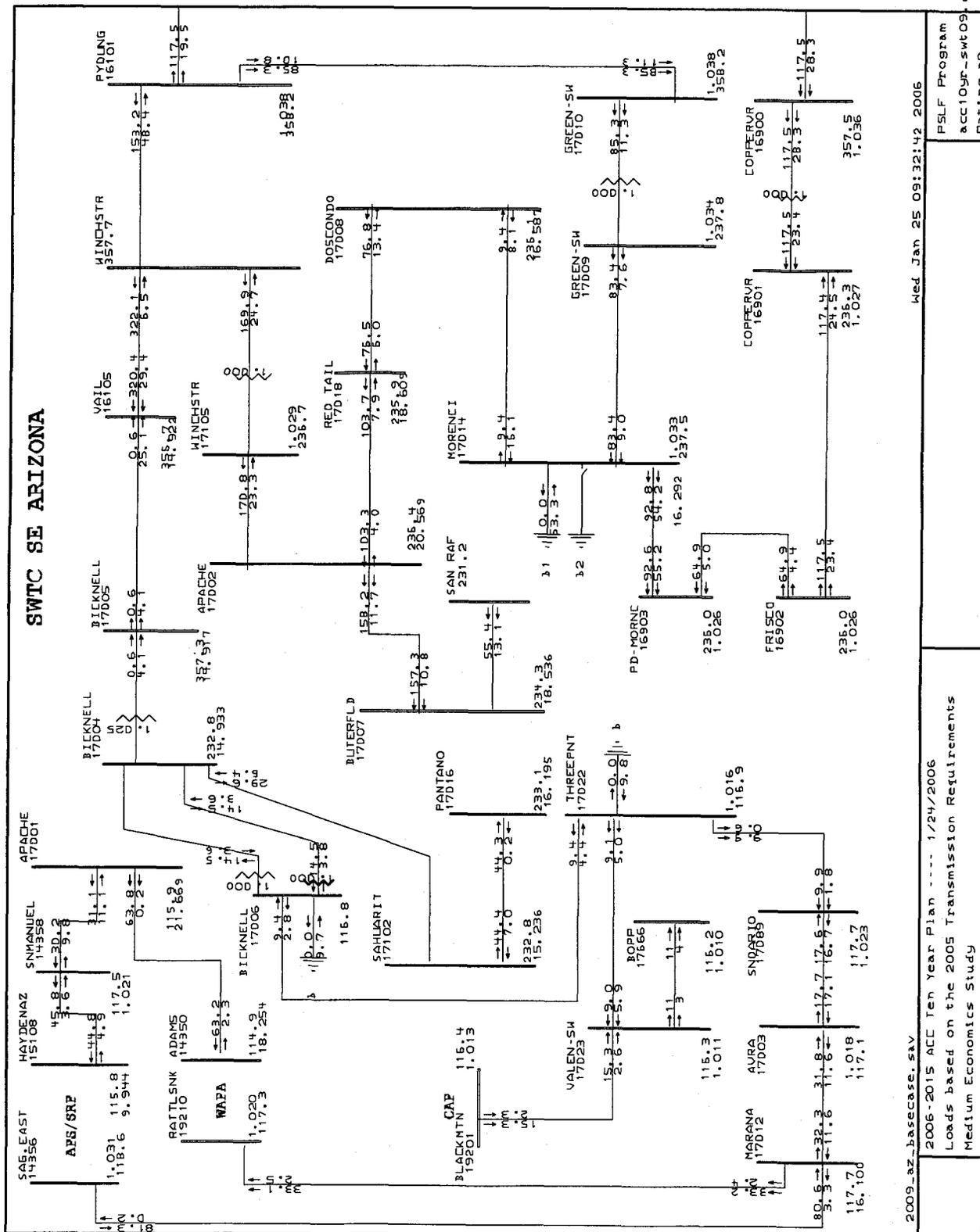
2008.az_basecase.sav
 WESTERN ELECTRICITY COORDINATING COUNCIL
 2009 HS1A APPROVED BASE CASE
 APRIL 21, 2005
 Tue Jan 24 16:18:48 2006
 PSLF Program
 acct09r_swt08.drw
 Rating -2

2008 Southwest Transmission Cooperative detail of Trico Area with a new interconnection at San Manuel

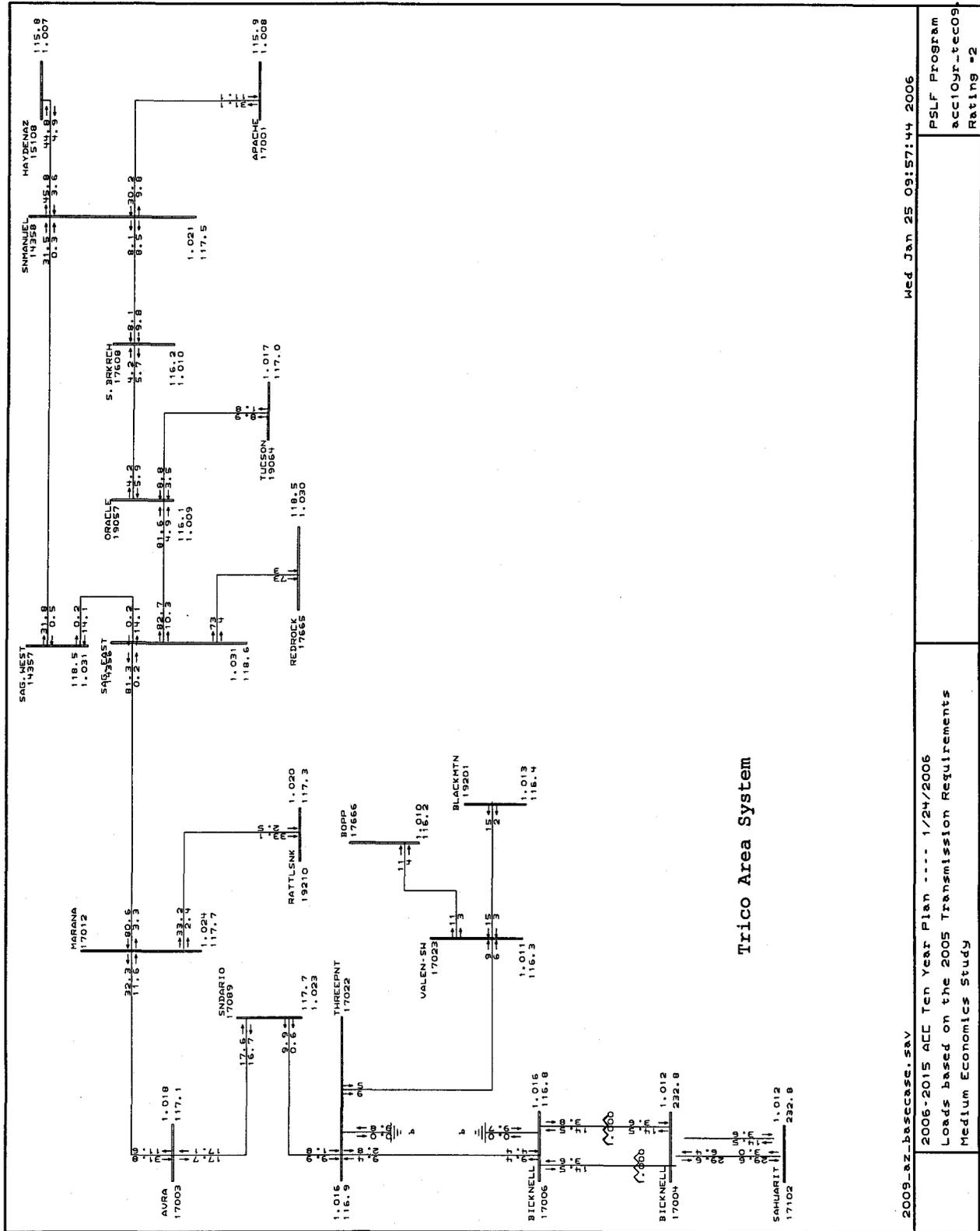


2008_sz_basecase.s3v	Wed Jan 25 09:49:38 2006	PSLF Program acc10yr-tec08.drv Rating #2
2006-2015 ACC Ten Year Plan --- 1/24/2006	Loads based on the 2005 Transmission Requirements Medium Economics Study	

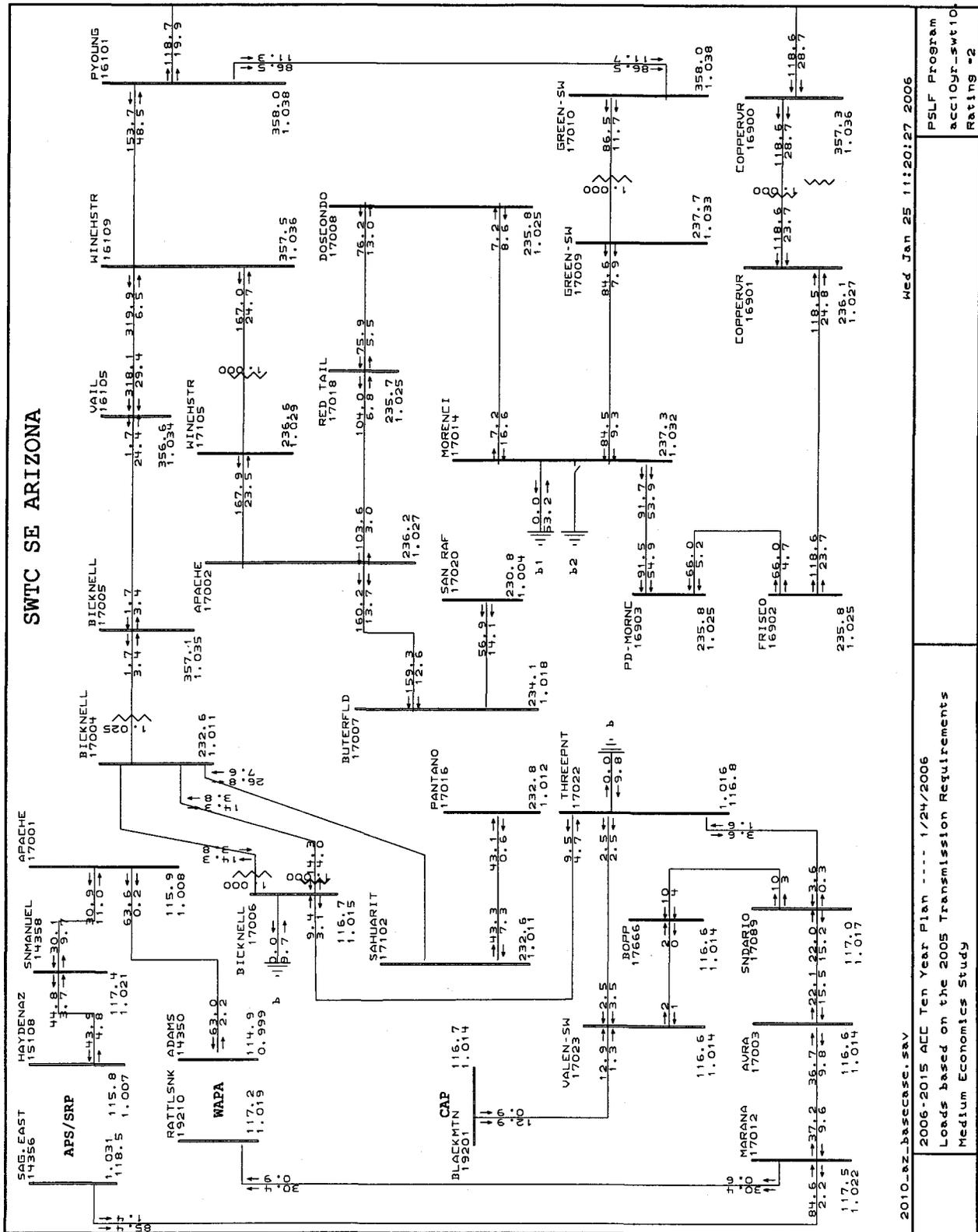
2009 Southwest Transmission Cooperative with the Valencia to Bopp Road 115 kV line



2009 Southwest Transmission Cooperative detail of Trico Area with the Valencia to Bopp Road 115 kV line

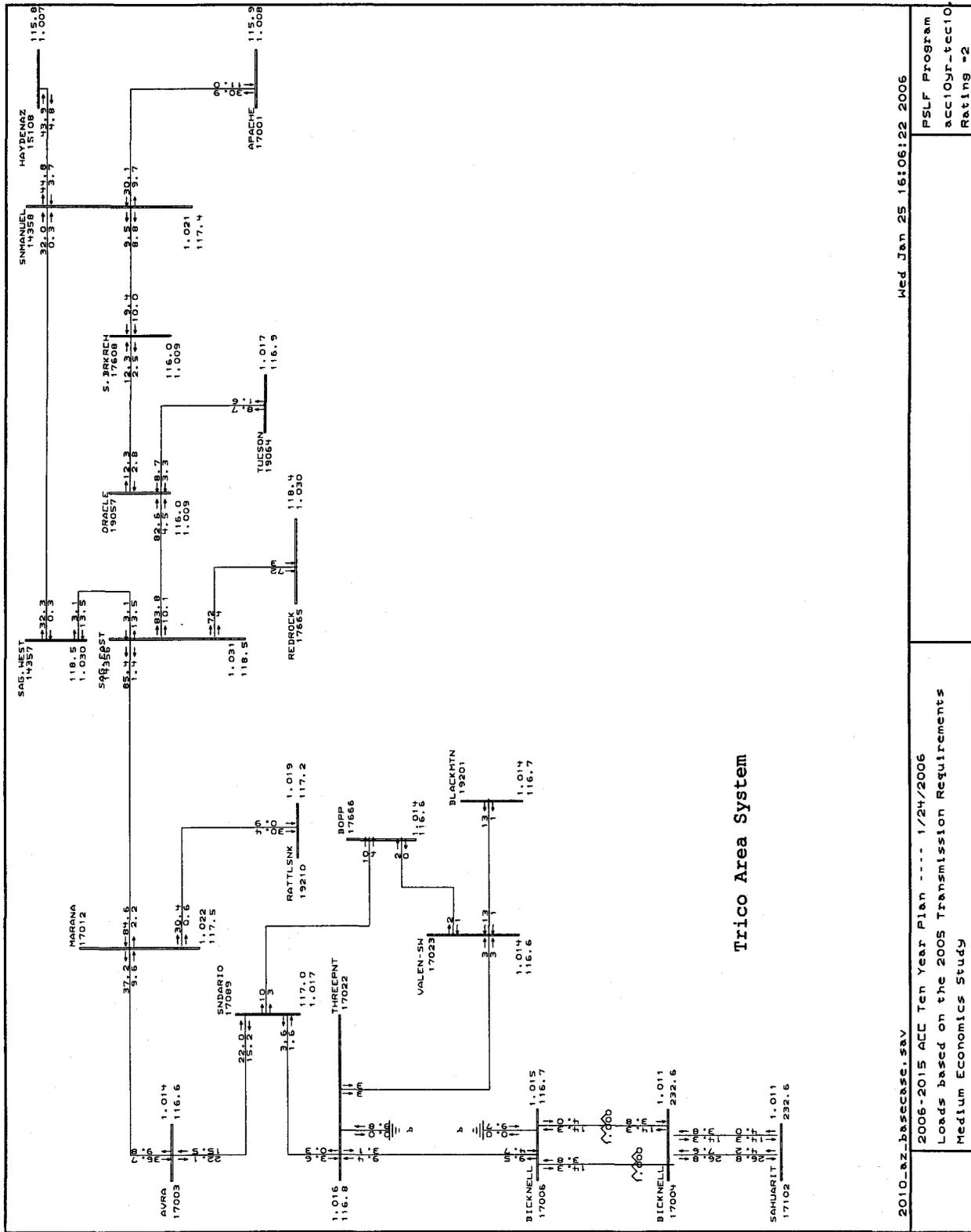


2010 Southwest Transmission Cooperative with the Sandario to Bopp Road 115 kV line



2010_az_basecase.sav	Wed Jan 25 11:20:27 2006
2006-2015 ACC Ten Year Plan ---- 1/24/2006	PSLF Program
Loads based on the 2005 Transmission Requirements	acc10yr_swt10.drw
Medium Economics Study	Rating -2

2010 Southwest Transmission Cooperative detail of Trico Area with the Sandario to Bopp Road 115 kV line



2010_rz_basecase.sav

2006-2015 ACC Ten Year Plan --- 1/24/2006

Loads based on the 2005 Transmission Requirements Medium Economics Study

PSLF Program acc10yr-tcc10.drw Rating -2	Wed Jan 25 16:06:22 2006
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2015 Southwest Transmission Cooperative detail of Trico Electric Cooperative Area with all planned projects

