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June 3, 1991

BY HAND-DELIVERY

Mr. Steve C. Tribble, Director
Division of Records and Reporting
Florida Public Service Commission
101 East Gaines Street
Tallahassee, Florida 32301

Re: Docket No. 910578-EI

Dear Mr. Tribble:

Enclosed for filing on behalf of Florida Power Corporation are the original and fifteen copies of FPC's Petition to Determine Need for Electrical Transmission Line and supporting document.

In accordance with Rule 25-22.076(3), only one copy of the complete load flow analysis is included with this filing. Two additional copies have been furnished to Mr. Floyd.

Very truly yours,

Richard D. Melson

RDM/cla
Enclosure
cc (w/encl.): Bob Elias
Roland Floyd
Pat Brady

ACK ✓
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Florida Power
CORPORATION

DETERMINATION OF NEED FOR DEBARY-WINTER SPRINGS 230kV TRANSMISSION LINE PROJECT

FLORIDA POWER CORPORATION

DETERMINATION OF NEED

FOR DEBARY-WINTER SPRINGS

230 kV TRANSMISSION LINE PROJECT

Docket No. 910578-EI

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

A. Introduction

Florida Power Corporation (FPC) has determined the need to construct a 230 kV transmission line from the DeBary Generating Site to interconnect with the bulk transmission grid at the Winter Springs Substation (the "DeBary-Winter Springs Line" or the "Project"). This line is needed to maintain and improve the reliability of FPC's 230 kV bulk transmission system in the Greater Orlando Area and to give FPC the ability to reliably disperse power if additional combustion turbine capacity is constructed at the DeBary Generating Site on short notice.

This document supports FPC's petition requesting the Commission to determine the need for the Project pursuant to the Transmission Line Siting Act (TLSA).

B. Project Description

The DeBary-Winter Springs 230 kV transmission line will extend south approximately 18 to 22 miles from the DeBary Generating Site in Volusia County to the existing Winter Springs Substation in Seminole County. A map showing the starting and ending points of the DeBary-Winter Springs line is shown on page 2. Corridor selection is still underway, and the final routing will be determined as part of the environmental proceedings under the TLSA.

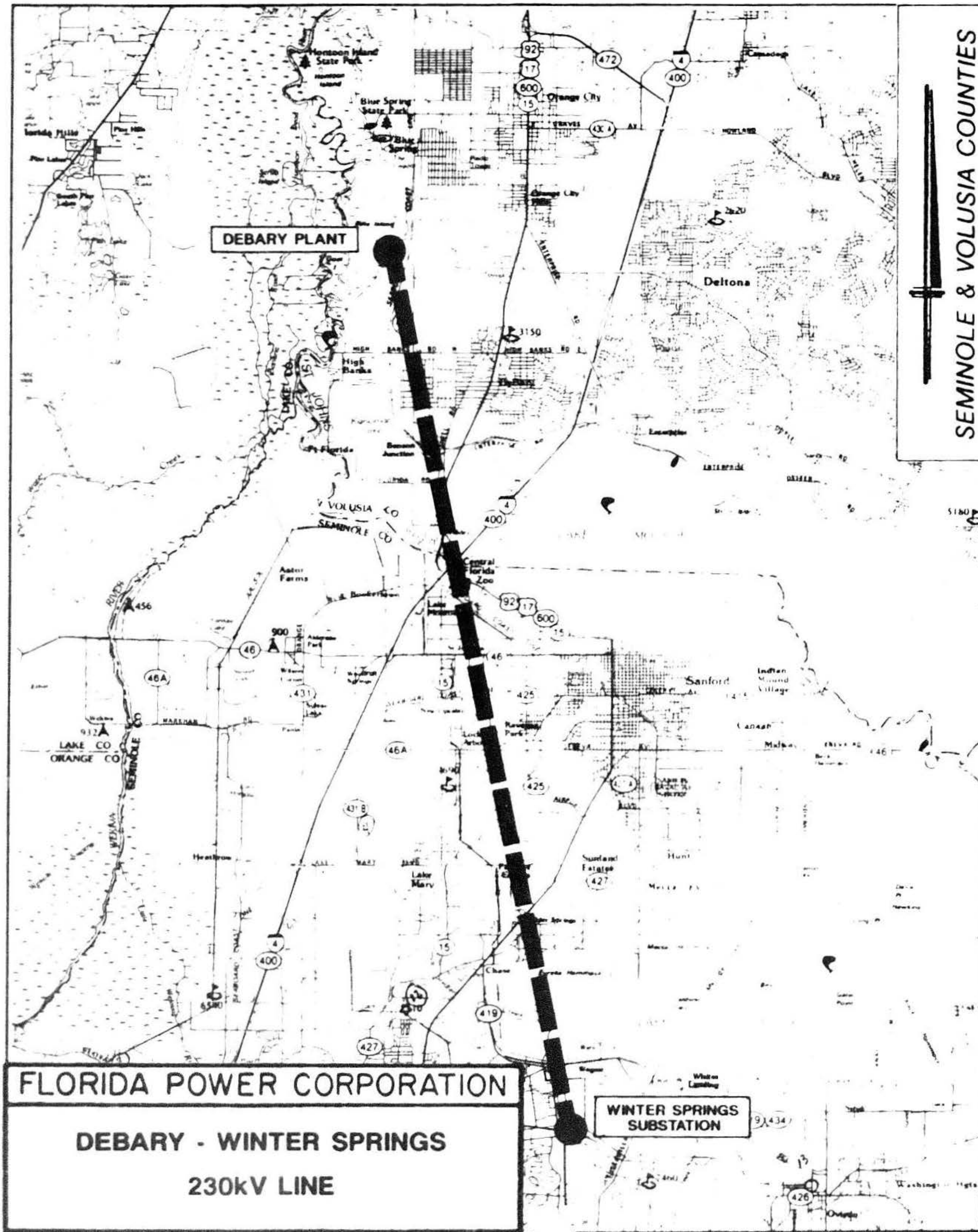
The Project is needed by December, 1995 to maintain the reliability of FPC's bulk transmission system and to accommodate the addition of combustion turbine capacity at the DeBary Generating Site. The cost of the Project is estimated at approximately $12 million to $16 million, depending on the final routing and length of the line.

C. Need for the Project

FPC has an obligation to provide adequate and reliable power to its customers in a cost-effective manner. The DeBary-Winter Springs line is needed to help meet this obligation. Specifically, the Project meets the following needs of the FPC system:

Need for Area Transmission Reliability

1. The DeBary-Winter Springs line is needed by December, 1995 to maintain single contingency reliability. Without the Project, the loss of the Sanford-North Longwood 230 kV line will cause the Sanford-Sylvan-North Longwood 230 kV line to exceed its emergency rating and could result in loss of customer load.



FLORIDA POWER CORPORATION

DEBARY - WINTER SPRINGS

230kV LINE

Date: 5/30/91	Drawn: SJN	Line Length: 20 MILES±	
Checked:	Approved:	Type of Construction: STEEL/CONC.	
W.O. N°.:	Dwg. N°.: T-13106A	CBID Date: 11/95	
Section , Twp.	, Rge.	CMI Date:	

2. By December, 1997, the DeBary-Winter Springs line is needed to maintain single contingency reliability for an additional contingency. By that date, without the Project, the loss of the North Longwood-Winter Springs 230 kV line would cause the Rio Pinar-Stanton 230 kV line to reach its emergency rating and could result in loss of customer load.

3. The Project will improve the reliability of service to the Greater Orlando Area load center by significantly reducing the amount by which the 230 kV transmission system overloads in the event of an outage on the double circuit segment of the Sanford-North Longwood and Sanford-Altamonte lines. This improvement reduces the risk of a cascading failure that could cause a widespread blackout of the Greater Orlando Area.

4. The Project will improve the power transfer capability on FPC's system by providing an additional transmission path from the electrical sources at DeBary and at FPL's Sanford Plant in the North to the Greater Orlando Area load center in the South.

5. The Project will provide an additional 230 kV source to the Winter Springs Substation that will support future extension of the 230 kV system, which will provide additional support for the 69 kV transmission system as load continues to grow in the eastern portion of FPC's service territory.

Strategic Need to Support Generation Planning Flexibility

FPC has 300 MW (nominal) of combustion turbine (CT) capacity at the DeBary Generating Site and engineering and equipment procurement is underway for an additional 340 MW of CTs with a planned in-service date of October, 1992. When these new units are in service, the 230 kV transmission system from the plant will be fully utilized and the site will become transmission-limited. This means that the addition of more capacity at the site without any new transmission would result in the violation of single contingency transmission reliability criteria.

The addition of the DeBary-Winter Springs line would enable FPC to reliably disperse the power from an additional 450 MW of CTs at the DeBary site, above the 640 MW that will be at the site at the end of 1992.

FPC's current generation plans do not call for additional CTs at DeBary beyond the 340 MW being installed in 1992. However, power supply planning is an inherently uncertain process. There are a number of contingency situations that could require FPC to construct additional CTs at the DeBary site on short notice, such as: (i) inability to use the Intercession City site for 340 MW of CTs needed by December, 1993; (ii) an unexpected delay in the third 500 kV interconnection with Georgia; (iii) unexpected changes in load growth in FPC's service area; and/or (iv) unexpected changes in the timely availability of planned generating capacity from qualifying facilities (QFs).

The licensing and construction lead time for 230 kV transmission lines subject to the TLSA is approximately 4 to 5 years, while the lead time for CTs is only about 2 years. Thus the licensing of transmission becomes the critical path item when FPC needs to add generating capacity on short notice. By overcoming the DeBary site's transmission limitations, the Project will give FPC a site capable of supporting additional CTs. This will provide FPC with the strategic flexibility to respond on short notice to a variety of generation or siting contingencies.

E. Alternatives

FPC examined a number of alternatives that would address the technical need to maintain transmission reliability by protecting against the various contingency situations and that would overcome the DeBary site's transmission limitation. The only single-line alternative that would solve all of these problems is a longer, more expensive version of the same line. While there are several two-line projects that would address these needs, each of these combinations is more costly than the Project and is less desirable from a technical viewpoint.

F. Conclusion

The DeBary-Winter Springs transmission line is needed by December, 1995 to maintain the ability of FPC's 230 kV transmission system to reliably withstand single contingency transmission outages. The Project also avoids another single contingency violation that would otherwise occur by December, 1997. In addition, the line enhances transmission reliability by minimizing the effect of outages of double-circuit transmission lines in the Greater Orlando Area; improves the power transfer capability into that load center; supports the future growth and extension of the transmission grid; and overcomes the transmission limitations at the DeBary site by supporting the installation of 450 MW of additional CT capacity at that site.

The Commission should therefore grant a determination of need for the DeBary-Winter Springs line as the first step in certification of the line under the Transmission Line Siting Act.

II. PROJECT DESCRIPTION

A. Project Name. DeBary-Winter Springs 230 kV Line.

B. Starting and Ending Point of Line. The line starts at the DeBary Plant 230 kV Substation in Volusia County, near DeBary, Florida, and terminates at the Winter Springs Substation in Winter Springs, Florida in Seminole County. The starting and ending points of the line are shown graphically on page 2 of the Executive Summary.

C. Design. The nominal design and operating voltage of the line is 230 kV. The line will be constructed on single-pole steel or concrete structures using 1,590 KCM ACSR (aluminum conductor steel reinforced) conductors having a normal summer rating of 677 MVA and a normal winter rating of 789 MVA. FPC expects to use single-circuit and double-circuit structures in the construction of the line.

D. Project Cost Estimate. The project has an estimated cost ranging from $12 million to $16 million (1991 dollars) depending on the final routing and length of the line. An estimate of $14 million (1991 dollars) has been used in this study to compare the Project to possible alternatives. A breakdown of that cost estimate, which corresponds to an approximate 20-mile line that includes a 230 kV conversion of the Lake Emma Substation, is contained in Appendix A.

E. Project Schedule. The estimated in-service date of the Project is December, 1995. A licensing and construction time line supporting that in-service date is contained in Appendix B.

III. DESCRIPTION OF EXISTING FACILITIES

FPC is an investor-owned electric utility organized to provide reliable electric service to customers in 32 counties. FPC provides retail and wholesale electric service to 1.13 million customers throughout its seven operating divisions. A map of FPC's service territory, showing its operating divisions, in contained in Appendix C.

FPC provides this service with its own generating resources, which totaled 6,571 MW at January 1, 1991, and with power purchased under interchange agreements in effect with twenty-four other electric systems in Florida and the Southeast. These electric systems are interconnected through a complex transmission grid. A map showing the bulk transmission system in Peninsular Florida is attached as Appendix D.

FPC's portion of the grid consists of over 4,300 miles of transmission lines at four operating voltage levels: 500 kV, 230 kV, 115 kV and 69 kV. The system also includes 75 transmission and plant substations. A map of FPC's transmission system, which shows major points of interconnection with other Florida utilities, is attached as Appendix E.

The portion of the 230 kV transmission grid in the area directly affected by the DeBary-Winter Springs line is shown on Figure 1:

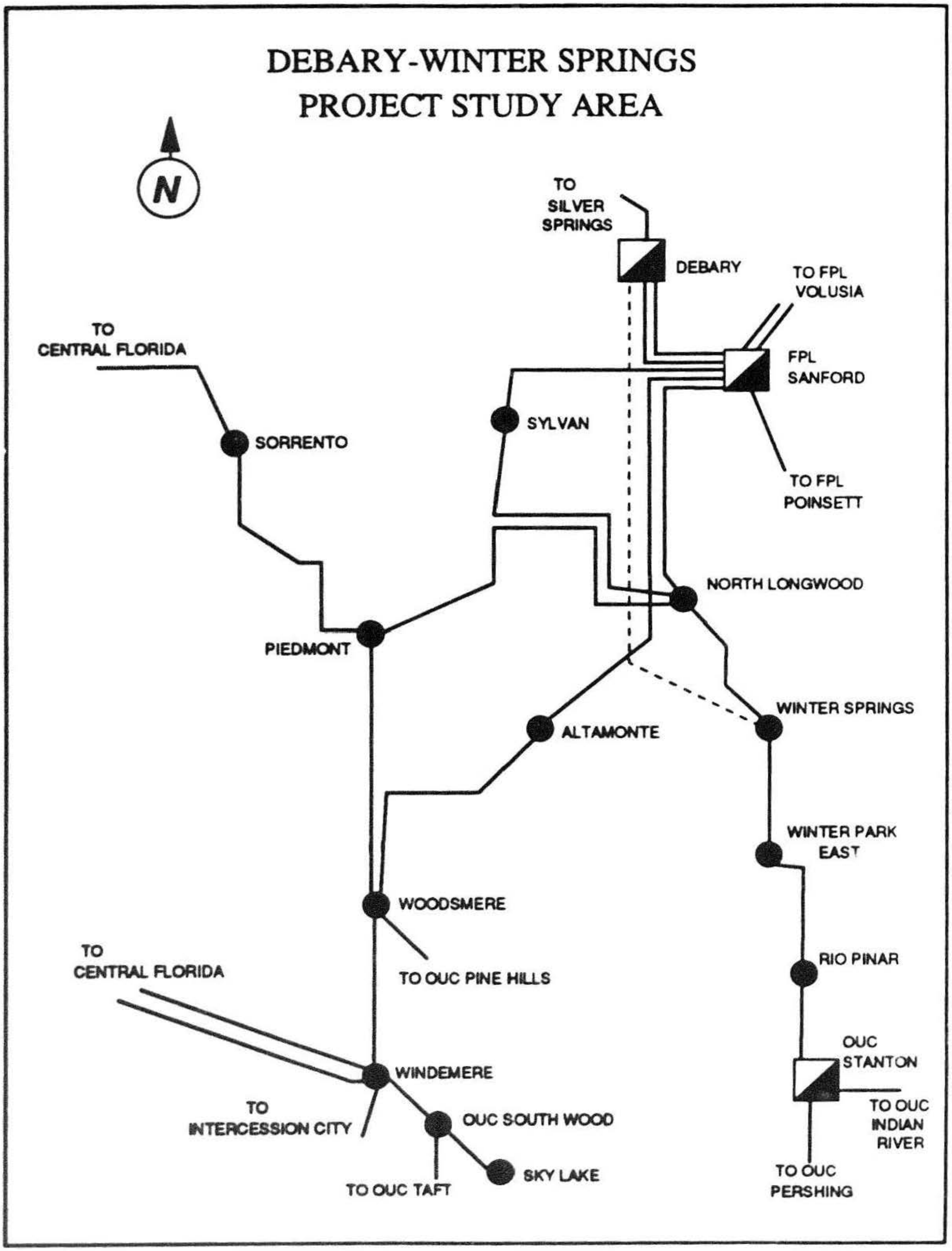

DEBARY-WINTER SPRINGS
PROJECT STUDY AREA
N
TO
SILVER
SPRINGS
DEBARY
TO FPL
VOLUSIA
TO
CENTRAL FLORIDA
FPL
SANFORD
SYLVAN
SORRENTO
TO FPL
POINSETT
NORTH LONGWOOD
PIEDMONT
WINTER SPRINGS
ALTAMONTE
WINTER PARK
EAST
WOODSMERE
TO
CENTRAL FLORIDA
TO OUC PINE HILLS
RIO PINAR
OUC
STANTON
WINDEMERE
TO
INTERCESSION CITY
OUC SOUTH WOOD
TO OUC
INDIAN
RIVER
SKY LAKE
TO OUC TAFT
TO OUC
PERSHING

FIGURE 1

IV. TECHNICAL ANALYSIS

A. Transmission Planning Process

FPC continually studies its transmission system to determine when additional transmission facilities will be required to maintain reliable service to its customers. This process includes planning a transmission system that will have the necessary components to adequately serve its customers ten years in the future. One important factor considered in the planning process is the need to have the flexibility to respond to changes in a timely manner. The demand forecast is one factor which has inherent uncertainties that the planning process must recognize. Therefore, transmission planning must take into account the ability to reliably disperse additional generation from various candidate generating sites that may be needed on short notice, such as the DeBary site.

B. Planning Criteria

FPC plans its transmission system based on criteria established by FPC which are consistent with the criteria established by the Florida Electric Power Coordinating Group (FCG). The FPC and FCG transmission planning criteria are included in Appendices F and G, respectively.

FPC plans its transmission system so that all lines and transformers are within their normal ratings and all voltages are between 95% and 105% of their nominal voltages under normal conditions.

Under single contingency situations (i.e., the loss of one line, transformer, or generator), the FCG planning criteria states that the transmission system should maintain an acceptable system voltage profile and experience no loss of load other than the load connected to the line or transformer which is lost. Each utility in Florida defines what line loading and voltage levels are acceptable on its system under single contingency conditions. FPC defines acceptable line and transformer ratings to be within their emergency ratings under single contingency conditions, and acceptable voltages to be between 95% and 105% of their nominal voltages.

When evaluating transmission projects, FPC also considers the ability of the project to help protect against loss of load in major load centers in the event of a common mode double contingency outage, such as the loss of both circuits of a double-circuit transmission line. FPC also evaluates, on an as-needed basis, the ability of the transmission system to reliably disperse power from generating sites where additional generation may be required.

C. Methodology and Assumptions

FPC's technical assessment examined the performance of the transmission system both with and without the DeBary-Winter Springs transmission line. That assessment included studies showing the impact of adding new combustion turbine generation at the DeBary Generating Site, above the 640 MW that will be in place by the end of 1992.

The technical assessment used the 1990/91 FCG Transmission Task Force Data Bank and the 1990/91 FPC Base Case Data Bank. Both data banks contain an annual model of the Florida interconnected transmission system and of the Southern system for the period 1991-2001. These models are in the form of mathematical representations of the transmission lines, generators, and other electrical system components, as well as substation loads during peak conditions.

Some of the major assumptions used in both data banks that affect the analysis of the DeBary-Winter Springs project include:

1. The West Coast 500 kV Expansion Project, which includes the Southern-Midpoint-Central Florida 500 kV line, the Kathleen-Barcola-FPL Orange River 500 kV line, and associated projects, was assumed to be in service in December, 1996.

2. A proposed reconfiguration of the transmission system that will loop the DeBary-North Longwood and the DeBary-Altamonte 230 kV lines into FPL's Sanford Plant was assumed to be completed in 1993. This reconfiguration,

which involves approximately 0.5 miles of line, will strengthen the Sanford-North Longwood interface.

3. A third Silver Springs-Silver Springs North 230 kV line, approximately 7 miles long, was assumed to be in service in 1993.

4. The models included the additional 340 MW (nominal) of combustion turbines scheduled for installation at the DeBary Generating Site in 1992.

5. All new 230 kV lines were assumed to be constructed with 1,590 KCM ACSR conductors.

The load forecast in the FCG data bank uses projected firm summer peak load levels derived from the utilities' long term average load forecasts. The FPC Base Case uses a peak load forecast that is 110% of the load forecast in the FCG data bank. This safety margin reflects that actual load may be higher than forecast due to extreme weather conditions or other factors. For example, actual load served can be higher than projected firm load if generating and purchased power resources are available to serve all demand without resorting to interruptions of interruptible customers or the exercise of load management. By using this slightly more conservative assumption for area transmission analyses, FPC is more confident that its transmission system will perform within design criteria under a broad range of possible weather and load conditions, and that FPC's ability to serve demand will not become transmission-limited.

FPC prepares both summer and winter data for each year, while the FCG data bank includes only summer data after the first study year. This report will present the results obtained using FPC's winter base cases.

The technical analysis used the Power Technologies, Inc. (PTI) Power System Simulator (PSS/E) package of computer programs to analyze the transmission network and generation performance. These programs are used by most utilities in Florida, as well as by the FCG.

FPC performed a series of steady state power flow analyses using these programs. These analyses considered system performance before and after addition of the DeBary-Winter Springs line, and with and without new generation at the DeBary Generating Site.

The study examined the performance of the system under a variety of single contingency outage conditions, such as the loss of a single transmission line or generating unit. In addition, FPC analyzed system performance in the Greater Orlando Area for the common mode failure of a double-circuit transmission line. The study included an analysis of the statewide transmission system. The results presented in this report are limited to areas of concern that impact the need for the DeBary-Winter Springs line.

D. Results

1. With Existing and Planned Generation at DeBary

The analysis shows that the DeBary-Winter Springs line is needed by December, 1995 to maintain transmission reliability under single contingency conditions. By that date, the single contingency loss of the Sanford-North

Longwood 230 kV line will cause the Sanford-Sylvan-North Longwood 230 kV line to overload to 109% of its emergency rating. FPC would be required to reduce generation by about 500 MW to reduce the flow on this line to its normal rating. If this situation occurred at a time when FPC's system was capacity-limited, that reduction in generation would result in rotating blackouts affecting approximately 95,000 customers at a time.

The need for the line becomes even more critical by December, 1997, when the single contingency loss of the North Longwood-Winter Springs 230 kV line will cause the Rio Pinar-Stanton 230 kV line to load to 100% of its emergency rating. FPC would be required to reduce generation by about 85 MW to respond to this condition. In a similar capacity-limited situation, this reduction in generation could interrupt service to approximately 16,000 customers at a time on a rotating basis.

Also by December, 1997, the single contingency loss of the Rio Pinar-Stanton line will cause the North Longwood-Winter Springs line to load to 107% of its normal rating, requiring corrective action that could affect service to approximately 8,000 customers.

The analysis shows that the addition of the DeBary-Winter Springs line maintains the reliability of the system by ensuring that the flow on any of these lines is within its normal rating under any single contingency situation.

In addition, the Project will mitigate the effect on customers in the event of the double contingency loss of both circuits of the 230 kV line south of the Sanford Plant. In 1993, there will be three circuits running south from FPL's Sanford Plant, two of which share a double-circuit structure for approximately 12 miles. The loss of both circuits (Sanford-Altamonte and Sanford-North Longwood) on the double-circuit section would cause the Sanford-Sylvan-North Longwood line to overload to 169% of its emergency rating. This severe overload would separate the Greater Orlando Area load center from all of the DeBary generation, the FPL Sanford generation, and from the support (through Sanford) of the FPL grid. This separation in turn would overload other lines into the area and could result in a cascading failure and widespread outages affecting approximately 500,000 customers in the Greater Orlando Area. Although the Project does not completely address this double-circuit failure, it does reduce the maximum loading on any line to 117% of the line's emergency rating, and gives system dispatchers more time to react to the situation in a way that would affect fewer customers on a more controlled basis. Table 1 summarizes these results.

Appendices H and J contain detailed load flow results for winter 1995 and 1997, respectively, depicting the flows on lines in the area with and without the Project, with 640 MW of existing and planned generation at DeBary.

LOAD FLOWS BEFORE AND AFTER DEBARY-WINTER SPRINGS PROJECT

CASE	OUTAGE	ADVERSELY AFFECTED LINE	% OF EMERGENCY RATING		% OF NORMAL RATING	
			WITHOUT PROJECT	WITH PROJECT	WITHOUT PROJECT	WITH PROJECT
1995 WINTER	Sanford-No.Longwood	Sanford-Sylvan-No.Longwood	109%	80%	134%	98%
	Sanford-Altamonte & Sanford-No.Longwood (Double-Circuit)	Sanford-Sylvan-No.Longwood	169%	117%	207%	144%
1995 WINTER PLUS 150 MW	Sanford-No.Longwood	Sanford-Sylvan-No.Longwood	115%	83%	140%	102%
	DeBary-Sanford Circuit #1	DeBary-Sanford Circuit #2	107%	56%	123%	65%
	Sanford-Altamonte & Sanford-No.Longwood (Double-Circuit)	Sanford-Sylvan-No.Longwood	177%	123%	217%	150%
1997 WINTER	No.Longwood-Winter Springs	Rio Pinar-OUC Stanton	100%	59%	120%	70%
	Rio Pinar-OUC Stanton	No.Longwood-Winter Springs	93%	44%	107%	51%

TABLE 1

2. <u>With Additional Generation at DeBary</u>

The existing transmission system will not be adequate to reliably serve FPC's Eastern and Mid-Florida Divisions if any new generation is added at the DeBary Generating Site beyond the 300 MW of existing generation and the 340 MW of CTs planned for 1992.

FPC's analysis shows that the addition of any generation at the DeBary Generating site will aggravate the single contingency problems that occur in 1995 and the double-circuit outage problem that exists today. The addition of 150 MW of generation will also cause the DeBary-Sanford Circuit #2 to overload to 107% of its emergency rating in the event of the single contingency outage of the DeBary-Sanford Circuit #1.

This means that improvements to the transmission grid are necessary if FPC is to have the option to add generation at the DeBary Generating site. The construction of the DeBary-Winter Springs line is the most cost effective way to increase the transmission support for the DeBary site. The construction of this line will allow up to 450 MW of CTs to be added at DeBary while keeping all transmission lines near their normal ratings for the loss of any single line or generating unit. Appendix I contains load flow maps that reflect winter 1995 load flow conditions with the addition of 150 MW of new generation at DeBary.

V. SUMMARY OF NEED FOR AND BENEFITS OF THE PROJECT

FPC has the responsibility to provide adequate and reliable electric service to its customers. In order to meet this responsibility, FPC must provide adequate generation resources and the transmission facilities required to reliably disperse that power to its customers. The DeBary-Winter Springs project is needed for two reasons: (1) to meet the need to provide transmission service to the Greater Orlando Area that meets established transmission reliability criteria; and (2) to maintain the ability to add new generation in a timely fashion to respond to the ever-changing energy demands of its customers.

A. Area Transmission Reliability

As discussed above in the technical analysis, the DeBary-Winter Springs line is needed by December, 1995 to prevent the overload of the Sanford-Sylvan-North Longwood line resulting from the loss of the Sanford-North Longwood line. By December, 1997, it is also needed to prevent an overload of the Rio Pinar-OUC Stanton 230 kV line resulting from the loss of the North Longwood-Winter Springs line.

The DeBary-Winter Springs line will meet this transmission reliability need and will provide a number of additional benefits:

1. It will improve the reliability of service to the Greater Orlando Area load center by minimizing the effect on customers resulting from the loss of the double-circuit

section of the Sanford-North Longwood and Sanford-Altamonte lines.

2. It will improve the power transfer capability in the area by creating an additional transmission path from the electrical sources at DeBary and FPL's Sanford plant in the North to the Greater Orlando Area in the South.

3. It will provide a new source into the Winter Springs area and will support the eventual extension of the 230 kV grid. That extension in turn will provide additional support required for the 69 kV transmission system to serve existing and future distribution substations as load continues to grow in the eastern portion of FPC's service area.

B. Generation Planning Flexibility

In order to meet existing and expected future load, FPC must maintain an adequate power supply. In addition to FPC's conservation, load management and other demand side management programs, additional generation and/or purchased power are available options.

Since generation reserves within Florida are limited, and given the uncertainty with all demand forecasts, FPC must be able to respond quickly to meet changing energy needs in a cost-effective manner. To do this, FPC must preserve the ability to construct new generation with as short a lead time as possible.

The licensing, design and construction of 230 kV transmission lines that are subject to the TLSA requires approximately 4 to 5 years. Providing an adequate transmission grid becomes the critical path when FPC needs to add capacity on short notice, since certain generation options (CTs) can be constructed in as little as two years. As discussed below, the Project responds to this critical path concern by giving FPC the flexibility to add up to 450 MW of CTs at the DeBary site without further transmission improvements.

1. Combustion Turbine Siting

FPC currently has approximately 300 MW of combustion turbine capacity at the DeBary Generating Site and approximately 300 MW of combustion turbine capacity at the Intercession City generating plant located near Kissimmee.

The DeBary site can accommodate an additional 340 MW of combustion turbines (CTs) with the transmission facilities that are in place today. Engineering and equipment procurement is underway on such CTs, which have a planned in-service date of October, 1992. Once these additional CTs are added at DeBary, the transmission system from the plant will be fully utilized and the site will become transmission-limited. This means that the addition of more capacity at the site without new transmission would result in the violation of single contingency transmission reliability criteria. Even without additional generation at DeBary, such violations will occur by December, 1995 due to load growth.

FPC plans to install 340 MW of additional CTs at the Intercession City site, with a planned in-service date of October, 1993. Even though the transmission system at Intercession City is adequate to accept this planned addition, the acquisition of additional land is required at the site for the power block area. If the additional land cannot be obtained, or if environmental concerns cause significant delays at Intercession City, then DeBary is a back-up site for this 1993 capacity.

The DeBary Generating Site is approximately 2,100 acres. The existing and planned combustion turbines will utilize only about 100 acres of the site. Adequate land is therefore available to construct generating capacity and to respond to current or future environmental issues, as well as to comply with local noise restrictions and buffer zone requirements. The remaining FPC generating sites have serious constraints that could prevent the construction of additional generating facilities. These constraints are primarily land availability, adjacent local development, and environmental concerns, such as air quality, availability of water and preservation of wetlands. Because of the amount of property currently owned by FPC at the DeBary site, these constraints are minimized, making DeBary the only available site that FPC is confident can accommodate additional generation to meet its short term energy needs. Therefore, the DeBary site, even with its transmission limitations, is a back-up site for the 1993 CTs planned for Intercession City.

The following table summarizes the current, planned, and potential future capacity at the DeBary and Intercession City sites, both with and without the DeBary-Winter Springs line.

	DEBARY SITE	INTERCESSION CITY SITE
WITHOUT NEW TRANSMISSION		
Current	300 MW	300 MW
Planned		
1992	340 MW	--- MW
1993	--- MW	340 MW**
SUBTOTAL	640 MW	640 MW
Additional Potential Without New Transmission	0 MW	300 MW**
TOTAL WITHOUT NEW TRANSMISSION	640 MW	940 MW
WITH PROPOSED LINE		
Additional Potential With DeBary-Winter Springs Line	450 MW	0 MW
TOTAL	1,090 MW	940 MW

** Requires additional land for plant additions.

The construction of the DeBary-Winter Springs line will support the construction of up to 450 MW of additional CTs at the DeBary site. By overcoming the transmission limitation that will occur at DeBary at the end of 1992, the

Project gives FPC the ability to construct CTs on short notice to reliably respond to a variety of planning contingencies.

2. Generation Planning Contingencies.

Power supply planning is an inherently uncertain process. Thus there are a number of contingency situations that could require FPC to construct additional CTs on short notice. These include an unexpected delay in the third 500 kV interconnection with Georgia, unexpected changes in FPC's load forecast, and/or unexpected changes in the timely availability of planned capacity from qualifying facilities (QFs).

If FPC succeeds in acquiring additional land at Intercession City, and in adequately addressing any environmental concerns, the existing transmission network will be capable of supporting 300 MW of CT capacity at that site beyond the 340 MW planned for 1993. Intercession City would then become transmission-limited and additional transmission would be required to accommodate future CTs at either the Intercession City or DeBary sites.

In order to preserve the flexibility to use DeBary on short notice as a site for additional CT capacity, the certification of the additional transmission needed to reliably disperse power from that site must begin now. Even so, it is possible that CTs could be needed at DeBary in late 1993, if the Intercession City site fails, but that the transmission necessary to support that generating capacity without violating single contingency criteria would not be in-service until late 1995.

VI. DISCUSSION OF ALTERNATIVES

FPC evaluated alternatives to the DeBary-Winter Springs line that could meet the same needs as the Project:

(i) correct the single contingency criteria violation that occurs in 1995 for the outage of the Sanford-North Longwood line;

(ii) address the violation of the emergency rating of the Sanford-Sylvan-North Longwood line that exists today for the loss of the double circuit segment of the Sanford-Altamonte and Sanford-North Longwood lines;

(the problems identified in items (i) and (ii) are referred to as the "DeBary-North Longwood Corridor violations")

(iii) correct the single contingency criteria violation that occurs in 1997 on the Rio Pinar-Stanton circuit for the outage of the North Longwood-Winter Springs transmission line (referred to as the "Rio Pinar-Stanton violation"); and

(iv) overcome the transmission limitation at the DeBary site that occurs at the end of 1992 and allow for the construction of additional generation at that site without violating single contingency reliability criteria.

The alternatives fell into three groups:

Group A: Alternatives that satisfy all four needs.

Group B: Alternatives that correct the DeBary-North Longwood Corridor violations and support additional capacity at DeBary, but do not correct the Rio Pinar-Stanton violation.

Group C: Alternatives that correct the Rio Pinar-Stanton violation, but do not address the other three needs.

Any alternative from Group B can be combined with any alternative from Group C to create a two-line project that would address all four needs. Each of the possible two-line combinations, which range in cost from approximately $17 million to approximately $31 million, is more expensive than the Project's approximate $14 million cost. These alternatives are summarized in Table 2, and discussed in more detail below.

1. Group A: Projects Meeting All Needs

Only one project, in addition to the proposed DeBary-Winter Springs line, meets all four needs.

DeBary-Winter Park East -- This line would be approximately 24 miles long and would cost approximately $17 million. This line is essentially a longer, more expensive version of the DeBary-Winter Springs Project, connecting into the bulk grid one substation further to the South. Because this line is more expensive than the Project, and provides no additional benefits, it was rejected as an alternative.

B. Group B: Projects Correcting the DeBary-North Longwood Corridor Violations and Supporting Additional Generation at DeBary

There are three alternatives involving transmission from the DeBary site that would prevent the overloading that occurs for the loss of the Sanford-North Longwood line and significantly reduce the overloading that occurs for the loss of the double-circuit portion of the Sanford-North Longwood and Sanford-Altamonte lines. Each of the alternatives listed below would also support the addition of some generation at DeBary, although not the same amount as the Project:

DeBary-North Longwood

DeBary-Piedmont

DeBary-Sorrento

None of these alternatives corrects the Rio Pinar-Stanton violation that occurs in 1997. Therefore, each of these alternatives would have to be constructed in combination with one of the lines from Group C to be comparable to the Project.

<u>DeBary-North Longwood</u> -- This line would be approximately 15 miles long and would cost about $12 million. This line is essentially the northern segment of the Project, terminating one substation farther to the North. It is part of the least costly combination of alternatives (DeBary-North Longwood and North-Longwood Winter Springs) that meets all of the needs the Project is designed to address. This combination is more expensive than the Project because it requires major substation

reconfiguration at North Longwood to interconnect the line into that substation. This combination is also less desirable than the Project from a technical viewpoint. Today, two of the three 230 kV circuits transferring power from North to South in the area terminate at North Longwood. It is not desirable to increase the reliance on this substation by interconnecting an additional 230 kV line, particularly when a less expensive option is available.

DeBary-Piedmont -- This line would be approximately 24 miles long and would cost approximately $21 million. It is thus more costly than the Project, even though it does not correct the Rio Pinar-Stanton violation. In addition, the feasibility of this line is questionable because of the site limitations at Piedmont. The Piedmont Substation is located such that any new transmission line into the substation may require the acquisition of property that is already used for residential purposes.

DeBary-Sorrento -- This line would be approximately 20 miles long and would cost approximately $12 million. It does not correct the Rio Pinar-Stanton violation; is more expensive than the Project when combined with an alternative that does correct that violation; and it does not support as much additional generation at DeBary.

C. Group C: Projects Correcting Rio Pinar-Stanton Violation

FPC identified alternative 230 kV lines between substations in the Greater Orlando Area that would correct the Rio Pinar-Stanton single contingency violation that occurs by December, 1997. The lines considered included:

North Longwood-Winter Springs

Altamonte-Winter Park East

Stanton-Rio Pinar

None of these alternatives corrects the DeBary-North Longwood Corridor violations. Also, none of these alternatives supports the installation of additional generation at the DeBary site. Therefore, each of these alternatives would have to be constructed in combination with one of the lines from Group B to be comparable to the Project.

North Longwood-Winter Springs. This line would be approximately 5 miles long and would cost approximately $5 million. This line is essentially the southern segment of the Project and is part of the least costly combination of alternatives (DeBary-North Longwood and North Longwood-Winter Springs) that solves all of the problems the Project is designed to address. As discussed above, this combination is more expensive than the Project and is less desirable from a technical viewpoint.

Altamonte-Winter Park East. This line is approximately 8 miles long and would cost approximately $7 million. This line provides no unique benefits. In combination with any alternative that corrects the DeBary-North Longwood corridor violations, it would be more expensive than the Project.

OUC Stanton-Rio Pinar. This line would be a second circuit, approximately 11 miles long and costing approximately $10 million, between OUC's Stanton Plant and the Rio Pinar Substation. This line is the least desirable technical alternative for addressing the Rio Pinar-Stanton violation, because it does not provide any increased ability to transfer power in the area from the generation at DeBary and Sanford in the North to the load center in the South.

COMPARISON OF ALTERNATIVES

Name Length (Milest)	Cost (000,000)	DeBary-North Longwood Corridor Violations		Support DeBary CTs	Rio Pinar-Stanton	Other Factors
		Correct 1995 Single Contingency	Address Double Contingency		Correct 1997 Single Contingency	
GROUP A						
THE PROJECT: **DeBary-Winter Springs (20)**	**$ 14**	**Yes**	**Yes**	**Yes**	**Yes**	**Option Selected**
DeBary-Winter Park E. (24)	$ 17	Yes	Yes	Yes	Yes	Longer version of DeBary-Winter Springs
GROUP B						
DeBary-North Longwood (15)	$ 12	Yes	Yes	Partly	No	A segment of the Project; adds third source to N. Longwood
DeBary-Piedmont (24)	$ 21	Yes	Yes	Partly	No	Site limited by adjacent development
DeBary-Sorrento (20)	$ 12	Yes	Yes	Partly	No	
GROUP C						
North Longwood-Winter Springs (5)	$ 5	No	No	No	Yes	A segment of the Project
Altamonte-Winter Park East (8)	$ 7	No	No	No	Yes	
OUC Stanton-Rio Pinar (11)	$ 10	No	No	No	Yes	Does not enhance North to South flow of power

TABLE 2

VII. ADVERSE CONSEQUENCES OF DELAY OR DENIAL

FPC has selected the DeBary-Winter Springs line as the best alternative to achieve transmission system adequacy and reliability for the Greater Orlando Area. FPC and its customers would suffer adverse consequences from any delay or denial in the licensing process.

1. Short Delay. If licensing of the Project is delayed long enough to postpone the in-service date of the Project beyond December, 1995, then FPC's customers will face the possibility of losing service in the event of the single contingency outage of the Sanford-North Longwood line. In addition, the DeBary site becomes transmission-limited by the end of 1992. If circumstances require the addition of CTs at DeBary prior to the in-service date of the Project, then any delay in licensing would extend, on a month for month basis, the period during which FPC's customers would be exposed to potential outages in a single contingency situation.

2. Long Delay. If licensing of the Project is delayed long enough to postpone the in-service date of the Project beyond December, 1997, then, in addition to the consequences of a shorter delay, FPC's customers will face the possibility of losing service in the event of the single contingency outage of the North Longwood-Winter Springs line.

3. Denial. If licensing of the Project is denied, then FPC will be required to pursue another 230 kV

transmission alternative to correct the violations of single contingency criteria that occur in 1995 and 1997 and to address the transmission limitation that affects the DeBary site. However, each of the available alternatives (other than a longer version of the same line) are less desirable from a technical viewpoint, and each of them is more costly than the Project.

VIII. CONCLUSION

The DeBary-Winter Springs transmission line is needed by December, 1995 to maintain the ability of FPC's 230 kV transmission system to reliably withstand single contingency transmission outages. The line also avoids another single contingency violation that would otherwise occur by the winter of 1997. In addition, the Project enhances transmission reliability by minimizing the effect of outages of double-circuit transmission lines in the Greater Orlando Area; improves the power transfer capability into that load center; supports the future growth and extension of the transmission grid; and overcomes the transmission limitations at the DeBary site by supporting the installation of 450 MW of additional CT capacity at that site.

FPC's analyses show that the Project is the best way to satisfy this combination of needs, and is less expensive than any available alternative. A delay in licensing the Project would jeopardize the reliability of service to FPC's customers.

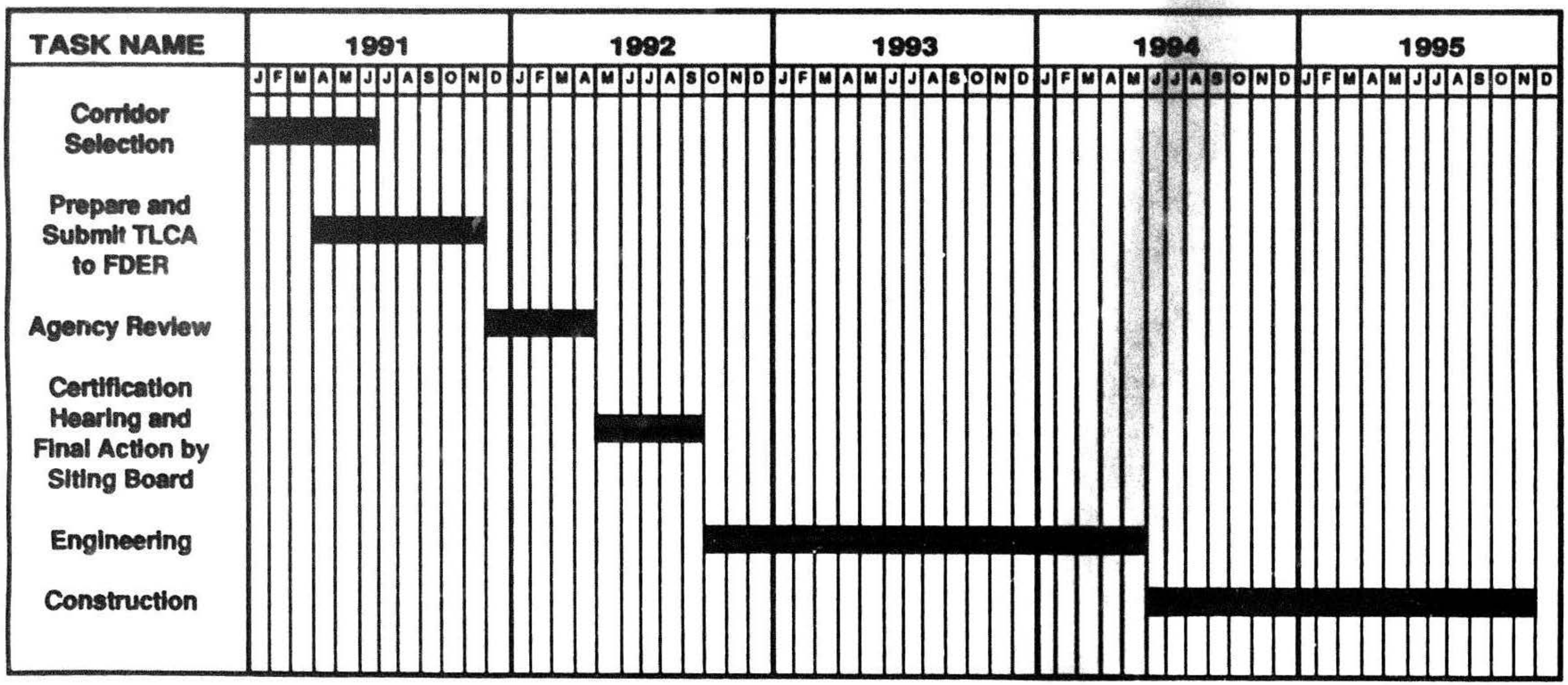
The Commission should therefore grant a determination of need for the DeBary-Winter Springs line as the first step in certification of the line under the Transmission Line Siting Act.

INDEX TO APPENDICES

ESTIMATED COST BREAKDOWN FOR
DEBARY-WINTER SPRINGS 230 kV LINE
(1991 Dollars)

DeBary-Winter Springs Line, including right-of-way; 20 miles; 1590 KCM ACSR-- @ $525,000/mile	$	10,500,000
Termination at DeBary Substation		800,000
Termination at Winter Springs Substation		400,000
** Conversion of Lake Emma Substation to 230 kV		2,300,000
Total Estimated Cost	$	14,000,000

** Conversion of the Lake Emma Substation from 115/13 kV to 230/13 kV may be required depending on the final route selected.



TLCA - Transmission Line Certification Application

Note:

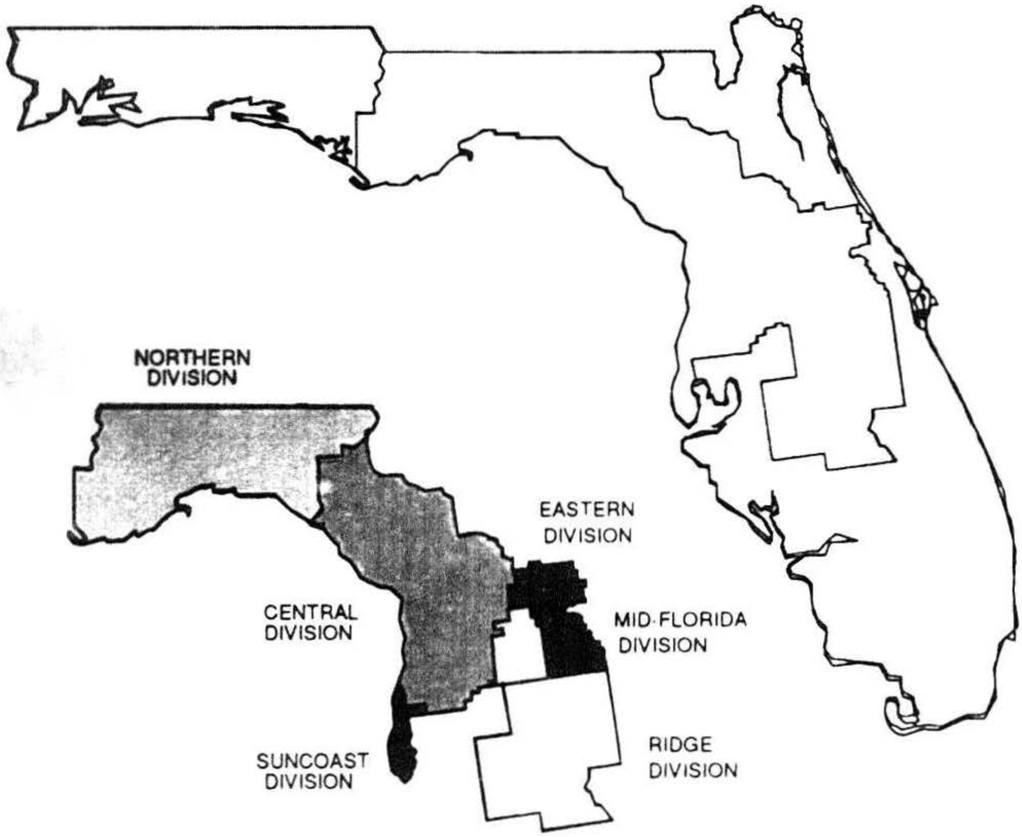
Times shown are preliminary and are subject to change.

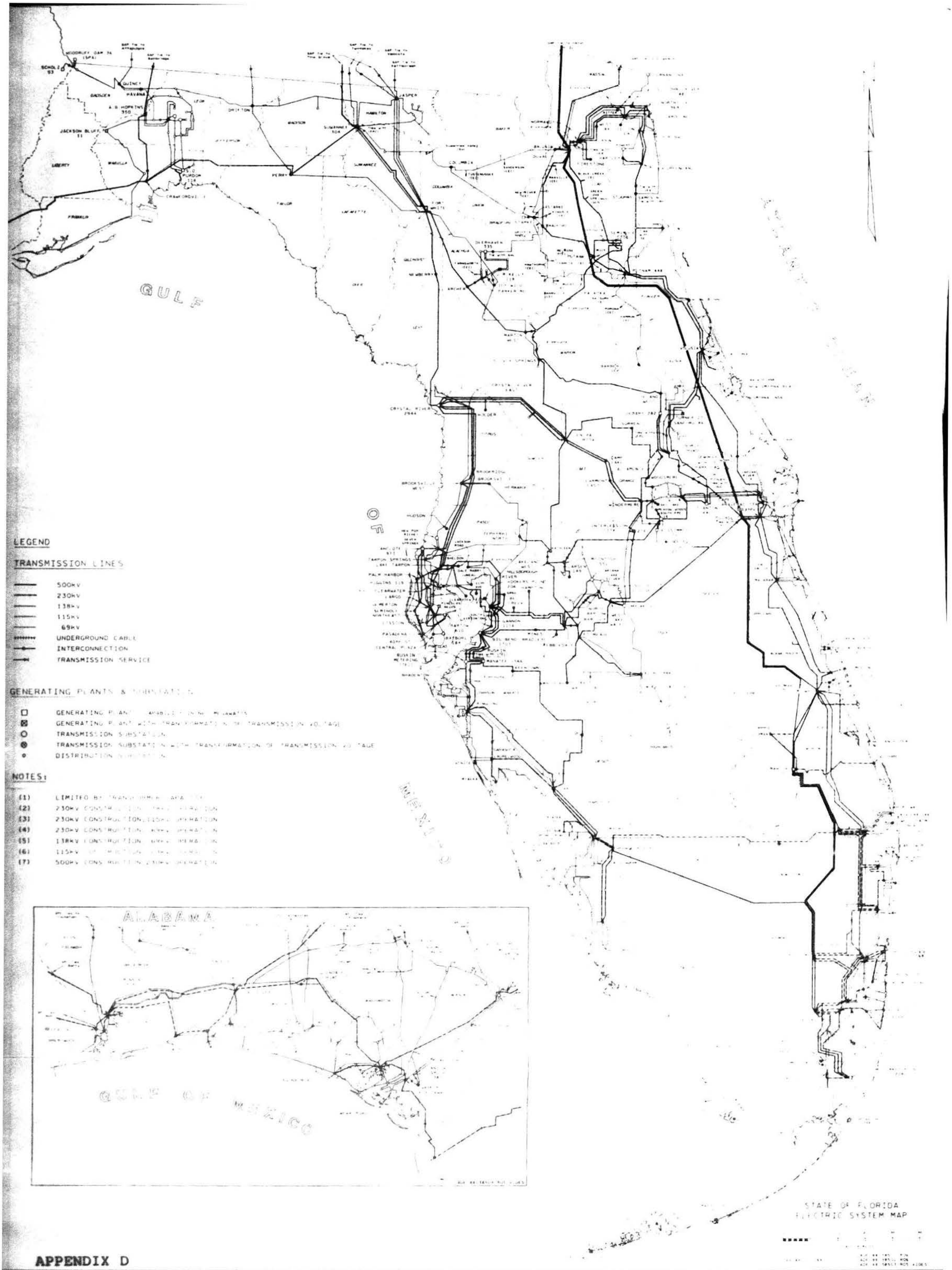
DEBARY - WINTER SPRINGS 230 KV TRANSMISSION LINE PROJECT OVERALL PROJECT SCHEDULE	Florida Power CORPORATION

APPENDIX B

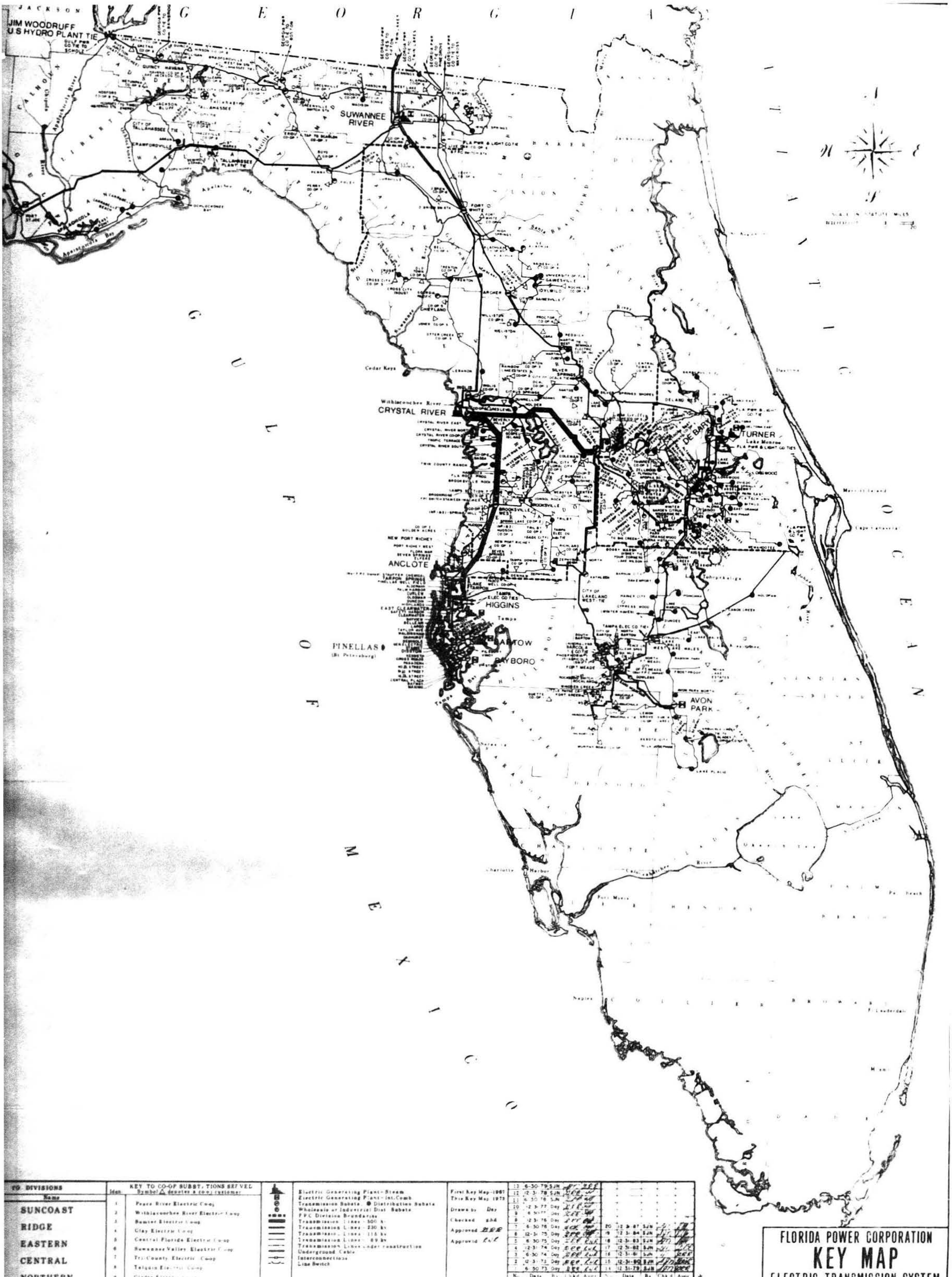
Florida Power Corporation

SERVICE AREA




GULF
OF
MEXICO
LEGEND
TRANSMISSION LINES
500KV
230KV
138KV
115KV
69KV
UNDERGROUND CABLE
INTERCONNECTION
TRANSMISSION SERVICE
GENERATING PLANTS & SUBSTATIONS
GENERATING PLANT
TRANSMISSION SUBSTATION
NOTES:
(1) LIMITED BY TRANSFORMER CAPACITY
(2) 230KV CONSTRUCTION
(3) 230KV CONSTRUCTION, 115KV OPERATION
(4) 230KV CONSTRUCTION
(5) 138KV CONSTRUCTION
(6) 115KV
(7) 500KV CONSTRUCTION, 230KV OPERATION
ALABAMA
STATE OF FLORIDA
ELECTRIC SYSTEM MAP
JACKSON BLUFF
QUINCY
HAVANA
A. B. HOPKINS
350
PERRY
JASPER
HAMILTON
SUWANNEE
CRYSTAL RIVER
2944
BROOKSVILLE
HUDSON
TARPON SPRINGS
PALM HARBOR
CLEARWATER
PASADENA
CRAWFORDVILLE
WINDERMERE
PUTNAM

APPENDIX D


GEORGIA
ATLANTIC OCEAN
GULF OF MEXICO
JIM WOODRUFF U S HYDRO PLANT TIE
SUWANNEE RIVER
CRYSTAL RIVER
ANCLOTE
HIGGINS
PINELLAS
(St Petersburg)
BARTOW
BAYBORO
DE BARY
TURNER
AVON PARK
Cedar Keys
Withlacoochee River
Tampa
Lake Monroe
Charlotte Harbor
Naples
DIVISIONS
Name
SUNCOAST
RIDGE
EASTERN
CENTRAL
NORTHERN
KEY TO CO-OP SUBSTATIONS SERVED
Symbol △ denotes a co-op customer
Peace River Electric Co-op
Withlacoochee River Electric Co-op
Sumter Electric Co-op
Clay Electric Co-op
Central Florida Electric Co-op
Suwannee Valley Electric Co-op
Tri-County Electric Co-op
Talquin Electric Co-op
Glades Electric Co-op
Electric Generating Plant - Steam
Electric Generating Plant - Int. Comb.
Transmission Substa. ● Distribution Substa.
Wholesale or Industrial Dist. Substa.
FPC Division Boundaries
Transmission Lines - 500 kv
Transmission Lines - 230 kv
Transmission Lines - 115 kv
Transmission Lines - 69 kv
Transmission Lines under construction
Underground Cable
Interconnections
Line Switch
First Key Map - 1967
This Key Map 1973
Drawn by Day
Checked
Approved
Approved
REVISIONS
FLORIDA POWER CORPORATION
KEY MAP
ELECTRIC TRANSMISSION SYSTEM

APPENDIX E

II. TRANSMISSION PLANNING

The following planning criteria have been developed for the purpose of evaluating transmission, substation, and distribution equipment requirements for the Florida Power Corporation system. Although these criteria are intended to be applicable throughout the Florida Power Corporation system, there may be isolated cases for which it is determined that expenditures to meet such criteria would be imprudent when compared to the number of customers involved, the probability of occurrence, or the relative improvement in reliability with respect to other recommended projects.

These criteria differ little from criteria which have been used over the years within this utility. The main objective here is to provide documentation and clarification for future reference. These criteria are also in harmony with the criteria agreed upon by the Florida Electric Power Coordinating Group (FCG), System Planning Committee, which in turn are in agreement with the Southeastern Electric Reliability Council (SERC) criteria. Where differences do occur, the Florida Power criteria proves to be slightly more conservative.

The criteria documented herein are to be considered planning criteria and are not to be confused with operating criteria. Planning criteria reflects a philosophy or policy of design. It provides a yardstick for the design of systems several years in advance and allows for uncertainties in the actual operating situations to be encountered. Operating criteria on the other hand are applied when the actual operating situation is known and usually reflects the absolute physical limitations of electrical equipment and customer constraints. The two are closely related and should be highly coordinated; but in general, design criteria should be slightly more conservative than operating criteria.

A power system reliability program is used within the Transmission & Distribution (T&D) Planning Section to rank and prioritize planned projects.

A. SYSTEM PLANNING STEADY STATE CRITERIA

1. System Load Criteria

Steady state analysis will be conducted using two different system load forecasts. For FCG studies and long range (5 yrs.) studies, the 50 percent confident system load forecast is used. This forecast provides the projected peak load level for which statistical data indicate there is a 50 percent chance that the actual system load will be equal to or less than the specified value. For FPC in-house studies, the 50 percent confident system load forecast is multiplied by 110 percent. By using this multiplier the planner is more confident that the FPC system will perform within design criteria. Both summer and winter load levels will be studied and evaluated against the criteria. In addition, off-peak scenarios will be evaluated to assure that planning criteria are met at other load conditions.

2. Definition of System Conditions

Normal condition is commonly used within the industry to specify the system situation with no contingencies in effect. First contingencies or probable contingencies consist of single contingency line, transformer and generator outages. Less probable contingencies are more severe tests of the system, and some loss of firm load is acceptable during the transient and switching periods. However, there should be no cascading of outages.

3. Statement of Criteria

The two charts in this section indicate branch loading and voltage levels acceptable for various system conditions. An explanation of line and transformer ratings are found in Appendicies A and B.

Chart A: Line and Transformer Loading Limits To Be Observed

Normal* Conditions	First Contingency Outages		Less Probable Contingency	
	Any line or transformer	Any line plus any generators	Any two generators	Other short duration contingency
Normal Rating	Emergency Rating	Emergency Rating	Emergency Rating	Emergency Rating

Chart B: Voltage Limits To Be Observed

Transmission Delivery Voltage	Normal* Conditions	First Contingency Outages	Less Probable Contingency
Busses serving Residential Customers	.950-1.05	.950-1.05	.950-1.05
Busses serving Industrial Customers	.950-1.05	.925-1.05	.925-1.05
Bulk System Busses	.950-1.05	.900-1.05	.900-1.05

* Normal conditions include all reasonable dispatches which allows for scheduled outages. Therefore any single generation outage is a normal condition.

4. <u>Acceptable Remedial Measures for Overloaded Lines</u>

The following remedial measures may be considered for alleviating line and transformer overloading during contingency situations and are listed in a generally accepted order of preference.

a. <u>Line switching</u>

Sectionalizing lines, closing normally open switches, or performing other switching operations provided such switching does not severely reduce reliability to the remaining system or create other problems.

b. <u>Emergency redispatching</u>

Redispatching the scheduled generating units (i.e., deviate from economic dispatch if necessary) during contingency situations to alleviate line and transformer overloading.

c. <u>Peaking units</u>

Operating peaking units to solve contingency problems provided the anticipated cost of such operation does not exceed the cost of some other feasible solution.

5. Acceptable Remedial Measures for Low Voltages

The following remedial measures may be considered for alleviating inadequate voltages during contingency situations and are listed in a generally accepted order of preference.

a. Capacitors and reactors

Switching capacitors or reactors on or off to restore bus voltages to acceptable values.

b. Synchronous condensers

Starting up synchronous condensers to control bus voltages.

c. Raise the control voltage

Raising the control voltage on source transformers provided such transformers are equipped with LTC and under supervisory control. However, one must be certain that the high side voltage of any transformer at or near the bus with raised voltage does not exceed 105 percent of the actual tap voltage. In any case, it is not considered acceptable to raise bus voltages in excess of 105 percent of the nominal base value (110 percent on 500 KV system) as a design criteria. If there is any doubt, then the standard control bus voltages (Appendix C) should be adhered to.

d. Peaking units

Operating peaking units to solve contingency voltage problems provided the anticipated cost of such operation does not exceed the cost of some other feasible solution.

e. Interruptible load

Curtailing interruptible load during contingency situations but only if the above remedial measures fail to alleviate the problem.

B. TRANSIENT CRITERIA

The following criteria are similar to the FCG Stability criteria contained in Appendix D. The Transient criteria listed below reference those probable and less probable disturbances listed in the Steady State criteria, but must additionally consider the possible, but improbable, disturbances defined by SERC and the FCG.

1. Probable Contingencies

   All load areas shall remain stable during and following a normally cleared three-phase fault at any location on the transmission system.

2. Less Probable Contingencies

   Less probable contingencies below may cause loss of some load and/or instability of some localized generation, but the State bulk power system shall stay capable of readjustment after the occurrence of the disturbance so it can be operated within its emergency ratings, and at voltages that can be accepted for their duration time interval.

   a. Loss of generation

      Sudden loss of any one generating unit while any one generating unit is out of service.

b. Loss of transmission

Loss of any two transmission lines, which are on the same double-circuit tower.

c. Loss of generation and transmission

Loss of any one transmission line while any one generating unit is out of service for scheduled routine maintenance.

3. Possible But Improbable Disturbances

These contingencies may cause disruption of a portion of the system resulting in loss of some load, instability of some generating units, and some islanding, but should not result in cascading.

a. Loss of generation

Sudden loss of entire generating capability in any one plant.

b. Loss of transmission

1. The outage of the most critical transmission line caused by a three-phase fault during the outage of any other critical transmission line.

2. Sudden loss of all lines on a common right-of-way.

3. Sudden loss of a substation (limited to a single voltage level within the substation, plus transformation from that voltage level within the substation), including any generating capacity connected thereto.

4. Delayed clearing of a three-phase fault at any point on the system due to failure of a breaker to open.

c. Loss of load

Sudden loss of a large load or major load center.

SECTION V

PLANNING CRITERIA

The members of the Florida Electric Power Coordinating Group aim to maintain a high degree of adequacy and reliability in the State of Florida bulk power system. This can be accomplished largely through coordination in planning and adoption of common planning criteria by all the electric utilities in the State of Florida.

The planning of FCG systems shall be guided by the regional criteria which have been set forth by the Southeastern Electric Reliability Council for avoidance of cascading. The following principles shall guide the planning of generation and transmission facilities by the FCG members:

A. The more probable contingencies can be met without loss of load.

B. The less probable contingencies can be sustained with a possible loss of some load.

C. Contingencies listed in SERC Guideline No. 3 are possible, but improbable, and shall be met without the occurrence of cascading.

D. System stability shall be maintained in the State of Florida during and following the contingency(s) except the load area(s) in which the major disturbance(s) occurred. This does not preclude islanding and loss of load in other areas.

I. FCG PLANNING CRITERIA

The bulk electric power system in the State of Florida shall be planned to meet the following criteria:

A. MORE PROBABLE CONTINGENCIES - To be sustained without loss of load (other than the load connected to the line or transformer which is lost):

1. Loss of generation

   Sudden loss of any one generating unit.

2. Loss of transmission

   a. Loss of any one transmission line.

   b. Loss of any one transformer bank at any one generating plant or bulk transmission substation.

Following any single element outage contingency, all equipment shall be loaded within its emergency rating and voltages shall be reasonably normal.

B. LESS PROBABLE CONTINGENCIES - To be sustained with possible loss of some load*:

1. Loss of generation

Sudden loss of any one generating unit while any one generating unit is out of service.

2. Loss of transmission

Loss of any two transmission lines which are on the same double-circuit tower.

3. Loss of generation and transmission

Loss of any one transmission line while any one generating unit is out of service for scheduled routine maintenance.

The above, less probable contingencies, may cause loss of some load* and/or instability* of some localized generation, but the State bulk power system shall stay capable of readjustment after the occurrence of the disturbance so it can be operated within its emergency ratings and at voltages that can be accepted for their duration time interval.

C. POSSIBLE BUT IMPROBABLE DISTURBANCES - To be sustained without occurrence of cascading:

1. Loss of generation

Sudden loss of entire generating capability in any one plant.

2. Loss of transmission

a. The outage of the most critical transmission line caused by a three-phase fault during the outage of any other critical transmission line.

b. Sudden loss of all lines on a common right of way.

c. Sudden loss of a substation (limited to a single voltage level within the substation, plus transformation from that voltage level within the substation), including any generating capacity connected thereto.

d. Delayed clearing of a three-phase fault at any point on the system due to failure of a breaker to open.

3. Loss of load

Sudden loss of a large load or major load center.

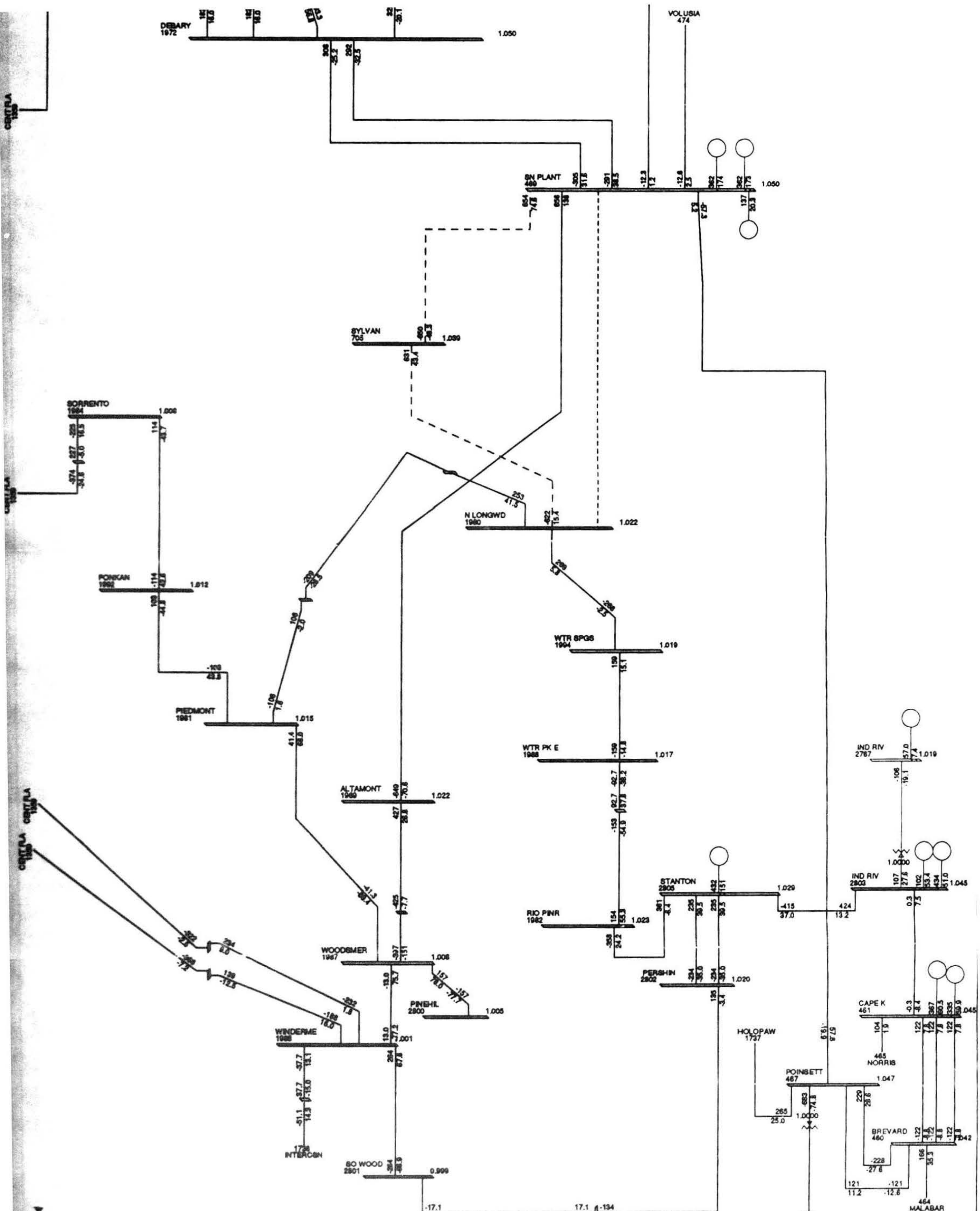
These contingencies may cause disruption of a portion of the system resulting in loss of some load*, instability* of some generating units, and some islanding*, but should not result in cascading.

D. SYSTEM STABILITY

1. All load areas shall remain stable during and following a normally cleared three-phase fault at any location of the transmission system.

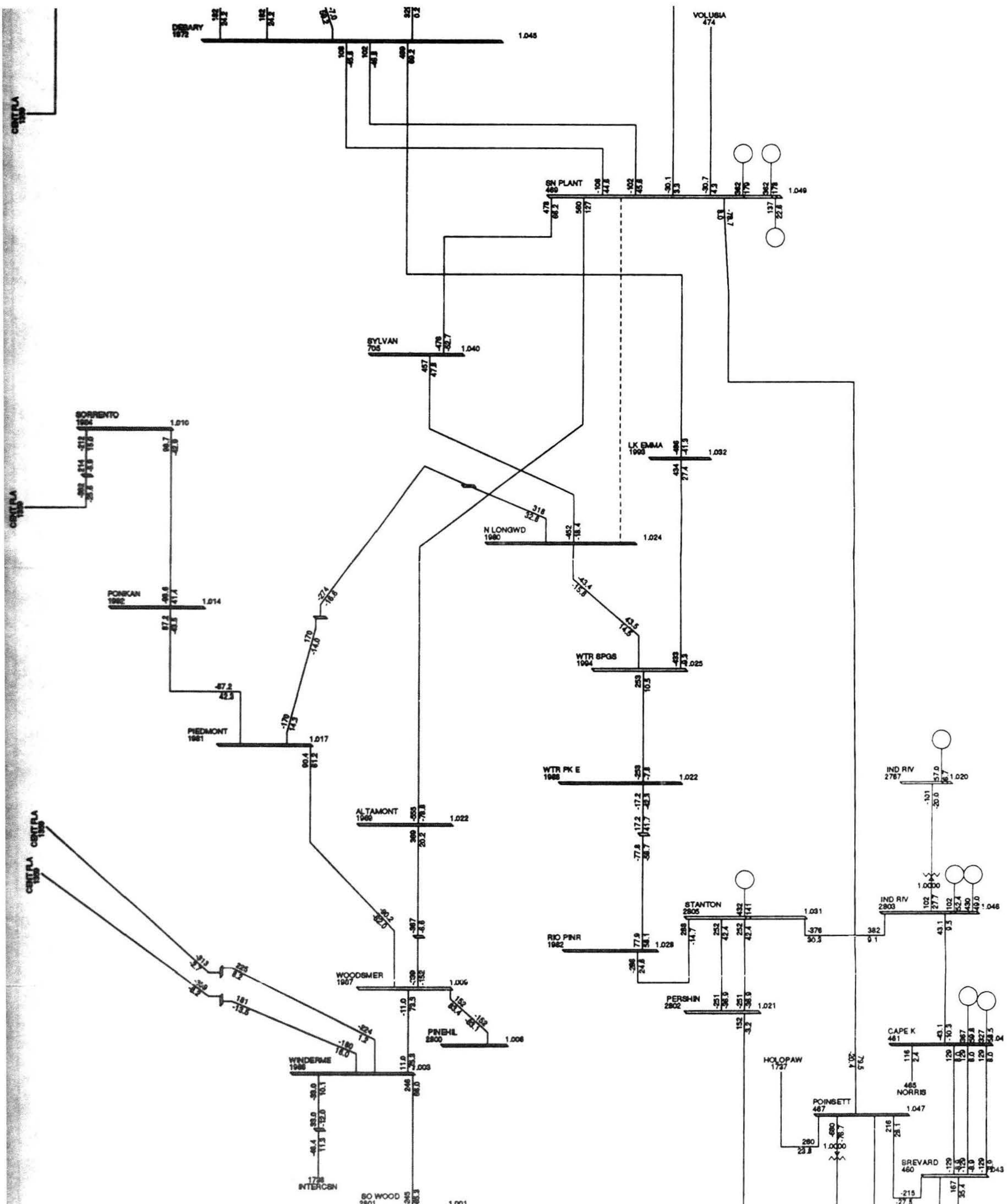
2. Stability shall be maintained in all load areas exclusive of the load area the disturbance occurred in during and following the contingencies in Paragraphs B.1, B.2 and B.3, assuming that transmission element loss contingencies are associated with the above fault conditions of Paragraph D.1.

* "Load Relief" measures in all load areas and transmission relaying are acceptable means for maintaining stability and avoiding cascading.



PENDIX H
PAGE 1

FPC 1995 WINTER BASE CASE FOR SY91 **OUTAGE SNFD-NLWD** **WED, MAY 29 1991 13:20**	100 % RATEA 0.950 UV 1.050 OV KV: ≤115 , ≤230 , ≤500	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR



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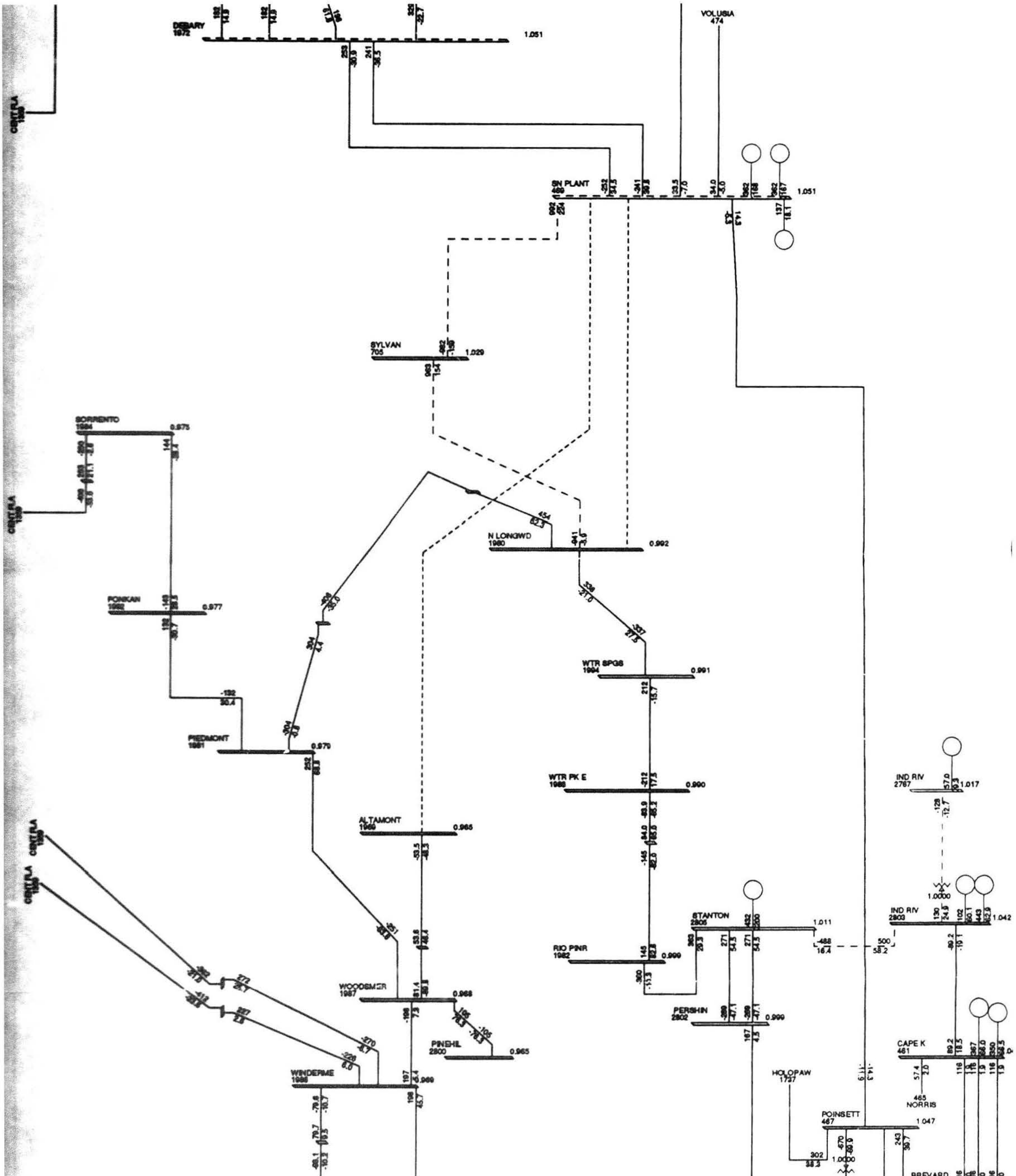
PAGE 2

FPC 1995 WINTER BASE CASE FOR SY91 W/DBRY-WTR SPGS; OUTAGE SNFD-NLWD WED, MAY 29 1991 13:22	100 % RATEA 0.950 UV 1.050 OV KV: ≤115 , ≤230 , ≤500	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR

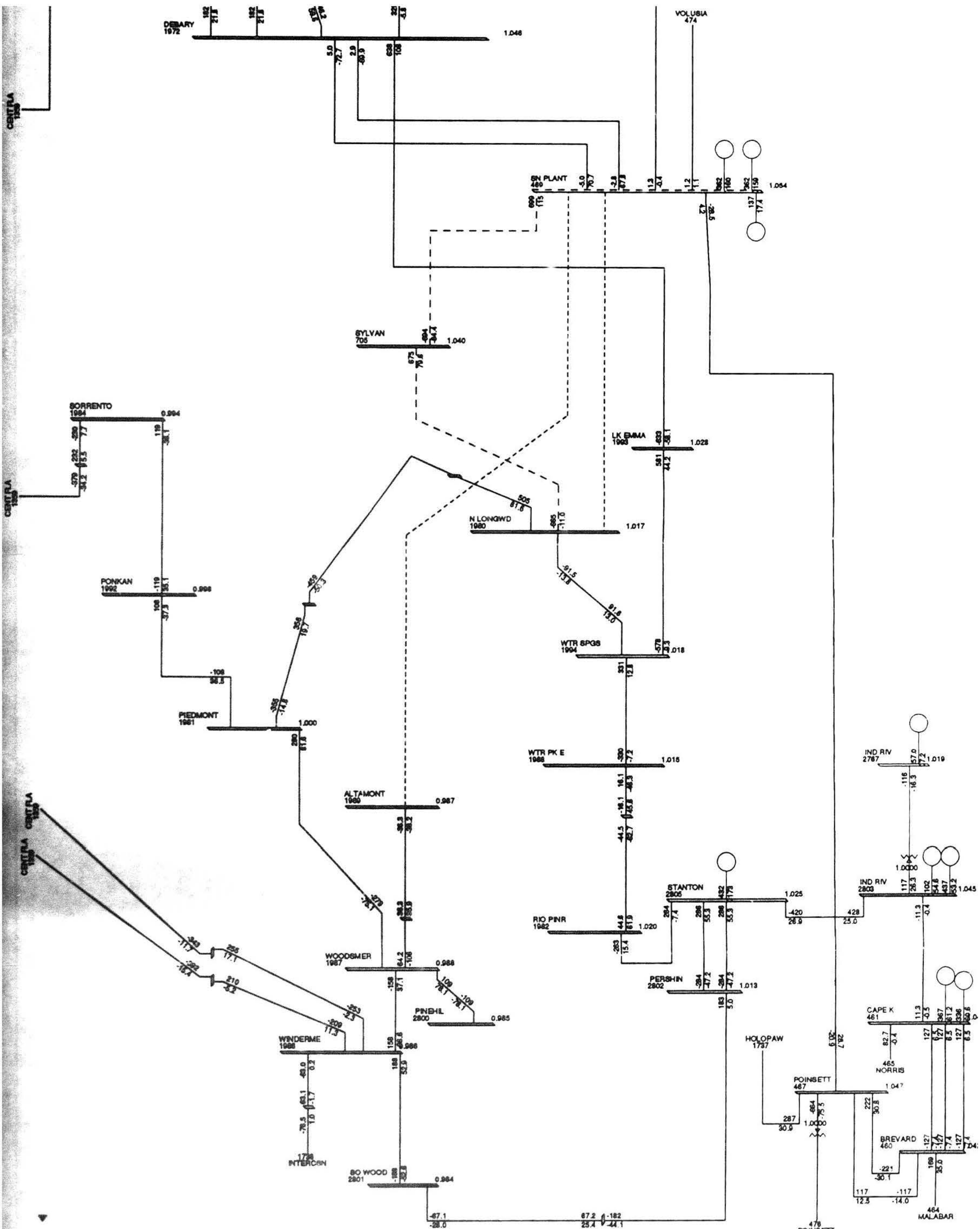


APPENDIX H
PAGE 3

FPC 1995 WINTER BASE CASE FOR SY91
OUTAGE SNFD-NLWD & SNFD-ALTA
WED, MAY 29 1991 13:27

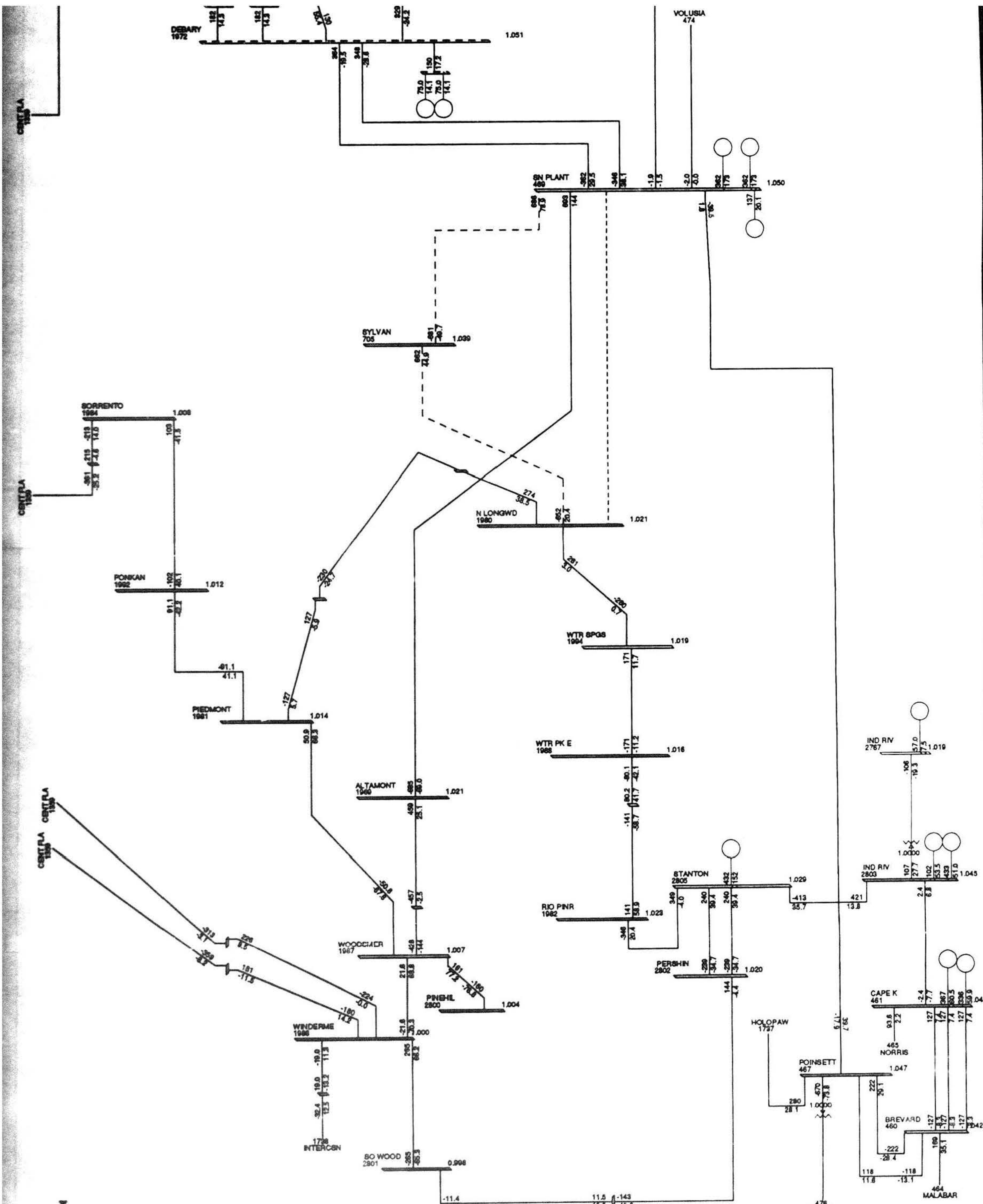
100 % RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≤500

BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR



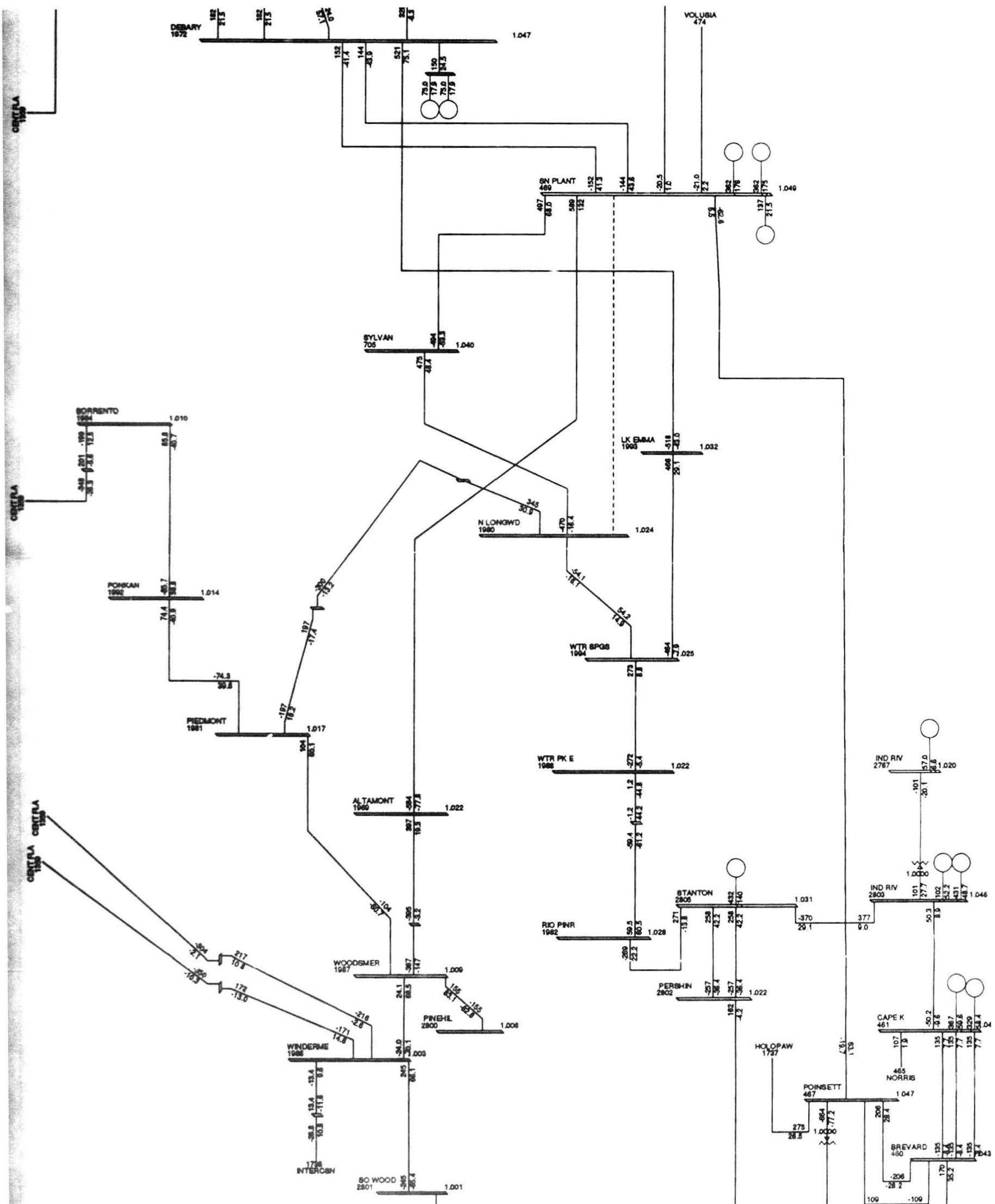
APPENDIX H
PAGE 4

FPC 1995 WINTER BASE CASE FOR SY91 W/DBRY-WTR SPGS; OUTAGE SNFD-NLWD & SNFD-ALTA WED, MAY 29 1991 13:25	100 % RATEA 0.950 UV 1.050 OV KV: ≤115 , ≤230 , ≥500	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR



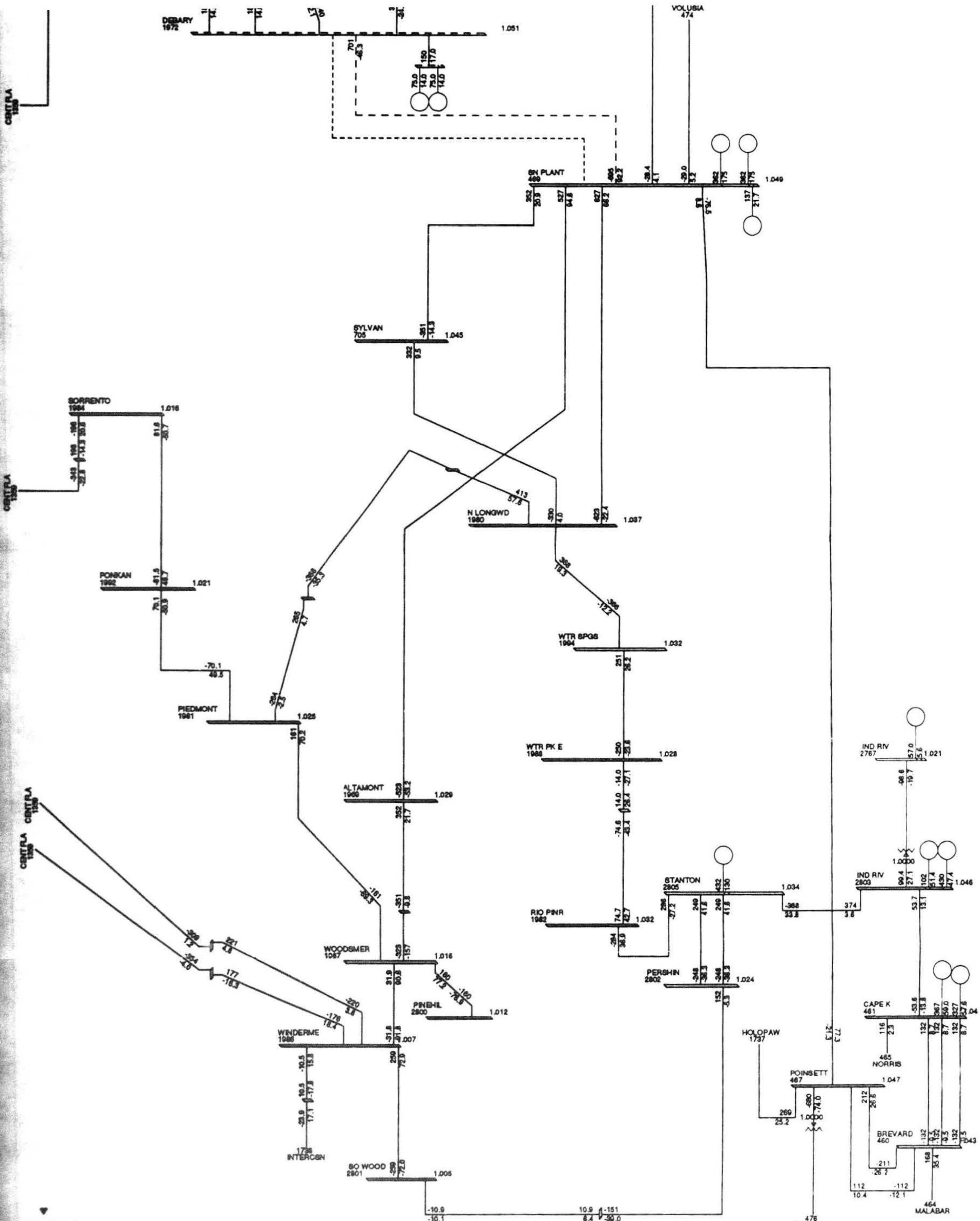
APPENDIX I
PAGE 1

FPC 1995 WINTER BASE CASE FOR SY91 W/150 MW NEW GEN @ DBRY; OUTAGE SNFD-NLWD WED, MAY 29 1991 13:33	100 % RATEA 0.950 UV 1.050 OV KV: ≤115 , ≤230 , ≤500	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR



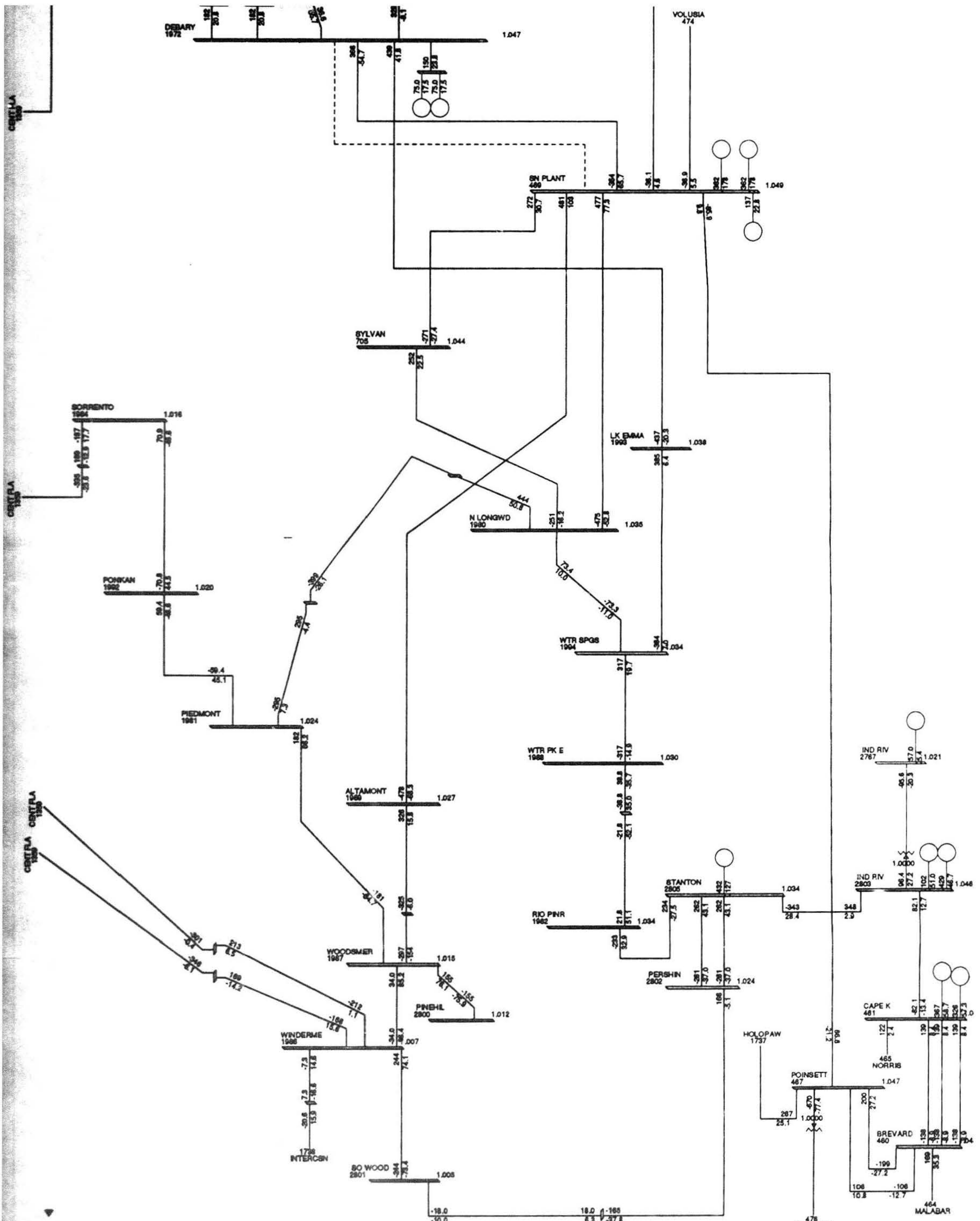
APPENDIX I
PAGE 2

FPC 1995 WINTER BASE CASE FOR SY91 150 MW @ DBRY & DWS LINE; OUTAGE SNFD-NLWD WED, MAY 29 1991 13:31	100 % RATEA 0.950 UV 1.050 OV KV: ≤115 , ≤230 , ≤500	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR



APPENDIX I
PAGE 3

FPC 1995 WINTER BASE CASE FOR SY91 **W/150 MW NEW GEN @ DBRY; OUTAGE DBRY-SNFD CKT 1** **WED, MAY 29 1991 13:38**	100 % RATEA 0.950 UV 1.050 OV KV: ≤115 , ≤230 , ≤500	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR



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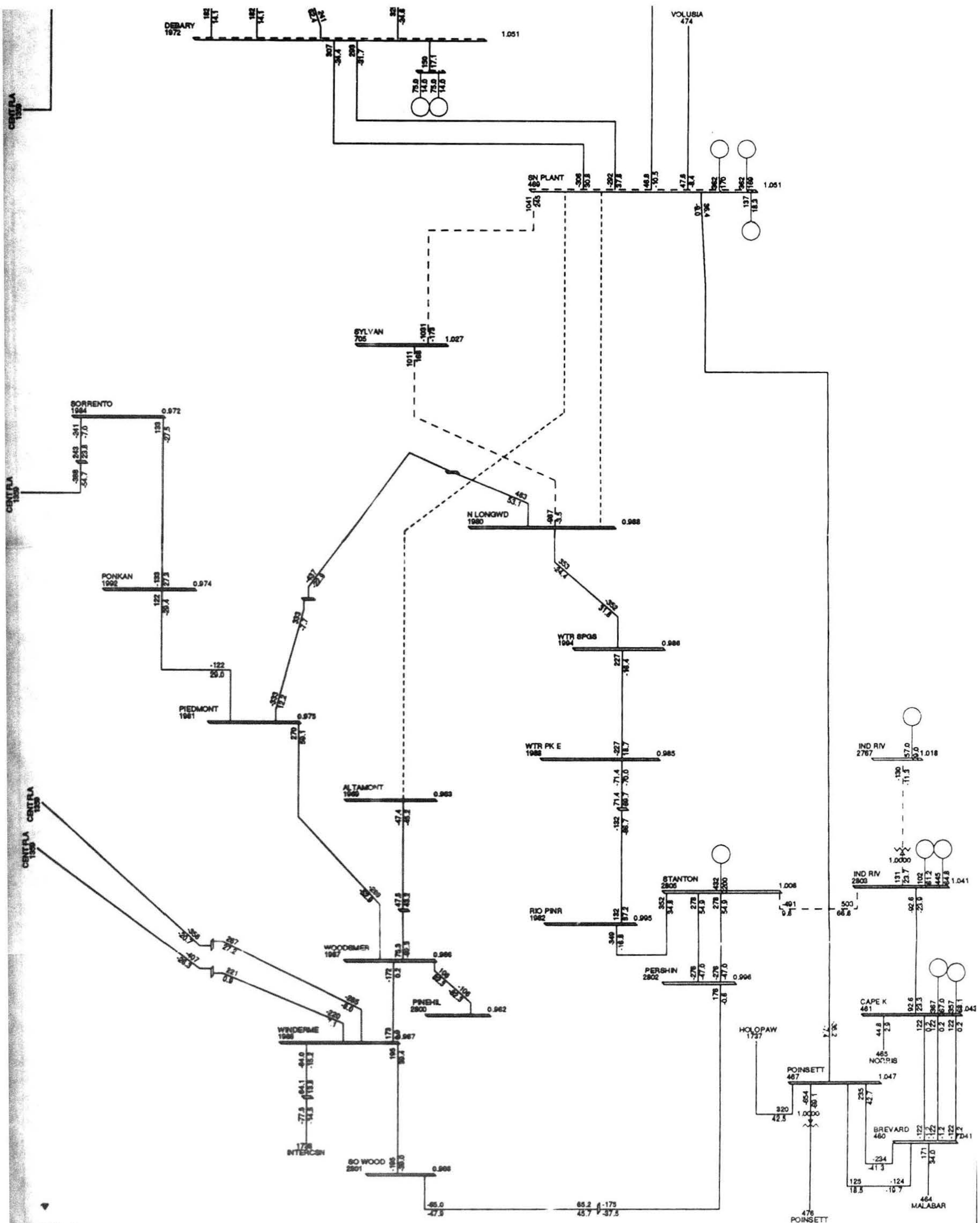
PAGE 4

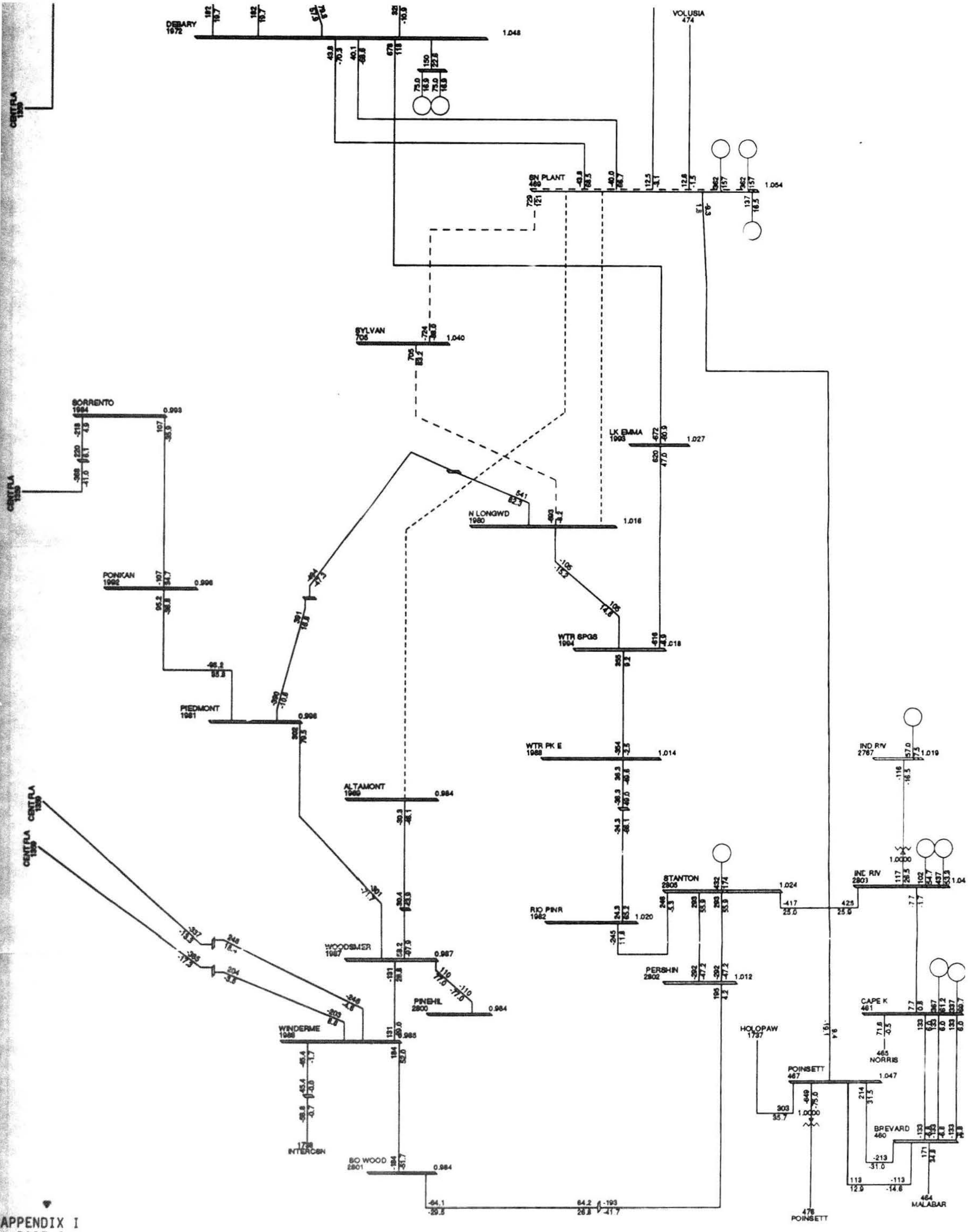
FPC 1995 WINTER BASE CASE FOR SY91
150 MW @ DBRY & DWS LINE; OUTAGE DBRY-SNFD CKT 1
WED, MAY 29 1991 13:36

100 % RATEA	BUS - VOLTAGE(PU)
0.950 UV 1.050 OV	BRANCH - MW/MVAR
KV: ≤115 , ≤230 , ≥500	EQUIPMENT - MW/MVAR



PPENDIX I
PAGE 5

FPC 1995 WINTER BASE CASE FOR SY91 W/150 MW NEW GEN @ DBRY; OUTAGE SNFD-NLWD & SNFD-ALTA WED, MAY 29 1991 13:43	100 % RATEA 0.950 UV 1.050 OV KV: ≤115 , ≤230 , ≥500	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR

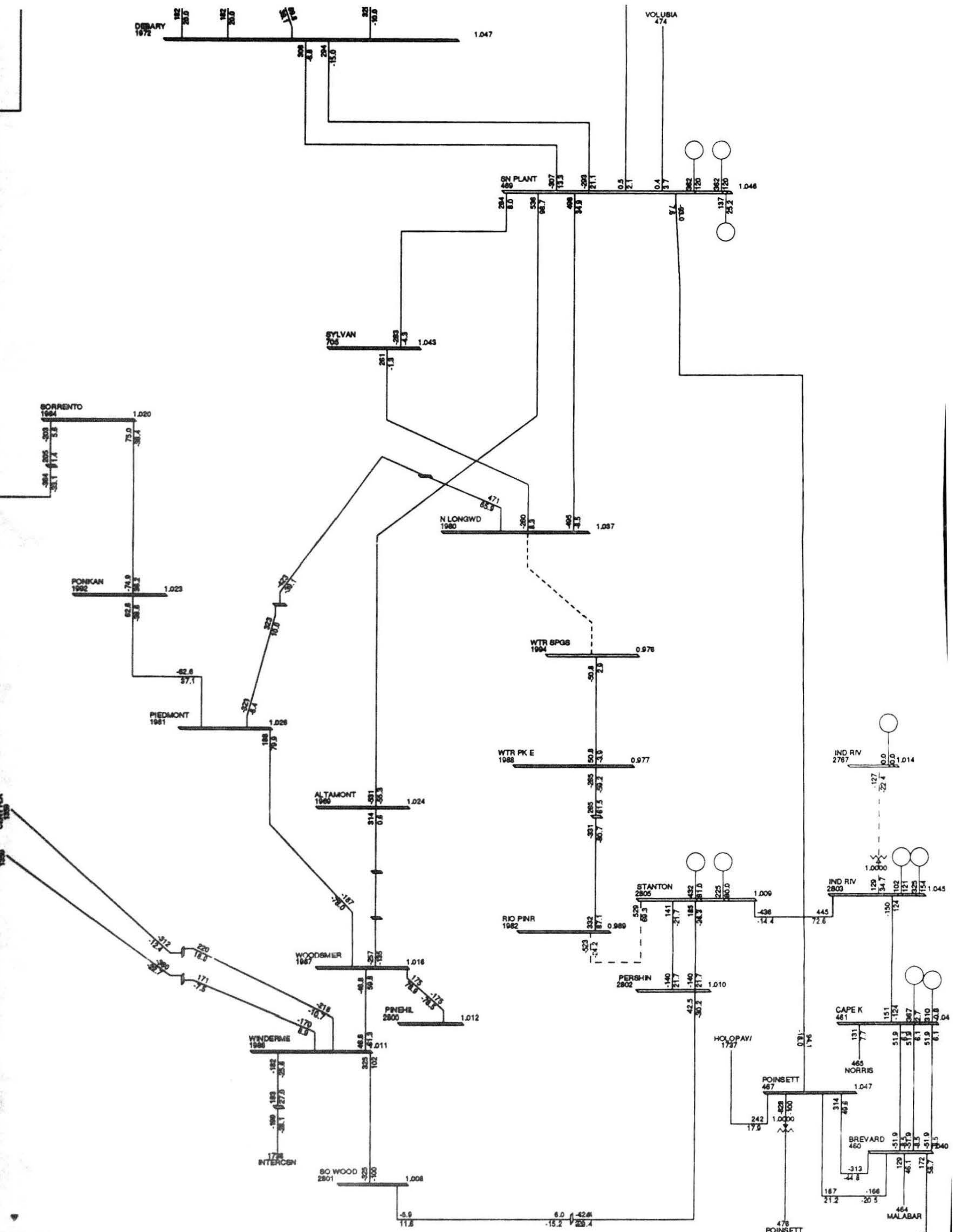


APPENDIX I
PAGE 6

FPC 1995 WINTER BASE CASE FOR SY91
150 MW @ DBRY & DWS LINE; OUTAGE SNFD-NLWD & SNFD-ALTA
WED, MAY 29 1991 13:40

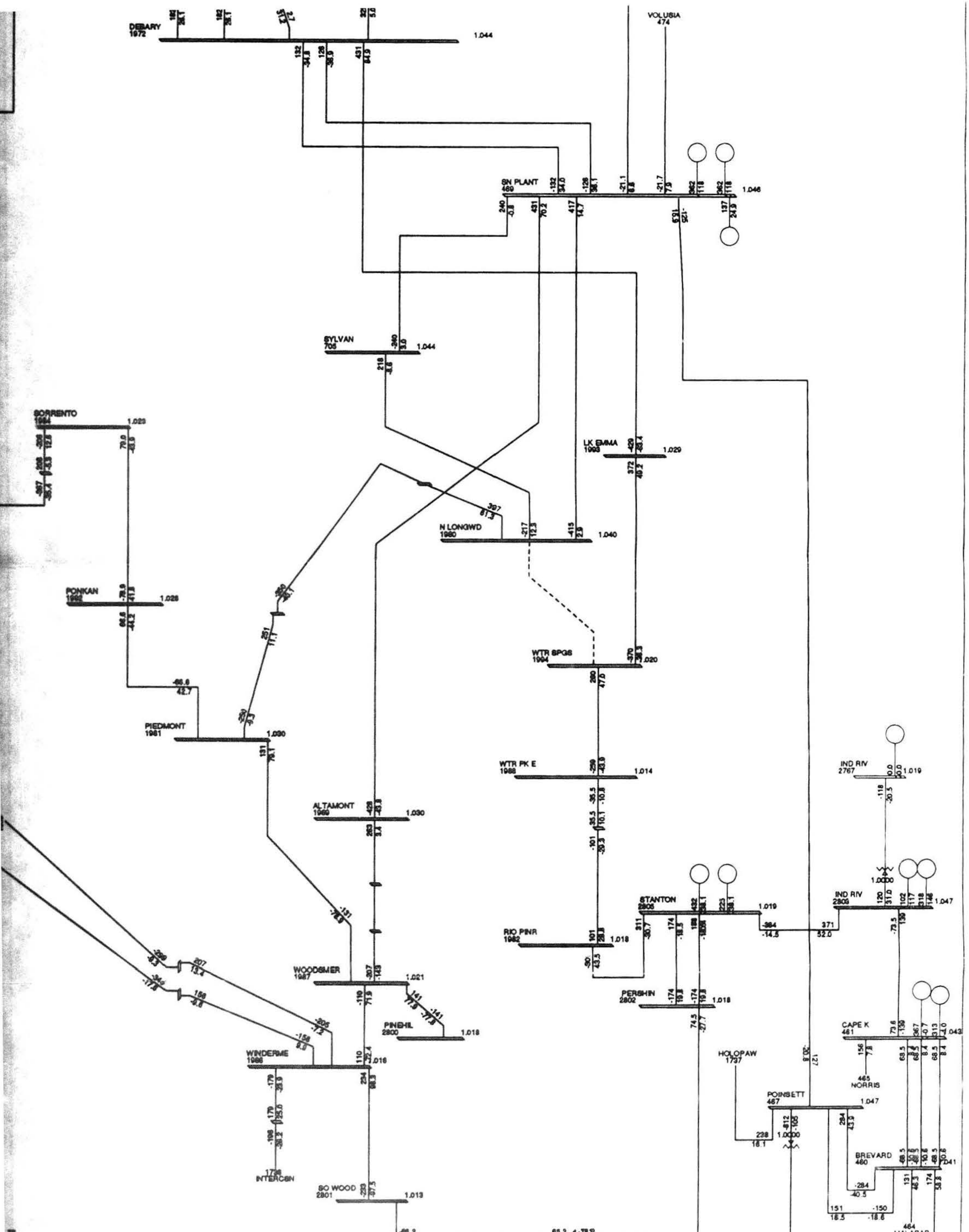
100 % RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≥500

BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR



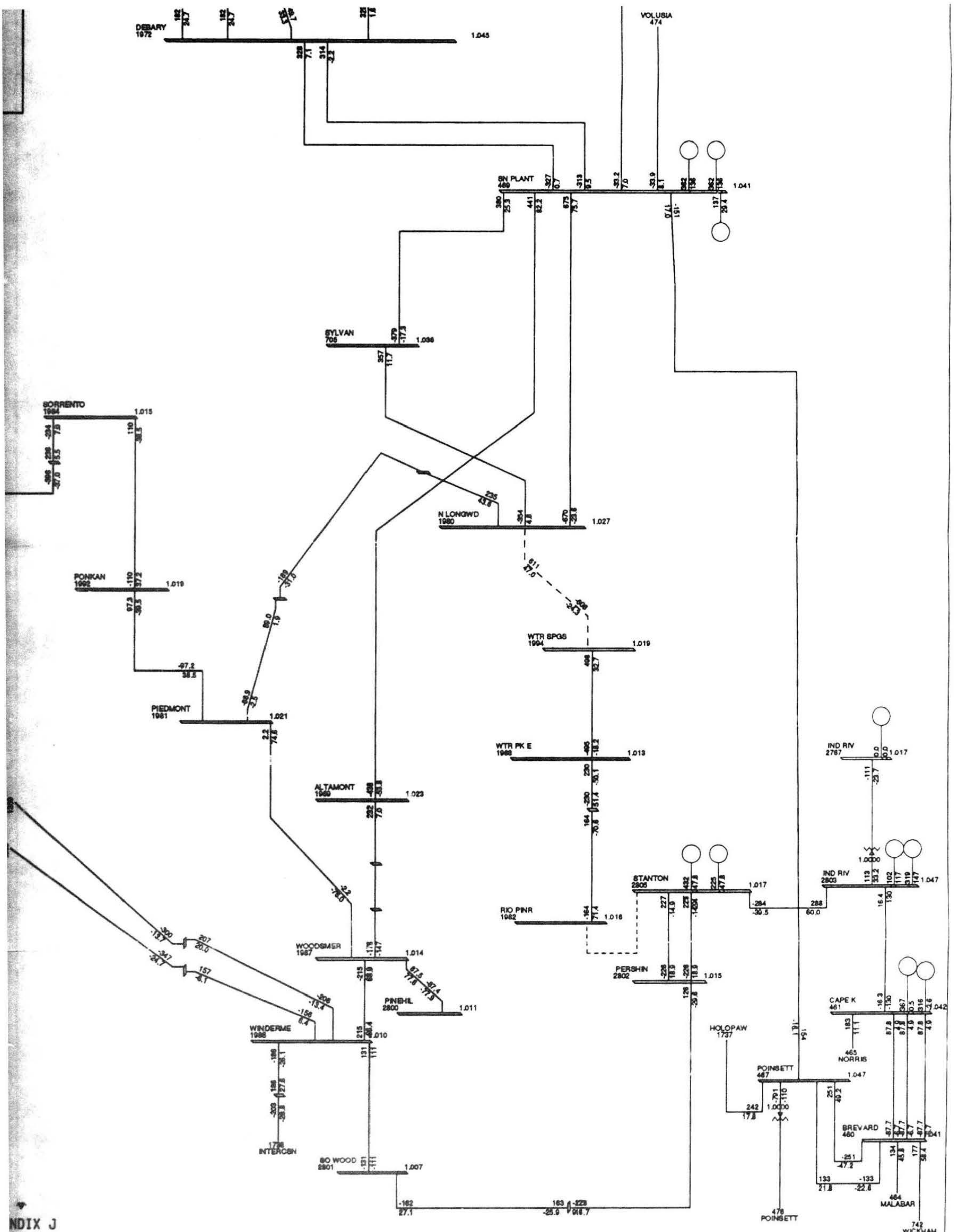
APPENDIX J
PAGE 1

FPC 1997 WINTER BASE CASE FOR SY91 **OUTAGE NLWD-WTR SPGS** **WED, MAY 29 1991 13:58**	100 % RATEA 0.950 UV 1.050 OV KV: ≤115 , ≤230 , ≤500	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR



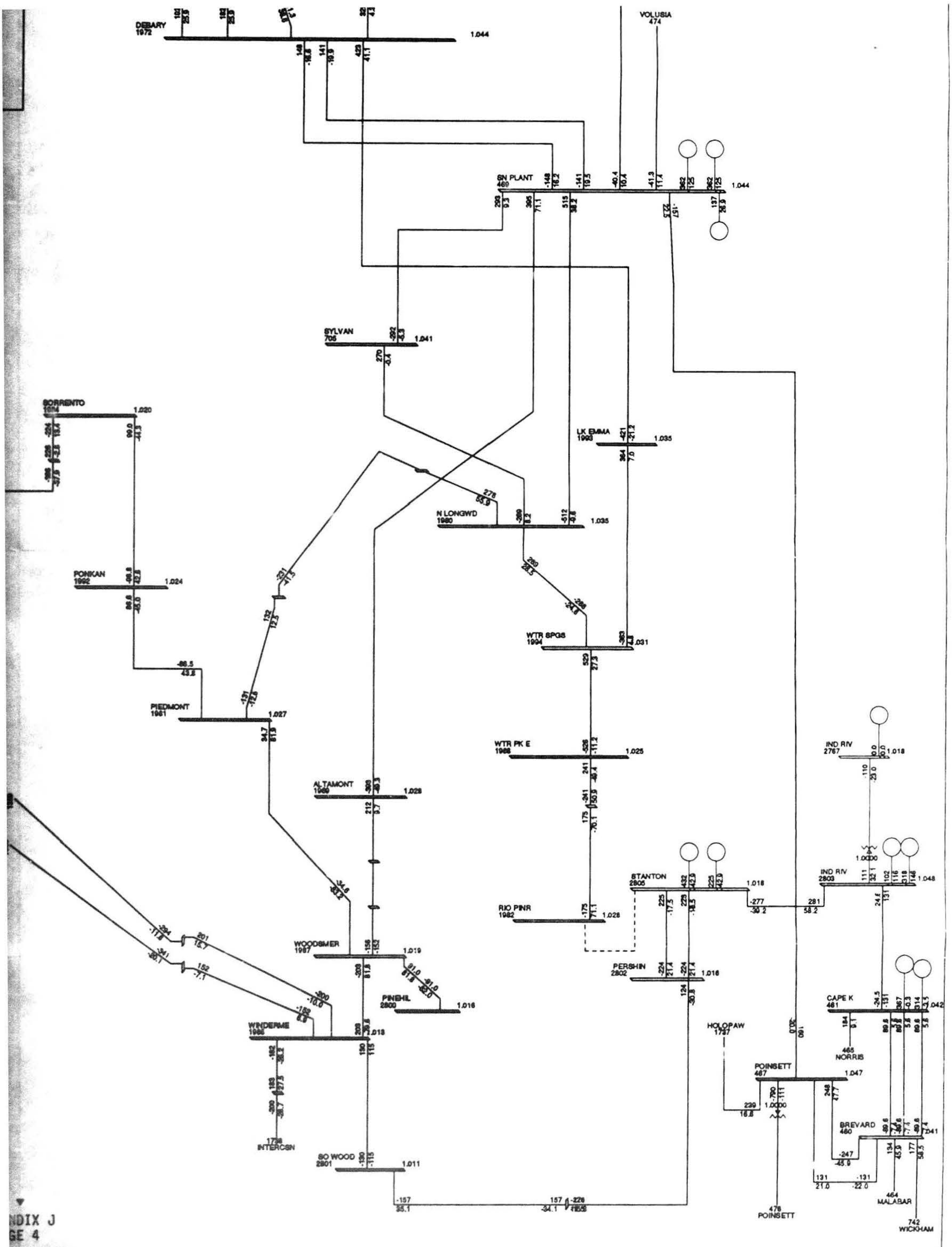
IDIX J
E 2

C 1997 WINTER BASE CASE FOR SY91 DBRY-WTR SPGS; OUTAGE NLWD-WTR SPGS ED, MAY 29 1991 13:55	100 % RATEA 0.950 UV 1.050 OV KV: ≤115 , ≤230 , ≥500	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR



NDIX J
GE 3

PC 1997 WINTER BASE CASE FOR SY91 UTAGE RIO PINAR-STANTON ED, MAY 29 1991 14:02	100 % RATEA 0.950 UV 1.050 OV KV: ≤115 , ≤230 , ≤500	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR

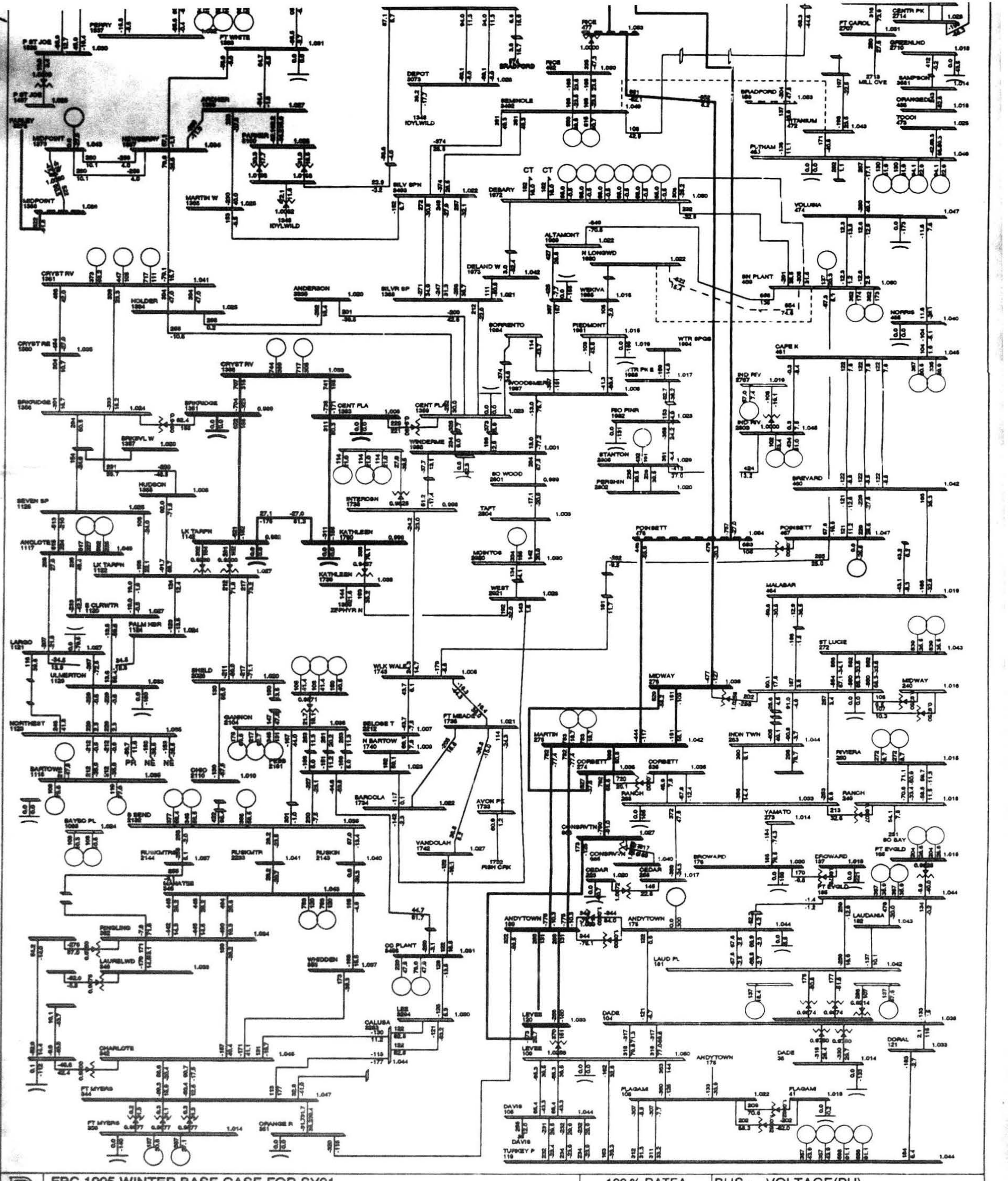


NDIX J
GE 4

PC 1997 WINTER BASE CASE FOR SY91
/DBRY-WTR SPGS; OUTAGE RIO PINAR-STANTON
ED, MAY 29 1991 14:00

100 % RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≤500

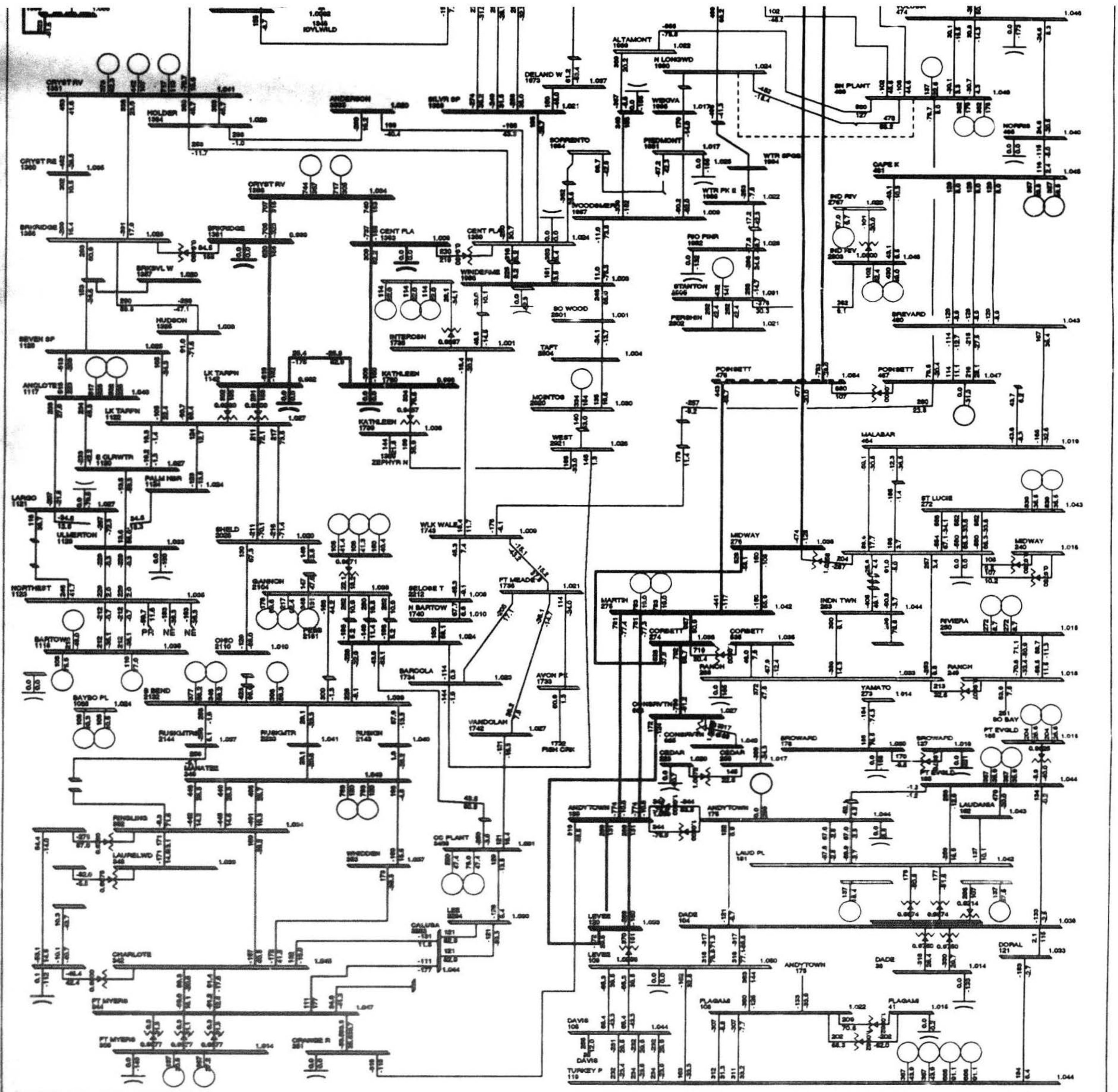
BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR



FPC 1995 WINTER BASE CASE FOR SY91
OUTAGE SNFD-NLWD
WED, MAY 29 1991 13:21

100 % RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≤500

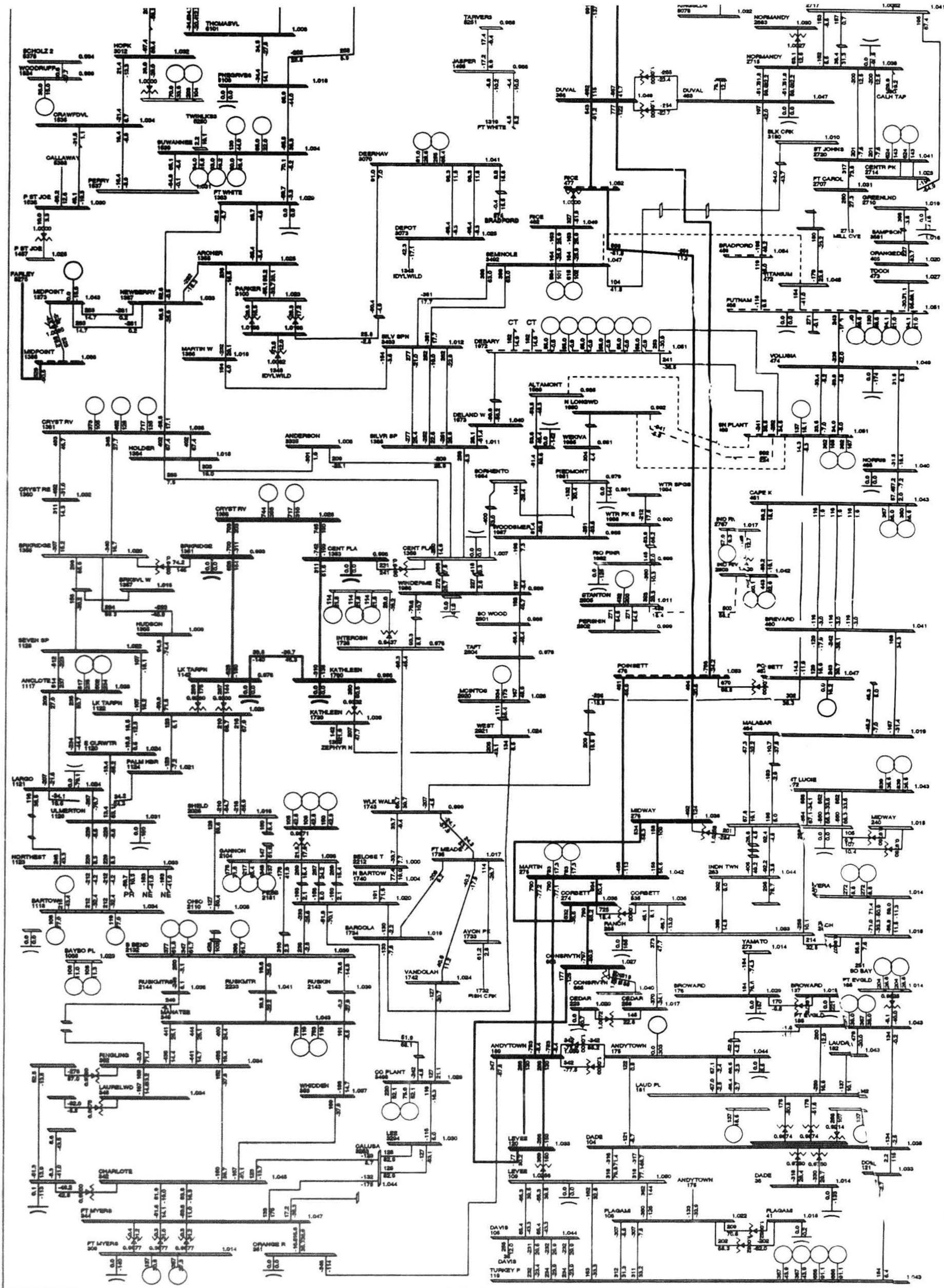
BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR



FPC 1995 WINTER BASE CASE FOR SY91
W/DBRY-WTR SPGS; OUTAGE SNFD-NLWD
WED, MAY 29 1991 13:23

100 % RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≥500

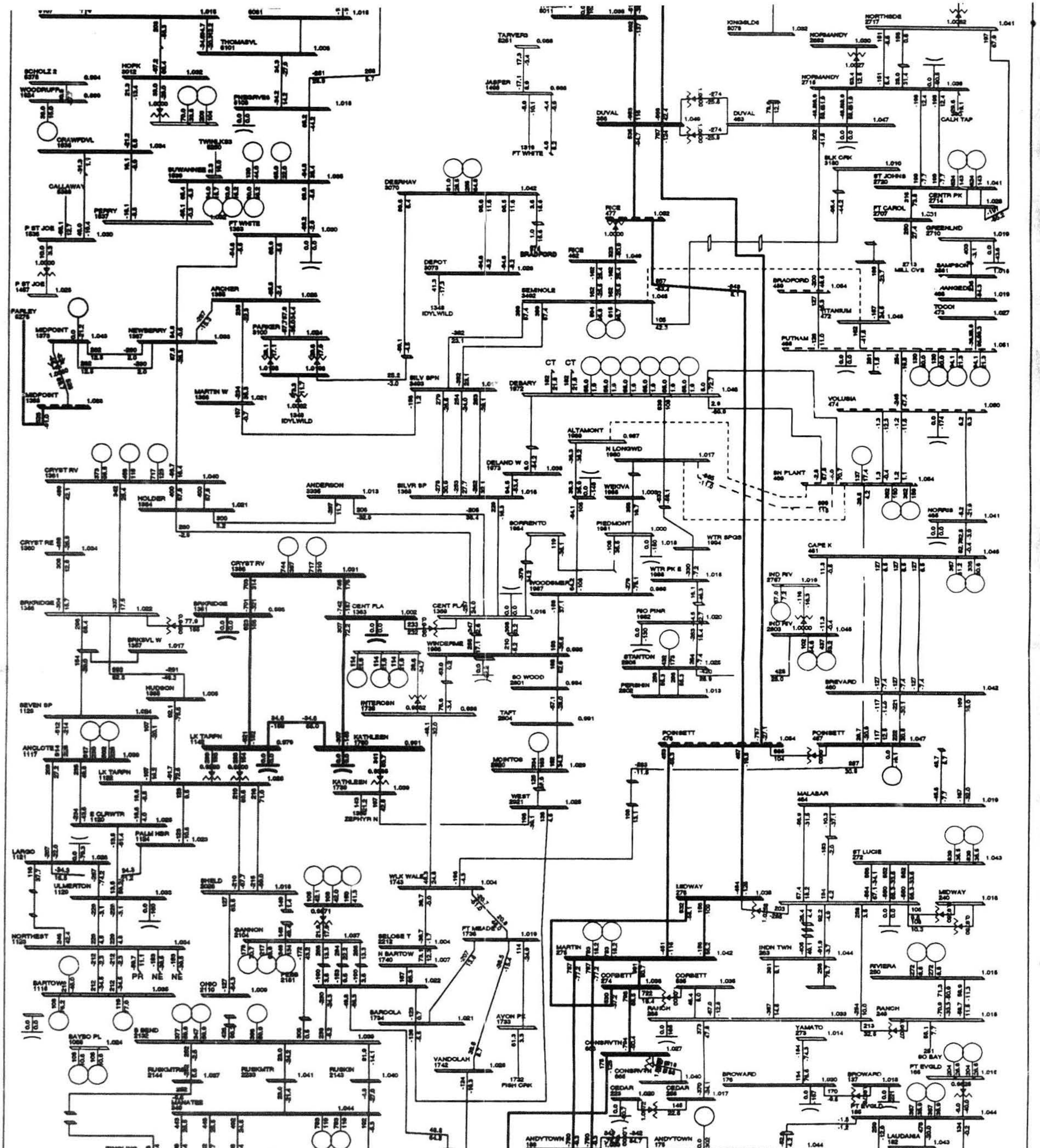
BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR



FPC 1995 WINTER BASE CASE FOR SY91
OUTAGE SNFD-NLWD & SNFD-ALTA
WED, MAY 29 1991 13:28

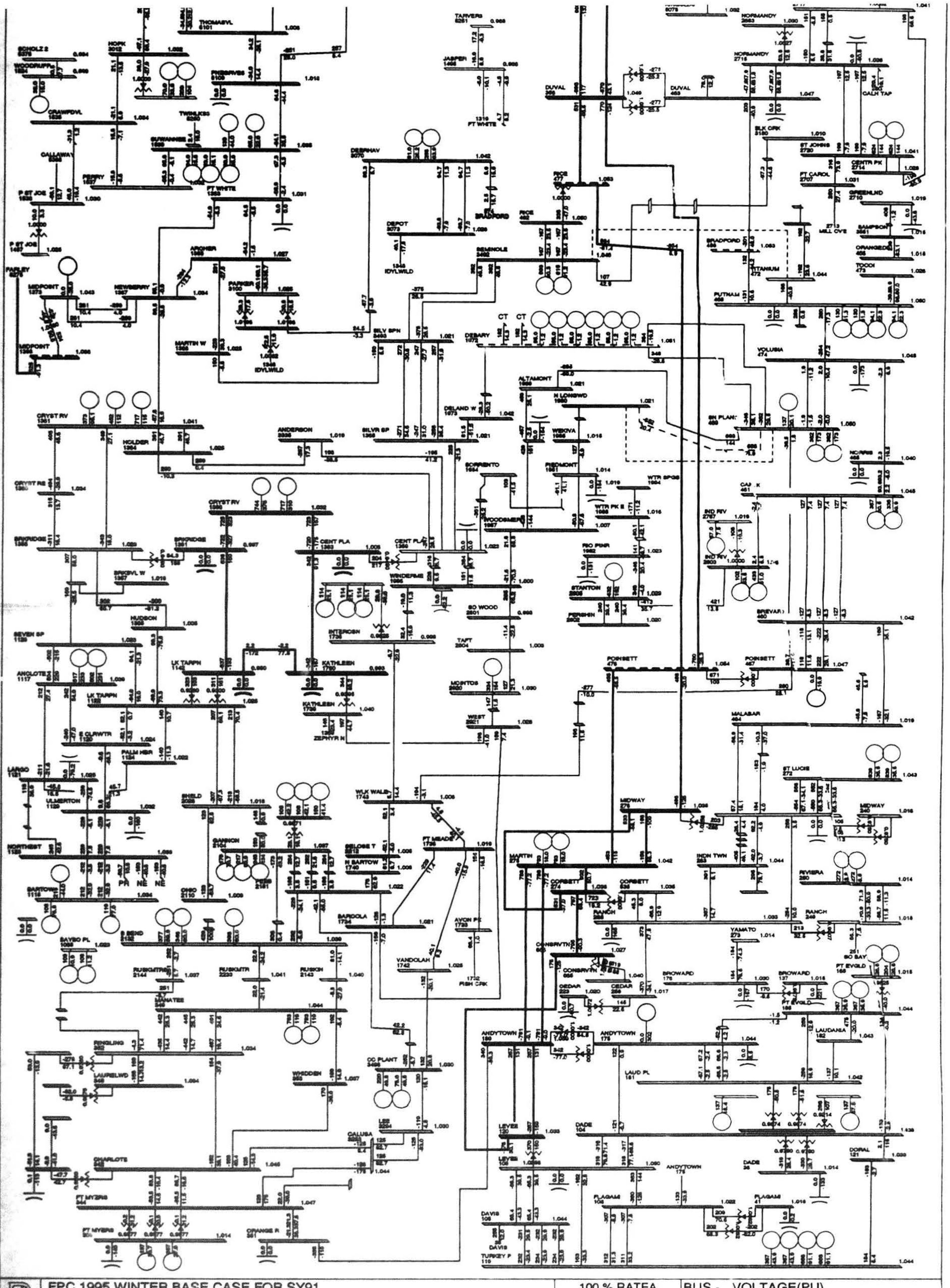
100 % RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≥500

BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR



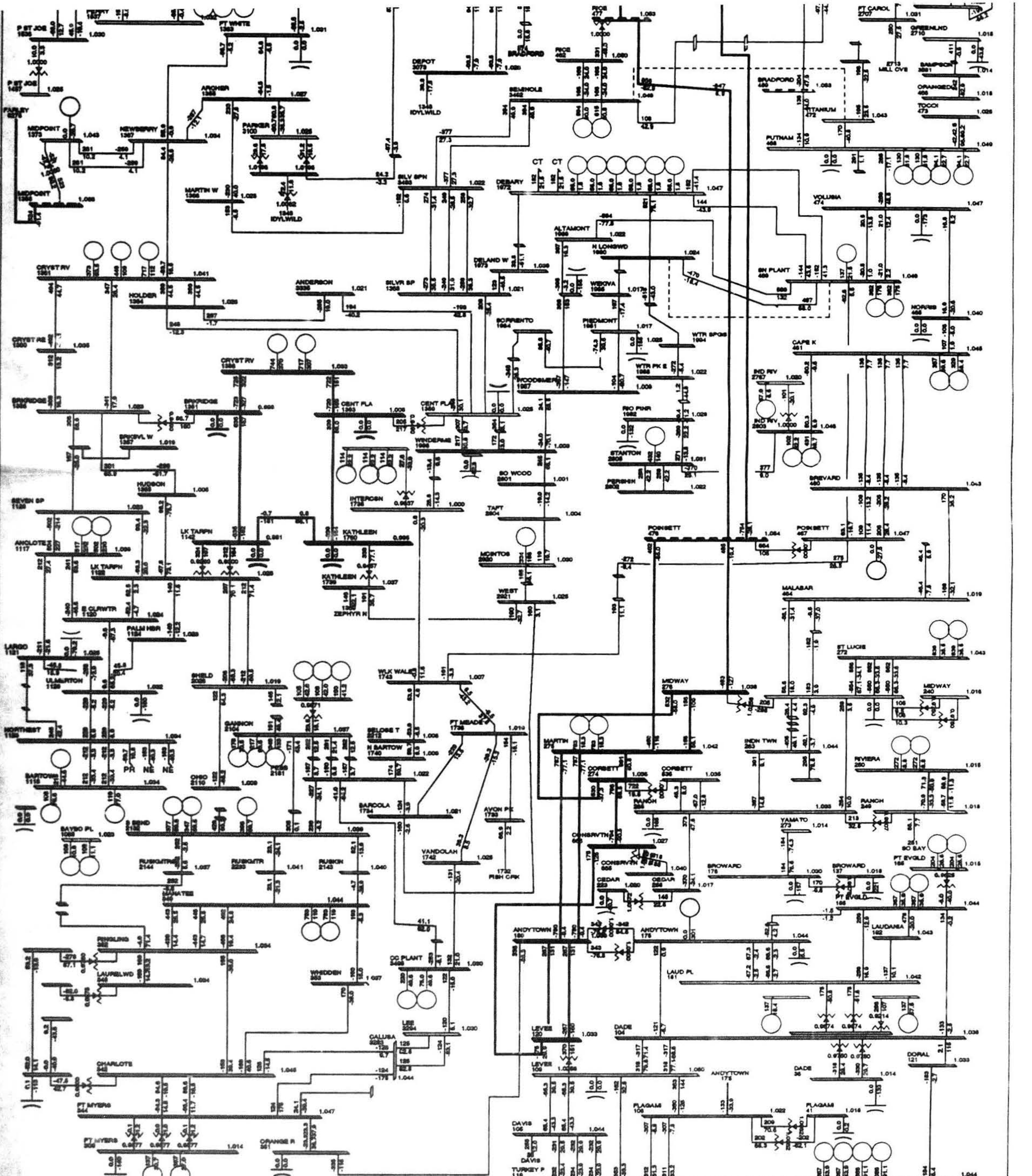
FPC 1995 WINTER BASE CASE FOR SY91
W/DBRY-WTR SPGS; OUTAGE SNFD-NLWD & SNFD-ALTA
WED, MAY 29 1991 13:25

100 % RATEA	BUS - VOLTAGE(PU)
0.950 UV 1.050 OV	BRANCH - MW/MVAR
KV: ≤115 , ≤230 , ≤500	EQUIPMENT - MW/MVAR



FPC 1995 WINTER BASE CASE FOR SY91
W/150 MW NEW GEN @ DBRY; OUTAGE SNFD-NLWD
WED, MAY 29 1991 13:34

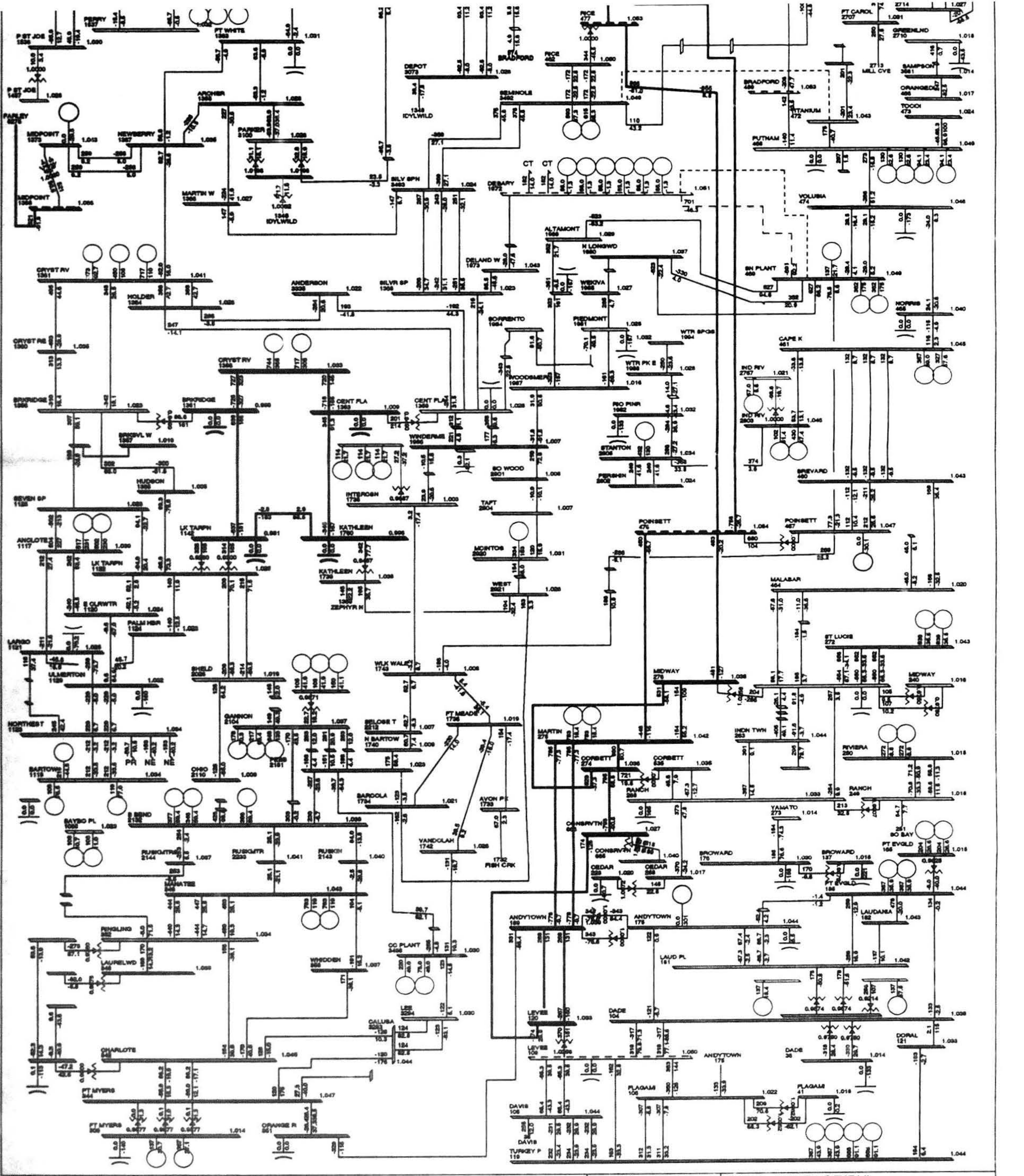
100 % RATEA	BUS -	VOLTAGE(PU)
0.950 UV 1.050 OV	BRANCH -	MW/MVAR
KV: ≤115 , ≤230 , ≤500	EQUIPMENT -	MW/MVAR



FPC 1995 WINTER BASE CASE FOR SY91
150 MW @ DBRY & DWS LINE; OUTAGE SNFD-NLWD
WED, MAY 29 1991 13:31

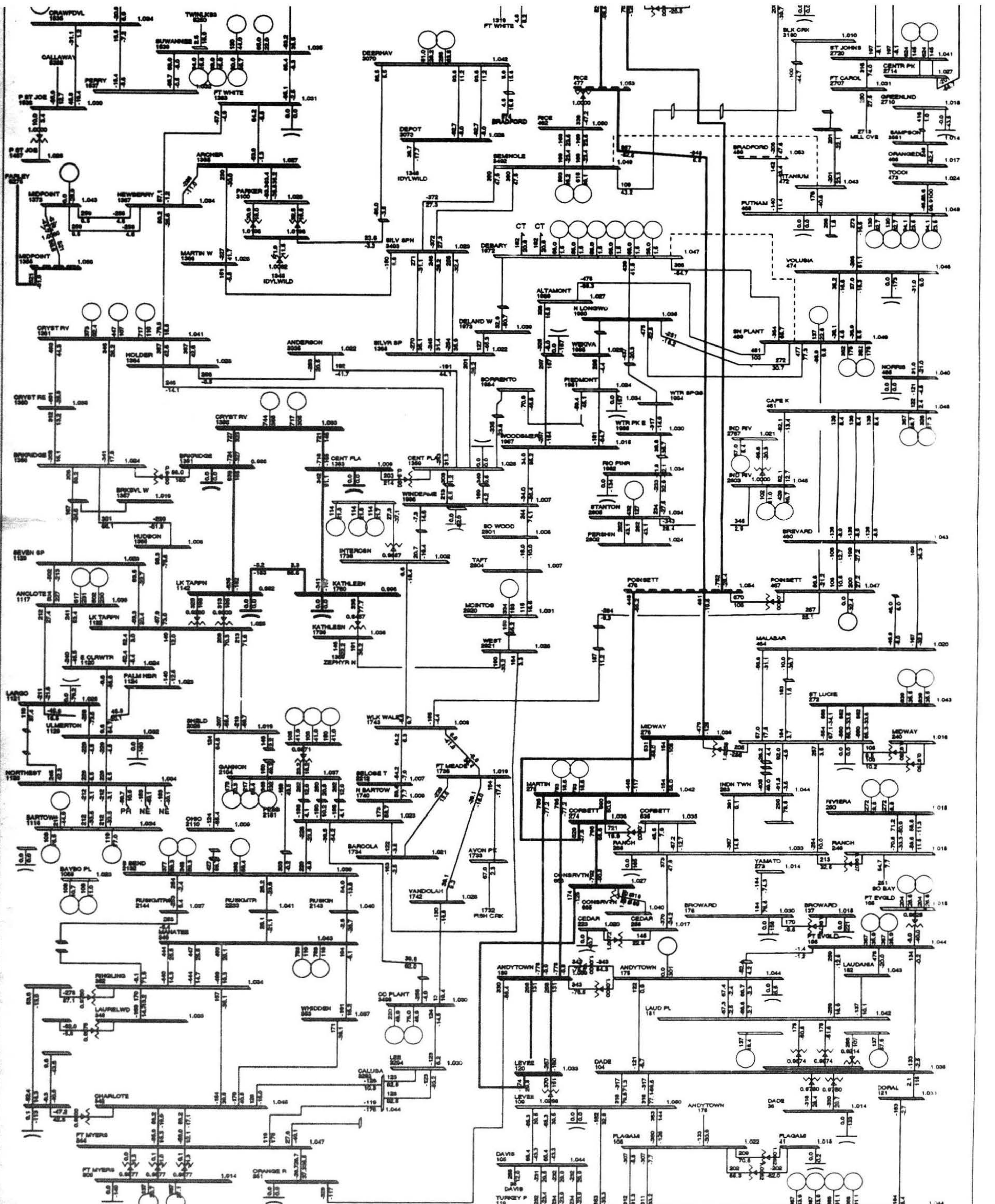
100 % RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≤500

BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR



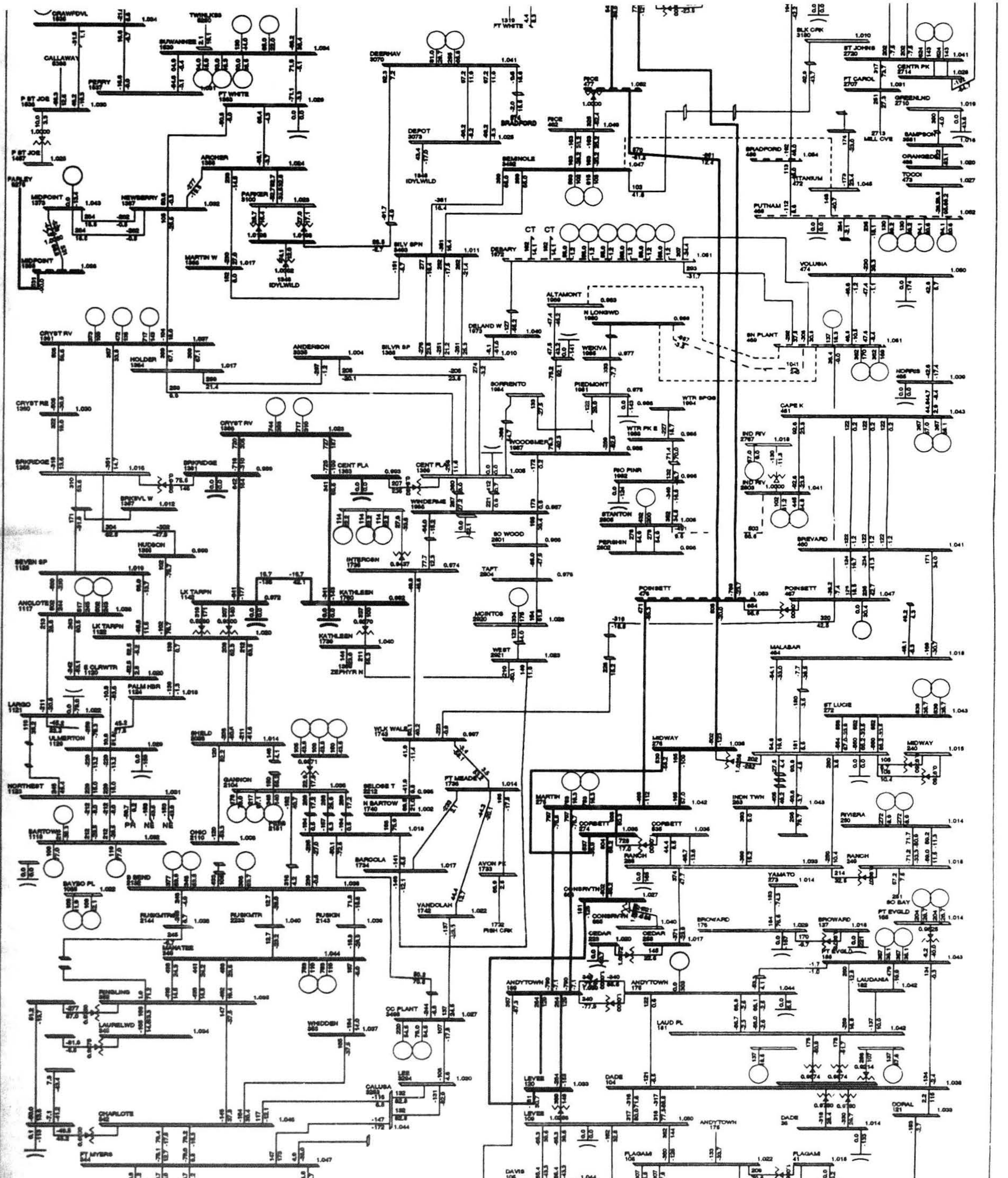
FPC 1995 WINTER BASE CASE FOR SY91
W/150 MW NEW GEN @ DBRY; OUTAGE DBRY-SNFD CKT 1
WED, MAY 29 1991 13:38

100 % RATEA	BUS - VOLTAGE(PU)
0.950 UV 1.050 OV	BRANCH - MW/MVAR
KV: ≤115 , ≤230 , ≤500	EQUIPMENT - MW/MVAR



FPC 1995 WINTER BASE CASE FOR SY91
150 MW @ DBRY & DWS LINE; OUTAGE DBRY-SNFD CKT 1
WED, MAY 29 1991 13:36

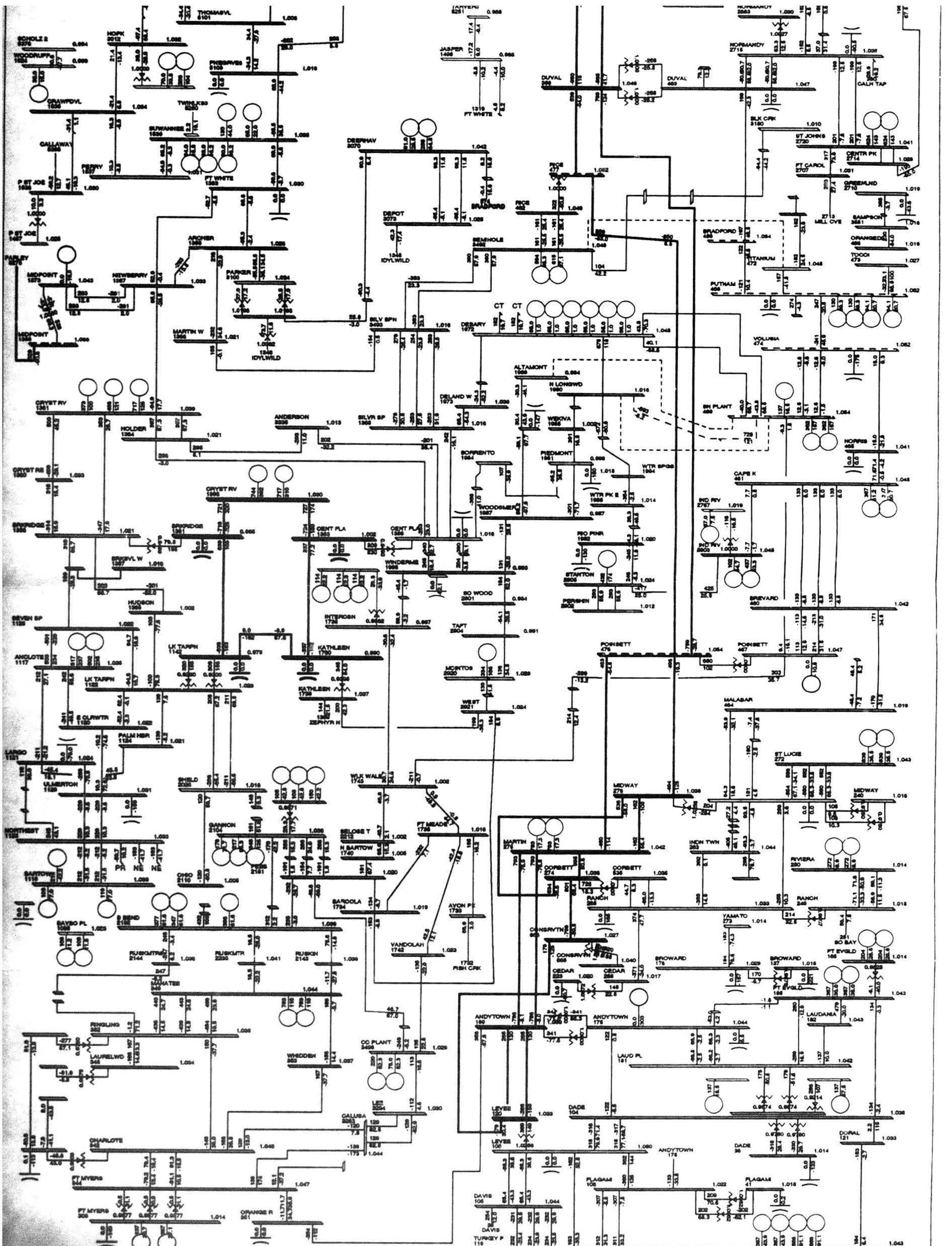
100 % RATEA	BUS -	VOLTAGE(PU)
0.950 UV 1.050 OV	BRANCH -	MW/MVAR
KV: ≤115 , ≤230 , ≤500	EQUIPMENT -	MW/MVAR



FPC 1995 WINTER BASE CASE FOR SY91
W/150 MW NEW GEN @ DBRY; OUTAGE SNFD-NLWD & SNFD-ALTA
WED, MAY 29 1991 13:44

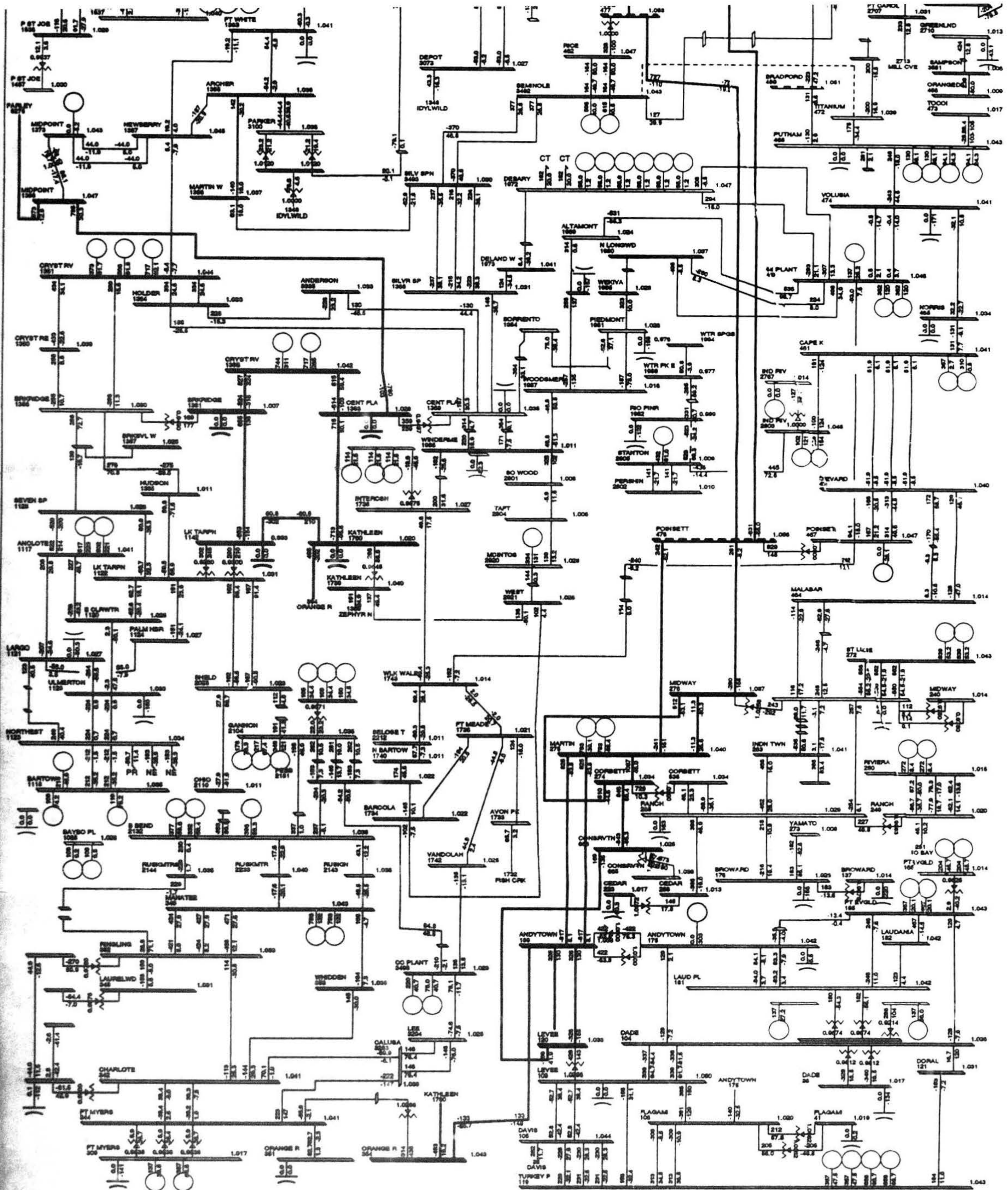
100 % RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≤500

BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR



FPC 1995 WINTER BASE CASE FOR SY91
150 MW @ DBRY & DWS LINE; OUTAGE SNFD-NLWD & SNFD-ALTA
WED, MAY 29 1991 13:41

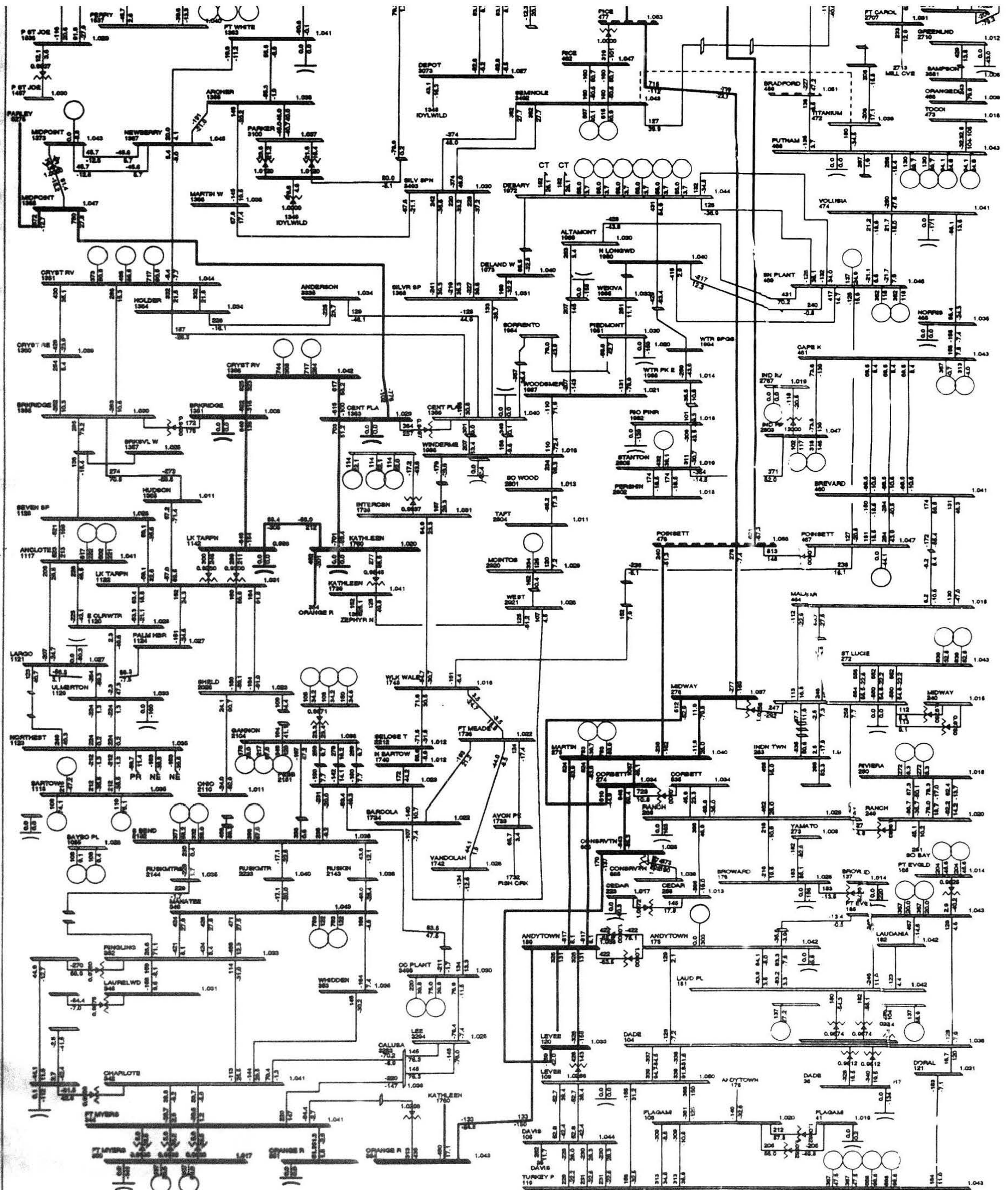
100 % RATEA	BUS - VOLTAGE(PU)
0.950 UV 1.050 OV	BRANCH - MW/MVAR
KV: ≤115 , ≤230 , ≥500	EQUIPMENT - MW/MVAR



FPC 1997 WINTER BASE CASE FOR SY91
OUTAGE NLWD-WTR SPGS
WED, MAY 29 1991 13:58

100 % RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≤500

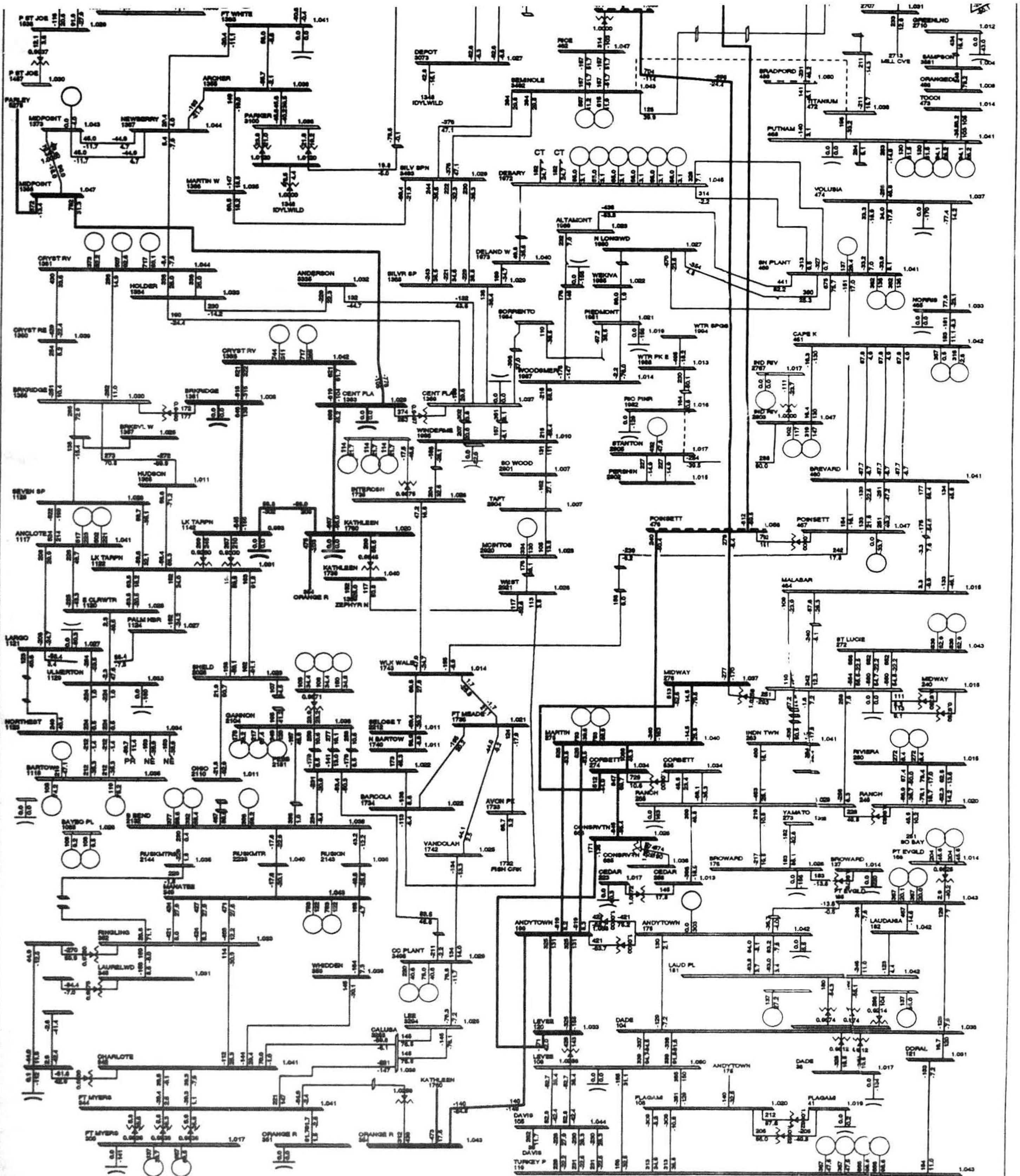
BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR



FPC 1997 WINTER BASE CASE FOR SY91
W/DBRY-WTR SPGS; OUTAGE NLWD-WTR SPGS
WED, MAY 29 1991 13:56

100 % RATEA
0.950 UV 1.050 CV
KV: ≤115 , ≤230 , ≤500

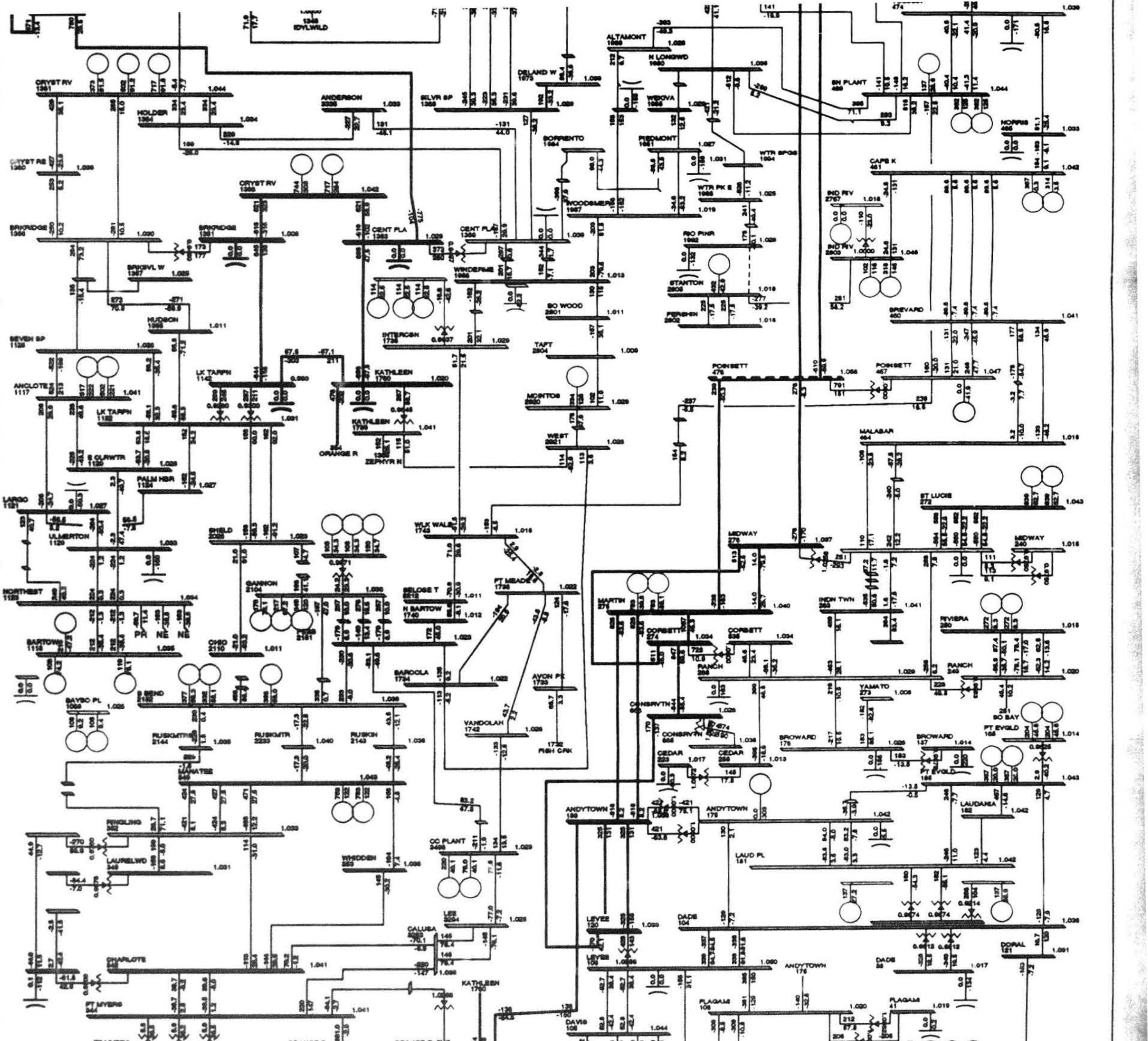
BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR



FPC 1997 WINTER BASE CASE FOR SY91
OUTAGE RIO PINAR-STANTON
WED, MAY 29 1991 14:02

100 % RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≤500

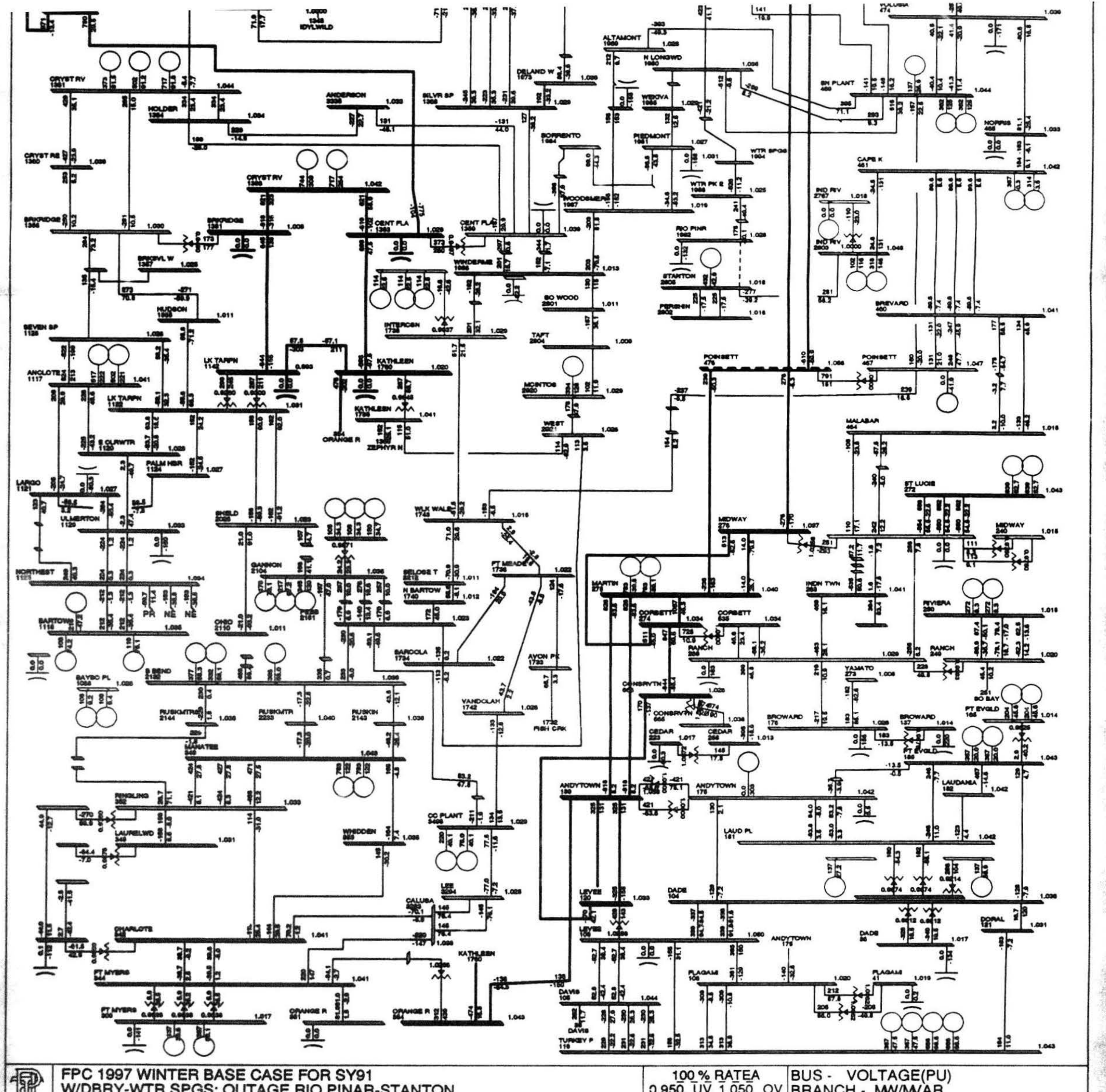
BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR



FPC 1997 WINTER BASE CASE FOR SY91
W/DBRY-WTR SPGS; OUTAGE RIO PINAR-STANTON
WED, MAY 29 1991 14:00

100 % RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≤500

BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR



FPC 1997 WINTER BASE CASE FOR SY91
W/DBRY-WTR SPGS; OUTAGE RIO PINAR-STANTON
WED, MAY 29 1991 14:00

100 % RATEA
0.950 UV 1.050 OV
KV: ≤115 , ≤230 , ≤500

BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR

from

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To

Docket No. 910578-EI
Load Flow Analysis