

(3)

BEFORE THE UNITED STATES
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In The Matter Of)
)
Florida Power & Light Company) Docket No. 50-389A
)
(St. Lucie Plant, Unit No. 2))

5/28/81

MOTION TO ESTABLISH PROCEDURES,
FOR A DECLARATION THAT A SITUATION INCONSISTENT
WITH THE ANTITRUST LAWS PRESENTLY EXISTS AND FOR RELATED RELIEF

Index of Appendices - Volume I

	<u>Page</u>
<u>Appendix A</u>	
Deposition of Robert J. Gardner, April 10, 1981	1-258
<u>Appendix B</u>	
Excerpt from "A History of Florida Power & Light Company," Gardner Ex. 1	B1-8
Excerpts from U.S. Central Station Nuclear Electric Generating Units: Significant Milestones, (Status as of July 1, 1980), September, 1980, U.S. Department of Energy, Gardner Ex. 1	B9-49
FPL Expenditure Requisitions for Turkey Point Plant, December 1968, Gardner Ex. 1	B50-51
Documents showing FPL awareness of cooperative and municipality interest in nuclear plants, 1959	B52-71
[Page reserved]	B72
Minutes of Meeting on Nuclear Power, November 27, 1961, Office of W. J. Clapp, Florida Power Corp., Gardner Ex. 4	B73-75

8105290/6/4

Appendix B (con't.)

Page

FPL letter from George Kinsman to Fischer S. Black of Tampa Electric Co. re formation of Atomic Power Committee, January 8, 1962, Gardner Ex. 5

B76

Letter from W. J. Clapp to W. B. McGuire of Duke Power Co. re Savannah River Nuclear Power Project assessments, February 7, 1964, Gardner Ex. 8

B77-78

Letter from R. H. Fite to Harllee Branch, The Southern Company re: competition in nuclear power field, December 4, 1959, Gardner Ex. 16

B79-80

[Pages reserved]

B81-88

Excerpts from Light Water - How the Nuclear Dream Dissolved, I. C. Bupp & J. Derian, Basic Books, Inc., Gardner Ex. 20

B89-96

[Pages reserved]

B97-100

[Page reserved]

B101

[Page reserved]

B102

Excerpt from report given by R. H. Fite at Annual Stockholders Meeting, May 15, 1961, Gardner Ex. 28

B103-05

Letter from J. R. Brice, J. T. Logan, and K. S. Buchanan of Tampa Electric Co. to H. W. Page of FPL re report entitled "A Coordinated Plan for the 1970 Generation and Transmission Requirements for the Electric Utilities of Florida," May 9, 1960, Gardner Ex. 29

B106-220

Letter from H. K. McKean of Florida Power Corp. to George Kinsman re data being furnished to Federal Power Commission for National Power Survey, February 18, 1963, Gardner Ex. 30

B221-36

Joint Planning Study, 1964-65, Florida Power Corp., FPL and Tampa Electric Co., prepared by Florida Operating Committee with Cooperation of Orlando Utilities Commission, June 1961, Gardner Ex. 31

B237-388

Appendix B (con't.)

Page

Letter from R. H. Fite to J. Dillon Kennedy, Commissioner of City of Jacksonville re request for power supply study data, November 3, 1964, Gardner Ex. 32	B389-391
Letter from Long-Range Study Group of Florida Operating Committee to Lester Ulm, Jr., Chairman re Interim Report of Long-Range Generation-Transmission Planning Study, July 8, 1966, Gardner Ex. 33	B392-426
[Page reserved]	B427-440
Internal FPL memorandum on pros and cons of acquisition of Homestead electric system, 10/18/67, Gardner Ex. 35	B441-50
[Pages reserved]	B451-70
Handwritten notes re Division Managers' meeting of October 18, 1973 re Antitrust - Homestead, Gardner Ex. 46	B471
Letter from J. J. Kearney of Edison Electric Institute to Policy Committee on Atomic Power re attached "Remarks of John B. Anderson - Changing Times for the Nuclear Power Industry," September 16, 1968, Gardner Ex. 47	B472-82
Documents re Armour & Company chemical processing plant, 1966, Gardner Ex. 49	B483-90

APPENDIX A

Transcript of Proceedings

UNITED STATES DISTRICT COURT
FOR THE
SOUTHERN DISTRICT OF FLORIDA

-----X
THE CITY OF GAINESVILLE AND THE GAINESVILLE- :
ALACHUA COUNTY REGIONAL UTILITIES BOARD, THE :
LAKE WORTH UTILITIES AUTHORITY, THE UTILITIES :
COMMISSION OF NEW SMYRNA BEACH, THE SEBRING :
UTILITIES COMMISSION, THE CITIES OF ALACHUA, :
BARTOW, FT. MEADE, HOMESTEAD, KISSIMEE, :
MOUNT DORA, NEWBERRY, ST. CLOUD, STARKE and : Civil Action No
TALLAHASSEE, FLORIDA, :
: 79-5101-Civ-JLK

Plaintiffs, :

-v- :

FLORIDA POWER & LIGHT COMPANY, :

Defendant. :

-----X

DEPOSITION OF ROBERT J. GARDNER

Washington, D. C.

Friday, 10 April 1981

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UNITED STATES DISTRICT COURT
FOR THE
SOUTHERN DISTRICT OF FLORIDA

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THE CITY OF GAINESVILLE AND THE GAINESVILLE- :
ALACHUA COUNTY REGIONAL UTILITIES BOARD, THE :
LAKE WORTH UTILITIES AUTHORITY, THE UTILITIES :
COMMISSION OF NEW SMYRNA BEACH, THE SEBRING :
UTILITIES COMMISSION, THE CITIES OF ALACHUA, :
BARTOW, FT. MEADE, HOMESTEAD, KISSIMMEE, :
MOUNT DORA, NEWBERRY, ST. CLOUD, STARKE and :Civil Action No.
TALLAHASSEE, FLORIDA, :
:79-5101-Civ-JLK
Plaintiffs, :

-v-

FLORIDA POWER & LIGHT COMPANY, :
:
Defendant. :
-----X

DEPOSITION OF ROBERT J. GARDNER

Washington, D. C.
Friday, 10 April 1981

Deposition of ROBERT J. GARDNER, called for examination
by counsel on behalf of the Plaintiffs, in the Law Offices of
Covington & Burling, 888 - Sixteenth Street, N. W., at 9:00
a.m., before JOEL BREITNER, a Notary Public within and for
the District of Columbia, when were present on behalf of the
respective parties:

DANIEL GUTTMAN, ESQ., and JOSEPH VAN EATON, ESQ., Spiegel
& McDiarmid, 2600 Vermont Avenue, N. W., Washington,
D. C. 20037; on behalf of the Plaintiffs.

J. A. BOUKNIGHT, JR., ESQ., Lowenstein, Newman, Reis,
Axelrad & Toll, Suite 1214, 1025 Connecticut Avenue,
N. W., Washington, D. C. 20036; on behalf of the
Defendant.

-- continued --

1 APPEARANCES - Continued:

2 JOHN P. RUPP, ESQ., JOANNE B. GROSSMAN, ESQ., and
3 HERBERT DYM, ESQ., Covington & Burling, 888 - Sixteenth
4 Street, N. W., Washington, D. C. 20006; on behalf of
5 the Defendant.
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CR 7803
SEP 12

I N D E X

WITNESS

DIRECT

Robert J. Gardner

By Mr. Guttman

3/122/246

By Mr. Rupp

242

E X H I B I T S

GARDNER EXHIBITS

IDENTIFIED

1	24
2	36
3	37
4	38
5	40
6	43
7	44
8	45
9	46
10	47
11	50
12	56
13	58
14	59
15	65

-- Continued --

R 7303

EXHIBITS - Continued:

1				
2	16	70	39	200
3	17	74	40	201
4	18	85	41 & 42	202
5	19	91	43	203
6	20	97	44 & 45	206
7	21	116	46	215
8	22	135	47	217
9	23	143	48	221
10	24	144	49	224
11	25	153	50	228
12	26	154	51	230
13	27	155	52	235
14	28	160	53	236
15	29 & 30	165	54	250
16	31	169		
17	32	170		
18	33	173		
19	34	182		
20	35	187		
21	36	189		
22	37	197		

PROCEEDINGS

Whereupon,

ROBERT J. GARDNER

was called as a witness and, having been duly sworn, was examined and testified as follows:

EXAMINATION

BY MR. GUTTMAN:

Q Good morning, Mr. Gardner.

A Good morning, Mr. Guttman.

Q Could you please -- you are the Robert J. Gardner who prepared the affidavit attached to the motion to dismiss Tallahassee's claim relating to nuclear power in this case?

A I am.

MR. BOUKNIGHT: Mr. Guttman, at this point Mr. Gardner has two corrections to make to his affidavit. Would it be helpful if he did it at this point?

MR. GUTTMAN: Sure.

MR. BOUKNIGHT: Mr. Gardner, would you do that, please?

THE WITNESS: In paragraph 16 on page 7. After the end of the first sentence add the words, "with the exception of expressions of interest by Homestead and New Smyrna Beach in response to an offer of participation extended to them in 1974." And, at the end of the second sentence add the words, "on the fourth unit." That's all.

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SST:gon

BY MR. GUTTMAN:

Q Now, would you briefly summarize the positions you have held in your employ with FPL, stating who you reported to, what division you were in and what were your responsibilities?

A I joined FPL in 1954 as a helper at the Miami plant. The duties of a helper are those of a laborer, janitor, assistant to carrying things, helping. In the spring of '54 I transferred to the Cutler plant as a results assistant. My duties at that time were calculating station efficiencies and performing chemistry tests on the plant. In the summer of 1955, I was assigned to a student engineer rotation program, where I spent short periods in a number of different offices and functions in the Miami area.

In November of 1955, I was assigned as a field engineer at the Fort Lauderdale plant, where my duties were liaison with the construction of units 4 and 5, which were under construction at that time.

In the winter of 1956, I was assigned to the industrial relations department as a personnel representative, reporting to Mr. John Crawford. I remained in the industrial relations department until 1965, when I became an executive assistant to Mr. McGregor Smith, who was chairman of the board of the company at the time. I assisted Mr. Smith in his activities in connection with the

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BETWON

1 development of the Turkey Point plant. I assisted him in
2 the negotiations for the contracts for the Turkey Point
3 nuclear unit. I assisted in the licensing of the Turkey
4 Point nuclear units, and various other duties that he had me
5 perform.

6 In 1967, I became executive assistant to Dr. James
7 Coughlin, who was vice president for engineering and
8 construction. I assisted Dr. Coughlin in carrying out his
9 duties, among which was negotiating contracts for the
10 St. Lucie unit number 1 and various fossil plants which were
11 under negotiations at that time, particularly Sanford units
12 4 and 5.

13 In 1968, I became involved in environmental problems that
14 were arising at Turkey Point, and from 1969 through 19 --
15 the middle of 1972, I was almost continuously involved in
16 the problems connected with environmental controversies at
17 the Turkey Point plant.

18 In 1972, I was assigned to -- excuse me. In 1971, I
19 became a vice president. In 1972, I was assigned to
20 establish the company's environmental affairs department,
21 which I did.

22 In 1973, I was assigned to establish a strategic planning
23 department reporting to Mr. McDonald, the then president of
24 the company.

25 In 1977, I received additional responsibilities in

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1 connection with interutility affairs. These were -- many
2 of these were reassigned in 1979, and I remain only with the
3 responsibility for being the management liaison with counsel
4 in the antitrust litigation.

5 Q By which you mean this particular case and its
6 related cases?

7 A Yes.

8 Q Have you ever been responsible for the preparation
9 of Florida Power & Light's load forecasts?

10 A Not directly.

11 Q When you say not directly, what do you mean?

12 A My responsibility in the strategic planning has
13 been to review those forecasts and to propose criteria for
14 them.

15 Q Prior to the period of your strategic planning
16 responsibility, were you directly or indirectly responsible?

17 MR. BOUKNIGHT: For what?

18 MR. GUTTMAN: Load forecasts.

19 THE WITNESS: I was not directly responsible for
20 making these forecasts, although I had occasion to review
21 them and use them.

22 BY MR. GUTTMAN:

23 Q Who was primarily responsible, in the period 1960
24 to 1975, roughly, for the load forecasting of the company?

25 A In the period 1960 through -- I'm going to guess

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1 -- about 1972 or '73, load forecasts were the responsibility
2 of Mr. Charles Coome -- Coomes, C-o-o-m-e-s, who was head of
3 the rate department at the time.

4 Following that time, the load forecasts were the
5 responsibility of the system planning department, which
6 was formed in 1973. And there they remained.

7 Q And that would be Mr. Bivens' department?

8 A Yes.

9 Q Have you been responsible for the preparation of
10 transmission or generation plans during your career at
11 the company?

12 A The same answer with respect to load forecasts. I
13 have not been responsible for the preparation of those
14 plans. But I have reviewed them and have recommended
15 criteria to be used in the plans.

16 Q And during the 1960-75 period, roughly who were
17 the individuals responsible? Primarily responsible?

18 A No. In the period 1960 through the time of
19 Mr. Smith's decease in 1972, Mr. Smith was primarily
20 responsible for the system planning.

21 Q Did he actually prepare the plans himself?

22 A I think that Mr. Smith made the decisions
23 regarding the units that were to be committed and
24 constructed and built. And to that -- I think that was the
25 extent of the plans that we actually had at that time.

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1 Q was there anyone who actually prepared physical
2 documents, the planning documents?

3 A I can't remember seeing documents regarding the
4 plans, similar to that which we have had since the system
5 planning department formed in 1973. I can't remember seeing
6 those prior to '73.

7 Q Well, when you say similar, was there anything
8 which you as a layman would call studies that were done
9 relating to planning in the 1960 period, through the decease
10 of Mr. Smith?

11 A There were individual studies made on the units
12 that were under consideration.

13 Q Did you prepare any of those?

14 A Yes.

15 Q Which?

16 A I prepared an economic and cost study with respect
17 to the Turkey Point units 3 and 4. I also prepared an
18 economic study with respect to St. Lucie unit number 1.

19 Q You mentioned in your initial statement that since
20 1977, you have been responsible for interutility affairs,
21 by which I presume you mean dealings with other utilities.

22 Do you mean all other utilities in the country, or the
23 state, or just a group of utilities? Or what universe of
24 utilities?

25 A Generally, all of the utilities: Municipals,

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Between

1 co-ops, and at least coordination of activities in -- of
2 the company's relationships with utilities through the FTG.

3 Q The Florida Coordinating Group?

4 A Yes.

5 Q Who held that responsibility prior to 1977?

6 A I took over from Mr. Ralph Mulholland, who is a
7 group vice president, I believe.

8 Q And, if I recall, he took that responsibility in
9 about 1973? Do you recall the dates?

10 A I think it was probably more like 1975, to the
11 best of my recollection.

12 Q And prior to Mr. Mulholland, who had that
13 responsibility?

14 A To the best of my knowledge, I don't think there
15 was a single person responsible for interutility affairs.

16 Q Prior to 1977, were you directly or -- I guess
17 you're not directly responsible -- were you indirectly
18 responsible for dealings with other utilities?

19 A Only insofar as the issues of those relationships
20 were important issues to the company, that fell under the --
21 my purview at the strategic planning department.

22 Q And prior to 1972 -- was it 1972 when you became
23 the strategic planning head?

24 A '73.

25 Q Prior to 1973, did you have any indirect or direct

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1 responsibility for dealings with other utility systems?

2 A No.

3 Q Okay. Have you ever represented Florida Power &
4 Light on any interutility coordinating groups? For example,
5 the Florida Operating Committee? The Florida Coordinating
6 Group? Or similar groups?

7 A I have represented FPL on a task force of the
8 Florida Electric Power Coordinating Group, the FCG.

9 Q Has that been in the relatively recent past?

10 A It's been within a year and a half or two years.

11 Q Now, how -- how did you -- well, let's go back.

12 You mentioned that you prepared an economic and cost
13 study of the Turkey Point plants; is that correct?

14 A Yes.

15 Q Have you ever prepared any other studies of
16 nuclear power in any of its facets?

17 A I believe that we have made, in strategic
18 planning, some evaluations of nuclear power, and we
19 coordinated a number of -- number of studies comparing
20 nuclear power economics with other forms of power.

21 Q How did you come to prepare this affidavit?

22 A Counsel and I have been discussing the subject of
23 a motion for summary judgment for some time. They informed
24 me that an affidavit would be necessary to support the
25 motion. I have informed them of the general circumstances

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1 and facts regarding FPL's involvement with nuclear power.
 2 They indicated the facts which they felt were necessary to
 3 include in an affidavit. And it was prepared.

4 Q When you say they indicated the facts, did they
 5 indicate -- I understand as lawyers they would tell you
 6 what was legally necessary, but did they indicate particular
 7 facts that were necessary?

8 A Of the information that I had given them, they
 9 indicated which of those facts they wished to include in the
 10 affidavit.

11 Q Now, in the course -- approximately when did you
 12 begin to prepare the affidavit?

13 A It was several weeks before the motion was filed.

14 Q In the course of preparing it, did you discuss it?
 15 And by that, I mean, including the facts in it? You may not
 16 have said to someone, I'm writing an affidavit, but you
 17 said, I'm interested in certain facts? Did you discuss the
 18 affidavit or the facts in it with anyone?

19 A Yes.

20 Q Who?

21 A With counsel.

22 Q And counsel was all? Is that all?

23 A I discussed it with my assistant, Mr. John
 24 Sullivan.

25

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BATWen 1 Q Did you discuss any of the facts with any company
2 officials, past or present?

3 A I don't recall that I did.

4 Q Above and beyond any discussions you might have
5 had, did Mr. Sullivan or anyone working for you have any
6 discussions related to the facts in the affidavit?

7 A I think Mr. Sullivan discussed certain factual
8 points with other people in the company, to obtain
9 verification of things that I remembered.

10 Q Do you know who those people were?

11 A I think one discussion he had was with project
12 management department.

13 Q Project management? Is that within systems? Is
14 that in Mr. Given's division? Or who was that under? ^{planning}

15 A Project management is headed up by Mr. Joe
16 Williams.

17 Q Did he talk with Mr. Williams?

18 A I don't know who in the project management
19 department he talked to. Probably not Mr. Williams, but I
20 don't know who.

21 Q Did he make any record of his conversation?

22 A There was a subsequent record made after the
23 conversation.

24 Q Have you provided that to us?

25 A I believe so.

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1 Q Did Mr. Sullivan talk with anyone other than
2 someone in Mr. Williams' department?

3 A He may have. I can't put my finger on -- I'm sure
4 in collecting various documents he must have talked to
5 people, but I can't specifically put my finger on the
6 individuals he obtained various documents from. He must
7 have asked people where the files were, or --

8 Q Other than perhaps Mr. Williams, did you
9 specifically tell him to talk to anyone? For example: Go
10 back to Mr. Smith? Or, Mr. Jones?

11 A Not that I can recall.

12 Q Okay. Did you draft the affidavit entirely by
13 yourself?

14 A No. We agreed that a first draft would be
15 prepared by counsel. I then rewrote that draft. And
16 checked various statements and facts in the draft to make
17 sure that they corresponded to my recollection and the
18 information that I had given counsel.

19 Q You mentioned looking for documents. How did you
20 determine what documents or records to review in order to
21 prepare the affidavit?

22 A Several sources. One, consultants furnished me
23 with some documents. And I remember most -- some of the
24 documents. Some of the documents were prepared in
25 connection with other testimony. And some of the documents

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1 were obtained by Mr. Sullivan, who knew the particular
2 document, indicating the fact that I knew and remembered.

3 Q Did you have master list of files that⁷ could refer
4 to when you were deciding where to go?

5 A - No.

6 Q Did you prepare a request for Mr. Sullivan? Was
7 there anything in writing, saying: Pull these files? Or
8 pull these documents?

9 A No.

10 Q You say this affidavit is based on your personal
11 knowledge?

12 A Yes.

13 Q Obviously, it covers quite a bit of material over
14 quite a span of time. During that period, 1965 -- 1960 to
15 the present, did you ever make calandar notes, schedule
16 notes? Did you keep a desk calendar? Anything of that
17 nature? Or did your secretary keep one for you?

18 A Yes. I'm fairly certain that I've kept calendars
19 through that time. I don't know whether I still have them
20 or not. I don't know how far back they'd go.

21 Q Did you ever make notes at meetings?

22 A I'm sure that notes of meetings -- I seem to
23 recall making notes at meetings. I can't put my finger on
24 any specific ones, but --

25 Q For example, the strategic -- as head of the

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1 strategic planning department I understand that you have had
2 quite a few meetings, is that correct?

3 A Yes.

4 Q Have you made notes at any of those?

5 A Not that I can recall. There was material
6 prepared for a number of meetings, which strategic planning
7 department had. Usually that material was prepared ahead of
8 time, as opposed to notes that were taken during the meeting
9 or afterward.

10 Q Do you recall anyone else taking notes during
11 strategic planning meetings?

12 A Not specifically. People may have jotted
13 something down on a scratchpad or something. But I can't
14 recall them being typed up and distributed or --

15 Q Do you know whether -- you referred to
16 possibly having made calendar notes or notes of meetings.
17 Insofar as you may have made them, have they been destroyed
18 or lost, or whatever?

19 A Well, I know that material from the 1965 days, I
20 have discarded because I have been unable -- for example,
21 been unable to find that economic study. I looked for it
22 several years ago. So I know that I have discarded material
23 that I have accumulated in one job after being in another.

24 Q When you say the 1965 date, does that go up to the
25 1972 strategy planning job or what does that 1960 date

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encompass?

A well, my experience with Mr. Smith in working on the nuclear power plant was a period of about two years, from 1965 through '67." And then I moved on to the environmental problems with Turkey Point. And also being an assistant to Dr. Coughlin, I think sometime during that period I discarded material that I had accumulated about nuclear power.

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Q In the course of preparing this affidavit, did you ask Mr. Sullivan, or anyone, or your counsel, to search and see if they could find a copy of your study? The 1965 Turkey Point --

A I had searched previously for that study, and been unable to find it.

Q Had you told counsel that there was such a study, but that you could not find it?

A Yes.

Q Are you relying on that study in this affidavit in any way?

A Yes.

Q Do you know if counsel has produced a copy of that study to Cities?

MR. BOUKNIGHT: I'll answer that, Mr. Guttman. We have not. We have tried to find the document, and apparently, it's not in Florida Power & Light Company's possession.

BY MR. GUTTMAN:

Q Do you know of any other studies of Turkey Point made in the 1965 period by FPL or for FPL?

A There were a number of studies made in that period.

1 Q Do you know if any of them are still in existence?

2 A I haven't seen them for a long time.

3 Q Did you check when you prepared the affidavit
4 to determine whether they were in existence?

5 A No.

6 Q Did you ask counsel if they had checked in the
7 course of responding to Cities' discovery?

8 MR. BOUKNIGHT: I'm going to object to that,
9 Mr. Guttman.

10 BY MR. GUTTMAN:

11 Q Do you know if they were provided to Cities in
12 the course of discovery?

13 A I don't think they would have been. The studies
14 were environmental in nature.

15 Q Solely environmental?

16 A The studies that I can remember that were made
17 with respect to Turkey Point were mainly environmental
18 studies.

19 Q Were there any environmental studies other than
20 the one that you referred to?

21 A Not that I can remember.

22 Q Were there any safety, as opposed to environmental,

1 studies?

2 A There were a number of safety studies made in
3 connection with the licensing, and there's been a number of
4 engineering and safety studies performed since that time.

5 Q Do you know if they were provided to Cities?

6 A I doubt if they would have been.

7 Q When you say you "doubt," why do you doubt that?

8 A Because I don't think they were in the general
9 area, pertinent to this inquiry.

10 Q Has counsel shown you Cities' response to Florida
11 Power & Light's initial interrogatories in this case,
12 which was a kind of thick document?

13 A Yes.

14 Q Did you go over that response?

15 A I have gone over it, right.

16 Q Then you are aware that response references
17 numerous communications between or among FPL and the Cities
18 over the years; is that correct?

19 A Yes.

20 Q Are you personally familiar with the contents of
21 all those communications?

22 A No.

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1 MR. BOUKNIGHT: Mr. Guttman --

2 MR. GUTTMAN: This is voir dire.

3 BY MR. GUTTMAN:

4 Q Have you asked anyone to prepare chronologies of
5 the Cities' communications with Florida Power & Light
6 as an aid to your affidavit?

7 A Not in connection with the affidavit.

8 Q Have you reviewed any chronology of Cities' --
9 or the dealing of any Cities with FPL?

10 MR. BOUKNIGHT: Are you asking in connection
11 with the affidavit?

12 MR. GUTTMAN: Or relied on in connection? By
13 which, I mean, are you relying either expressly or indirectly
14 on any chronology which you reviewed?

15 THE WITNESS: No.

16 BY MR. GUTTMAN:

17 Q Have you ever performed a power supply study for
18 Florida Power & Light Company, an engineering economic
19 study?

20 A I would think that's the same kind of study
21 I told you about before.

22 Q The nuclear cost study you did in 1965?

1 A Yes.

2 Q Have you done any others?

3 A I think I indicated that, as in -- in strategic
4 planning we have coordinated several economic studies.

5 Q Have you ever performed a power supply study
6 of the alternatives available to Tallahassee?

7 A I can't think we performed a study, as such.

8 Q When you say "a study, as such," what would you
9 have performed other than a study that would be a study?

10 MR. BOUKNIGHT: Mr. Guttman, I will object to that
11 and direct the witness not to answer to the extent that it
12 encompasses material that may have been prepared by counsel,
13 and that he's aware of, with respect to this litigation.

14 BY MR. GUTTMAN:

15 Q In preparing your affidavit, did you in any
16 respect rely on any study or such relating to Tallahassee?

17 A No.

18 MR. GUTTMAN: The reference "study or such" refers
19 to a power supply study of Tallahassee, so the record is clear;
20 is that correct, Mr. Gardner?

21 THE WITNESS: I understood.
22

BY MR. GUTTMAN:

Q Now, your counsel, I presume, provided you with a copy of the notice of this deposition; is that correct?

A Yes.

Q That notice, as you recall, asked you to bring with you to the deposition certain documents that you relied on, as stated in the notice; is that correct?

A Yes.

Q Yesterday your counsel gave us a bundle of documents. Do you have a copy of that bundle?

A No, I don't.

MR. GUTTMAN: Does counsel have a copy of that bundle?

MR. RUPP: We have the documents, yes.

MR. BOUKNIGHT: Mr. Guttman, one item we should bring to your attention. Certain documents which may be called for by your schedule of documents have been withheld on grounds of privilege and/or work product. And you will be provided a list of those documents.

(Discussion off the record.)

MR. GUTTMAN: There actually are not as many documents as might appear in this pile. I would like to

1 briefly go through them and describe them, and get my
2 understanding if I have described them accurately for
3 the record.

4 BY MR. GUTTMAN:

5 Q The first document is a single page which has
6 just the handwritten notation "Turkey Point Plant, Budget
7 Items, Unit No. 3" --

8 MR. BOUKNIGHT: Mr. Guttman, you don't plan to
9 go through these and place an index of them on the record,
10 do you?

11 MR. GUTTMAN: I may do so if that's convenient
12 to the parties. I just want the record to show what
13 documents were submitted to us.

14 MR. BOUKNIGHT: I don't think that we have to
15 sit here and let you catalog the documents that were given
16 to you. We attempted to comply with the subpoena. I
17 think we did.

18 MR. GUTTMAN: In this case I would just enter
19 them -- I would like Mr. Gardner to go over them, and I
20 would like to, then, upon his attestation that this is an
21 accurate collection, put them in the record as Plaintiff
22 Exhibit.

CR-803
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1 MR. SOUKNIGHT: I don't think Mr. Gardner has to go
2 over that. Mr. Gardner reviewed them with counsel
3 yesterday, and those are the documents counsel produced.

4 MR. GUTTMAN: Fine. I was just doing that as
5 a courtesy. I would like to have this pile marked as
6 Plaintiff's Exhibit No. 1.

7 (Gardner Exhibit No. 1 identified.)

8 MR. DYM: We will assume for present purposes --

9 MR. GUTTMAN: Off the record.

10 (Discussion off the record.)

11 MR. GUTTMAN: I'm entering this as an exhibit
12 subject to the Company, its counsel, checking the stack.

13 (Discussion off the record.)

14 BY MR. GUTTMAN:

15 Q Other than the documents in this Gardner
16 Exhibit No. 1, did you review or cause to be reviewed
17 documents other than those in the course of preparing for
18 this affidavit?

19 A I think that is all.

20 Q When you provided -- when counsel prepared
21 the first draft of the affidavit, had you given to them any
22 documents other than those in this stack?

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1 A No.

2 Q You stated earlier that you received some
3 materials from consultants, or a consultant?

4 A Yes.

5 MR. BOUKNIGHT: I will object to your going
6 into that area, Mr. Guttman. The only material, to my
7 knowledge, and Mr. Gardner, if there's anything in addition
8 to this, then you may answer, but the only material, to
9 my knowledge, that you may have received from consultants
10 was received indirectly through counsel from consultants
11 who are assisting counsel in preparation for this lawsuit,
12 and I would object to any inquiry into those people.

13 BY MR. GUTTMAN:

14 Q Which of the documents were prepared by
15 consultants?

16 A The map showing the locations of nuclear power
17 plants, and the government publication showing the status
18 of nuclear power plants.

19 Q And what consultant or consultants prepared
20 that?

21 MR. BOUKNIGHT: I will not allow that question to
22 be answered.

BY MR. GUTTMAN:

Q Are you relying on those in your affidavit?

MR. BOUKNIGHT: Mr. Guttman, let's be clear what we are talking about. We are talking about a map which was prepared by some agency other than the consultant. I'm not sure by who at this time. And we are talking about a report prepared by the United States Department of Energy, which a consultant provided to counsel, and counsel in turn provided that report to Mr. Gardner.

MR. GUTTMAN: Excuse me. It was my understanding that one set of the documents was not a public document in the sense of being a U. S. Government report, but was actually a prepared study of some sort; is that correct?

THE WITNESS: The other document was a NUS report, showing essentially the same material that's in the government report.

BY MR. GUTTMAN:

Q Now, in the period during which you worked for Mr. McGregor Smith, did you ever prepare any written materials for him? Or in your capacity as his executive assistant?

1 A Yes, I'm sure I did.

2 Q Have those been lost, destroyed, or discarded,
3 or are they still in existence?

4 A I don't know.

5 Q Did you seek to review those potential files in
6 the course of preparing for the affidavit?

7 A No.

8 Q Now, in paragraph 3 of the affidavit, you refer
9 to contract negotiations that you were involved in. Which
10 negotiations were these? What specific contracts?

11 A I assisted Mr. Smith in the negotiations of
12 contracts with various nuclear steam supply vendors for a
13 nuclear steam supply system for Turkey Point and a
14 turbine; and various engineer-constructors for a
15 construction contract for the balance of plant.

16 The negotiations with the vendors also included
17 a fuel supply for the plant.

18 Q Is that the extent of your contract negotiations
19 involvement? Or were there other contracts?

20 A If you are asking with respect to the nuclear
21 plants, yes.

22 Q I am just asking with respect to your statement

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1 12

1 that you are engaged in contract negotiations for large
2 generating plants.

3 A I believe that I assisted Mr. Smith in negotiating
4 an engineering construction contract for the Ft. Myers
5 Unit No. 2.

6 Q Were these contracts presented to the Board of
7 Directors for approval?

8 A Yes, they were.

9 Q Were you involved or present in such
10 presentations?

11 A No.

12 Q Were documents prepared in behalf of the
13 presentation, to your knowledge?

14 A I can't remember whether they were or not.

15 Q Did you perform any written analysis, memos,
16 studies, or anything else in writing related to the Turkey
17 Point contract negotiations?

18 A I'm sure that I must have prepared memos from
19 time to time, and prepared drafts of the contract from
20 time to time.

21 Q Were you the only one who was putting things
22 in writing, or do you know if anybody else involved in

CR-803
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1 those negotiations was preparing -- might have been
2 preparing memos or studies or analyses?

3 A The only other person, other than Mr. Smith, that
4 I can remember was possibly preparing written materials
5 was George Kinsman.

6 Q What was Mr. Kinsman's position at the time?

7 A He was a vice-president.

8 Q Was he responsible for nuclear power, or what
9 was his interest in the matter?

10 A Engineering and construction, including nuclear
11 power.

12 Q Do you know if the documents you just referred
13 to are still in existence?

14 A No.

15 Q Are they in existence, or you just don't know?

16 A I answered your question. You asked me if I
17 knew, and I don't know.

18 Q Okay.

19 In paragraph 4 of your affidavit, you state that
20 you were personally involved in decisions made by FPL to
21 commit the construction of nuclear generating facilities.
22 Which discussions are you referring to?

1 A Mr. Smith's decision to commit to the Turkey
2 Point Units No. 3 and 4; Mr. Fite's decision to commit to
3 St. Lucie Unit No. 1; and Mr. McDonald's decision to
4 commit to St. Lucie Unit No. 2.

5 Q Were you primarily responsible, or I presume,
6 Mr. Smith --

7 A No.

8 Q Who was primarily responsible?

9 A The chief executive officer or president, in
10 each case.

11 Q Who else was involved for FPL in each case?

12 A In the case of Turkey Point 3 and 4, Mr. Kinsman
13 was involved; various other people were -- assisted in
14 various phases of the negotiations. In the case of St. Lucie
15 Dr. Coughlin was involved. And various other people
16 assisted.

17 In the case of St. Lucie 2, Mr. Allen was involved.
18 And probably various other people.

19 Q Now, starting with the Turkey Point units,
20 did FPL, the people you were talking about, consider any
21 alternatives to those units?

22 A Yes.

1 Q. What form were any -- were any documents prepared
2 relating to those considerations?

3 A. The economic study that I described compared a
4 nuclear unit with an oil and gas-fired unit.

5 Q. Were there any others? Is that the only
6 comparison that you recall, or were any other comparisons
7 performed?

8 A. That is the only comparison I can recall.

9 Q. Were any comparisons performed relating to the
10 size of the nuclear unit, as opposed to oil versus
11 nuclear?

12 A. No.

13 Q. Do you know if the company had available to it any
14 studies of the economies of scale at the time of the
15 Turkey Point commitment -- excuse me, economies of scale
16 of nuclear?

17 A. We had proposals for two different unit sizes,
18 including the costs of those. I don't recall that we made
19 any serious comparison between the two -- the cost of
20 the two sizes.

21 Q. Who were the proposals from?

22 A. The proposals were from Westinghouse,

1 General Electric, Combustion Engineering, and Babcock &
2 Wilcox.

3 Q Do you know if the proposals are still in
4 the company's possession or control? Or have they been
5 lost?

6 A I don't know.

7 Q When you say two different sizes, what size?

8 A A size in the neighborhood of 700 to 800 megawatts,
9 and another size around 900 to 1,000 megawatts.

10 Q Did each proposal have those two alternatives
11 among them, or do you recall?

12 A I don't think that combustion engineering
13 and Babcock & Wilcox submitted the larger size proposal.

14 Q In other words, let me ask you, each company
15 submitted only one size; is that correct?

16 A No.

17 Q I'm sorry. Did each of the companies submit two
18 sizes?

19 A No.

20 Q Some companies submitted one and some submitted
21 two?

22 A Yes.

1 Q Did Florida Power & Light commission or
2 participate in any study of the -- considering the economies
3 of scale in nuclear at or about the time of Turkey Point
4 commitment in 1965?

5 A Not that I recall.

6 Q Not that you recall. Do you know of any study
7 which would have shown a greater economy to a plant
8 larger than the size that Turkey Point actually was,
9 approximately 800 megawatts?

10 A No.

11 Q Do you recall the company examining -- do you
12 recall whether the company sought to determine whether
13 there was any potential study that existed showing a
14 greater economy to a larger plant?

15 A I don't know.

16 Q Now, looking at paragraph 16 of your affidavit --
17 excuse me. Let's go to paragraph 7, I believe.

18 There, you say FPL first began considering nuclear
19 generating units in the mid-1960's. Do you see that
20 paragraph there? When you say "mid-1960's," what event
21 or events marks the beginning of that consideration?

22 A The best that I can recall, that vendors submitted

1 some proposals for nuclear plants to FPL.
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1 Q Which vendors and when?

2 A General Electric and Westinghouse, in about
3 February or March of 1965.

4 Q Was that the first time vendors had submitted
5 proposals to FPL, relating to nuclear, of course?

6 A With respect to my first sentence in paragraph 7,
7 yes.

8 Q Had vendors — without regard for that sentence,
9 had vendors previously submitted proposals?

10 A I'm not sure.

11 Q Did you seek to check when you prepared the
12 affidavit?

13 A No.

14 Q Did FPL in any way consider nuclear power prior to
15 the mid-1960s?

16 A Yes.

17 Q How did FPL consider nuclear power prior to that?

18 A I understand that there was some consideration
19 given to nuclear power in the mid-1950s. I'm not very
20 familiar with that, only to know that there was some
21 consideration given.

22 (Discussion off the record.)

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MR. GUTTMAN: I would like to have marked as Gardner Exhibit No. 2 a document which I represent that we received from Florida Power & Light in discovery, dated January 23, 1957, Miami, Florida; bearing the names at the top: Mr. R. H. Fite, McGregor Smith, John Kinsman; entitled "Florida Nuclear Power Meeting with Members Clapp and MacInnes."

(Gardner Exhibit 2 identified.)

BY MR. GUTTMAN:

Q Mr. Gardner, have you ever seen that document before?

A I can't recall if I have.

Q The document refers at the top to a contract. Do you know what the contract referred to is?

A No.

Q Do you know -- do you know whether -- you do not know -- as I understand it, you have never seen a contract as referred to there; is that correct?

A That's correct.

Q Do you know what the Florida Nuclear Power Project, as referred to at the heading of that document, is or was?

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1 A No. Except — my only recollection is that there
2 was some consideration of a project, and this maybe is it.

3 Q Just one project?

4 A There may have been more. I don't know.

5 MR. GUTTMAN: I would like marked, as Gardner
6 Exhibit Number 3, a document we received from discovery,
7 from Florida Power & Light, this case, dated, Miami,
8 Florida, June 16, 1960, from John Kinsman to McGregor Smith,
9 R. F. Fite, entitled "Florida Nuclear Project."

10 Will you take a look at that document?

11 (Gardner Exhibit 3 identified.)

12 BY MR. GUTTMAN:

13 Q Have you ever seen that document before?

14 A I can't remember if I have.

15 Q Do you know what the Florida Nuclear Project
16 referred to there was?

17 A No.

18 Q Do you know at the bottom of the document there's
19 an indication that Florida companies were perhaps going to
20 commit themselves to some nuclear project? Do you see that?
21 Do you have any recollection of that?

22 A I have no recollection of the document.

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1 Q Or of the substance?

2 A No.

3 MR. GUTTMAN: Mr. Gardner, I would like to show
4 you, as Gardner Exhibit 4, four pages of what appears to be
5 related material, which we obtained from the company in
6 discovery, dated December 1, 1961, the cover page, on the
7 heading of Tampa Electric Company, being a letter from
8 Fischer S. Black, Executive Vice President, to
9 Robert H. Fite, President, Florida Power & Light, and
10 William J. Clapp, C-l-a-p-p, President, Florida Power
11 Corporation.

12 The attachments, insofar as it appears, are a two-page
13 document entitled "Minutes of Meeting on Nuclear Power,"
14 November 27, 1961, Office of Mr. W. J. Clapp, Florida Power
15 Corporation, St. Petersburg," and a one-page document,
16 headed "Atomic Power Committee Form."

17 (Gardner Exhibit 4 identified.)

18 BY MR. GUTTMAN:

19 Q Mr. Gardner, have you seen this document or these
20 three documents before?

21 A I can't recall it if I have.

22 Q Do you know anything about the events recorded in

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1 these documents?

2 A No.

3 Q Did you review the -- we talked earlier about the
4 package of documents which you provided to us as documents
5 you relied on. Did you review those documents before you
6 gave them to us?

7 A Yes.

8 Q Do you recall whether they in any way talked about
9 the apparent joint efforts in the 1955-'65 period, among
10 Florida Power & Light, Tampa Electric, and Florida Power
11 Corporation?

12 A I don't think they did.

13 Q They did not? You don't think they did.

14 I refer you to a document included in that packet which
15 appears to be a corporate history, "A Half Century of People
16 Serving People, a History of Florida Power & Light Company,
17 Fourth of Four Parts."

18 Now, reading from the first narrative page of the
19 material supplied to us, it states that: "In 1955, Florida
20 companies, FPL, Tampa Electric, and Florida Power
21 Corporations, decided to pool interest in resources to build
22 a nuclear plant with government help."

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1 Do you know anything about --

2 A I stand corrected. The history does relate a
3 company involvement in the mid-1950s, which is the one which
4 I previously referred to when I answered your question about
5 the previous involvement with nuclear power. And I don't
6 know anything about that project except what's in that
7 history.

8 Q Was there only one project? Or may there have
9 been more than one project?

10 A There may have been more than one.

11 Q Who would know, if you did not know?

12 A Mr. Kinsman would know.

13 Q And he is still alive, I presume?

14 A Yes, he is.

15 MR. GUTTMAN: I would like to mark, as Gardner
16 Exhibit 5, a document also obtained from the company files,
17 dated January 8, 1962, on Florida Power & Light letterhead,
18 from Mr. George Kinsman, Vice President, to
19 Mr. Fischer S. Black, Executive Vice President, Tampa
20 Electric.

21 (Gardner Exhibit 5 identified.)

22

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BY MR. GUTTMAN:

Q Can you take a look at that document and tell me if you have seen it before?

A I can't remember if I have.

Q Now, that document records the formation of an atomic power committee. Do you know anything about that committee, as referred to?

A No.

Q The document also records the existence of correspondence regarding the formation of an atomic power committee. Did you review such correspondence in preparing your affidavit?

A No.

Q Do you know if such correspondence is still in the possession of Florida Power & Light Company?

A I don't know.

Q Do you know if such correspondence was provided to Cities in the discovery?

A I don't know. If it was there, it was provided.

Q Is it possible any such correspondence would be lost or destroyed or discarded accidentally, or for whatever reason, over the years?

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1 A I'm sure it's possible.

2 Q To the best of your knowledge, has anybody made
3 any check to determine whether or not such correspondence or
4 materials generally relating to the atomic power committee
5 are still in existence in the company's files?

6 MR. BOUKNIGHT: Mr. Guttman, I'm going to object
7 to that. Counsel took the responsibility for responding to
8 your extremely voluminous and broad discovery request. An
9 effort has been made to locate and provide to you all
10 documents in the possession or control of Florida Power &
11 Light Company which are responsive to that request and are
12 not privileged. I don't think there's any point in your
13 asking Mr. Gardner, who did not have responsibility for that
14 effort in any respect, whether counsel have located and
15 provided specific documents.

16 MR. GUTTMAN: As I understand counsel, in the
17 July 1980 response of Defendant Power & Light Company, the
18 first request for documents and motion for protective order
19 stated that "Any original company" -- excuse me. "No
20 original documents prepared by FPL responsive to requests
21 for production are known to have been destroyed or
22 misplaced." Is that correct?

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MR. BOUKNIGHT: That's correct.

MR. GUTTMAN: I would like to have marked, as Gardner Exhibit 6, a collection of documents which were provided to us by FPL in discovery. The cover page marked by FPL is "Responsive to Cities' Interrogatories 16 and 17."

And on the left is a heading "PRG" atomic power. And I would like to know, when you look at these documents, who PRG may have been.

MR. BOUKNIGHT: He hasn't been provided with the document. I would like to object.

(Gardner Exhibit 6 identified.)

MR. BOUKNIGHT: Mr. Guttman, this document consists of 50 pages. Is it necessary for Mr. Gardner to review these pages?

MR. GUTTMAN: No.

BY MR. GUTTMAN:

Q Can you tell me who PRG might have been?

A I can't.

Q Is there anybody named by PRG's initials who may have been involved in atomic power planning back then?

A I can't think of who, or what PRG means, or even if it refers to a person.

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MR. GUTTMAN: I would like to identify, as Gardner Exhibit No. 7, a November 6, 1961 letter from W. J. Clapp, President, Florida Power Corporation, to Fischer S. Black, with a CC to Mr. R. H. Fite, F-i-t-e, and Mr. H. K. McKean, M-c-K-e-a-n.

(Gardner Exhibit 7 identified.)

BY MR. GUTTMAN:

Q Will you take a look at that and tell me if you have ever seen that before?

A I can't remember if I have.

Q Have you ever seen that before?

A I can't remember if I have.

Q Do you know anything about the substance of the events?

A No.

Q Do you know whether Florida Power & Light ever worked with the company referred to there?

MR. RUPP: In any respect? At any time?

MR. GUTTMAN: In the period, the rough year or so, two years, of that letter?

THE WITNESS: I'm afraid I don't understand your question.

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1 BY MR. GUTTMAN:

2 Q Do you know whether, in fact, Florida Power &
3 Light actually went to visit General Atomic and discussed
4 nuclear power with them?

5 A No, I don't.

6 MR. GUTTMAN: I would like to show you, as Gardner
7 Exhibit No. 8, a document also obtained from the company's
8 files, dated February 7, 1964, again from Mr. Claop to
9 Mr. W. B. McGuire, President, Duke Power Company, with a CC
10 to Messrs. Fite, W. C. MacInnes, Mr. Black, and
11 Mr. Kinsman.

12 (Gardner Exhibit 8 identified.)

13 BY MR. GUTTMAN:

14 Q Will you tell me if you have ever seen that
15 document before?

16 A I can't remember it, if I have."

17 Q Do you know anything about the apparent project,
18 the Savannah River Nuclear Power Project?

19 A No.

20 MR. GUTTMAN: I would like marked, as Gardner
21 Exhibit No. 9, another document obtained from Florida Power
22 & Light, an interoffice memo, dated September 10, 1959, from

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1 George Kinsman, re "Regional Advisory Council on Nuclear
2 Energy."

3 (Gardner Exhibit 9 identified.)

4 BY MR. CUTTMAN:

5 Q Can you take a look at that and tell me if you
6 have ever seen that before?

7 A I can't remember it if I have.

8 Q The document refers to Mr. Kinsman as having
9 been the "Representative of the power industry to the
10 Regional Advisory Council on Nuclear Energy."

11 Do you know anything about either what that council was
12 or -- or Mr. Kinsman's representation?

13 A I know that there was a Interstate Nuclear Compact
14 ultimately formed. I don't know what the "Regional Advisory
15 Council on Nuclear Energy" was.

16 Q Do you ever discuss with Mr. Kinsman what did he,
17 by way of representing the industry in that compact, or --

18 A I knew that Mr. Kinsman was involved with the
19 Interstate Nuclear Compact, and we discussed that
20 organization, I believe. I don't recall the discussions of
21 the Regional Advisory Council.

22 Q Have you ever seen any records relating to

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1 Mr. Kinsman's work in that connection?

2 A I have seen material put out by the Interstate
3 Nuclear Compact group. I recall having seen it.

4 Q Put out, as opposed to being put out by FPL or
5 Mr. Kinsman relating to it?

6 A Yes.

7 MR. GUTTMAN: I would like marked, as Document
8 -- Plaintiff Gardner Exhibit 10, a news clipping given to us
9 by the company in discovery from the Miami Daily News, dated
10 Friday, December 2, 1955. The document is headed "FPL's
11 Smith Chosen for Atomic Board."

12 (Gardner Exhibit 10 identified.)

13 MR. DYM: Can we take a break while you get a
14 little better organized, Mr. Guttman?

15 MR. GUTTMAN: I think we are well organized. The
16 problem is we are getting multiple copies to counsel, that's
17 why --

18 MR. DYM: It might be a useful thing to put each
19 document together. I have a copy here --

20 They are not together. Mr. Van Eaton is fumbling through
21 papers.

22 MR. GUTTMAN: He's not fumbling through papers --

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1 MR. DYM: He's shuffling through papers.

2 BY MR. GUTTMAN:

3 Q Are you aware, Mr. Gardner, of Mr. Smith's
4 participation in anything called the Florida Nuclear
5 Development Commission by the Governor of Florida?

6 MR. BOUKNIGHT: I object to that.

7 And I instruct you not to answer that at this time.

8 If you are going to question him about an exhibit that
9 you have just had marked, then he's entitled to a copy of
10 the exhibit and his counsel is entitled to a copy of the
11 exhibit. And that's not a mere courtesy.

12 MR. GUTTMAN: I should note that one of the
13 reasons I have varied my participating is because of the
14 change in Mr. Gardner's affidavit as of this morning, of
15 which we haven't been ^{formed} ~~involved~~ previously. We intended to
16 start our discovery on that topic, but since we weren't
17 notified of the change of the affidavit until this
18 morning --

19 MR. BOUKNIGHT: I don't know that that has
20 anything to do with what we are talking about. I'm telling
21 you Mr. Gardner is not going to be questioned about an
22 exhibit when you have the only copy of that exhibit at the

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1 table.

2 MR. GUTTMAN: That's fine. We will provide you
3 with a copy.

4 MR. BOUKNIGHT: Do you think Mr. Dym's suggestion
5 of taking a break and your using the time fruitfully is an
6 appropriate one?

7 MR. GUTTMAN: Let's take about five minutes.

8 (Recess.)

9 BY MR. GUTTMAN:

10 Q I'll re-ask the question.

11 Mr. Gardner, that article refers to the appointment by
12 Governor Collins of Mr. Smith to some type of state atomic
13 energy commission. Are you familiar with any activities of
14 Mr. Smith on that commission? Or with the existence of the
15 commission?

16 A No.

17 MR. BOUKNIGHT: Let me ask you at this point --
18 this is Gardner Exhibit 10. This is the one copy of
19 Gardner Exhibit 10. We'll give it back to the reporter.

20 MR. GUTTMAN: He -- we will provide you that. It
21 apparently got lost.

22 I would like to have marked, as Gardner Exhibit 11, a

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1 document obtained from the company in discovery, reheaded
2 initially "GK-11-61, Notes on Nuclear Power Meeting,
3 Americana Hotel, October 31, 1961."
4 (Gardner Exhibit 11 identified.)

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BY MR. GUTTMAN:

Q Have you seen this document before?

A I can't recall specifically if I have or not.

Q Do you recall, other than through this document -- this meeting, or a meeting like this meeting?

A No. I know I have heard about the Peach Bottom project, and the gas-cooled reactor, and the Peach Bottom demonstration project was ultimately carried out on a small research or development-type reactor.

Q Could you look at page 3?

I call your attention to the third and fourth paragraphs, the third and fourth paragraphs starting "Mr. Clapp" and "Mr. Ginna."

On the fourth paragraph, Mr. Clapp, who -- was he the president of Florida Power Corporation at that time, if you recall?

A I believe he was.

Q Said, "The manufacturers can't do it at this time, that Florida is in a more vulnerable position than any other areas with the REA's and the municipal wholesale contracts running out in three years."

Do you know what he may have been referring to

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1 in that sentence?

2 MR. BOUKNIGHT: Mr. Guttman, Mr. Gardner
3 doesn't even know if he said that. Mr. Gardner hasn't even
4 seen this document.

5 MR. GUTTMAN: Well, if Mr. Gardner says that,
6 that will answer the question.

7 BY MR. GUTTMAN:

8 Q Do you know whether any of Florida Power &
9 Light's municipal or REA contracts were running out as
10 indicated by Mr. Clapp?

11 MR. RUPP: You misunderstood Mr. Bouknight's
12 point. He's never indicated any knowledge of whether this
13 document said what he suggested or not..

14 BY MR. GUTTMAN:

15 Q Do you know whether the FPL, REA, or municipal
16 contracts were running out as it's recorded in this document?

17 MR. BOUKNIGHT: I object to that. It doesn't
18 say any such thing. It doesn't mention Florida Power &
19 Light contract.

20 MR. GUTTMAN: That's why I was asking whether
21 it was a reference -- whether the reference to Florida --
22 he could have meant Florida Power & Light. That's the

1 purpose of the question.

2 MR. BOUKNIGHT: Is the question simply whether
3 to Mr. Gardner's knowledge as of October 31, 1961, some
4 contracts that Florida Power & Light might have had with
5 municipals and REA's, if indeed there were any, were
6 running out?

7 MR. GUTTMAN: That is correct.

8 THE WITNESS: I don't mind answering that
9 question. But I believe the affidavit was to be the subject
10 of this, and I don't mention any such thing in the affidavit.
11 The answer to the question is that I don't know.

12 BY MR. GUTTMAN:

13 Q Do you know whether there was any interest on
14 the part of REA cooperatives in the State of Florida in
15 nuclear power prior to the time at which Florida Power &
16 Light began to consider it, according to your affidavit?

17 MR. BOUKNIGHT: We are getting very far
18 afield. How does this relate to the affidavit which
19 is supposed to be the subject and the only subject of this
20 deposition?

21 MR. GUTTMAN: It's related. We have established,
22 I think, that there was substantial -- at least, according

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1 to the company's documents, that there was substantial
2 consideration of nuclear power at a time prior to the time
3 stated by Mr. Gardner in his affidavit. And one of the
4 issues as provided by the affidavit in your motion is
5 whether or not Florida Power & Light -- how Florida Power
6 & Light has behaved vis-a-vis other systems in Florida in
7 relation to nuclear power.

8 On the one hand, Florida Power & Light contends
9 in the affidavit, my characterization, obviously, that
10 it's ^egoing along with it. On the other hand, that it's
11 contending that it didn't behave unfairly towards anyone
12 else. I'm trying to assert Mr. Gardner's knowledge, and he's
13 asserting that other people didn't come to Florida Power
14 & Light and ask for its participation until the mid-70's.

15 MR. BOUKNIGHT: First, you haven't established
16 anything so far in this deposition. You have shown Mr.
17 Gardner a number of documents, which Mr. Gardner told you he
18 can't identify. So those documents can certainly be
19 disregarded for purposes of this deposition.

20 MR. GUTTMAN: You can disregard at your pleasure.
21 Obviously, it's your privilege.

22 MR. BOUKNIGHT: Well, I'm going to see that

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1 they are disregarded in further questioning in this
2 deposition, as well, Mr. Guttman. And moreover, if you --
3 if your question to Mr. Gardner is whether any REA
4 cooperative in Florida, to his knowledge, expressed an
5 interest in nuclear power to FPL, then ask that question.
6 But I'm not going to allow you to go back into a 1961
7 document and start asking Mr. Gardner whether he knows
8 what REA's were doing entirely independently of FPL,
9 years before this affidavit covers.

10 BY MR. GUTTMAN:

11 Q Do you know whether FP&L was concerned in the
12 period prior to 1965, with potential REA entrance
13 into nuclear power in Florida?

14 A I have not been aware of any REA interest or
15 any REA -- or any FPL concern with REA interest in the
16 period 1965 or before.

17 MR. GUTTMAN: I would like to mark as Gardner
18 Exhibit No. 12 a memorandum, or document from the Florida
19 Power & Light discovery from W. J. Clapp, President, Florida
20 Power Corporation, to R. H. Fite, Vice-President and
21 General Manager, FPL, May 11, 1954, with an enclosure,
22 "Statement of Clyde T. Ellis, Executive Manager, National

1 Rural Electric Cooperative Association on Atomic Power."

2 (Gardner Exhibit No. 12 identified.)

3 BY MR. GUTTMAN:

4 Q Have you seen these documents, or this document
5 before, Mr. Gardner?

6 A I can't recall it, if I have.

7 Q Have you seen this document before?

8 A I think I answered the question. I can't
9 recall it, if I have.

10 Q Mr. Gardner, one of the documents you did
11 provide us in the package that's the Gardner Exhibit No. 1
12 is a 1976 Key West expression of interest in nuclear
13 participation with FPL; do you recall that?

14 MR. BOUKNIGHT: I would like you to show him this
15 document. Then we'll talk about this document.

16 BY MR. GUTTMAN:

17 Q Do you have your package there? I don't have
18 multiple copies of your package. It's the -- towards the
19 back.

20 MR. BOUKNIGHT: That's already been marked as an
21 exhibit. Why don't we use that one and look on together?

22 MR. GUTTMAN: This is the document right there.

1 (Discussion off the record.)

2 BY MR. GUTTMAN:

3 Q Is it your testimony that this is the first
4 occasion on which Key West discussed or expressed an
5 interest to FPL in nuclear power? Or may there have been
6 prior discussions?

7 A I don't think I made any such statement.

8 Q Do you know whether Key West ever talked to
9 any Florida Power & Light officials about possibly bidding
10 a nuclear power plant, or getting access to nuclear
11 power in the period prior to 1976?

12 A No.

13 Q No, you do not know?

14 A I do not know.

15 MR. GUTTMAN: I would like to offer as Gardner
16 Exhibit 13 --

17 MR. BOUKNIGHT: Are we through now of this
18 document which came out of the back?

19 MR. GUTTMAN: Yes.

20 MR. BOUKNIGHT: Are we also through with Gardner
21 Exhibit 12?

22 MR. GUTTMAN: Yes.

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1 I would like to mark a document obtained from
2 the Company in discovery, evidently a clipping from the
3 Key West Citizen newspaper, March 5, 1956, headed "Efforts
4 to secure atomic reactor told."

5 Would you take a look at that?

6 (Gardner Exhibit No. 13 identified.)

7 MR. BOUKNIGHT: Is there a question pending?

8 BY MR. GUTTMAN:

9 Q The article states at the fourth paragraph
10 that a Key West City Commissioner contacted and
11 consulted with Robert H. Fite, President and General Manager
12 of the Florida Power & Light Company, about their future
13 atomic plans and the possibility of an atomic plant in the
14 Key West or the Lower Keys. Do you have any knowledge of
15 that contact insofar as it's recorded there?

16 A No.

17 MR. BOUKNIGHT: Is this 13 that we are looking at?

18 MR. GUTTMAN: 13.

19 BY MR. GUTTMAN:

20 Q Prior to the period at which FPL began to
21 consider nuclear power in the mid-60's, as you state,
22 was FPL aware of any interest on the part of Florida

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1 municipal systems in nuclear power?

2 MR. BOUKNIGHT: I think that question is hopelessly
3 vague. I object to the form of it.

4 MR. GUTTMAN: I would like to mark as Gardner
5 Exhibit No. 14 a packet obtained from Florida Power &
6 Light Company entitled, "Memorandum to File," from
7 B.H.F., 12-29-59. The cover page refers to the proposal
8 of five municipal and cooperative utilities to the AEC
9 "pursuant to the AEC invitation for a small-size nuclear
10 power plant."

11 And then there are attachments which I
12 represent as relating to these proposals by way of
13 information sheets and AEC documentation. Would you take a
14 look at that?

15 (Gardner Exhibit No. 14 identified.)

16 MR. RUPP: I think we have been very patient
17 about these 1950 documents so far. I fail to see how they
18 relate in any way, however tenuous, to the affidavit
19 the deposition was supposed to be focusing on.

20 MR. GUTTMAN: FPL is contending that FPL first
21 began to consider nuclear power --

22 MR. RUPP: If you read the sentence, it reads,

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1 "First began considering nuclear generating units in
2 the mid-1960's as an alternative form to nuclear generating
3 capacity to meet the growing electrical demands of our
4 customers."

5 MR. GUTTMAN: I'm not sure -- I read the sentence,
6 and the point being --

7 MR. RUPP: The point being that the consideration
8 talked about here is of a specific type. If you would
9 like to ask Mr. Gardner about the consideration he's
10 talking about, perhaps we can avoid looking at these ancient
11 documents.

12 BY MR. GUTTMAN:

13 Q Mr. Gardner, with Mr. Rupp's assistance, we have
14 discussed documents relating to committees and joint projects
15 that Florida Power & Light was engaged in with others. What
16 would those projects have been for if -- what would you
17 have used the nuclear power from those projects for, other
18 than for electricity? Or what would the purpose of those
19 projects have been for?

20 A It's my understanding that all of those projects
21 involved either research and development, prototype, or
22 demonstration reactors that were not commercially competitive

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1 with other alternative forms of nuclear power, and would
2 not be considered candidates for an alternative for formal
3 power supply on an electric system such as FPL. Some such
4 demonstration and prototype reactors were built in
5 the country, and the electric power furnished from them
6 was used by utilities, just as any other electricity was
7 used. But they were not considered a commercial alternative
8 to the normal forms of electric generation.

9 It is my understanding, at least, and my belief,
10 that all of the projects that you have been -- have been
11 contained in the documents that you showed me are of
12 that form. My affidavit relates to the first time in which
13 an offering was made that could be considered an
14 alternative to the other available forms of generation.

15
16 Q I'm a bit confused. You say the projects prior
17 to the mid-60's are research and development? Is it
18 your affidavit's statement that the Turkey Point plants
19 were research and development?

20 A The licenses to be granted were so-called research
21 and development licenses. The plants were of a size and
22 the potential economics were projected to be on the same scale

1 as other alternatives that were available.

2 Q So they were planned commercial, as opposed to
3 research and development?

4 MR. BOUKNIGHT: I object to that. You are asking
5 Mr. Gardner to make a legal characterization, Mr. Guttman.
6 You know both of those are terms of the Atomic Energy
7 Act as of that time. A moment ago Mr. Gardner did not use
8 the phrase "research and development" in describing these
9 old plants. He did not. He said that these were research,
10 experimental, or prototype reactors.

11 THE WITNESS: Demonstration.

12 BY MR. GUTTMAN:

13 Q Were the Turkey Point plants research,
14 experimental, or prototype reactors?

15 A , Excuse me, I didn't hear your question.

16 Q Were the Turkey Point plants research,
17 experimental, demonstration, or prototype reactors?

18 A The Turkey Point plants were licensed under a
19 provision of the Atomic Energy Act providing for research and
20 development reactors. They were plants of a size and
21 potential economics to be comparable to other alternatives
22 which were available to us.

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1 Q Now, in your affidavit, you refer to the number
2 of -- you suggest that FPL got in in the mid-60's at the
3 beginning of the game. Is that a fair characterization?
4 If not, please tell me, the beginning of the nuclear game;
5 is that the gist of what you are suggesting?

6 MR. RUPP: What portion of the affidavit are you
7 referring to?

8 MR. GUTTMAN: I'm sorry. It's paragraph 7.

9 MR. RUPP: What in particular are you referring
10 to?

11 MR. GUTTMAN: The second and third sentence --
12 excuse me, third and fourth sentence.

13 MR. RUPP: Are you asking him whether they are
14 correct?

15 BY MR. GUTTMAN:

16 Q Is the gist of what you are saying there, the
17 suggestion that FPL got in at the beginning of the game, the
18 nuclear game?

19 MR. BOUKNIGHT: Objection.

20 MR. GUTTMAN: Why?

21 MR. BOUKNIGHT: I object to the form of that,
22 Mr. Guttman. You can't throw him your three or four-word

1 characterization of an affidavit that he's written carefully
2 and make him respond to it.

3 BY MR. GUTTMAN:

4 Q Do you know how many nuclear plants -- nuclear
5 reactors had been completed by 1955?

6 A They are in the documents that we furnished.

7 Q Can you tell me?

8 A I haven't counted them.

9 Q Do you have any idea, roughly?

10 A Seven or eight.

11 Q Seven or eight?

12 MR. RUPP: Well, there's a time frame -- is it '55
13 or '65?

14 MR. GUTTMAN: 1955.

15 THE WITNESS: I'm sorry, I beg your pardon. I
16 thought you said '65.

17 As of 1955, I don't know.

18 BY MR. GUTTMAN:

19 Q Would it be less than seven or eight?

20 A I don't know.

21 Q Mr. Gardner, I --

22 MR. RUPP: I take it here you are talking about

1 plants of any type, whether prototype plants, research
2 plants --

3 MR. GUTTMAN: Nuclear reactors.

4 MR. RUPP: Submarine reactors? Do we include
5 the Nautilus?

6 MR. GUTTMAN: I used the term "reactor" and
7 Mr. Gardner answered the question. He said he didn't know.

8 MR. RUPP: I think he said he didn't know because
9 your question was hopelessly vague. If you would like to put
10 it again --

11 MR. GUTTMAN: Mr. Gardner, I would like to mark
12 as Exhibit No. 14 a series -- actually, it's three
13 documents obtained from Florida Power & Light in discovery --

14 (Discussion off the record.)

15 (Gardner Exhibit No. 14 identified.)

16 MR. BOUKNIGHT: Do I take it this group of seven
17 unstapled pages are Gardner Exhibit 15?

18 MR. GUTTMAN: Right. Right.

19 For your reference, apparently four of these
20 pages are one advertisement which we received this way
21 from the company.

22 MR. BOUKNIGHT: I'm unable to decipher this

1 exhibit.

2 MR. GUTTMAN: This is the way we received it
3 from the company. The key is the statement, I'm
4 just going to ask him if it's accurate to the best of his
5 knowledge.

6 MR. BOUKNIGHT: Are you referring to the statement
7 that's on the fifth of these pages?

8 MR. GUTTMAN: Headed "This is the way nations
9 rate nuclear reactors built or planned."

10 (Discussion off the record.)

11 MR. RUPP: Were these documents attached in
12 this form when they were produced by FPL?

13 MR. GUTTMAN: Possibly not. There were a series
14 of documents with duplications and repetitions.

15 MR. RUPP: It appears to be a series of unrelated
16 documents.

17 MR. GUTTMAN: I think these relate to these
18 documents.

19 MR. RUPP: Which relates to which? There's an
20 article here from the Miami Herald; another document which
21 it's difficult to tell what it is. As a matter of fact --

22 MR. GUTTMAN: I think those are related to the

1 advertisement. We took them off the copy. Can we go
2 off the record?

3 (Discussion off the record.)
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SY MR. GUTTMAN:

Q Do you have any reason to doubt the accuracy of that advertisement?

MR. BOUKNIGHT: Mr. Guttman, I object and I'm troubled that you are attempting to trick the witness. We are in a lawsuit that involves the electric utility industry. Mr. Gardner has filed an affidavit that concerns the generalization of commercial electricity through nuclear power.

You asked him a few moments ago how many reactors had been built. Mr. Gardner, of course, assumed, as did everyone at the table, that you were talking about reactors that had something to do with nuclear power; not the one built under Soldier's Field by T.R. Termey and the others, and not reactors produced to produce material for the atomic and hydrogen bombs.

MR. GUTTMAN: The reaction that the public, when Florida Power & Light published this ad -- what I wanted to know is whether Florida Power & Light stands by the accuracy of the statement stated in that advertisement as it was published.

MR. BOUKNIGHT: I don't think you ought to

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1 testify how Congress or anyone else reacted.

2 If you want to ask Mr. Gardner if he knows anything about
3 it, go ahead. But stop trying to be tricky.

4 MR. GUTTMAN: I resent that statement, quite
5 frankly. I asked Mr. Gardner, I believe, initially, if he
6 knew how many reactors -- and I used the term that is used
7 in the advertisement, were completed by 1955. And that
8 advertisement purports to make such a statement.

9 And I'm asking him if he finds that an accurate
10 representation.

11 MR. BOUKNIGHT: Mr. Guttman, I resent your being
12 tricky.

13 MR. GUTTMAN: You can do what you wish, but the
14 question is still pending: Do you find that advertisement
15 to be an accurate representation of what it purports to
16 represent?

17 MR. BOUKNIGHT: I object to the form of that
18 question.

19 MR. GUTTMAN: Why?

20 MR. BOUKNIGHT: Mr. Gardner has never said that
21 he's seen this piece of paper, he had anything to do with
22 the advertisement, that he knows anything about the subject

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1 matter.

2 BY MR. GUTTMAN:

3 Q Do you know anything about the subject matter of
4 it, Mr. Gardner?

5 A I have never seen the ad. The subject matter of
6 the ad appears to be very broad. I'm sure I do know
7 something about the subject matter that's mentioned in that
8 ad. I certainly don't know everything about the subject
9 matter that's in that ad.

10 Q Do you have any reason to doubt its accuracy?

11 A I have no idea about its accuracy one way or the
12 other.

13 MR. GUTTMAN: I would like to have identified and
14 marked as Gardner Exhibit 16 a document obtained from
15 Florida Power & Light dated December 4, 1959, from Robert
16 Fite, president and general manager to Mr. Harlee,
17 H-a-r-l-e-e, Branch, B-r-a-n-c-h, Jr., president, the
18 Southern Company, Atlanta, Georgia, with blind carbon copies
19 to Mr. W. J. Clapp, W. C. MacInnes, L. T. Smith, Jr., and
20 the notations per Mr. K-u-q-u-a.

21 (Gardner Exhibit 16 identified.)

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BY MR. GUTTMAN:

Q Can you look at that document and tell whether you have ever seen it before?

A I don't recall having seen this before, if I have.

Q That first paragraph refers to an EEI task force. Do you know what EEI stands for in that letter?

A That's generally the designation for Edison Electric Institute.

Q Could you explain what that is, for the record?

A Edison Electric Institute is a trade association of investor-owned electric utilities.

Q Has EEI ever had any groups or committees relating to nuclear or atomic power?

A - Yes.

Q Do you know when they were first initiated?

A No.

Q Have you ever participated in any such committees?

A No.

Q Do you know whether Florida Power & Light has?

A I don't know for sure.

Q Do you know, that first paragraph —

A Wait a minute. Excuse me. We have participated

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1 in some committee activities dealing with nuclear power.

2 Just which ones, I don't know for sure.

3 Q When that came to your mind, what were your --

4 A I was remembering Mr. -- one of our people used to,
5 attend a regular EEI session dealing with nuclear power. I
6 can't remember the specific name of the committee.

7 Q When you say one of our people, which one?

8 A Mr. Walt Rogers.

9 Q In what period was that, roughly?

10 A Subsequent to 1965.

11 Q Do you know if any official of Florida Power &
12 Light was ever a member of any EEI nuclear power committee?

13 A Well, Mr. Rogers was a member of this particular
14 committee. Mr. Schmidt has been a member of the Prime
15 Mover's Committee, which considered nuclear power in its
16 activities.

17 Mr. Tomomto has been on the EEI Nuclear Fuels Committee.
18 Those are the ones I can remember offhand.

19 Q Mr. Fite, who signed this letter, was he ever a
20 member of an EEI committee?

21 A I don't know.

22 (Discussion off the record.)

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BY MR. GUTTMAN:

Q Now, looking at the second paragraph, Mr. Fite states:

"As you know, we have been following the situation closely and our company undoubtedly will enter the nuclear power field when it becomes competitive."

To the best of your knowledge, is that a fair characterizations of the company's thinking or policy at that time?

A I think this letter overall is a characterization of the company thinking about nuclear power at that time, as I understand it now.

Q When you say "as I understand it now," what are you referring to?

A That's what I heard, the general understanding, resulting from just a variety of sources I heard, I talked to.

Let me summarize that, because, in essence, we followed nuclear power closely from the '50s and early '60s, considered a variety of possible research prototype demonstration plants. But the indications were, up until 19 -- the mid-'60s, 1965, that the projected costs of nuclear

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power were not comparable, would not be comparable with the other alternatives which we had.

MR. GUTTMAN: I would like to have marked as Gardner Exhibit 17, an eight-page letter, again obtained from Florida Power & Light, dated July 19, 1963, from J. W. Landis, L-a-n-d-i-s, manager, on the letterhead of the Babcock & Wilcox Company, Atomic Energy Division, to Mr. McGregor Smith, chairman of the board, FPL.

(Gardner Exhibit 17 identified.)

BY MR. GUTTMAN:

Q Would you take a look at that and tell me whether you have ever seen that letter before?

A I don't recall that I have seen this letter before.

Q In the second sentence there —

MR. RUPP: The second sentence of the letter?

MR. GUTTMAN: Right.

BY MR. GUTTMAN:

Q Mr. Landis writes that, "I remember well that during one of those early meetings -- with Mr. Smith, presumably -- you made the point that nuclear stations should be evaluated on exactly the same basis as

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1 conventional stations and built only when they have been
2 proven to be competitive." And it goes on.

3 Again, without -- to the best of your knowledge, is this
4 an accurate reflection of Mr. Smith's thinking?

5 A I don't know if it is or not.

6 Q Is this the approach that the company followed?

7 MR. RUPP: What time are we talking about?

8 MR. GUTTMAN: In the --

9 MR. RUPP: 1963? 1965? Later?

10 MR. GUTTMAN: In the period prior to 1965; in the
11 period prior to the decision to commit to Turkey Point.

12 THE WITNESS: I assume by an approach that you
13 mean that the evaluation on exactly the same basis of
14 conventional stations, the only -- the evaluation was made
15 similar to that of conventional stations. I'm not sure that
16 I would accept the word "exactly."

17 The statement, "built only when they have proven to be
18 competitive" is all right except for the word "proven."
19 Given that there's a range of what one might consider proof
20 and an adequate proof to embark and that that range might be
21 different than somebody else's.

22 I would say, given those reservations on my part,

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generally it's reflective of what happened subsequently.

BY MR. GUTTMAN:

Q I presume you subscribe to or receive the EPRI Research Institute Journal?

A Yes.

Q Which is the journal of the Public Utility Research Institute trade or -- just to clarify the record? I'm not trying to trick, deceive, or --

A The EPRI Journal is a publication of the Electric Power Research Institute.

Q I'm going to read you two paragraphs from an article, and I'll let you look at the paragraphs after I read them. I want to ask you if this, in your opinion, is a correct characterization.

"Development of nuclear power in the '60 to '67 or '8 time period."

MR. BOUKNIGHT: Could we be told who the author is?

MR. GUTTMAN: Sure. It's from the Volume 3, Number 6, July-August 1978 Journal. It may not list the author. Let's see.

It is by John E. K-e-n-t-o-n, who is the nuclear editor

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1 in the communications division of EPRI, entitled "The Birth
2 and Early History of Nuclear Power." At page 15, it states:

3 "In 1963, Jersey Central Power & Light published an
4 economic analysis explaining its choice of nuclear over coal
5 for its next large generating station. This analysis, which
6 became widely known as the Oyster Creek report, caused a
7 sensation. Until that time, many utilities had justified
8 nuclear projects on the grounds of preparing for the future,
9 getting in on the ground floor, and patriotically supporting
10 a national effort. Now for the first time a utility
11 decision to go nuclear had been made on strictly
12 commercial grounds and the calculations leading to that
13 decision had been published in detail. The effect was like
14 breaking a log jam.

15 "In 1963, three other nuclear plants were ordered, in
16 1965-7, in 1966-20, 1967-30, in 1968-14." By the end of
17 1969, 91 units had been ordered."

18 If you want to look at it, this is what I was reading
19 from.

20 MR. BOUKNIGHT: It would be helpful to know what
21 the question is.

22 MR. GUTTMAN: The question is if this summary

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1 of developments is an accurate one, to the best of your
2 knowledge.

3 THE WITNESS: "I have no reason to doubt the
4 facts. The journalistic rhetoric, I don't know if this is
5 representative or not,

6 BY MR. GUTTMAN:

7 Q What do you mean when you refer to journalistic
8 rhetoric?

9 A Well, the words "sensation" -- I don't know if it
10 caused a sensation or not. "Getting in on the ground
11 floor"; "patriotically"; I don't know if that's the case.

12 "Decision had been made strictly on commercial grounds."
13 I don't know if the word "strictly" is appropriate.

14 Presumably my recollection of the Jersey Central report
15 was 1964. The number of orders, I suppose, for nuclear
16 plants, is a matter of record. I don't have any reason to
17 doubt those. I don't know that I would characterize the
18 history that way.

19 Q Did they "break a log jam"? Would you
20 characterize it that way?

21 A I think the most that I would be willing to say is
22 that those companies that ordered reactors in the '64, '65,

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1 1950 time frame were pioneers, so to speak, and incurred --
2 undertook ventures that other utilities were unwilling to
3 undertake up to that time.

4 And apparently following the lead of these earlier
5 companies, a number of companies embarked on nuclear power
6 ventures and that the number of orders did increase.

7 Q Now, I would like to show you a page -- let me
8 preface it -- Florida Power & Light is a member of the
9 Edison Electric Institute, is that correct?

10 A Yes.

11 Q Has it been a member throughout the period that we
12 are talking about, 1950 through 1980 period, do you know?
13 To the best of your knowledge?

14 A I don't know. We have been a member of Edison
15 Electric Institute --

16 Q Insofar as it existed?

17 A We have been, certainly, a member of Edison
18 Electric Institute in recent years. I don't know for sure
19 how long.

20 Q Let me show you a page, page number 63, from the
21 August 10, 1965 hearings on the development, growth and
22 state of the atomic energy industry; hearings before the

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1 Joint Committee on Atomic Energy, Congress of the United
2 States, 99th Congress, First Session.

3 I show you Appendix C to the testimony, statement of
4 Harris Ward, W-a-r-d, Edison Electric Institute, accompanied
5 by Murray J-o-s-l-i-n, vice president, Commonwealth Edison
6 company, and John Carney, EEI staff.

7 Now, Appendix C identifies the projects and participants
8 of electric utility companies. It's headed, "Names of
9 Electric Utility Companies Participating in Nuclear Power
10 Study Search Development Operating and Construction
11 Projects."

12 I would like you to take a look at the
13 projects-in-operation category, which lists the projects,
14 the people who are participating as of the time of the
15 testimony, and I would like to ask you if that's correct, to
16 the best of your knowledge.

17 Obviously you may not have any precise knowledge, but do
18 you have any particular reason to doubt it?

19 MR. BOUKNIGHT: What's the point of this,
20 Mr. Guttman?

21 MR. GUTTMAN: Mr. Gardner used the term pioneers,
22 and I'm just trying to put that in context, whether or not

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587 there were any other utilities involved in operating plants
1 at the time of the Turkey Point commitment.

2 MR. BOUKNIGHT: Mr. Guttman, those are readily
3 ascertainable facts.

4 MR. GUTTMAN: I want to ask him if he has any
5 reason to doubt that presentation.

6 MR. BOUKNIGHT: Well, this presentation appears,
7 as you pointed out, as an attachment to an, apparently,
8 very lengthy report which appears in the context of --

9 MR. GUTTMAN: Very lengthy?

10 MR. BOUKNIGHT: It's a rather thick book.

11 MR. GUTTMAN: It's a specific part. It was an
12 attachment to testimony of two or three pages, I believe,
13 Mr. Souknight. Maybe four or five.

14 MR. BOUKNIGHT: You have an advantage of having
15 seen this before. We obviously don't have that advantage.

16 MR. GUTTMAN: Mr. Gardner testified on the
17 subject, he testified about the number of operating plants,
18 and I'm asking him a particular question.

19 MR. BOUKNIGHT: Where did he testify about the
20 number of operating plants, Mr. Guttman?

21 MR. GUTTMAN: He states that only a few nuclear
22

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units were then operating, at the bottom of page 2 of his affidavit.

I want to ask him if that's a correct representation of the operating -- if that is correct as stated.

MR. BOUKNIGHT: I'm going to object. Mr. Gardner, I'm going to instruct that you don't have any obligation to read this material and to point out exceptions to it.

MR. GUTTMAN: Well then, let me ask you, Mr. Gardner.

BY MR. GUTTMAN:

Q Do you have a -- let me go on and drop this line for a second.

Mr. Gardner, do utilities like Florida Power & Light actually build nuclear power plants themselves? Does Mr. Gardner and his staff assistant go out there and put on fittings? Or do you hire contractors? Or what's the general arrangement by which utilities have built nuclear power plants?

A I don't know that you can generalize.

Q What's the arrangement, historically, in the case of Florida Power & Light?

A FPL purchased a nuclear steam supply system and

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retained, in the case of Turkey Points 3 and 4, retained a engineer-constructor to design and build the balance of the plant.

In the case of St. Lucie Number 1, FPL purchased a nuclear steam supply system, retained a design engineer, and jointly managed the construction of the plant.

On St. Lucie Number 2, we purchased the nuclear steam supply system, retained a design engineer, and have assumed responsibility for the construction management of the plant. To the best of my knowledge.

Q Now, other than what may have been spent on contractors in the period we are talking about, 1965 to 1970, let's say, was FPL doing any of its — any nuclear research on its own? Research and development on its own, in house, that is?

A I'm not sure. I recall generally some research and development work which was being done and reported. And I can't put my finger on it right now.

Q Let me ask you this. As you know, utilities report research and development in the Form 1 to the Federal Energy Regulatory Commission and its predecessor; is that correct?

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1 A They do now in recent years. I'm not sure how far
2 that practice goes back.

3 Q I submit, subject to your check, that it went back
4 to about 1966. And my question is, insofar as FPL had done
5 such work, is it fair to assume it would have been reported?

6 MR. BOUKNIGHT: I object to that, Mr. Guttman, as
7 you know Florida Power & Light Company took the position in
8 1966 that it was not a public utility under the Federal
9 Power Act.

10 BY MR. GUTTMAN:

11 Q Was FPL filing Form 1s with the —

12 MR. BOUKNIGHT: If you know.

13 THE WITNESS: We have filed Form 1s in recent
14 years. I don't know how far it goes back.

15 MR. GUTTMAN: You have provided us with Form 1s
16 back to a period back prior to the '70s. My question is —

17 MR. BOUKNIGHT: Why don't you just show the man
18 the Form 1 if you have a question about it?

19 MR. GUTTMAN: Let me show you what I represent as
20 excerpts from Florida Power & Light Company Form 1s for —
21 this is an excerpt from the section entitled "Research and
22 Development Activities." It's three pages, one for 1966,

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one for 1967 and one from 1968. And they are also page 448 of the Florida Power & Light Form 1 submission to the Florida Power & Light Commission.

I would like to have these marked as Exhibit 18.

(Gardner Exhibit 1.3 identified.)

(Discussion off the record.)

BY MR. GUTTMAN:

Q Mr. Gardner, from looking at these reports, can you tell me how much they reflect FPL having spent on research in-house? R&D in-house?

A Not for -- no, I can't.

Q Why not?

A Well, the thing that gives me concern is that I had occasion to get into the reporting of research and development expenditures to the FPL in Form 1, sometime in 19 -- late '60s or early '70s. And I remember at the time that there was some area of judgment involved as to what expenditures really fell in the category of research and development and should be reported.

The research and development accounting, or classification, wasn't a matter of unanimous agreement as to what expenditures should be put in and what expenditures

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1 should not. So, I'm not in a position to say that we made
2 all of the proper judgments about which expenditures were
3 categorized as research and development at that time or not.

4 Q Bearing that in mind, can you now recall any
5 projects or expenditures that you might -- that should have
6 been in there for those years but are not?

7 MR. BOUKNIGHT: I object to that.

8 MR. RUPP: The one problem is that you have given
9 us one page from each -- from three reports, apparently.
10 You haven't given us the full Form 1s for the years that
11 these pages apparently were drawn from. And you are asking
12 Mr. Gardner whether these are the universe of expenditures
13 that were made during a period when he has told you he had
14 no responsibility for performing the Form 1s.

15 MR. GUTTMAN: Excuse me, Mr. Rupp. John,
16 obviously the Form 1s were in your possession. You gave
17 them to us. But these are the complete reports on research
18 and development. There are numerous discrete sections. The
19 rest of the Form 1 relates to sales of electricity and how
20 much the officers are paid and so forth.

21 And I'm asking Mr. Gardner to the best of his knowledge,
22 with that qualification, do you know of anything else that

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1 you would have put in there? That's all my question is.
2 Not may have been in there, should have been, maybe not.

3 MR. BOUKNIGHT: My objection, Mr. Guttman, is
4 simply that Form 1s are prescribed by regulations by the
5 FERC. To ask him what should be put on these Form 1s or
6 even what he thinks should have been put on these Form 1s
7 requires him to make an interpretation of law. Why don't
8 you ask him --

9 MR. GUTTMAN: My question is a simple one. We
10 want to know how much the company spent on research and
11 development. The FPC has a report that's supposed to have
12 that. If you are saying there's some judgment involved, I'm
13 asking you what else should have been put on. I'm not
14 asking you to testify as to the accuracy or bona fides of
15 the submission, just --

16 MR. BOUKNIGHT: Again, I object to that question.
17 If you want to know what Mr. Gardner thinks of research and
18 development, ask him that. Don't ask him what he would have
19 done had he been in charge of filling out this form.

20 BY MR. GUTTMAN:

21 Q In your judgment, was the company spending any
22 additional sums on research and development in 1966, '67

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and '68 other than as reported there?

MR. BOUKNIGHT: I object to that question once again, Mr. Guttman. For the same reason.

MR. GUTTMAN: I'm not sure I follow.

MR. BOUKNIGHT: You are asking him to define research and development as research and development as defined in the FERC's regulation.

MR. GUTTMAN: No, I am not.

BY MR. GUTTMAN:

Q Would you please define research and development and then tell me whether there were any other items or projects that would have come under the headings listed in Form 1?

MR. RUPP: The problem with that is you are asking him to ask himself a question. If you have a specific question to put about some specific kind of expenditure, you should ask that question.

BY MR. GUTTMAN:

Q Do you define research and development as defined in that Form 1, Mr. Gardner?

MR. BOUKNIGHT: Objection. I won't let him answer that.

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MR. GUTTMAN: I'm not quite sure why you people are resisting so strenuously. I'm just trying to get a simple picture of the company's expenditures on nuclear power.

MR. BOUKNIGHT: I have gone so far as to tell you there's another way to do it, which I don't have to do. I'm telling you I'm not going to let you question Mr. Gardner as to whether he defines or reads this FERC regulation differently than the person who filled it out.

If you want to put that aside and ask Mr. Gardner what he defines as research and development, if you have some other things —

MR. GUTTMAN: If you had listened to my question more carefully, Mr. Bouknight —

BY MR. GUTTMAN:

Q Put this aside. Can you tell me what research and development expenditures there were in-house in 1966?

A I don't know.

Q All right. 1967?

A Same answer. I don't know what research and development expenditures --

Q And if I asked you for 1968 —

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1 A -- were in those periods.

2 Q The '66 to '70 period? Is that fair? When you
3 refer to that period, what period are you referring to?

4 A You can put it for any period if you want, because
5 I just don't know what the research and development
6 expenditures have been for any period.

7 Q Now, were the Turkey Points 3 and 4 contracts
8 entered into on the same date? Or what were the dates of
9 the prime contracts? And who were the prime contractors for
10 the Turkey Point units?

11 A Contracts were signed with Westinghouse for the
12 nuclear steam supply system, the turbine, and nuclear fuel
13 in May of 1966 or thereabouts. The contracts were signed
14 with Bechtel Corporation for engineering and construction
15 services for the balance of plant -- my memory is more hazy
16 on that. I can't tell you, but it's in that approximate
17 time frame.

18 Q Were these contracts for both 3 and 4? When you
19 say the plant, you mean for both units?

20 A They were for both units.

21 Q You entered into the contracts for both units at
22 one fell swoop?

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BRT 1 A One contract covered.

2 Q So those contracts were assigned in 1966? Is that
3 your —

4 A Yes.

5 MR. GUTTMAN: I should preface the next series of
6 questions. We, in our best search through the discovery
7 responses from FPL, did not get any documents which appear
8 to be definitive, complete copies of the contracts. We
9 would like one, for obvious reasons.

10 What I'm going to show Mr. Gardner is what seems to be
11 closest, and it's in the order we received it in. This is
12 to anticipate the question.

13 I would like Mr. Gardner to look at it and tell me if
14 this is a complete set of the Bechtel and Westinghouse
15 contracts. And if it's not, then we would like a complete
16 set.

17 I would like to identify this as Gardner Exhibit Number
18 19.

19 (Gardner Exhibit 19 identified.)

20 MR. BOUKNIGHT: While the witness is reviewing his
21 copy of this material, would you be kind enough of telling
22 us the background of how these documents came to be grouped

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us 3RT 1 together?

2 MR. GUTTMAN: To the best of my understanding,
3 that is the way they were received. That's why I'm asking
4 the question. This is just simply a request that
5 Mr. Gardner tell me whether there is a complete copy of the
6 contract there and if not —

7 MR. BOUKNIGHT: Well, maybe I misunderstood the
8 question originally. Is your question whether this exhibit
9 somewhere in it contains complete copies of certain
10 contracts? Very clearly I thought you asked Mr. Gardner if
11 this was the contract. Very clearly the first page of this
12 thing isn't the contract.

13 MR. GUTTMAN: My explanation was that I didn't
14 want to tamper with the order because I didn't know the
15 order. For all I know, this was a complete copy that was
16 out of order, but if someone was familiar with the contract,
17 they could put it in order.

18 The first page obviously is not a first page of a
19 contract.

20 THE WITNESS: You appear to have a complete fuel
21 contract and a complete Bechtel contract for balance of
22 plant with the possible exception of attachments. But I'm

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BRT 1 not sure there are any. You do not appear to have a
2 complete Westinghouse equipment contract.

3 BY MR. GUTTMAN:

4 Q Now, if you look at the second page of the pile,
5 it is headed "Plant Equipment Contract Effective November
6 15, 1965." Between FPL and Westinghouse. Now, earlier you
7 said the contract was dated 1966. Is this the contract you
8 are referring to?

9 A That's not what I said.

10 Q Would you please explain what it was that was
11 effective in 1965?

12 A I said the contracts were executed in May of 1966.

13 Q In this particular case, effective as of
14 November —

26 15 A The effective date of the contract was November
16 15, 1965.

17 Q Were these contracts presented to the board of
18 directors?

19 A These particular contracts, documents were not.
20 To the best of my knowledge.

21
22

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1 Q To the best of your knowledge, was any
2 presentation made relating to the Turkey Point units?

3 A Yes.

4 Q What was the nature of that presentation and when
5 was it?

6 A The basic negotiations were completed --
7 preliminary agreements were completed on November 15 of
8 1965, and prior to -- I think prior to that time had been
9 presented to the board of directors a few days prior to
10 that.

11 Q Were you involved personally in the presentation?
12 Either --

13 A No.

14 Q Do you know if any materials, written or prepared
15 materials were presented?

16 A I don't know.

17 MR. GUTTMAN: I should note, as I discussed with
18 Mr. Rupp, we have a lot of documents. We may be overlooking
19 them. But I don't believe we have any board of directors'
20 minutes relating to the approval of the --

21 MR. BOUKNIGHT: We will check and try to provide
22 you with copies of the resolutions approving these

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1 paragraphs.

2 MR. GUTTMAN: We'll request the entire — whatever
3 is called for in the initial documentary request, relating
4 to the board.

5 MR. RUPP: Just for the record, what I have asked
6 to be done, Mr. Guttman called me and asked — suggested
7 that he may be missing some documents. I asked him to
8 provide me a list of the documents he thought he was
9 missing, understanding that FPL turned over to Spiegel &
10 McDiarmid 177 boxes of documents, understanding that there
11 may be some documents still scattered through there.
12 Mr. Guttman has agreed to do that.

13 I told him when I received that listing I would undertake
14 to determine both whether the documents were turned over,
15 and if not, to see whether the documents exist.

16 MR. GUTTMAN: Fine.

17 MR. RUPP: I am awaiting that letter.

18 MR. GUTTMAN: You've have it soon, as soon as we
19 got out of here, I hope.

20 BY MR. GUTTMAN:

21 Q Do you know Mr. Irvin (Chip) Supp?

22 A Yes, I do.

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1 Q Who is Mr. Bupp?

2 A He is an assistant professor at the Harvard
3 Graduate School of Business Administration.

4 Q Does he have any expertise in the nuclear power
5 field?

6 A He's written a book entitled "Light Water
7 Reactors."

8 Q Have you read the book?

9 A Yes, parts of it.

10 Q Parts of it. Was Mr. Bupp ever an advisor or
11 consultant to Florida Power & Light on nuclear power?

12 A Dr. Bupp has made a presentation on the subject of
13 nuclear power to a senior management committee. I was not
14 -- and as such, he was giving his knowledge and opinions and
15 judgments about nuclear power. He was not paid to do that
16 and was not, in my judgment, officially in a position of a
17 consultant.

18 Q Do you generally consider him to be a reputable
19 expert in the area of history of nuclear power development?

20 A I think he's knowledgeable. He has undertaken a
21 study of it, extensive study. Whether you'd classify him as
22 an expert, I don't know. He might well be.

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1 MR. GUTTMAN: I would like to have marked as
2 Gardner Exhibit 20 an excerpt from a volume by Mr. Bupp and
3 Mr. Jean-Claude Derian.

4 THE WITNESS: Jean-Claude Derian.

5 MR. GUTTMAN: You either speak French or read the
6 book. It's an excerpt of a book entitled "Light Water, How
7 the Nuclear Dream Dissolved." And the particular excerpt is
8 pages 43 to 53.

9 BY MR. GUTTMAN:

10 Q First of all, I presume this is the book you were
11 referring to as having read in part?

12 A Yes, I have read parts of it. In fact, I have an
13 autographed copy of it.

14 (Gardner Exhibit 20 identified.)

15 BY MR. GUTTMAN:

16 Q Do you recall having read this particular chapter,
17 chapter 2?

18 A I think I did.

19 Q Could you look at page 48? I refer you to the
20 first paragraph after the heading "Aftermath"; the paragraph
21 starting, "In the year." Would you just look at the
22 paragraph, which describes turnkey?

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1 I would like to know if that's an accurate reflection of
2 the concept, "turnkey," as it applies to the nuclear power
3 business. My question is, do you generally accept, at the
4 bottom of the paragraph he describes what the turnkey was in
5 the context of the 1966-1967 utility business. Is that an
6 acceptable explanation to you?

7 MR. RUPP: He's talking about the period in the
8 year following the 1962 Atomic Energy Commission's report.
9 If you see that he's discussing '66 --

10 MR. GUTTMAN: The result is after 1962 he says
11 there were a series of turnkey offers. I am just asking
12 Mr. Gardner is this an acceptable explanation of what those
13 turnkey offers were?

14 THE WITNESS: Yes, I think so.

15 BY MR. GUTTMAN:

16 Q Were the Turkey Point units turnkey, as
17 described?

18 A No.

19 Q Do you know how many utilities received turnkey
20 offers, approximately?

21 A We received turnkey offers.

22 Q But you did not accept the turnkey offers?

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1 A No.

2 Q Why? Did you do any study of the turnkey offer?

3 A Yes.

4 Q Let me just preface it. Go back. Earlier you
5 said you received proposals of what became the Turkey Point
6 units from three or four companies; GE, Westinghouse,
7 Babcock & Wilcox, and Combustion Engineering; is that
8 correct?

9 A Yes.

10 Q Who submitted turnkey offers?

11 A I think all of them. All of those four.

12 Q Did you prepare any evaluations of the comparative
13 offers and of the turnkey concept?

14 A We evaluated them.

15 Q When you say evaluated, did you put anything on
16 paper? Did anybody who was doing that evaluation put
17 anything on paper?

18 A I believe there were some notes made, comparisons
19 made on paper.

20 Q Who would have made them?

21 A I may have made one or two, and Mr. Smith would
22 have, I think, made some. And I think possibly the

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engineering department might have made -- no, they would not have. Engineering department made an engineering evaluation of their scope offerings.

Q Let me see if I understand. If I understood you correctly earlier. You said you began to consider nuclear power in the mid-'60s when the companies that were building units came to you with proposals; is that correct?

A Yes.

Q They all came to you at once?

A My recollection is they were all very close in time.

Q Could -- do you know if any of them had come to you previously?

A Yes. I think my impression was that the vendors were visiting the company periodically with information.

Q Was anyone assigned by FPL, or by Mr. Smith, I guess, to study the comparative proposals?

A I was assigned to study the proposals. And I think the engineering department was.

Q Did you compare the offers of the various firms?

A Yes.

Q And you did that in writing?

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A We made some written notes or worksheets, and so forth. And I can't remember specifically what they were at this point.

Q Did you have any outside assistance? Did you hire consultants to look at the proposals?

A No.

Q Did you prepare anything for the board of directors to compare the alternative proposals?

A I didn't.

Q Did anybody?

A I don't know.

Q You say you had turnkey offers but you decided not to take the turnkey offer. What was the basis for that decision?

A I think the arrangement that we worked out was more in accordance with our normal pattern of procuring equipment and services for the construction of power plants and, as I recall, that arrangement which we worked out was the more economical.

Q Explain. What do you mean when you say more in keeping with the normal arrangements? What would the difference be between the turnkey and what you selected?

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1 A Well, with one exception, the normal arrangements
2 for procuring a power plant was for the company to purchase
3 a boiler and a turbine and to hire an engineer-constructor
4 who would build a balance of plant. And that was the
5 arrangement that was worked out for Turkey Point 3 and 4.

6 Q When you say build, do you include in addition to
7 the physical putting the bricks together, the management of
8 the construction as well?

9 A Yes.

10 Q Now, referring to the stack which we identified
11 earlier as containing the contracts for the Turkey Point
12 units —

13 MR. BOUKNIGHT: You are referring to Gardner
14 Exhibit 19?

15 MR. GUTTMAN: Right.

16 BY MR. GUTTMAN:

17 Q Looking towards the end there, there is an article
18 4.

19 MR. BOUKNIGHT: Which contract?

20 MR. GUTTMAN: The Bechtel contract towards the
21 end. It's on the page marked — I'm sorry — it's page 6,
22 at the bottom. Take a look at article 4.

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THE WITNESS: I am generally familiar with that.

BY MR. GUTTMAN:

Q Okay. Now, as I understand it -- it says, "Bechtel has apprised itself of the extent and scope of Westinghouse's responsibility to owner" -- which was FPL, I presume?

A Yes.

Q And therefore agrees to furnish owner with the complete, operable -- and subject to Westinghouse's fulfillments of its guarantees -- a licensable plant.

As I understand it, then, Bechtel -- you in fact said to Bechtel: you manage the construction and bring in the plant, and we'll pay you. Is that a fair characterization?

A Well, I don't know that I'd want to characterize it any other way than is described in the contract.

Q Let me ask you this. How many FPL officials were involved in the daily construction management?

A It varies from time to time.

Q Of the Turkey Point units?

A Of the Turkey Point Units 3 and 4? Again, it varied from time to time. I was involved. The construction department people were involved, and engineering department

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people, and later the operating people:

Q Referring to an excerpt from a document, or documents excerpted which you provided to us --

(Discussion off the record.)

MR. GUTTMAN: I am referring to Exhibit 2 to the -- I think it is the Turkey Point application. Yes, what became the Turkey Point application dated March 22, 1966. Do you have that?

MR. RUPP: March 22, 1966?

MR. GUTTMAN: Right. Exhibit 2.

MR. BOUKNIGHT: You mean Exhibit 2 to that application as it was filed at that time?

MR. GUTTMAN: Right.

BY MR. GUTTMAN:

Q It says there that the contract price for Turkey Point unit 3 is not subject to escalation. I presume that was a correct statement when made. Was that in fact something that -- a situation that maintained throughout the life of the construction?

A I'm not sure I understand.

Q As I read it, you had a fixed price for Turkey Point Unit 3; is that correct?

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1 A Yes.

2 Q And in fact, nobody broke the contract? You ended
3 up paying the price that you initially bargained for; is
4 that correct?

5 A No.

6 Q What happened?

7 A The contract contained a provision -- it was fixed
8 with respect to the scope that was defined. The scope was
9 defined with respect to AEC regulations in effect as of the
10 time of the contract. What happened was there were changes
11 -- and also, the scope could be changed by FPL itself.
12 Additional changes in AEC regulations resulted in an
13 increase in costs.

14 Q Now, to summarize, in the case of Turkey Point 3
15 and 4, sometime in early -- mid 1965 the vendors came to
16 you. Someone in the company looked at their proposals and
17 then you decided to commit by 1966; is that the general
18 scenario?

19 MR. RUPP: Dan, that testimony is already on the
20 record. Did you have another question?

21 MR. GUTTMAN: The question was the same sequence
22 for the St. Lucie.

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MR. RUPP: Why don't you ask him the question?

MR. GUTTMAN: I apologize. I thought that would just put it in the context. Not changing the subject -- analyzing.

BY MR. GUTTMAN:

Q When was the first inkling of St. Lucie I, which was of course born as the Hutchinson Island I in the mind of the company?

A I think that we solicited proposals for St. Lucie I sometime in 1967.

Q Was there any discussion or planning study or memo which preceeded that solicitation? Did anybody do any generation studies which said: we may need a nuclear unit?

A I'm sure there was, but I can't remember a specific document or paper at this time. It was just generally -- the context in which FPL was doing business at the time was a very rapid and constant growth in customers and load, which we had forecast. We had certain units under construction of a certain size. So people were continuously concerned with -- aware of the gap between the existing capacity, the capacity that had been committed to, and the future load growth. So we were aware of the schedules, what

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1 we thought were the schedules at the time. And we knew that
2 for a certain time frame we had to make commitments to
3 plants.

4 Q I understand that. But you have --

5 A So that's why I say, these kinds of figures were
6 more or less continuously in front of us and I'm sure those
7 figures were in people's minds and they were aware of them.
8 And that's why I can't remember a specific study leading to
9 a unit. It's more or less a continuous --

10 Q But is your testimony that there was likely one or
11 several specific studies?

12 A Possibly.

13 Q Well, how did the company decide -- assuming the
14 load was growing, you probably commonsensically realized you
15 needed to build something -- but did you do any studies to
16 decide to build nuclear versus coal versus oil versus gas?

17 A I think I did a study of a nuclear versus an oil
18 and gas-fired plant for Mr. Fite.

19 Q Is this in addition to the study you referred to
20 earlier?

21 A Yes, it was in addition to.

22 Q Did you review this study in the course of

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1 preparing for this affidavit?

2 A I probably did.

3 Q So the study is still in existence?

4 A I think it is.

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BETWON

1 Q Do you know of any other studies of that nature
2 done by anybody else in the company?

3 A No.

4 Q Was your study the study relied on in the
5 determination to proceed with St. Lucie?

6 A I don't know.

7 Q Do you know whether any studies were relied on in
8 the determination to proceed with either St. Lucie --

9 A I don't know.

10 Q Do you know if any studies were presented to the
11 board of directors?

12 A I don't know what was presented to the board of
13 directors in connection with St. Lucie.

14 Q Do you know if any studies were presented to the
15 board of directors in connection with St. Lucie commitments?

16 A I don't know.

17 Q Do you know whether any studies, of the size of the
18 St. Lucie units, potential size, that is building it 100
19 megawatts, 200, 300, 400, 500, were ever made?

20 MR. RUPP: Dan, we may well subsequently have a
21 problem with the use of the word studies.

22 We have been loose with the word as we have gone along.

23 MR. GUTTMAN: I apologize, you're right. Good
24 point.

25

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BY MR. GUTTMAN:

Q Did the company ever commit to paper, broad enough, meaning to be broad, any analysis --- by which I mean to be broad -- of whether or not what became St. Lucie 1 and 2 should be 100 megawatts, versus 200, versus 300 verus, you know, 600.

A Well, we had -- again, we had -- the vendors had certain sizes that they were offering. There was not an infinite range of size. The vendors had more or less standard sizes that they were offering and we selected the 300-megawatt size for that unit. And I don't know if we were considering a larger unit at that time or not. I have no -- I don't have as clear a recollection of a larger unit being considered in the case of St. Lucie as I did in the case of Turkey Point.

Q I'm sorry, was a larger unit than that actually built considered in the case of Turkey Point?

A I think I indicated in the case of Turkey Point that there were offerings of two different size. One in the general range of 7- to 800; and the other in the general range of 900 to 1000. I can't recall as clearly if the two sizes were offered in the case of St. Lucie 1 or whether we simply asked for an offering in the 800-megawatt range. I just don't recall.

Q You don't recall. Who would have made that

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1 decision?

2 A Well, it would have been a number of people
3 involved. Mr. Smith, Mr. Fite, Mr. Kinsman would have been
4 involved in that decision.

5 MR. BOUKNIGHT: Just a second.

6 (Discussion off the record.)

7 BY MR. GUTTMAN:

8 Q A couple of questions earlier, you referred to a
9 study of oil versus nuclear, or oil versus coal versus
10 nuclear? What exactly was it?

11 A In connection with St. Lucie 2, the study, as I
12 recall it, was between an oil- and gas-fired unit, and a
13 nuclear unit. And I think that primary emphasis was on gas
14 as a fuel.

15 Q When, approximately, was this study done, if you
16 recall?

17 A 1967, to the best of my recollection.

18 Q Now, would that have related to St. Lucie 1,
19 St. Lucie 2, or both?

20 A Well, we were considering -- we were considering
21 one or two units almost indiscriminately at that time. The
22 proposal that we got and the contract we made contained an
23 option for a second unit. That is -- the contract for
24 St. Lucie 1 with an option for St. Lucie 2.

25 Q Now, how did you determine the size -- you're

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33Twan 1 saying indiscriminately. There's a big difference between
2 one and two units in terms of capacity --

3 A Well, the normal practice of the company at that
4 time had been to consider two units. Turkey Point 3 and 4
5 was considered as two units. And the contract was framed in
6 the form of an option for the second unit, number 4.

7 Turkey Point 1 and 2 were considered as two units.
8 Again, it goes back to the context in which the company was
9 planning. We knew there was a continuous growth in load
10 from year to year, and that the construction of two units
11 was more economical than just the construction of a single
12 unit. So, we usually approached a project like that in
13 terms of getting bids on two units and then looking to see
14 if, within the option period, whether we felt that the load
15 was going to grow, or whether the second option was
16 desirable, and so forth.

17 Q Did you study whether the construction of a larger
18 unit, larger than the ones you built, was more economical
19 than the construction of two?

20 A That's what I can't recall. I don't know whether
21 we did or not. I tend to doubt it because I think we had
22 some concern about the larger size fitting in with our
23 system growth, and also the larger size, whether there was
24 enough experience to support the larger size.

25 Q You talk about the system growth. Have you, in

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BATWON

1 preparing for this affidavit, have you reviewed the load
2 forecasts on the growth decisions on which the decisions to
3 commit to each of these units was made?

4 A Yes.

5 Q Have you provided them to us?

6 A Yes.

7 Q I think you're referring to the document -- these
8 documents which appear to be authorizations requests to the
9 board.

10 A The budget items would contain an estimate of load
11 growth and the need for the unit.

12 Q Right. Those documents have, I guess, what would
13 be called a bottom line load forecast. It says what the
14 load should be in 1973. Do you know what the assumptions
15 were behind those forecasts?

16 A I don't know specifically what you're referring
17 to. But the company had a load forecast that was more or
18 less continuously in front of it and was revised from time
19 to time on the basis of assessment of customer growth and
20 past load growth, and the general expectations regarding the
21 Florida economy, and so forth.

22 Q Were there any studies, documents showing who were
23 considered to be customers for the purpose of these
24 forecasts, and what their growth rates were?

25 MR. RUPP: I'm sorry? What does that question

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1 mean? Whether Mary Smith was a customer --

2 MR. GUTTMAN: I mean generally.

3 BY MR. GUTTMAN:

4 Q In the old days in the utility business, and
5 Mr. Gardner can correct me, the chief executive would say, I
6 expect the load to be 3000 and that's it. Then people got
7 more sophisticated and people said, let's assume we'll have
8 this kind of customer --

9 MR. RUPP: If we can have a question, rather than
10 a recitation of what utility practice has been --

11 BY MR. GUTTMAN:

12 Q You provided us in the packet you gave us numbers
13 that said we expect when Turkey Point is built in 1963 the
14 load to be 300, or whatever. Was that the entirety of the
15 forecast that was put to paper?

16 A I'm sure the forecast would consist of an
17 estimated loadout for a number of years.

18 Q I understand that, but were there any explanations
19 of what the constituents of that load would be?

20 MR. RUPP: By whom? Or where?

21 MR. GUTTMAN: By Florida Power & Light. In that
22 forecast that you have given to us, do you know what the
23 assumptions were? That's my question.

24 BY MR. GUTTMAN:

25 Q What are the assumptions in that forecast?

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337407 1 A I'm trying to recall. And I don't recall at the
2 moment whether there were any pieces of paper which made
3 explicit the assumptions back in that time frame.

4 Q Is there any paper today that makes the
5 assumptions explicit?

6 A Yes.

7 Q Is there a name for that paper?

8 A Today's forecast is backed up by a paper called
9 "Load Forecasting Methodology."

10 Q Now, for example, are you familiar with the term
11 "interruptible load"? Or can you tell me what you
12 understand by that term?

13 A Yes. Generally, interruptible load means a load
14 of a retail customer or even a wholesale customer, which can
15 be interrupted by the utility under certain conditions.

16 Q Would a customer, another utility who has an
17 interchange agreement which is subject to interruption --
18 would that be an interruptible customer? Or would that not
19 be?

20 A Generally, that's not what --

21 MR. RUPP: Mr. Guttman, what does this have to do
22 with the affidavit?

23 MR. GUTTMAN: Mr. Gardner is making assertions
24 about the basis for planning for the Turkey Point units, the
25 company plant influence for itself and not anything else.

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1 It relied on some assumptions in planning these units. I'm
2 trying to find out what the assumptions were in fact for
3 these forecasts.

4 MR. BOUKNIGHT: Mr. Gardner has told you that he's
5 provided you what the company -- the forecast on which the
6 company based the decisions. He's also told you that he
7 didn't have anything to do with preparing the underlying
8 materials. So, I'm not certain where this can lead you.
9 You may answer if you can.

10 MR. GUTTMAN: Could you repeat the question,
11 please?

12 (The reporter read the record as requested.)

13 THE WITNESS: Generally, that's not what we would
14 consider an interruptible customer.

15 MR. GUTTMAN: I would like to identify and mark as
16 21 a document received from the company, prepared by
17 Mr. Gardner to Mr. E.L. Bivens, subject: Power supply
18 planning study, dated November 20, 1979.

19 (Gardner Exhibit 21 identified.)

20 BY MR. GUTTMAN:

21 Q Is it fair to presume you prepared that document,
22 Mr. Gardner?

23 A Yes.

24 Q That document indicates you were asking the
25 company officials to conduct an analysis. Was the analysis

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referred to there in fact conducted?

A Some analysis was. I don't know if it was completed or not.

Q It was prepared -- it was done in written form; is that correct? Somebody put something down on paper?

A Yes.

Q Who would have done that?

A Mr. Bivens and his people would have done that.

Q Do you know if that was provided to us in discovery?

A I don't know.

MR. RUPP: We have already mentioned that Mr. Gardner did not take responsibility for responding to your discovery requests.

MR. GUTTMAN: I was just asking him. I'm not trying to make a point of contention, I'm just asking.

BY MR. GUTTMAN:

Q At the top of page 3 of the affidavit, you say, "In addition, FPL recognizes that the construction and operation of such units presented substantial economic and regulatory risks." Did FPL make a study of the risks referred to prior to commitment to Turkey Point? Any studies? Using the term broadly, putting anything down on paper?

MR. RUPP: Let me make sure I understand the

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1 question. Did anyone within FPL do anything in writing, say
2 anything in writing about the risks that might be associated
3 with nuclear power projects?

4 MR. GUTTMAN: About the risks that Mr. Gardner is
5 referring to in his affidavit. Insofar as he's making a
6 statement, did anybody in the company ever write anything
7 about what he's talking about here, at the time?

8 MR. SOUKNIGHT: Is that the question?

9 MR. GUTTMAN: Yes.

10 MR. RUPP: If you know.

11 MR. GUTTMAN: Obviously.

12 THE WITNESS: We may have. I seem to remember an
13 evaluation of risks associated with nuclear fuel that I
14 prepared. I can't — I don't have a good recollection of
15 it, but I have some recollection of it. During that time,
16 we made a lot of investigation of the situation around
17 nuclear power. I just don't know how — I can't recall how
18 much we put down on paper at that time. But I do seem to
19 recall one paper on some risk associated with nuclear fuel.

20 BY MR. GUTTMAN:

21 Q Did you review that paper in preparing the
22 affidavit?

23 A Not specifically.

24 Q Do you know if it's still in existence?

25 A I think it is.

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BETWEEN

1 Q Do you know if any presentation in the 1965-66
2 period, when you're committing -- deciding to commit to
3 Turkey Point -- did anybody in the company make a
4 presentation to the board of directors about any types of
5 risks related to nuclear power?

6 A I don't know what was presented to the board of
7 directors. I was not involved in the board of directors
8 presentations.

9 Q Did, in the -- I'm going to ask you the same
10 questions about the St. Lucie 1 and 2 now. In the period --
11 go back -- I think you said you decided to go ahead with
12 St. Lucie 1 in what year? And St. Lucie 2 in what year?

13 A It seems to me St. Lucie 1 was -- we committed in
14 the fall of 1967. And then contract documents sometime
15 later in '68.

16 Q And St. Lucie 2?

17 A St. Lucie 2 was committed to, I think, in late
18 '72.

19 Q Let's take those each one by one. Separate
20 cases. Prior to the commitment to St. Lucie 1, in the fall
21 of 1967, did anybody in the company put anything down on
22 paper, relating to the risks referred to in your affidavit?

23 A I can't recall if they did or -- if they did. I
24 don't recall that they did.

25 Q And what about prior to the -- in the period

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1 between the fall of 1967 and the commitment to St. Lucie 2,
2 did anybody put anything down on paper related to these
3 risks?

4 A St. Lucie 2?

5 Q Right.

6 A I think there was some analysis of risk in the
7 case of St. Lucie 2.

8 Q What risks?

9 A The same risks described in my affidavit.

10 Q What analysis are you referring to?

11 A I seem to remember analysis that I made of
12 regulatory and economic risks.

13 Q Approximately when did you make this and in what
14 capacity?

15 A That possibly might have been later.

16 Q Later than 1972?

17 A Later than '72. I think there was some — after
18 committing to that unit, there was some — I'm having a
19 difficult time recalling just the exact sequence of events.
20 But I think there was some consideration given to cancelling
21 the unit. I think we evaluated the situation. That may
22 have been in connection with that, rather than made prior to
23 the commitment in '72, the evaluation I'm thinking of.

24 Q Now, in your affidavit, just to see if we can get
25 it clear, in making the statements that you do about risk on

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1 paragraph 7, are there any documents created by the company
2 or for the company, in the period prior to the commitment to
3 St. Lucie 2, which you would cite in support of that
4 statement?

5 A I don't recall if there were any or not.

6 MR. GUTTMAN: Do you want to take a break?

7 MR. BOUKNIGHT: Fine.

8 (Whereupon, at 12:30 p.m., the hearing was
9 recessed, to reconvene at 1:30 p.m., this same day.)
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AFTERNOON SESSION

(1:30 p.m.)

Whereupon,

ROBERT J. GARDNER

resumed the stand and, having been previously duly sworn,
was examined and testified further as follows:

BY MR. GUTTMAN:

Q At page 31 of the motion to which your affidavit
was attached the company states that:

"As noted, FPL officials understood, when they were
attempting to decide in the mid-1960s whether to invest in
nuclear-fueled generating facilities, that the building of
nuclear units would entail substantial financial and
regulatory risks."

The footnote citation is paragraph 7 of your affidavit;
is that correct?

MR. BOUKNIGHT: Are you asking whether or not the
memo does in fact refer to the affidavit?

MR. GUTTMAN: Yes. Have I read this correctly?
Take a look at it.

THE WITNESS: You read it. Properly.

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1 BY MR. GUTTMAN:

2 Q Can you cite for me now, identify, any documents
3 that were contemporaneous to the planning of the units
4 referred to that support that statement?

5 A I think I told you that I recall preparing one
6 document that contained at least some reference to
7 revisions associated with nuclear fuel. I can't remember
8 other specific pieces of paper that we prepared that
9 recorded our understanding of the revisions at the time.

10 Q Do you know whether there were such other
11 documents that would support this, that were ones in
12 existence but no longer --

13 A I don't know whether there were or not. I can't
14 remember whether there were or not.

15 Q So the sole documentary basis for your support of
16 this statement is the fuel study you just referred to; is
17 that correct?

18 MR. BOUKNIGHT: I object to that. Mr. Gardner is
19 not responsible for that statement. Mr. Gardner is
20 responsible for the paragraph in that affidavit that he
21 wrote.

22

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BY MR. GUTTMAN:

Q Insofar as your affidavit is a basis for this statement, the sole basis for the statement, sole documentary basis for the affidavit statement, is the fuel study you just referred to; is that correct?

MR. BOUKNIGHT: Which affidavit statement, Mr. Guttman?

MR. GUTTMAN: The statement referenced in the Gardner affidavit, paragraph 7.

MR. BOUKNIGHT: Gardner affidavit paragraph 7 is a rather lengthy thing. Are you asking him about paragraph 7 of his affidavit rather than about the motion?

MR. GUTTMAN: What I'm asking him is —

BY MR. GUTTMAN:

Q Mr. Gardner, do you know, can you identify for me now, any documents, contemporaneous documents that were produced at the time of the planning, that would support the statement I just read you from the company's motion?

MR. BOUKNIGHT: I object to that.

BY MR. GUTTMAN:

Q In producing your affidavit, Mr. Gardner, in paragraph 7, were you relying on any contemporaneous

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documents? That is, contemporaneous to the planning?

A With respect to paragraph 7, I was not relying on any specific document that I identified specifically in making this. I'm relying on my memory of the understanding of the information that we gathered at the time, the studies that we made.

There were documents. There were pieces of paper that I can't specifically recall right now. I simply recall that there were pieces of paper. There were a great deal of information that was in written form that was furnished to us by vendors, by the AEC, by consultants and other sources that we examined and tapped. All of that is documentary evidence upon which my memory is based. And I can't specifically recall, or identify a specific document at this time.

I had occasion to give testimony in the litigation involving the Westinghouse fuel contract and I made very much the same statements there that I'm making here regarding my memory of the risks and the attendant circumstances surrounding the company's commitment to Turkey Point 3 and 4. I went through the -- very much the same process of recollection and examination of company files

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1 at that time.

2 Q Are those documents that you recall from memory
3 provided among the documents that were given to us in the
4 package yesterday?

5 A I don't -- I think that we gave you all of the
6 dockets (sic) that I could specifically identify that I
7 relied upon.

8 Q In other words, you did not -- did you give us all
9 the documents you relied on?

10 A I think that I gave you all of the dockets --
11 documents that I could specifically identify, as I remember.
12 What I'm trying to say to you -- I have a general
13 recollection of reading a great deal of material and
14 documents. I can't specifically identify and put my hands
15 on an individual or specific document at this time. And I
16 didn't rely on a specific document that I could identify in
17 preparing this affidavit. I simply remember that there was
18 a great number of documents that we reviewed and looked at,
19 took cognizance of, undoubtedly made notes and summaries of
20 at the time.

21 Q And some were produced by the company itself?

22 A Some summaries that I produced, an example of

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PORT

1 which, I think I have mentioned several times here, and I
2 seem to recall that there were others. I can't
3 specifically identify or recollect specific documents. I
4 simply have a memory that there were documents.

5 Q Again, did you ask anybody to collect them for you
6 when you prepared the affidavit?

7 A No.

8 Q Do you know whether they exist?

9 A I don't think they do other than the one that I
10 mentioned, because, as I said before, I had occasion to
11 resurrect this subject in very similar form in preparing for
12 testimony in the Westinghouse fuel litigation.

13 Q And that was in about 1973 or '79?

14 A Thereabouts.

15 Q Now, do you know what the term "capacity factor"
16 means?

17 A I believe I do.

18 Q Can you explain it just briefly?

19 A Capacity factor of an electric power generating
20 unit is generally defined as the amount of energy generated
21 by that unit in the course of a year's time, divided by the
22 rated capacity of that unit times 8760.

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Q Could you briefly define the term "baseload unit," for the record? I'm sure you are familiar with it.

A The baseload unit -- a baseload unit is one whose economics of operating costs causes it to be called upon to serve load all the time that it's available. That is, called upon by our economic dispatch system.

Q What typically are -- is it true that baseload units are supposed to be used on relatively high capacity factor basis?

A Not necessarily.

Q What are the capacity factors, ranges? Are the Turkey Point units baseload units?

A The Turkey Point units are baseloaded under our economic dispatch system.

Q And what is the approximately capacity factor of those units?

A They vary from the 40s to the 70s, percent.

Q When FPL planned the Turkey Point units, did they -- did FPL do any studies of the capacity factor that it would operate at?

A In making the economic study for the Turkey Point units that I referred to, I think we assumed a capacity

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1 factor.

2 Q What was the capacity factor that you assumed?

3 A I think we assumed several different capacity
4 factors, and I can't remember specifically what they were
5 right now.

6 Q Was there any break-even point relating to the
7 economic feasibility of the Turkey Point units? In other
8 words, if it were operated at a zero percent capacity factor
9 throughout its life, of course, it would not be a viable
10 investment. But if it were a higher one it might be. Did
11 you study that? Did you consider that?

12 A I can't remember whether I calculated a break-even
13 capacity factor or not.

14 Q Now, in your paragraph 7 subheading A, "Economic,"
15 you say there, "We believe that during the 40-year life of
16 the plant" — you refer to the 40-year life of the plant.
17 Did FPL assume that the Turkey Point units would have a
18 40-year life?

19 A The 40-year life was the time that the units would
20 be licensed for operation under the licensing practices that
21 were then in effect.

22 Q But did you, in your economic studies, assume it

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1 would operate for 40 years?

2 A I can't remember what overall life -- whether it
3 was 20 years, 30 years, or 40 years, offhand. But it was
4 some. Maybe it was all three.

5 Q Who would have done the examination, when you say
6 "we"?

7 A Me. I. Excuse me.

8 Q "We" collectively.

9 Going to the topic of regulatory revisions, which you
10 have down there, paragraph B.

11 Did, to the best of your recollection, you or any other
12 official of the company make any presentation to the Board
13 of Directors related to these regulatory revisions prior to
14 the commitments for any of these units?

15 A I did not make a presentation. Mr. Smith made the
16 presentation to the Board. Generally the practice was to
17 present the economic figures which I knew about and
18 participated in, but I don't know what information he
19 conveyed to the Board about the revisions which we had
20 identified in the course of our informing ourselves about
21 nuclear power.

22 Q What were the other specific revisions that you

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identified at the time?

MR. BOUKNIGHT: Other than what?

MR. GUTTMAN: Other than economic.

THE WITNESS: Regulatory.

BY MR. GUTTMAN:

Q Okay. Can you tell me, does FPL consider nuclear power to be -- did FPL consider nuclear power to be a safety risk at the time you committed to these units?

MR. BOUKNIGHT: Mr. Guttman, what's the relevance of that?

MR. GUTTMAN: Your company is asserting that this was very risky: "We are big risk-takers, got into all this and knew all the risks."

And so far I can't see any evidence of anybody showing sufficient concern to document it. And I'm trying to figure out what the risks were.

MR. BOUKNIGHT: What do safety risks have to do with this?

BY MR. GUTTMAN:

Q Well, Mr. Gardner, you say, "There were public concerns about the safety and environmental effects of nuclear units."

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1 As I read that sentence, is it FPL's position that these
2 safety concerns are valid? Does FPL share -- have the same
3 concerns about --

4 MR. RUPP: As who?

5 MR. GUTTMAN: As the public.

6 MR. BOUKNIGHT: Mr. Guttman, I don't see the
7 relevance of that question at all.

8 MR. GUTTMAN: I'm trying to understand.

9 BY MR. GUTTMAN:

10 Q Is it FPL's position that these public concerns
11 are merely public concerns? That is, they are not concerns
12 that FPL, as someone running the business, agrees to? or
13 shares?

14 MR. BOUKNIGHT: Objection.

15 MR. GUTTMAN: Grounds?

16 MR. BOUKNIGHT: Well, Mr. Guttman, first that has
17 absolutely nothing to do with this affidavit. If you're
18 concerned with the public health and safety, then that has
19 nothing to do with the material that Mr. Gardner has put in
20 his affidavit. What Mr. Gardner is discussing here are the
21 risks to the shareholders and ratepayers of Florida Power
22 & Light Company.

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BY MR. GUTTMAN:

Is the safety of nuclear power a risk the
shareholders and ratepayers of Florida Power & Light
Company --

A Yes, it is.

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Q Prior to committing to any of these units, did FPL do any written memos, analyses, studies, relating to any potential safety risks of these units?

A I would like to supplement my previous answer by saying there is a safety risk in all of the technology that FPL uses for the delivery and sale of electric power to its customers. I don't recall that we did any written reduction of our investigation into the safety risks.

We did gather a great deal of information about the safety risks. We had conferences with the -- with AEC, the chairman of the Atomic Energy Committee -- Commission visited Turkey Point and I accompanied Mr. Smith in escorting Dr. Seaborg to the plant.

During that time, I remember Mr. Smith asking Dr. Seaborg about the safety aspects of the plant and this was characteristic of the information that we gathered about the safety risks.

But I can't remember that these were reduced to any sort of written form. -

Q And that would include just memos of meetings, when you say you can't remember?

A There may have been memorandums at meetings and

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so forth.

MR. GUTTMAN: I would like to offer as Gardner Exhibit Number 22 a March 12, 1975 document from the Strategic Planning Department, received from FPL discovery from O. F. P-e-a-r-s-o-n, to Marshall McDonald, the president, signed by Mr. Pearson.

(Gardner Exhibit 22 identified.)

BY MR. GUTTMAN:

Q Can you take a look and please tell me if you have seen this document before?

A Yes, I have.

Q Can you tell us who Mr. Pearson is?

A Mr. Pearson is director of Strategic Planning.

Q A director? Or he is director now?

A He is now director of Strategic Planning.

Q At the time that memorandum was written, were you the director of the Strategic Planning? Was he working for you?

A Yes, he was.

Q You've seen this document? Is it true you have seen this document before?

A Yes.

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Q Did you approve it?

A I believe so.

Q Thank you. Now, when you referred --

MR. BOUKNIGHT: Hold on just a second. Do you need another minute to look at this?

MR. GUTTMAN: Sure. Take whatever time you need.

BY MR. GUTTMAN:

Q At the top of page 4 you refer to the potential intervention in licensing processes by individuals or groups opposed to nuclear power when FPL determined to go ahead with nuclear power in 1965-66, what groups did you have in mind?

A No specific groups. Members of the public, but members of the public in general who were concerned about the safety of nuclear power.

There had been in California at that time demonstrations against proposed nuclear power plants by community groups. Women were concerned about releases from nuclear power plants. And had been included in those groups expressing concern for their children.

Those were, in general, the kinds of groups that we had in mind.

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1 Q Is, in the context of the licensing review and
2 regulatory concern area, is antitrust review a regulatory
3 concern?

4 A Antitrust review is a regulatory concern. It was
5 not in 1965.

6 Q When did it become a regulatory concern?

7 A It became a regulatory concern after 1970, when we

8 —
9 Q That completes your answer?

10 A Yes.

11 Q How did it come to be a regulatory concern at that
12 time?

13 A After 1970.

14 Q How did it come about that it became to be a
15 regulatory concern?

16 A The licensing procedure in 1970 was changed to
17 make all of the licenses for new nuclear plants to become
18 commercial licenses, and as such an antitrust review was
19 included in the licensing process.

20 In our considerations of nuclear power after that time,
21 along with all other regulatory concerns, we included the
22 antitrust review as one of the concerns that we evaluated in

1 considering nuclear power.

2 MR. GUTTMAN: I'm going to show you a document
3 which I hadn't planned to use as an exhibit, but I'll show
4 it to you. I believe this document, which was given to us
5 in the discovery is a record of the dates and general
6 subjects of the meetings of the Senior Management Planning
7 Council.

8 The first question is, are you familiar with what the
9 Senior Management Planning Council is?

10 THE WITNESS: Yes..

11 BY MR. GUTTMAN:

12 Q Will you please describe it and tell us what it
13 was?

14 A The Senior Management Planning Council was a group
15 of executives that existed in the period 1973 to 1975, who
16 -- maybe a little bit into '77 -- consisted of the chairman
17 of the board, the chief executive officer, the executive
18 vice-presidents, and the senior vice-presidents.

19 Q And you -- were you in charge or in some way
20 responsible for the meetings of these people?

21 A I prepared the agenda for the meetings.

22 Q Were there typically presentations in advance of

1 the meetings?

2 A Yes.

3 Q Written presentations; is that correct?

4 A Yes.

5 Q And they were distributed to the members in
6 advance?

7 A Yes.

8 Q Did anybody keep notes or records in any way of
9 what happened? What was said?

10 A Usually not. I don't recall any specific, unless
11 some sort of recommendation came out which required
12 implementation. But I'd have no specific recollection right
13 now of one.

14 Q I'm going to show you, you can tell me -- it
15 doesn't have a heading, but it appears to me this is a list
16 that you people prepared of the various meetings.

17 I would just like to know, I'm going to ask you about
18 it.

19 MR. BOUKNIGHT: What's the question, Mr. Guttman?

20 MR. GUTTMAN: I'm going to ask questions about a
21 couple of meetings; I want to know if I'm in the ball park;
22 were these the meetings of the group we are talking about?

That's the general question.

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THE WITNESS: There are several documents here.

BY MR. GUTTMAN:

Q I'm going to ask you a question which will clarify it. Does this generally seem to be a record of the various meetings your group had?

A Yes.

MR. BOUKNIGHT: What do you mean by this?

MR. GUTTMAN: This was a predicate.

THE WITNESS: The first few pages of that.

MR. BOUKNIGHT: Is that an exhibit?

MR. GUTTMAN: No, I'm going to read from it but I wanted to know what the document was in advance before I read from it.

MR. BOUKNIGHT: What we have so far is that you handed him several documents. They weren't marked for identification. Then you used the word "this" and pointed at something, and I'm troubled by that.

MR. GUTTMAN: Let me describe it. It's a 14-page document which is, on its first 10 pages -- first 9 pages -- has a listing from 1 to 104 of meeting numbers, dates, and descriptions of meetings.

I was just trying to determine whether indeed these

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1 appeared to be the meetings of the Senior Planning Council?

2 BY MR. GUTTMAN:

3 Q Now, according to this document, the Council met
4 on October 23, 1973, at meeting number 19, to discuss the
5 current status of St. Lucie Unit 2 antitrust proceedings.
6 B. H. Fuqua made a presentation.

7 Who is B. H. Fuqua?

8 A Does it list all of the participants to that
9 meeting?

10 MR. BOUKNIGHT: Let the witness look at the piece
11 of paper.

12 MR. GUTTMAN: I'm just going to read to you —
13 (handing).

14 THE WITNESS: B. H. Fuqua was a senior
15 vice-president of the company.

16 BY MR. GUTTMAN:

17 Q Why would he be identified in relation to that
18 topic? What was his role?

19 A I think he was a management representative in
20 regard to the antitrust proceeding, or review which was
21 being conducted by the Justice Department at the time, with
22 respect to St. Lucie Unit Number 2.

Q Now, meeting number 20 refers to policy guidelines for dealings with Jacksonville on 1962-64 nuclear units, Marshall McDonald.

What units are being referred to there?

A I think, to the best of my recollection, these were the units that Jacksonville had proposed that we participate in.

Q When did Jacksonville make this proposal?

A About that time, to the best of my recollection.

Q And the meetings number 21 and 22, if you'll note -- meeting number 21 lists as one of the topics St. Lucie Unit Number 2, R. J. Gardner.

And meeting number 22, St. Lucie Unit Number 2, B. H. Fuqua and R. J. Gardner.

Do you see those?

A Yes.

Q Do you recall whether to the best of your recollection such meetings as we just discussed did take place?

A Other than that piece of paper, I don't have any specific recollection of each of these meetings. Some of the meetings we scheduled did not take place. And I,

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without looking at additional records, I couldn't say whether that meeting took place or not.

Q Do you know whether — so would you recall if you had made any written preparation in anticipation of any of these meetings and your role in them?

A No, I cannot recall.

Q I would like to show you two documents. These, again, we obtained from Florida Power & Light in discovery. The first would be Gardner Exhibit Number 23, and it's initialed —

MR. RUPP: Could we wait until we have a copy of that?

MR. BOUKNIGHT: Are both of these documents Gardner Exhibit 23?

MR. GUTTMAN: Let me just talk about the first one.

MR. RUPP: Which are we calling the first one?

MR. GUTTMAN: 23 will be RJG 10-19-73, a typed series of pages headed, "Strategic Planning Department, St. Lucie Unit Number 2."

(Gardner Exhibit 23 identified.)

EXHIBIT

BY MR. GUTTMAN:

Q Will you take a look at that and tell me whether you are the RJG referred to there?

A Yes.

Q Do you recall whether that document was used in connection with the meeting or meetings we have just discussed?

A I think it was, without being absolutely sure.

Q Do you recall did you present -- do you recall presenting this document or discussing it with anyone?

A I don't have a specific recollection of it but I believe it was. I don't know what meeting it was presented to. But I think it was presented to the group.

MR. GUTTMAN: I would like to identify as Gardner Exhibit 24 a 2-page document headed, "Alternatives," typescript, with "Problem 1" and Problem 2," and let me ask you whether you have ever seen this document before?

(Gardner Exhibit 24 identified.)

THE WITNESS: Yes. I remember this document. It's not dated, but I think this is a document that I referred to in answer to a previous question, whether we considered the cancellation of St. Lucie Unit Number 2. And

1 at that time made an analysis of the various risks and so
2 forth associated with the project, including regulatory
3 risks.

4 And I believe that this piece of paper was prepared in
5 connection with that analysis.

6 BY MR. GUTTMAN:

7 Q It appears that antitrust was one of the
8 regulatory risks in that connection; is that correct?

9 A Yes, it was.

10 Q What was the nature of the antitrust risk?

11 A I believe that's spelled out in the previous
12 document under II.

13 "Opposing these conditions increases the risk of delay
14 and unacceptable cost increases."

15 Q What were the conditions? What were the
16 conditions that are referred to as those that you felt
17 contrary to the best interests of customers and
18 stockholders?

19 A I'm not exactly sure. They at that time would
20 have been conditions which were under discussion with the
21 Department of Justice at the time.

22 Q Was there a possibility that FPL would be required
to let other systems have access to St. Lucie 2 or other

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1 nuclear units?

2 A We were asked to let other systems have access to
3 St. Lucie 2. And we offered access to St. Lucie 2 in
4 accordance with that request.

5 Q When were you asked?

6 A When?

7 Q Yes.

8 A In this general time frame.

9 Q Did you have any --..

10 A In connection with this antitrust review with the
11 Department of Justice.

12 Q Was that one of the concerns you had? That you
13 felt contrary to stockholders, that other systems might be
14 gaining access? Was that one of the -- when you refer in
15 paragraph 2 --

16 A I don't know if that specific condition was one of
17 the concerns.

18 Q What would have been?

19 A There were a number of other conditions under
20 discussion at the time. And I can't specifically recall
21 what those were at the time.

22 Q Was wheeling? Was the requirement that you might

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have to wheel a problem for you?

MR. SOUKNIGHT: I'm going to object at this point. Mr. Guttman, these documents were prepared at a time when the company was in negotiations with the Department of Justice in an effort to settle the difference between them with respect to the St. Lucie 2 antitrust review.

Mr. Gardner testified that he doesn't remember what proposal was on the table at that time, but whatever proposal it was, was a proposal under negotiation.

And I'm not prepared to allow Mr. Gardner to describe to you the considerations that FPL may have taken into account in deciding whether to accept or reject a tentative proposal from the Department of Justice.

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BY MR. GUTTMAN:

Q Let me take it out of that context. Would the requirement that FPL provide wheeling have been a concern to FPL at this time?

MR. BOUKNIGHT: Would you tell me, now, what that has to do with the affidavit?

MR. GUTTMAN: I'm getting into the question of the nature of regulatory risk, and what the regulatory risk was. Mr. Gardner has already testified about the regulatory risk. The only regulatory risk documents we have, I might note, are those related to antitrust.

So, I'm doing my best to --

MR. BOUKNIGHT: I'm still at a loss as to what you are trying to establish with respect to this affidavit.

BY MR. GUTTMAN:

Q Let me ask you, Mr. Gardner, did FPL consider canceling the unit for antitrust reasons? St. Lucie 2?

MR. BOUKNIGHT: I would like you to put that in the context of -- are you talking about in this context at the time that FPL had been faced with a specific proposal by the Antitrust Division of the Department of Justice in the midst of the licensing process?

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1 BY MR. GUTTMAN:

2 Q Mr. Gardner, you just discussed that you do
3 recall document No. 24?

4 A Yes.

5 Q Right. Problem No. II, the heading is, the
6 first item is, "Cancel the Unit for Antitrust Reasons and
7 Terminate Justice Department Inquiry on Antitrust."

8 Is it your testimony that this document was
9 produced in 1973 or 1974, in that period?

10 A You mean it was written?

11 Q Written, right.

12 A It was written in that general time period, yes.

13 Q Is it true that FPL was considering the
14 cancellation of the unit for the reasons stated in No. I?

15 A FPL was considering cancellation of the unit for
16 a number of concerns. Those concerns are set forth in
17 the problem statement in both I and II. They were concerned
18 with uncertainty regarding cost of the project, the fuel
19 cost, the project schedule, escalation, fuel costs, the
20 availability of enrichment capacity, the cost of uranium ore,
21 the schedule of the plant was uncertain because of
22 burgeoning AEC design requirements and licensing concerns

1 of the type which I referred to in my affidavit. And,
2 in addition to the other regulatory concerns, the
3 company was concerned about the effect of antitrust review
4 and the possibility that the antitrust review would lead
5 to delay and cost increases of the plant.

6 All of these were under consideration. Analysis
7 was made of these various factors to determine whether
8 or not to cancel the unit, and additional documentation
9 will show that we felt that a conclusion of this review was
10 that the antitrust review would not result in an unacceptable
11 situation to the company, and the unit -- we determined not
12 to cancel the unit. And it continues in construction to
13 this time.

14 Q. When you say "additional documentation will show,"
15 what documentation are you referring to?

16 A. I'm referring to additional documents
17 in connection with this particular analysis.

18 Q. Which documents are you referring to?

19 A. I'm referring to additional documents in
20 connection with this analysis.

21 Q. And "this analysis" meaning the analysis that
22 you performed?

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11-4

1 A The one described in the document that you gave
2 me.

3 Q Could you look at paragraph 10 of your affidavit?
4 In paragraph 10 you talk about the cost growing in the
5 units from initial planning. Do you see that?

6 A Are you referring to the statement that "Turkey
7 Point Units 3 and 4 were originally projected to cost FPL
8 a total of 139 million?"

9 Q Well, above that, when you say, "The vendor's
10 initial projections were overly optimistic," which vendor
11 were you referring to?

12 A Westinghouse.

13 Q As a result of their over-optimism, did you ever
14 pick up any of the costs that were incurred over the
15 initial estimates?

16 A Yes.

17 Q Did you ever or anybody study the initial
18 estimates when they came in, an independent analysis by
19 yourself, or some consultant?

20 A The engineering department -- correction,
21 Mr. Smith conducted the study of the costs which were proposed
22 for the plant. I had indicated before that I made an

1 economic analysis comparing the cost of the nuclear
2 plant with an oil and gas-fired plant, using costs which
3 were representative of the proposals which had been
4 submitted, and which were reasonably close to the
5 figures which we finally agreed upon as a result of
6 contract negotiations.

7 Q When you say Mr. Smith did a study, again,
8 was this anything done in written form? Did he put anything
9 on paper?

10 A He had the proposals in front of him. And I think
11 he made a summary of the various proposals and costs.

12 Q Have you examined that in connection with this
13 affidavit?

14 A No, I only have a recollection of that from
15 back in 1965. I haven't seen that document in a long, long
16 time.

17 Q Do you know if it's in existence?

18 A I don't know if it's in existence or not.

19 MR. GUTTMAN: I would like to have marked as
20 Exhibit 25 another document obtained from Florida Power &
21 Light in discovery, an internal memorandum from H. L. Allen
22 to Mr. H. W. Page; Subject: Generation forecast purchases

1 and construction, February 11, 1972.

2 (Gardner Exhibit No. 25 identified.)

3 THE WITNESS: Did you have a question?

4 BY MR. GUTTMAN:

5 Q Who was Mr. H. L. Allen, first of all? Who
6 was he at the time?

7 A Mr. Allen was vice-president in charge of our
8 construction and procurement.

9 Q And Mr. Page?

10 A Mr. Page was a vice-president of the company. I
11 don't know if he was a senior vice-president at that time
12 or not. But very shortly -- here, or very shortly after, he
13 was senior vice-president.

14 Q Do you recall having seen this memorandum before?

15 A I have a vague recollection of it, but it's very
16 uncertain.

17 Q Now, looking at that last paragraph, do you have
18 any idea what Mr. Allen was referring to, in particular?

19 A I don't know what Mr. Allen is referring to there.
20 I can only make a speculation that the Turkey Point Units,
21 above delays, additional regulatory requirements, and
22 the growing load and the need to get that unit on the line

1 to meet the load, we had had to work a great deal of overtime.
2 And the overtime was costly to the company. And I think
3 Mr. Allen was expressing his desire to plan and implement
4 units under schedules which would not necessitate the
5 use of overtime.

6 Q Isn't it true that at about that time the
7 Turkey -- the Turkey Point units were about \$50 million
8 over original budget.

9 A I think the figures are set forth in my affidavit
10 in paragraph 10.

11 MR. GUTTMAN: I would like to show you a copy of
12 another document, which appeared to be a one-page document
13 that we got from the company. It's entitled, "Construction
14 Work in Progress Summary, Power Plant Construction to Date
15 for the Month of June, 1972." And it's initialed "G.J.T.,
16 June 10, 1972."

17 Have you seen forms like this in the company's
18 daily workings? Is this a familiar type of form? I would
19 like to mark that as Exhibit 26.

20 (Gardner Exhibit No. 26 identified.)

21 THE WITNESS: I believe I have. Again, my
22 recollection is kind of faint. But I think I have.

BY MR. GUTTMAN:

Q Just to see if I understand this, the column "Original Budget" in the second from the right, would that be the amount that FPL originally estimated the cost of a particular unit on the left?

If you don't know, that will be fine. We can ask someone else.

A I don't know.

Q Let me ask you this. To your general knowledge, were the costs of the nuclear plants the only costs that were turning out to be in excess of the original estimates, or were the fossil plants also turning out to be in excess of the original estimates?

A The fossil plants were, in some cases, turning out to be in excess of original estimates in this time frame, also.

MR. GUTTMAN: I would like to identify as Gardner Exhibit 27 another document received from the company from R. J. Gardner to Messrs. Loftin Johnson, G. Spencer, and F. E. Autrey, dated August 28, 1973.

(Gardner Exhibit No. 27 identified.)

BY MR. GUTTMAN:

Q Do you recall this document, Mr. Gardner?

A Yes, I do.

Q What was the origin of the document? How did it come into being?

A Well, I marched in, I made a pencil draft of it, and my secretary, Mrs. Dubber --

Q Let me skip back. I apologize. Too much legalese on my part and an appropriate response. I understand Mr. McDonald, as the memorandum indicates, requested people to prepare a list of certain conditions; is that correct? A list of five occurrences which could "absolutely bring the company to its knees"; is that correct?

A To the best of my recollection, the statements I made in the memorandum were correct.

Q To the best of your recollection, were these lists prepared? The items requested prepared in written form?

A Yes, they were.

Q Who prepared them?

A The people who were requested to prepare them.

Q Messrs. Johnson, Spencer, and Autrey; is that correct?

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1 A Yes.

2 Q Were they subsequently circulated within the
3 company?

4 A They were discussed at a subsequent meeting of the
5 senior management council, to the best of my recollection.
6 I don't think they were circulated.

7 Q Do you recall what the five occurrences were,
8 in the case of any of the lists?

9 A Each of them had a different one. But I can --
10 can't remember each of them perfectly. But I can remember
11 some of them.

12 Q Well, let me ask you just to short-circuit,
13 do you know if the lists are still in existence, or
14 would they have been destroyed or discarded?

15 A I think they are probably still in existence.

16 Q Now, turning to --

17 MR. RUPP: Are we going to continue this line of
18 questioning?

19 MR. GUTTMAN: In terms of risks and uncertainties,
20 I wanted to know what the company was thinking about, and
21 we don't have the documents. Were you going to --

22 MR. RUPP: It's not apparent how any of the last

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1 half-hour or so has been connected in any way at all to the
2 affidavit.

3 MR. GUTTMAN: I believe it is, obviously.

4 BY MR. GUTTMAN:

5 Q Turning to paragraph 8, where you talk about
6 FPL acting alone. As I understand your affidavit, the gist of
7 it is that FPL has historically planned its generation by
8 itself; is that correct? And planned to construct
9 generation by itself; is that correct?

10 A Historically we have planned our own generation,
11 yes.

12 Q Did you plan jointly or in cooperation with any
13 other utilities in Florida in the period of the '60's?

14 A No.

15 Q I asked you earlier about what you called the
16 Florida Operating Committee -- let me ask you, do you know
17 what the Florida Operating Committee was?

18 A Yes.

19 Q What was it?

20 A The Florida Operating Committee was a committee
21 formed by Florida utilities to pursue coordination efforts.

22 Q Which Florida utilities?

1 MR. RUPP: At what time?

2 BY MR. GUTTMAN:

3 Q Well, when was it formed, Mr. Gardner?

4 A I'm not sure. I became aware of the Florida
5 Operating Committee, the best recollection I have, is
6 sometime in the early '70's. And my recollection as of
7 that time was that most of the Florida utilities were members
8 of that committee. I don't have a very good chronological
9 recollection, but what my memory does say to me is that
10 at the time that I think I knew about it, or became aware
11 of it, most of the Florida generating utilities were members
12 of the Operating Committee.

13 Q And that was in the '70's that you became aware
14 of it; is that correct? The time you're referring to?

15 A The best I can do is the early '70's.

16 MR. GUTTMAN: Let me identify as Gardner Exhibit
17 No. 28 another document received from the company in the
18 course of discovery, and the heading of the document which
19 is typed, says, "The following is an excerpt that was taken
20 from a report that was given by Mr. R. H. Fite, President
21 of Florida Power & Light Company, at the company's annual
22 stockholders meeting on May 15, 1961."

1 Could you take a look at it and tell me if you
2 have ever seen that document?

3 (Gardner Exhibit No. 28 identified.)
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1 MR. RUPP: Again, this deposition is supposed to
2 be limited by agreement with you all, I think, as a matter
3 of fact as proposed by you, to the affidavit that
4 Mr. Gardner submitted.

5 Let me finish my statement. The sentence that I take it
6 you read, because it purportedly offers an invitation to
7 this line of questioning, was the statement that, "With
8 these concerns in mind FPL determined in 1965, without
9 assistance from, or participation by, any other utility to
10 commit substantial resources to construct nuclear generating
11 units."

12 Now, if you can explain to me how this relates in any way
13 to that statement -- we are talking about nuclear generating
14 units now. And the statement is "FPL determined in '65
15 without assistance from, or participation by, any other
16 utility, to commit substantial resources to construct
17 nuclear generating units."

18 BY MR. GUTTMAN:

19 Q Let me ask you to turn to page 3 of this, Mr.
20 Gardner. I should note he says "Back in 1959 we joined with
21 Tampa Electric Company and Florida Power Corporation in
22 forming the Florida Operating Committee for the purpose of
23 planning ways and means of complete cooperation in the
24 design and operation of our system in a manner that will
25 obtain the most efficient and economical results."

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1 Do you have any knowledge of what Mr. Fite is referring
2 to?

3 MR. SOUKNIGHT: Let me make several objections.
4 The first is, you indicate on a number of instances that
5 there — these papers were provided to you on discovery from
6 FPL. I don't have any reason to doubt an assertion that you
7 make. That doesn't make it so or make it an evidentiary
8 fact.

9 Secondly, the witness hasn't testified that he knows
10 anything about this document, or has seen it. And thirdly,
11 as Mr. Rupp pointed out, this has nothing conceivable to do
12 with this affidavit.

13 BY MR. GUTTMAN:

14 Q Let me ask you, Mr. Gardner, do you know anything
15 about the document? Have you seen it before?

16 A No.

17 Q Can you tell me if you know anything about the
18 subject matter in the document?

19 A There's an awful lot of subject matter listed.

20 Q Do you know anything about the activities of the
21 Florida Operating Committee in the period prior to the
22 Turkey Point commitment?

23 A I know something about the Florida Operating
24 Committee's activities generally. I have a very imperfect
25 memory of the chronology of when I knew those — when

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1 various things took place. So, if I could tell you that I
2 knew that the Florida Operating Committee did certain
3 things, I can't tell you that they did certain things as of
4 a certain time.

5 Q Prior to the Turkey Point commitment, did the
6 Florida Operating Committee prepare joint generation and
7 transmission plans for the members?

8 A I don't think they prepared joint generation
9 plans. They may have been preparing joint transmission
10 plans.

11 Q Did you seek, in the process of preparing for your
12 affidavit, to determine whether any such joint plans were
13 performed prior to the Turkey Point commitment?

14 MR. BOUKNIGHT: What do you mean, any such joint
15 plans?

16 MR. GUTTMAN: Any joint generating or transmission
17 plans among the members of the Florida Operating Committee.

18 THE WITNESS: In preparing my affidavit I did not
19 deal with this subject of joint planning, except to say that
20 the nuclear generating units were not planned with anyone
21 else. And that is a fact. And that's the fact that I
22 stated.

23 BY MR. GUTTMAN:

24 Q What documentary basis do you have for that fact?

25 A The documentary basis for that fact is the budget

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1 item, which is submitted, which shows the full output of the
2 fact that all of the contract documents are entered into
3 between Florida Power & Light Company and the vendors and no
4 other parties.

5 Q Maybe there's a misunderstanding here. I
6 understand, of course, that Florida Power & Light laid out
7 the money for the entire unit and took the output. Is it
8 your contention that Florida Power & Light did not, at the
9 time prior to the commitment, or about that time, engage in
10 joint planning studies relating to nuclear and other matters
11 with other utilities?

12 MR. BOUKNIGHT: Objection. Mr. Gardner is not
13 making contentions. He's here simply as a fact witness. He
14 stated on his affidavit that he was there and this is what
15 happened.

16 BY MR. GUTTMAN:

17 Q What I'm trying to understand, Mr. Gardner, is
18 when you say without assistance from or participation by any
19 other utility, does that reference include planning
20 assistance? Did other utilities help plan with you in
21 connection with nuclear? Your nuclear plans?

22 A The reference refers to financial assistance and
23 participation refers to ownership. That's all I'm saying is
24 that without financial assistance, without assumption of the
25 risks, without the incurring of any obligation, contractual
or otherwise, by any other utility, without the assignment

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1 of ownership to any other utility -- that's what that
2 statement means and says.

3 MR. GUTTMAN: I would like to offer as Gardner
4 Exhibit 29 a document entitled -- again received from
5 Florida Power & Light "A Coordinated Plan for the 1970
6 Generation and Transmission Requirements for the Electric
7 Utilities of Florida, prepared by the Planning Committee,
8 Florida Operating Committee of Florida Power & Light
9 Company, Florida Power Corporation, Tampa Electric Company.
10 April 1960."

11 (Gardner Exhibit 29 identified.)

12 BY MR. GUTTMAN:

13 Q Did you review this document in preparing your
14 affidavit?

15 A No, I can't recall having seen this document.

16 (Gardner Exhibit 30 identified.)

17 MR. GUTTMAN: I would like to identify this
18 document as one received by the company in discovery. It's
19 a February 1963 document, from H.D. McKean --

20 THE WITNESS: Before you go on to that, I would
21 just like to make a comment on the document which you handed
22 me. It's entitled, "1970 Generation and Transmission
23 Requirements." It does not appear to be a plan for joint
24 generation. It appears to be a plan primarily for
25 transmission.

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1 MR. BOUKNIGHT: Let the record show that the
2 witness was referring to Gardner Exhibit 29.

3 MR. RUPP: Is that 29 or is that 30?

4 MR. GUTTMAN: 30 is a February 18, 1963 letter
5 from H.D. McKean, M-c-K-e-a-n, senior vice president,
6 Florida Power Corporation, to John Kinsman of Florida Power
7 & Light Company, with the enclosure purporting to be the set
8 of data being furnished the Federal Power Commission for the
9 National Power Survey, compiled by engineers of FPL, Tampa
10 Electric, and Florida Power Corporation.

11 BY MR. GUTTMAN:

12 Q Will you take a look at that and tell me whether
13 you have ever seen that before, Mr. Gardner? Have you ever
14 seen this before, Mr. Gardner? When you're finished
15 reviewing it?

16 A I'm reading it. I don't recall having seen this
17 document before.

18 Q Looking at the first page, the first page of the
19 enclosure, the heading, "General"?

20 A Page 4 of the attachment?

21 Q Excuse me (indicating). Can you read the
22 paragraph there that says, "Coordinated planning of the
23 generating and transmission facilities of the four major
24 utilities in the study area has been carried on by planning
25 the committees made up of personnel from FPL, Florida

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1 Power Corporation, and Tampa Electric Company. At present,
2 there is a general plan in everthing which is serving as a
3 guide for expansion up to the year 1970.

4 "This plan is based upon the 'single system' approach,
5 taking into consideration factors such as the pooling of
6 reserve, the sharing of units, area protection with
7 interarea transmission ties, so that the expansion pattern
8 would be one that is well coordinated among the
9 participating companies."

10 Do you know what the plan is that's being referred to
11 there?

12 A I think the plan that's being referred to there is
13 the document which you showed me just previously, and that
14 document is the output of coordinated planning. In general,
15 the plan lists the generation expansion plans of the
16 individual systems, and displays the results of a number of
17 transmission studies which have been made, and which indicate
18 the needs for certain kinds of transmission lines.

19 This report refers to load forecasts, which are combined
20 for several companies; transmission line and primarily
21 transmission lines. And describes capacity additions, which
22 the individual systems have indicated that they will
23 undertake.

24 Q Do you know of any other plans, joint plans
25 performed prior to February 1963, by the Florida

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Operating Committee?

MR. BOUKNIGHT: Objection, that mischaracterizes the witness' testimony.

MR. GUTTMAN: Excuse me.

THE WITNESS: I would like to make this statement that this says coordinated plan. Not joint planning, and there is a distinction.

BY MR. GUTTMAN:

Q What's the distinction?

A Coordinated planning is a making sure that the plans of the individual systems can be accommodated one with the other.

Q And joint?

A Joint planning is where companies undertake to plan together.

Q I see.

A This document describes coordinated planning, which is bringing together the individual plans of several different systems.

Q Well, a —

A In a coordinated manner.

Q At or prior to the time of this document, was FPL engaged in any joint planning in connection with the Florida Operating committee?

A I don't believe so. But I do believe that the

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1 nomenclature of coordinated planning describes the
2 activities of the planning committee, as I understood them.

3 (Recess.).

4 MR. GUTTMAN: I would like to identify for the
5 record a document obtained from the company in discovery
6 entitled, "Florida Power Corporation, Florida Power & Light
7 Company, Tampa Electric Company, Joint Planning Study,
8 1964-65, prepared by the Florida Operating Committee with
9 the Cooperation of the Orlando Utility Commission, June,
10 1961."

11 MR. BOUKNIGHT: This is Exhibit 31?

12 MR. GUTTMAN: Right.

13 (Gardner Exhibit 31 identified.)

14 BY MR. GUTTMAN:

15 Q Mr. Gardner, did you review this document in
16 preparing for the affidavit?

17 A No.

18 Q Did you ever see it before today?

19 A I don't believe I have. It appears to be a joint
20 transmission study prepared for the Florida Operating
21 Committee.

22 Q Have you ever discussed this study with anyone?

23 A Not this 1961 study, no.

24 MR. GUTTMAN: Now, I would like to mark as Gardner
25 Exhibit 32, three pages, a memoranda kind of notation cover

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1 sheet with two pages, again obtained from the company in
2 discovery.

3 The cover sheet is the note, "Mr. Page, Mr. Fite signed
4 this letter and it went out." With a signature. I think
5 that's what it says. If that's what it looks like to you?
6 Is that what it looks like to you? I hear no dissent.

7 The two attached pages are a letter, November 3rd, 1964,
8 from Robert H. Fite, F-i-t-e-, President and General
9 Manager, to Honorable J. Dillon Kennedy, Commissioner, City
10 of Jacksonville, Utilities Division.

11 (Gardner Exhibit 32 identified.)

12 BY MR. GUTTMAN:

13 Q Have you seen this set of papers before,
14 Mr. Gardner?

15 A I don't recall having seen this letter before.

16 Q Now, this letter refers to a proposed long-range
17 power supply study to be used as a guide for generating and
18 transmission additions. Do you know anything about whether
19 such a study was ever performed? Another such, or a study,
20 after this letter?

21 A No. But it's my understanding that the Florida
22 Operating Committee did and does regularly perform joint
23 transmission studies which, by using the present and
24 projected plans of each participant for operating unit
25 additions, as this letter says. So, this letter seems to

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1 reflect the continuing practice of the Florida Operating
2 Committee, as I understand it.

3 (Discussion off the record.)
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1 THE WITNESS: The only thing I wanted to add was
2 my affidavit really has nothing to do with joint
3 transmission studies.

4 BY MR. GUTTMAN:

5 Q Is it your testimony that the Florida Operating
6 Committee never considered generations in its studies in the
7 '60 to '65 period?

8 MR. BOUKNIGHT: I object to that and I think we
9 have come to a point where we have to draw a line. This has
10 nothing whatsoever to do with Mr. Gardner's affidavit.

11 BY MR. GUTTMAN:

12 Q Did the Florida Operating Committee ever engage in
13 a study of the economics, costs, of nuclear generation?

14 MR. BOUKNIGHT: To your knowledge.

15 MR. GUTTMAN: Well, yes.

16 MR. BOUKNIGHT: He's told you he doesn't have any
17 direct knowledge about the Florida Operating Committee
18 before the 1970s.

19 MR. GUTTMAN: But he's testified about the early
20 planning of Florida Power & Light with regard to nuclear,
21 and my question is: Does he know whether the Florida
22 Operating Committee considered nuclear in its joint plans.

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1 THE WITNESS: Not to my knowledge. And it was not
2 the practice, to the best of my understanding, of the
3 Florida Operating Committee, to engage in joint generation
4 planning. And my statement is that we planned and
5 constructed the nuclear generating units without the
6 assistance and participation of any other utility.

7 And the documents related to joint transmission studies
8 or coordinated transmission studies had nothing to do
9 whatsoever with that statement.

10 BY MR. GUTTMAN:

11 Q Because they relate to transmission and not to
12 generation?

13 A That's right.

14 (Gardner Exhibit 33 identified.)

15 MR. GUTTMAN: Gardner 33 is a July 8, 1966
16 document obtained from Florida Power & Light in discovery.
17 It is a cover transmittal letter on FPL heading, to
18 Mr. Lester Ulm, Jr., chairman, Long-Range Study
19 Administering Committee of Florida Operating Committee
20 entitled "Interim Report, Long-Range Generation --
21 Transmission Planning Study" signed by Long-Range Study
22 Group of Florida Operating Committee signed by

387

1. K. S. Buchanan and other names, and then after that is the
2 "Interim Report, Long-Range Generation Transmission Planning
3 Study."

4 BY MR. GUTTMAN:

5 Q Have you seen this interim report before?

6 A No, I have not.

7 Q Did — you have examined it. Does it appear to
8 include materials relating to nuclear generation?

9 A It appears to be a study of nuclear and fossil
10 generation expansion. And I have not been aware of the
11 report before this, was not aware of it in 1965. And, I
12 might add that a very hasty reading of the report does not
13 indicate that the units would be jointly owned.

14 Q Excuse me?

15 A Would not indicate that the units would be jointly
16 owned because it talks about citing an assignment of the
17 units to individual utilities.

18 Q Does it indicate that units would be individually
19 owned?

20 MR. BOUKNIGHT: I object and I'm afraid at this
21 point, Mr. Guttman, I'm going to have to stop this. We are
22 not going to go through the various activities of the

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1 Florida Operating Committee today. The statement that
2 Mr. Gardner has made, and he's clarified it to you several
3 times, is very straightforwardly that: Florida Power &
4 Light Company, without assistance from or participation by
5 any other utility, committed to these nuclear plants in
6 1965. He's told you what he meant by assistance from other
7 participation by any other utility.

8 And we are just not going to go through this. We are not
9 going to have Mr. Gardner shown documents that have nothing
10 to do with the affidavit, that he's never seen before, and
11 to have you fish for instant characterizations.

12 MR. GUTTMAN: Mr. Bouknight, with due respect, I'm
13 finished with that line of questioning, but it's clear that
14 it has to do with assistance, coordination, planning between
15 Florida Power & Light and other utilities, and I asked
16 Mr. Gardner if he had considered that.

17 MR. BOUKNIGHT: That's irrelevant.

18 MR. GUTTMAN: That's what we put in our briefs.
19 You argue it's irrelevant and we'll argue it is relevant,
20 and let's not argue it any more here.

21 MR. BOUKNIGHT: Well, we are not going to argue it
22 any more here. We are not going to do this any more.

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1 MR. GUTTMAN: Let's look at paragraph number 9,
2 Mr. Gardner.

3 MR. SOUKNIGHT: Paragraph number 9 of what?

4 MR. GUTTMAN: Of your affidavit, sorry.

5 BY MR. GUTTMAN:

6 Q There you indicate that the Atomic Energy
7 Commission, you say that the "construction permits were for
8 research and development rather than commercial because the
9 AEC had found that nuclear generating plans had not been in
10 operation" -- et cetera, et cetera. When you say "found,"
11 what finding are you referring to?

12 A The AEC, as I understand it, was required to make
13 a finding of practical value before commercial-type licenses
14 could be issued. This was as a provision of the Atomic
15 Energy Act that was in effect at the time.

16 The NRC held a proceeding on the subject of practical
17 value and concluded that it could not make a finding of
18 practical value at that time.

19 Q When was this proceeding held?

20 A It's in the documents that I think we gave you.
21 The proceeding is described in a Federal Register entry that
22 was furnished to you as part of the documents.

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1 Q I see, thank you. Now, I'm going to turn
2 generally to give you an idea where we are going, the area
3 of forecasting and who you planned your units for, and load
4 projections, and so forth. And it relates primarily to
5 paragraphs 5 -- where you say that "we built the unit to
6 serve our customers," and paragraph 17, I think, where you
7 discussed load projections.

8 I believe earlier I asked you what were the load
9 forecasts on which the various planning units were -- the
10 nuclear units were committed. And I think you told me that
11 you had provided documents to me which showed that.

12 And I'm going to show you the -- an example of the
13 document and you tell me if that's it.

14 This is from the document, the document is in the packet
15 Gardner Exhibit Number 1. It's headed "Expenditure
16 Requisition." Turkey Point, South Dade, Miami, and titled,
17 "Turkey Point, 760,000 KW Extension" dated 12/12/68, and
18 prepared by J. B. O-l-m-s-t-e-a-d, Olmstead.

19 Will you take a look at that and tell me if that --

20 MR. RUPP: May we go off the record for a moment?

21 (Discussion off the record.)

22 THE WITNESS: What would you like to know about

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1 that?

2 BY MR. GUTTMAN:

3 Q My question is, I see that that states, for
4 example -- it says that in 1970-1971 the system load will be
5 5500 megawatts; is that correct?

6 A There are two documents. One relating to Turkey
7 Point Unit 3 and one to Turkey Point Unit 4. The one you
8 just handed me was to 4 and refers to the '71-'72 season.

9 Q What is the load it states -- it states, does it
10 not, 6230 megawatt load for the winter season 1971-72; is
11 that not correct?

12 A System load is forecast to be 6230 megawatts for
13 the '71-'72 winter season, cold weather.

14 Q Can you tell me, were there any documents
15 underlying this document showing where those numbers came
16 from?

17 A There is a load forecast. There was a load
18 forecast. It was in effect at the time.

19 Q Did that -- have you examined that load forecast?

20 A Not recently.

21 Q Do you recall ever having examined that load
22 forecast?

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1 A I can't say specifically that I examined that
2 particular load forecast. I looked at a lot of load
3 forecasts throughout this whole period, from 1965 on,
4 including previous forecasts. I can't pick out any
5 individual one and lay my hands on it, but I have looked at
6 a lot of forecasts that the company has made over this time
7 period.

8 Q Was the load of any municipal systems in Florida
9 -- would they have been included in that number we were just
10 looking at?

11 A I don't know whether it would have or not. As I
12 say, I don't know what the underlying components of the
13 forecasts were.

14 Q Who would have known or who would have made that
15 determination?

16 A Mr. Coomes was the one who made the forecasts.

17 Q Were all the customers who were going to use
18 Turkey Point, customers of FPL at the time the forecast was
19 made? I'm not trying to ask you a trick question. Let
20 me --

21 A No.

22 Q Isn't it -- it is true that at the time you

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1 planned Turkey Point you had about half a million customers
2 all told? Is that correct? Something like that? '65?

3 A I'd have to check. I can't recall offhand.

4 Q Is it fair to say you have got several hundred
5 thousand customers who have come on to the system in the
6 interim since you committed to Turkey Point?

7 A More than that.

8 Q I was being conservative. And many of those
9 customers -- all of them that are retail customers would
10 receive power priced in part and generated in part by Turkey
11 Point; is that correct?

12 A Retail and wholesale receive power -- from Turkey
13 Point.

14 Q Now, when you prepared that fiscal forecast, did
15 you include the, as load, any of the Plaintiffs in this
16 case?

17 MR. BOUKNIGHT: Objection, he's testified that he
18 didn't prepare that particular load forecast.

19 MR. GUTTMAN: Excuse me.

20 BY MR. GUTTMAN:

21 Q When the forecast was prepared, do you know
22 whether it included any of the load of any of the

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1 Plaintiffs in this case?

2 A I don't know.

3 Q Reading to you -- I'm going to read to you from a
4 response you gave to the Atomic Energy Commission from a
5 response you gave in South Dade.

6 "On July 14, 1975, Mr. Tracy Danese transmitted to the
7 NRC a response to the information requested by the attorney
8 general. I assume you are generally familiar." In that
9 response, question 18 says, "List applicants offers or
10 proposals to purchase, merge, or consolidate with electric
11 utilities subsequent to January 1, 1960."

12 First it says that "In 1965, '70, and '74, at the request
13 of the city of New Smyrna Beach, applicant made a proposal
14 for the lease or purchase of the New Smyrna Beach electric
15 system." In 1965, was New Smyrna Beach a customer of FPL?

16 A I don't know.

17 Q Do you know whether in planning the Turkey Point
18 units New Smyrna was included in the load forecast?

19 A I don't know.

20 Q It also goes on to say: "City of Vero Beach, in
21 1974, at the request of the city of Vero Beach, applicant
22 offered to conduct study of possible purchase of the city's

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BRT 1 electrical system." Is it correct that subsequently FPL
2 offered to acquire the Vero Beach system, is that correct?
3 In 1976 you offered to acquire the system?

4 A Yes.

5 Q Was Vero Beach a customer of FPL's at the time of
6 the Turkey Point planning?

7 A I don't know.

8 Q Was Vero Beach a customer of FPL's at the time of
9 the planning for either the St. Lucie 1 or St. Lucie 2
10 units?

11 A I don't know that.

12 Q Do you know where Vero Beach -- service to Vero
13 Beach was contemplated in the load forecast underlying the
14 decision to commit to either of the nuclear units?

15 A I don't know that.

16 (Discussion off the record.)

17 (Gardner Exhibit 34 identified.)

18 MR. GUTTMAN: I would like to identify as Gardner
19 Exhibit number 34 a series of pages which were initially
20 obtained from Florida Power & Light in the Vero Beach
21 discovery, and I assume, reproduced in this discovery.

22 The numbers, I think from the Vero Beach discovery,
consecutively 251017 to 251029 -- 1030, 251030. They appear

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1 to be, I believe, three distinct documents which are
2 related.

3 One entitled Clewiston, RHF, which is a cover page, 1966,
4 which is accompanied by general background pages.

5 The next is a cover sheet, "Discussion of FPL Purchase
6 Offer for the City of Clewiston Electric System."

7 And the final is a document, cover sheet followed by
8 pages, titled, "Continued Ownership by City of Clewiston
9 Versus Sale FPL Company."

10 Have you seen this sequence of documents previously,
11 Mr. Gardner?

12 THE WITNESS: I don't think so.

13 BY MR. GUTTMAN:

14 Q Do you know whether FPL was serving Clewiston in
15 -- at the time of the Turkey Point -- decision to commit to
16 Turkey Point?

17 A I think I know.

18 Q If you can, what was the --

19 A I believe we were serving Clewiston indirectly by
20 means of Glades Co-op.

21 Q If you look at the second page of this series, the
22 document states, "The city of Clewiston purchases its power

1 from the U.S. Sugar Corporation which supplies part of the
2 power from its own generating facilities and buys the
3 remainder from Glades."

4 Is that a correct statement of the situation at about
5 that time?

6 A To the best of my knowledge, it is. I don't know
7 anything about the relative quantities as of that time.

8 Q Right. But in general, that was it. Now, the RHF
9 on the cover, did you know, at the time, any RHF in the
10 company?

11 A RHF are probably the initials of R. H. Fite,
12 F-i-t-e.

13 Q Now, on the page marked 251029 under the "Sale to
14 Florida Power & Light Company Advantages," number 2 is:

15 "Our Clewiston customers will participate in any future
16 savings in the cost of electricity resulting from the large
17 scale development of conventional nuclear power plants."

18 This is in the context of a sale to Florida Power &
19 Light Company. Was the full Clewiston load included in the
20 load forecasts to which the Turkey Point commitments were --

21 A I don't know about the full load. I can only
22 assume that whatever load they were getting from the Glades

1 Co-op would have been included, since we were serving that
2 co-op as one of our customers.

3 Q Do you know -- but you do not know about the full
4 load? Full requirements?

5 A As I say, I don't know what proportion is being
6 served by the Sugar Corporation. Usually that served only a
7 part of the year, when they are grinding cane. So, chances
8 are the full load was being served by -- the full load, as
9 it would occur, say, in the summer, was probably being
10 served by the co-op and indirectly by FPL.

11 Q Now, at paragraph 17 of the affidavit you state
12 that "It is apparent that FPL did not in 1976 or thereafter
13 have any excess capacity on our system available for
14 permanent transfer to any other utility."

15 When did FPL file with the Federal Power Commission a
16 request to acquire the Vero Beach electric system?

17 A I think in 1975, if I'm not mistaken.

18 Q Did FPL pursue that request after 1976? In 1976
19 and thereafter?

20 MR. BOUKNIGHT: I simply object to the form that
21 you somehow implied that there's some relationship between
22 this sentence and the question you are asking.

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BY MR. GUTTMAN:

Q Did FPL serve -- has FPL ever served Vero Beach on any permanent basis?

A Yes.

Q What has it provided it with?

A We serve them wholesale power now.

Q Vero Beach you serve wholesale power to?

A Yes.

Q Starting when?

A Sometime in 1980, I believe.

Q Is that a permanent, potentially permanent commitment of power?

MR. BOUKNIGHT: I object to that. That's a question of law concerning the tariff obligations of the company --

MR. GUTTMAN: Let me rephrase it.

BY MR. GUTTMAN:

Q For purposes of planning, putting aside any legal obligations and so forth, does the company assume that Vero Beach will continue to take power at the rate, at least the rate that it's taking it currently under the wholesale tariff?

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337

1 A I have got to apologize for just not being
2 familiar with the way in which municipal loads are being
3 handled in our current forecast methodology. I just don't
4 know.

5 Q Do you know how they were handled on the prior, in
6 earlier forecast methodologies?

7 A I don't know how they were handled in earlier
8 forecasts. And I regret to say that I should know, but I
9 don't.

10 (Gardner Exhibit 35 identified.)

11 MR. GUTTMAN: This is another document obtained
12 from the company, apparently both in the Vero Beach and the
13 current discovery. It bears Vero Beach document markings
14 270210 through 270219. I think this may be the way it was
15 delivered or may be the way it was copied, but it appears to
16 be a "KRB, 10/16/67" on the top right-hand corner, and it's
17 a series of two or three typed sentences a page.

18 Excuse me, on page 3, you can see clearly page 3 is
19 KRB. It appears these pages were prepared by KRB.

20 Do you know who KRB might be in the company? Is there a
21 KRB?

22 THE WITNESS: I don't know who KRB is.

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BY MR. GUTTMAN:

Q Is there a Ken Buchanan in the company?

A Yes, he's KSB.

Q He's KSB. Have you seen this document before?

A No, I haven't.

Q You generally, in paragraph 17 and other places, suggest that the costs of future units are going to relatively increase relative to prior costs. Is FPL involved in spending money for research on generation, nuclear generation and so forth?

A Yes.

Q Is it true that you spend a good deal of money -- contribute money along with others to the Electric Power Research Institute?

A Yes.

Q Do you expect that this research may result in, among other things, the reduced costs -- reductions in cost or cost savings relating to nuclear power?

A If you mean reduced costs over what they are now, no. We might produce some form of generation which might not go up as much as we currently project some forms of generation to go up.

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(Gardner Exhibit 36 identified.)

MR. GUTTMAN: I would like to mark as Gardner Exhibit 36, an EPRI effectiveness report dated November 23, 1978. Attached to this is a July 1, 1978 FPL evaluation of the EPRI research and development program.

Did you receive a copy of this report? I do not see on the distribution list that you received this.

THE WITNESS: I don't recall having seen it.

(Discussion off the record.)

BY MR. GUTTMAN:

Q Looking at paragraph 16 of your affidavit, prior to the time at which this affidavit was filed with the court, what documents had you reviewed in relation to that first sentence?

A I reviewed the letters that were transmitted to the company in 1976.

Q Which letters? The two letters that were included? One from Key West and one from Homestead in the package that you gave to us?

A Yes.

Q In 1976 or prior to 1976, did the company receive any other letters from any of Plaintiff cities which

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1 indicated an interest in acquiring a share of FPL's
2 operating --

3 A I had not been made aware of that.

4 Q Did you seek to --

5 A The Plaintiffs -- from the Plaintiffs in the case.

6 Q Did you undertake to determine whether any such
7 letters existed?

8 A Yes, I did.

9 Q What did you do?

10 A I asked counsel to inform me what their knowledge
11 was about their indications of interest were on the part of
12 Plaintiffs in the case prior to that time.

13 Q Did they inform you in writing or orally?

14 A Orally.

15 Q Were counsel -- when you say counsel, do you mean
16 specifically Covington & Burling and/or Lowenstein, Newman,
17 Reis, Axlerad, Toll? Let me clarify that.

18 Were counsel whom you asked themselves FPL officials who
19 were recipients of the letters? Or involved in FPL's
20 dealings with the utilities, municipal utilities in Florida,
21 in the period 1955 through '76?

22 A Counsel of record in this case.

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SS 627

1 Q Did you ask any other FPL officials past or
2 present whether any such documents existed?

3 A I had had conversations with Mr. Danese on this
4 subject. But this was prior to the preparation of the
5 affidavit. And I, to the best of my recollection, he
6 indicated to me that this is the first time that -- or the
7 first, the only letters we had received from Plaintiffs and
8 I had asked counsel to verify that.

9 MR. RUPP: Dan, did you mean to use the date 1955
10 through --

11 MR. GUTTMAN: Well, the gist of the question, what
12 I was trying to get at, was, did you talk to the people who
13 were assisting you in preparing the case but weren't running
14 the company back at the time these things happened?

15 I can rephrase the question.

16 MR. RUPP: I don't think it makes any difference.

17 MR. GUTTMAN: I don't think it makes any
18 difference in the context.

19 MR. BOUKNIGHT: It may be of some help to you that
20 the counsel whom he's referring to are the same people who
21 supervised the search of the company's files in response to
22 a request of yours which ask for all documents of that

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1 sort. So, that's where counsel became involved in it.

2 MR. GUTTMAN: Fine, it wasn't as if counsel were
3 sitting there in the company's offices for the last 20
4 years waiting for these documents to arrive.

5 MR. BOUKNIGHT: No, counsel was there for a number
6 of months copiously digging out these documents that had
7 arrived over the last 20 years.

8 BY MR. GUTTMAN:

9 Q Is it true that Mr. Danese joined FPL in 1974-75;
10 is that true?

11 A In that general time frame.

12 Q If a city, including the Plaintiffs, wanted to
13 write a letter seeking nuclear power or any other type of
14 generation in the period prior to 1976, would they have
15 likely written to you or to someone else?

16 A Probably wouldn't have written to me. In 1976 I
17 believe the letters were written to Mr. Danese. They could
18 have written to anybody that they knew of.

19 Q Did you discuss this sentence, the first sentence
20 in paragraph 16, with Mr. Mulholland?

21 A No.

22 Q Did you discuss it with Mr. Fuqua?

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1 A No.

2 Q Mr. Willis Irwin?

3 A No.

4 Q With Mr. Fite?

5 A No.

6 Q With Mr. Page?

7 A No.

8 Q We have just covered the area of written
9 requests. Is it your testimony that there were no oral
10 indications of interest from any of the Plaintiff cities in
11 the period prior to 1976?

12 A I don't think so.

13 Q And what is the basis for that statement?

14 A I was primarily considering written requests being
15 requests that we really would be -- that would be indicative
16 of a serious intent to participate.

17 Q Do you know whether there were any oral?

18 A No, I don't.

19 MR. BOUKNIGHT: I didn't hear that question, I'm
20 sorry, could you read it back to me?

21 (The reporter read the record as requested.)

22

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BY MR. GUTTMAN:

Q What about Mr. Al Zinni, Z-i-n-n-i, did you discuss?

A No.

Q With a Yontz? Y-o-n-t-z? I'm sorry, is there a Mr. Yontz?

A Yontz, Y-o-n-t-z? No, I didn't talk --

Q I must be confusing my companies.

Now, when you prepared the affidavit, did you ask counsel -- as I understand it, counsel helped you determine whether there were written requests; is that correct?

A Yes.

Q Did you ask counsel to determine whether there were any oral requests that the company knew of?

A No, I did not.

Q Did you ask anybody else to make that determination?

A No.

Q Do you know whether counsel examined -- do you know what the universe of documents examined by counsel was?

MR. BOUKNIGHT: Well, I will give you an answer to that.

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MR. GUTTMAN: Yes?

MR. BOUKNIGHT: Again, as I thought I tried to make clear. What Mr. Gardner asked, knowing that you had sent us a document request covering this subject, is, I asked if our search of the company's files had revealed any documents of this sort.

BY MR. GUTTMAN:

Q This morning, of course, you put in a little addendum to that sentence, if you recall. How did it come about that you have modified or revised -- what's the correct word?

A I, in looking at the sentence again later, I remembered that there had been an earlier offer of participation to Homestead and New Smyrna Beach as a result of license conditions that were agreed upon with the Department of Justice and the NRC in the 1973-'74 time frame. 1974. And I thought maybe a typographical error had been made in leaving out that, in that sentence --

Q Is it your testimony that --

A And the language that I have clarifies what the situation was.

Q Now, to clarify that, is it your testimony that

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Florida Power & Light went out and offered -- that is, did any of these cities, did New Smyrna Beach or Homestead actively come to you and say "We are interested," or is it simply a case of Florida Power & Light going out and saying: "If you want this, hey, here it is"?

A It's my understanding that the sequence of events was that the Department of Justice and/or the NRC wrote to all of the electric systems in Florida about the pending antitrust review of St. Lucia Number 2 and asked for expressions of interest. It received letters from counsel on behalf of Homestead and New Smyrna Beach which I was told were somewhat equivocal expressions of interest.

Q These are letters from --

A The Justice Department asked in these energy negotiations, asked FPL to extend participation to those systems which had responded to their written requests. And that was, among others, New Smyrna Beach and Homestead.

When that condition was agreed upon, FPL did extend offers of participation and received responses from Homestead and New Smyrna Beach of some kind of interest.

Q Which was when?

A Well, it would have been sometime after --

1 somewhere in 1974, I believe.

2 Q But not before 1974?

3 A I can't be sure of the dates. I'm speculating
4 about 1974.

5 MR. GUTTMAN: Let me offer as Gardner Exhibit 37 a
6 document obtained from Florida Power & Light in discovery
7 dated November 13, 1974, from the Utilities Commission of
8 New Smyrna Beach, John Kelly, director, to Ralph
9 G. Mulholland, group vice president, FPL.

10 (Gardner Exhibit 37 identified.)

11 BY MR. GUTTMAN:

12 Q Have you seen this document before, Mr. Gardner?

13 A I don't recall if I have seen the document. I was
14 told that there was a reply from New Smyrna Beach.

15 Q A reply? A reply to what?

16 A Offer of participation -- FPL's offer of
17 participation in St. Lucie Unit 2.

18 MR. GUTTMAN: I would like to show you, as Gardner
19 Exhibit Number 38, a document, December 2, 1973, from Tracy
20 Danese -- from Tracy Danese to Walter Baldwin, director of
21 utilities, Fort Pierce.

22 MR. BOUKNIGHT: Mr. Guttman, I object to any

1 questions based on this document. Fort Pierce is not a
2 statement based on in this case. Mr. Gardner's statement is
3 based on Plaintiffs in this case.

4 MR. GUTTMAN: Excuse me, are you telling me I
5 can't question on a document relating to Jacksonville or
6 Orlando? I'm not sure.

7 MR. BOUKNIGHT: I'm telling you that the scope of
8 this deposition is Mr. Gardner's affidavit. Perhaps I have
9 been anticipating a little too quickly in this instance. I
10 have been, I think, too patient in the past. Go ahead and
11 ask your question, but we are not going to ask questions
12 about people that are not encompassed in this sentence --
13 number 16, the one you read a moment ago when you said your
14 questions would pertain to that.

15 MR. GUTTMAN: We would save a lot of time --

16 MR. BOUKNIGHT: If we are talking about wasting
17 time when you go fumbling through documents --

18 MR. GUTTMAN: Why don't I just go ahead?

19 MR. BOUKNIGHT: Why don't you do so?

20 BY MR. GUTTMAN:

21 Q The letter, third paragraph, first sentence,
22 refers to FPL's offer for participation in two particular

1 cities, each of which indicated interest in participation as
2 early as 1973. Have you ever discussed that sentence with
3 Mr. Danese?

4 A I believe that I have discussed the general
5 subject matter. Whether that exact sentence, I don't know.

6 Q Which cities are being referred to as those having
7 expressed interest as early as 1973?

8 A To the best of my knowledge, the two cities
9 involved are New Smyrna and Homestead.

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1 Q Now, I would like to show you as Gardner
2 Exhibit No. 39 a -- two pages copied in the Vero Beach
3 discovery, apparently, as well as in this discovery.
4 FPL interoffice correspondence, Willis Irwin to Clark Cook,
5 re: City of Homestead.

6 (Gardner Exhibit No. 39 identified.)

7 MR. GUTTMAN: "Purchase portion of St. Lucie Unit,"
8 stating, "Enclosed is a copy from Sonny Peters requesting a
9 meeting with our officials to discuss purchasing a portion of
10 our nuclear generating unit at St. Lucie."

11
12 BY MR. GUTTMAN:

13 Q Have you ever seen these two documents before?

14 A Not to my knowledge.

15 Q Were these among the type of documents that you
16 would have asked counsel to identify for you, insofar as
17 they may have existed?

18 A I would believe so.

19 Q Now, I have got a one-page document, which I
20 must confess, was as blurry in the original as it was in the
21 copies. We received this from the company in this case as
22 discovery. It's a kind of chart-like document which I would

1 like identified as Gardner Exhibit No. 40, dated August,
2 1973. And, as best as I can tell, the heading is --
3 and Mr. Gardner who may be familiar can correct me if I'm
4 incorrect -- "Situation analysis assessment." And it's
5 got a list of concerns and one of the concerns is
6 identified -- under list of concerns is, "Agreement to Permit
7 Homestead to connect a transmission system; No. 2 is
8 an agreement for interchange contract; No. 3 is agreement
9 for firm base load."

10 Have you ever seen a document like this --
11 this document, or one like this, Mr. Gardner?

12 A. No, I can't read it, really.

13 (Gardner Exhibit No. 40 identified.)

14 BY MR. GUTTMAN:

15 Q Do you know whether Homestead was involved in
16 requesting firm base load power from Florida Power & Light
17 in or about August, 1973?

18 MR. BOUKNIGHT: Objection, again, Mr. Guttman,
19 that has nothing to do with this affidavit. If you think
20 it does, please tell me what.

21 MR. GUTTMAN: Nuclear power is a form of firm base
22 power, Mr. --

1 THE WITNESS: No, it ain't.

2 MR. GUTTMAN: I would like to request a clearer
3 copy of this document of counsel.

4 (Discussion of the record.)

5 MR. GUTTMAN: I would like to show Mr. Gardner
6 a document which I believe we received from company
7 files. I think we did, yes. From Lake Worth Utilities
8 Authority, dated April 3, 1975, to Mr. Tracy Danese, from
9 C. C. Blaisdell.

10 (Gardner Exhibit No. 41 identified.)

11 BY MR. GUTTMAN:

12 Q Have you ever seen this document before, Mr.
13 Gardner?

14 A I don't think so. It does not appear to be the
15 type I would have asked attorneys to find.

16 MR. GUTTMAN: I would like to show the witness
17 and identify as Gardner Exhibit 42 a document obtained from
18 the company, headed on the right "REA 5-27-69, City Homestead
19 File," which appears to be a typed printing of an article in
20 the Miami Herald, South Dade Section, May 27, 1969. "Homestead
21 to seek power plant ideas."

22 (Gardner Exhibit No. 42 identified.)

1 BY MR. GUTTMAN:

2 Q Have you seen this document before?

3 A No, I haven't.

4 Q Do you know whether Homestead discussed -- if
5 you note the paragraph, the second from the bottom, notes,
6 -"One of the points the City will want studied by an
7 engineering firm is the purchase of atomic power at cost from
8 a private utility."

9 Did you ever discuss with anyone to see whether
10 Homestead had communicated with FPL at this time relating
11 to possibly buying from one of their units, nuclear units?

12 A I think I indicated that I had not particularly
13 requested verbal conversations and had asked counsel to
14 indicate to me written inquiries. This does not appear
15 to be a written inquiry of interest.

16 (Gardner Exhibit No. 43 identified.)

17 BY MR. GUTTMAN:

18 Q I show you Gardner Exhibit 43, which was again
19 obtained, I contend, from a FPL discovery. It's three
20 pages, handwritten notes, titled, "Interchange-Interconnection-
21 Wholesale." It's dated 8-27-73, WMK being the initials under
22 that. Do you know who "WMK" is, Mr. Gardner?



1 A I think that's W. M. Klein.

2 Q And what was he doing with the company during
3 that period, 1973?

4 A I think Mr. Klein was vice-president of the Miami
5 area and he was substituting for Mr. Autrey during that
6 period for some reason.

7 Q What was the function that Mr. Autrey had been
8 performing?

9 A Mr. Autrey was executive vice-president at that
10 time.

11 Q Have you seen this document before?

12 A Not to my knowledge.

13 Q Now, down on that first page it says, "Gainesville"
14 as the next to the last item. And it says, you can correct
15 me if I'm not deciphering this adequately, but it says
16 "Meeting arranged in MI" -- which I assume is Miami --
17 "September 5."

18 MR. RUPP: From where are you reading?

19 MR. GUTTMAN: First page.

20 BY MR. GUTTMAN:

21 Q In that section, it's noted that Gainesville
22 wants to know our -- and then a D; "Share generation, i.e., we

1 commit portion of the plant, they do same on their
2 next generator (leap frog)." Do you know anything about
3 Gainesville's interest at that time?

4 MR. BOUKNIGHT: Interest in what?

5 MR. GUTTMAN: I'm asking, do you know anything
6 about the words I'm quoting there?

7 MR. BOUKNIGHT: I object to that on the basis
8 Mr. Gardner told you he's never seen this document before.
9 I don't know if you can ask him to tell you what Mr. Klein
10 must have meant.

11 BY MR. GUTTMAN:

12 Q Do you know whether Gainesville in 1973
13 met with FPL to discuss potential sharing of units or
14 coordination of units?

15 A I don't know. I've never heard of such a
16 meeting.

17 MR. GUTTMAN: I would like to identify as Gardner
18 Exhibit 44 four pages, again, obtained from the company.
19 The first page, from R. G. Mulholland, memo pad, to
20 L. Bivens, dated November 18, '75, with a notation,
21 "Gainesville G-5" on the right. The second page, FPL
22 stationery 1975, a letter to -- from E. L. Bivens to

1 R. L. Hester, and the next two pages, which are obliterated
2 in the case of the first page -- but this is the way we
3 received it, are a letter from R. L. Hester of Gainesville
4 to E. L. Bivens, dated October 28, 1975.

5 (Gardner Exhibit No. 44 identified.)

6 BY MR. GUTTMAN:

7 Q Have you ever seen these documents before,
8 Mr. Gardner?

9 A The wording is obscured, but I don't think
10 I have. I don't recall having seen these. It does not
11 appear to be dealing with nuclear power.

12 Q Did you ever discuss with Mr. Bivens or Mr.
13 Mulholland anything relating to any of their discussions
14 with Gainesville during the 1975 period about possible
15 joint planning or coordinated --

16 A I don't recall that I did.

17 (Gardner Exhibit-No. 45 identified.)

18 BY MR. GUTTMAN:

19 Q I show you as Gardner Exhibit 45, a one-page
20 document which is a clipping from the Orlando Centennial,
21 12-20-66, obtained from the company in discovery.

22 Have you ever seen this clipping?

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1 A. No.

2 Q. Can you just take a look at it and tell me
3 if you were aware of any of the events as reported there?

4 A. I'm afraid I didn't go to the meetings of the
5 FMUA a lot of times.

6 Q. Do you know whether Florida Power & Light was
7 aware -- well, strike that question.

8 Mr. Gardner, I'm going to show you examples of
9 a series of documents which we received in this discovery
10 from Florida Power & Light Company.

11 MR. BOUKNIGHT: Would you read that back? I didn't
12 think I heard it correctly.

13 MR. GUTTMAN: I'm going to show him examples of
14 a series of documents --

15 MR. BOUKNIGHT: I thought that's what I heard.

16 MR. GUTTMAN: Let the record reflect that counsel
17 and the witness burst into uproarious laughter for reasons
18 that I don't understand. Perhaps I'm not that bright.

19 MR. DYM: Let the record so reflect.

20 MR. BOUKNIGHT: I think perhaps the reader will
21 be a little quicker on the uptake. Now, I take it these
22 five paper writings are to compose one exhibit. Are we

1 to staple these together?

2 MR. GUTTMAN: You may, if you wish.

3 (Discussion off the record.)

4 (Gardner Exhibit No. 46 identified.)

5 MR. RUPP: Before you ask any questions about
6 this document, will you explain to me how this document
7 relates in any way to any statement in Bob Gardner's
8 affidavit?

9 MR. GUTTMAN: Well, after I get the voir dire --

10 MR. RUPP: The problem is, we are ranging so
11 far afield with these things. This one, as with several of
12 the others to which we haven't bothered to object, we
13 continue to have document after document that can't conceivably
14 relate to the purpose of this affidavit. If you could
15 explain to us in what respect this document could relate --
16 we are looking at this document which is the document that's
17 marked. Are you looking at something else?

18 MR. GUTTMAN: I've arranged them in a different
19 order, but it's the same series.

20 MR. RUPP: This is Gardner Exhibit No. 46.
21 Let's talk about Gardner Exhibit 46.

22 MR. GUTTMAN: Now, as I understand it, as we

1 received it and tried to decipher it, Florida Power & Light
2 appeared to have somebody in New Smyrna Beach serving as the
3 company's eyes and ears keeping watch what they are doing.
4 That's why I want to voir dire on the series. But my question
5 is one of these documents states that Little is proposing a
6 500-megawatt plant --

7 MR. RUPP: I'm talking about Gardner Exhibit 46.
8 Am I missing something here?

9 MR. GUTTMAN: It's right there.

10 MR. RUPP: What are all of these pages? Why do
11 we have all of those pages?

12 MR. GUTTMAN: You have all of those pages because
13 I frankly cannot tell by myself what the source was, and
14 I thought Mr. Gardner might be aided if he saw a series.

15 MR. RUPP: Is it your suggestion that all of these
16 documents are somehow related?

17 MR. GUTTMAN: It appears from my analysis of the
18 discovery that there are dozens and perhaps hundreds of
19 reports filed by someone for the company relating to
20 New Smyrna Beach.

21 MR. RUPP: Even if that's true, the answer is,
22 so what?. How does it relate to the purpose of this

1 deposition? You're going to have an opportunity at some
2 point in the not-so-distant future to ask a series of
3 questions of Mr. Gardner. This deposition relates to
4 the affidavit.

5 MR. GUTTMAN: Exactly. My question, John -- the
6 questions we are asking are related to what New Smyrna
7 Beach, or any other Plaintiff City discussed with Florida
8 Power & Light about nuclear power in the period prior to 1976.
9 I want to know what Mr. Gardner knows about an evidence
10 of New Smyrna Beach's interest here.

11 MR. RUPP: At a minimum, the document which you
12 are pointing to, which I have not seen and which so far as I
13 can tell is not marked as Gardner Exhibit 46, I can't find
14 the word "nuclear power" in this entire series of
15 documents.

16 BY MR. GUTTMAN:

17 Q Sir, the copy you have in front of you, does
18 the first sentence on the first page say, "Little is
19 proposing a 500-megawatt atomic plant to supply all municipal
20 plants in an emergency or peak load"?

21 MR. BOUKNIGHT: It does, indeed. I share his
22 concern about what does this expression -- you're not

1 suggesting that Mr. Little's 500-megawatt plant is either
2 Turkey Point 3 and 4 or St. Lucie 1 and 2, are you?

3 MR. GUTTMAN: What I'm suggesting is that there's
4 ample documentation that -- when Mr. Gardner prepared his
5 affidavit, did he find out, go interview, or did his counsel
6 go interview those who were clearly, at that time, familiar
7 with the Cities' interest to find out what kind of
8 communications there were?

9 MR. BOUKNIGHT: You asked him thoroughly. You
10 asked him who he talked to, and he told you he didn't talk
11 to anyone other than his lawyers and Mr. Danese. You
12 took the names of 20 company people, and you got him to say
13 no to each of those. He said Mr. Danese was the only one
14 he talked to.

15 And my question is, why do we have to go through
16 this example of a series of documents? In order to
17 reestablish that that's all Mr. Gardner talked to?

18 MR. GUTTMAN: Because we also want to establish,
19 probably not from your side, but certainly from ours, that
20 there were ample pieces of evidence that indeed there were
21 discussions or knowledge or communications of Cities'
22 expression of interest in nuclear plants to FPL.

1 MR. BOUKNIGHT: Of FPL nuclear plants?

2 MR. GUTTMAN: Of plants that hadn't been conceived
3 yet in the case of St. Lucie 2, of potential St. Lucie plants.

4 MR. BOUKNIGHT: Please tell me what on any of
5 these pieces of paper has anything to do with any FPL
6 nuclear plant, which is what Mr. Gardner's affidavit is
7 about.

8 MR. GUTTMAN: Let me ask Mr. Gardner a narrowing
9 question --

10 BY MR. GUTTMAN:

11 Q Do you know, or do you purport to testify about
12 discussions or communications related to nuclear plants
13 or potential nuclear plants in general? Or simply the Turkey
14 Point and the St. Lucie plants?

15 MR. BOUKNIGHT: Mr. Guttman, I object to that.
16 Mr. Gardner may testify to a number of things before this
17 proceeding is over. There's nothing in his affidavit --
18 if you're asking if there's anything in his affidavit,
19 then --

20 MR. GUTTMAN: That's what I mean. In his affidavit.
21 Excuse me.

22

BY MR. GUTTMAN:

Q In your affidavit, Mr. Gardner, when you ask your lawyers and Mr. Danese to help you out in this, did you say: "Please tell me if Cities ever expressed an interest in nuclear power to us"?

Or, "Please tell me if they expressed an interest in Turkey Point and St. Lucie"?

MR. SOUKNIGHT: Are we talking about the first sentence in paragraph 16?

MR. GUTTMAN: Yes.

THE WITNESS: The only thing I said in this affidavit was that, "Neither Tallahassee nor any other Plaintiff in this litigation indicated to FPL any interest whatever in acquiring a share of FPL's operating nuclear plant or of St. Lucie Number 2 until 1976."

That's the language I described. I'm only talking about interest in Turkey Point 3 and 4, St. Lucie 1, and St. Lucie 2.

MR. GUTTMAN: I would like to mark --

THE WITNESS: which are the only nuclear plants the company has.

MR. GUTTMAN: I would like to mark as Gardner --

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MR. RUPP: Withdrawing these?

MR. GUTTMAN: No.

MR. RUPP: Why? What are they?

BY MR. GUTTMAN:

Q Do you know what they are?

A No.

Q Have you seen them?

A No.

MR. RUPP: What basis do you have for marking those in the deposition?

MR. GUTTMAN: I request the company provide us with a means of identifying them.

MR. DYM: You will have an opportunity to do that when you take their depositions.

MR. RUPP: What purpose does it show cluttering up this deposition with document after document which the man testifies he has never seen?

MR. GUTTMAN: I wish counsel for the company to stop referring to the exhibits as clutter when from our view, there's clearly a certain amount of evidence from the affidavits. Let's not get into an argument about clutter.

I will withdraw that and not make it an exhibit.

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1 MR. SUPP: Number 45 is being withdrawn; is that
2 right?

3 MR. GUTTMAN: Yes.

4 (Gardner Exhibit 45 withdrawn.)

5 MR. GUTTMAN: I would like to identify as Exhibit
6 46 a 1-page document again obtained from FPL's files,
7 handwritten memoranda, on lined notebook paper, dated
8 Thursday, October 13, 1973, Division Managers' Meeting.

9 Underneath Ben Fuqua, and then there are a series of
10 notations. This is an example of a document I would request
11 we get a clearer copy of.

12 (Gardner Exhibit 46 identified.)

13 BY MR. GUTTMAN:

14 Q Have you seen this document before, Mr. Gardner?

15 A I can't really read it, but I don't think so.

16 Q We've discussed Mr. Fuqua before. Is it correct
17 that at the period this document was dated, October 13,
18 1973, he was involved in the company's consideration of the
19 antitrust review of the St. Lucie 2 plant?

20 A Yes.

21 Q Now, if you look down to the second -- have you
22 discussed -- if you look down to the second sentence, or

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1 fragment of a sentence from the bottom you'll note it says,
2 and again if I'm reading it incorrectly, please correct me.

3 "Cities want to share ownership and wheeling, et cetera."

4 Is that an agreeable reading to you?

5 MR. BOUKNIGHT: Do you mean by that does he share
6 your view that that's what the letters add up to?

7 MR. GUTTMAN: If you were a calligrapher, would
8 you dispute --

9 THE WITNESS: It appears to be what the memo
10 says. I don't know what it means.

11 BY MR. GUTTMAN:

12 Q You don't know what it means. Have you ever had
13 cause -- is Mr. Fuqua still with the company?

14 A No.

15 Q When did he leave the company?

16 A Best guess is around '74 or '75.

17 MR. BOUKNIGHT: Fuqua?

18 BY MR. GUTTMAN:

19 Q Have you, in the preparation for -- have you
20 discussed with Mr. Fuqua -- I guess not. I'll withdraw the
21 question. I would just like to request a clean copy of this
22 document. And if there is -- I would also like to know

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1 whether this is an isolated page or if it comes from a
2 series of volumes or whatever.

3 (Gardner Exhibit 47 identified.)

4 MR. GUTTMAN: I would like to offer as Gardner
5 Exhibit 47 a document obtained from the company, the cover
6 sheet is "Edison Electric Institute," and it says, "To
7 Policy Committee on Atomic Power, September 16, 1968.

8 "Gentlemen, the attached may be of interest to you"; from
9 John Kearney, secretary of the Policy Committee. And
10 attached are remarks by John Anderson, member, Joint
11 Committee on Atomic Energy.

12 BY MR. GUTTMAN:

13 Q Have you reviewed this document?

14 A I have never seen it.

15 Q You have never seen it. The Policy Committee on
16 Atomic Power, on the cover page, it refers to Mister, down
17 there, R. H. Fite. Do you recollect whether the R. H. Fite
18 there is likely to be the R. H. Fite that was employed by
19 Florida Power & Light Company?

20 Is it fair to assume that Mr. Fite was a member of the
21 Policy Committee on Atomic Power of EEI?

22 A Yes.

Q Okay. Have you discussed with Mr. Fite the

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1 position taken by FPL through EEI in relation to access to
2 nuclear units by smaller systems?

3 A No.

4 MR. BOUKNIGHT: There are a lot of assumptions in
5 that question.

6 MR. GUTTMAN: The question has been answered.
7 What can I say?

8 MR. BOUKNIGHT: What I can say is I object to the
9 form of the question in that it assumes facts not in
10 evidence.

11 BY MR. GUTTMAN:

12 Q Now, is --

13 MR. RUPP: Is this document marked as an exhibit?

14 MR. GUTTMAN: Yes.

15 MR. RUPP: What's the purpose of this document?
16 I've now skimmed it and it appears to me to be a speech by
17 the Honorable John B. Anderson, a member of the Joint
18 Committee on Atomic Energy, which apparently among others,
19 Mr. R. H. Fite received a copy?

20 MR. GUTTMAN: That's right.

21 MR. RUPP: We are sitting here hour after hour.
22 How does this relate to Mr. Gardner's affidavit?

1 MR. GUTTMAN: If you looked at page 3, second and
2 third paragraph --

3 MR. RUPP: Not necessarily given before Mr. Fite
4 or anyone else.

5 MR. GUTTMAN: Transmitted to Mr. Fite. He read
6 the speech. He presumably read the speech or maybe he
7 didn't.

8 MR. RUPP: Who knows? He's not the preparer of
9 this affidavit nor the Deponent.

10 MR. GUTTMAN: Mr. Rupp, I'm really getting a
11 little bit upset. You have a deponent who can't remember
12 anything about the period he's testifying about, and you are
13 accusing us for putting in documents about which he knows
14 nothing and saying that's our problem.

15 He's testifying about the planning of nuclear power from
16 the '65 to '75 period, and here is a Central Policy
17 Committee, Atomic Power, and if you look at what the
18 document says it makes clear that the industry, of which FPL
19 was a part, the Edison Electric Institute, was generally
20 aware that smaller utilities throughout the country, as
21 Mr. Anderson records -- or that there was a group, a general
22 impression -- maybe not everybody held it, but the industry

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1 knew -- that smaller systems wanted in, and bigger systems
2 didn't necessarily want them.

3 MR. RUPP: You are suggesting, the temerity of
4 suggesting here, taking our time with the suggestion that
5 Mr. John Anderson's speech, a member of the Joint Committee
6 on Atomic Energy, of a general nature, a copy of which was
7 sent apparently to Mr. R. H. Fite, is contrary to the
8 assertion in Mr. Gardner's affidavit that neither
9 Tallahassee nor any of the Plaintiff Cities in this
10 litigation indicated to FPL and so on?

11 MR. GUTTMAN: Mr. Rupp, I think we have already
12 contradicted his assertion, we are going beyond that.

13 MR. RUPP: Not only haven't you contradicted his
14 assertions, this doesn't go to it in any way.

15 MR. GUTTMAN: As you wish. We can get through if
16 we don't proceed to argue.

17 MR. RUPP: Well, unless rather soon we get to
18 something that relates to the affidavit, it seems to me we
19 are at an end.

20 BY MR. GUTTMAN:

21 Q Mr. Gardner, has FPL ever volunteered any
22 Plaintiff's willingness to share ownership in a nuclear

1 unit?

2 A I think I said earlier that it was my
3 understanding that FPL offered participation to New Smyrna
4 Beach and Homestead. FPL has entered into a settlement with
5 the Department of Justice whereby we will undertake to
6 offer, and would offer if your client would stop opposing
7 that -- shares in St. Lucie 2 to a variety of Cities.

8 MR. RUPP: Were you done?

9 THE WITNESS: Yes.

10 BY MR. GUTTMAN:

11 Q Are you saying that in the case of the St. Lucie 2
12 participation, it was FPL's voluntary offer? Or was there
13 an offer made because the terms of the license condition
14 required it?

15 A The settlement was voluntarily entered into.

16 Q Was FPL --

17 MR. GUTTMAN: I would like to mark as Gardner
18 Exhibit 43 a document dated December 19, 1975. From
19 Mr. Tracy Danese to Mr. Walter Baldwin, 3-a-l-d-w-i-n.

20 (Gardner Exhibit 43 identified.)

21 BY MR. GUTTMAN:

22 Q Have you ever seen that document before?

1 A I think I have. But I don't have a clear
2 recollection of it.

3 Q At page 2 at the top, Mr. Danese states to
4 Mr. Baldwin, "You have requested the names of systems which
5 are invited but elected not to participate. Your letter
6 implies FPL affirmatively invited participation. That is
7 not the case." It goes on.

8 Do you have any reason to disagree with what Mr. Danese
9 has said there?

10 MR. BOUKNIGHT: Objection. Again, what in the
11 world has this got to do with Mr. Gardner's affidavit?

12 MR. GUTTMAN: Mr. Gardner is testifying that -- he
13 just testified that nobody asked. We offered. And it's
14 clear that --

15 MR. BOUKNIGHT: Do you have any doubt that in fact
16 FPL, in 1974, did offer participation to the cities of
17 Homestead and New Smyrna Beach?

18 MR. GUTTMAN: I have a doubt that it was done
19 voluntarily.

20 MR. BOUKNIGHT: You just asked Mr. Gardner that
21 question. He just answered it for you. Now, you are
22 talking about the city of Fort Pierce.

MR. GUTTMAN: I'm showing him a document, and I'm asking him -- well, I'll ask you, Mr. Gardner.

BY MR. GUTTMAN:

Q Is that correct? Is Mr. Danese correct in the first two sentences on page 2 of his letter?

A I have no reason to believe that the whole situation that Mr. Danese describes in that paragraph in his letter is not correct.

I think it's probably improper to single out a single sentence.

Q Has FPL ever offered to share a nuclear unit with another utility in order to enable that utility to serve its customers?

MR. RUPP: Whose customers?

MR. GUTTMAN: The other utility's customers. To help another utility along as well as FPL's.

MR. BOUKNIGHT: I object to the form. I can't understand it. If he can, he can answer.

THE WITNESS: I can't.

BY MR. GUTTMAN:

Q Mr. Gardner, as I understand it, is your affidavit stating that when FPL built nuclear, it built nuclear to

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1 serve the needs of its customers; is that correct?

2 A Yes.

3 Q Has FPL ever offered to help -- to share in a
4 nuclear plant in order to serve the needs of some other
5 utility's customers?

6 A I don't really understand your question, but I
7 would assume that any utility to whom we have offered
8 participation is going to use that participation to serve
9 its own customers.

10 I would assume that's the objective of any participation.

11 (Gardner Exhibit 49 identified.)

12 MR. GUTTMAN: I would like to identify as Gardner
13 Exhibit Number 49, eight pages of document obtained from the
14 company in discovery. The first, and they are in
15 chronological order, is a July 11, 1966 document on the
16 letterhead of Armour & Company, to McGregor Smith, signed
17 "Billy."

18 The second is a letter of July 11, 1966 from Billy, who
19 is apparently the chairman of the board of Armour Company,
20 to McGregor Smith, one a 1-page attachment.

21 The third is a September 13, 1966 letter from
22 M. E. Lewis, Armour & Company, to Mr. Smith.

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1 The fourth is a September 16, 1966 letter from Mr. Smith
2 to Mr. Lewis.

3 The fifth is a September 19, 1966 letter from
4 Mr. W. C. MacInnes of Tampa Electric, to Mr. Smith.

5 And the final one is a September 16, 1966 letter from
6 Mr. Smith to Mr. MacInnes.

7 BY MR. GUTTMAN:

8 Q Have you seen these documents before?

9 A I think I have seen some of them. I'm not sure I
10 have seen them all.

11 Q When? On what occasion?

12 MR. BOUKNIGHT: Objection. Are you prepared to
13 tell us what this relates to in Mr. Gardner's affidavit?

14 MR. GUTTMAN: Yes, third from the last document,
15 September 16, '66 --

16 MR. RUPP: That's the last one in my set. Am I
17 missing documents?

18 MR. BOUKNIGHT: There are two of that date.
19 Third page from the end. What's on there that --

20 MR. GUTTMAN: As I understand it, that document
21 and the context, indicates that Florida Power & Light was
22 willing to invest in a joint plant and the context, you'll
see from other documents, refers to it as a nuclear plant

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1 with Tampa Electric, in order to serve -- enable Tampa to
2 serve potential Tampa customers.

3 MR. BOUKNIGHT: What does that relate to in the
4 affidavit?

5 MR. GUTTMAN: He's talking about nuclear planning
6 --

7 MR. BOUKNIGHT: Just show me in the affidavit.
8 I'm not trying to be argumentative with you.

9 MR. GUTTMAN: He testifies that the company builds
10 its nuclear units to serve its own customers. My question
11 is: did it ever -- is this an indication that it was
12 willing to engage in a nuclear venture?

13 MR. BOUKNIGHT: Mr. Gardner has put in his
14 affidavit that FPL built the four nuclear plants at issue in
15 this proceeding to serve its own customers. Is that -- is
16 that for your relevance for this piece of paper?

17 BY MR. GUTTMAN:

18 Q Is that a policy, Mr. Gardner, that pertained
19 solely to these four plants, or was that FPL's policy in
20 general with regard to all of its plants?

21 A I don't know what you mean by "policy." I am
22 talking about the four nuclear plants, in my affidavit, were

1 built to serve our customers. And that's all I said in that
2 affidavit.

3 The company has no policy one way or the other.

4 (Recess.)
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03 17 01
1 BY MR. GUTTMAN:

2 Q Looking now at the last paragraph of your
3 affidavit, Mr. Gardner, paragraph number 18, has FPL
4 or yourself ever studied the cost to Tallahassee, the cost
5 of purchasing into any nuclear plant outside the State of
6 Florida?

7 A Not studied, per se.

8 Q Not studied, per se.

9 What consideration was given to it?

10 A Well, I think, for example, on the Votgle units,
11 we have information as to the cost of those units. And I
12 would assume that the cost would be the same to
13 Tallahassee. We had information relating to what some of
14 them would be or would have been.

15 Q To anticipate, as I understand then, FPL has
16 considered the cost to FPL of purchasing the Votgle unit,
17 and you are suggesting that that would be similar in the
18 case of Tallahassee; is that correct?

19 A Yes.

20 (Gardner Exhibit 50 identified.)

21 BY MR. GUTTMAN:

22 Q I show you, Mr. Gardner, Exhibit No. 50, a

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1 two-page document which came from FPL in this case. Page 1
2 appears to be a record of a -- excuse me -- a telephone memo
3 reporting a call from Mr. Grady Baker to Mr. Bivens. And
4 the second page is a one-page, June 15, 1978 letter from
5 Mr. Bivens of FPL to Mr. Baker, a Senior Vice President of
6 Georgia Power Company.

7 Take a look at it, and tell me if you recall the letter
8 or the general subjects discussed.

9 A Yes. I recall the general subject matter of the
10 letter.

11 Q As I understand it, if FPL were to buy into
12 Votgle, it would be necessary to build another relatively
13 substantial transmission system, 500 kv transmission system;
14 is that correct?

15 A Transmission would be necessary. And Mr. Bivens
16 indicated that he made a cursory examination and thought
17 that a 500 kv line would be necessary.

18 Q In the utility business, is a 500 kv line a
19 smaller -- is it a less or more costly transmission line
20 compared to others, in terms of size?

21 MR. RUPP: Which others?
22

BERT

1 BY MR. GUTTMAN:

2 Q Does Florida Power & Light currently have any
3 500 kv lines on its system?

4 A Yes, it does.

5 Q What percentage of FPL's transmission is 500 kv?

6 A I don't know. It's a very hard question to
7 answer.

8 Q Is -- did you say that Mr. Bivens examination was
9 cursory -- did the FPL perform any more detailed
10 examinations of the cost of transmissions if Votgle --

11 A Yes, we subsequently have under construction two
12 500 kv lines to Georgia Power Company.

13 (Gardner Exhibit 51 identified.)

14 BY MR. GUTTMAN:

15 Q I would like to show you another document from the
16 company files, which I would like to mark as Gardner 51, a
17 memorandum from the FPL files to Mr. E. A. Adomat, Finance
18 Department; Ray Votgle, Nuclear Plant; dated October 10,
19 1979.

20 Have you seen this or a similar analysis, Mr. Gardner?

21 A I believe so.

22 Q At Exhibit 1 -- go a little in there, you'll see

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1 Exhibit 1. There you have got, as I understand it, some
2 cost estimates for Votgle 1 and 2; is that correct? On the
3 top of the page, initialed by J.Y.?

4 A Yes.

5 Q Yes.

6 A J.Y. -- Josefina Yespika. She is a Columbian.

7 Q Is she in the Finance Department?

8 A Yes.

9 Q There it indicates 700, in Votgle 1 and 2, when
10 you combine 700 megawatts of FPL interest; is that correct?
11 That's right, 700 megawatts? You are assuming 700 megawatts
12 a purchase in that?

13 A The assumptions of this particular study indicate
14 that they compared the economics of 700 megawatts of
15 Martin 3; 350 megawatts of Votgle Unit 1, and 350 megawatts
16 of Votgle 2.

17 Q Where is Martin 3? Is that a FPL plant?

18 A Martin Unit 3 is a proposed FPL coal plant.

19 Q And where would that be located?

20 A At the Martin plant.

21 Q And is that in the State of Florida?

22 A Yes, it is.

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1 Q And is there a county that it's in, to be more
2 particular?

3 A It's in Martin County.

4 Q As I understand it, the transmission to get into
5 the Vogtle plant would cost \$237 per kilowatt; is that
6 correct?

7 A That was the assumption in this study.

8 Q Do you know what the -- as I understand, reading
9 this, there would be no additional transmission cost for
10 that Martin 3 unit, according to this?

11 A That was the assumption of this study.

12 Q Now, you referred to, before, the Florida
13 Coordinating Group, which is a group you are familiar with.

14 A Yes.

15 Q Is it correct that Tallahassee, along with Florida
16 Power & Light and many other utilities in this state, are
17 members of the Florida Coordinating Group?

18 A Yes.

19 Q And is it true that that group generally prepares
20 plans to submit to the state or other agencies relating to
21 the operations of the Peninsular Florida Grid?

22 A Yes.

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1 Q Do those plans include -- let me ask you -- let me
2 show you -- could you describe, as you understand it, the
3 term "Peninsular Florida Grid"?

4 MR. BOUKNIGHT: Mr. Guttman, what is the relevance
5 of this?

6 MR. GUTTMAN: Well, the relevance is the cost of
7 buying a unit in another state and the cost of buying it in
8 Florida is an apples and oranges comparison.

9 MR. BOUKNIGHT: Mr. Gardner hasn't made that
10 comparison.

11 BY MR. GUTTMAN:

12 Q Is it your affidavit's purport that a purchase by
13 Tallahassee of nuclear power from any unit outside of the
14 State of Florida would be as economic as a purchase of
15 nuclear capacity from a unit within Florida?

16 A I haven't made any such comparison in this
17 affidavit. It might well be that a purchase of nuclear
18 power could be considerably cheaper to Tallahassee.

19 Q Do you have any basis for that statement?

20 A Yes.

21 Q Which is?

22 A It's a statement on the part of Tallahassee's

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1 Director of Utilities that the recent transmission line that
2 they built to Georgia would pay for itself in less than one
3 year.

4 Q And who built it? Tallahassee built it?

5 A Tallahassee built it.

6 Q Do you know what is being carried over that line?

7 MR. BOUKNIGHT: Over what line?

8 BY MR. GUTTMAN:

9 Q The line you just referred to.

10 A Electric power.

11 Q Firm power?

12 A It's whatever power Tallahassee has arranged or
13 purchased from the other company.

14 Q Do you know whether the planning studies provide
15 for the transmission of firm power over that line for a
16 duration of a year from --

17 A The line, if it's a 240 kv transmission line --
18 it's designed to anything like utility standards, it would
19 transmit firm power.

20 Q Is it in the context of the Florida Grid System?
21 Assume that that line will continually provide firm power
22 from --

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1 A I believe it is, to the extent it's been studied.

2 MR. GUTTMAN: Let me identify Gardner Exhibit

3 No. 52.

4 (Gardner Exhibit 52 identified.)

5 BY MR. GUTTMAN:

6 Q Do you recall having previously viewed this?

7 A No. I don't recall having seen this document.

8 Q Well, it was one that I believe, as stated on
9 cost, very -- this is a May 11, 1978 transmittal from
10 L. C. Oakes of the Oak Ridge National Laboratory to the
11 Director of the Division of Operating Reactors of the NRC.
12 And it's -- we received it from FPL. It's a supplement to
13 transmission system discussions, FPL, May 16, 1977.

14 I want to read you a sentence or two, and ask you if this
15 comports with your understanding of the way the world was at
16 the time that this was produced, at least; which was in
17 1977.

18 Page 7, the first full sentence states: "Peninsular
19 Florida will in most instances momentarily separate itself
20 from the United States Transmission Grid whenever the
21 Florida to Georgia transfer capability is less than the
22 megawatt loading on a generating unit that is tripped
off-line.

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03 17 00
Appendix G shows the times that the Peninsular Florida has electrically isolated itself upon the loss of a large FPL nuclear unit, he had notes, "22 times from February 20, 1974, to April 3, 1977."

Is that first sentence -- does that comport with your understanding --

A The first sentence is not understandable to me, and it doesn't jibe with my understanding.

(Gardner Exhibit 53 Identified.)

BY MR. GUTTMAN:

Q I would like to show you, as Gardner Exhibit 53, a document that came from the company. It's a report from the Florida Operating Committee, dated October 1970; Report of a Stability Study for 1971 and 1973.

The material I provided as an exhibit goes up to page 7 of the document. The rest is here for your examination if you wish. I did not want to burden the record with the rest of it.

Have you familiarity with this report or this type of report by the Florida Operating Committee?

A I believe I saw that report at the time. I can't have those specific details right --

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1 Q Is it correct, to the best of your recollection?
2 Do you have any reason to believe that it's not an accurate
3 study by the people who did it?

4 MR. RUPP: Do you have something specific?

5 BY MR. GUTTMAN:

6 Q Could you look at page 5, look at conclusions of
7 that and tell me if you have any reason to call those
8 conclusions into question?

9 MR. BOUKNIGHT: I object. There's nothing in this
10 affidavit where Mr. Gardner said anything about
11 transmissions. The last paragraph is a straightforward
12 statement of where certain nuclear power plants are located,
13 as you can find; and that's all it does.

14 BY MR. GUTTMAN:

15 Q Mr. Gardner, maybe this will be the end along this
16 particular line, which is maybe three or four questions.
17 But is your affidavit in that last paragraph simply stating
18 that as a potential, from the standpoint of particular
19 knowledge, Tallahassee may potentially have access to a
20 series of nuclear units out of Florida? Or are you
21 suggesting that, in fact, these units would indeed be
22 beneficial investments for Tallahassee?

1 MR. BOUKNIGHT: Again, I have the same objection,
2 Mr. Guttman. The affidavit has to speak for itself. What
3 counsel may suggest is another matter, but if you look at
4 the affidavit, it doesn't say anything like that.

5 MR. GUTTMAN: Like what?

6 MR. BOUKNIGHT: Like what you just said. It's
7 just a matter of you and I sitting here reading it. It
8 simply says where these power plants are.

9 BY MR. GUTTMAN:

10 Q That's all you are trying to do, Mr. Gardner, is
11 state the location of power plants; is that correct?

12 A That's all the affidavit states. I should add
13 that I feel, as a technical matter, there's no reason why
14 Tallahassee cannot obtain access. There's no physical or
15 technical reason that I know of that Tallahassee could not
16 obtain access to those plants.

17 Q Have you studied Tallahassee's situation?

18 A Not in detail. I'm basing that on a general
19 understanding that Tallahassee is interconnected with the
20 southern system by its own transmission line that it built
21 itself. And by interconnection with the southern system, by
22 transmission, it would have access to, through the southern

1 system transmission and other transmission systems, to those
2 plants.

3 Q As I understand it --

4 A I don't want to leave the impression that
5 Tallahassee must depend on existing transmission lines or
6 other transmission lines, or transmission lines in 1970. It
7 has been able to build its own transmission lines at any
8 time.

9 Q I have a final series of short questions.

10 Is the City of Jacksonville Beach a wholesale customer,
11 eligible under the wholesale tariff for wholesale power from
12 Florida Power & Light.

13 A FPL has made arrangements to sell wholesale power
14 to Jacksonville Beach.

15 Q Would FPL -- would Tallahassee be eligible for
16 wholesale power under the current tariff?

17 MR. BOUKNIGHT: Objection. Mr. Guttman, why are
18 we going through this?

19 MR. GUTTMAN: I'm trying to pin down the
20 geographic rationale involved in any measures of distances
21 here.

22

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1 BY MR. GUTTMAN:

2 Q Is Tallahassee eligible for wholesale power?

3 A No.

4 Q How far, or how close, do you know, is the
5 Jacksonville Beach system from the Turkey Point units or the
6 St. Lucie units?

7 A I think about, to the best of my knowledge, it's
8 around 50 feet.

9 Q Could you explain that?

10 MR. BOUKNIGHT: I think you misunderstood the
11 question.

12 THE WITNESS: How close is the Jacksonville Beach
13 to FPL?

14 MR. GUTTMAN: To the Turkey Point or St. Lucie.
15 I was wondering about that -- corporate merger overnight --

16 THE WITNESS: I would say about 300 miles.

17 BY MR. GUTTMAN:

18 Q Is it fair to state, without getting out our maps,
19 that Tallahassee is within 300 miles of FPL's retail service
20 territory?

21 A Yes. I would think so.

22 Q Has Florida Power & Light offered Jacksonville

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1 Beach access to St. Lucie 2?

2 A Not yet. The settlement --

3 Q Well, assuming that the settlement that FPL is
4 proposing -- it's contained in a settlement proposal
5 currently outstanding; is that correct?

6 A Yes.

7 MR. GUTTMAN: I think that finishes.

8 I would like to thank you, Mr. Gardner.

9 I would like to -- in the course of the deposition there
10 were references to a number of documents which may or may
11 not have been in existence. I would want to go back in the
12 transcript and talk with your counsel and see if he could
13 arrange to clear up, you know, in a cooperative fashion,
14 whether documents could be located or it could be determined
15 that they did or did not exist.

16 THE WITNESS: You can talk with my counsel any
17 time.

18 MR. GUTTMAN: And yourself?

19 THE WITNESS: Any time you want to.

20 MR. GUTTMAN: Thank you very much.

21

22

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DWBRT

EXAMINATION

BY MR. RUPP:

Q I have very few questions for you.

In the course of the deposition today, Mr. Gardner, Mr. Guttman has shown you a series of documents and, on occasion, you have mentioned that you had not seen the document or don't recall today having seen the document previously. On the basis of all of the documents you have reviewed today, including those that you had not seen previously, do you want now to alter in any respect the affidavit on which you have been examined with the — which was amended earlier this morning, to correct an oversight?

A No.

Q Prior to the decision that was made by FPL with respect to each of its four nuclear plants, three operating plants, as well as the plant under construction, did any of the Plaintiff Cities communicate to FPL any interest in the plants? That is, prior to the time the decision was communicated to FPL to construct the nuclear plants, was any interest communicated to FPL to build those plants?

MR. GUTTMAN: Are you saying prior to the time FPL knew such plants were going to exist? Did anybody ask

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2 BWSRT

1 for them or --

2 BY MR. RUPP:

3 Q Let me try again. Is it true that there was a
4 point in time at which FPL decided to construct each of its
5 four nuclear generating plants?

6 A Yes.

7 Q Prior to those four times, did any of the Plaintiff
8 Cities request, make a request of FPL to participate in any
9 of the plants for which the decision was being made?

10 A No.

11 MR. GUTTMAN: I don't quite understand. I'll do
12 it on -- go ahead.

13 MR. RUPP: Just so it's quite clear, I think I
14 understand what your problem is.

15 BY MR. RUPP:

16 Q Prior to the time FPL made a decision to construct
17 the Turkey Point 3 nuclear units, did any nuclear plant --
18 did any of the Plaintiff Cities request to FPL an
19 opportunity to participate in that unit?

20 A No.

21 Q Would the same be true of Turkey Point 4 nuclear
22 unit?

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1 A The same would be true.

2 Q Would the same also be true of the St. Lucie 1
3 nuclear unit?

4 A The same would be true.

5 Q And finally, prior to the time FPL made a decision
6 to construct St. Lucie Unit No. 2, did any of the
7 Plaintiff Cities request an opportunity to participate in
8 that unit?

9 A They did not.

10 Q Now given your position in Florida Power & Light,
11 would you in the normal course of your duties have been
12 aware of any such request to participate, had such a request
13 been made?

14 A I believe I would have.

15 MR. GUTTMAN: I really object. Mr. Gardner has
16 gone through extensive length explaining in great detail the
17 ins and outs of that.

18 MR. RUPP: Your objection is duly noted.

19 MR. GUTTMAN: Okay. Go ahead.

20 BY MR. RUPP:

21 Q Let me ask you to look again at what has been
22 marked for identification as Gardner Exhibit No. 39.

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3 DWBRT

1 A Yes.

2 Q Prior to the time of the correspondence that has
3 been so marked, did FPL offer to the City of Homestead
4 opportunity to participate in St. Lucie Unit No. 2?

5 A Yes. My affidavit states that in the material
6 that I corrected this morning.

7 Q Mr. Gardner, you stated in response to a question
8 that Mr Guttman asked earlier in the day, that at least one
9 of the vendors that made a proposal to FPL on what became
10 Turkey Point 3, I believe, units of two sizes -- that is,
11 made alternative proposals with respect to size, one larger
12 than the other; is that correct?

13 A Yes.

14 Q And did you also testify that FPL decided
15 ultimately to choose the smaller of those two?

16 A Yes.

17 Q Why did FPL make that decision?

18 A There are two basic reasons. One was that the
19 size in the 700 to 800 megawatt range corresponded more
20 closely to our estimated annual growth, and secondly, our
21 technical people felt that the three-loop plant, in the 700
22 to 800 megawatt size, represented a prudent

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1 extrapolation from plants that were then in operation.
2 Whereas the 1000 megawatt size was too great an application,
3 in our judgment, to be considered.

4 MR. RUPP: Thank you.

5 Mr. Guttman, that is all I have.

6 EXAMINATION

7 BY MR. GUTTMAN:

8 Q Mr. Gardner, did you intend any of the responses
9 you have just given to Mr. Rupp to in any way amend, modify,
10 alter, change any of the answers regarding your knowledge of
11 events and your responsibility for dealings with utilities
12 in the 1955-1980 period?

13 A No.

14 Q Mr. Gardner, earlier we mentioned that you had
15 reviewed the Cities' response to FPL's interrogatory
16 requests. Document requests in this proceeding. Do you
17 recall?

18 Well, as I understand it, you did review Cities'
19 responses to FPL's initial interrogatories; is that correct?

20 A I don't think I did.

21 Q Oh, you have not. Let me ask you, Mr. Gardner,
22 those responses identify numerous documents relating to, or

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1 consisting of communications between Plaintiffs and FPL in
2 the period 1955-1972, as well as later.

3 Would we expect to see you as a party who participated in
4 those communications, either by being the recipient of a
5 communication or being part of a meeting?

6 MR. BOUKNIGHT: Objection, that is just hopelessly
7 broad and vague.

8 MR. GUTTMAN: Well, I'm responding to Mr. Rupp's
9 hopelessly broad and vague attempt to rehabilitate
10 Mr. Gardner by saying he knows everything, when he said he
11 didn't know anything.

12 MR. BOUKNIGHT: He didn't need rehabilitation. A
13 few simple questions were asked of Mr. Gardner. If you
14 could calm yourself a bit —

15 BY MR. GUTTMAN:

16 Q When did you first become aware of the Homestead
17 1974 letter to Mr. Irwin that is an exhibit here?

18 A I was aware throughout the period 1973 and 1974
19 that Homestead and New Smyrna Beach were being considered
20 for participation in that unit. And I knew
21 contemporaneously therewith that participation had been
22 offered to Homestead and New Smyrna Beach, and I knew about

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1 the general time period that they had indicated interest in
2 participation.

3 Q When did you become aware of that letter?

4 A I became aware of that particular letter this
5 morning. But I became aware of the event of their interest
6 in participation, contemporaneously or very close thereto.
7 I became aware of it through conversations with people in
8 FPL, namely, Mr. Danese and Mr. Fuqua.

9 Q We discussed earlier a possible meeting in 1973
10 between Gainesville and FPL. Other than discussion today,
11 were you aware of the possibility of such a meeting?

12 A I was not aware of the possibility of that
13 meeting. To my knowledge, Gainesville has never requested
14 participation in the nuclear units. And I feel that I would
15 have known had Gainesville expressed such interest in
16 participation. And I would have known that, even though I
17 didn't know of a particular meeting that had been held
18 between Gainesville and FPL.

19 Q Let me ask you, if -- is it your testimony that if
20 a utility had expressed interest in one of the St. Lucie
21 plants, you would have known about it?

22 A I would have known about an expression of

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1 interest in genuine or legitimate participation in a
2 plant --

3 Q Ft. Pierce --

4 A -- I believe.

5 Q Did Ft. Pierce ever express interest in St. Lucie
6 or any of the operating nuclear units prior to 1974?

7 A (No response.)

8 Q Excuse me? What's the answer?

9 MR. BOUKNIGHT: The witness is pausing and
10 thinking. He'll answer the question.

11 MR. RUPP: Would you read the question for me?
12 I'm afraid I missed it.

13 (The reporter read the record as requested.)

14 THE WITNESS: Ft. Pierce expressed interest in the
15 St. Lucie plant sometime prior to 1976. I couldn't say
16 exactly when.

17 BY MR. GUTTMAN:

18 Q Did it express interest prior to 1974?

19 A I can spot it as prior to 1976. I think they
20 expressed interest sometime in '75, and perhaps they
21 expressed interest earlier.

22

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1 Q Would you have known if they expressed interest in
2 1970?

3 A If that interest was an interest conveyed in
4 writing on generally what is felt to be a legitimate,
5 genuine expression of interest, I would have. There was a
6 meeting in 1970 between Ft. Pierce and FPL, where the
7 subject was mentioned on our side of the table. It wasn't
8 mentioned on Ft. Pierce's side of the table. So I —

9 Q And what about in 1972 or '73?

10 A I don't know about '72 or '73.

11 (Gardner Exhibit 54 identified.)

12 BY MR. GUTTMAN:

13 Q I've got here as a document which I would like to
14 identify as Gardner No. 53 from Florida Power & Light, "Memo
15 to File," "E. G. B" is the initials at the top, dated
16 10-9-73. I would like you to examine the document and tell
17 me if you have ever seen it before.

18 A What is your question?

19 Q Have you seen that document before?

20 A I don't recall that I have. It doesn't seem to
21 purport to discuss municipal interest in nuclear power — in
22 one of our nuclear plants.

3 CWSRT

1 Q Do you see down there at the city of Ft. Pierce,
2 the next to the last, it says, "Mr. Sanders and Mr. Zinni
3 have an appointment with the head of the Utility Board with
4 a request that we reserve them some power from St. Lucie 2."

5 Do you see that?

6 A Yes.

7 Q Who was Mr. Sanders and who was Mr. Zinni?

8 A Mr. Zinni was the district manager of our
9 St. Lucie office. Mr. Sanders was in the Commercial
10 Department of West Palm Beach.

11 Q Mr. Gardner —

12 MR. RUPP: Excuse me, I don't think he's completed
13 his answer.

14 MR. GUTTMAN: Sorry.

15 THE WITNESS: I would not regard that request as a
16 kind of a request of interest that we would treat with
17 sufficient seriousness to be of the type that would come to
18 my attention.

19 BY MR. GUTTMAN:

20 Q Do you know anything about the substance of that
21 request?

22 A Other than what's there, I don't. I don't think

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1 there was any formal request on the part of Ft. Pierce.

2 Q Is it your testimony, then, that there may be
3 requests that you do not know about, but that did not come
4 to your attention?

5 MR. BOUKNIGHT: I object to the form, in that the
6 word "requests" is a loaded word.

7 BY MR. GUTTMAN:

8 Q The word in the Florida Power & Light memoranda.
9 It's characterized by the memoranda as a request. Would all
10 such requests have come to your attention? Or is it your
11 testimony that here is a request that didn't come to my
12 attention?

13 A First of all, I didn't know what kind of request
14 it was; whether it was merely an expression of interest in
15 obtaining information, interest in discussing. But whether
16 Ft. Pierce wrote to FPL, to Mr. Danese, requesting.
17 expressing an interest in St. Lucie, I became aware of that
18 request.

19 Q So there may be oral -- let me ask you. Are you
20 stating that you are aware of all written requests for
21 nuclear power in the St. Lucie units?

22 A I believe that I was aware of all of the requests

POWERT

1 of --- which were believed to be of sufficient seriousness to
2 be ---

3 Q When you say "believe" ---

4 MR. RUPP: Would you wait a minute?

5 MR. GUTTMAN: I apologize.

6 THE WITNESS: Which were believed to be legitimate
7 interest in participation.

8 BY MR. GUTTMAN:

9 Q Who makes that determination?

10 A Well, I think that the determination would be one
11 just made generally by people in FPL, who deal with this
12 kind of problem. If a request came in, it was considered to
13 be a genuine or a significant request for participation, it
14 would have been generally known in the company, and I would
15 know about it, under those circumstances, if it happened
16 contemporaneous to the time when the units were being
17 committed.

18 Q You say contemporaneous to the time. Let me ask
19 you: when were the Turkey Point units --- you say units
20 committed? What date was that?

21 A Well, we discussed earlier that the contracts were
22 made effective in November 15, 1965.

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1 Q And when you say "contemporaneous units
2 committed," you were meaning in that case, November of 1965?

3 A In that general area, yes.

4 Q What date were those units publicly announced?

5 A On November 15, 1965. Or very close thereto.

6 Q And if I ask you in the case of St. Lucie units,
7 what dates were the units committed to in St. Lucie?

8 A I believe in November of 1967.

9 Q Both of them?

10 A Yes.

11 Q What date --

12 A Well, St. Lucie Unit No. 1.

13 Q And St. Lucie Unit No. 2?

14 A In 1972.

15 Q What dates were the -- was the public, at large
16 made aware of the St. Lucie Unit No. 1 commitment?

17 A I would have -- as of the time we made the
18 commitment, which would have been November 1967. To the
19 best of my reaction.

20 Q Well, was it generally known before November 1965,
21 that you were preparing a Turkey Point unit?

22 A There was a considerable amount of publicity in

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1 the papers concerning FPL's interest in nuclear power at
2 Turkey Point prior to November of 1965.

3 Q When? How much prior?

4 A Throughout the summer of 1965.

5 Q You mean in -- prior, you mean a couple months
6 prior?

7 A Several months prior.

8 Q Does it take any study to determine?

9 Would a small system have to make any studies to
10 determine whether they could make a commitment to you? Do
11 you think that would be necessary?

12 A I would think that a system would not have to make
13 a great deal of study to express interest in participation.
14 I may have to make a study at sometime. Certainly, such a
15 study wouldn't take more than a couple of months.

16 Q You referred in the final series -- Mr. Rupp asked
17 you about the planning, economics, economies of scale --

18 MR. RUPP: Excuse me?

19 MR. GUTTMAN: Economies of scale consideration.

20 MR. RUPP: I don't think Mr. Gardner talked about
21 economies of scale. That's a word you used earlier, but I
22 don't think you heard it from Mr. Gardner.

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1 MR. GUTTMAN: I apologize. I thought I was
2 expediting things by synopsisizing. I don't think the Judge
3 is going to rule on my characterization, off the record, as
4 the testimony of the witness.

5 BY MR. GUTTMAN:

6 Q You talked of the choice of unit sizes. Was
7 FPL -- did FPL have any study that showed that the unit cost
8 of a larger unit would be cheaper? If the larger one
9 selected could be cheaper than the one selected?

10 A We probably had comparison costs between the
11 different sizes. I don't know what they showed. I can't
12 remember at this point. But we would have -- I think we
13 would have had the cost of the larger size, and we could at
14 least indicate what the dollars per kilowatt, or megawatt,
15 were.

16 Q Are those documents -- when you say you had the
17 cost and when you were answering Mr. Rupp's question, were
18 you referring to written materials?

19 A They were the same materials that I think I
20 answered questions about previously in the deposition.

21 Q Fine. If FPL -- do you know whether the unit
22 costs -- did FPL commission any studies which showed that

1 the unit costs per kw of a larger unit would be lower than
2 the --

3 A It wouldn't take a study. It would be a simple
4 matter of looking at the vendor's quotation and dividing it
5 by the size.

6 Q Well, did FPL have any calculations --

7 A I'm not sure that we did. But the information on
8 the cost was there. We had the size of the unit. Somebody
9 may well have divided the two numbers and compared it with a
10 similar division in the case of a smaller unit. I can't
11 remember specifically whether that was done or not.

12 Q Do you have any -- if the unit cost of the larger
13 unit were less than the unit cost -- and large unit, I mean
14 one larger than the Turkey Point unit -- were less than the
15 unit cost of a smaller unit, would that normally be a strong
16 factor in your consideration?

17 A It would be a factor. It would not be the only
18 one.

19 MR. GUTTMAN: Thank you very much. No more
20 questions. Thank you all.

21 (Whereupon, at 6:02 p.m. the taking of the
22 deposition was concluded.)

23 -----
24 Robert J. Gardner

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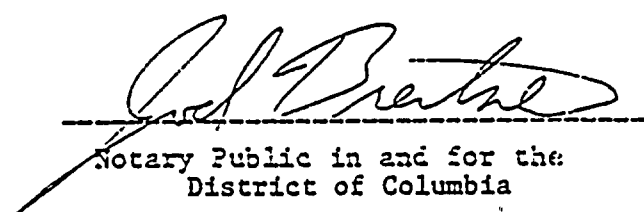
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I, Joel Breitner, the officer before whom

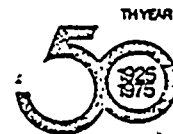
the foregoing deposition was taken, do hereby certify that the witness whose testimony appears in the foregoing deposition was duly sworn by me; that the testimony of said witness was taken in shorthand and thereafter reduced to typewriting by me or under my direction; that said deposition is a true record of the testimony given by said witness; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this deposition was taken; and, further, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of the action.


Notary Public in and for the
District of Columbia

My commission expires

15 August 1985

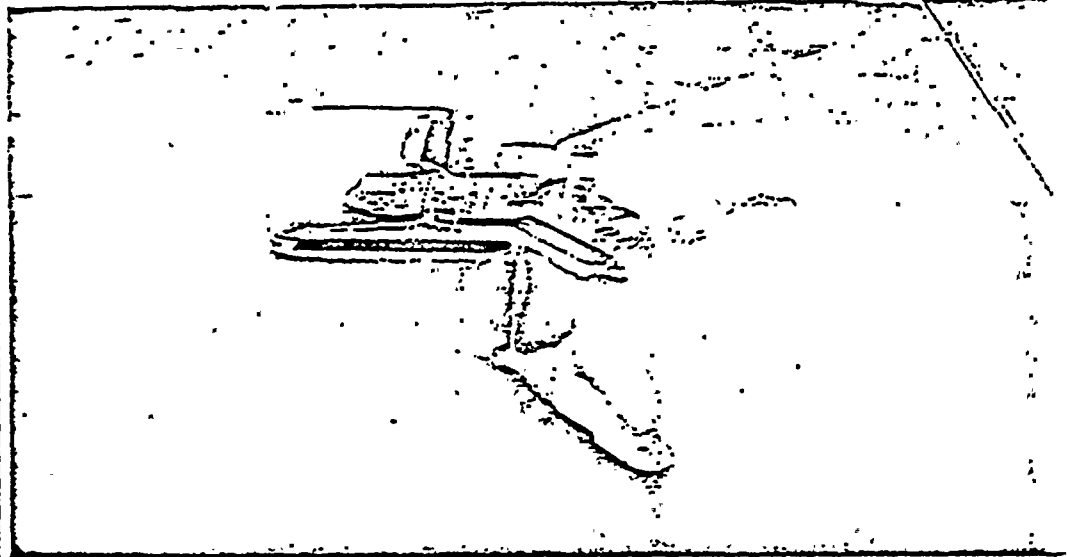
APPENDIX B



A HALF CENTURY
OF PEOPLE SERVING PEOPLE

A HISTORY OF
FLORIDA POWER & LIGHT COMPANY

FOURTH OF FOUR PARTS



In 1963, Turkey Point was a mangrove wilderness of 1,500 acres into which FPL had built one road in order to begin construction of two fossil units. A blunted point of sandy land, protruding into Biscayne Bay and shaped like a Turkey's neck, gave the South Dade area its name.

So the decision was made to find a new and isolated site in South Florida. Selected after careful and prolonged investigation was Turkey Point, a mangrove wilderness 24 air miles south of Miami.

It was here FPL and its management would be sorely tested in the next eight years.

The story of nuclear power in Florida is interlinked with the history of Turkey Point, where—in 1964—the company began planning a large power plant with four generating units. Units 1 and 2 were to be fueled with oil, and units 3 and 4 would be nuclear.

FPL had been considering nuclear power for many years.

Just after World War II, Congress transferred control of the U.S. Atomic Energy Program from the Army to the Atomic Energy Commission (AEC), a civilian body. Information was still classified, but in the next few years, study groups of representatives from power companies and other firms were formed to find out if the heat from nuclear fission would be practical for power generation.

The studies were promising.

The way was then opened for Congress to pass the Atomic Energy Act of 1954, which made possible the use by private industry of fissionable materials. Qualified persons, carefully screened, were cleared to study technical information. FPL had 25 employees clear-

ed for this work.

Even prior to 1954, FPL had assigned Vice President George Kinsman to keep an eye on the field of atomic fuel. Kinsman, who retired in 1972, became one of the early utility industry specialists in this field. He traveled the country, viewing the latest in nuclear plant operation.

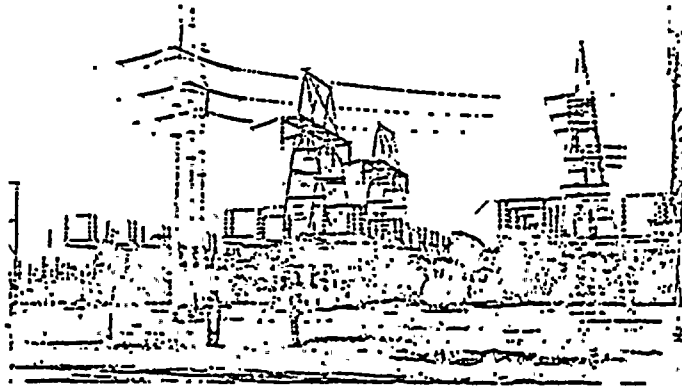
At first, small test reactors were built—"tea kettles," as Kinsman called them. But in 1954, the Duquesne Light Company in Pennsylvania and the AEC began construction of the Shippingport, 60,000 kw nuclear plant in Pittsburgh.

In 1955, three Florida companies—FPL, Tampa Electric and Florida Power Corporation—decided to pool interests and resources to build a nuclear plant, with government help.

The heads of the three utilities went to Washington to talk to Atomic Energy Commission officials and to Dr. Walter Zinn, of the Argonne National Laboratories who had worked out the design of a reactor. The AEC wanted the Florida group to sponsor the building of Zinn's reactor.

Contracts were prepared, details ironed out, and the Florida firms committed to the project. Then the vital question arose, "How much will this cost?"

No one knew for certain. "The Atomic



Florida's interconnected power grid was strengthened in the Sixties with completion of a 66-mile cross-state transmission line built as a joint project of FPL, Tampa Electric and Florida Power. The line linked FPC and TECO facilities on the West Coast with FPL through this substation near Cocoa. Construction required erection of 40 wood pole structures and 234 towers, many of them transported by helicopter. The line helped provide back up service for the sprawling Cape Kennedy complex in Brevard County served by FPL.

Energy Commission would not agree to pick up any excess costs," Kinsman said. "Neither would the Florida firms."

So the proposal died.

But the idea of nuclear-generated power was still very much alive with FPL.

Kinsman kept an eye on the Shippingport project, and watched even more closely a plant built by Commonwealth Edison near Chicago. These two facilities and a half dozen more went into successful operation. In fact, 12 were operating successfully by November, 1965, when McGregor Smith, Florida Power & Light chairman of the board, made the announcement that the company would build "a \$100 million nuclear plant, larger than any in operation, at Turkey Point." The nuclear facilities were to be units 3 and 4 of the complex already under construction at this site.

Turkey Point was an 1,800-acre wilderness of sun-cracked mud flats and mangrove thicket, threaded by a ribbon of river and edged by Biscayne Bay. It included a neck of land with two blunted points, somewhat the shape of a turkey's neck, jutting into the bay. (The name "Turkey Point" came either from this configuration or from the fact that anhingas, or water turkeys, nested on the point.) There were no buildings or roads in this vast tract when it was purchased by FPL.





Turkey Point from its beginning included research areas. Ponds developed by FPL were used by the University of Miami's School of Marine Sciences to study crabs, trout and shrimp. In the Seventies, consideration was being given to commercial harvesting of seafoods at Turkey Point and other FPL sites.

at the rate of 1,200 a week. The recently completed first unit at Turkey Point (which had been brought on line in 1967), and the second unit which went into service in April of 1968, were of tremendous help in meeting the demands for electricity being made on FPL.

But what of the nuclear units planned for Turkey Point and announced by FPL in 1963?

After the announcement, FPL had called for bids. Eventually, the company reached an agreement with Westinghouse Electric for construction of the units and nuclear fuel supply. Other contracts were signed, and the building of the nuclear plant went forward—but the licensing by the Atomic Energy Commission was frustratingly slow.

"They would come up with 150 questions or so that would take months to answer. But we did answer them," remembered Vice President George Kinsman. "Other utilities were also moving ahead with nuclear plant construction, and the AEC kept changing the rules on all of us, making them more complicated. Of course, the AEC was leaning over backward for safety."

Despite delays and frustrations at Turkey Point, on November 20, 1967, FPL had announced plans for another nuclear plant. This one would be called St. Lucia, and would be built on Hutchinson Island south of Fort Pierce, on Florida's mid-East Coast. The plan called for two units of 810,000kw each.

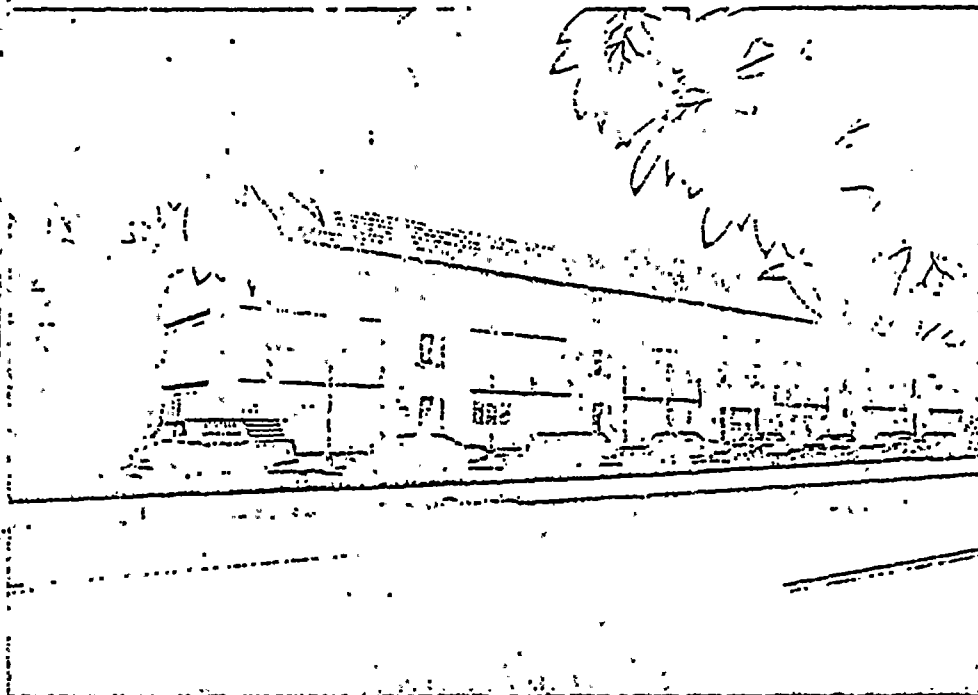
By 1969, however, Florida Power & Light, still basking in the sunshine of public praise for its move to a remote area for construction of the mammoth Turkey Point project, found itself in "hot water."

It resulted from a Dade County ordinance limiting discharges of water into Biscayne Bay to a temperature of 95 degrees. The restriction had been adopted prior to 1967, when a corporation named Sea Dade proposed an oil refinery in the South Dade area. Sea Dade later abandoned the idea, and no one subsequently paid much attention to the ordinance.

But after the two oil-fired units at Turkey Point went into operation in 1967 and 1968, an agency of the federal government decided to take some temperature readings in the Bay. As a result, Dade County cited the company for violation of the ordinance. Hearings on the matter would drag on through 1970.

FPL's solution was to purchase additional land and dig a canal direct from the plant to Card Sound, about five miles to the south, removing all warm water discharge from the Bay. At this point, the federal government again stepped into the picture. In late 1969, the state and federal authorities called for a "Water Quality Conference" in Dade County.

"The federal government started the conference by telling us to stop digging our canal," explained Robert J. Gardner, who represented the company in its involvement with environmental control. "They postulated a



In 1963, FPL added 20 substations around the system—the most in one year in company history. An additional 13 were under construction early in 1969, including this Indian Creek "apartment house" on Miami Beach. The Indian Creek substation is an example of FPL's efforts to make its facilities compatible with their environment.

series of horrors that might result. We refused to stop digging." So, in April of 1970, the U.S. Justice Department filed suit against FPL, alleging violation of the Rivers & Harbors Act.

Among those faced with the growing controversy: new FPL President Richard C. Fullerton.

In August of 1969, Fullerton had been named president and chief executive officer by the Board. Bob Flite was elected Board vice chairman, and Smith remained chairman.

Fullerton's career spanned the company's transition from selling ice to harnessing the atom. He joined FPL in July, 1930, as a clerk in the Coral Gables office. He became president one month after U.S. newspapers announced in six-inch headlines: "MAN WALKS ON THE MOON."

Fullerton was born in Economy, Pennsylvania, and graduated from Cumberland University, Lebanon, Tennessee, with a law degree in 1929. After three years as a clerk in FPL's Coral Gables office, he was transferred to Miami Beach as a chief clerk in 1933. In 1942, he was named Director of Customer Service in Miami, and three years later was also named Assistant Treasurer by the Board of Directors.

In 1950, Fullerton was named a vice president; an executive vice president in 1961. Director in 1964, and in May of 1968, elected general manager.

Though Fullerton shunned the publicity spotlight, he noted in an interview published in the September, 1969, *Sunshine Service News* that of his years with the company, "the best part is people."

"Our basic job stays the same as it was when I started: We're in the service-to-the-public business. Our job always has been to come up with the best possible service at the lowest possible price: It's the 'spirit of the service' idea. We've always needed that, and always will need it. It's what will have each of our customers thinking, 'FPL people go all out. I like to have them working for me.'"

And in his first presidential message to stockholders, Fullerton noted, "We are dedicated to bringing a brighter life to those we are privileged to serve."

But it was not an easy time to concentrate on a brighter life.

In addition to the continuing controversy at Turkey Point, Fullerton and the company were faced in late 1969 with FPL's first strike.

Though the company was confronted with a "wildcat" walkout in the summer of 1959, which lasted less than one week and involved only a partial work stoppage, the 1969 labor dispute was the first major confrontation since the International Brotherhood of Electrical Workers organized a portion of FPL employees in 1943.

Wages were the basic issue in the strike, which would last for 69 days—from October into December.

One result of the strike, due to IBEW picketing, was the stoppage for more than one month of construction activity at the beleaguered Turkey Point site.

Thanks to the Justice Department's filing of the suit against FPL in 1970, tempers were flaring to a much warmer degree than the Turkey Point plant's discharge waters.

McGregor Smith, who had been brought to the company by Electric Bond and Share in 1939 to help soothe the troubled waters caused by the City of Miami-FPL rate controversy (Chapter 3), found himself and Florida Power & Light swimming upstream against mounting—and what was felt to be very undeserved—public misunderstanding and criticism.

"Experts" on warm-water discharge and its possible effects to Biscayne Bay came and went, proving pros and cons. Added to the problem was much ado about a missing patch of turtle grass from the Bay bottom, near the plant site.

The entire matter was bitterly ironic to Smith, Fullerton, Flite and other company officials when viewed in light of Florida Power &



R. C. Fullerton

Light's historically impressive and well documented record of environmental concern.

For instance:

- In 1968, FPL's Turkey Point plant development was prominently portrayed in "From Sea to Shining Sea," a report on the American environment from the President's Council on Recreation and Natural Beauty.

- In 1968, Smith was named Dade County's Outstanding Conservationist, an honor he had first received two years earlier. Under Smith's direction, the Turkey Point complex was developed into Dade's largest natural park and conservation preserve. Dade officials cited the complex as "outstanding in encouraging wildlife protection, while including excellent recreational—research facilities for youth and governmental projects."

- In 1968, the Florida Wildlife Federation presented Smith and FPL with the Governor's special award for conservation efforts.

- At the 180-acre Palatka plant site in North Central Florida, FPL preserved a forest





"Best fishin' in Florida," said this man of the spot where the St. Johns River sweeps past FPL's Sanford plant. This scene, with mangroves instead of cypress trees, red snapper instead of bass, is duplicated at Palatka and at other company generating plant sites.

103

as a haven for birds and picnickers. At the Sanford plant, a 42-acre park with campsite, boat docks, picnic areas and experimental catfish farming project was established. At Fort Myers, a 10-acre pine forest was created in cooperation with the Florida Forestry Service.

• In 1970, FPL was one of five electric utilities in the nation honored by *Electrical World* magazine for "eminence in the field of environmental control and creative conservation."

• Dating to its award-winning and internationally-recognized beautification efforts in the late Forties in connection with the Cutler plant (Chapter 8), and even before, FPL routinely included environmental compatibility as an integral part of its planning for all company facilities. In 1938, a substation built on Miami Beach by FPL so closely resembled an apartment building that visitors to the area stopped to inquire about renting.

• And it was FPL's concern for the Florida environment that was a factor in the company's decision early in its history to not use coal as one of the fuels from which it would generate electricity.

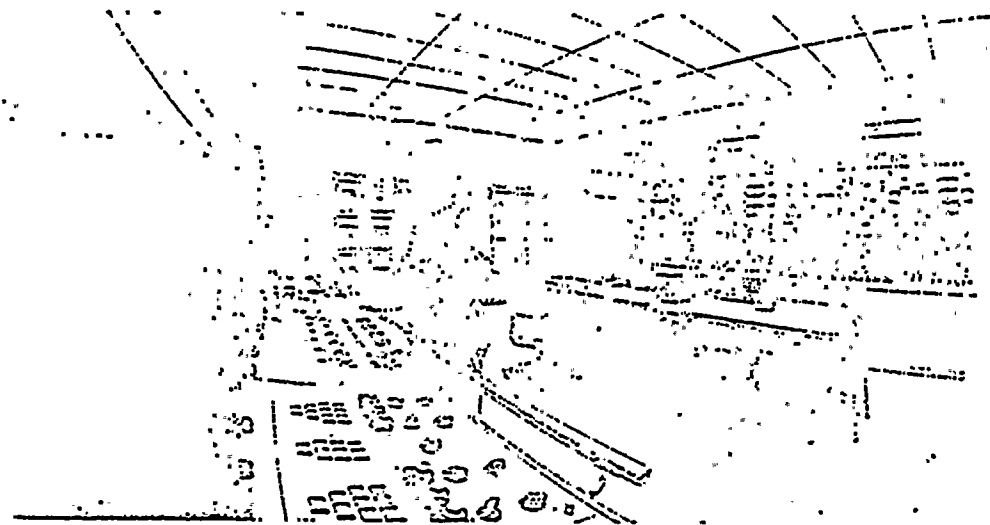
Thus the company was willing and ready to continue discussions with all interested agencies and individuals on the problem of cooling the discharge waters from Turkey Point. And in the fall of 1970, talks began with the departments of Justice, the Interior and Environmental Protection.

The talks were proceeding smoothly when a stockholder from Massachusetts, a member of an Audubon Society chapter, filed a suit seeking an injunction to stop the building of the Card Sound canal at Turkey Point. The suit also asked that officers-directors Smith, Flite and Fullerton pay damages of \$300 million to the company.

Through the winter of 1970-71, FPL sought a solution and a settlement.

The problem, as FPL perceived it, was to find a suitable cooling system that would meet revised strict federal standards. Three basic types of cooling systems were studied: cooling towers, cooling lakes or ponds (seemingly the most practical) and spray modules in canals.

In March 1971, Sea Dade Corporation officials approached FPL with an idea which on the surface seemed feasible. Sea Dade proposed that FPL work out a cooling system of



One of Miami's early power plants was operated by a man with a two-by-four, who made sure he had a space to jump if necessary. This control center at FPL's Riviera plant shows changes that took place by 1970.

waterways on Sea Dade land, south of the Turkey Point site. These waterways would cool the discharge waters from the Turkey Point plant, and would provide scenic canals around which a new city, a small Venice, could be built.

For several months, FPL worked on this Utopian plan. But inevitably, problems arose concerning joint use of the water and the two firms could not merge their aims and interests. Finally Sea Dade dropped a strong hint that it would be willing to sell all of its South Dade County property to Florida Power & Light.

This meant the purchase of 21,000 acres when FPL needed but 5,000. In failing health, McGregor Smith was not happy about the purchase—although he agreed with President Fullerton and the Board of Directors that it was the best solution to the problem.

"I told Mr. Smith that the purchase of the

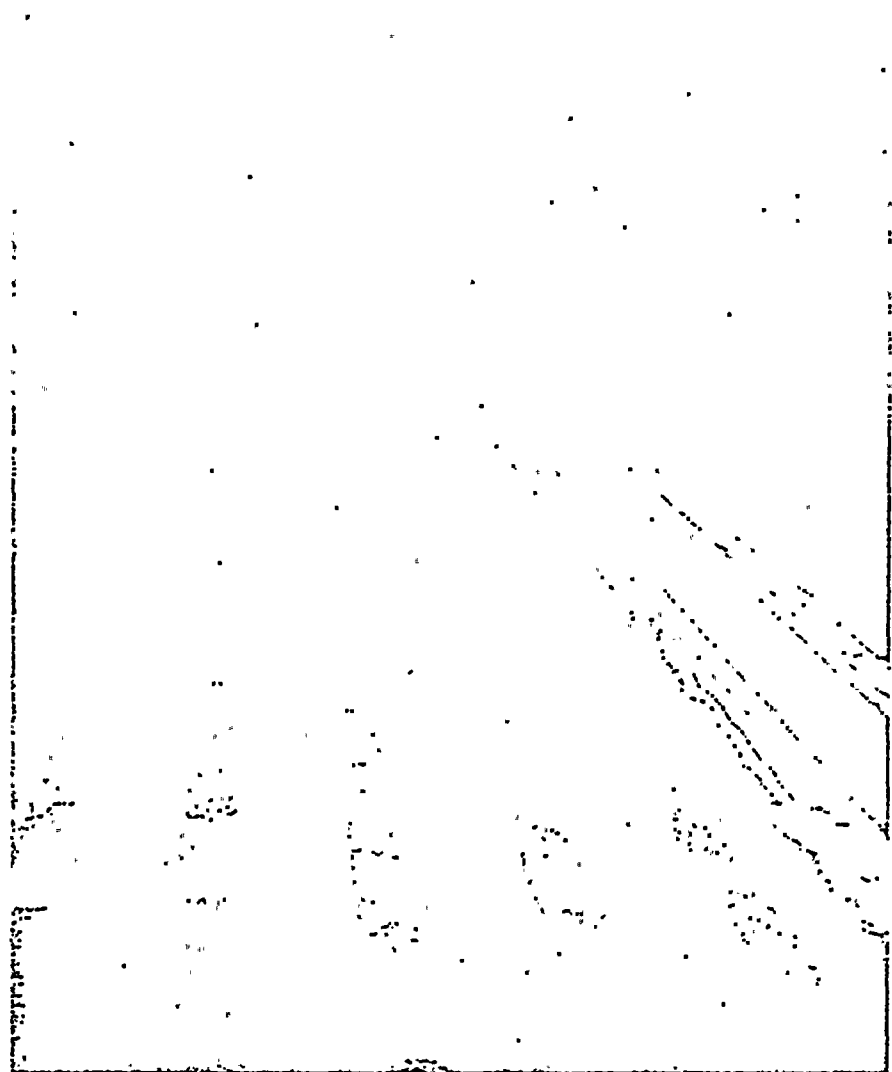
Sea Dade land was not an obstacle but an opportunity," FPL's Bob Gardner said. "It would provide an ideal site for future power plants"—a prophesy that would come true in less than five years.

So the purchase was made. But it was a condition of the purchase that the suit filed by the Massachusetts stockholder be withdrawn.

At about the same time, the law suit filed by the federal government was settled, with the obligation upon the company to build a suitable cooling system.

The cooling canal system, as it was finally worked out, is a unique design—probably never to be constructed again. It is a novel design adapted to the rough, swampy Turkey Point terrain, which consisted of four feet of muck or organic material on solid limestone.

Draglines scalped muck from the rock and piled it on the sides to form canals. Deep



By 1972, the radiator-shaped closed cooling canal at FPL's Turkey Point plant was under construction. It ended years of controversy about the plant's discharge system, but cost FPL and its customers more than \$35 million.

canals, biting into the rock, were dug at the top (or northern end) of the system so that the final design, involving 150 miles of canals, resembles the connected coils of a radiator—with no open discharge to Biscayne Bay or Card Sound.

Unbelievably, one final problem developed. The State of Florida raised an objection concerning the mean high water mark. State officials were not certain where the FPL property began in this swampy area, and one of its theories concerning the mean high water

mark would have taken away two-thirds of the property FPL thought it owned.

Frantic negotiations began with the State early in 1972, and an agreement worked out—an exchange of rights whereby the State was granted all of the mangrove swamp along the shore, leaving FPL full rights to the balance of the property.

And so, at long last, after more than five years of controversy and unplanned expenditures of more than \$35 million, the Turkey Point cooling system problem was resolved.



U.S. Central Station Nuclear Electric Generating Units:

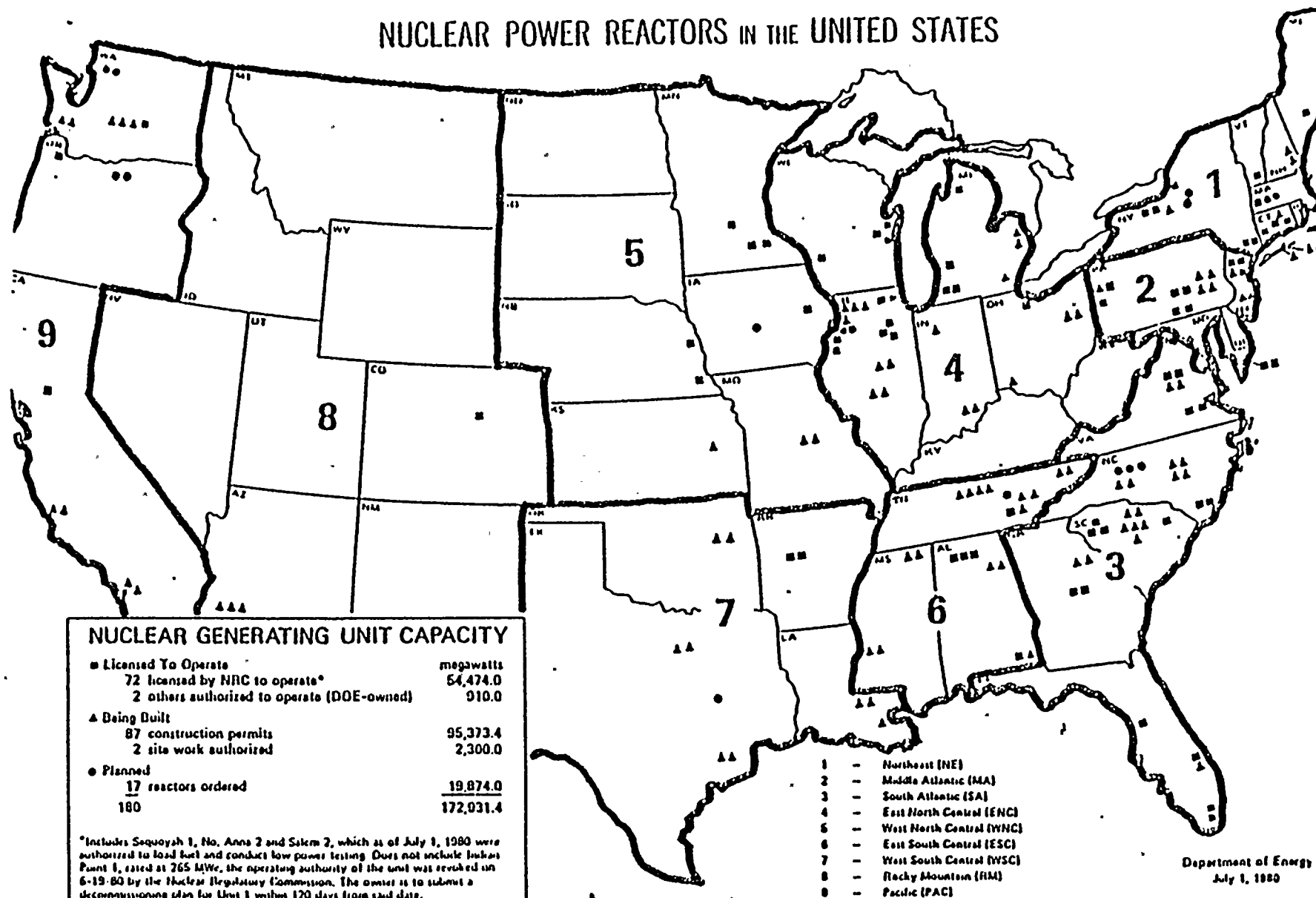
Significant Milestones

(Status as of July 1, 1980)

September 1980

U.S. Department of Energy
Assistant Secretary for Nuclear Energy
Office of Nuclear Reactor Programs
Washington, D.C. 20545

NUCLEAR POWER REACTORS IN THE UNITED STATES



NUCLEAR GENERATING UNIT CAPACITY

● Licensed To Operate	megawatts
72 licensed by NRC to operate*	54,474.0
2 others authorized to operate (DOE-owned)	910.0
▲ Being Built	
87 construction permits	95,373.4
2 site work authorized	2,300.0
○ Planned	
17 reactors ordered	19,874.0
180	172,931.4

*Includes Sequoyah 1, No. Anna 2 and Salem 2, which as of July 1, 1980 were authorized to load fuel and conduct low power testing. Does not include Indian Point 1, rated at 765 MWe, the operating authority of the unit was revoked in 6-19-80 by the Nuclear Regulatory Commission. The owner is to submit a decommissioning plan for Unit 1 within 170 days from said date.

- 1 - Northeast (NE)
- 2 - Middle Atlantic (MA)
- 3 - South Atlantic (SA)
- 4 - East North Central (ENC)
- 5 - West North Central (WNC)
- 6 - East South Central (ESC)
- 7 - West South Central (WSC)
- 8 - Rocky Mountain (RM)
- 9 - Pacific (PAC)

Department of Energy
July 1, 1980

Because of space limitations, symbols do not reflect precise locations.

STATUS OF U.S. CENTRAL STATION NUCLEAR ELECTRIC GENERATING UNITS
SIGNIFICANT MILESTONES

PLANT (STATE/REGION)	OWNER(S)	CAP MLT (MWE)	TYPE	NSSS/ AE CONTR	PUBLIC NSSS ANN'D ORDER	CP/ OL APPLIED	CP/ OL ISSUED	INITIAL CRIT.	FIRST ELEC.	INITIAL DESIGN POWER	CON- NEVCIAL OPER.	
X 14 BUILDING NUCLEAR SUPERHEAT POWER STATION (PR/REGION-3 SA)	PUERTO RICO WATER RES AUTH & DOE	16.5	BWR	0160 JEM	✓06/58 —	01/60 —	12/59 02/62	07/60 04/64	04/64	08/64	09/65	h
15 LACROSSE (GENOA) NUCLEAR GENERATING STATION (WI/REGION-4 ENC)	DAIRYLAND POWER COOPERATIVE	50.0	BWR	AC SEL	✓04/61 —	06/62	10/62 08/65	03/63 - 07/67	07/67	04/68	08/69	09/69 -
16 HADDAM NECK (CONNECTICUT YANKEE). (CT/REGION-1 NE)	CONNECTICUT YANKEE ATOMIC POWER CO	575.0	PHR	WEST SEL	✓12/62 —	12/62	09/63 07/66	05/64 - 06/67	07/67	08/67	12/67	01/68 -
17 SAN ONOFRE NUCLEAR GENERATING STATION UNIT 1 (CA/REGION-9 PAC)	SO CALIFORNIA EDISON CO; SAN DIEGO GAS & ELECTRIC CO	436.0	PHR	WEST BECH	✓04/60 —	01/63	02/63 11/65	03/64 - 03/67	06/67	07/67	09/67	01/68 -
X 18 N REACTOR/HPPSS (WA/REGION-9 PAC)	WA PUBLIC POWER SUPPLY SYSTEM & DOE	850.0	GR	UNI BER	✓04/62 —	04/63	N/A N/A	N/A N/A	12/63	04/66	07/66	11/66 -
19 NINE MILE POINT NUCLEAR STATION UNIT 1 (NY/REGION-1 NE)	NIAGARA MOHAWK POWER CORP	620.0	BWR	GE D	✓07/63 —	10/63	03/64 06/67	04/65 - 08/69	09/64	11/69	01/70	12/69 -
20 OYSTER CREEK NUCLEAR POWER PLANT (NJ/REGION-2 MA)	JERSEY CENTRAL POWER & LIGHT CO	650.0	BWR	GE BER.	✓05/63 —	12/63	03/64 11/67	12/64 - 04/69	05/69	09/69	12/69	12/69 -
21 DRESDEN NUCLEAR POWER STATION UNIT 2 (IL/REGION-4 ENC)	COMMONWEALTH EDISON CO	794.0	BWR	GE SEL	✓02/65 —	02/65	04/65 11/67	01/66 12/69	01/70	04/70	10/70	06/70 -
22 FT ST VRAIN NUCLEAR GENERATING STATION (CO/REGION-8 RM)	PUBLIC SERVICE CO OF COLORADO	330.0	HTGR	GAC SEL	✓03/65 —	03/65	10/66 11/69	09/68 23 12/73	01/74	12/76	00/78	07/79 -
23 R. E. GINIA NUCLEAR POWER PLANT UNIT 1 (NY/REGION-1 NE)	ROCHESTER GAS & ELECTRIC CORP	470.0	PHR.	WEST GIL	✓00/65 —	00/65	11/65 01/68	04/66 09/69	11/69	12/69	03/70	07/70 -
24 PILGRIM STATION UNIT 1 (MA/REGION-1 NE)	BOSTON EDISON CO	655.0	BWR	GE BECH	✓00/65 —	08/65	06/67 01/70	00/68 06/72	06/72	07/72	10/72	12/72 -

STATUS OF U.S. CENTRAL STATION NUCLEAR ELECTRIC GENERATING UNITS
SIGNIFICANT MILESTONES

PLANT (STATE/REGION)	OWNER(S)	CAP NET (MWE)	TYPE	HSSS/ AE CONTR	PUBLIC HSSS ANN'D ORDR	CP/ OL APPLIED	CP/ OL ISSUED	INITIAL CRIT.	FIRST ELEC.	INITIAL DESIGN POWER	CUM- MENCIAL OPER.
36 OCONEE NUCLEAR STATION UNIT 1 (SC/REGION-3 SA)	DUKE POWER CO	887.0	PHR	B&W 07/DEC	✓07/66 07/66	11/66 06/69	11/67 ¹² 02/73	04/73	05/73	11/73	07/73
37 OCONEE NUCLEAR STATION UNIT 2 (SC/REGION-3 SA)	DUKE POWER CO	887.0	PHR	B&W 07/DEC	✓07/66 07/66	11/66 06/69	11/67 ¹² 10/73	11/73	12/73	06/74	09/74
38 QUAD-CITIES STATION UNIT 2 (IL/REGION-4 ENC)	COMMONWEALTH EDISON CO.; IOWA-ILLINOIS GAS & ELECTRIC CO	789.0	BWR	GE SEL	✓07/66 07/66	08/66 09/68	02/67 ¹⁴ 03/72	04/72	05/72	12/72	10/72
39 PEACH BOTTOM ATOMIC POWER STATION UNIT 2 (PA/REGION-2 HA)	PHILADELPHIA ELECTRIC CO; PUBLIC SERVICE ELECTRIC & GAS CO; DELMARVA POWER & LIGHT CO; ATLANTIC CITY ELECTRIC CO	1065.0	BWR	GE BECH	✓05/66 08/66	02/67 08/70	01/68 ¹¹ 08/73	09/73	02/74	05/74	07/74
40 PEACH BOTTOM ATOMIC POWER STATION UNIT 3 (PA/REGION-2 HA)	PHILADELPHIA ELECTRIC CO; PUBLIC SERVICE ELECTRIC & GAS CO; DELMARVA POWER & LIGHT CO; ATLANTIC CITY ELECTRIC CO	1065.0	BWR	GE BECH	✓05/66 08/66	02/67 08/70	01/68 ¹¹ 07/74	08/74	09/74	12/74	12/74
41 SALEM NUCLEAR GENERATING STATION UNIT 1 (NJ/REGION-2 HA)	PUBLIC SERVICE ELECTRIC & GAS CO; PHILADELPHIA ELECTRIC CO; DELMARVA POWER & LIGHT CO; ATLANTIC CITY ELECTRIC CO	1090.0	PHR	WEST PSEG	✓05/66 08/66	12/66 08/71	09/68 ²¹ 08/76	12/76	12/76	05/77	06/77
42 VERMONT YANKEE GENERATING STATION (VT/REGION-1 NE)	VERMONT YANKEE NUCLEAR POWER CORP	514.0	BWR	GE EDAS	✓12/65 08/66	11/66 01/70	12/67 ¹³ 03/72	03/72	09/72	11/72	11/72
43 FORT CALHOUN STATION (NB/REGION-5 WNC)	OMAHA PUBLIC POWER DISTRICT	457.0	PHR	COMB GEH	✓06/66 10/66	04/67 11/69	06/68 ¹⁴ 05/73	08/73	08/73	05/74	09/73
44 SURRY POWER STATION UNIT 1 (VA/REGION-3 SA)	VIRGINIA ELECTRIC & POWER CO	822.0	PHR	WEST SEW	✓06/66 10/66	03/67 01/70	06/68 ¹⁶ 05/72	07/72	07/72	11/72	12/72
45 SURRY POWER STATION UNIT 2 (VA/REGION-3 SA)	VIRGINIA ELECTRIC & POWER CO	822.0	PHR	WEST SEW	✓10/66 10/66	03/67 01/70	06/68 ¹⁵ 01/73	03/73	03/73	04/73	05/73

STATUS OF U.S. CENTRAL STATION NUCLEAR ELECTRIC GENERATING UNITS
SIGNIFICANT MILESTONES

PLANT (STATE/REGION)	OWNER(S)	CAP MWT (MWE)	TYPE	SSS/ AE CONTR	PUBLIC ANN'D	SSS ORDER	CP/ OL APPLIED	CP/ OL ISSUED	INITIAL CRIT.	FIRST ELEC.	INITIAL DESIGN POWER	COM- MERCIAL OPER.
57 ARKANSAS NUCLEAR UNIT 1 (AR/REGION-7 WSC)	ARKANSAS POWER & LIGHT CO.	850.0	PWR	B&W BECH	✓04/67	04/67	11/67 04/71	12/68 05/74	08/74	08/74	12/74	12/74
58 COOPER NUCLEAR STATION (NB/REGION-5 WNC)	NEBRASKA PUBLIC POWER DISTRICT	778.0	BWR	GE B&R	✓06/66	04/67	07/67 03/71	06/68 01/74	02/74	05/74	10/74	07/74
59 INDIAN POINT STATION UNIT 3 (NY/REGION-1 NE)	POWER AUTHORITY OF STATE OF NEW YORK	965.0	PWR	WEST UEC	✓04/67	04/67	04/67 12/70	08/69 12/75	04/76	04/76	06/76	06/76
60 TURKEY POINT STATION UNIT 4 (FL/REGION-3 SA)	FLORIDA POWER & LIGHT CO	693.0	PWR	WEST BECH	✓11/65	04/67	03/66 05/69	04/67 ^{1b} 04/73	06/73	06/73	04/74	09/75
61 CALVERT CLIFFS NUCLEAR POWER PLANT UNIT 1 (MD/REGION-2 HA)	BALTIMORE GAS & ELECTRIC CO	845.0	PWR	COMB BECH	✓05/67	05/67	01/68 01/71	07/69 07/74	10/74	12/74	04/75	05/75
62 CALVERT CLIFFS NUCLEAR POWER PLANT UNIT 2 (MD/REGION-2 HA)	BALTIMORE GAS & ELECTRIC CO	845.0	PWR	COMB BECH	✓05/67	05/67	01/68 01/71	07/69 08/76	11/76	12/76	01/77	04/77
63 OCONEE NUCLEAR STATION UNIT 3 (SC/REGION-3 SA)	DUKE POWER CO	887.0	PWR	B&W O/BECH	✓05/67	05/67	04/67 06/69	11/67 07/74	09/74	09/74	12/74	12/74
64 SALEM NUCLEAR GENERATING STATION UNIT 2 (NJ/REGION-2 HA)	PUBLIC SERVICE ELECTRIC & GAS CO; PHILADELPHIA ELECTRIC CO; DELMARVA POWER & LIGHT CO; ATLANTIC CITY ELECTRIC CO	1115.0	PWR	WEST PSEG	✓05/66	05/67	10/67 08/71	09/68 04/80	20/80		(3Q/80)	(4Q/80)
65 BROWNS FERRY NUCLEAR POWER PLANT UNIT 3 (AL/REGION-6 ESC)	TENNESSEE VALLEY AUTHORITY	1065.0	BWR	GE TVA	✓06/67	06/67	07/67 09/70	07/68 07/76	08/76	08/76	12/76	03/77
66 PHAUKIE ISLAND NUCLEAR GENERATING PLANT UNIT 2 (MN/REGION-5 WNC)	NORTHSTAR STATES POWER CO	530.0	PWR	WEST PSE	✓06/67	06/67	03/67 02/71	06/68 10/74	12/74	12/74		12/74
67 DONALD C COOK PLANT UNIT 1 (MI/REGION-4 ENC)	INDIANA & MICHIGAN POWER CO	1054.0	PWR	WEST AEP	✓12/66	07/67	12/67 02/71	03/69 10/74	01/75	02/75	04/76	06/75

**STATUS OF U.S. CENTRAL STATION NUCLEAR ELECTRIC GENERATING UNITS
SIGNIFICANT MILESTONES**

PLANT (STATE/REGION)	OWNER(S)	CAP NET (MWE)	TYPE	HSSS/ AE CONTR	PUBLIC ANN'D	HSSS ORDER	CP/ OL APPLIED	CP/ OL ISSUED	INITIAL CRIT.	FIRST ELEC.	INITIAL DESIGN POWER	COM- MERCIAL OPER.
79 BRUNSWICK STEAM ELECTRIC PLANT UNIT 2 (NC/REGION-3 SA)	CAROLINA POWER & LIGHT CO	621.0	BWR	GE UEC	✓ 01/68	01/68	07/68 10/72	02/70 12/74	03/75	04/75	09/75	11/75
80 DUANE ARNOLD ENERGY CENTER UNIT 1 (IA/REG)(N-5 MNC)	IOWA ELECTRIC LIGHT & POWER CO; CENTRAL IOWA POWER COOPERATIVE; CORNBELT POWER COOPERATIVE	536.0	BWR	GE BECH	✓ 02/68	02/68	11/68 05/72	06/70 02/74	03/74	05/74	08/74	02/75
81 SEQUOYAH NUCLEAR POWER PLANT UNIT 1 (TN/REGION-6 ESC)	TENNESSEE VALLEY AUTHORITY	1148.0	PWR	WEST TVA	✓ 04/68	04/68	10/68 01/74	05/70 02/80	(3Q/80)		(3Q/80)	(3Q/80)
82 SEQUOYAH NUCLEAR POWER PLANT UNIT 2 (TN/REGION-6 ESC)	TENNESSEE VALLEY AUTHORITY	1148.0	PWR	WEST TVA	✓ 04/68	04/68	10/68 01/74	05/70	(3Q/81)		(4Q/81)	(01/82)
83 MIDLAND NUCLEAR POWER PLANT UNIT 1 (MI/REGION-4 ENC)	CONSUMERS POWER CO	460.0	PWR	BECH BECH	✓ 12/67	05/68	01/69 11/77	12/72	(00/85)		(00/85)	(00/85)
84 MIDLAND NUCLEAR POWER PLANT UNIT 2 (MI/REGION-4 ENC)	CONSUMERS POWER CO	811.0	PWR	BECH BECH	✓ 12/67	05/68	01/69 11/77	12/72	(00/84)		(00/84)	(01/85)
85 SUSQUEHANNA STEAM ELECTRIC STATION UNIT 1 (PA/REGION-2 HA)	PENNSYLVANIA POWER & LIGHT CO; ALLEGHENY ELECTRIC COOPERATIVE	1050.0	BWR	GE BECH	✓ 05/67	05/68	03/71 06/78	11/73	(05/81)		(00/81)	(01/82)
86 SUSQUEHANNA STEAM ELECTRIC STATION UNIT 2 (PA/REGION-2 HA)	PENNSYLVANIA POWER & LIGHT CO; ALLEGHENY ELECTRIC COOPERATIVE	1050.0	BWR	GE BECH	✓ 05/68	05/68	03/71 06/78	11/73	(06/82)		(00/82)	(06/82)
87 DIABLO CANYON NUCLEAR POWER PLANT UNIT 2 (CA/REGION-9 PAC)	PACIFIC GAS & ELECTRIC CO	1106.0	PWR	WEST PG&E	✓ 02/68	07/68	06/68 10/73	12/70	(00/81)		(00/81)	(00/81)
88 ENRICO FERMI ATOMIC POWER PLANT UNIT 2 (MI/REGION-4 ENC)	DETROIT EDISON CO; NO MI ELECTRIC COOP; WOLVERINE ELECTRIC COOP	1093.0	BWR	GE SEL	✓ 07/68	08/68	04/69 04/75	09/72	(05/81)		(02/82)	(03/82)
89 DAVIS BESSE NUCLEAR POWER STATION UNIT 1 (OH/REGION-4 ENC)	TOLEDO EDISON CO; CLEVELAND ELECTRIC ILLUMINATING CO	966.0	PWR	BECH BECH	✓ 02/68	10/68	07/69 03/73	03/71 04/77	06/77	06/77	12/77	11/77

* No report received from utility for 2080; improved commercial operating schedule of 1/83 and 7/84 for units 2 and 1, respectively, reported in the press.
 ** In August 1980 the utility announced a commercial operation date of 11/81.

STATUS OF U.S. CENTRAL STATION NUCLEAR ELECTRIC GENERATING UNITS
SIGNIFICANT MILESTONES

PLANT (STATE/REGION)	OWNER(S)	CAP NET (MW)	TYPE	SSSS/ AE CONTR	PUBLIC NISS ANN'D ORDER	CP/ OL APPLIED	CP/ OL ISSUED	INITIAL CMT.	FIRST ELEC.	INITIAL DESIGN POWER	COM- MERCIAL OPER.
100 SAN ONOFRE NUCLEAR GENERATING STATION UNIT 2 (CA/REGION-9 PAC)	SO CALIFORNIA EDISON CO; SAN DIEGO GAS & ELECTRIC CO	1100.0	PWR	COMB DECH	✓01/70 01/70	05/70 03/77	10/73 ¹¹	(06/81)		(10/81)	(12/81)
101 SAN ONOFRE NUCLEAR GENERATING STATION UNIT 3 (CA/REGION-9 PAC)	SO CALIFORNIA EDISON CO; SAN DIEGO GAS & ELECTRIC CO	1100.0	PWR	COMB DECH	✓01/70 01/70	05/70 03/77	10/73 ¹¹	(01/82)		(07/82)	(01/83)
102 EDWIN'1 HATCH NUCLEAR PLANT UNIT 2 (GA/REGION-3 SA)	GEORGIA POWER CO; OGLETHORPE ELECTRIC MEMBERSHIP COOP; MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA; DALTON WATER & LIGHT COMMISSION	786.0	BWR	GE SSI/B	✓02/70 01/70	07/70 10/75	12/72 ²¹ 06/78	07/78	09/78	05/79	09/79
103 ARKANSAS NUCLEAR ONE UNIT 2 (AR/REGION-7 MSC)	ARKANSAS POWER & LIGHT CO.	912.0	PWR	COMB DECH	✓05/70 05/70	09/70 04/74	12/72 ²¹ 09/78	12/78	12/78	09/79	03/80
104 LASALLE COUNTY NUCLEAR STATION UNIT 1 (IL/REGION-4 ENC)	COMMONWEALTH EDISON CO	1078.0	BWR	GE SEL	✓03/70 05/70	11/70 05/77	09/73 ³¹	(02/81)		(06/81)	(06/81)
105 LASALLE COUNTY NUCLEAR STATION UNIT 2 (IL/REGION-4 ENC)	COMMONWEALTH EDISON CO	1078.0	BWR	GE SEL	✓03/70 05/70	11/70 05/77	09/73 ³¹	(02/82)		(06/82)	(06/82)
106 BELLEFONTE NUCLEAR PLANT UNIT 1 (AL/REGION-6 ESC)	TENNESSEE VALLEY AUTHORITY	1213.0	PWR	BCH TVA	✓08/70 08/70	06/73 06/78	12/74	(40/82)		(30/83)	(09/83)
107 BELLEFONTE NUCLEAR PLANT UNIT 2 (AL/REGION-6 ESC)	TENNESSEE VALLEY AUTHORITY	1213.0	PWR	BCH TVA	✓08/70 08/70	06/73 06/78	12/74	(30/83)		(20/84)	(06/84)
108 WATTS BAR NUCLEAR PLANT UNIT 1 (TN/REGION-6 ESC)	TENNESSEE VALLEY AUTHORITY	1177.0	PWR	WEST TVA	✓08/70 08/70	05/71 10/76	01/73	(40/81)		(10/82)	(05/82)
109 WATTS BAR NUCLEAR PLANT UNIT 2 (TN/REGION-6 ESC)	TENNESSEE VALLEY AUTHORITY	1177.0	PWR	WEST TVA	✓08/70 08/70	05/71 10/76	01/73	(03/82)		(40/82)	(02/83)

**STATUS OF U.S. CENTRAL STATION NUCLEAR ELECTRIC GENERATING UNITS
SIGNIFICANT MILESTONES**

PLANT (STATE/REGION)	OWNER(S)	CAP NET (MWE)	TYPE	SSS/ AE CONTR	PUBLIC SSS ANN'D ORDER	CP/ OL APPLIED	CP/ OL ISSUED	INITIAL - FIRST CRIT. ELEC.	INITIAL DESIGN POWER	COM- MERCIAL OPER.
122 ALVIN W VOGTLE NUCLEAR PLANT UNIT 1 (GA/REGION-3 SA)	GEORGIA POWER CO; OGLETHORPE ELECTRIC MEMBERSHIP COOP; MUNICIPAL ELECTRIC AUTH OF GA; DALTON WATER & LIGHT COMMISSION	1110.0	PWR	WEST SSI/B	✓09/71 09/71	02/73	06/74	(12/84)	(04/85)	(05/85)
123 ALVIN W VOGTLE NUCLEAR PLANT UNIT 2 (GA/REGION-3 SA)	GEORGIA POWER CO; OGLETHORPE ELECTRIC MEMBERSHIP COOP; MUNICIPAL ELECTRIC AUTH OF GA; DALTON WATER & LIGHT COMMISSION	1110.0	PWR	WEST SSI/B	✓09/71 09/71	02/73	06/74	(06/87)	(10/87)	(11/87)
124 BEAVER VALLEY POWER STATION UNIT 2 (PA/REGION-2 HA)	OHIO EDISON CO; CLEVELAND ELECTRIC ILLUMINATING CO; TOLEDO EDISON CO; DUQUESNE LIGHT CO	833.0	PWR	WEST D/SEN	✓09/71 09/71	11/72	05/74	(12/85)	(04/86)	(05/86)
125 NINE MILE POINT NUCLEAR STATION UNIT 2 (NY/REGION-1 NE)	NIAGARA MOHAWK POWER CORP; ROCHESTER GAS & ELECTRIC CO; CENTRAL HUDSON GAS & ELECTRIC CORP; NY STATE ELECTRIC & GAS CORP; LONG ISLAND LIGHTING CO	1099.8	BWR	GE SLM	✓06/71 09/71	06/72	06/74	(04/86)	(09/86)	(10/86)
126 GRAND GULF NUCLEAR STATION UNIT 1 (MS/REGION-6 ESC)	MISSISSIPPI POWER & LIGHT CO	1250.0	BWR	GE BECH	✓08/71 01/72	11/72 06/78	09/74	(12/81)	(02/82)	(04/82)
127 GRAND GULF NUCLEAR STATION UNIT 2 (MS/REGION-6 ESC)	MISSISSIPPI POWER & LIGHT CO	1250.0	BWR	GE BECH	✓08/71 01/72	11/72 06/78	09/74	(12/85)	(02/86)	(04/86)
128 PILGRIM STATION UNIT 2 (MA/REGION-1 NE)	BOSTON EDISON CO; MA MUNICIPAL WHOLESALE ELECTRIC CO; NEW ENGLAND POWER CO & OTHERS	1150.0	PWR	CONB BECH	03/72 03/72	12/74		(10/86)	(12/86)	(10/87)

* Commercial operation date of 1987 received by telephone from utility on 10-16-80.

**STATUS OF U.S. CENTRAL STATION NUCLEAR ELECTRIC GENERATING UNITS
SIGNIFICANT MILESTONES**

PLANT (STATE/REGION)	OWNER(S)	CAP NET (MWE)	TYPE	NSSS/ AE CONTR	PUBLIC NSSS ANNOUNCED	CP/ OL ORDER	CP/ OL APPLIED	CP/ OL ISSUED	INITIAL CHIT.	FIRST ELEC.	INITIAL DESIGN POWER	COM- MERCIAL OPER.
138 COMANCHE PEAK STEAM ELECTRIC STATION UNIT 1 (TX/REGION-7 WSC)	DALLAS POWER & LIGHT CO; TEXAS ELECTRIC SERVICE CO; TEXAS POWER & LIGHT CO	1111.0	PHR	WEST GCH	07/72	10/72	07/73 04/78	12/74	(00/81)		(00/81)	(00/81)
139 COMANCHE PEAK STEAM ELECTRIC STATION UNIT 2 (TX/REGION-7 WSC)	DALLAS POWER & LIGHT CO; TEXAS ELECTRIC SERVICE CO; TEXAS POWER AND LIGHT CO	1111.0	PHR	WEST GCH	07/72	10/72	07/73 04/78	12/74	(00/82)		(00/82)	(00/83)
140 CLINCH RIVER BREIDLER REACTOR PLANT (TN/REGION-6 ESC)	UNITED STATES GOVERNMENT	350.0	LHFB	WEST BER	08/72	11/72	04/75					
141 ST. LUCIE UNIT 2 (FL/REGION-3 SA)	FLORIDA POWER & LIGHT CO	810.0	PHR	COMB EBAS	11/72	11/72	09/73	05/77	(12/82)		(05/83)	(05/83)
142 WPPSS NUCLEAR PROJECT NO 1 (WA/REGION-9 PAC)	WASHINGTON PUBLIC POWER SUPPLY SYSTEM	1210.0	PHR	B&W UEC	11/72	11/72	10/73	12/75	(12/84)		(04/85)	(06/85)
143 HARTSVILLE PLANT A, TENNESSEE VALLEY UNIT 1 (TN/REGION-6 AUTHORITY ESC)		1233.0	BWR	GE TVA	05/72	12/72	09/74	05/77	(10/85)		(20/86)	(07/86)
144 HARTSVILLE PLANT A, TENNESSEE VALLEY UNIT 2 (TN/REGION-6 AUTHORITY ESC)		1233.0	BWR	GE TVA	05/72	12/72	09/74	05/77	(10/86)		(20/87)	(07/87)
145 HARTSVILLE PLANT B, TENNESSEE VALLEY UNIT 1 (TN/REGION-6 AUTHORITY ESC)		1233.0	BWR	GE TVA	05/72	12/72	09/74	05/77	(20/88)		(20/89)	(06/89)
146 HARTSVILLE PLANT B, TENNESSEE VALLEY UNIT 2 (TN/REGION-6 AUTHORITY ESC)		1233.0	BWR	GE TVA	05/72	12/72	09/74	05/77	(20/89)		(20/90)	(06/90)
147 CLINTON NUCLEAR POWER STATION UNIT 1 (IL/REGION-4 ENC)	ILLINOIS POWER COMPANY	933.4	BWR	GE SEL	02/72	01/73	10/73 07/80	02/76	(04/82)		(12/82)	(12/82)
148 CLINTON NUCLEAR POWER STATION UNIT 2 (IL/REGION-4 ENC)	ILLINOIS POWER COMPANY	933.4	BWR	GE SEL	02/72	01/73	10/73 07/80	02/76	(10/87)		(06/88)	(06/88)

* Utility announced in July initial operation of 1982, and 1984, respectively.

STATUS OF U.S. CENTRAL STATION NUCLEAR ELECTRIC GENERATING UNITS
SIGNIFICANT MILESTONES

PLANT (STATE/REGION)	OWNER(S)	CAP NET (MWE)	TYPE	SSS/ AE CONTR	PUBLIC ANN'D	SSS ORDER	CP/ OL APPLIED	CP/ OL ISSUED	INITIAL CRIT.	FIRST ELEC.	INITIAL DESIGN POWER	COM- MERCIAL OPER.
159 SOUTH TEXAS NUCLEAR PROJECT UNIT 1 (TX/REGION-7 MSC)	HOUSTON LIGHTING & POWER CO; SAN ANTONIO PUBLIC SERVICE BOARD; CENTRAL POWER & LIGHT CO; CITY OF AUSTIN ELECTRIC DEPT	1250.0	PHR	WEST BRRT	06/73	07/73	07/74 07/78	12/75	(09/83)		(01/84)	(02/84)
160 SOUTH TEXAS NUCLEAR PROJECT UNIT 2 (TX/REGION-7 MSC)	HOUSTON LIGHTING & POWER CO; SAN ANTONIO PUBLIC SERVICE BOARD; CENTRAL POWER & LIGHT CO; CITY OF AUSTIN ELECTRIC DEPT	1250.0	PHR	WEST BRRT	06/73	07/73	07/74 07/78	12/75	(09/85)		(01/86)	(02/86)
161 WPPSS NUCLEAR PROJECT NO 3 (WA/REGION-9 PAC)	WASHINGTON PUBLIC POWER SUPPLY SYSTEM; PAC PCL & PORTLAND GE; PUGET SOUND PCL; WA WATER POWER CO	1240.0	PHR	COMB EBAS	01/73	07/73	08/74	04/78	(12/85)		(04/86)	(06/86)
162 RIVER BEND STATION UNIT 2 (LA/REGION-7 MSC)	GULF STATES UTILITIES CO	934.0	BWR	GE SCM	09/73	09/73	09/73	03/77				
163 PALO VERDE NUCLEAR GENERATING STATION UNIT 1 (AZ/REGION-8 RM)	ARIZONA PUBLIC SERVICE CO; SALT RIVER PROJECT; EL PASO ELECTRIC CO; PUBLIC SERVICE CO OF NM; SO CA EDISON	1270.0	PHR	COMB BECH	08/73	10/73	10/74 06/80	05/76	(12/82)		(02/83)	(05/83)
164 PALO VERDE NUCLEAR GENERATING STATION UNIT 2 (AZ/REGION-8 RM)	ARIZONA PUBLIC SERVICE CO; SALT RIVER PROJECT; EL PASO ELECTRIC CO; PUBLIC SERVICE CO OF NM; SO CA EDISON	1270.0	PHR	COMB BECH	08/73	10/73	10/74 06/80	05/76	(11/83)		(02/84)	(05/84)
165 PALO VERDE NUCLEAR GENERATING STATION UNIT 3 (AZ/REGION-8 RM)	ARIZONA PUBLIC SERVICE CO; SALT RIVER PROJECT; EL PASO ELECTRIC CO; PUBLIC SERVICE CO OF NM; SO CA EDISON	1270.0	PHR	COMB BECH	08/73	10/73	10/74 06/80	05/76	(12/85)		(02/86)	(06/86)

**STATUS OF U.S. CENTRAL STATION NUCLEAR ELECTRIC GENERATING UNITS
SIGNIFICANT MILESTONES**

PLANT (STATE/REGION)	OWNER(S)	CAP NET (MWE)	TYPE	NSSS/ AL CONTR	PUBLIC ANN'D	NSSS ORDER	CP/ OL APPLIED	CP/ OL ISSUED	INITIAL UNIT.	FIRST ELEC.	INITIAL DESIGN POWER	COM- MERCIAL OPER.
177 WPPSS NUCLEAR PROJECT NO. 5 (WA/REGION-9 PAC)	WASHINGTON PUBLIC POWER SUPPLY SYSTEM; PACIFIC POWER & LIGHT	1240.0	PWR	COMB Ebas	07/74	07/74	08/74	04/78	(12/86)		(04/87)	(06/87)
178 HARBLE HILL NUCLEAR POWER STATION UNIT 1 (IN/REGION-4 ENC)	PUBLIC SERVICE CO OF INDIANA; WABASH VALLEY POWER ASSOCIATION	1130.0	PWR	WEST SEL	11/73	8/74	09/75	04/78	(06/86)		(00/86)	(12/86)
179 HARBLE HILL NUCLEAR POWER STATION UNIT 2 (IN/REGION-4 ENC)	PUBLIC SERVICE CO OF INDIANA; WABASH VALLEY POWER ASSOCIATION	1130.0	PWR	WEST SEL	02/74	8/74	09/75	04/78	(06/87)		(00/87)	(12/87)
180 SKAGIT PROJECT UNIT #2 (WA/REGION-9 PAC)	PUGET SOUND POWER & LIGHT CO; PORTLAND GE CO; PACIFIC POWER & LIGHT CO; WA WATER POWER CO	1277.0	BWR	GE BECH	7/74	7/74	09/74		(09/88)		(12/88)	(01/89)
181 YELLOW CREEK NO. 1 (MS/REGION-6 ESC)	TENNESSEE VALLEY AUTHORITY	1285.0	PWR	COMB TVA	8/74	8/74	07/76	11/78	(14/85)		(4Q/85)	(11/85)
182 YELLOW CREEK NO. 2 (MS/REGION-6 ESC)	TENNESSEE VALLEY AUTHORITY	1285.0	PWR	COMB TVA	8/74	8/74	07/76	11/78	(2Q/87)		(2Q/88)	(04/88)
183 PHIPPS BEND NO. 1 (TN/REGION-6 ESC)	TENNESSEE VALLEY AUTHORITY	1233.0	BWR	GE TVA	8/74	8/74	11/75	01/78	(00/87)		(1Q/87)	(03/87)
184 PHIPPS BEND NO. 2 (TN/REGION-6 ESC)	TENNESSEE VALLEY AUTHORITY	1233.0	BWR	GE TVA	8/74	8/74	11/75	01/78	(00/89)		(3Q/89)	(08/89)
185 VANDALIA NUCLEAR PROJECT (IA/REGION-5 WNC)	IOWA POWER & LIGHT CO.; ASSOC EL COOP; CENTRAL IOWA POWER COOPERATIVE; IOWA POWER	1270.0	PWR	BECH BECH	06/74	06/76						
186 NEW HAVEN #1 (NY/REGION-1 NE)	NEW YORK STATE ELECTRIC & GAS CO	1250.0	PWR	COMB SCW	04/77	07/77	12/78		(00/92)		(00/92)	(00/92)
187 NEW HAVEN #2 (NY/REGION-1 NE)	NEW YORK STATE ELECTRIC & GAS CO	1250.0	PWR	COMB SCW	04/77	07/77	12/78		(00/94)		(00/94)	(00/94)
188 CARROLL COUNTY STATION UNIT #1 (IL/REGION-4 ENC)	COMMONWEALTH EDISON CO; INTERSTATE POWER CO; IOWA-ILLINOIS GAS & ELECTRIC	1120.0	PWR	WEST	01/74	12/78			(06/92)		(10/92)	(10/92)

* Utility announced on 10/1/80 a commercial operation date of 1/93.

NOTES

KEY TO AE's (Architect-Engineer)

AEC American Electric Power
Service Corporation
BECH Bechtel
B&R Burns & Roe
B&V Black & Veatch
BRRT Brown & Root, Inc.
EBAS Ebasco
G/CA Gilbert/Commonwealth Assoc.
G&H Gibbs & Hill, Inc.
GIL Gilbert Associates

GHD&R Gibbs, Hill, Durham & Richardson
H&N Holmes & Narver
J&M Jackson & Moreland
O Owner
PSE Pioneer Service & Engineering
S&L Sargeant & Lundy
SSI Southern Services, Inc.
S&W Stone & Webster
UEC United Engineers & Constructors
VIT Vitro

KEY TO NSSS's (Nuclear Steam System Supplier)

AC Allis-Chalmers
AI Atomics International
B&W Babcock & Wilcox
COMB Combustion Engineering
GE General Electric
GAC General Atomic Corporation
PRDC Power Reactor Development Co.
WEST Westinghouse

Project schedules in this report are in accordance with utility reporting for the second quarter 1980.
except for newly ordered and announced units.

Footnotes for tabulation on pages 1 through 21.

- * Initial or current capacity; may differ from that authorized by license.
- ** Date docketed by Nuclear Regulatory Commission.
- *** Future schedular dates are shown in parenthesis.
- CP Construction Permit.
- OL Operating License.
- N/A Not applicable.
- a Fermi 1 - Decision to decommission announced 11/29/72.
- b Pathfinder - Nuclear plant was shut down 10/67.
- c Hallam - Shut down 9/64.
- d Elk River - Shut down 2/68.
- e Peach Bottom 1 - Shut down 11/74.
- f CVTR - Shut down 1/67.
- g Plaquemine - Shut down for repairs 1/66; operating contract terminated 12/67.
- h BONUS - Decision to decommission announced 6/68. Order to dismantle issued 8/11/69.
- i Indian Point 1 - Shut down since 10/31/74; the operating authority of this unit was revoked.
on 6/19/80 by the Nuclear Regulatory Commission. The owner is to submit a decommissioning
plan within 120 days from said date.
- j Humboldt Bay - Shut down since 7/2/76 for major modification; no decision on future operation.
- k Midland Unit 1 will also produce up to 4 million pounds per hour of process steam.
- l Three Mile Island 2 - Shut down since 3/28/79; cleanup operations underway; no decision on future operation.

State Listing of U.S. Central Station Nuclear Electric Generating Units

			NEW YORK		CAP		PENNSYLVANIA		CAP		VIRGINIA		CAP							
			# OF		# OF		# OF		# OF		# OF		# OF							
			UNITS	(NET MWE)	UNITS	(NET MWE)	UNITS	(NET MWE)	UNITS	(NET MWE)	UNITS	(NET MWE)	UNITS	(NET MWE)						
NEBRASKA	# OF	CAP	FITZPATRICK			PEACH BOTTOM #3			NORTH ANNA #1			907.0								
			GINNA #1			SHIPPINGPORT			NORTH ANNA #2			907.0								
			INDIAN POINT #2			SUSQUEHANNA #1			NORTH ANNA #3			907.0								
			INDIAN POINT #3			SUSQUEHANNA #2			NORTH ANNA #4			907.0								
			JAMESPORT 1			THREE MILE #1			SURRY #1			822.0								
COOPER		178.0	JAMESPORT 2			THREE MILE #2			SURRY #2			822.0								
FORT CALICUM		457.0	NEW HAVEN #1			STATE TOTAL			STATE TOTAL			6 5272.0								
STATE TOTAL	2	1235.0	NEW HAVEN #2			11	9810.0	SOUTH CAROLINA			VERMONT			# OF	CAP					
			NINE MILE #1									UNITS (NET MWE)								
			NINE MILE #2																	
			SHUREHAM																	
			STATE TOTAL			11	10467.0													
NORTH CAROLINA	# OF	CAP	CATAMBA #1			CATAMBA #1			VERMONT YANKEE			514.0								
			CATAMBA #2			CATAMBA #2			VERMONT YANKEE			514.0								
			CHEROKEE 1			CHEROKEE 1			STATE TOTAL			1 514.0								
			CHEROKEE 2			CHEROKEE 2														
			CHEROKEE 3			CHEROKEE 3														
			CONNEE #1			CONNEE #1			WASHINGTON			# OF			CAP					
			CONNEE #2			CONNEE #2						UNITS (NET MWE)								
			CONNEE #3			CONNEE #3														
			HCDINSON #2			HCDINSON #2														
			SUMNER #1			SUMNER #1														
STATE TOTAL	11	11442.0	STATE TOTAL			4	4126.0	STATE TOTAL			10	10391.0	STATE TOTAL			8	9413.0			
			OKLAHOMA			TENNESSEE						WISCONSIN			# OF			CAP		
NEW HAMPSHIRE	# OF	CAP	BLACK FOX #1			CLINCH RIVER			STATE TOTAL			0 9413.0								
			BLACK FOX #2			HARTSVILLE A-1														
			STATE TOTAL			HARTSVILLE A-2														
						HARTSVILLE B-1														
						HARTSVILLE B-2														
SEABRICK #1		1200.0	PHIP BEND 1			PHIP BEND 2			SEQUOYAH #1			SEQUOYAH #2			WATTS BAR #1			WATTS BAR #2		
SEABRICK #2		1200.0	SEQUOYAH #1			SEQUOYAH #2			WATTS BAR #1			WATTS BAR #2			STATE TOTAL			11 12390.0		
STATE TOTAL	2	2400.0	STATE TOTAL			2	2300.0	STATE TOTAL			11	12390.0	STATE TOTAL			4	1579.0			
			OREGON			TEXAS														
NEW JERSEY	# OF	CAP	PEBBLE SPRINGS #1			ALLEN'S CREEK #1			1150.0											
			PEBBLE SPRINGS #2			COMANCHE #1			1111.0											
			TROJAN #1			COMANCHE #2			1111.0											
			STATE TOTAL			SOUTH TEXAS #1			1250.0											
						SOUTH TEXAS #2			1250.0											
PERKINS FIVE #1		1070.0	BLAVER VALLEY #1			BLAVER VALLEY #2			LINERICK #1			LINERICK #2			PEACH BOTTOM #2					
MOPE CREEK #1		1067.0	BLAVER VALLEY #2			LINERICK #1			LINERICK #2			PEACH BOTTOM #2								
MOPE CREEK #2		1067.0	LINERICK #1			LINERICK #2			PEACH BOTTOM #2											
MYSTER CREEK		650.0	LINERICK #2			PEACH BOTTOM #2														
SALIN #1		1090.0	PEACH BOTTOM #2																	
SALIN #2		1115.0																		
STATE TOTAL	6	6059.0																		

Regional Listing of U. S. Central Station Nuclear Electric Generating Units

REGION 5 (WNC)	# OF UNITS (NET MWE)	CAP	REGION 6 (ESC)	# OF UNITS (NET MWE)	CAP	REGION 7 (WSC)	# OF UNITS (NET MWE)	CAP	REGION 8 (RM)	# OF UNITS (NET MWE)	CAP
OPERABLE			OPERABLE			OPERABLE			OPERABLE		
ARNOLD #1		538.0	ARKANSAS FERRY #1		1065.0	ARKANSAS ONE #1		850.0	FORT ST. VRAIN		330.0
COOPER		778.0	ARKANSAS FERRY #2		1065.0	ARKANSAS ONE #2		912.0	STATUS TOTAL	1	330.0
FORT CALFORN		457.0	ARKANSAS FERRY #3		1065.0	STATUS TOTAL	2	1762.0	BEING BUILT		
MONTICELLO		545.0	FARLEY #1		829.0	BEING BUILT			PALO VERDE #1		1270.0
PRAIRIE ISLAND #1		550.0	SEQUOYAH #1		1148.0	BLACK FCX #1		1150.0	PALO VERDE #2		1270.0
PRAIRIE ISLAND #2		550.0	STATUS TOTAL	5	5172.0	BLACK FCX #2		1150.0	PALO VERDE #3		1270.0
STATUS TOTAL	6	3378.0	BEING BUILT			COMANCHE #1		1111.0	STATUS TOTAL	3	3810.0
BEING BUILT			BELLEFONTE #1		1213.0	COMANCHE #2		1111.0	REGIONAL TOTAL	4	4140.0
CALLAWAY #1		1120.0	BELLEFONTE #2		1213.0	RIVER BEND #1		934.0			
CALLAWAY #2		1120.0	FARLEY #2		829.0	RIVER BEND #2		934.0			
WOLF CREEK		1150.0	GRAND GULF #1		1250.0	SOUTH TEXAS #1		1250.0			
STATUS TOTAL	3	3390.0	GRAND GULF #2		1250.0	SOUTH TEXAS #2		1250.0			
ORDERED			HARTSVILLE A-1		1233.0	WATERFORD #3		1113.0	REGION 9 (PAL)	# OF UNITS (NET MWE)	CAP
VANDALIA		1270.0	HARTSVILLE A-2		1233.0	STATUS TOTAL	9	10003.0	OPERABLE		
STATUS TOTAL	1	1270.0	HARTSVILLE B-1		1233.0	ORDERED			HUMPHREY BAY		65.0
REGIONAL TOTAL	10	8038.0	HARTSVILLE B-2		1233.0	ALLEN'S CREEK #1		1150.0	N REACTOR		850.0
			PHIL BEND 1		1233.0	STATUS TOTAL	1	1150.0	RANCHO SECO		418.0
			PHIL BEND 2		1233.0	REGIONAL TOTAL	12	12915.0	SAN JOSE #1		456.0
			SEQUOYAH #2		1148.0				TRCJAN #1		1110.0
			WATTS BAR #1		1177.0				STATUS TOTAL	5	3399.0
			WATTS BAR #2		1177.0				BEING BUILT		
			YELLOW CRK #1		1285.0				CIADLE #1		1084.0
			YELLOW CRK #2		1285.0				CIADLE #2		1100.0
			STATUS TOTAL	16	19225.0				SAN CECIL #2		1100.0
			ORDERED						SAN CECIL #3		1100.0
			CLINCH RIVER		350.0				WPPSS PROJECT #1		1218.0
			STATUS TOTAL	1	350.0				WPPSS PROJECT #2		1053.0
			REGIONAL TOTAL	22	24747.0				WPPSS PROJECT #3		1240.0
									WPPSS PROJECT #4		1218.0
									WPPSS PROJECT #5		1240.0
									STATUS TOTAL	9	10399.0
									ORDERED		
									PENNIE SPRINGS #1		1260.0
									PENNIE SPRINGS #2		1260.0
									SKAGIT #1		1277.0
									SKAGIT #2		1277.0
									STATUS TOTAL	4	5074.0
									REGIONAL TOTAL	18	18072.0

Utility Listing of U.S. Central Station Nuclear Electric Generating Units

UNITS CAPACITY CONSIDER X
 MWE COMPLETE

COMMONWEALTH EDISON CO OPERABLE

OKESDEN #1	200.0
OKESDEN #2	794.0
OKESDEN #3	794.0
QUAD CITIES #1	789.0
QUAD CITIES #2	789.0
ZION #1	1040.0
ZION #2	1040.0

STATUS TOTAL 1 5446.0

BEING BUILT

OKALOONIA #1	1120.0	50.0
OKALOONIA #2	1120.0	44.0
BYRON #1	1120.0	69.0
BYRON #2	1120.0	55.0
LASALLE #1	1070.0	90.0
LASALLE #2	1070.0	76.0

STATUS TOTAL 6 6030.0

ORDERED

CARRHILL COUNTY #1	1120.0
CARRHILL COUNTY #2	1120.0

STATUS TOTAL 2 2240.0

UTILITY TOTAL 19 14322.0

CONNECTICUT LIGHT & POWER CO OPERABLE

MILLSTONE #1	600.0
MILLSTONE #2	670.0

STATUS TOTAL 2 1270.0

BEING BUILT

MILLSTONE #3	1156.0	34.1
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STATUS TOTAL 1 1156.0

UTILITY TOTAL 3 2686.0

CONNECTICUT YANKEE ATOMIC POWER CO OPERABLE

NAUBURN	575.0
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STATUS TOTAL 1 575.0

CONSOLIDATED EDISON CO OPERABLE

INDIAN POINT #2	673.0
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STATUS TOTAL 1 673.0

CONSUMERS POWER CO OPERABLE

BIG ROCK Pt.	12.0
PALISADES	865.0

STATUS TOTAL 2 877.0

BEING BUILT

MIDLAND #1	480.0	60.0
MIDLAND #2	611.0	64.0

STATUS TOTAL 2 1211.0

UTILITY TOTAL 4 2148.0

Utility Listing of U. S. Central Station Nuclear Electric Generating Units

	# OF UNITS	CAP(HEI) MWE	CONSTR % COMPLETE
BEING BUILT			
ST. LUCIE #2		810.0	45.1
STATS TOTAL	1	810.0	
UTILITY TOTAL	4	2990.0	

FLORIDA POWER CORP & OTHERS OPERABLE

CRYSTAL RIVER #3		825.0	
STATS TOTAL	1	825.0	
	1	825.0	

GEORGIA POWER CO OPERABLE

HATCH #1		786.0	
HATCH #2		786.0	
STATS TOTAL	2	1572.0	

BEING BUILT

VICTRE #1		1110.0	10.0
VICTRE #2		1110.0	4.0
STATS TOTAL	2	2220.0	
UTILITY TOTAL	4	3792.0	

GULF STATES UTILITIES CO BEING BUILT

RIVER BLVD #1		934.0	11.9
RIVER BLVD #2		934.0	5.0
STATS TOTAL	2	1868.0	

# OF UNITS	CAP(HEI) MWE	CONSTR % COMPLETE
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HOUSTON LIGHTING & POWER CO BEING BUILT

SOUTH TEXAS #1		1250.0	57.9
SOUTH TEXAS #2		1250.0	21.1
STATUS TOTAL	2	2500.0	

ORDERED

ALLEN'S CREEK #1		1150.0	
STATUS TOTAL	1	1150.0	
UTILITY TOTAL	3	3650.0	

ILLINOIS POWER COMPANY BEING BUILT

CLINTON #1		933.4	71.0
CLINTON #2		933.4	1.0
STATUS TOTAL	2	1866.8	

INDIANA & MICHIGAN POWER CO OPERABLE

COOK #1		1054.0	
COOK #2		1100.0	
STATUS TOTAL	2	2154.0	

IGWA ELECTRIC LIGHT & POWER CO OPERABLE

ARNOLD #1		530.0	
STATUS TOTAL	1	530.0	

Utility Listing of U. S. Central Station Nuclear Electric Generating Units

OF CAPINETS CONSTR &
UNITS MNE COMPLETE

OF CAPINETS CONSTR &
UNITS MNE COMPLETE

NEW YORK STATE ELECTRIC & GAS CO OPERABLE

NEW HAVEN #1	1250.0	
NEW HAVEN #2	1250.0	
STATUS TOTAL	2	2500.0

NIAGARA MOHAWK POWER CORP OPERABLE

NINE MILE #1	620.0	
STATUS TOTAL	1	620.0

BEING BUILT

NINE MILE #2	1099.0	37.0
STATUS TOTAL	1	1099.0
UTILITY TOTAL	2	1719.0

IN INDIANA PUBLIC SERVICE CO BEING BUILT

BATTLI	643.0	.5
STATUS TOTAL	1	643.0

NORTHEAST UTILITIES OPERABLE

MONTEAGUE #1	1150.0	
MONTEAGUE #2	1150.0	
STATUS TOTAL	2	2300.0

NORTHERN STATES POWER CO OPERABLE

MONTECELLO	545.0	
PRAIRIE ISLAND #1	530.0	
PRAIRIE ISLAND #2	530.0	
STATUS TOTAL	3	1605.0

CHIO EDISON CO BEING BUILT

BEAVER VALLEY #2	833.0	38.2
PERRY #1	1205.0	59.4
PERRY #2	1205.0	46.5
STATUS TOTAL	3	3243.0

CHAMPA PUBLIC POWER DISTRICT OPERABLE

FGRT CALHOUN	457.0	
STATUS TOTAL	1	457.0

PACIFIC GAS & ELECTRIC CO OPERABLE

HUMBOLDT BAY	65.0	
STATUS TOTAL	1	65.0

BEING BUILT

DIABLO #1	1084.0	95.5
DIABLO #2	1106.0	88.1
STATUS TOTAL	2	2190.0
UTILITY TOTAL	3	2255.0

Utility Listing of U. S. Central Station Nuclear Electric Generating Units

OF CAPITAL CONSTR
UNITS MWE COMPLETE

OF CAPITAL CONSTR
UNITS MWE COMPLETE

PUBLIC SERVICE CO OF OKLAHOMA
BEING BUILT

SACRAMENTO MUNICIPAL UTILITY DISTRICT
OPERABLE

PUBLIC SERVICE ELECTRIC & GAS CO
OPERABLE

RANCHO SECO 918.0
STATUS TOTAL 1 918.0

SALEM #1 1090.0
SALEM #2 1115.0
STATUS TOTAL 2 2205.0

SO CALIFORNIA EDISON CO
OPERABLE

SAN ONOFRE #1 436.0
STATUS TOTAL 1 436.0

BEING BUILT

INPE CREEK #1 1067.0 23.5
INPE CREEK #2 1067.0
STATUS TOTAL 2 2134.0
UTILITY TOTAL 4 4339.0

BEING BUILT

SAN ONOFRE #2 1100.0 91.0
SAN ONOFRE #3 1100.0 63.0
STATUS TOTAL 2 2200.0
UTILITY TOTAL 3 2636.0

PUGET SOUND POWER & LIGHT CO
OPERABLE

SKAGIT #1 1277.0
SKAGIT #2 1277.0
STATUS TOTAL 2 2554.0

SO CAROLINA ELECTRIC & GAS CO
BEING BUILT

SUMNER #1 900.0 95.2
STATUS TOTAL 1 900.0

ROCHESTER GAS & ELECTRIC CO
OPERABLE

GINNA #1 470.0
STATUS TOTAL 1 470.0

TENNESSEE VALLEY AUTHORITY
OPERABLE

BROWNS FERRY #1 1065.0
BROWNS FERRY #2 1065.0
BROWNS FERRY #3 1065.0
SEQUOYAH #1 1148.0
STATUS TOTAL 4 4343.0

Utility Listing of U.S. Central Station Nuclear Electric Generating Units

OF CAPACITY COST
UNITS MW COMPLETE

WASHINGTON PUBLIC POWER SUPPLY SYSTEM BEING BUILT

UTILITY TOTAL	5	6609.0
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WISCONSIN ELECTRIC POWER CO OPERABLE

POINT BEACH #1		497.0
POINT BEACH #2		497.0

STATES TOTAL	2	994.0
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WISCONSIN PUBLIC SERVICE CORP OPERABLE

KEWAUNEE #1		535.0
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STATES TOTAL	1	535.0
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YANKEE ATOMIC ELECTRIC CO OPERABLE

YANKEE		175.0
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STATES TOTAL	1	175.0
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U.S. UTILITY NUCLEAR STEAM SUPPLY SYSTEM ORDERS ^{1/} 2/
NO. OF UNITS AND MWE NET CAPACITY

	NU.	GE MWE	WESTINGHOUSE NU.	MWE	NU.	GEN MWE	NU.	GEN. MWE	NU.	TOTALS ^{2/} MWE
THRU 1965	6	5,716.0	7	3,262.0					13	8,978.0
1966	9	7,691.0	6	5,615.0	3	2,593.0	2	1,262.0	20	16,561.0
1967	7	6,261.0	13	10,050.0	5	4,366.0	5	4,161.0	30	25,037.0
1968	3	2,199.0	4	4,532.0	3	2,177.0			14	12,908.0
1969	3	2,944.0	3	3,189.0			1	1,070.0	1	7,202.0
1970	3	2,942.0	4	4,690.0	2	2,426.0	4	4,225.0	13	13,683.0
1971	2	2,192.0	10	9,193.0	2	1,814.0			14	13,199.0
1972	4	10,776.0	9	9,562.0	1	1,218.0	2	1,960.0	21	23,516.0
1973	1	1,527.0	7	6,150.0	1	1,260.0	10	12,756.0	29	29,693.0
1974	5	6,045.0	3	3,410.0	2	2,478.0	3	3,810.0	13	15,743.0
1976					1	1,210.0	1		1	1,210.0
1977							2	2,500.0	2	2,500.0
1978			2	2,240.0					2	2,240.0
	60	56,228.0	60	64,107.0	20	19,622.0	29	31,341.0	160	172,531.0

^{1/} As of July 1, 1980

^{2/} Does not include units ordered and cancelled prior to 7-1-80

^{3/} Includes three units ordered from "Other" contractors prior to 1965 totaling 1230 MWe; does not include eight units totaling 301.3 MWe permanently shut down. Does not include Indian Point 1, rated at 265 MWe; the operating authority of this unit was revoked on 6/19/80 by the Nuclear Regulatory Commission.

INDEX

151 ALLIUS CREEK #1	98 FORKED RIVER #1	120 NORTH ANNA #3	45 SUNKY #2
57 ARKANSAS LIE #1	43 FORT CALHOUN	121 NORTH ANNA #4	85 SUSQUEHANNA #1
103 ARKANSAS LIE #2	22 FORT ST. VRAIN		86 SUSQUEHANNA #2
80 ARNOLD #1		36 OCONEE #1	
	23 CINNA #1	37 OCONEE #2	47 THREE MILE #1
48 BAILLY	126 GRAND GULF #1	43 OCONEE #3	55 THREE MILE #2
71 BEAVER VALLEY #1	127 GRAND GULF #2	20 OYSTER CREEK	90 TROJAN #1
124 BEAVER VALLEY #2			27 TURKEY POINT #3
106 BELLEFONTE #1	16 HADDAM	29 PALISADES	60 TURKEY POINT #4
107 BELLEFONTE #2	7 HALLAM	163 PALO VERDE #1	
13 BIG HUCK PT.	114 HARRIS #1	164 PALO VERDE #2	185 VANDALIA
166 BLACK FOX #1	115 HARRIS #2	165 PALO VERDE #3	42 VERMONT YAMKEE
167 BLACK FOX #2	116 HARRIS #3	6 PATHFINDER	122 VOGTLE #1
14 BUNUS	117 HARRIS #4	10 PEACH BOTTOM #1	123 VOGTLE #2
136 BHAIWOOD #1	143 HARTSVILLE A-1	39 PEACH BOTTOM #2	
137 BHAIWOOD #2	144 HARTSVILLE A-2	40 PEACH BOTTOM #3	110 WATERFORD #3
34 BROWNS FERRY #1	145 HARTSVILLE B-1	150 PEBBLE SPRINGS #1	100 WATTS BAY #1
35 BROWNS FERRY #2	146 HARTSVILLE B-2	173 PEBBLE SPRINGS #2	109 WATTS BAY #2
65 BROWNS FERRY #3	75 HATCH #1	152 PERKINS 1	170 WOLF CREEK
78 BRUNSWICK #1	102 HATCH #2	153 PERKINS 2	142 WPPSS PROJECT #1
79 BRUNSWICK #2	93 HOPE CREEK #1	154 PERKINS 3	113 WPPSS PROJECT #2
116 BYRON #1	94 HOPE CREEK #2	129 PERRY #1	161 WPPSS PROJECT #3
119 BYRON #2	8 HUMBOLDT BAY	130 PERRY #2	176 WPPSS PROJECT #4
		163 PHIP BEND 1	177 WPPSS PROJECT #5
169 CALLAWAY #1	2 INDIAN POINT #1	184 PHIP BEND 2	
171 CALLAWAY #2	26 INDIAN POINT #2	24 PILGRIM #1	4 YANKEE
61 CALVERT CLIFFS #1	59 INDIAN POINT #3	128 PILGRIM #2	101 YELLOW CRK #1
62 CALVERT CLIFFS #2		12 PIQUA	102 YELLOW CRK #2
108 CARRULL COUNTY #1	158 JAMESPORT 1	31 POINT BEACH #1	
189 CARRULL COUNTY #2	172 JAMESPORT 2	52 POINT BEACH #2	95 ZIMMER #1
134 CATAMBA #1		53 PRAIRIE ISLAND #1	56 ZION #1
135 CATAMBA #2	50 KEWAUNEE #1	66 PRAIRIE ISLAND #2	69 ZION #2
155 CHEROKEE 1			
156 CHEROKEE 2	15 LACROSSE	33 QUAD CITIES #1	
157 CHEROKEE 3	104 LASALLE #1	36 QUAD CITIES #2	
140 CLINCH RIVER	105 LASALLE #2		
147 CLINTON #1	72 LINEHICK #1	70 RANCHO SECO	
148 CLINTON #2	73 LINEHICK #2	133 RIVER BEND #1	
138 CUMANCHE #1		162 RIVER BEND #2	
139 CUMANCHE #2	51 MAINE YAMKEE	30 ROBINSON #2	
67 COOK #1	176 MARBLE HILL #1		
68 COOK #2	179 MARBLE HILL #2	41 SALEM #1	
50 COOPER	96 MCGUIRE #1	64 SALEM #2	
49 CRYSTAL RIVER #3	97 MCGUIRE #2	17 SAN ONOFRE #1	
11 CVTR	83 MIDLAND #1	100 SAN ONOFRE #2	
	64 MIDLAND #2	101 SAN ONOFRE #3	
89 DAVIS-BESSE #1	25 MILLSTONE #1	131 SEABROOK #1	
46 DIABLO #1	77 MILLSTONE #2	132 SEABROOK #2	
87 DIABLO #2	149 MILLSTONE #3	81 SEQUOYAH #1	
3 DRESDEN #1	174 MONTAGUE #1	82 SEQUOYAH #2	
21 DRESDEN #2	175 MONTAGUE #2	1 SHIPPINGPORT	
26 DRESDEN #3	32 MONTICELLO	54 SHOREHAM	
		168 SKAGIT #1	
9 ELK RIVER	18 N REACTOR	160 SKAGIT #2	
	186 NEW HAVEN #1	159 SOUTH TEXAS #1	
92 FARLEY #1	187 NEW HAVEN #2	160 SOUTH TEXAS #2	
111 FARLEY #2	19 NINE MILE #1	76 ST. LUCIE #1	
5 FERMI #1	125 NINE MILE #2	141 ST. LUCIE #2	
88 FERMI #2	74 NORTH ANNA #1	112 SUMNER #1	
91 FITZPATRICK	99 NORTH ANNA #2	44 SUNKY #1	

FLORIDA POWER & LIGHT COMPANY
EXPENDITURE REQUISITION
AUTHORIZED
AMOUNT \$ 72,400,000.00
(Line 13 + 10)

ER NO. 1624
LOCN CODE NO. 914
B I NO. 183
C.

PRELIMINARY NO. _____

LOCATION: TURKEY POINT PLANT DISTRICT SOUTH DADE DIVISION MIAMI AREA

TITLE TURKEY POINT PLANT - 760,000 KW EXTENSION (LINE #3)
EXTENSION LOCATED INSIDE ~~XXXXXX~~ CITY LIMITS ~~XX~~ FRANCHISE POINT DADE COUNTY

DESCRIPTION (Including franchise, permit, right of way, crossing, joint use data)

Install a 760,000 KW gross capability pressurized water nuclear reactor and turbine generator complete with all accessory equipment, containment, safeguards, substation equipment and systems necessary for proper operation.

PURPOSE & NECESSITY:

The need for additional system generating capacity to be located in the Miami Area for 1970 - 1971 is shown by the following tabulation:

	<u>September</u> <u>1970</u>	<u>1970-71 Winter Season</u> <u>Cold Weather</u>
Total generation	5315 MW	5444 MW
Firm generation	4883 MW	5012 MW
System load	<u>5000</u> MW	<u>5500</u> MW
System deficit in firm generation	117 MW	488 MW
Miami Area generation	1253 MW	1286 MW
Miami Area load (South of Lauderdale)	<u>2400</u> MW	<u>2200</u> MW
Deficit in Miami Area generation	1147 MW	914 MW

EASEMENTS REQUIRED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		SKETCH OR DRAWING ATTACHED NO.	PREPARED <u>J. B. Olmstead</u>	DATE <u>12/12/68</u>
PERMITS REQUIRED YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>			RECOMMENDED <u>W. H. Rogers</u>	DATE <u>12-13-68</u>
1 ORIGINAL COST OF PROPERTY RETIRED			APPROVED <u>J. H. New</u>	DATE <u>DEC 16 '68</u>
2 NET DEBIT TO ACCUM. PROV. FOR DEPRECIATION			APPROVED FOR ACCOUNTING <u>[Signature]</u>	DATE _____
3 NET ADDITIONS (4-1)	71,400,000		APPROVED <u>[Signature]</u>	DATE _____
SUMMARY OF ESTIMATED COST				
4 PROPERTY ADDITIONS, (COL. M)	71,400,000		DEPARTMENT HEAD, MCB, TRANSMISSION-DISTRIBUTION	DATE _____
5 EQUIPMENT TRANSFERRED, IN			APPROVED <u>[Signature]</u>	DATE <u>12-14-68</u>
6 EQUIPMENT TRANSFERRED, OUT			AUTHORIZED <u>[Signature]</u>	DATE _____
7 PROPERTY ADDITIONS, THIS LOCATION (4 + 5 - 6)	71,400,000			
8				
9 REMOVAL COST				
10 SALVAGE				
11 TOTAL COST OF ER (7 + 9 - 10)	71,400,000			
12 OPERATION & MAINTENANCE COSTS				
13 TOTAL COST OF JOB (11 + 12)	71,400,000			
14 NET AVAILABLE BY TRANSFER (5 - 6)				
15 CUSTOMER CONTRIBUTION, CASH/MATERIAL/ LABOR				
16 CASH REQUIRED (13 + 10 - 14 - 15)	71,400,000			

FLORIDA POWER & LIGHT COMPANY
EXPENDITURE REQUISITION
 AUTHORIZED
 AMOUNT \$68,000,000.00
 (Line 13 + 10)

ER NO. 1625
 914
 LOCN CODE NO. 184
 81 NO. C

PRELIMINARY NO. _____

LOCATION TURKEY POINT PLANT DISTRICT SOUTH DADE DIVISION MIAMI AREA

TITLE <u>TURKEY POINT PLANT - 760,000 KW EXTENSION (UNIT #4)</u>																									
EXTENSION LOCATED <u>W/IN</u> OUTSIDE CITY LIMITS <u>OF</u>	FRANCHISE POINT <u>DADE COUNTY</u>																								
DESCRIPTION (Including franchise, permit, right of way, crossing, joint use data)																									
<p>Install a 760,000 KW gross capability pressurized water nuclear reactor and turbine generator complete with all accessory equipment, containment, safeguards, substation equipment and systems necessary for proper operation.</p> <p>PURPOSE & NECESSITY:</p> <p>The need for additional system generating capacity to be located in the Miami Area for 1971 - 1972 is shown by the following tabulation:</p> <table border="1"> <thead> <tr> <th></th> <th><u>SEPT-EMR</u> <u>1971</u></th> <th><u>1971-72 WINTER SEASON</u> <u>COLD WEATHER</u></th> </tr> </thead> <tbody> <tr> <td>Total generation (without additional unit)</td> <td>6075 MW</td> <td>6204 MW</td> </tr> <tr> <td>Firm generation</td> <td>5315 MW</td> <td>5444 MW</td> </tr> <tr> <td>System load</td> <td><u>5600</u> MW</td> <td><u>6230</u> MW</td> </tr> <tr> <td>System deficit in firm generation</td> <td>285 MW</td> <td>786 MW</td> </tr> <tr> <td>Miami Area generation (without added unit)</td> <td>2013 MW</td> <td>2046 MW</td> </tr> <tr> <td>Miami Area load (South of Lauderdale)</td> <td><u>2360</u> MW</td> <td><u>2580</u> MW</td> </tr> <tr> <td>Deficit in Miami Area generation</td> <td>347 MW</td> <td>534 MW</td> </tr> </tbody> </table>			<u>SEPT-EMR</u> <u>1971</u>	<u>1971-72 WINTER SEASON</u> <u>COLD WEATHER</u>	Total generation (without additional unit)	6075 MW	6204 MW	Firm generation	5315 MW	5444 MW	System load	<u>5600</u> MW	<u>6230</u> MW	System deficit in firm generation	285 MW	786 MW	Miami Area generation (without added unit)	2013 MW	2046 MW	Miami Area load (South of Lauderdale)	<u>2360</u> MW	<u>2580</u> MW	Deficit in Miami Area generation	347 MW	534 MW
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PERMITS REQUIRED YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	RECOMMENDED <u>W. H. Rogers Jr.</u> <u>12-13-68</u>																								
1 ORIGINAL COST OF PROPERTY RETIRED	APPROVED <u>H. W. [Signature]</u> <u>DEC 16 '68</u>																								
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4 PROPERTY ADDITIONS, (COL. 4)	APPROVED <u>[Signature]</u> <u>DATE</u>																								
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6 EQUIPMENT TRANSFERRED, OUT	APPROVED <u>[Signature]</u> <u>DATE</u>																								
7 PROPERTY ADDITIONS, THIS LOCATION (4 + 5 - 6) <u>68,000,000</u>	APPROVED <u>[Signature]</u> <u>DATE</u>																								
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12 OPERATION & MAINTENANCE COSTS	APPROVED <u>[Signature]</u> <u>DATE</u>																								
13 TOTAL COST OF JOB (11 + 12) <u>68,000,000</u>	APPROVED <u>[Signature]</u> <u>DATE</u>																								
14 NET AVAILABLE BY TRANSFER (5 - 6)	APPROVED <u>[Signature]</u> <u>DATE</u>																								
15 CUSTOMER CONTRIBUTION, CASH MATERIAL LABOR	APPROVED <u>[Signature]</u> <u>DATE</u>																								
16 CASH REQUIRED (13 + 10 - 14 - 15) <u>68,000,000</u>	APPROVED <u>[Signature]</u> <u>DATE</u>																								

12/29/59

MEMORANDUM TO FILE:

Mr. Dolan of the National Association of Electric Companies advised this date that the Atomic Energy Commission had received proposals from the following cooperative and municipalities, pursuant to their invitation for a small sized nuclear power plant:

- 1.) The City of Ft. Pierce, Florida.
- 2.) Miamisburg, Ohio
- 3.) Detroit, Michigan
- 4.) Jamestown, New York
- 5.) Dairyland REA Cooperative of Wisconsin.

The press announcement will be released today.

BHF

5/17/59

U. S. Atomic Energy Commission
Washington, D. C.

Florida Nuclear Energy and Irrigation
State Capitol
Tallahassee, Florida

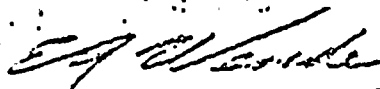
Gentlemen:

Enclosed for your information, and any action you feel appropriate, are the following:

1. A letter of invitation to cooperatives and publicly-owned power organizations soliciting proposals to participate with the Commission in the design, construction and operation of a small size nuclear power plant,
2. A news release, publicly announcing AEC's inviting proposals for a small size nuclear power plant, and
3. An information sheet on proposals.

We appreciate your interest in our small size nuclear power plant program.

Very truly yours,



E. A. Wende
Acting Manager
Oak Ridge Operations

Enclosure:

Cpy letter of invitation w/encs, 2-3-59

1. _____
 2. _____
 3. _____
 Return to W. S. McDonald

City FORT PIERCE, FLA
 Paper NEWS TRIBUNE
 Date Sept. 6, 1959 Page 6 Sect 1
 Office Mailed From Stuart

Copies	For
White	- Office Circul
Blue	- Permanent Rec
Yellow	- Special File

Atomic Electricity... For Us? Maybe!

An atomic reactor for the generating of electricity for Fort Pierce? ... It's a possibility! The first hurdle was taken when the City Commission, at its meeting last Monday night, decided it was interested in investigating the matter fully and completely.

To say that the commission was interested would, in our opinion, be a definite understatement. We have an idea that, individually and collectively, the members of the commission are decidedly intrigued by the possibilities. If, after a detailed investigation, the picture looks as good as it does now, an all-out pitch for the reactor plant would be in order.

In making a bid for the atomic reactor, Fort Pierce would be in competition with other communities throughout the country. This is an experimental project of the federal government, handled through the Atomic Energy Commission. Its purpose is to determine whether steam, for the generation of electricity, can be produced through the use of atomic energy at a cost comparable to present conventional methods; that is, boilers using either oil or coal as fuel.

The government will select the community where the experimental reactor will be built ... and that community, as we see it, will have nothing to lose and much to gain. That might seem to make the odds against being the community selected too long to warrant making a bid. But the odds don't actually work out that way. For one thing, the government specifies that the atomic reactor will be built to furnish steam for a 16,500 kw generator. That eliminates many communities immediately. For larger cities, an addition of 16,500 kw wouldn't be enough to bother with ... and for many smaller cities, it would represent too much additional capacity.

For Fort Pierce it would be JUST RIGHT! Then, too, an atomic reactor takes lots of fresh water—more than conventional methods—to produce the same amount of steam. Many cities which might

Fort Pierce has plenty of fresh water. So the odds narrow down.

Would an atomic reactor fit into the long-range program for Fort Pierce? On the basis of known facts, it would seem to fit perfectly. It would: . . .

SAVE MONEY. While the community selected would have to provide a site, furnish a conventional turbo-generator and some allied services, the city would save the cost of boiler facilities to go with another 16,500 kw. of generating capacity . . . and that would be a substantial saving indeed.

MEET SCHEDULE. The forecast for the growth-need of Fort Pierce for additional electrical generating capacity calls for having another 16,500 kw generator ready to go on the line by the fall of 1962. The schedule for the government's experimental atomic reactor calls for construction to start in May of 1960, and be finished by May of 1962. The pieces couldn't fit together more perfectly.

NO PURCHASE COMMITMENT. While it would be necessary to guarantee the purchase of steam from the atomic reactor at a satisfactory price, the community selected does NOT guarantee to purchase the reactor itself. The reactor to be built will be experimental . . . at this time, no one knows whether it will generate at a greater, or a lesser, cost than conventional methods. After five or ten years, the community can buy the reactor, or tell the government to take it back, whichever is preferable.

One of the greatest plus factors for the fortunate community would be the resulting national—and—international—publicity. It would get Fort Pierce into the news for years to come . . . and it would prove a focal point which would bring visitors from all over the world to see it in operation.

The selection of Fort Pierce for the experimental atomic reactor . . .

FLORIDA POWER & LIGHT COMPANY
INTER-OFFICE CORRESPONDENCE

LOCATION *St. Pierre, Fla.*
DATE *Sept. 11, 1959*

TO *Mr. R. D. Hill*
FROM *A. J. Ennis*

COPIES TO

SUBJECT:

Page 6 Thursday, September 10, 1959

Atomic Electricity... For Us? Maybe!

An atomic reactor for the generating of electricity for Fort Pierce? . . . it's a possibility! The first hurdle was taken when the City Commission, at its meeting last Monday night, decided it was interested in investigating the matter fully and completely.

To say that the commission was interested would, in our opinion, be a definite understatement. We have an idea that, individually and collectively, the members of the commission are decidedly intrigued by the possibilities. If, after a detailed investigation, the picture looks as good as it does now, an all-out pitch for the reactor plant would be in order.

In making a bid for the atomic re-takes lots of fresh water—more than conventional methods—to produce the same amount of steam. Many cities which might otherwise qualify would rather conserve water than get an atomic reactor . . .

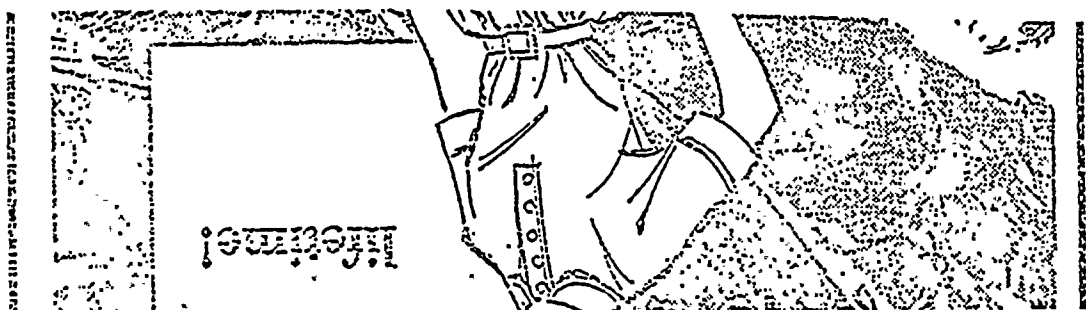
Fort Pierce has plenty of fresh water. So the odds narrow down.

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SAVE MONEY. While the community selected would have to provide a site, furnish a conventional turbo-generator and some allied services, the city would save the cost of boiler facilities to go with another 16,500 kv. of generating capacity . . . and that would be a substantial saving indeed.

MEET SCHEDULE. The forecast for the growth-need of Fort Pierce for additional electrical generation in operation.

The selection of Fort Pierce for the experimental atomic reactor isn't for sure by any means . . . but, for sure, it looks like it would be a great thing!



Cost
100 Florida
100 Your Company
100 You!

RECEIVED

AUG 7 1959

OS - Sugar -

Five marked points of
possible interest -

File


GEORGE KINSMAN

8-3-59

MEMO

Oak Ridge, Tennessee
August 3, 1959

Gentlemen:

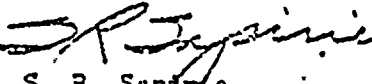
The Commission is designing and plans to construct a small size pressurized water reactor. You are hereby invited to submit a proposal for participation under which, as a minimum, you would be expected to furnish the site, the conventional turbogenerating facilities and certain other services. The proposal should be in accordance with the attached public announcement and information sheet.

It is recognized that the attached documents, in their present form, do not provide the detailed information upon which can be based a definitive and complete proposal. They are intended primarily to provide a basis for the determination of possible interest by eligible organizations and to permit preliminary work on proposals. Meanwhile, we are planning to issue supplemental information about October 1, 1959, which will include the following items:

1. Model contract.
2. Detailed technical performance characteristics of the nuclear reactor system.

Indications of interest by September 15, 1959, are requested. If there are questions or need for additional information regarding any aspects of this invitation, please submit requests to the undersigned, U. S. Atomic Energy Commission, Post Office Box E, Oak Ridge, Tennessee. X

Very truly yours,


S. R. Sappington
Manager
Oak Ridge Operations

Enclosures:

1. News Release
2. Information Sheet

UNITED STATES
ATOMIC ENERGY COMMISSION
Oak Ridge, Tennessee

ATTACHMENT

8-3-59

Information for Press, Radio and TV (No. 65)
FOR IMMEDIATE RELEASE

Telephone No.
Oak Ridge 5-8611
Extension 4231

AEC INVITES PROPOSALS FOR
SMALL SIZE NUCLEAR POWER PLANT

John A. McCone, Chairman of the Atomic Energy Commission, today announced that the Commission is designing and plans to construct a small size pressurized water reactor. Accordingly, the Commission is inviting proposals from cooperatives and public power organizations for participation in the project. The proposer is expected to provide, as a minimum, the site, the conventional turbogenerating facilities, and certain other services.

The small size power plant is planned under the Commission's Power Demonstration Reactor Program. The project will have as its major objective the development of a reactor which will make a significant contribution to achievement of economical electric power in a small size plant. Construction is expected to begin about May 1960 with completion of the plant scheduled for May 1962.

The proposed plant would use a pressurized water reactor for the generation of about 60,000 kilowatts thermal and 16,500 kilowatts electrical power. Installation of oil & coal fired a superheater, which would make it possible to increase the electrical capacity of the plant to 22,000 kilowatts, could be included at the option of the proposer.

The cooperatives and public power organizations would be expected to make a contribution which should include, as a minimum, provisions for plant site, turbogenerating facilities, and associated buildings and services. Contributions beyond the minimum provisions will be considered in the final selection of a proposal by the Commission.

Under the terms of invitation, the organization selected would provide for the training of operating personnel and, upon mutual agreement, assume responsibility for

the operation of the entire plant and purchase steam from the Commission at rates based on the present or projected cost of comparable steam from a plant using conventional fuel at the same general location. After a period of not more than ten years, the reactor portion of the plant would be offered for sale by the Commission to the plant operator.

Deadline for receipt of proposals is November 16, 1959. The Commission reserves the right to reject any or all proposals. If no satisfactory proposal is received, the Commission will consider construction of the plant at a Commission site at Commission expense.

Decision to build the proposed power plant resulted from a study made by the Commission's Oak Ridge Operations, which has been given responsibility for the small size nuclear power plant program. Results of the study indicated a wide interest by public power organizations in participating in a small nuclear power plant project.

Selection of the pressurized water reactor concept for this first plant was made after consideration of the following factors:

1. The technology is sufficiently advanced to permit construction without additional research and development and to give a high degree of assurance that plant operation will be reliable;
2. The concept has a potential for significant engineering improvement leading to lower power generating costs;
3. The study did not indicate any clear economic advantage for any other concept;
4. Currently no nuclear power plant in this size range utilizing a pressurized water reactor is under construction in the United States.

The Commission is giving serious consideration to the issuance in the near future of an additional invitation to cooperatives or publicly-owned organizations for proposals to cooperate in the design and construction of another small nuclear power plant utilizing a boiling water reactor.

Additional information concerning the project may be obtained by writing:

S. R. Safford, Manager
U. S. Atomic Energy Commission
Oak Ridge Operations
Post Office Box "37"
Oak Ridge, Tennessee.

#

(NOTE TO EDITORS: This information is being issued simultaneously by the Atomic Energy Commission in Washington, D. C.)

73159

ATTACHED
8-3-59

INFORMATION SHEET ON PROPOSALS
FOR
SMALL SIZE NUCLEAR POWER PLANT

1. Submission Date for Proposals

Proposals must be submitted no later than November 16, 1959.

2. Who May Submit Proposals

Proposals may be submitted from cooperative or publicly-owned organizations, or from groups of such organizations.

3. Location of Proposed Power Plant

The site is to be within the United States, its territories and possessions, the Canal Zone, or Puerto Rico.

Analysis of the site must give reasonable assurance that the potential effluents therefrom, as a result of normal operation or the occurrence of any credible accident, will not create undue hazard to the health and safety of the public.

4. Schedule of Construction

It is desired to complete the project at the earliest practicable date.

The AEC's present plans call for initiation of field construction about May 1960 and completion of construction about May 1962.

5. General Design Features

The heat source for the power plant will be a pressurized, light-water cooled and moderated nuclear reactor having a capability of about 60,000 thermal kilowatts. Saturated steam from the reactor facility will supply a turbogenerator at a gross electrical output of about

16,500 kilowatts; or, in conjunction with a fossil-fueled superheater, at a gross electrical output of about 22,000 kilowatts. The pressure of the saturated steam from the steam generator will probably be in the order of 500 psig to 600 psig. The final pressure will be furnished as the result of detailed design studies by October 1, 1959.

The fuel elements will use a single assay of slightly enriched (not more than 10% U-235) uranium oxide clad with either Zircalloy-2 or stainless steel. The fuel element design is to make maximum use of presently available specifications and is to be based upon an average exposure of 10,000 Mwd/tonne uranium or better.

The primary consideration in this program is the production of electrical power in as economical a manner as possible; thus, adaptability of the reactor to experimental use, inclusion of experimental facilities, by-product use, or accommodations for use of postulated future technology and increased capacity will not be a primary consideration in the plant design.

6. Major Program Objectives

This program has as its major objective the design, construction and operation of a reactor which will make a significant contribution to the achievement of economical power in a small size nuclear power plant. Included objectives are as follows:

- a. To provide a clear-cut demonstration of the present position of such a plant relative to a similar size conventional fossil-fuel plant in the same location.
- b. To define elements of potential future cost reductions through detailed analysis of construction and operating experience.

- c. To provide a basis for a research and development program directed towards the design and construction of small civilian power reactors of advanced design.

7. General Nature of Contractual Arrangement

The Commission seeks proposals as a basis for an arrangement with a cooperative or publicly-owned organization under which the reactor is to be financed in major part by the Commission and is to be owned by the Federal Government. Such arrangement would comprise a contract with the Commission with respect to the provision of a site and conventional turbogenerating facilities, the operation of the entire plant including training of personnel, the sale by the Commission of steam from the reactor complex to the participating organization, and other relevant matters.

The plant would be operated by the participating organization under contract with the Commission for such a period of time as the Commission determines to be advisable for demonstration purposes but not less than five years nor more than ten years. The initial contract period will be five years with provision for extension at the option of the Commission. Upon completion of operation for demonstration purposes the plant would be sold to the participating organization, or dismantled as provided by law.

8. Scope of Capital Contributions by Participants

By Commission: The Commission may contribute as a maximum and make arrangements for, the design, fabrication and installation of the nuclear reactor portion of the power plant. Examples of included items are

reactor core structure, reactor pressure vessel, control rod system, initial fuel loading, fuel handling and storage equipment, shielding, primary coolant system including pump and heat exchanger (steam generator), reactor containment building, instrumentation related to control of the reactor system, radiation and health physics monitoring equipment, mineral waste disposal system, purification system for reactor water, and service lines within the reactor containment building for connection adjacent to the building to service supply lines provided by the cooperative or publicly-owned organization.

By Cooperative or Publicly-owned Organization: The organization is expected to finance and make all arrangements for the detailed design, fabrication and installation of all additional items necessary to integrate the nuclear reactor system provided by the Commission into a complete generating facility capable of being incorporated into an existing electrical transmission system. Thus, the minimum contribution by the organization is expected to include, but not be limited to, provision of a site, site improvement, roads, utilities, turbogenerator set and associated equipment such as condenser system, and associated piping and valving; suitable building structure for the above, including a central control room, office, storage, repair shop, etc.

The AEC's studies indicate economic merit in associating a fossil-fueled superheater with the reactor in order to produce steam of a quality comparable to that produced by modern conventional plants. This feature is reserved to the cooperative or publicly-owned organization as an optional item to be provided at its own expense. Such additional contributions will be a consideration in selection of a final proposal by the Commission.

The Commission desires the right of approval of all major contractors selected by the participating organization for the above described work.

9. Reimbursement for Operating Expenses

The participating organization would operate the entire plant as an integrated unit.

The proposal should state the extent of reimbursement of actual reactor plant training and operating costs desired by the operator. The degree of such reimbursement requested will be a factor in the consideration of the proposal.

As a maximum, expenses will be reimbursed to the extent that the total expenses actually incurred is in excess of those that would have been incurred if the reactor portion of the plant were a conventional steam generating unit, taking into account the value received for steam delivered.

10. Sale of Steam

Sale of steam by the Commission under contract with the cooperative or publicly-owned organization would be at rates based upon the present cost of, or the projected cost of, comparable steam from a unit or units using conventional fuels at such a location. Thus, the sale price will take into consideration the following factors:

- a. Cost of fossil-fuel which would otherwise have been burned.
- b. The full cost, direct and indirect, of operation and maintenance of a conventional boiler having a capacity comparable to that developed by the nuclear reactor portion of the plant.

- c. All costs that would have been incurred by the participating organization in the nature of amortization and other fixed charges on a conventional boiler having a capacity comparable to that developed by the nuclear portion of the plant.

Additional details concerning the method of calculating the price of steam will be provided in the later supplement to this invitation.

The value of the reactor produced steam will be a factor in the consideration of the proposal.

11. General Consideration in Site Selection

A number of factors are identified below, for general guidance purposes, which are considered basic to selection and evaluation of reactor sites:

- a. Exclusion distance around power reactors. Each power reactor should be surrounded by an exclusion area under the complete control of the operator of the facility. The size of area will depend upon many factors including among other things reactor power level, design features, and containment and site characteristics.
- b. Population density in surrounding areas. Power reactors should be located in areas of low population density.
- c. Meteorological Considerations. The capabilities of the atmosphere for diffusion and dispersion of air-borne radioactivity should be considered in assessing the vulnerability of the area surrounding the site. Thus, a high probability of good diffusion conditions and a wind direction pattern away from vulnerable areas during periods of slow diffusion would enhance the suitability of the site.

- d. Seismological considerations. The earthquake history of the area in which the reactor is to be located is important and affects the design and construction of the facility and its protective components. A site should not be located on a fault.
- e. Hydrology and Geology. The hydrology of ground and surface waters, including site drainage and the geology of the site should be favorable for the management of any radioactively-contaminated liquid and solid-effluents that might accidentally result from reactor operations.

The Commission has published and invited public comment on a statement of factors for consideration in site selection. The initial version of the text may be obtained by reference to Notice of Proposed Rule Making published May 23, 1959, in the Federal Register and entitled "Factors Considered in Site Evaluation for Power and Test Reactors".

12. Information to be Furnished in Proposal

- 1. Introduction to proposal including:
 - a. Identification of organizations submitting proposal or assisting in its development.
 - b. General acceptance of provisions and objectives established by AEC in invitation as follows:
 - (1) Recognition and acceptance of the objective to demonstrate and establish minimum over-all power generating costs consistent with present technology, including mutual recognition of need to properly integrate nuclear and conventional portions of the plant during the periods of design, fabrication, installation and operation of the facility; and need for

proposer to provide, on a periodic basis for further dissemination of all technical and economic data resulting from design, construction and operation of the generating facility.

(2) Recognition and acceptance of the objective to have nuclear plant operated as a base load facility after a suitable testing and start-up period.

(3) Recognition and acceptance of Commission's objective that the cost of steam sold to the operator should be, as a minimum, equivalent to the cost he would incur through the construction and operation of a conventional plant at the same site with the same gross capability.

(4) Recognition and acceptance of Commission's requirement for right of approval of proposer's design firm, prime construction contractor and key personnel for generating plant operation.

c. Design and construction schedule for all facilities to be furnished by the proposer.

2. Detailed Organizational Description (principal and associates if applicable).

a. Brief history and description of proposing organization(s) including nuclear experience, if any.

b. Brief summary of facilities now being operated and services now being furnished.

c. Current financial statement and detailed statement of proposed sources of funds to finance project contributions.

d. Current and projected demand curve until January 1, 1967, and any existing plans to meet projected increases in demand.

- e. Current and projected station requirements with specific designation of hydro-electric capacity and standby plants.
- f. Estimated required and probable degree of utilization of nuclear plant on a yearly basis over the five years following completion of construction and testing to meet anticipated load demands.
- g. Detailed description of proposed project organization including total number of personnel and names and background of key personnel to be assigned to project and those who will be made available to participate in an extended training program designed to provide a qualified staff to operate the complete integrated facility.

3. Detailed Description of Capital and Other Contributions (excludes site, see Section 4. below)

- a. Description of existing facilities, if any, including estimated value (with cost breakdown of same) to be made available to project.
- b. Estimated value of new facilities (with cost breakdown of same) to be provided as part of minimum capital contribution including identification of proposed design and construction firms, if known.
- c. Description and estimated value of other proposed commitments or services with estimated value and cost breakdown.
- d. Availability of construction and operating labor and service facilities (water, power, telephone, etc.) convenient to proposed construction site.

4. Detailed Site Description

- a. Proposed arrangements for making site available, value of site, and plot plan or plans showing the boundaries and dimensions of the site, the location of the plant, topographical features on and near the site, and nearby facilities either existing or anticipated, such as roads, railroads, factories, residential areas, schools, hospitals, etc.
- b. Population density including its variation and land usage within a radius of 10 miles of the site; both numerical information and a map showing urban areas.
- c. General available information on site covering meteorology, hydrology, geology and seismology.
- d. Information on intended future use of land comprising the proposed exclusion area and adjacent land in the nearby vicinity.

5. Detailed Basis for Purchase of Steam

- a. Description and breakdown of capital and operating cost of conventional plant (either hypothetical or existing) at equivalent location to be used as basis for establishment of purchase price of steam.
- b. Also show estimated present delivered cost of fossil-fuel in cents per million Btu, and heat rate or efficiency from fossil-fuel to steam output of boiler.

13. General Criteria for Evaluating Proposals

1. Responsiveness to Commission objectives and requirements as stated in Section 12.1 hereof.
2. Over-all cost to the Commission during the design, construction, start-up and testing period and throughout an initial five-year operating period.

3. Degree of competitiveness of nuclear plant to conventional plant of equal capability in area chosen for construction of nuclear plant.
4. Technical and financial competence of proposer, either by himself or in combination with others from whom he has received commitments, to meet the responsibilities entailed in the proposal.
5. Suitability of proposed site.
6. Ability to meet Commission's proposed designated construction schedule.

14. Right to Reject Proposals

The Commission reserves the right to reject any or all proposals. If no satisfactory proposal is received, the Commission may proceed with the design, construction and operation of the proposed facility on a selected Commission site.

MINUTES OF MEETING ON NUCLEAR POWER
NOVEMBER 27, 1961
OFFICES OF MR. W. J. CLAPP
FLORIDA POWER CORPORATION - ST. PETERSBURG

Those Present: W. J. Clapp
Robert H. Fite
H. K. McKean
Fischer S. Black

Three matters were brought up before the group for discussion. These were: The merits of setting up an Atomic Power Committee made up of representatives of the three companies; investigation of the proposal presented by General Atomic Division of General Dynamics Corporation in their letter of November 7, 1961, and the preparation of a press release covering the decisions to be made.

In the matter of the formation of a committee, it was decided that the representatives would recommend that a committee be formed consisting of George Kinsman, Florida Power & Light, Chairman with Ray Welch representing the Tampa Electric Company and Donald Roland representing Florida Power Corporation. The duties of this committee will be to carry on continuing studies of nuclear reactor types which may eventually become economical. The committee will be expected to investigate individual reactor types developed by various manufacturers and make reports indicating the potential feasibility where it is apparent that the reactor type has possibilities of becoming competitive.

In the matter of the proposed study referred to in the letter from General Atomic of November 7, 1961, it was decided that this matter would be referred to the Atomic Power Committee for their consideration.

The matter of giving out a press release was discussed and it was decided that at the appropriate time some information on the formation of the Atomic Power Committee should be released but no decision was reached as to the method to be used.

ATOMIC POWER COMMITTEE FORMED

Officials of the Florida Power & Light Company, Florida Power Corporation and Tampa Electric Company announced today the formation of an Atomic Power Committee.

This Committee, made up of representatives from each Company, will carry on continuing studies of nuclear reactor types which may eventually be economical. It is the opinion of the group that no type of nuclear plant has yet been proven competitive with Florida generating plants operating on coal, oil or gas.

However, the three companies are anxious to maintain continuing studies of all types of generating facilities to assure our customers of the lowest cost power available.

Since a great deal of research work is being carried on over the country on various reactor types many developments are expected over the next few years.

Maintaining up-to-date information on all of these projects and evaluating them as they progress will be one of the principal duties of this Committee.

FLORIDA POWER & LIGHT COMPANY

JAN 8 1962

January 8, 1962

Mr. Fischer S. Black
Executive Vice President
Tampa Electric Company
Tampa, Florida

Dear Fischer:

Upon my return from vacation I found the correspondence regarding the formation of an Atomic Power Committee of our three companies and the suggestion that I act as chairman. I shall be very glad to serve in that capacity and will get in touch with you and Mr. Clapp in the very near future to arrange a meeting in the Tampa Bay area.

Kindest regards and best wishes for the new year.

Sincerely,



George Kinsman
Vice President

GK:st

cc: R. H. Fite ✓
W. J. Clapp

*How agreed
Feb 10 1964
This is not correct
We should
Participate
at all*

FLORIDA POWER CORPORATION

St. Petersburg 1, Florida

February 7, 1964

200

Mr. W. B. McGuire, President
Duke Power Company
422 S. Church St.
Charlotte 2, N. C.

Dear Bill:

Pursuant to your telephone conversation yesterday please be advised that Florida Power & Light Company, Tampa Electric Company, and Florida Power Corporation accept the responsibility for the assessments outlined at our meeting in Atlanta on January 31, for payments in connection with the financing of the proposed study of the Savannah River Nuclear Power Project.

My understanding is that the range for these figures is as follows:

	<u>\$300,000.</u> <u>survey cost</u>	<u>\$400,000.</u> <u>survey cost</u>
Florida Power & Light Co.	45,333.	60,444.
Tampa Electric Company	5,265.	7,020.
Florida Power Corporation	17,827.	23,769.

✓

It is understood that Mr. George Kinsman will be assigned to serve on the Technical Committee, representing the Florida Power & Light Company; and Mr. R. D. Welch, the Tampa Electric Company. With these two capable gentlemen representing Florida, it is not felt that Florida Power Corporation will need to have a representative.

By copy of this letter I am asking Messrs. Flite and MacInnes to notify you directly as to whom they will appoint to serve on the Management Committee with you. I will be the representative for our Company.


I think it is fine that you have agreed to take on the

2-7-64

Chairmanship of this activity, and look forward to working with you.

Best regards.

Sincerely yours,


W. J. Clapp
President

cc:

Mr. R. H. Fite ✓
Mr. W. C. MacInnes
Mr. Fischer S. Black
Mr. George Kinsman

December 4, 1959

Mr. Harllee Branch, Jr., President
The Southern Company
1330 West Peachtree Street, N. W.
Atlanta 9, Georgia

Dear Harllee:

I have received a copy of your round-robin letter of November 27 which enclosed a copy of the section of the EEI Task Force report dealing with nuclear power.

As you know, we have been following the situation closely, and our Company undoubtedly will enter the nuclear power field when it becomes competitive. Accordingly, we feel that the following statement contained in the proposed report is inaccurate and unrealistic: "The higher prevailing fuel costs in Florida and New England create an incentive for introducing nuclear power." That statement will no doubt be true when the costs of nuclear energy are in line or less than such high prevailing fuel costs in Florida.

We hope that the EEI Task Force Committee will see fit to either delete or revise the statement in question before the report is submitted to the Select Committee on National Water Resources, created pursuant to SR 48, 86th Congress.

It is our thought that a lot more development and research will have to take place before nuclear power can compete either here or in New England. There are a lot of questions, as you well know, besides the single factor of cost of fuel. I refer to such items as the reliability of an atomic plant, length of time required to overhaul such plants, operating costs, number of

Mr. Harllee Branch, Jr.

-2-

December 4, 1959

people required to operate such a plant, as well as the much higher costs of installation which are still three times or more what we are currently spending per kilowatt for conventional steam plants.

I hope this letter is getting off in time so that our requests with respect to changes in the report can be considered.

Very best Season's Greetings to you.

Sincerely yours,

Robert H. Fite
President & General Manager

RHF:bh

Bcc: Mr. W. J. Clapp)
Mr. W. C. MacInnes) Per Mr. Fuqua
Mr. L. T. Smith, Jr.)

Light Water

How the Nuclear Dream Dissolved

Irvin C. Bupp & Jean-Claude Derian

Basic Books, Inc., Publishers

New York

CHAPTER 2

A "Great Bandwagon Market" for Light Water in the United States

- B90 -

IN DECEMBER 1963, the Jersey Central Power & Light Company announced its purchase of a 515 MW light water reactor from General Electric. To explain its decision, Jersey Central offered a reason no one had ever heard before: the Oyster Creek plant would produce electricity more cheaply than any other generating system. Also unique was the non-participation of the U.S. Atomic Energy Commission. For the first time a nuclear power plant would be built without any direct subsidy. The manufacturer of the proposed nuclear power plant had offered to build the complete generating facility for a price which, between the beginning and the end of the multi-year project, could change only according to certain indices to correct for monetary inflation.

Jersey Central's decision was widely regarded as a milestone in the development of power reactor technology. It was ac-

A "Great Bandwagon Market" in the U.S.

43

cepted as proof that the day when nuclear power plants would be sold through the United States in direct competition with conventional plants was very close at hand, if indeed it had not already arrived.

Several weeks after its initial announcement, Jersey Central released an economic analysis of the Oyster Creek project. According to the principal trade journal of the American nuclear industry, this analysis "confirmed in the strongest possible way" that earlier economic evaluations of nuclear power had become "obsolete." Jersey Central's report, said the *Forum Memo*, established that the costs of building and operating large light water power plants were "now at levels which would have seemed incredibly low a year ago."¹

The electric utility believed that within five years of start-up, its nuclear plant would be more economical than any conventional power source. To make a coal-fired station at the Oyster Creek site competitive with the nuclear plant, for example, the cost of coal delivered to the plant would, according to the Jersey Central economic analysis, have to have been less than 20¢ per million British thermal units (20¢/mbtu).² At the time, the average cost of coal consumed by American utilities ranged from a high of more than 35¢/mbtu in New England to less than 20¢/mbtu for plants close to the Appalachian coal fields. Jersey Central's own average coal costs were about 29¢/mbtu.

The assumption that the proposed nuclear power plant could be operated steadily at a power level about 20 percent higher than its guaranteed rating was important to the economic justification for the purchase. Based on a "stretched" capacity of 640 MW, the utility's analysis projected an initial construction cost of approximately \$100/kw, a figure which the *Forum Memo* said would have been "almost unimaginable a year ago."³ (The initial construction cost of a reactor, or its "capital cost," is usually expressed in \$/kw. This figure is obtained by dividing the total cost of the plant by its size.)

Another crucial element in the utility's economic analysis

was the expectation of an extraordinarily high capacity factor. Jersey Central postulated that the nuclear plant could be operated at an average capacity factor of 88 percent over the first half of the plant's projected 30-year life. The capacity factor is the ratio of the amount of electricity per year the plant produces to the amount it could theoretically produce if it operated nonstop at full capacity. This ratio can never be 100 percent because of inevitable maintenance, fuel reloading, and repairs.

In February 1964, spokesmen for General Electric maintained that the low cost of the Oyster Creek plant was by no means unique.⁴ General Electric was also furnishing another utility in upper New York State, Niagara Mohawk, with the major components for its "Nine-Mile Point" nuclear station at prices "in line" with those for Oyster Creek. In addition, the company intended to publish a price list for nuclear plants of many sizes. The Westinghouse Electric Company was quick to match General Electric's price quotations with its own for a slightly different type of light water system, the "pressurized water reactor." A race had clearly begun. So, too, had a rather curious "debate" about the meaning of these events.

Background to Oyster Creek: Debate without Disagreement

In November 1962, the U.S. Atomic Energy Commission sent to the White House a study titled: *Civilian Nuclear Power—A Report to the President—1962*. It quickly became a benchmark reference document for the American nuclear power industry. In it, the AEC claimed that significant progress had been made in nine years since Shippingport was authorized by Congress. It estimated that the costs of electricity

generated by light water reactors had been reduced, from about 50 mills/kwh⁵ at Shippingport in 1958 to less than 10 mills/kwh in contemporary plants. This cost was expected to plummet to an estimated 5.6 mills for a large plant soon to be built by the Pacific Gas and Electric Company at Bodega Bay, California. The Commission was optimistic about the future economic prospects for light water reactors, concluding that nuclear power was "on the threshold of economic competitiveness" and could "soon be made competitive in areas consuming a significant fraction of the nation's electrical energy."⁶ Relatively modest assistance by the government would ensure that threshold was crossed in good time.

So it was that the Jersey Central announcement, coming less than two years after the release of the AEC study, seemed to confirm official optimism about the progress of reactor commercialization. The Commission had estimated in 1962 that light water reactors entering operation in 1980 would produce electricity for only 3.8 mills/kwh during the first five years of their operation. Yet, the Oyster Creek plant, scheduled for first operation in 1968, would meet that goal years earlier.

Few informed persons in either industry or government publicly questioned this rosy picture. Philip Sporn, President of the American Electric Power Company, was virtually alone in challenging these economic analyses of nuclear power. At the request of the Congressional Joint Committee on Atomic Energy, Sporn reviewed the AEC's 1962 Report. In his view "excitement and preoccupation with nuclear fission" had produced a "disposition to sweep certain difficult or unpleasant facts connected with nuclear technology under the rug."⁷

Nevertheless, Sporn was far less critical of the estimates of nuclear electricity's cost than he was about the comparative economics of nuclear and fossil generating plants. His principal contention was that the nuclear industry and the government had been insufficiently attentive to the rate of progress in conventional generating technology. Sporn argued

that fossil fuel technology was still in a state of dynamic development. Between 1900 and 1960, there had been an eightfold increase in the amount of electrical energy that could be extracted from conventional fuels, and in his view, this spectacular progress was still not at its end. He also contended that the AEC had made an "improper appraisal" of the present and future costs of conventional fuels. He pointed out that in many parts of the world the cost of both coal and oil were far cheaper in 1962 than they had been in 1952. Moreover, there was a "veritable glut" of energy in many of the technologically and economically advanced countries.⁸

The AEC criticized Sporn for his pessimism, and he received surprisingly little support from those in competitive fuel industries who might have been expected to welcome his skepticism. The coal industry focused on the secondary issue of whether it was legitimate to attempt a comparative economic analysis of the two technologies when one of them benefited from various government subsidies. We found no indication that anyone raised the more fundamental point of the uncertainty involved in making cost estimates for nuclear plants for which there was little prior construction experience and of nonexistent industrial processes necessary to use uranium in light water reactors.

Sporn himself acknowledged that his sole source of information on nuclear economics had been presentations made to his own company by reactor manufacturers. He also explicitly noted his concurrence with the two key assumptions of the reactor manufacturers' own analyses. The first of these was that it was possible to predict costs of nuclear power plants which were two to three times larger than those already operating. Second, the companies believed that "learning effects" would help reduce costs in the early years of nuclear plant construction. Sporn accepted both of these assumptions with only minor reservations.⁹

In its reaction to Sporn's analysis, General Electric objected: "We feel that Mr. Sporn's choice of a reference reactor sys-

tem may have been unduly conservative. For example, the capital cost for a 460 MW plant . . . is \$30/kw higher than we are presently quoting for a complete plant (of comparable size.)"¹⁰ This difference of \$30/kw between Sporn and General Electric represented less than a 15 percent difference in their estimate of the total capital cost of nuclear power plants. This narrow difference would appear to be well within the inevitable band of uncertainty for any first-of-a-kind technology. A skeptic might have supposed that reactor construction and operating experience in 1963 was hardly sufficient to allow cost predictions for new, larger plants at this level of precision, but no one seemed prepared to acknowledge this fact. Rather, the AEC agreed with General Electric that ". . . Mr. Sporn could have been more optimistic in his economic appraisal of the nuclear alternative."¹¹ All of the participants in the first public debate on the economic status of nuclear power agreed that there were highly predictable economic benefits to be derived from scale economies and learning by experience. These expectations were, of course, consistent with the experience of other high technology industries at that time.

The disagreements about the capital cost of reactors among the manufacturers, Sporn, and the government were on the order of 10 to 15 percent. There were few skeptics to challenge the basis for this relative certainty. The distinction between empirically supported fact and expectation—often quite obviously self-interested expectation—was blurred from the beginning in the discussion of nuclear power economics.

Nonetheless, by early 1963, there was a consensus on the estimated costs of electricity from light water reactors. The government and the reactor manufacturers were at one extreme, predicting about 5.8 mills/kwh; and Sporn was at the other, predicting about 7.6 mills/kwh—a relatively small difference of about 25 percent. Contemporary costs of electricity from fossil fuels ranged between 4.3 mills/kwh and 6.4 mills/kwh. Hence, depending upon the assumptions one

chose to work with, nuclear power was either "quite competitive," "almost competitive," or "not yet competitive," in 1963.

The AEC's 1962 Report to the President had argued that dramatic developments in the reactor commercialization process were close at hand. Nuclear power would soon be able to compete with conventional generating technologies. Discussion of the AEC's conclusions revealed a range of differences narrow enough to justify serious consideration by electric utilities of the purchase of nuclear power plants.

Aftermath of Oyster Creek: A "Great Bandwagon Market"

In the year following the Atomic Energy Commission's 1962 Report, intense competition developed between General Electric and Westinghouse over several potential nuclear power plant sales. During those crucial months the two major vendors evidently decided to take drastic action to gain an assured market share in what would soon be a lucrative business. The result was a series of "turnkey" offers to build a complete nuclear generating facility at a contractually secured, "firm" price. The manufacturers committed themselves to deliver complete nuclear power generating stations at prices subject to change only according to a formula designed to reflect monetary inflation. They would assume responsibility for the cost of materials and equipment manufactured by other companies as well as the responsibility for managing the entire construction project. All the electric utility had to do was "open the door" of its complete plant at a specified date in the future and start the generating equipment—hence the name "turnkey."

The Jersey Central Power & Light Company was the first

utility to accept such an offer for its Oyster Creek plant. The cost of electricity General Electric guaranteed to Jersey Central was even less than the most optimistic estimates made less than a year previously. Within a few months the advertised economic status of light water reactors had declined from 5.8–7.6 mills/kwh to 4.3 mills/kwh without any new construction experience. In keeping with standards of skepticism established during the debate on the 1962 AEC Report, the fact that the latter figure was expectation and not accomplishment was not the object of widespread attention.

The first "turnkey" contract was quickly followed by eight others, and these sales were accepted as proof of the reality of commercial nuclear power from light water reactors.

Yet another new phase of reactor commercialization began in 1965 when American utilities placed their first orders for nuclear plants without firm price guarantees by the manufacturers. In 1966–67 a "Great Bandwagon Market"¹² for nuclear plants developed as U.S. utilities placed firm orders for 49 plants, totaling 39,732 MW of capacity.¹³ Two other manufacturers—Babcock & Wilcox and Combustion Engineering—had already joined General Electric and Westinghouse in the light water reactor business. Intense competition very quickly developed among the four reactor manufacturers. This competition was waged in terms of prices of equipment and with ancillary guarantees on fuel delivery and other factors affecting future plant operating costs. As a practical matter, in most cases, a utility considering the purchase of a reactor was able to solicit secret bids from each of the four manufacturers and then to negotiate among the lowest bidders for the most attractive supplemental guarantees. This remarkable buyer's market was characterized by continuous downward revision of the estimated cost of electricity from nuclear plants. By the end of 1967, U.S. utilities had ordered 75 nuclear power plants totaling more than 45,000 MW of generating capacity. More than 80 percent of these orders were placed in 1966–1967.¹⁴

Proponents of nuclear power were ecstatic. Many spoke of a "revolution" having been accomplished. "Nuclear reactors now appear to be the cheapest of all sources of energy," Alvin Weinberg, the Director of the Oak Ridge National Laboratory, told the National Academy of Sciences. He saw the "nuclear energy revolution" to be "based upon the permanent and ubiquitous availability of cheap power." Among informed experts, only Sporn questioned this assessment. He saw "a bandwagon effect, with many utilities rushing ahead to order nuclear power plants, often on the basis of only nebulous analysis and frequently because of a desire to get started in the nuclear business."¹⁵

Nonetheless as the "Great Bandwagon Market" drew to a close in early 1968, there was euphoria in the United States nuclear industry. Both the nuclear industry and the AEC were making forecasts of installed nuclear capacity in 1975 and 1980, which would have seemed surprising to say the least to even the most bullish proponent of nuclear power ten, or even five, years earlier.

The AEC Practices Benign Neglect of Light Water Reactor Development

The U.S. Atomic Energy Commission's reactor development program underwent an historic transformation almost simultaneously with the beginning of the Great Bandwagon Market for light water reactors, but the changes in its policy and internal organization were only indirectly related to these commercial developments. Instead, they were the culmination of the decade-long squabble between it and the Joint Committee on Atomic Energy about the proper role of government in reactor development. The changes were more related

to the issues of the 1950s than to the rapidly unfolding events of the 1960s and their implications for the early 1970s.¹⁶

In November 1964, Milton Shaw was named Director of Reactor Development for the Atomic Energy Commission. He came to the Commission from Admiral Hyman Rickover's naval propulsion reactor program. His mandate was to turn the Commission's reactor development activities into the type of aggressive, government-controlled program which the Joint Committee had been demanding since the Eisenhower years. In redefining the government's reactor development program, however, Shaw did not give top priority to the rapidly changing commercial outlook for light water systems. For both Shaw and the Commission a more important problem of reactor development was that light water technology seemed wasteful of uranium resources. The new AEC policy was based on an accelerated effort to develop more "advanced" systems. These would simultaneously use uranium more efficiently and have a higher thermodynamic efficiency by operating at higher temperatures.

Five different reactor design concepts, each associated with a particular manufacturer, had seemed to offer roughly equal promise for "second generation" nuclear power plants. Prior to Shaw's arrival, the Commission's technical staff had taken the laissez-faire position that electric utilities would have to make their own selections from this menu. In February 1964, they had solicited proposals for cooperative prototype projects without indicating the technical superiority of any one concept over the others. Several proposals were soon in hand. Throughout the spring and summer of 1964 the choice among them occupied the Commission and its staff to the virtual exclusion of any other commercial nuclear power issue. During the months immediately preceding the Great Bandwagon Market for light water reactors, in other words, the government's attention to nuclear power issues was largely confined to sorting out the technical and political pros and cons of the

LIGHT WATER

How
the Nuclear
Dream
Dissolved

Irvin C. Bupp & Jean-Claude Derian

After thirty years of extravagant claims and a staggering investment of \$250 billion, the efforts of the Western industrialized nations to develop nuclear energy as a cheap and reliable source of power have come to a virtual halt.

Here for the first time is the fully documented story behind a commercial and political debacle of unprecedented proportions—the collapse of the so-called American “light water” reactor technology which only ten years ago had achieved a monopoly in the reactor markets of the United States and Western Europe. The authors, two of the world’s leading experts on the nuclear

(continued on back flap)

A TIDAL FLOW

ogy. In August, the staff selected helium as a coolant and graphite to operate at temperatures higher than a “high temperature gas reactor” designed in a way which more or less reflected a management philosophy which had been dominant in government programs during the 1950s. The reactor program, as it took shape in 1964, was basically an industry project with government support. The series of events which followed, in which the government played an increasingly limited role, culminated only in a balancing act between competing pressures against its own internal constraints.

The government was in no position to support a program of private reactor manufacture. The industry was in sharp contrast to the government. As Shaw, the new reactor development director, came from Admiral Rickover’s program, the cornerstone of the Rickover program was Shaw’s view of the key to the technique of propulsion plants, was abstracted by government engineers. The program was a “government program” in which expert government administrators controlled the activities of their contractors. The program was a product of the Rickover philosophy, with the gas reactor project. The electric utility company, participated by the Commission in 1964, a contract terms between them. The project in early 1965, however, soon returned to the government and plans for an even more ambitious project quickly broke out between Shaw and the government wanted to revive yet another

A “Great Bandwagon Market” in the U.S.

53

project—a sodium-cooled breeder reactor, called the “liquid metal fast breeder reactor”—as a government development effort modeled on the Naval Reactor Program.

He saw the gas reactor project as a continuation of old AEC reactor development projects. The government would, in effect, be gambling many millions of dollars without technical control of the outcome. Given the requirements of a breeder reactor development program, this would be a serious mistake.

Many on the Commission’s technical staff believed that when the ultimate “customer” for a new technology was a private commercial interest—as distinct from the government itself, as was the case of the Navy reactors—it was the Commission’s responsibility to carry its development only through the initial experimental phases and then turn it over to private industry. Even Shaw agreed with this distinction, especially to the degree that it implied that the initial commitment of \$40 million to the high temperature gas reactor project was a “hard ceiling” and that the government would not bail out the manufacturer if it encountered difficulties. The problem with this project, as Shaw saw it, was the manufacturer’s evident reluctance to accept full technical and financial responsibility. It was a “seriously underfunded” enterprise over whose eventual success the government would have little direct control, and it would divert resources from the breeder reactor program.¹⁷

The Commission, however, wanted the high temperature gas reactor prototype to proceed. Chairman Glenn Seaborg was particularly adamant about the need for the government to help develop an improvement on light water technology.¹⁸ In addition, most of the members of the Commission believed that the President’s Budget Bureau would insist upon “co-operative” reactor development projects in which the government’s industrial partner accepted “the open end of the deal” and assumed ultimate responsibility for technical control. Shaw countered that even in extreme cases where a project’s success was a matter of “life or death” to a company,

the inevitable tendency in industry would be to "cut corners" as the magnitude and complexity of development problems became apparent.¹⁹

These arguments were the subject of much discussion, but they did not prove persuasive to a majority of the Commission. In April 1965 the Atomic Energy Commission decided to proceed with the high temperature gas reactor project over Shaw's reservations.

These basic issues soon resurfaced in connection with the role of the Argonne National Laboratory in Shaw's breeder reactor program. A new test reactor, known as the Fast Flux Test Facility, was a key part of that program. But for several years the Argonne laboratory had been promoting a much smaller but directly competitive project as part of its laboratory director's efforts to place Argonne in a position of technical leadership in breeder reactors. Moreover, there was considerable support within the industry for the Argonne conception of a breeder development program. Many people in the industry believed that projects like the Fast Flux Test Facility under Shaw's "dictatorial" control would divert federal money from cooperative government/industry development of a true prototype for breeder reactors.

The battle was joined during the summer and fall of 1965. Shaw argued that the Fast Flux Test Facility was essential to the resolution of a host of technical questions about the fuel for breeder reactors. These questions would have to be answered before an electric utility could sensibly make the huge financial commitments that construction of a breeder prototype required. It was, he claimed, the Commission's clear obligation to do for breeders what the Naval Reactors Program had done for light water reactors: provide the technical base for a prototype construction project—and in a government-controlled program.

Shaw won this battle. The Fast Flux Test Facility was approved in November 1965, and his victory signaled the first significant change in government reactor development

policy in more than a decade. For the first time the government's program had become what the Democratic majority on the Joint Committee on Atomic Energy had wanted for years: a top-priority, government-controlled effort. Under Shaw, the Atomic Energy Commission assumed full responsibility for shepherding a new reactor technology from engineering concepts to full-scale prototype "demonstration." Moreover, in the following years, the AEC showed growing willingness to sacrifice other goals to meet this commitment.

Unfortunately, this bitterly fought change diverted managerial, financial, and political resources from the problems of light water reactors. Soon these problems would all but overwhelm the AEC's reactor regulatory program. But even more important, they would help destroy one necessary ingredient of a successful government reactor development effort which both Shaw and the Commission apparently overlooked: public confidence.

But none of this was yet apparent. Indeed, the coming years saw one of the seemingly great innovational triumphs of the century for American technology. During the late 1960s light water reactors became the commercially dominant nuclear power technology not only in the United States but throughout Western Europe and Japan.

*summary of report
APR 1961*

(The following is an excerpt that was taken from a report that was given by Mr. R. H. Fite, President of Florida Power & Light Company, at the Company's Annual Stockholders Meeting on May 15, 1961.)

R

This state-wide electric system is shown in the map now on the screen and I know you will be interested in plans for its expansion. The black lines indicate transmission lines already constructed -- red lines are proposed transmission ties.

Back in 1959 we joined with the Tampa Electric Company and Florida Power Corporation in forming the Florida Operating Committee for the purpose of planning ways and means of complete cooperation in the design and operation of our systems in a manner that will obtain the most efficient and economical results.

By coordinating our schedules of plant shut-downs for overhaul and through sharing the spinning reserve requirements of the individual companies, we are already effecting important operating economies plus providing greater protection to continuity of service by the greater diversity of

back up reserves.

Coping efficiently with emergency situations, such as hurricanes or the sudden loss of a large generating unit, is only one of the many advantages to be gained from our coordination plans. Coordination of daily system operations for greater economy and efficiency for each participant is a major objective.

Economies are effected by sharing extra power or spinning reserves available from the most economical units.

Plans for additional benefits that will accrue from further physical coordination of our systems are taking shape. Last year we strengthened our tie with the City of Jacksonville, increasing it from 69 KV to 115 KV. We are now considering plans to build a 240 KV cross-state transmission line for an additional tie between the lower east coast and our west coast facilities where our tie with Tampa Electric Company will be reconstructed for 240 KV also.

Studies are now being made with the City of Orlando relative to the mutual benefits that will result from a new connection with their municipal

system.

The objectives are to plan and operate our individual systems and facilities as though they were one integrated statewide, 240 KV transmission line grid.

This includes coordination of our individual plant expansion programs which can result in the construction of much larger units with resulting important economies, both in the lower cost per KW for plant additions and the improved economies in the operation of the larger generating units.

Through this coordination and planning we intend to assure even greater dependability of service for our customers and to take advantage of every practical means of improving operating economies to help hold down the cost of service in spite of constantly increasing taxes and more and more inflation.

TAMPA ELECTRIC COMPANY

"Center of Power for Florida's Center of Activity"

Tampa, Florida

May 9, 1960

Mr. H. W. Page, Chairman
Florida Operating Committee
Florida Power and Light Company
Miami, Florida

Dear Mr. Page:

Attached hereto is a report entitled, "A Coordinated Plan for the 1970 Generation and Transmission Requirements for the Electric Utilities of Florida." The entire state east of the Apalachicola River is treated as if it were served by one fully integrated electric company.

This is a bold undertaking and the results of this initial attempt are good only as a first approximation. The report should be read with the understanding that the various plans and any conclusions are of a tentative nature.

This committee, though slow in getting out a report, feels that much has been accomplished; that this is a basic step toward reducing the cost of electric service in this area. There are a great many other facets to this objective which in time and by other groups will surely be worked out. We are happy to have had a part in this endeavor.

Respectfully submitted,

James R. Brice
J. R. Brice, Chairman

James T. Logan
J. T. Logan

K. S. Buchanan
K. S. Buchanan

Planning Committee

JRB:lg

A COORDINATED PLAN FOR
THE 1970 GENERATION AND TRANSMISSION REQUIREMENTS
FOR
THE ELECTRIC UTILITIES OF FLORIDA

PREPARED BY:
THE PLANNING COMMITTEE
FOR
FLORIDA OPERATING COMMITTEE
OF

FLORIDA POWER AND LIGHT COMPANY
FLORIDA POWER CORPORATION
TAMPA ELECTRIC COMPANY

APRIL, 1960

CONTENTS

I. Committee Background and Assignment.....	1
II. Basis of Integration.....	2
III. Appraisal of Study.....	3
IV. Basis of Equity for Integrated Operation.....	6
V. Conclusions.....	7
VI. Description of Basic System.....	25
VII. Analysis of Conditions Studied.....	30

MAPS AND TABLES

Nine Natural Load Areas.....	13
Basic Transmission System.....	14
Minimum Transmission System.....	15
Alternate Plan for Orlando and Lake Wales Areas.....	16
Alternate Plan for North Florida.....	17
Plan for North Florida without Southern Company 230 KV Tie.....	18
Plan for North Florida with Stronger Southern Company ties.....	19
Transmission Systems in Florida, January, 1960.....	20
Load and Generation Statistics.....	21
Summary 230 KV Transmission Line Loadings.....	22

A COORDINATED PLAN FOR
THE 1970 GENERATION AND TRANSMISSION REQUIREMENTS
FOR
THE ELECTRIC UTILITIES OF FLORIDA

I. Committee Background and Assignment

A major step was taken January 16, 1959, towards providing Florida with an adequate supply of electric power for meeting rapidly expanding loads and at the same time protect the interest of customers and investors alike. On this date, the Presidents of the three largest investor owned utilities in the State met to discuss ways and means for accomplishing this objective. The utilities involved were: Florida Power and Light Company (FPL); Florida Power Corporation (FPC); and Tampa Electric Company (TEC). This meeting resulted in the formation of a committee composed of two members from each company authorized to coordinate operations of the three to obtain optimum results with existing facilities. The committee, titled Florida Operating Committee, was also instructed to study the benefits that might accrue through joint planning of future system expansions.

The above committee quickly realized that the major contribution to the above objectives would be through integration of new and existing facilities (Capital Expenditures). Therefore, the committee, at its third meeting in Miami, March 19-20, 1959, appointed a sub-committee for the purpose of considering the electric systems in Florida, east of the Apalachicola River, as one company and of planning generation and transmission facilities accordingly on a long range basis.

At its first meeting in Tampa, April 2, 1959, the sub-committee selected the title of Planning Committee, and embarked on the task of preparing for and conducting the study of which this is a report. The study was conducted on the Georgia Tech Analog Computer, November 16-20, 1959. Those participating were:

J. R. Brice	Tampa Electric Company, Chairman) Planning
E. L. Bivans	Florida Power & Light Company) Committee
J. T. Logan	Consultant for Florida Power Corp.) Members
W. B. Simonds	Florida Power Corporation	
K. S. Buchanan	Florida Power & Light Company	
H. W. Page	Florida Power & Light Company	

H. P. Peters Supervisor of Georgia Tech Computer
R. H. Watkins Assistant

The study was concerned primarily with "Long Range" planning; that is, with loads on the three systems totaling 9,193,000 kw. In addition, the Orlando Utilities system with an estimated load of 350,000 kw was included in the integration.

II. Basis of Integration

The demand for electric energy in Florida, east of the Apalachicola River is concentrated in nine (9) geographic areas. These areas are shown in red overlay on Transmission Map, page 13, together with estimated peak demands and required FPL-FPC-TEC generating capacity for 1970. The principal municipal loads are also shown, those in Gainesville, Orlando, Sebring and Tallahassee having been estimated by Florida Power Corporation and Jacksonville load by Florida Power & Light Company. Tampa Electric Company obtained a load estimate from Lakeland. A breakdown of the generating capacity, existing and planned, is shown in a tabulation on page 21. Normal peak-hour generation and spinning reserve statistics are also tabulated by area.

These are natural load areas, the boundaries of which are not influenced by individual utility service areas. For example, the area designated "ORLANDO" includes the facilities of, and loads served by, Florida Power & Light Company, Florida Power Corporation, and the Orlando municipality.

During the past, the facilities required to serve these areas have been "integrated" in a manner as to form three investor owned and four major municipal systems all loosely interconnected but not integrated in the sense that the facilities could be operated economically as one system.

The task assigned the Planning Committee was to set up a pattern of future expansion on the "one system" approach, the immediate objective being:

- A. Allocation of future generating capacity on the basis of over-all economy which requires the following major considerations:

1. Cost of delivered fuel
2. Availability of plant sites

3. Unit economy (size)
4. Problem of relaying unit

- B. provision for firm power supply to generating capacity deficit areas through transmission loops or grid capable of serving the area with the major power source out.

For the purpose of this study only single jeopardy was considered; that is, the loss of the largest generating unit or the strongest transmission line.

III. Appraisal of Study

Results indicate that substantial savings in investment would result through integrated planning and expansion under the "one system" approach by avoiding duplication of facilities. However, few of the projects considered could be accepted without further study involving alternate possibilities.

Three basic systems, as identified below, were studied on the computer, any one of which would adequately serve the load.

- A. Location of a major generating plant near the center of the Florida Power Corporation's system, and joint use of some 230 kv lines by Florida Power Corporation and Tampa Electric Company.
- B. Same as "A" except without joint use of 230 kv lines.
- C. Expansion of the Higgins and Turner plants to accommodate the capacity allocated to the Central Florida Plant; otherwise, same as "A".

All the above basic systems included a new generating plant on the Florida Power & Light Company system located on the East Coast north of Ft. Pierce and a 230 kv interconnection with the Southern Company.

The basic system under "A" proved to be superior to the other two; however, it is obvious that decisions outside

the scope of engineering economics must be made before pursuing the course further, particularly with regards to location of future generating capacity and joint use of transmission lines. As decisions are reached and as new ideas and methods present themselves, studies should be continued by use of digital computers. Following is a list of projects that should be given more study through this relatively inexpensive medium.

- A. Additional study of many of the lines.
- B. Study of line outages while certain units are down for maintenance.
- C. Alternate plan for the Orlando and Lake Wales Area.
- D. Alternate plan for North Florida with one 230 kv tie to the Southern Company.
- E. Alternate plan for North Florida without 230 kv tie with the Southern Company.
- F. Alternate plan for North Florida providing two 230 kv interconnections with the Southern Company, with additional ones as required.

Projects C, D, E & F of the above list are discussed in the conclusions and a diagram is included for each.

Transmission Voltage Level: With the loads under consideration it would be uneconomical to expand the 115 kv and 138 kv systems to provide inter-area transmission capacity, except in a few isolated cases. The 230 kv level performed very satisfactorily; however, the interlacing of 230 kv with the lower transmission voltages will not be simple, and without adequate study could result in extravagant investments. As an example, a 230 kv line should carry four times the load of a similar 115 kv line, but actually when the impedances of the 115/230 kv transformers required for networking are inserted the division of load might drop from 1 to 4 to around 1 to 2.5, depending to which voltage the generation and load are connected.

A considerable amount of surplus transmission capacity is necessary for practical and economical operation of an integrated power system; however, as indicated by the appended summary of 230 kv transmission line loadings, many

of the 45 odd lines studied fall in the category of "service" lines at this load level with the generating installations as shown on the Basic System. By "service" lines is meant lines that carry sizeable loads only during emergencies which may occur rather infrequently. Transmission lines costing around \$50,000 per mile should operate at a reasonably high annual load factor based on capability; otherwise, other means should be investigated for protecting service.

Reactive Supply Problem: Unlike energy, the net interchange of which can be controlled, reactive interchange cannot, except within restricted limits, due to the power system characteristics. Throughout the study it was noted that each individual system could be manipulated such as to supply the total or any portion of its kw requirements; however, this was not the case in connection with reactive supply. Only limited effort was made to control the interchange of study, with results that one company was caused to over-generate in order to supply a neighbor's deficit. The seriousness of this problem should be determined in future studies:

For a company to supply reactive to a neighbor represents an investment upon which the supplier should earn a reasonable return, and in justice to its customers, is a source of revenue which should not be ignored. Equity in the supply of reactive could be established in the same way as it is with generating capacity.

The Orlando System: An interconnection between the Orlando Utilities Commission system and Florida Power & Light Company (Indian River Plant-Brevard 230 kv) would substantially strengthen the transmission systems in this section of Florida by establishing, in effect, the following ties:

1. A fourth power source from Turner to Woodsmere via the FPL and OUC systems.
2. A second tie between Brevard and Sanford via the FPC and OUC systems.

The interconnections would, however, introduce some operating problems in regard to the transfer of energy and reactive between the Florida Power Corporation and Florida Power and Light Company. Therefore, negotiations pertinent to establishing this interconnection should involve the

three utilities, in order to make certain that existing and future interchange contracts will establish or promote equity under closed loop operation.

IV. Basis of Equity for Integrated Operation

A joint expansion program such as this could never be consummated without some means for establishing and maintaining equity. By this is meant that seldom is an interconnection of equal benefit to both parties, and in some cases a third non-contributing party might receive substantial benefits.

Assuming each company would own the portions of interconnecting lines within its service area, few of the new interconnections studied could be established on basis of equity proportionate to investment. Therefore, some means must be agreed upon by the various managements for establishing equity, or the interconnection will likely never become a reality. In short, why should a company invest substantial monies in a line largely to serve a neighbor's customers, without ample remuneration in some form?

The major savings accruing through integrated planning will be in the field of bulk power supply -- new generating equipment. The staggered installation of larger and more efficient units can become a reality only if participation in each unit is on an "equallized reserve" basis. This means sale of capacity to and/or purchase from the reserve pool. Payments to or receipts from the power pool could be expanded to cover interconnection costs, in which case "equity" could always be maintained on basis of company self-sufficiency. In short, each company's net income picture must improve under coordinated planning and integrated operation; otherwise, there would be no incentive for participation.

The various power pools in existence today all seem to employ different methods for establishing equity. However, they do have one common practice in that there is no reluctance in passing money from one company to another as the final equalizer.

Many worthwhile ideas and guiding principles for establishing equity under integrated operation can be

obtained from recently presented papers on the interchange practices of interconnected power systems. Three excellent references are:

1. "Symposium on Scheduling and Billing of Economy Interchange on Interconnected Power Systems," a group of papers and discussions by Nathan Cohn, H. W. Phillips, W. D. Wilder, A. H. Willennar, M. J. Lacopo and E. K. Corporon presented at the American Power Conference, Chicago, Illinois, March 26, 27 and 28, 1958, Proceedings VXX, pages 447-489.
2. "Benefits and Obligations of Interconnections," by E. E. George presented at 1959 annual meeting of The Interconnected Systems Group.
3. "An Introduction to the Study of System Planning by Operational Gaming Models," by J. K. Dillard and H. K. Sels. AIEE Trans. Paper No. 59-817.

V. Conclusions

A. Basic System: A basic system which proved to be adequate for serving the FPL-FPC-TEC peak demand of 9,193,000 kw for 1970 was studied. It is primarily a 230 kv loop system integrating the nine natural load areas of the State. The additional transmission facilities that would be required under this program are shown on page 14 as a red overlay on the present map showing the Transmission Systems in Florida. Any one line could be taken out of service under peak load conditions without jeopardizing service, as could up to 500,000 kw of generating capacity in any of the major load areas. The system was capable of receiving up to 400,000 kw from the Southern Company and of delivering at least 350,000 kw to the Southern Company.

The capability of the required new generating units totaled 7,306,000 kw. New capacity of 350,000 kw or more was added in six of the nine load areas with the additional power requirements of the Lake Wales, Palatka and Suwannee areas being provided by 230 kv transmission. Three new plant sites - Central Florida, East Coast and South Florida - were the location for 1,550,000 kw of the new capacity. The balance of the new capacity was provided by extensions to plants presently in service or under construction with units up to 500,000 kw being utilized.

Each load area has from two to six 230 kv ties with adjacent areas. These ties provided sufficient transmission capability for pooling the installed and operating reserves proportional to installed capacity - approximate percentages being Florida Power & Light Company, 50 - Florida Power Corporation, 30 and Tampa Electric Company, 20.

The inter-area ties provided the additional transmission capability necessary to effect further substantial savings in the investment and operating costs resulting from:

1. Construction of generating and transmission facilities on the system of one company to meet the over-all requirements of one of the natural load areas served by two companies rather than on both systems.
2. Provision of installed reserve by one company greater than its percentage share with over-all savings being shared on "split-savings" basis.
3. Provision of operating reserve by the lowest cost units available on the three systems rather than by units of each company on a fixed percentage basis, with the savings in "out-of-pocket" costs being split by the three companies. Substantial savings in start-up costs and additional cost of minimum load operation of some units would thus be possible, especially during months other than annual peak load ones.
4. Economy interchange transactions, particularly during months other than annual peak load ones.

The loops formed by the 230 kv lines provided, in most instances, normal and emergency operations comparable to that of a double circuit 230 kv grid, but required many less miles of lines. The total miles of 230 kv lines was 1660; 300 miles presently being in service or under construction.

The detailed arrangement and termination of lines can vary considerably from the system studied and still accomplish the purpose. Therefore, other plans should be studied with the objective of creating the strongest and most economical system.

Five alternate plans are described below. With the exception of plans for a minimum system and for North Florida without a 230 kv tie to Southern Company, the plans are comparable or superior to the Basic System at this load level. These plans should provide a considerable part of the inter-area and intra-area transmission capabilities required at higher load levels. Although these alternate plans were not studied on the computer, the required facilities can be conditionally determined by an analysis of the cases studied together with an evaluation of electrical and physical factors involved. These plans should be verified by additional studies.

B. Minimum System: Certain transmission lines included in the Basic System may not be required at the load level studied, deferment depending upon the affects of such factors as: (a) Loss of strategic lines which would result in others loading up to or above thermal rating. (b) Voltage drops slightly in excess of regulator range. (c) Instability (system split-ups) resulting from severe system disturbances.

The lines falling in this category and omitted from the map representing the minimum system, page 15 are:

1. Second 230 kv line from Ranch to East Coast, 110 miles.
2. Second 230 kv line from East Coast to Brevard, 38 miles.
3. The 230 kv line from Woodsmere to Sanford, 28 miles.
4. The 230 kv line from Silver Springs to Palatka, 42 miles.
5. Second line from Ringling to Gannon, 46 miles (by conversion of the present 138 kv line to 230 kv.)

While this study indicates that the above lines might be deferred or eliminated completely from further consideration, the results were by no means conclusive. Therefore, each of these projects should be studied further, particularly from the system stability angle.

C. Alternate Plan for the Lake Wales and Orlando Areas: Because of the number of utilities involved and the pattern

followed in the past with regards to serving loads individually, it is felt that the number of 230 kv substations provided in the Lake Wales area in the Basic System are excessive. Also, the manner of interlacing the 230 kv and 115 kv systems in the Orlando area leaves much to be desired.

Additional study is required for these areas in order to effectively and economically integrate existing and future facilities. One of the many possibilities for accomplishing this objective is shown in red overlay on the Transmission System Map page 16. The principal changes in this layout from the Basic System are:

1. Establishing a major 230 kv, 8-line switching station in the general vicinity of Lake Wales or Winter Haven, replacing three smaller stations in Basic System.
2. Establishing a major 230/115 kv substation southeast of Orlando (East End) for termination of four 230 kv lines.
3. Providing stronger tie between the large Miami and West Coast generating centers by construction of a 230 kv tie between Ranch and Lake Wales.
4. Providing stronger ties between the Orlando generating center (Indian River, Turner, Sanford) and both the West Coast and Miami generating centers by establishing a 230 kv tie between East End and Lake Wales.

This layout would provide a transmission system stronger than required for the loads under consideration; however, certain projects might be deferred for from one to five years.

D. Alternate Plan for North Florida with One 230 kv Tie to Southern Company: An alternate plan for North Florida based on one 230 kv tie to the Southern Company is shown on page 17.

The principal changes of this plan from the Basic System are:

1. Central Florida-Daytona 230 kv line, 55 miles, replacing Silver Springs-Palatka 230 kv line, 42 miles.

2. Gainesville-Starke 230 kv line, 33 miles,
replacing Ft. White-Lake City 230 kv line,
21 miles.
3. Elimination of Starke-Lake City 115 kv line,
39 miles.
4. Addition of Starke-Jacksonville 230 kv line,
34 miles.

The city of Jacksonville should have been initially considered in developing the system for North Florida since their load of 835,000 kw is 60% of the load of the Suwannee and Palatka Areas. All alternate plans for North Florida provide sufficient transmission capacity for emergency interchange with Jacksonville of 200,000 kw or more and for economy interchange of 100,000 kw or more.

These three 230 kv lines provide a much stronger system in the Ocala, Orlando and Palatka Areas than did the Basic System. The power supply to Daytona and Woodsmere was strengthened sufficiently to provide considerable margin for future load growth.

E. North Florida Without 230 kv Tie with Southern Company: The Basic System is predicated on the construction of a strong tie with the Southern Company. If this interconnected capacity is not to be increased, a different plan should be developed for serving North Florida. A possible alternate development plan for North Florida, which does not include a 230 kv tie with the Southern Company is shown on page 18.

The principal changes from the Basic System in addition to elimination of the 106 mile Lake City-Pine Grove-Tifton 230 kv tie are:

1. 230 kv lines eliminated:
Lake City-Ft. White, 21 miles
Lake City-Starke, 26 miles
Starke-Palatka, 40 miles
Palatka-Silver Springs, 42 miles
Palatka-Bunnell, 27 miles
2. 230 kv lines added:
Central Florida-Daytona, 55 miles
Gainesville-Starke, 33 miles

3. 115 kv lines added:
Lake City-Macclenny, 32 miles
Palatka-Jacksonville, 52 miles
(230 kv construction)

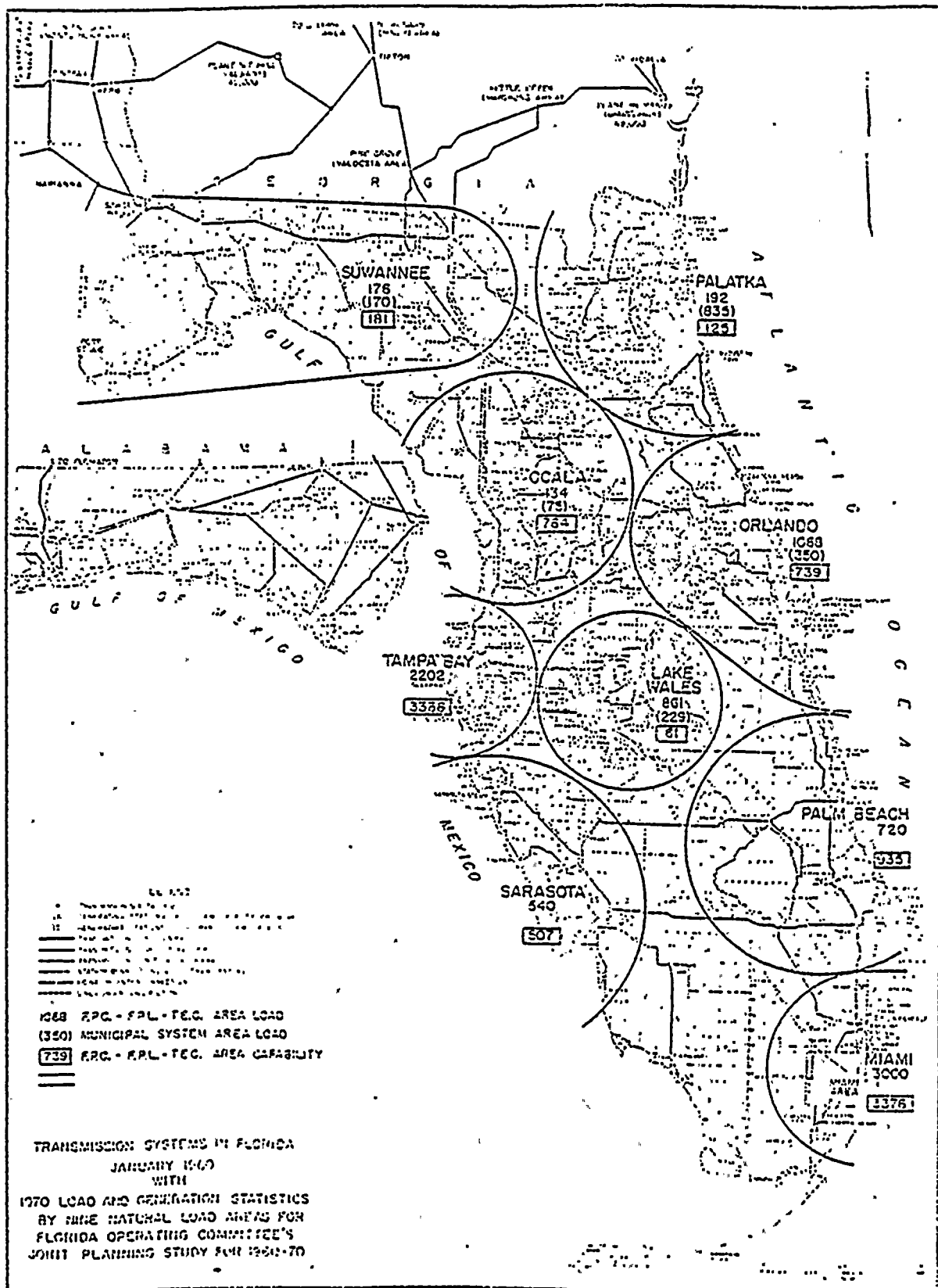
This plan provides transmission capacity into the Palatka area from the south comparable to that of the Basic System. The power supply to Daytona and Woodsmere from Central Florida and Sanford is strengthened sufficiently to provide considerable margin for future load growth.

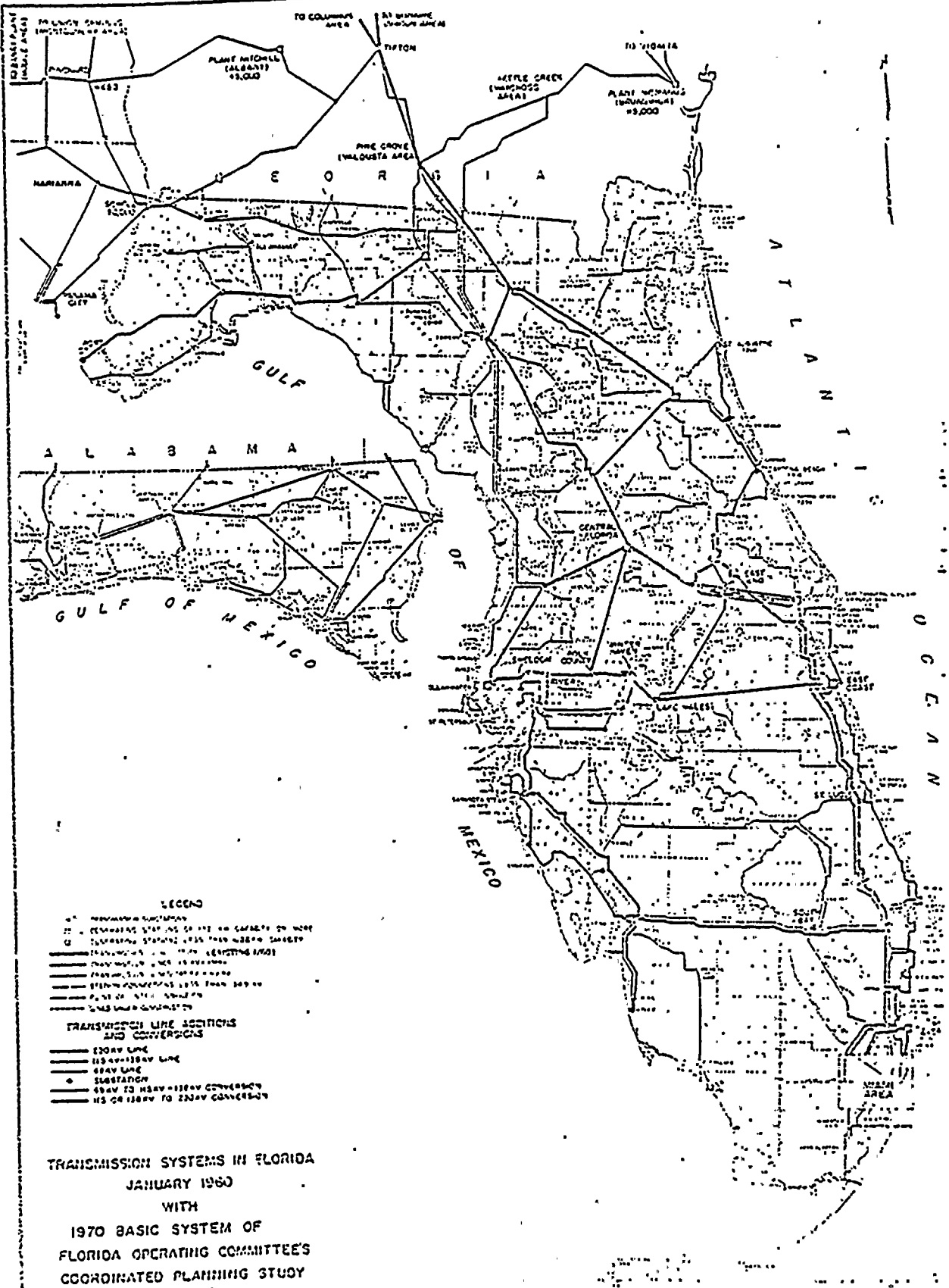
F. Alternate Plan for North Florida Providing Stronger Interconnecting Capacity with Southern Company: The City of Jacksonville should have been considered in the development of a Florida integrated system. Probably the most feasible way to integrate this system, and at the same time increase the interconnected capacity with the Southern Company would be to establish a 230 kv tie between Plant McManus' (Brunswick) and Starke via Jacksonville.

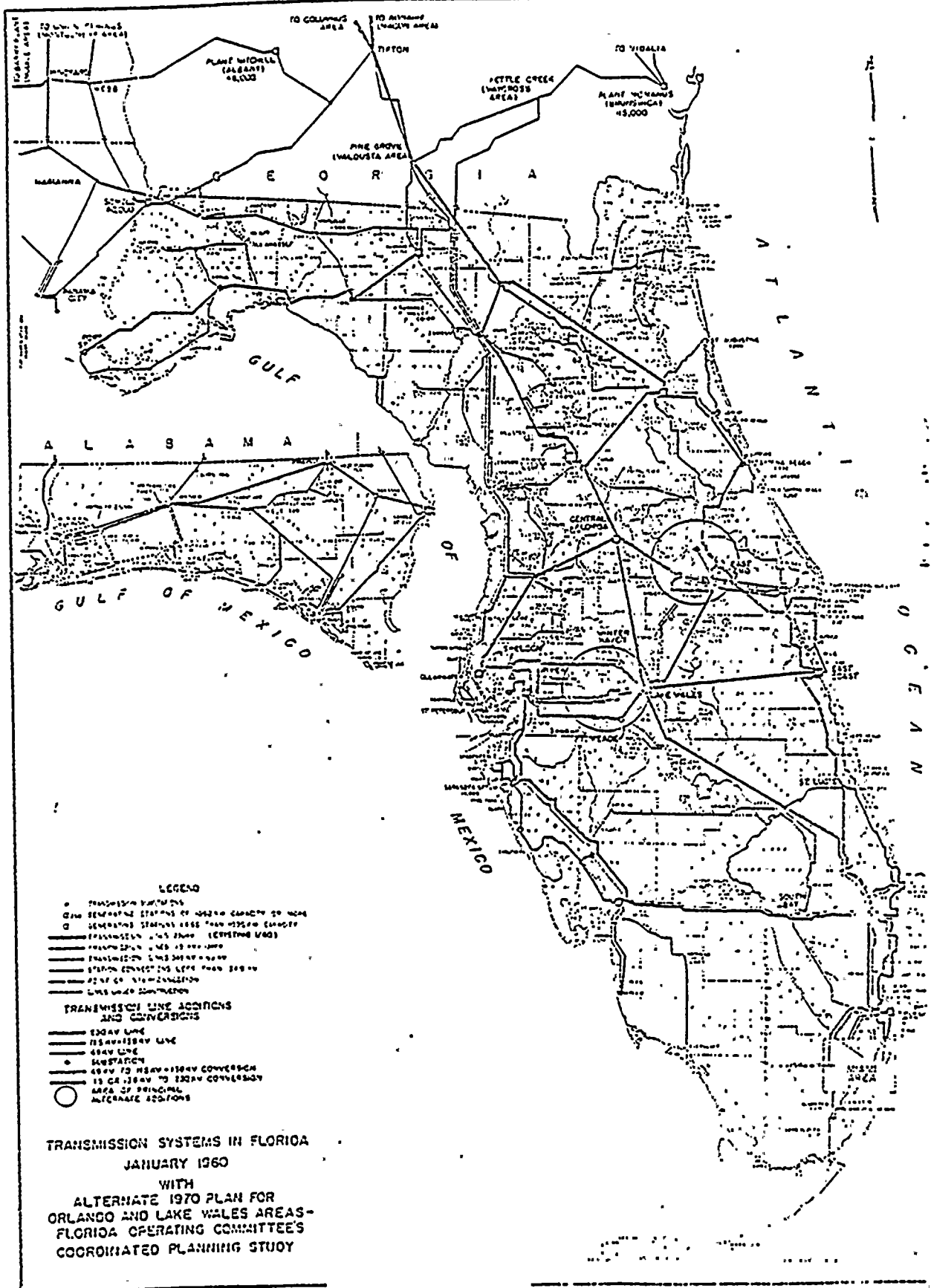
Florida Power Corporation plans the immediate construction of a 145 mile, 230 kv line connecting Fort St. Joe with Suwannee Plant which offers possibilities toward establishing a second 230 kv interconnection with Southern Company. To accomplish this objective a 230 kv tie between Pinckard (Alabama) and Port St. Joe via Panama City could be established.

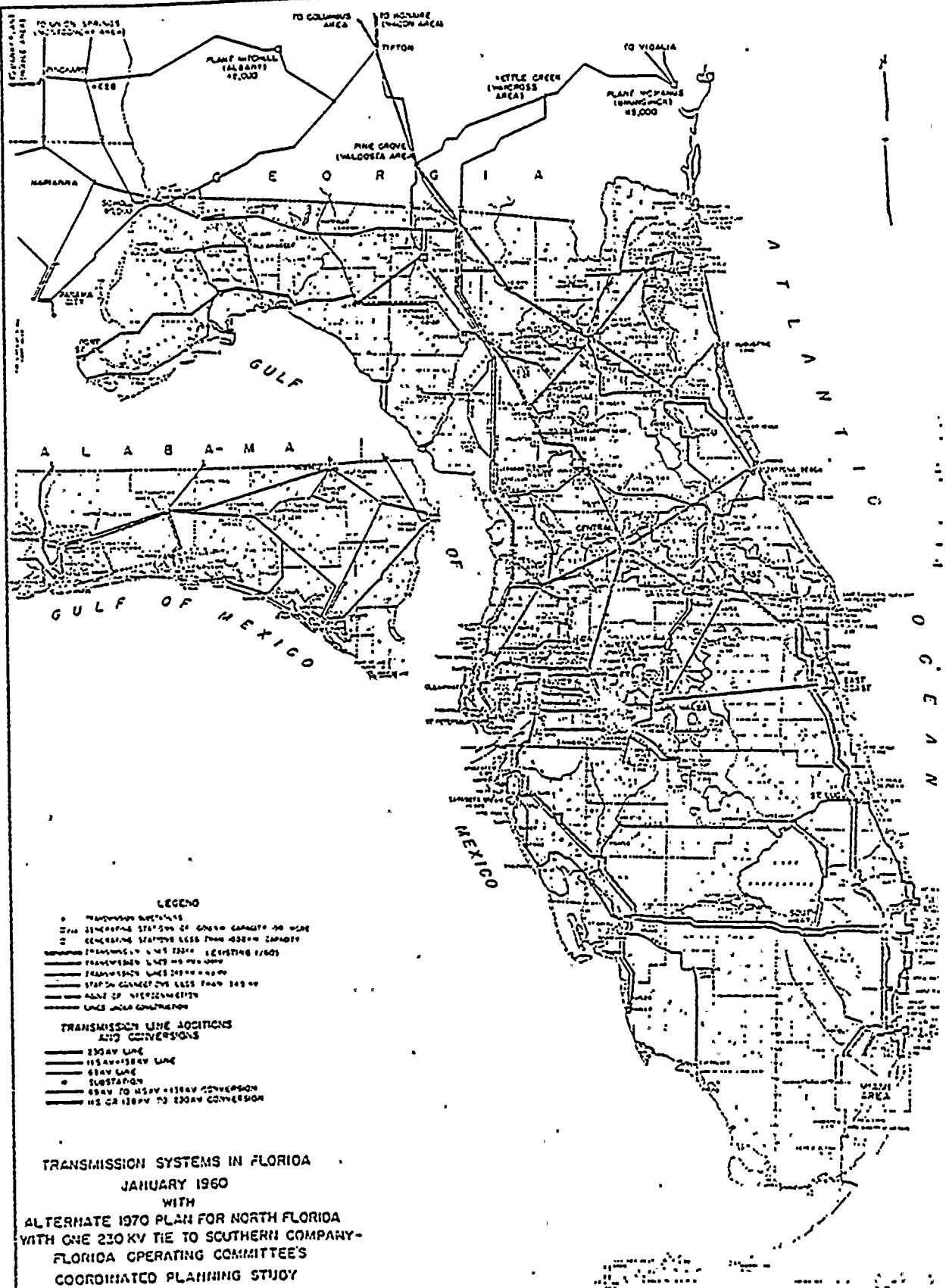
The above 230 kv interconnections, in addition to increasing the interconnected capacity with Southern Company to at least 500,000 kw, would firm up the power supply to Jacksonville, Brunswick, Port St. Joe and Panama City. Also, the Suwannee-Port St. Joe 230 kv line would be accessible to the City of Tallahassee and might be employed to supply this municipality with future capacity and energy requirements.

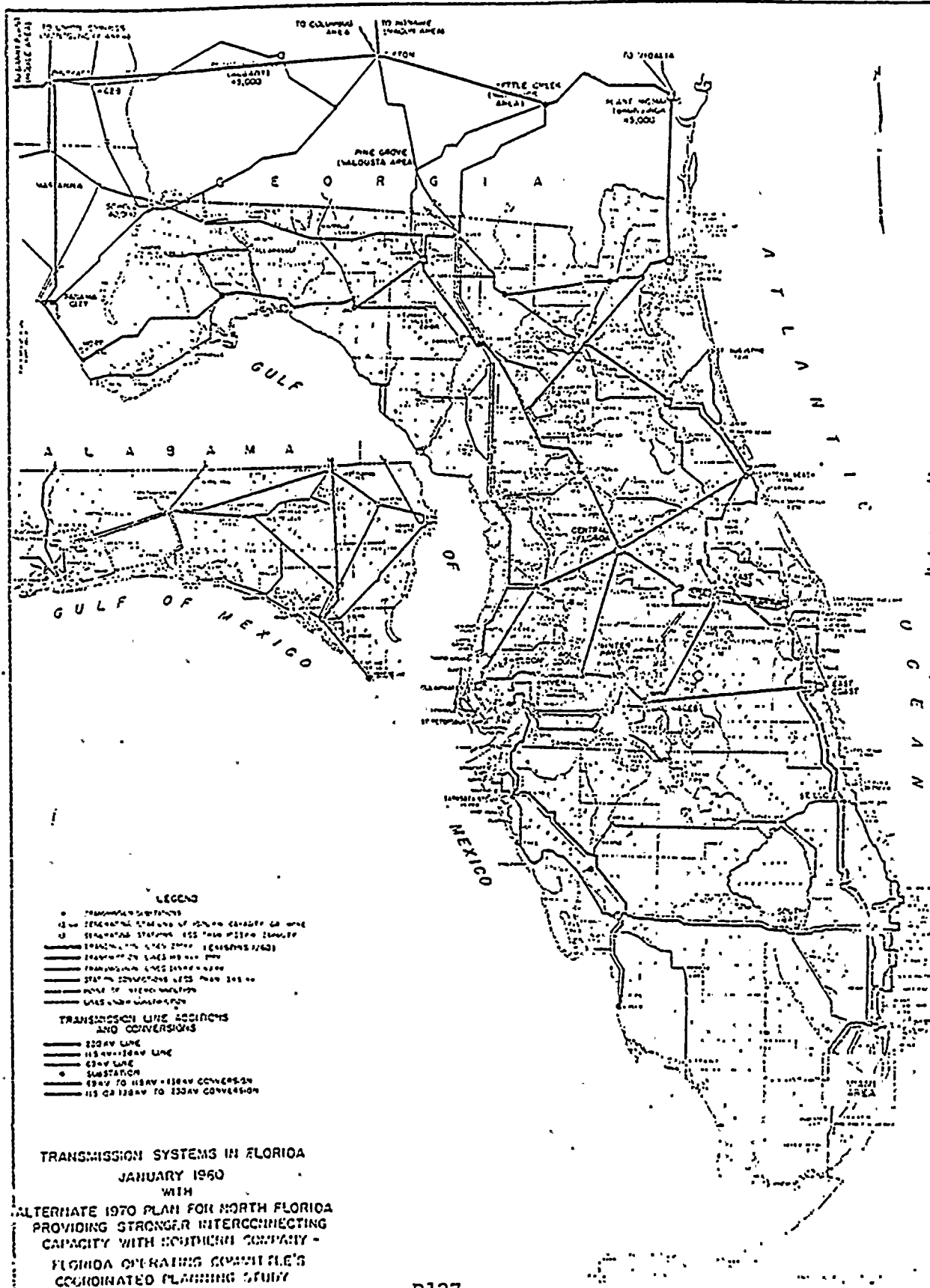
These interconnections, shown in red overlay on the Transmission Map, page 19, represent the beginning of 230 kv loop through Southeast Alabama, South Georgia and North Florida which loop would be completed and/or latticed from north to south as required.

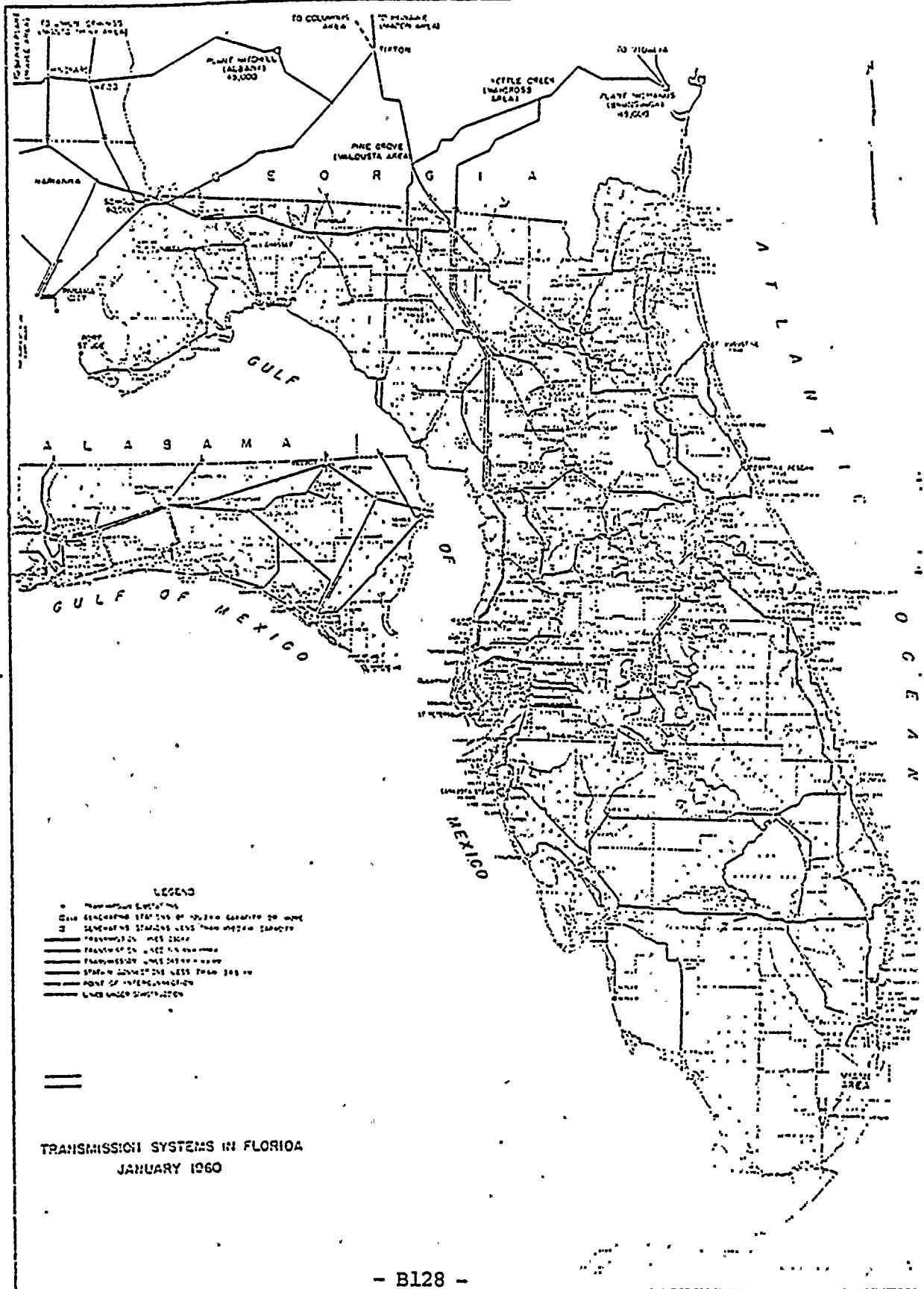












UNITED STATES GOVERNMENT
NAVY DEPARTMENT
BUREAU OF NAVAL PERSONNEL
WASHINGTON, D. C.
JUNE 1944

AREA	COMPANY	AREA DATA	CAPABILITY					
			CAPABILITY (1)	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
1	F. P. Corp. Savannah Jim Woodruff Jas. Huff Dierke F.P. & L. Co. Total	148 28	181 145 25 8 3 0 101	105 0	+ 33 - 28	178 0	3 0	73 0
2	F.P. & L. Co. (Palatka 1 & 2)	192	125	115	- 67	119	0	1
3	F. P. Corp. Cent. Florida Ingles H.P. Ingles L.P. Hyman	334 	704 700 31 30 1	7-0 	+330 	769 	0 	25
4	F. P. Corp. Turner 1 Turner 2 Turner 3 & 4 F.P. & L. Co. Sanford 1 - 3 Malabar 1 Total	548 520 1,003	193 12 31 130 346 196 350 759	130 493 873	-355 + 26 -329	180 516 695	12 30 42	0 23 25
5	F. P. Corp. Easton 1 & 2 Easton 3 & 4 Easton 5 Higgins 1 - 3 Higgins 4 & 5 Easton 1 - 5 T.E. Company PO Knight Hookers Pt. Cannon Ruskin Total	1,242 960 3,332	1,578 250 400 300 144 400 64 1,780 60 230 950 510 3,435	1,495 1,625 3,125	+115 -320 -115	1,527 1,750 3,277	31 20 51	259 135 420
6	F. P. Corp. Aven Park 1 Aven Park 2 T.E. Company Total	295 565 861	61 13 48 0 61	5 0 61	-133 -663 -603	43 0 50	13 0 13	0 0 1
7	F.P. & L. Co. Savanna 1 & 2 Pt. Myers 1 Pt. Myers 2	340 	307 42 155 100	43 	- 33 	424 	23 	21
8	F.P. & L. Co. Rivers 1 & 2 Rivers 3 Rivers 4	720 	933 135 100 503	650 	+215 	598 	37 	40
9	F.P. & L. Co. Lauderdale 1 - 5 Pt. Everglades 1 - 2 Pt. Everglades 3 Pt. Everglades 4 Miami Beach 1 Miami 8 Cutler 1 - 6 Cutler 7 Cutler 8 Cruik Florida 1	3003 5003	3370 420 480 300 500 31 50 395 350 350 500	3071 	+376 	3223 	153 	152
GRAND TOTAL			9473	10,007	9493	899	9290	591
F.P. Corp. Total			2948	2757	2548	137	2498	59
F.P. & L. Co. Total			1425	1750	1625	157	1740	135
F.P. & L. Co. Total			1425	1750	1625	157	1740	135

(1) Capability of 240% of F.P. Corp. generation is more than rating. During emergencies, these units should deliver at least 110% of M.P. rating. Therefore same 227.5% were should be reflected in the above table.

(2) F.P. & L. "Rating" obtainable by raising steam pressure approx. 3% above normal on units larger than 50 m.

(3) F.P. & L. "Rating" capacity includes 240 m obtainable from units on line by cutting feedwater heaters out of service and other special measures required to obtain capability.

J.C.H.
10/10/44 / 10-2-44

All cases except A-3 Preliminary; A-6; B-7;
F-0 and F-1 represent removal of charges by conviction.

[illegible]

המחלקה המרכזית לטיפול בנפגעים
המחלקה המרכזית לטיפול בנפגעים

[illegible]

21. The report also contains a list of the names of the persons who were arrested and the names of the persons who were released.

- B132 -

JOINT BOARD STUDY

BASIC SYSTEM

The Basic System employed in this study is comprised of the systems as of December 31, 1959, plus major improvements, by companies, as listed below:

FLORIDA POWER CORPORATION

<u>Generating Capacity:</u>	Capability as of 12-31-59	833 mw
(Includes 25 mw at	Bartow 2,3,4,5, & 6	825 "
Woodruff Dam)	Higgins 4 & 5	400 "
	Central Florida 1, 2, & 3	700 "
	Total	2,758 mw

Load Requirements: 2,568 mw

Transmission Substations:

(Only those 230/115 kv Substations, excluding generator banks, pertinent to the integrated network).

Brooksville 230/115 kv, 100 mva
Ft. White 230/115 kv, 150 mva
Higgins 230/115 kv, 150 mva
Lake Wales 230/115 kv, 150 mva
Polk County 230/115 kv, 150 mva
Silver Springs 230/115 kv, 50 mva
Woodsmere 230/115 kv, 300 mva

Transmission Lines:
(230 kv and 115 kv)

(a) Also listed under Tampa Electric Co.

(b) Also listed under Florida Power & Light Company

(c) Also listed under Orlando Utilities Commission

- (a) Higgins-TEC (Sheldon) 230 kv
- (a) Lake Wales-TEC (Winter Haven) 230 kv
- (a) Polk County-TEC (River) 230 kv
- (a) Polk County-TEC (Winter Haven) 230 kv
- (b) Lake Wales-FPL (East Coast) 230 kv
- (b) Ft. White-FPL (Lake City) 230 kv
- (b) Pine Grove (SOU. CO.)-FPL (Lake City) 230 kv
- (b) Silver Springs-FPL (Palatka) 230 kv
- (b) Woodsmere-FPL (Sanford) 230 kv
- (c) Woodsmere-OUC (Orlando Utilities Comm.) 115 kv
- Ft. White-Gainesville-Silver Springs 230 kv
- Central Florida-Silver Springs 230 kv
- Central Florida-Woodsmere 230 kv
- Polk County-Central Florida 230 kv
- Higgins-Brooksville 230 kv
- Brooksville-Central Florida 230 kv
- Longwood-East End 115 kv
- Lake Wales - East End 115 kv
- 34 miles 120 kv U.G. Cable in St. Petersburg

FLORIDA POWER & LIGHT COMPANY:

Generating Capacity:

(That readily available without cutting out heaters)	Capability as of 12-31-59	1,272 mw
	East Coast 1	350 "
	Ft. Myers 2	300 "
	East Coast 2	350 "
	Riviera 3 & 4	800 "
	Port Everglades 1, 2, 3, & 4	1,280 "
	Cutler 7 & 8	700 "
	South Dade 1	500 "
	Total	5,552 mw

Load Requirements:

5,000 mw

Transmission Substation:

(Only those 230/138-115-69 kv Substations, excluding generator banks, pertinent to the integrated network)

Brevard 230/69 kv 250 mva
Broward 230/138 kv, 300 mva
Bunnell 230/115 kv, 150 mva
Daytona 230/115 kv, 250 mva
East Coast 230/69 kv, 250 mva
Ft. Myers 230/138 kv, 300 mva
Lake City 230/115 kv, 150 mva
Lauderdale 230/138 kv, 300 mva
Palatka 230/115 kv, 100 mva
Ringling 230/138 kv, 200 mva
St. Lucie 230/138 kv, 100 mva
Sanford 230/115 kv, 150 mva

Transmission Lines:

(230 kv, 138 kv and 115 kv)

(a) Also listed under Tampa Electric Co.

(b) Also Listed under F.P. Corporation

(c) Also listed under Orlando Utilities Commission

(a) Ringling-TEC(Gannon) 230 kv
Ft. Myers-Ringling 230 kv
Ft. Myers-Ranch 230 kv
Broward-Ranch 230 kv
Broward-Lauderdale 230 kv
Pratt-Whitney-St. Lucie #2 230 kv
East Coast-St. Lucie #2 230 kv
(b) East Coast-FPC(Lake Wales) 230 kv
(c) Brevard-OUC(Indian River) 230 kv
(b) Sanford-FPC(Woodmere) 230 kv
Sanford-Daytona Beach 230 kv
Daytona-Bunnell 230 kv
Palatka-Bunnell 230 kv
(b) Palatka-FPC (Silver Springs) 230 kv
Palatka-Lake City 230 kv
(b) Lake City-FPC (Ft. White) 230 kv
(b) Lake City-Pine Grove (GPC) 230 kv
Ft. Myers-Ringling 138 kv
Broward-Lauderdale #2 138 kv
Broward-Riviera 138 kv
Riviera-St. Lucie 138 kv
Starke-Lake City 115 kv
Starke-Jacksonville 115 kv

TAMPA ELECTRIC COMPANY

Generating Capacity:

Capability as of 12-31-59
Gannon-New Units

558 mw
1,222 "
1,780 mw

Load Requirements:

1,625 mw

Transmission Substations:
(Only those 230/138-69 kv
Substations, excluding
generator banks, per-
tinent to the integrated
network)

Gannon 230/138kv, 200 mva
River 230/69 kv, 150 mva
Sheldon 230/69 kv, 150 mva
Sandhill 230/69 kv, 150 mva
Winter Haven 230/69 kv, 150 mva
Brewster 230/69 kv, 150 mva
Himes 138/69 kv, 150 mva
Clearview 138/69 kv, 150 mva.

Transmission Lines:

(230 kv & 138 kv)

(a) Also listed under
Florida Power and
Light Company

(b) Also listed under
Florida Power
Corporation

- (a) Gannon-FPL (Ringling) 230 kv.
- Gannon-Winter Haven 230 kv
- Gannon-River 230 kv
- Gannon-Sandhill 2-230 kv
- Sandhill-Winter Haven 2-230 kv
- (b) Sheldon-FPC (Higgins) 230 kv
- (b) River-FPC(Polk County) 230 kv
- (b) Sandhill-FPC (Polk County) 230 kv
- (b) Winter Haven-FPC(Lake Wales) 230 kv
- Gannon-Himes 138 kv
- Gannon-Clearview 138 kv

ORLANDO UTILITIES COMMISSION:

Generating Capacity:

Capability as of 12-31-59
Indian River 2 & 3
Total

237 mw
150 mw
387 mw

Load Requirements:

350 mw

Transmission Substations:

Indian River 230/115 kv, 150 mva

Transmission Lines:

- (a) Indian River-FPL (Brevard) 230 kv
- Indian River-Orlando No. 4 115 kv

(a) Also listed under
Florida Power &
Light Co.

CONSOLIDATED SYSTEMS. - 1970

Generating Capability:

	<u>Megawatts</u>	
Florida Power Corporation	2,757	
Florida Power & Light Company	5,552	
Tampa Electric Company	1,780	
Total FPL, FPC, TEC		10,089
Orlando Utilities Commission	387	
Total	<u>10,476</u>	

System Coincident Demands:

Florida Power Corporation	2,568	
Florida Power & Light Company	5,000	
Tampa Electric Company	1,625	
Total FPL, FPC, TEC		9,193
Orlando Utilities Commission	350	
Total	<u>9,543</u>	

Reserve Generating Capacity:

Florida Power Corporation	189	
Florida Power & Light Company	552	
Tampa Electric Company	155	
Total FPL, FPC, TEC		896
Orlando Utilities Commission	37	
Total	<u>933</u>	

Note: The above capability figures for Florida Power Corporation and Orlando Utilities Commission reflect only Name Plate rating for units of 75 mw and larger. These units should deliver at least 110% of N.P. rating in emergencies. Therefore, reflecting this extra 10% the Reserve Capacity situation would become:

Florida Power Corporation	416	
Florida Power & Light Company	552	
Tampa Electric Company	155	
Total FPL, FPC, TEC		1,123
Orlando Utilities Commission	60	
Total	<u>1,183 mw</u>	
	or	11.3%

General:

The question of Load Power Factor was not discussed by the Committee during preparation for the study. The amount of reactive kva transmitted has a large bearing on the amount of transmission capacity that must be provided.

An analysis of the Base Case indicates that average Load Power Factors used by various companies varied widely as shown below:

	<u>P.F. of Load</u>
Florida Power Corporation	89.4%
Florida Power & Light Company	96.5%
Tampa Electric Company	98.4%
Orlando Utilities Commission	89.4%

The difference between, say a 90% and a 98% P.F. for loads of this magnitude represents some 2,625 mvar, the transmission of which would absorb a staggering amount of transmission system capacity.

Beginning with Case A-11, a load power factor approximating 95% was applied to the Corporation's and Orlando Utilities loads.

The economical load power factor will vary for each company and can be determined only through a study of economic factors involved. Certainly, static capacitors would not be installed if the reactive could be supplied from generators with a reasonable voltage drop. On the other hand, it would be financial suicide to construct high voltage lines, largely to accommodate the transmission of reactive kva, which could be supplied locally at less than \$10 per rkva.

CASE A-O (PRELIMINARY)

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System, modified as follows:
(1) 500 mw of Tampa Electric's future capacity located in new West Coast Plant.
(2) The Sandhill-Winter Haven 230 kv circuits eliminated in this setup.
(3) FPL transformer changes.

Transmission Line Outage: None

Purpose:

To determine if the integrated system planned in accordance with the "basic system" outlined herein, with the above modifications would be adequate for satisfying a demand of 9,543 mw with all facilities available.

This was originally intended to be the "Base Case", however, elimination of the West Coast Plant after this setup made it expedient to select the next setup as the Base Case.

Results:

Voltage levels were satisfactory at all locations. The Central Florida-Silver Springs and the Central Florida-Woodsmere 230 kv lines were heavily loaded. 74 mw was delivered via the Woodsmere-Sanford 230 kv line and from Sanford on to the Winter Park area via Turner at 115 kv.

Conclusions:

The Woodsmere transformer should be changed to 300 mva to handle emergency conditions. The Gannon-Sandhill double circuit should be extended to tie in with the Winter Haven 230 kv bus to handle emergency bulk power flows. The West Coast generating capacity should be combined with Gannon since, with coordinated planning, the future units would have much larger ratings, making the new site unnecessary at this time. These changes were made on Case A-O to establish a new base case.

CASE A-O

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System

Transmission Line Outage: None

Purpose of Study:

To determine if the integrated systems, expanded in accordance with Basic System outlined herein, would adequately serve a demand of 9,543 mw with all facilities available.

Results:

Voltage levels at all locations were satisfactory. They varied from 105% of nominal at major generating plants to 95% at some substations. The Woodsmere transformer load increased from 160 to 310 mw. The two new lines from Sandhill to Winter Haven carried 166 mw. The inter area power flows are shown on an accompanying diagram for the nine natural load areas.

While this study is not primarily concerned with interchange between various companies, such flows are summarized on the two accompanying diagrams for reference.

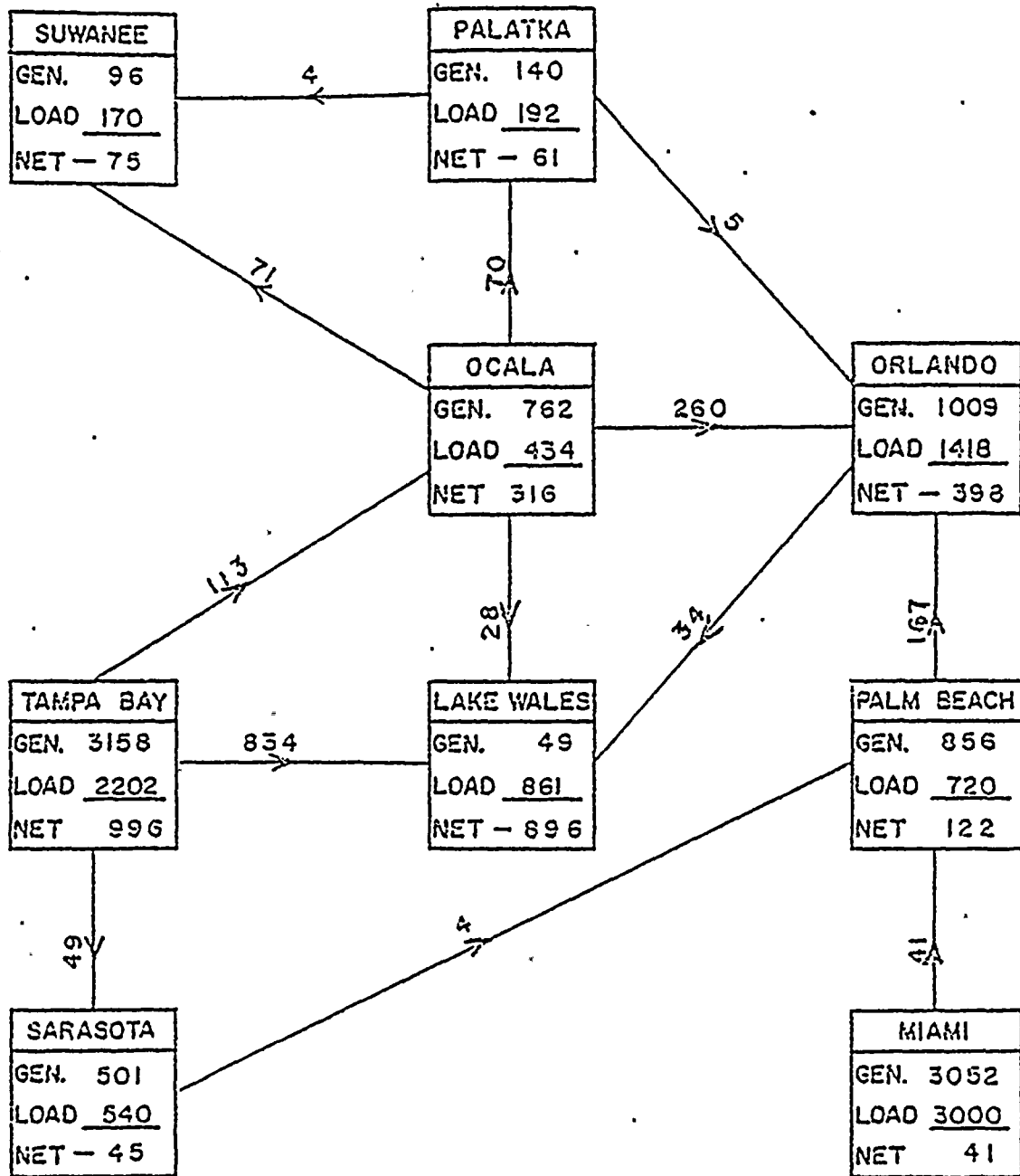
Conclusions:

Increasing the Woodsmere bank capacity resulted in a more desirable distribution of load flow in the transmission system in the Orlando Load Area.

This was considered to be a satisfactory base case. In subsequent cases, it was found that a few points need strengthening to handle emergency line outages. It was also found that the system was over built at other points and several of the lines could be omitted for this load level.

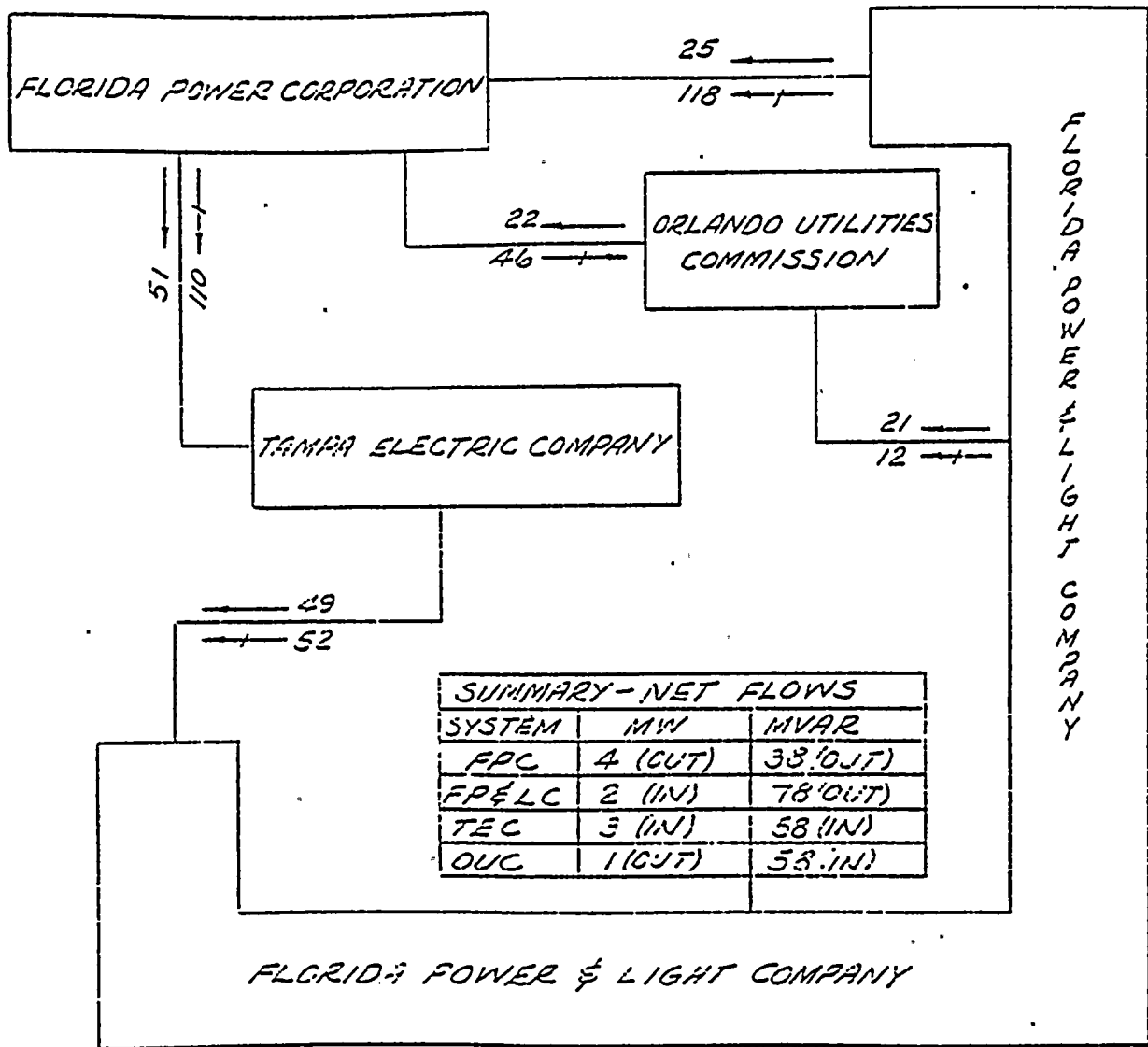
PLANNING COMMITTEE
FLORIDA OPERATING COMMITTEE
JOINT BOARD STUDY

LOAD, GENERATION, & INTER-AREA POWER FLOW DATA



CASE NO. A - 0

FLORIDA INTEGRATED SYSTEMS.
INADVERTENT POWER TRANSFERS
AS DETERMINED FROM
JOINT AC BOARD STUDY OF PROSPECTIVE 1970 LOAD



————— INDICATES NET MEGAWATTS AND DIRECTION OF FLOW
 - - - - - INDICATES NET MEGAVARS AND DIRECTION OF FLOW

CASE A-1

General Conditions:

Major Generating Unit

Out of Service-Emergency: None

Transmission System: Basic System

Transmission Line Outage: Central Florida-Woodsmere 230 kv

Purpose of Study:

To determine if satisfactory service could be rendered the Winter Park area in the event the Central Florida-Woodsmere 230 kv line should fail. To determine also if the lines out of the Central Florida Plant provide firm transmission under this condition.

Results:

With a 230 kv tie between Woodsmere and Sanford as provided for in the basic system, voltage levels would be satisfactory, since the 115 kv levels at Woodsmere dropped only 7.5%. However, the 115 kv drop was prevented from being greater by changing taps in the 230/115 kv bank simulating an automatic 10% boost towards the 115 kv bus. Without LTC features in this transformer, voltage at Woodsmere would have been critical.

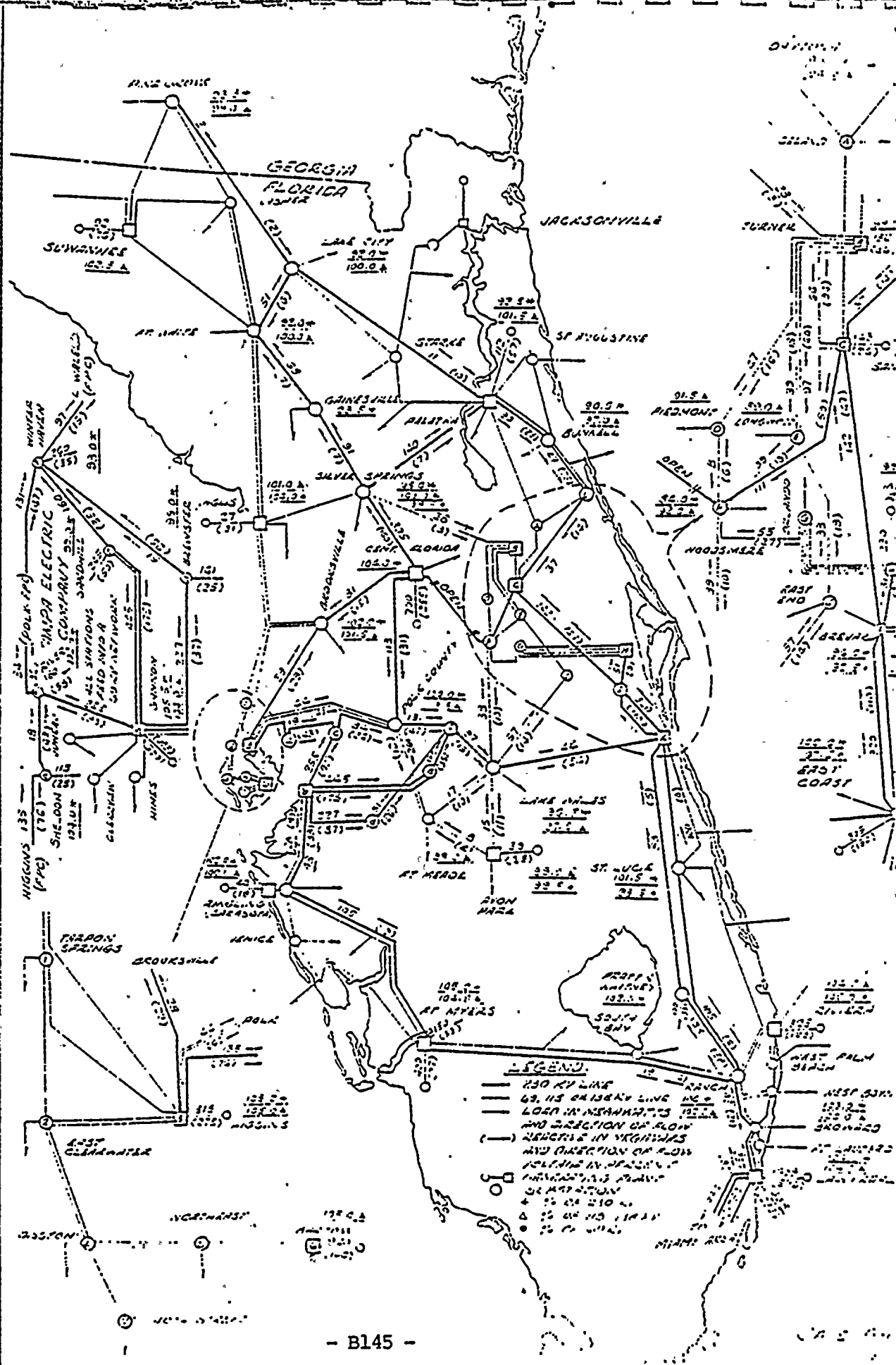
Loading in the Central Florida-Silver Springs 230 kv line increased from a normal of 276 mw and 66 mvar to 395 mw and 160mvar or 115% of the 900 amp thermal rating of 795 MCM ACSR conductors.

The system performed very satisfactorily under this outage condition. Power flows into Orlando area, as compared to normals of Case A-0, changed considerably: from Ocala area, decreased by 232 mw to 28 mw; from Palatka area increased by 95 mw to 100 mw; from Lake Wales increased by 85 mw to 51 mw. Woodsmere-Sanford 230 kv line delivered 111 mw to Woodsmere, a total change of 142 mw.

Conclusions:

The economical solution to the overloaded Central Florida-Silver Springs line would be increased conductor size (954 mcm) or the installation of static capacitors in the Ocala area for power factor improvement. The overloaded condition could be further relieved by shifting 50 MW to the Suwanee Plant.

The Basic System was adequate to protect against an outage of the Central Florida-Woodsmere 230 kv line. However, this line outage was considered with other modifications to the system in Case A-9.



CASE A-2

General Conditions:

Major Generating Unit

Out of Service-Emergency: None

Transmission System:

Basic System

Transmission Outage:

Central Florida-Silver Springs 230 kv

Other Changes:

Increased Suwannee 50 mw to 143 mw
(capability). Reduced Central Florida.
Holding voltage at Pine Grove (53 MVAR)

Purpose of Study:

To determine firm transmission requirements at Central Florida Plant and firm power supply requirements of Silver Springs area for loss of the Central Florida-Silver Springs 230 kv line which normally carried 276 mw and 66 mvar toward Silver Springs.

Results:

The voltage drop at Silver Springs was 12% from normal. However, by proper adjustment of the transformer taps in the Ft. White 115/230 kv bank the drop could be reduced to the point where voltage levels on the 115 kv and 69 kv systems around Ocala would be within commercially acceptable limits.

Loss of the Central Florida-Silver Springs 230 kv line, imposed a loading of 381 mw and 140 mvar on the Central Florida-Woodsmere 230 kv line, which is around 10% above the safe loading for 795 MCM ACSR conductors.

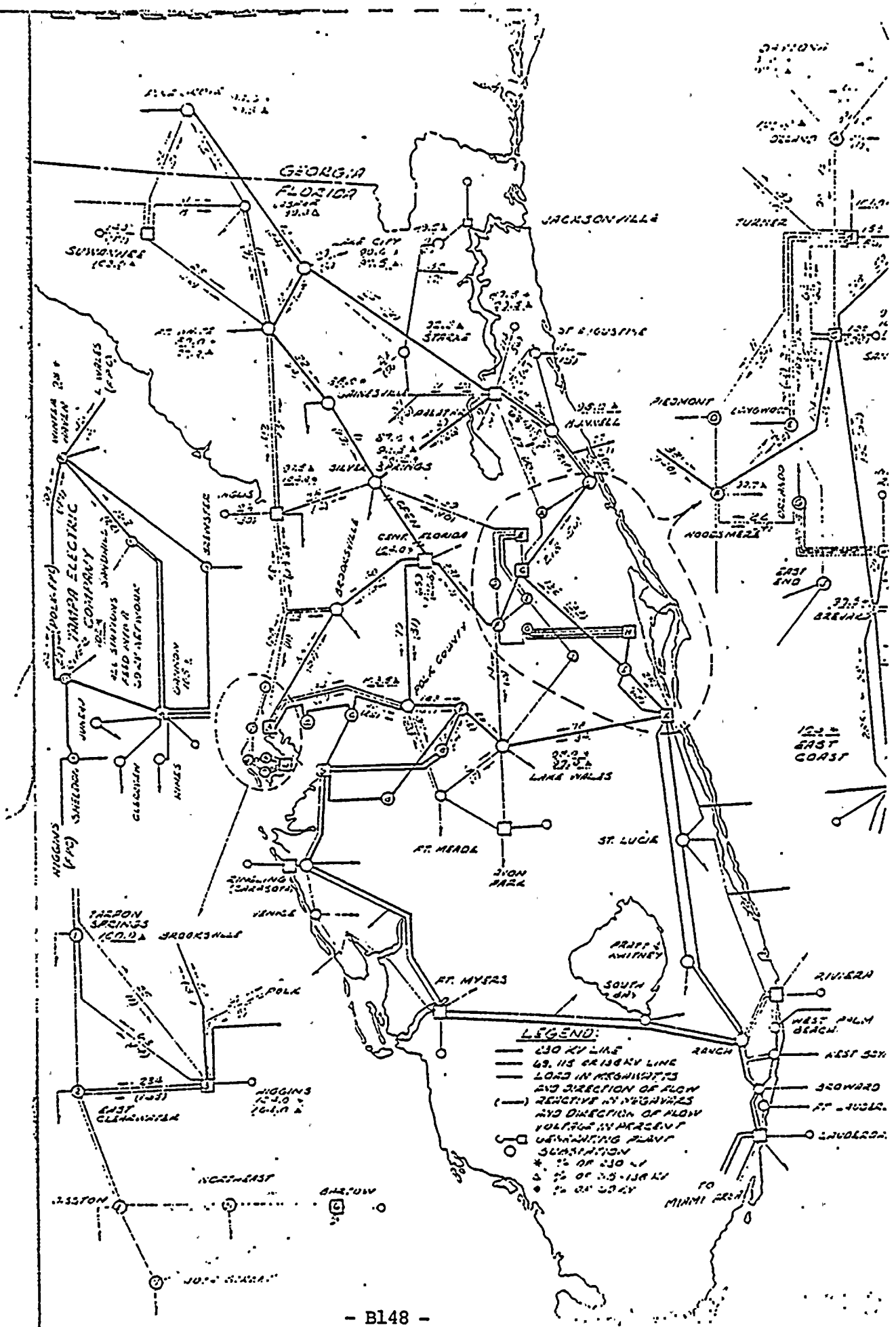
It was necessary to drop the generation at Central Florida 41 mw; and increase Suwannee 51 mw. Pine Grove supplied 53 MVAR to hold voltage to 94% at that point.

Inter-area power flows as compared to normals of Case A-0, changed considerably; from Area 3 to Area 4, increased by 82 mw to 342 mw; from Area 4 to Area 2, increased by 121 mw to 116 mw; and from Area 2 to Area 3, changed by 129 mw to 59 mw.

Conclusions:

By increasing conductor size to 954 MCM and improving the P.F. of the loads in the Winter Park and Ocala areas, line loadings and voltage conditions would be satisfactory for this emergency condition.

The Basic System was adequate to protect against an outage of the Central Florida-Silver Springs 230 kv line. However, this line outage was considered with other modifications to the system in Cases A-3, A-8, and E-1.



CASE A-3

General Conditions:

- Major Generating Unit.
- Out of Service-Emergency: None
- Transmission System: Basic System, modified as follows:
Opened all interconnections of FPL with FPC, GPC and Orlando.
- Transmission Line Outage: Central Florida-Silver Springs 230 kv
- Other Changes: Increased Suwannee 50 mw to 143 mw (capability). Reduced Central Florida. Holding voltage at Pine Grove (72 MVAR).

Purpose of Study:

To determine the necessity for a second 230 kv circuit between Central Florida plant and Silver Springs should the three 230 kv. interconnections not be established between the FPC, FPL and GPC in North Florida.

Results:

Voltage conditions were unsatisfactory in the northern half of the Ocala area due principally to low load power factors. The board was not adjusted carefully and some transformer taps were off.

Conclusions:

Conditions were not so critical as to require the construction of a second circuit between Central Florida Plant and Silver Springs as voltage levels could be made tenable under this emergency by less expensive means such as increasing power factor, increasing conductor size and shifting of generation.

CASE A-4

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System.

Transmission Line Outage: Brevard-Sanford 230 kv

Purpose of Study:

To determine firm transmission requirements in the East Coast-Sanford area for loss of the Brevard-Sanford 230 kv line which normally delivered 104 mw and 4 MVAR to Sanford.

Results:

The loss of the Brevard-Sanford 230 kv line resulted in less than a 2% drop in voltage at Sanford. The flow from Brevard to Woodsmere through Orlando increased by 37 mw to 58 mw. East Coast-Lake Wales 230 kv line picked up 48 mw to 134 mw. Woodsmere-Sanford 230 kv line picked up 52 mw to 83 mw. Brevard-Sanford 69 kv line picked up only 14 mw to 40 mw. Inter area power flows changed only 10 to 35 mw from the normals of Case A-0.

Conclusions:

The Basic System was adequate to protect against an outage of the Brevard-Sanford 230 kv line. However, this line outage was considered with other modifications to the system in Case A-7.

CASE A-5

General Conditions:

Major Generating Unit

Out of Service-Emergency: None

Transmission System: Basic System

Transmission Line Outage: East Coast-Lake Wales 230 kv

Purpose of Study:

To determine if service in the Lake Wales area would be jeopardized by loss of the East Coast-Lake Wales 230 kv line which normally carried 86 mw and 40 MVARs. To determine also the firm transmission from the East Coast Plant.

Results:

Loss of the East Coast-Lake Wales 230 kv line resulted in only a 5% drop in voltage at Lake Wales. Neither did the emergency result in overloading any lines out of East Coast Plant. Winter Haven-Lake Wales 230 kv line picked up 69 mw to 96. East Coast-Brevard 230 kv line picked up 52 mw to 312 mw. Power flow between the Orlando and Lake Wales areas changed by 68 mw to 34 mw to Orlando area.

Conclusions:

Loss of the East Coast-Lake Wales 230 kv line would not jeopardize service in the Lake Wales area provided there is a 230 kv tie into Lake Wales from the West. The East Coast Plant had firm transmission.

CASE A-6

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System

Transmission Line Outage: Sanford-Daytona 230 kv

Other Changes: Orlando reactive load reduced
50 MVAR to increase power factor
to 95%.

Purpose of Study:

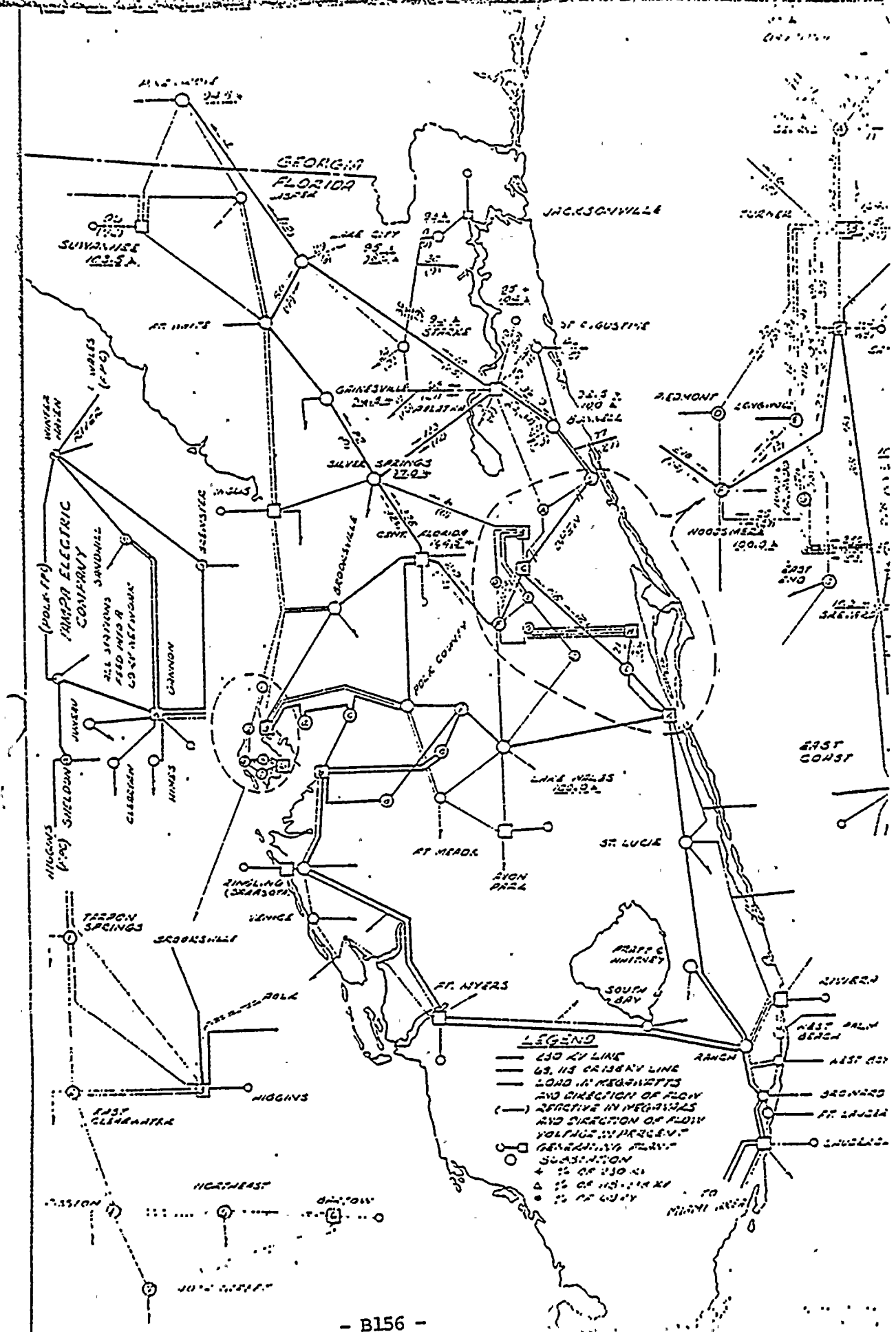
To determine firm transmission requirements at Sanford Plant and firm power supply requirements of Daytona area with an outage of the Sanford-Daytona 230 kv line which normally carried 118 mw and 0 MVAR.

Results:

Loss of the Sanford-Daytona 230 kv line resulted in a voltage drop at Daytona of only 7.5%. Voltages on 115 kv system north of Sanford were only 1.5% below normal. Of the 118 mw normally supplied Daytona by this line, 50 mw and 53 mw were picked up by the Sanford-DeLand 115 kv and the Silver Springs-Palatka 230 kv lines respectively. The Sanford-DeLand 115 kv line flow was 69% of its 730 amp thermal rating.

Conclusions:

The Basic System was adequate to protect against an outage of the Sanford-Daytona 230 kv line. However, this line outage was considered with other modification to the system in Cases A-11 and F-2.



CASE A-7

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System, modified as follows:
Eliminated Woodsmere-Sanford
230 kv line

Transmission Line Outage: Brevard-Sanford 230 kv

Purpose of Study:

To determine if Sanford-Woodsmere 230 kv line is required to provide firm transmission in the East Coast-Sanford area during an outage of the Brevard-Sanford 230 kv line which normally carried approximately 104 mw and 4 MVAR.

Results:

The flow from Brevard to Woodsmere through Orlando increased by 31 mw to 52 mw. East Coast-Lake Wales 230 kv line picked up 40 mw to 120 mw. Brevard-Sanford 69 kv line picked up only 13 mw to 44 mw. These flows are approximately the same as Case A-4 which included the Sanford-Woodsmere 230 kv line. Elimination of the Woodsmere-Sanford 230 kv tie forced the 83 mw supplied by this line in Case A-4, to flow through the 230/115 kv bank at Woodsmere into the 115 kv system, reducing the normal flow of 67 mw from Sanford to Turner to zero over the 115 kv line.

Conclusions:

Firm transmission was provided in the Sanford-East Coast area without the Sanford-Woodsmere 230 kv line. However, a further study would be required to determine if this area can be adequately served in the event of an outage of the Brevard-Sanford 230 kv line during periods when the Sanford #3, 165 mw unit is down for maintenance.

CASE A-8

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System, modified as follows:
Eliminated Woodsmere-Sanford 230 kv
line. Increased Load Power Factors
on FPC system outside Pinellas
County to 95%. Orlando Utilities
P.F. increased to 95% in Case A-6.

Transmission Line Outage: Central Florida-Silver Springs
230 kv.

Other Changes: Increased Suwannee 57 mw to
capability. Reduced Central
Florida.

Purpose of Study:

To determine the necessity of a second 230 kv circuit
between Central Florida plant and Silver Springs as protection
against loss of the otherwise single circuit. This is a repeat
of Case A-2 except under improved system PF. conditions.

Results:

Loss of the 230 kv line between the Central Florida plant
and Silver Springs resulted in a 9.5% drop in voltage on the
Silver Springs 230 kv bus. The Palatka-Silver Springs 230 kv
line delivered 52 mw and 15 MVARs to Silver Springs which,
together with the flow on the Lake City-Ft. White 230 kv line,
resulted in a net delivery of 39 mw and 40 MVAR to the Ocala
area.

Conclusions:

With the improved power factor, a second 230 kv circuit
between Central Florida and Silver Springs would not be required
under this emergency.

CASE A-9

General Conditions:

Major Generating Unit

Out of Service-Emergency: None

Transmission System:

Basic System, modified as follows:
Eliminated Woodsmere-Sanford 230 kv line. Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage: Central Florida-Woodsmere 230 kv

Purpose of Study:

To determine if elimination of the Woodsmere-Sanford 230 kv line would necessitate constructing a second 230 kv line into Woodsmere in order to protect service for loss of the Central Florida-Woodsmere 230 kv line which normally carried around 275 mw.

Results:

Loss of the Central Florida-Woodsmere 230 kv line resulted in the Woodsmere 115 kv bus voltage dropping 13.5% below normal which is about the maximum that can be corrected by LTC in the 115/69 kv and 69/12 kv transformers.

The section of 115 kv, 4/0 ACSR line between Turner and Piedmont carried 96 mva or 485 amperes. This is 140% of thermal rating. The 950 amp load on the Central Florida-Silver Springs 230 kv line would require a conductor size of at least 954 mcm.

For this emergency, FPL delivered 82 mw to Woodsmere through the Orlando system. Other flows out of Central Florida and inter-area flows were approximately the same as in Case A-1, which was this outage condition with Sanford-Woodsmere 230 kv line in service.

Conclusions:

While a second 230 kv circuit is not essential under steady state condition, a stability check might show that the system would disintegrate due to the shock of losing the 230 kv line.

If further study shows that a second 230 kv source into Woodsmere is essential, three possibilities must be considered, viz:

1. Sanford-Woodsmere 230 kv.
2. Sanford-Turner-Woodsmere 230 kv.
3. Central Florida-Woodsmere 230 kv.

The latter, of course, could be considered only if a generating plant is located in Central Florida.

CASE A-10

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System, modified as follows:
Eliminated Woodsmere-Sanford 230
kv line. Increased P.F. of FPC &
OUC loads to 95%. Added 2nd
230 kv circuit between Central
Florida and Woodsmere.

Transmission Line Outage: Ft. Myers-Ringling 230 kv.

Purpose of Study:

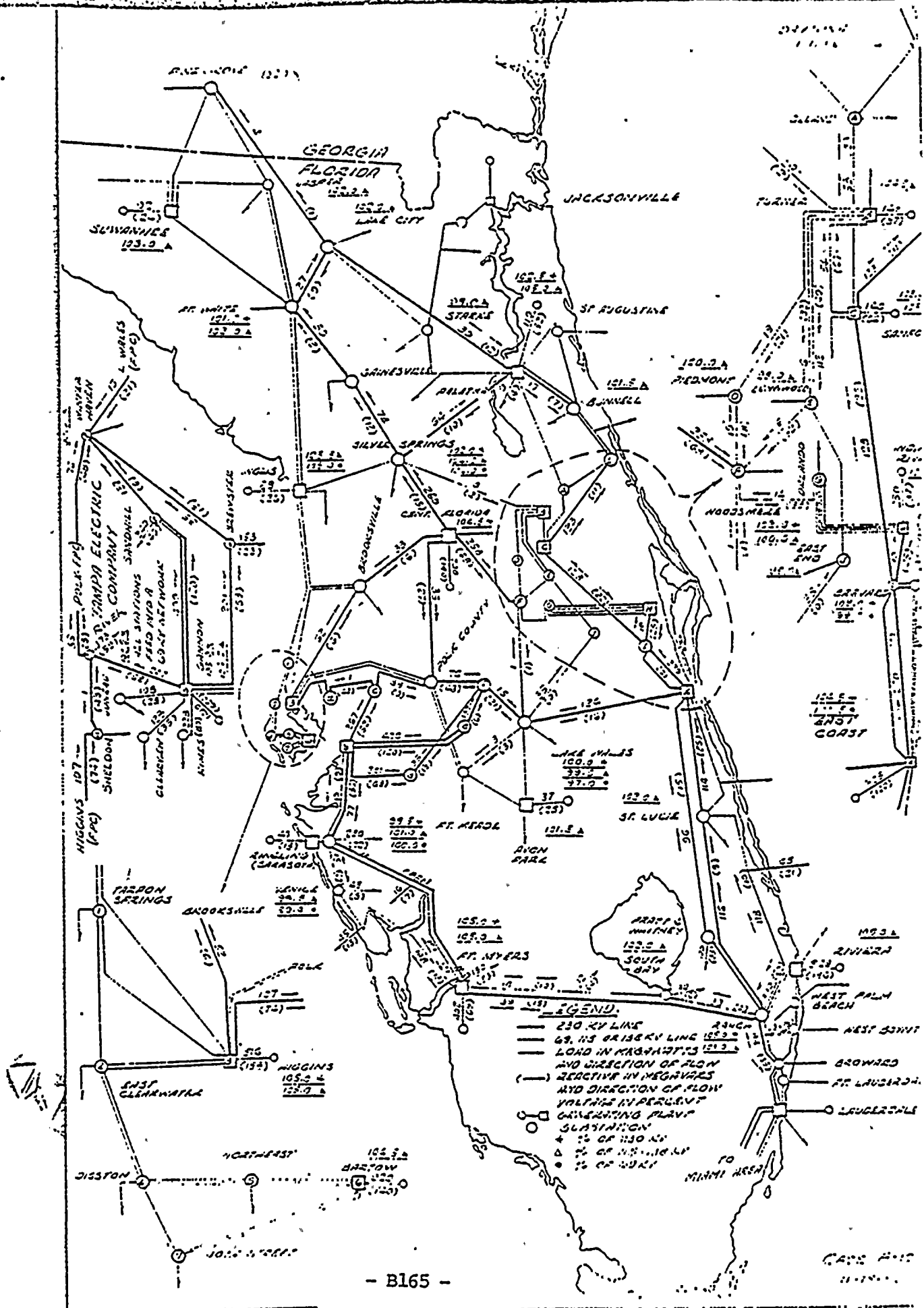
To determine if firm power supply is provided to the
Sarasota area during an outage of the Ft. Myers-Ringling 230 kv
line which normally carried 127 mw and 9 mvar..

Results:

Voltages were normal. The two 138 kv lines north out of
Ft. Myers carried total of 209 mw, picking up 82 mw of the 127 mw
normally carried by Ft. Myers-Ringling 230 kv line. The other
45 mw went to Ranch; 53 mw on to East Coast; 38 mw to Lake Wales;
42 mw to Winter Haven; and 48 mw on to Ringling. Deliveries to
Ringling from Gannon were 77 mw and 85 mvar on 230 kv and only
19 mw and 9 mvar on 138 kv.

Conclusions:

Analysis of this and subsequent cases shows that both a
230 kv line and a 138 kv line between Ringling and Gannon are
not required for a firm power supply to the Sarasota area.
Conversion to 230 kv and reconductoring of existing FPL-TEC
interconnection would be sufficient.



CASE A-11

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System, modified as follows:
Eliminated Woodsmere-Sanford 230 kv line. Eliminated Silver Springs-Palatka 230 kv line. Added 2nd 230 kv circuit between Central Florida and Woodsmere. Increased P.F. of FPC & OUC loads to 95%.

Transmission Line Outage: Sanford-Daytona 230 kv.

Purpose of Study:

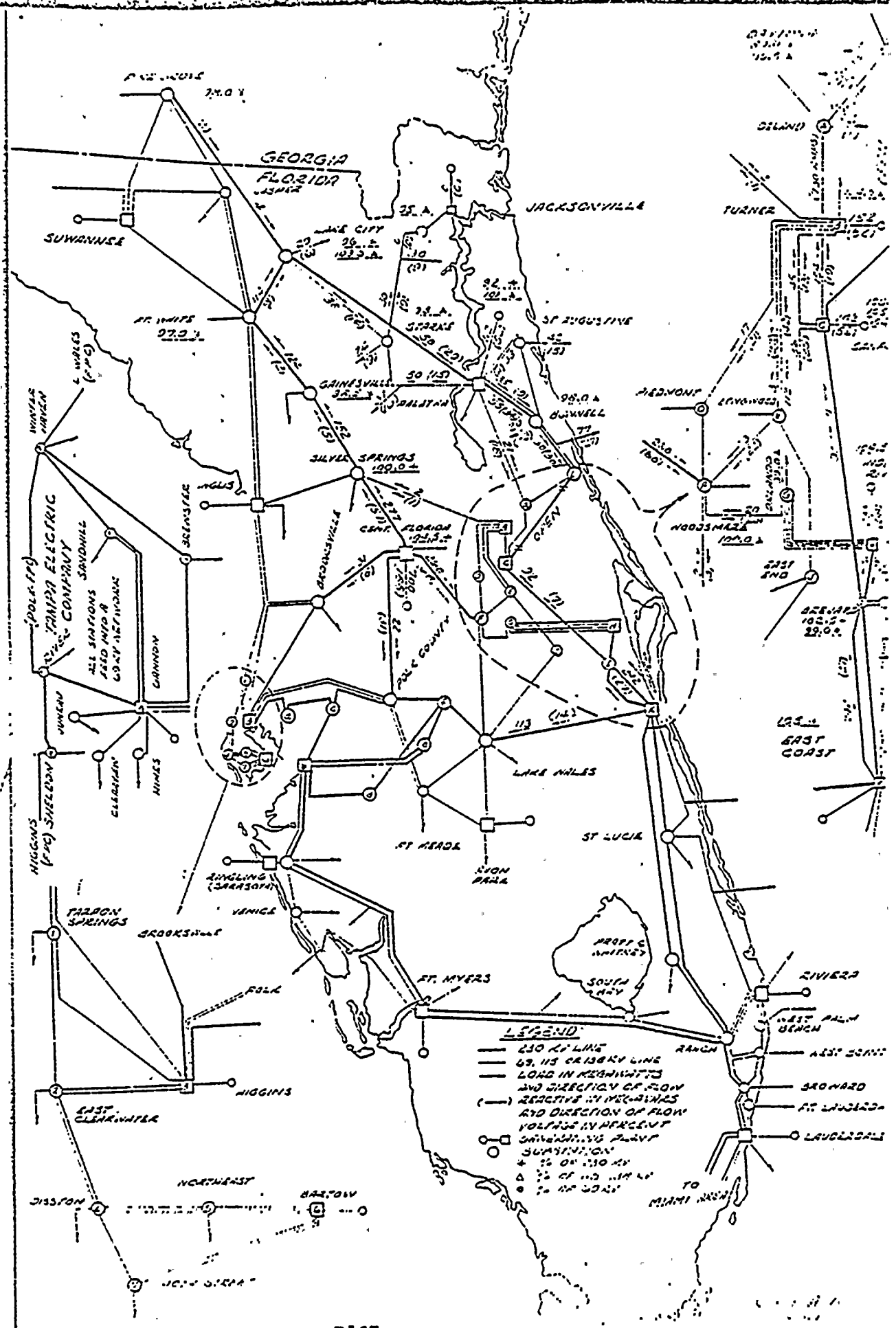
To determine if Sanford-Woodsmere and Silver Springs-Palatka 230 kv lines are required to provide firm transmission at Sanford Plant and firm power supply to Daytona-Palatka area for loss of the Sanford-Daytona 230 kv line which normally carried 147 mw and 12 mvars.

Results:

Sanford-Deland 115 kv line picked up 86 mw to 154 mw (730 amp), which is the thermal rating of its 556.5 mcm ACSR Conductor Ft. White-Lake City 230 kv delivered 114 mw and 8 mvars to Lake City, which is 54 mw increase above normal of Case B-0. Voltages in Daytona-Palatka area were 4 to 6% below normal on 115 kv and 10 to 12% below normal on 230 kv.

Conclusions:

During an outage of Sanford-Daytona 230 kv line, Sanford-Woodsmere and Silver Springs-Palatka 230 kv lines are not required to provide firm transmission at Sanford Plant or firm power supply to Daytona-Palatka area. The loading on the Sanford-Deland 115 kv line was somewhat critical. However, this loading could be sufficiently reduced by generation changes at Suwannee and Jacksonville.



CASE A-12

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System, modified as follows:
Eliminated Woodsmere-Sanford 230 kv line. Eliminated Silver Springs-Palatka 230 kv line. Added 2nd 230 kv circuit between Central Florida and Woodsmere. Increased P.F. of FPC & OUC loads to 95%.

Transmission Line Outage: Higgins-Sheldon 230 kv.

Purpose of Study:

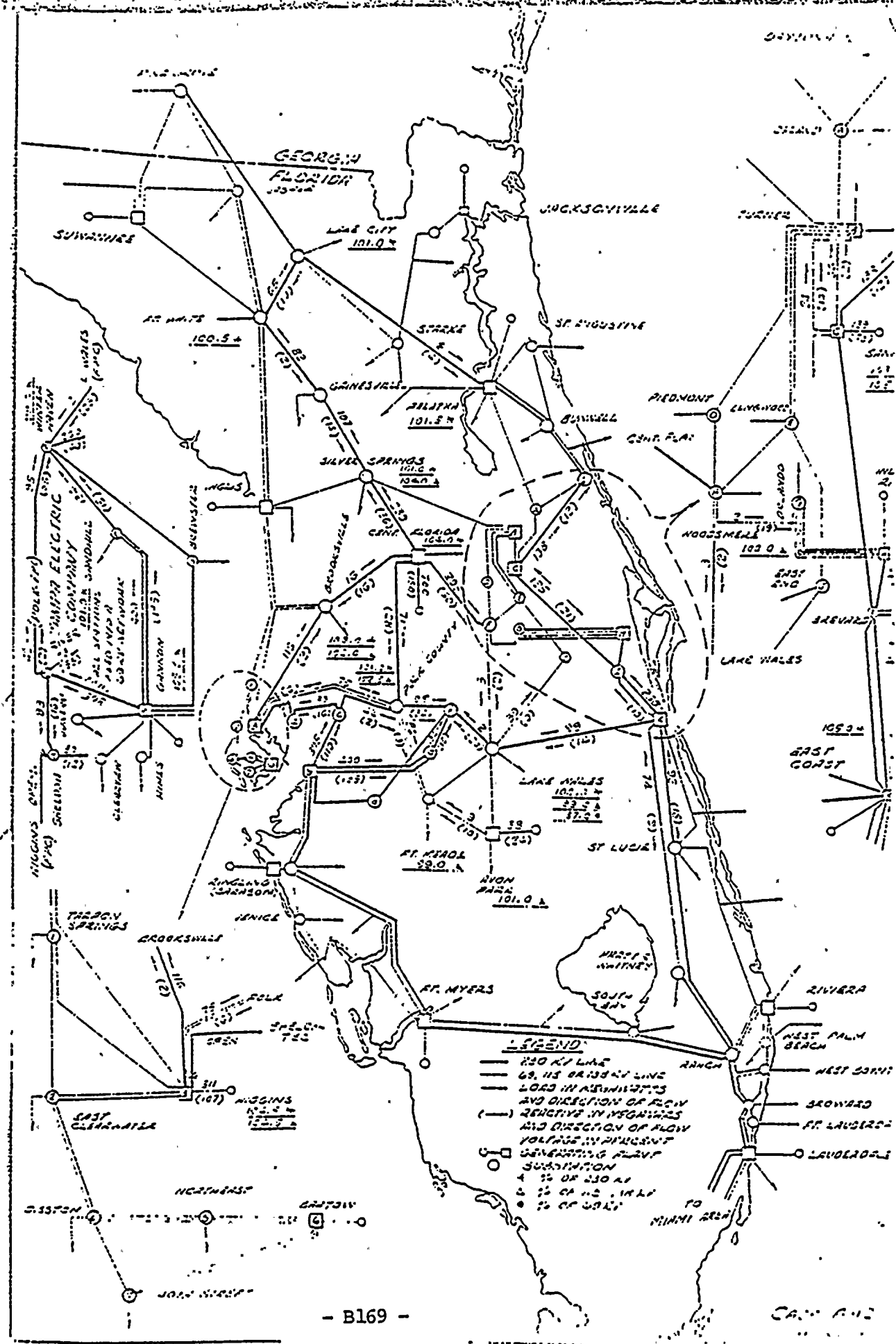
To determine if loss of the Higgins-Sheldon 230 kv line, which normally carried 100 mw and 76 mvars, would jeopardize service to West end of the TEC system.

Results:

Loss of this line had negligible effect on voltage at Sheldon or River substations and the 100 mw and 76 mvar normally carried by this line redistributed over other lines out of Higgins in a manner as to impose no overloads.

Conclusions:

The voltages and line flows were satisfactory.



CASE A-13

General Conditions:

Major Generating Unit

Out of Service-Emergency: None

Transmission System:

Basic System, modified as follows:
Eliminated Woodsmere-Sanford
230 kv line. Eliminated Silver
Springs-Palatka 230 kv line.
Added 2nd 230 kv circuit between
Central Florida and Woodsmere.
Increase P.F. of FPC & OUC loads
to 95%.

Transmission Line Outage: River-Polk Co. 230 kv

Purpose of Study:

To determine if the loss of the River-Polk Co. 230 kv line, which normally carried 102 mw and 21 mvar, would create voltage or line loading problems.

Results:

Loss of this line resulted in negligible voltage drop at Winter Haven, and the 102 mw and 21 mvar normally supplied over this circuit redistributed 75 mw through the Gannon-Winter Haven 230 kv line and 28 mw through the Central Florida-Polk Co. line.

Conclusions:

Emergency outage of the Polk County-River 230 kv line would introduce no problem.

CASE A-14

General Conditions:

Major Generating Unit

Out of Service-Emergency: None

Transmission System:

Basic System, modified as follows:
Eliminated Woodsmere-Sanford 230 kv line. Eliminated Silver Springs-Palatka 230 kv line. Added 2nd 230 kv circuit between Central Florida plant and Woodsmere. Increased P.F. of FPC & OUC loads to 95%.

Transmission Line Outage: Gannon-River 230 kv

Purpose of Study:

To determine firm transmission requirements at Gannon and firm power supply requirements of River-Sheldon area during loss of Gannon-River 230 kv line which normally carried 287 mw and 68 mvar.

Results:

Loss of this line had negligible effect on the voltage level at River substation. Loading in the Gannon-Sandhill double circuit 230 kv line increased from 432 mw and 146 mvar to 542 mw and 139 mvar. The Higgins-Sheldon line supplied 47 mw more than its normal 100 mw into Sheldon. The Polk Co.-River line flow reversed and supplied 38 mw to River for a net change of 140 mw. The 138 kv lines out of Gannon supplied about 94 mw.

Conclusions:

The outage of the Gannon-River line is adequately taken care of through the 230 kv system around by Winter Haven and back through Polk Co. and Higgins plus the local 138 kv system.

CASE A-15

General Conditions:

Major Generating Unit

Out of Service-Emergency: None

Transmission System:

Basic System, modified as follows:

230 kv lines Eliminated: (1)

Woodsmere-Sanford; (2) Silver

Springs-Palatka; (3) Pratt &

Whitney-East Coast.

230 kv lines Established:

Central Florida-Woodsmere No. 2
circuit.

Increased P.F. of FPC & OUC Loads
to 95%.

Transmission Line Outage: St. Lucie-Ranch 230 kv

Purpose of Study:

To determine whether a second 230 kv line between Ranch and the East Coast plant is required for firm transmission.

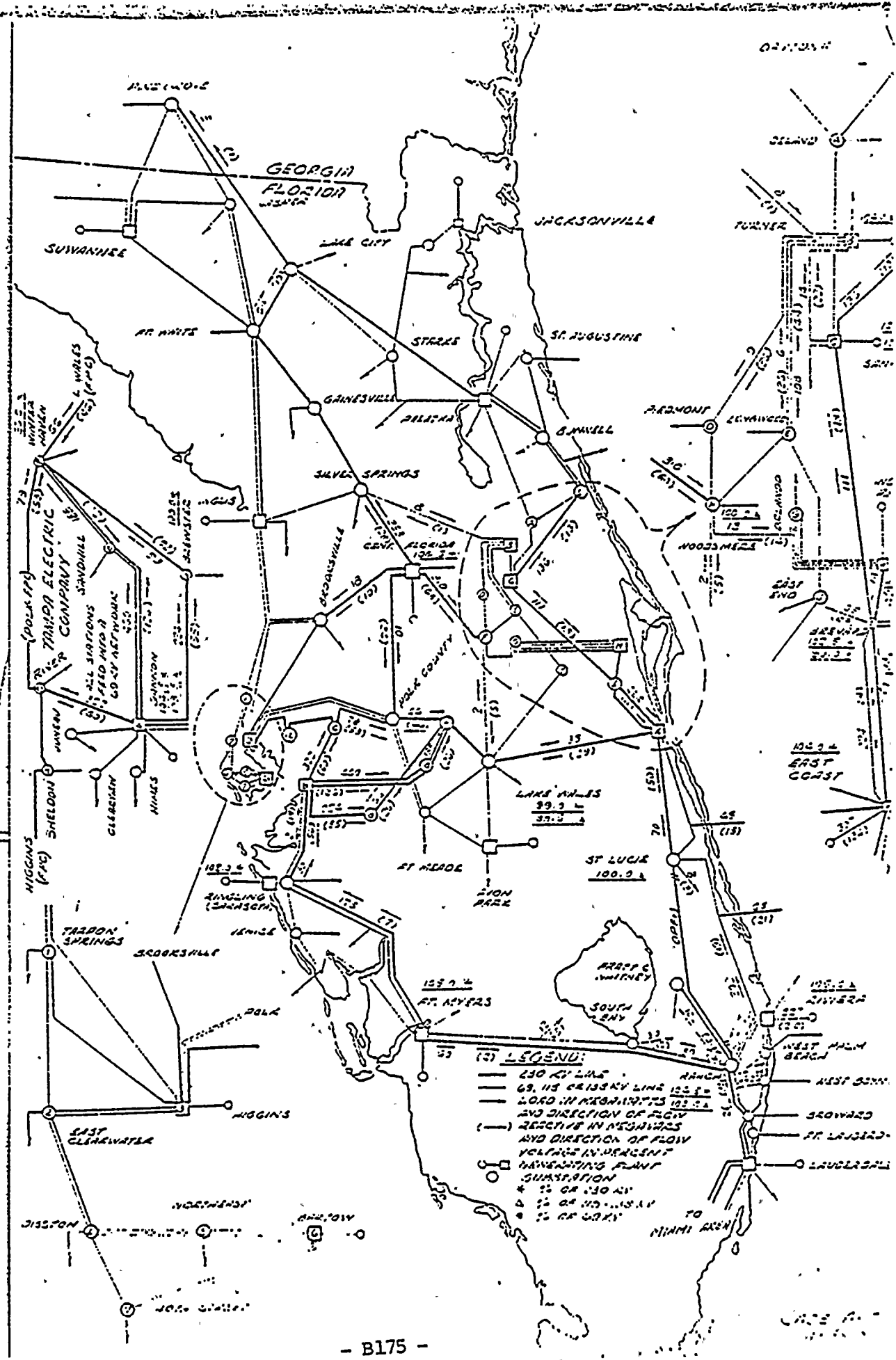
Results:

By supplying 202 mw from Riviera toward St. Lucie at 138 kv, no critical voltage levels or overloaded circuits developed. The 825 amp loading on the Riviera-St. Lucie 138 kv line was 92% of thermal rating of proposed 795 mcm conductor.

The two 230 kv lines from the south into the East Coast of Case A-0 normally carried about 162 mw. In this case, the Riviera-St. Lucie 138 kv line increased 90 mw, and the Ranch-Ft. Myers lines increased 80 mw.

Conclusions:

With the East Coast Plant and 230 kv around by Ft. Myers, a second 230 kv line between Ranch and the East Coast Plant is not required for this outage condition for steady state stability. However, the transient stability should be determined.



CASE A-16

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System, modified as follows:
230 kv lines Eliminated: (1) Woodsmere-Sanford; (2) Silver Springs-Palatka; (3) Pratt & Whitney-East Coast.
230 kv Lines Established: Central Florida-Woodsmere No. 2 Circuit.
Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage: East Coast-St. Lucie 230 kv

Purpose of Study:

To determine whether a second 230 kv line between Ranch and East Coast is required for firm transmission.

Results:

The St. Lucie-East Coast 69 kv line flow is 81 mw (685 amps) which is 76% of the thermal rating of the proposed 795 mcm conductor. Of the 167 mw normally flowing from St. Lucie to East Coast, 47 mw now is carried by the St. Lucie-East Coast 69 kv line and 122 mw works its way around through Ft. Myers.

Conclusions:

With the East Coast Plant and 230 kv around by Ft. Myers, a second 230 kv line between Ranch and the East Coast Plant is not required for this outage condition for steady state stability. However, the transient stability should be determined since the only tie between St. Lucie and East Coast is one 69 kv line 59 miles long.

CASE A-17

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System, modified as follows:
230 kv lines Eliminated: (1) Woodsmere-Sanford; (2) Silver Springs-Palatka; (3) Pratt & Whitney-East Coast.
230 kv lines Established: Central Florida-Woodsmere No. 2 circuit.
Bussed the two Turner 115 kv lines at Longwood.
Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage: Brevard-East Coast 230 kv

Purpose of Study:

To determine whether a second 230 kv line between East Coast and Brevard is required for firm transmission.

Results:

The three East Coast-Brevard 69 kv lines carried 115 mw of the 260 mw normally flowing on the East Coast-Brevard 230 kv lines. The three lines carried 234 mw with one line carrying 95 mw or 95% of its thermal rating for 795 mcm conductor. The East Coast-Lake Wales 230 kv line increased 100 mw to 179 mw. The Indian River-Brevard 230 kv line delivered 59 mw to Brevard.

Brevard 69 kv bus voltage was 6.5% below normal; however, it could have been maintained by a 10% transformer tap change.

The bussing of the second 115 kv line at Longwood improved the bus voltage about 5% and reduced the normal loading on the one Turner-Longwood 115 kv line from 110 mw to 55 mw.

Conclusions:

Since the three 69 kv circuits between Brevard and East Coast can accommodate the 234 mw, the second 230 kv circuit between Brevard and East Coast could not be justified for firming up the transmission out of East Coast Plant.

CASE B-O

General Conditions:

- Major Generating Unit
- Out of Service-Emergency: None
- Transmission System: Basic System, modified as follows:
230 kv lines eliminated: (1) Woodsmere-Sanford; (2) Silver Springs-Palatka;
(3) Higgins-Sheldon; (4) Polk County-River; (5) Lake Wales-Winter Haven.
230 kv lines established:
(1) Higgins-Polk County; (2) Polk County-Lake Wales; (3) Central Florida-Woodsmere No. 2.
Increased P.F. of FPC & TEC loads to 95%.

Transmission Line Outage: None

Purpose of Study:

To set up a basic system with the Polk Co.-Winter Haven 230 kv line as the only tie between FPC and TEC and with a 230 kv line from Higgins to Polk Co. and on to Lake Wales.

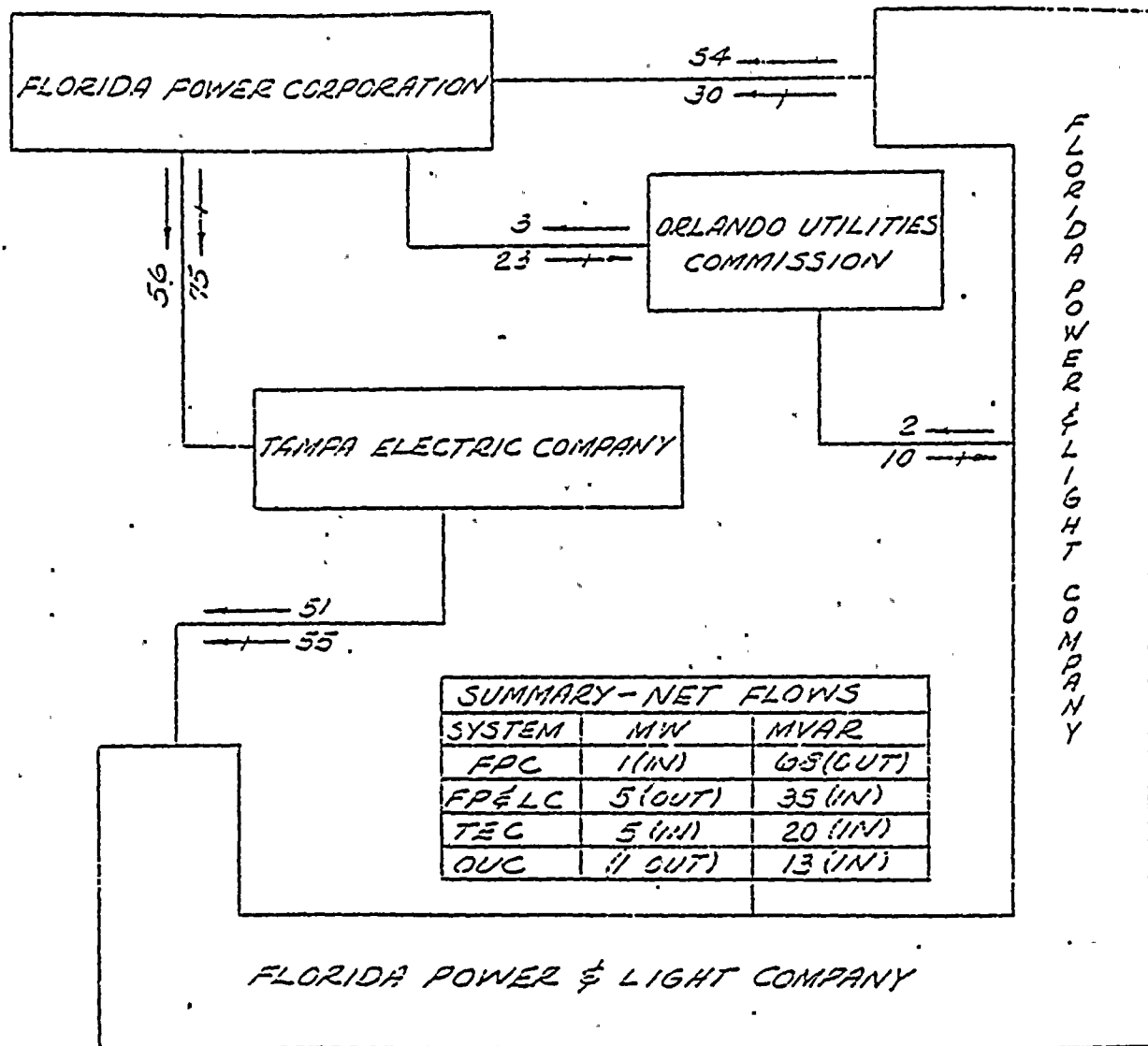
Results:

The Higgins-Polk Co. 230 kv line carried 96 mw and 25 mvar where normally the Higgins-Sheldon 230 kv line carried 100 mw and 76 mvar and the River-Polk Co. 230 kv line carried 102 mw and 21 mvar. The Polk Co.-Lake Wales 230 kv line carried 42 mw and -7 mvar where normally the Winter Haven-Lake Wales 230 kv line carried 27 mw and -6 mvar.

Conclusions:

Under normal conditions, this seems to be a satisfactory arrangement. Some of the weaknesses show up in the next two cases. This arrangement would require additional study.

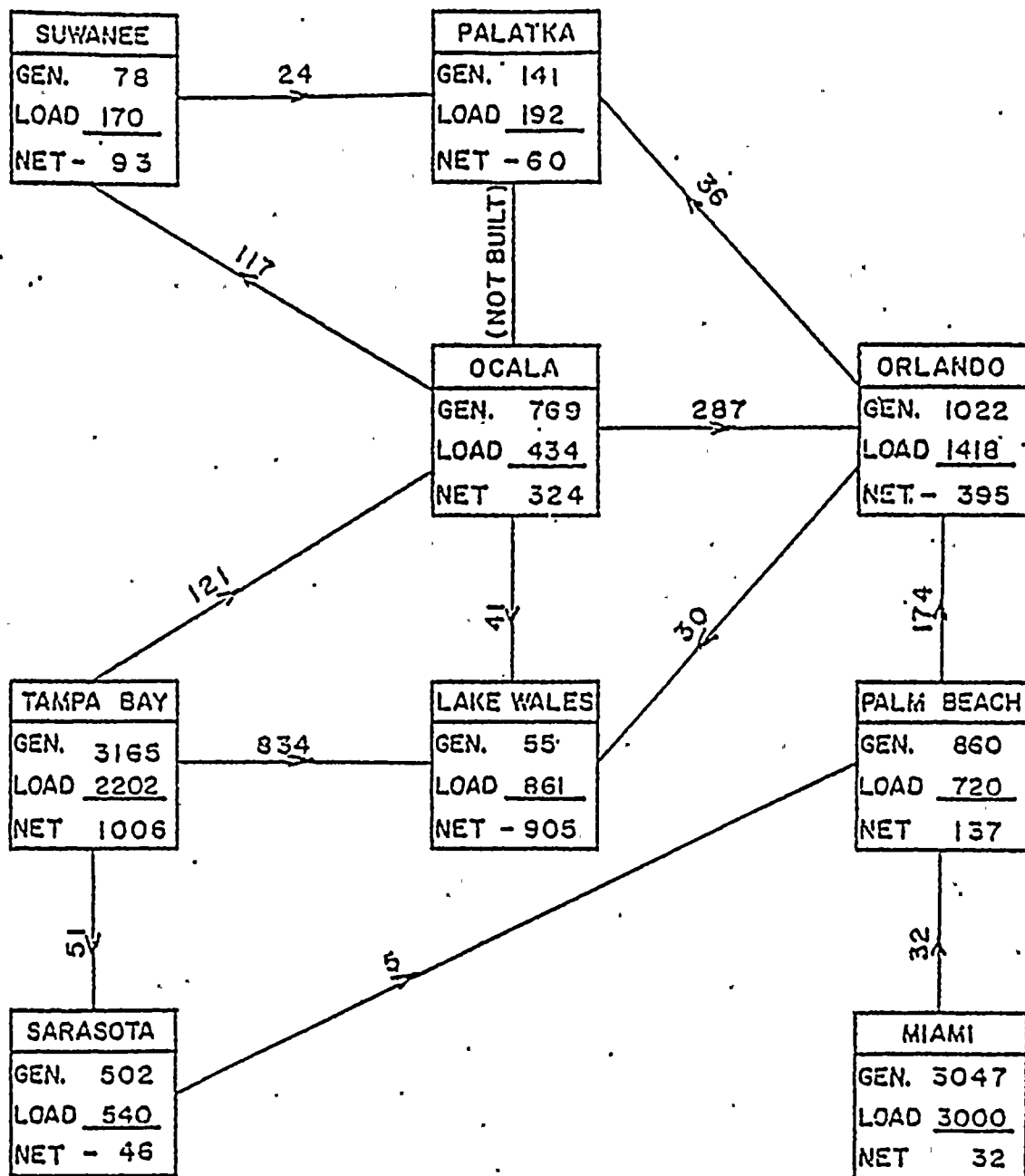
FLORIDA INTEGRATED SYSTEMS
INADVERTENT POWER TRANSFERS
AS DETERMINED FROM
JOINT AC BOARD STUDY OF PROSPECTIVE 1970 LOAD



———— INDICATES NET MEGAWATTS AND DIRECTION OF FLOW
 ———+—— INDICATES NET MEG-VARS AND DIRECTION OF FLOW

PLANNING COMMITTEE
FLORIDA OPERATING COMMITTEE
JOINT BOARD STUDY

LOAD, GENERATION, & INTER-AREA POWER FLOW DATA



CASE NO. B-0

CASE B-1

General Conditions:

Major Generating Unit

Out of Service-Emergency: None

Transmission System:

Basic System, modified as follows:

230 kv lines Eliminated:

(1) Woodsmere-Sanford; (2) Silver Springs-Palatka; (3) Higgins-Sheldon; (4) Polk County-River; (5) Lake Wales-Winter Haven;

230 kv lines Established:

(1) Higgins-Polk County; (2) Polk County-Lake Wales; (3) Central Florida-Woodsmere No. 2.

Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage:

Gannon-River-Sheldon 230 kv.

Other Changes:

Increased Hookers Pt. generation 100 mw to capacity; decreased Gannon 230 kv generation.

Purpose of Study:

To determine firm power supply requirements of River-Sheldon area.

Results:

Loss of the Gannon source would be critical as shown by the following comparison of voltage levels:

<u>Location</u>	<u>KV</u>		
	<u>Status of Higgins-Sheldon Line</u>		
	<u>With</u>	<u>With</u>	<u>Without</u>
	<u>(Normal)</u>	<u>(Case A-14)</u>	<u>(Case B-1)</u>
Sheldon	69.7	69.0	62.2
River	69.3	68.3	60.6
Gannon	143.5	143.5	144.0
Gannon	242.0	242.0	242.0

The River 69 kv bus voltage was about 12% below normal.

Flow on the 138 kv lines north from Gannon increased 147 mw.

Conclusions:

Provision of firm power supply to River-Sheldon area would require a Higgins-Sheldon 230 kv line or a second Gannon-River 230 kv line.

CASE B-2

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System, modified as follows:
230 kv lines Eliminated:
(1) Woodsmere-Sanford; (2) Silver Springs-Palatka; (3) Higgins-Sheldon; (4) Polk County-River; (5) Lake Wales-Winter Haven;
230 kv lines Established:
(1) Higgins-Polk County; (2) Polk County-Lake Wales; (3) Central Florida-Woodsmere No. 2.
Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage: Gannon-Brewster-Wtr. Haven 230 kv

Other Changes: Increased Hookers Pt. generation 100 mw; decreased Gannon 230 kv generation.

Purpose of Study:

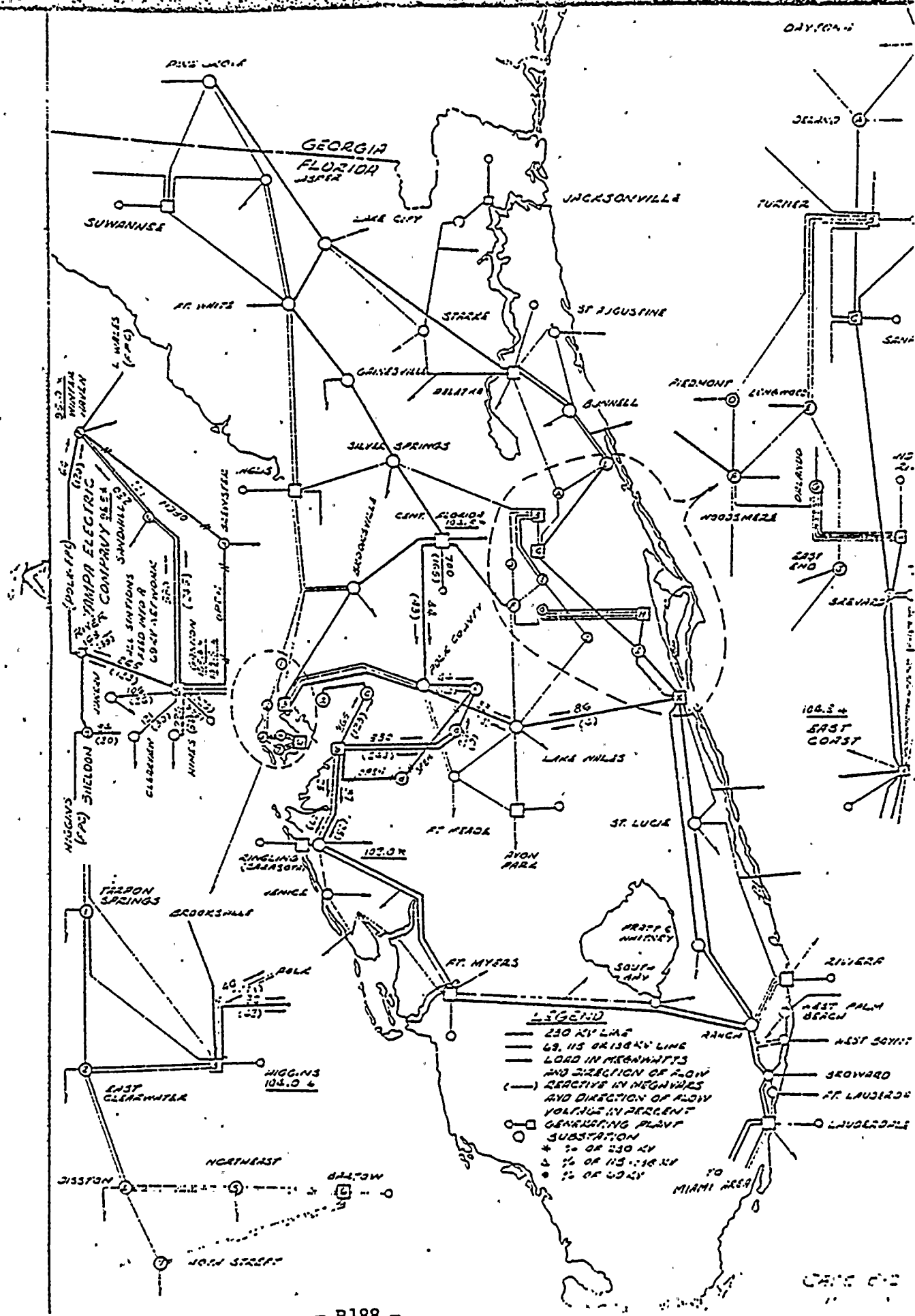
To determine necessity for sectionalizing the Gannon-Winter Haven 230 kv line at Brewster.

Results:

Loss of the 230 kv source to Brewster resulted in the voltage dropping 13% from normal. The voltage drop at Winter Haven was only 3.5%. The Hookers Point-Mulberry 69 kv flow increased 58 mw. All the 120 mvar to Winter Haven were supplied over the Polk Co.-Winter Haven 230 kv line.

Conclusions:

Firm power supply to Brewster-Mulberry area could be provided by sectionalizing 230 kv at Brewster so that only Gannon-Brewster or Brewster-Winter Haven section would be lost.



CASE C-0

General Conditions:

Major Generating Unit
Cut of Service-Emergency: East Coast 350 mw.

Transmission System: Basic System, modified as follows:
230 kv lines Eliminated: (1) Woodsmere-Sanford; (2) Silver Springs-Palatka; (3) Ranch-East Coast No. 2 Circuit.
230 kv lines Established: Central Florida-Woodsmere No. 2 circuit.
Bussed the two Turner 115 kv lines at Longwood.
Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage: None

Interchange Power: 103 mw from FPC to FPL
50 mw from TEC to FPL
157 mw picked up on FPL Reserve.

Purpose of Study:

To determine if an outage to the East Coast 350 mw unit will impair service in the Orlando Load area and to establish the possibility of exchanging economy energy between areas. The deficit was to be supplied 50% by FPL, 30% by FPC, and 20% by TEC.

Results:

The 310 mw that the East Coast unit had been carrying was picked up by FPL, 157 mw (Riviera, 40; Sanford, 15; Ft. Myers, 40; and Lauderdale, 62 mw), by FPC, 103 mw (Central Florida, 75 and Higgins, 25 mw) and by TEC at Gannon, 50 mw.

The voltage drop in area was 4% or less on the 69 and 115 kv busses and up to 13.5% on the 230 kv busses. The Indian River-Brevard 230 kv line delivered 44 mw and 46 mvars to Brevard.

Conclusions:

The total deficit in the Orlando Load Area, during the outage of the East Coast Unit, of 685 mw was supplied satisfactorily from the other areas.

Large blocks of economy energy could be delivered to the Orlando Load Area.

CASE C-1

General Conditions:

Major Generating Unit

Out of Service-Emergency: Ft. Myers 300 mw.

Transmission System:

Basic System, modified as follows:

230 kv lines Eliminated: (1)

Woodsmere-Sanford; (2) Silver Springs-Palatka; (3) Pratt & Whitney-East Coast.

230 kv lines Established:

Central Florida-Woodsmere No. 2 circuit.

Bussed the two Turner 115 kv lines at Longwood.

Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage: None

Interchange Power:

100 mw from FPC to FPL

65 mw from TEC to FPL

150 mw picked up on FPL Reserve.

Purpose of Study:

To determine if an outage to the Ft. Myers 300 mw unit would jeopardize service to the Sarasota Load Area and to establish the possibility of exchanging economy energy between areas. The deficit was to be supplied 50% by FPL, 30% by FPC, and 20% by TEC.

Results:

Loss of the major unit at Ft. Myers resulted in only a 3.5% drop from normal. The 265 mw normally carried by the Ft. Myers unit was picked up by FPL, 150 mw (Riviera 35 and Lauderdale, 115); FPC, 100 mw (Central Florida 80, and Higgins 20) and TEC, 65 mw at Gannon. The flow on the Gannon-Ringling lines increased 105 mw and the Ranch-Ft. Myers lines, 159 mw.

Conclusions:

Scheduled or emergency outages of the Ft. Myers unit would present no problem since the 318 mw area deficit was easily supplied from other areas. Large blocks of economy energy could be delivered to the Sarasota Load Area.

CASE C-2

General Conditions:

Major Generating Unit

Out of Service-Emergency: Gannon 500 mw

Transmission System:

Basic System, modified as follows:

230 kv lines Eliminated: (1)

Woodsmere-Sanford; (2) Silver

Springs-Palatka; (3) Pratt &

Whitney-East Coast.

230 kv lines Established: Central

Florida-Woodsmere No. 2 circuit.

Bussed the two Turner 115 kv line at Longwood.

Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage:

None

Interchange Power:

130 mw from FPC to TEC.

235 mw from FPL to TEC.

150 mw picked up by TEC Reserve.

Purpose of Study:

To determine if the integrated transmission system would be adequate for protecting Tampa Bay Load Area for loss of a 500 mw unit at Gannon. The deficit was to be supplied 50% by FPL, 30% by FPC and 20% by TEC. To establish the practicability of exchanging economy energy between areas.

Results:

The 500 mw normally carried by the Gannon unit was picked up by FPL, 235 mw (Lauderdale 160 mw, Riviera 30mw, East Coast 25 mw and Ft. Myers 20 mw); FPC, 130 mw (Central Florida 80mw, Suwannee 35 mw and Higgins 15 mw) and TEC, 150 mw (Hookers Point 100 mw and Gannon 50 mw). The flow from Ringling to Gannon increased 137 mw; Lake Wales to Winter Haven, 85 mw; Polk Co. to TEC, 64 mw and Higgins to Sheldon, 52 mw.

Conclusions:

The loss of a 500 mw unit at Gannon was easily sustained by supplying the 48 mw area deficit from the other areas. This demonstrates that large blocks of economy energy could be delivered to the Tampa Bay Area.

CASE C-3

General Conditions:

Major Generating Unit
Out of Service-Emergency: Central Florida 500 mw Capacity

Transmission System: Basic System, modified as follows:
230 kv lines Eliminated: (1) Woodsmere-Sanford; (2) Silver Springs-Palatka; (3) Pratt & Whitney-East Coast.
230 kv lines Established: Central Florida-Woodsmere No. 2 circuit.
Bussed the two Turner 115 kv lines at Longwood.
Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage: None

Interchange Power: 245 mw from FPL to FPC.
120 mw from TEC to FPC.
.160 mw picked up by FPC Reserve.

Purpose of Study:

To determine if the integrated transmission system would be adequate for protecting the Ocala Load Area against scheduled or emergency outage of 500 mw capacity in the area. The deficit was to be supplied 50% by FPL, 30% by FPC and 20% by TEC. To determine also the potentiality of exchanging economy energy between areas.

Results:

The 500 mw loss at Central Florida was picked up by FPL, 245 mw (Lauderdale 160 mw, Riviera 30 mw, East Coast 30 mw and Ft. Myers 25 mw); FPC, 160 mw (Suwannee 70 mw, Turner 46 mw, Higgins 24 mw and Central Florida 20 mw) and TEC, 120 mw (Hookers Point 100 mw and Gannon 20 mw). The flow from Ranch to Ft. Myers increased 97 mw; Ringling to Gannon, 112 mw; and East Coast to Lake Wales, 44 mw. The Gannon-River line carried 385 mw. The 230 kv level in Central Florida dropped only 4% or a negligible amount.

Conclusions:

The loss of 500 mw capacity at Central Florida would introduce no operating problems since the 157 mw area deficit was easily supplied from other areas. This demonstrates that large blocks of economy energy could be delivered to the Ocala Load Area. The relatively small voltage drop is largely due to the remaining 220 mw generating capacity in Central Florida.

CASE C-4

General Conditions:

Major Generating Unit

Out of Service-Emergency: Lauderdale (Port Everglades). 500 mw

Transmission System:

Basic System, modified as follows:

230 kv lines Eliminated: (1)

Woodsmere-Sanford; (2) Silver Springs-Palatka; (3) Pratt & Whitney-East Coast.

230 kv lines Established: Central Florida-Woodsmere No. 2 circuit.

Bussed the two Turner 115 kv lines at Longwood.

Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage: None

Interchange Power:

120 mw from FPC to FPL.

145 mw from TEC to FPL.

214 mw picked up by FPL Reserve.

Purpose of Study:

To determine if the integrated transmission system would be adequate for protecting the Miami load area against scheduled or emergency outage of a 500 mw unit in the area.

The deficit was to be supplied 50% by FPL, 30% by FPC, and 20% by TEC. To determine also the potentiality of exchanging economy energy between areas.

Results:

The 500 mw loss in south Florida was picked up by FPL, 210 mw (Lauderdale 130 mw, Riviera 35 mw, East Coast 25 mw and Ft. Myers 20 mw); FPC, 120 mw (Central Florida 65 mw, Suwannee 35 mw, and Higgins 20 mw) and TEC, 145 mw (Hookers Point 100 mw and Gannon 45 mw). The line flow from Gannon to Ringling increased 114 mw; Ft. Myers to Ranch, 139 mw; and south from Ranch, 364 mw. The maximum voltage drop on the integrated system was only 2% at Lauderdale.

Conclusions:

The loss of a 500 mw unit in the Miami Load Area would introduce no operating problems since the 332 mw was easily supplied from other areas. This demonstrates that large blocks of economy energy could be delivered to the Miami Load Area.

CASE D-0

General Conditions:

Major Generating Unit

Out of Service-Emergency: None

Transmission System:

Basic System, modified as follows:

230 kv lines Eliminated: (1)

Woodsmere-Sanford; (2) Silver Springs-Palatka; (3) Pratt & Whitney-East Coast.

230 kv lines Established: Central Florida-Woodsmere No. 2 Circuit.

Bussed the two Turner 115 kv lines at Longwood.

Increased P.F. of FPC & OUC loads to 95%.

Transmission Line Outage: None

Interchange Power:

150 mw from FPC to Southern Company

195 mw from FPL to Southern Company

45 mw from TEC to Southern Company

390 mw - Total generations increase

Purpose of Study:

To determine maximum amount of power that might be delivered the Southern Company over the four existing 115 kv lines and the proposed 230 kv line.

Results:

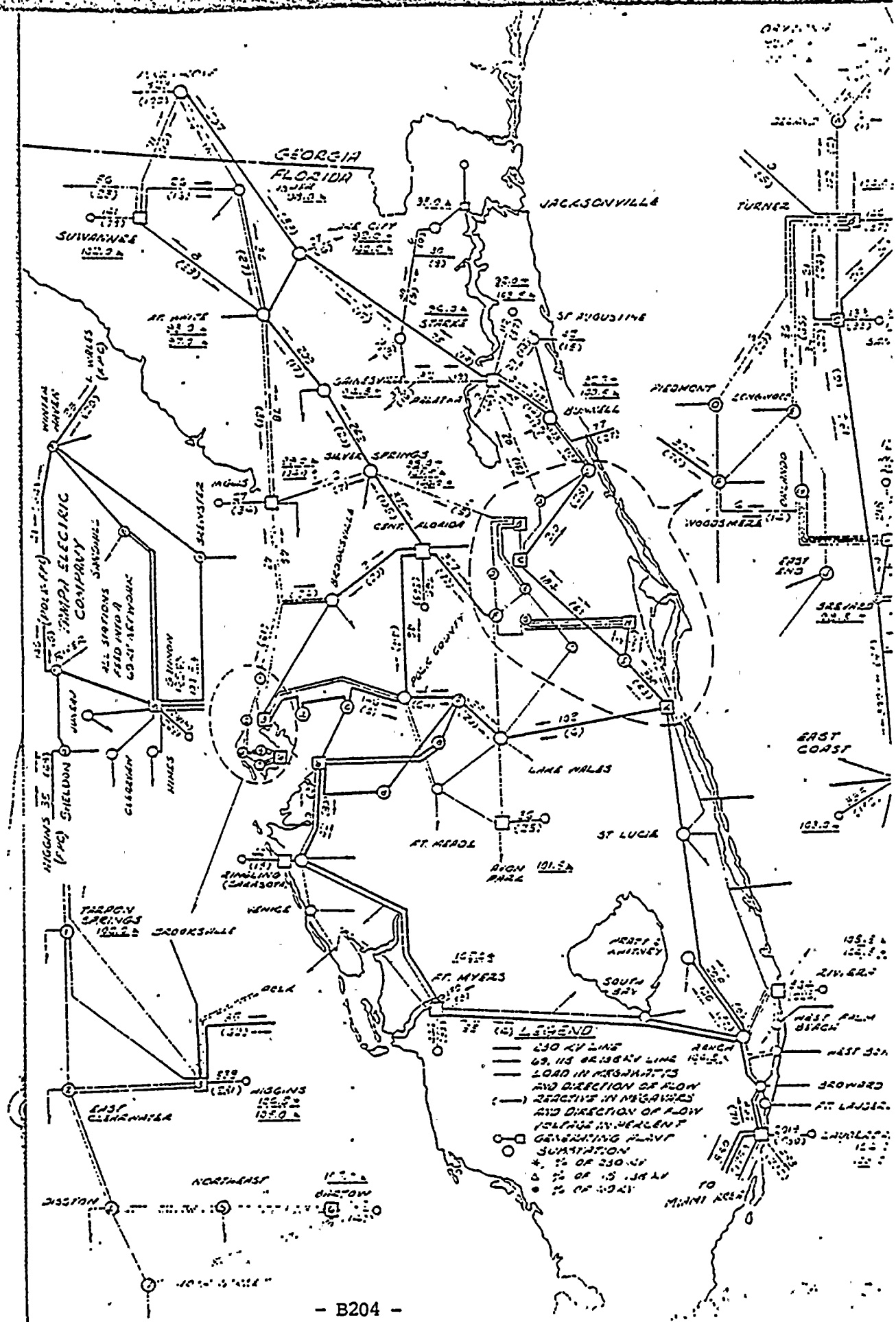
The Florida systems delivered the Southern Company 300 mw at Pine Grove with a 3.5% voltage drop; however, in limiting the drop to this value, it was necessary for the Southern Company to supply Florida 120 mvar.

FPL supplied 195 mw (Lauderdale 115 mw, Riviera 35 mw, East Coast 25 mw, and Ft. Myers 20 mw); FPC, 150 mw, (Suwannee 65 mw, Central Florida 65 mw, and Higgins, 20 mw) and TEC, 45 mw (Hookers Point 100 mw and Gannon -55 mw).

The Central Florida-Silver Springs 230 kv line carried 375 mw or 935 amps. This is 4% over the thermal rating of 795 mcm conductor. The Ft. White-Lake City 230 kv line carried 181 mw and Lake City-Pine Grove, 207 mw. The Ft. White, Lake City, Palatka, Bunnell and Daytona 230 kv bus voltages dropped 8 to 10% below normal.

Conclusions:

The maximum power that could be delivered to Pine Grove was about 300 to 350 mw due to reactive requirements at Pine Grove and voltage conditions in the Ft. White, Lake City, Palatka, Sunnell and Daytona areas. The Central Florida-Silver Springs line was slightly over its thermal limit.



CASE D-1

General Conditions:

Major Generating Unit

Out of Service-Emergency:

Tampa Bay Load Area 400 mw capacity

Transmission System:

Basic System, modified as follows:

230 kv lines Eliminated: (1)

Woodsmere-Sanford; (2) Silver

Springs-Palatka; (3) Pratt &

Whitney-East Coast No. 2 circuit.

230 kv lines Established: Central

Florida-Woodsmere No. 2 circuit.

Bussed the two Turner 115 kv lines at Longwood.

Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage:

None

Interchange Power:

400 mw from Southern Company.

Purpose of Study:

To determine maximum amount of power that might be received from the Southern Company over the four existing 115 kv lines and the proposed 230 kv line. To determine also the potentiality of receiving economy energy from the Southern Company.

Results:

Operation was satisfactory. Transmission of 400 mw south from Pine Grove required only 55 mvar delivery to Pine Grove, assuming 95% voltage could be maintained on Southern Company 230 kv system. Lake City-Pine Grove 230 kv line loaded well, carrying 290 mw. Flow east from Lake City toward Palatka increased 125 mw to 159 mw with 230 kv carrying 108 mw (111 mw change from normal). 82 mw flowed south to Ft. White. Voltages in Inglis-Starke area were only 2 to 5% below normal on 230 kv system.

All of this power was absorbed in the Tampa Bay Load Area. The line flow increased from East Coast to Lake Wales, 55 mw; Central Florida to Polk Co., 109 mw; Inglis and Brooksville to Higgins, 105 mw; Ringling to Gannon, 57 mw; Woodsmere and Turner to Lake Wales, 45 mw; and Ranch to Ft. Myers, 64 mw.

Conclusions:

While Suwannee was generating only 74 mw, voltage drops in taking 400 mw from Southern Company were negligible. Also, the 115 kv circuits between Suwannee and Ft. White were only partially loaded, indicating that the Florida system could absorb 400 mw from Southern Company even with Suwannee fully loaded.

Limitations on absorbing energy from across the Georgia State line would be in the ability of Southern Company to make delivery.

CASE E-0

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System, modified as follows:
230 kv lines Eliminated: (1) Woodsmere-Sanford; (2) Silver Springs-Palatka; (3) Pratt & Whitney-East Coast.
230 kv lines Established: Higgins-Polk County
115 kv lines converted to 230 kv: (1) Turner-Sanford; (2) Turner-Woodsmere West. Bussed the two Turner 115 kv lines at Longwood.
Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage: None

Purpose of Study:

To study relocation of the 700 mw generating capacity allocated to Central Florida, with 400 mw to Higgins and 300 mw to Turner.

Results:

Voltage levels were satisfactory at all locations and there were no overloaded circuits. However, the 230 kv voltage level in Central Florida was some 6% to 7% lower than would be the case with a 700 mw generating plant located in the area.

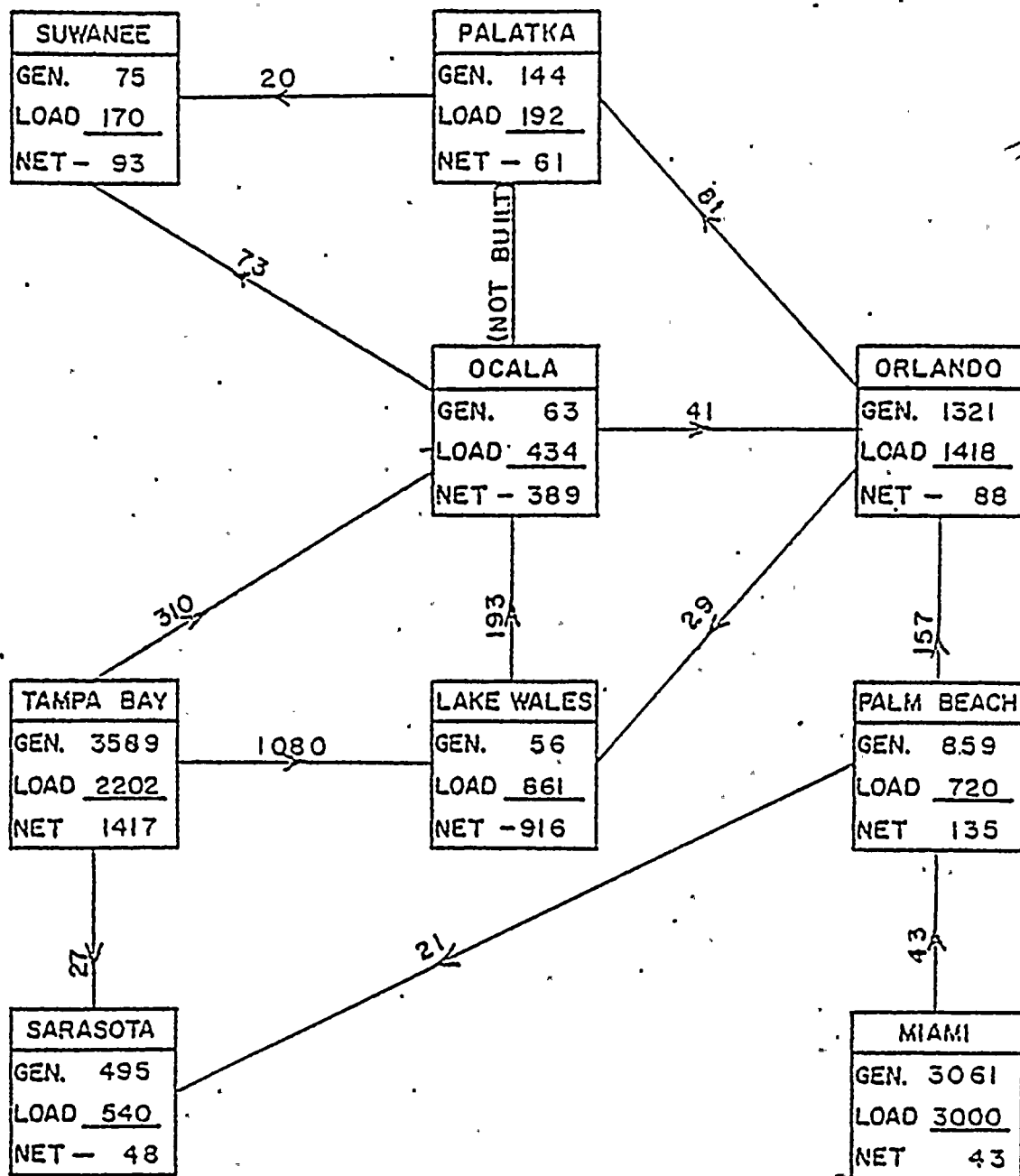
Conclusions:

The transmission system would be considerably stronger with than without a Central Florida plant. However, to evaluate the sacrifice in transmission capacity resulting from elimination of the plant is a study within itself. Certainly, the loss so sustained would support some differential in fuel cost favoring the Central Florida location.

Relocation of the Central Florida generating capacity weakened the transmission system to some extent as evidenced by a drop of 6.5% in voltage on the Central Florida 230 kv bus. However, time would not permit determining the amount of transmission capacity sacrificed by this relocation of generating capacity.

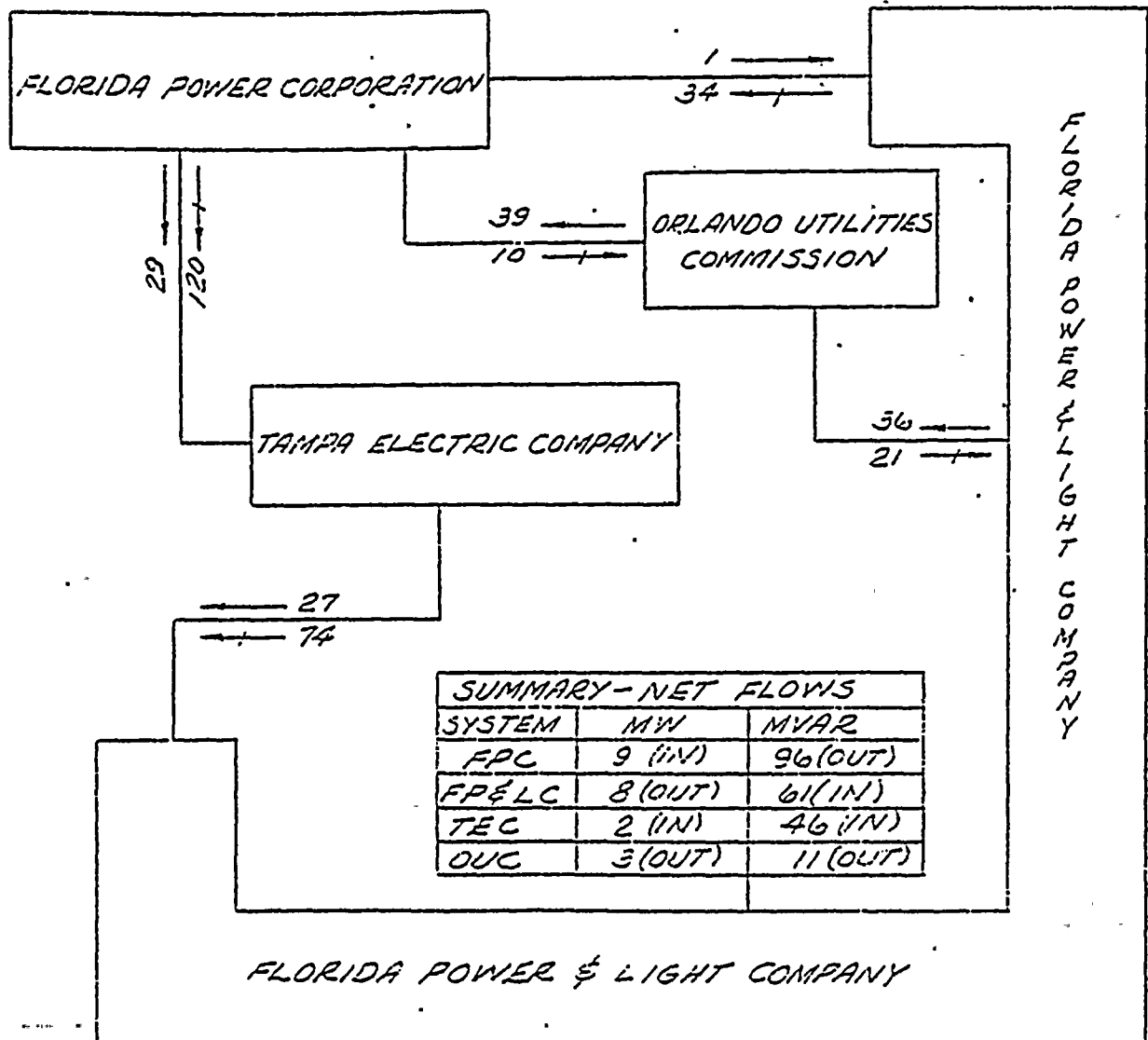
PLANNING COMMITTEE
FLORIDA OPERATING COMMITTEE
JOINT BOARD STUDY

LOAD, GENERATION, & INTER-AREA POWER FLOW DATA



CASE NO. E - 0

FLORIDA INTEGRATED SYSTEMS
INADVERTENT POWER TRANSFERS
AS DETERMINED FROM
JOINT AC BOARD STUDY OF PROSPECTIVE 1970 LOAD



————— INDICATES NET MEGAWATTS AND DIRECTION OF FLOW
 ———+—— INDICATES NET MEGAVARS AND DIRECTION OF FLOW

CASE E-1

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System, modified as follows:
230 kv lines Eliminated: (1) Woodsmere-Sanford; (2) Silver Springs-Palatka; (3) Pratt & Whitney-East Coast.
230 kv lines Established: Higgins-Polk County.
115 kv lines Converted to 230 kv:
(1) Turner-Sanford; (2) Turner-Woodsmere West.
Bussed the two Turner 115 kv lines at Longwood.
Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage: Central Florida-Silver Springs 230 kv

Purpose of Study:

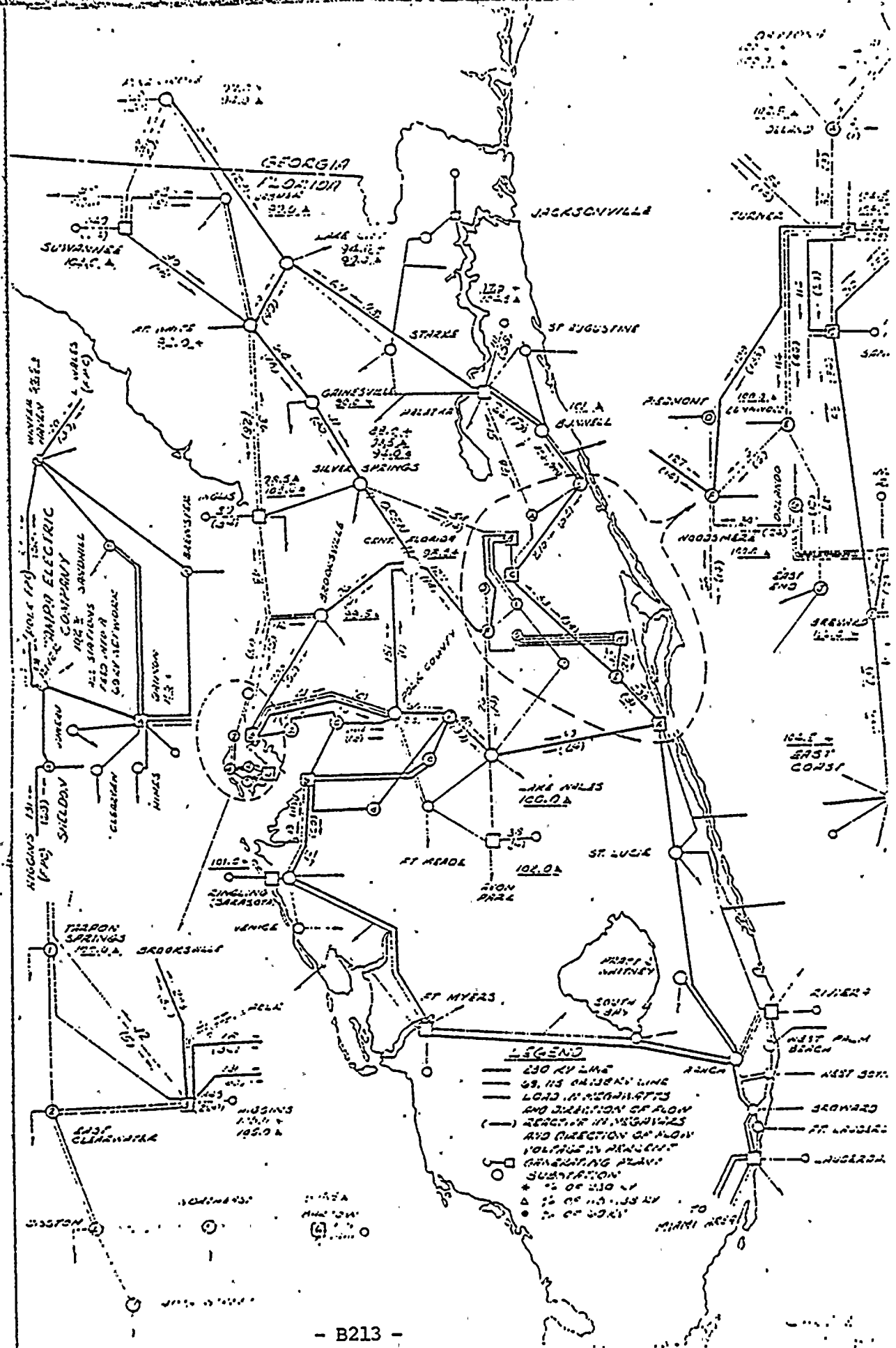
To determine adequacy of the transmission system to supply the Silver Springs area during loss of the Central Florida-Silver Springs 230 kv line which normally delivered 160 mw and zero mvars to Silver Springs.

Results:

The voltage at Silver Springs dropped 12% from normal on the 230 kv bus.

Conclusions:

The transmission system seems to be adequate to supply the northern part of the Ocala Load Area during loss of the Central Florida-Silver Springs 230 kv line after shifting 75 mw from Higgins to Suwannee.



CASE E-2

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System, modified as follows:
230 kv lines Eliminated: (1) Woodsmere-Sanford; (2) Silver Springs-Palatka; (3) Pratt & Whitney-East Coast.
230 kv lines Established: Higgins Polk County
115 kv lines Converted to 230 kv: (1) Turner-Sanford; (2) Turner-Woodsmere West.
Bussed the two Turner 115 kv lines at Longwood.
Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage: Sanford-Daytona 230 kv.

Purpose of Study:

To determine firm transmission requirements at Sanford Plant and firm power supply requirements of Daytona-Palatka area during an outage of the Sanford-Daytona 230 kv line which normally carried 181 mw and 23 mvars.

Results:

Before increasing the Suwannee generation, a loading of 182 mw and 37 mvar (915 amps) was imposed on the Sanford-DeLand 115 kv line which represents 25% above conductor thermal rating. By increasing Suwannee generation 64 mw to 139 mw, the loading in this circuit was reduced to 168 mw (821 amps). This is 12.5% over its 730 amp thermal rating of 556 mcm conductor.

In general, the 115 kv voltage level in the Palatka-Daytona area dropped 6% to 7% below normal with the 230/115 kv transformers in the area set for maximum boost of 10%. The 230 kv bus voltages were 7 to 16% below normal in the Ft. White, Lake City, Palatka, Daytona areas.

Conclusions:

The overload on the Sanford-DeLand 115 kv line probably could be eliminated by receiving emergency power from the city of Jacksonville over the Jacksonville-Starke 115 kv interconnection.

Further study should be made to determine if additional transmission is required into this area.



CASE E-3

General Conditions:

Major Generating Unit

Out of Service-Emergency: None

Transmission System:

Basic System, modified as follows:

230 kv lines Eliminated: (1)

Woodsmere-Sanford; (2) Silver

Springs-Palatka; (3) Pratt &

Whitney-East Coast.

230 kv lines Established:

Higgins-Polk County

115 kv lines Converted to 230 kv:

(1) Turner-Sanford; (2) Turner-

Woodsmere West.

Bussed the two Turner 115 kv lines at Longwood.

Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage: Turner-Woodsmere 230 kv

Purpose of Study:

To check adequacy of power supply to the Winter Park area with the main power source between Turner and Woodsmere out. Also, to determine if the Turner plant would remain synchronized to the integrated systems under steady state conditions for loss of this line.

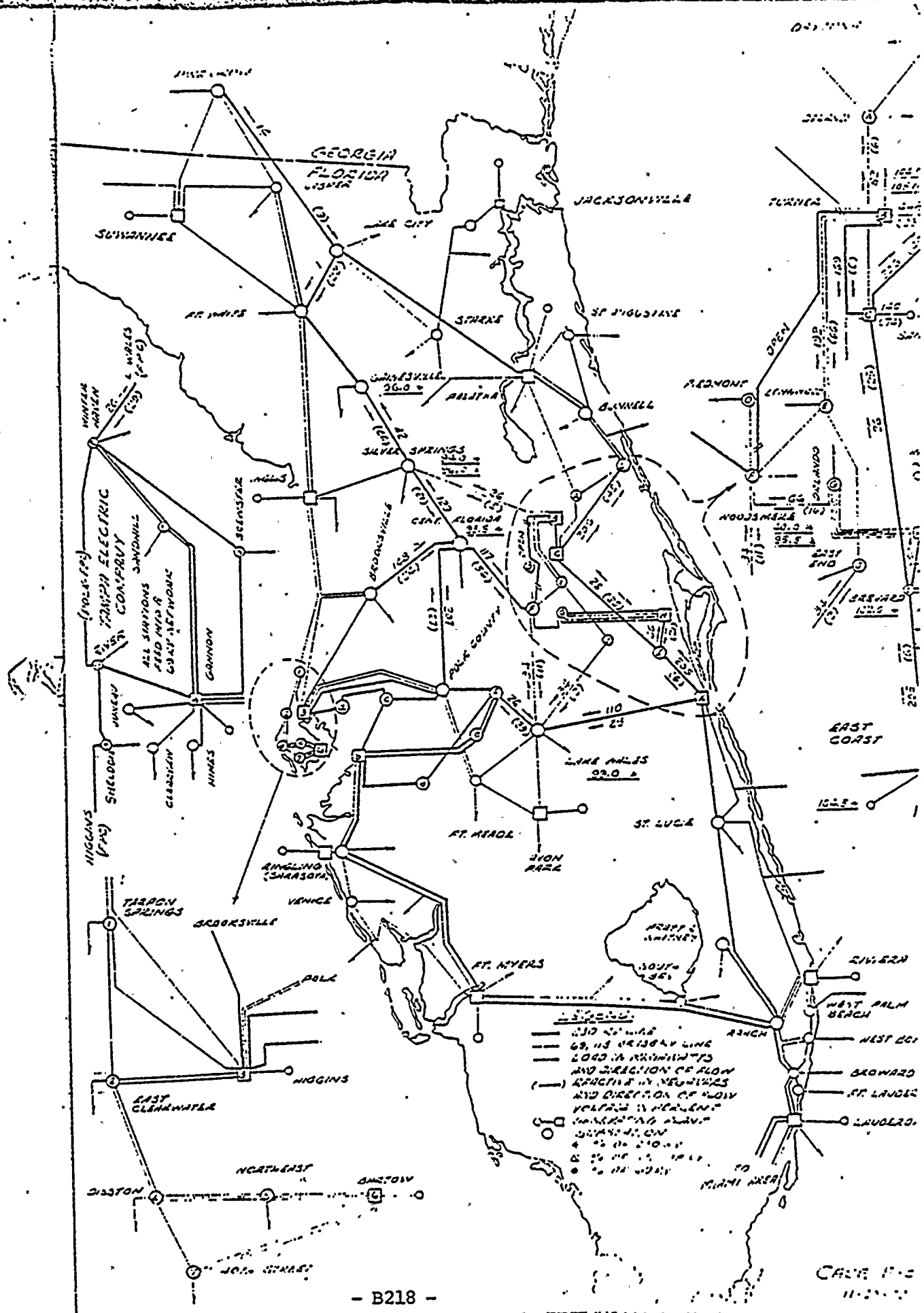
Results:

The 230 kv voltage level at Woodsmere dropped 10%. A factor in maintaining satisfactory voltage at Woodsmere was the transfer of 66 mw from FPL to Woodsmere through the Orlando system.

Turner-Longwood 115 kv lines carried 96 mw each, picking up total of 56 mw of 154 mw normally carried by Turner-Woodsmere 230 kv lines. Turner-Sanford 230 kv line picked up 83 mw, carrying 169 mw.

Conclusions:

Loss of the Turner-Woodsmere 230 kv line would not jeopardize service to the Winter Park area. The Turner plant would not become isolated from the integrated system under steady state conditions.



CASE E-4

General Conditions:

Major Generating Unit
Out of Service-Emergency: None

Transmission System: Basic System, modified as follows:
230 kv lines Eliminated: (1) Woodsmere-Sanford; (2) Silver Springs-Palatka; (3) Pratt & Whitney-East Coast No. 2 Circuit.
230 kv lines Established: Higgins-Polk County
115 kv lines Converted to 230 kv: (1) Turner-Sanford; (2) Turner-Woodsmere West.
Bussed the two Turner 115 kv lines at Longwood.
Increased P.F. of FPC & OUC Loads to 95%.

Transmission Line Outage: Higgins-Polk County 230 kv.

Purpose of Study:

To check the adequacy of power supply to the Central Florida area with one of the three Higgins 230 kv sources out which normally carried 141 mw (combined normal loading of these circuits is 540 mw).

Results:

The two remaining 230 kv circuits out of Higgins picked up 113 mw to a total of 505 mw, thereby limiting the voltage drop in Central Florida to about 2% below normal.

Conclusions:

Service would be adequately protected under this emergency and there is a possibility that additional study will show that the Higgins-Polk Co. 230 kv line would not be required.

FLORIDA POWER CORPORATION
ST. PETERSBURG FLORIDA

February 18, 1963

Mr. George Kinsman, Vice President
Florida Power & Light Company
P. O. Box 3100
Miami 1, Florida

Dear George:

We are attaching a set of the data which is being furnished to the Federal Power Commission for the National Power Survey, which was compiled by engineers of the Florida Power & Light Company, Tampa Electric Company and Florida Power Corporation, and contains data gathered through the cooperation of representatives of the Orlando Utilities Commission, the City of Tallahassee and the City of Lakeland.

Your cooperation in making this information available to the Southeast Regional Advisory Committee is greatly appreciated.

It is expected that in the near future, additional data will be requested of this committee, which may necessitate our calling upon you for aid again.

Very truly yours,

FLORIDA POWER CORPORATION

H. K. McKean
H. K. McKean
Senior Vice President

HKM:ib
Atts.

NATIONAL POWER SURVEY
1963 - 1980
STATE OF FLORIDA
(FEDERAL POWER COMMISSION STUDY AREA 24)
FEBRUARY, 1963

SCOPE: This report is for the purpose of displaying the plans for the expansion of the generation and transmission facilities of the major electric utilities in the Federal Power Commission Study Area 24, which constitutes the State of Florida east of the Apalachicola River. The exhibits are arranged to show the summation of proposed projects for five year increments, beginning December 1965, and ending December 1980. The facilities of the City of Jacksonville are not included. The Southeastern Power Administration loads in the study area are considered as a part of the Florida Power Corporation load.

PARTICIPANTS: Engineering personnel of Florida Power and Light Company, Florida Power Corporation, and Tampa Electric Company compiled the data for this report, and contacts were made with representatives of the Orlando Utilities Commission, the City of Tallahassee, and the City of Lakeland, for obtaining their plans for the study period. Contacts were also made with the engineering personnel of the Southern Services for coordination of interstate ties.

GENERAL: Coordinated planning of the generating and transmission facilities of the four major utilities in the study area has been carried on by planning committees made up of personnel from Florida Power and Light Company, Florida Power Corporation and Tampa Electric Company. At the present, there is a general plan in effect which is

serving as a guide for expansion up to the year 1970. This plan is based upon the "single system" approach, taking into consideration factors such as pooling of reserves, the sharing of units, area protection with inter-area transmission ties so that the expansion pattern would be one that is well coordinated among the participating companies.

The expansion plan described in this report is a projection of this joint plan to the year 1980, based upon the same criteria which has been applied to the plan in the past. The study area has been subdivided into six natural load areas as indicated on the maps being presented as Exhibits 8 through 11 in this report. Using this load area approach, coordinated generator schedules may be applied on a unit sharing basis. Some of the future generators are therefore identified by area only, rather than by exact locations in existing or new sites.

LOAD FORECAST: The demand forecast for Study Area 24 as compiled by the committees reporting to the Federal Power Commission, and as furnished to the Regional Advisory Committee in December, 1962, could not be reconciled with the forecasts presently being made by Florida Power and Light Company, Florida Power Corporation, and Tampa Electric Company. For example, the combined peak forecast for these three companies in the year 1980 is 23,200 megawatts as compared to the Federal Power Commission's forecast of 20,580 megawatts for the entire Study Area 24 in 1980. The expansion plans shown in this report are based on the higher forecasts, which appear to be a more reasonable projection of the electrical growth in the State.

GENERATOR SCHEDULES: Tabulations have been prepared as Exhibits 1 through 5, to show the tentative schedules of generating units for the load area within the State, and for the four major utilities. Exhibits 2 through 5 also include the peak demands as forecast for the individual companies. In Exhibit 3, which shows the generating unit schedule for Florida Power Corporation, a tabulation is included to reflect the estimated capacity which is created by seasonal diversity between Florida and the Southern Companies, and which would be available as firm capacity during peak months.

TRANSMISSION LINES: Exhibit 6 is a summation of the addition of transmission lines rated 230 KV and above in the Study Area for the five year periods. The lines are identified by owner and, where applicable, they are identified as interconnections. Exhibit 7 is a map of the major transmission lines in the state of Florida as of December 31, 1962, and the tabulation, Exhibit 6, begins with transmission lines to be installed after December 31, 1962. Exhibits 8 through 11 are high voltage transmission maps for the four study periods, showing all of the existing and proposed transmission lines rated 230 KV and above.

EHV TRANSMISSION: In the mid seventies it is expected that the unit sizes in Florida will be in the neighborhood of 1,000 megawatts. It is felt that at that time adequate protection to the state could be afforded only by a transmission tie to the grid in the southeast which would be rated in the 500 KV to 750 KV class. The actual selection of voltage would, of course, depend upon factors which can not be resolved

at this early date. In the contacts with representatives of Southern Services it was determined that the thinking of their engineers on this point is that multiple 230 KV lines would be adequate for this purpose and it is our understanding that the data which they will present for the National Power Survey will indicate such 230 KV lines. It was agreed that this apparent incongruity would not affect the overall conclusions which might be drawn for the years 1975-1980. Special studies in the future which would take into consideration energy transfers, seasonal diversity, interstate reserves, etc., would be made to determine the most economical pattern which should be followed in increasing the capacity of the ties between Florida and the southeast. The Florida engineers favor the EHV transmission system with the feeling that it would serve better as an intrastate system as well as perform the functions of a strong interstate transmission circuit.

CITY OF TALLAHASSEE: Contact with the City of Tallahassee has resulted in the following tentative generation schedule for that utility:

<u>Year</u>	<u>Installed Capacity-MW</u>
Present	74
1965	98
1970	195
1975	330
1980	600

The future 230 KV lines for Tallahassee, including interconnections, are shown on the Maps, Exhibits 8 - 11.

CITY OF GAINESVILLE: At the time of the preparation of this narrative portion of the report, there is no generation expansion data for Gainesville available to the compilers, but a contact has been made with a representative of the utility, and this information may be forwarded in the near future.

CITY OF LAKELAND: Contact with the City of Lakeland has resulted in the following tentative generation schedule for that utility:

<u>YEAR</u>	<u>SIZE UNIT</u>	<u>TYPE OF UNIT</u>
Present	128.5 mw	Present Capability
1965	48.0 mw	Steam
1967	2-13 mw	Gas Turbines
1969	72.6 mw	Steam
1972	13 mw 72.6 mw	Gas Steam
1975	72.6 mw	Steam

It is reasonable to assume that there would be two more units of the 72.6 mw size required prior to 1980 in the City of Lakeland expansion plan.

NUCLEAR ENERGY: It is felt that nuclear powered generating units will be competitive to fossil fired units in the State of Florida by about 1970.. At the present, there have been no plans firmed up as to the location, size, and timing of the first major nuclear plant in the State. Inasmuch as there are few deep water ports along the coast line of the State of Florida, it is felt that nuclear energy will

permit the development of plant sites in the major load areas that would not be otherwise suitable for fossil fired plants. No identification is made in this report as to which sites or units are being considered as nuclear, since this is a matter of economics to be decided in the future.

CONCLUSION: Due to the rapidly fluctuating and accelerating economies in the State of Florida, it is extremely difficult to project requirements very far into the future. The normal methods of mathematical trending gives rise to gross errors when extended for very many years. The data and plans contained herein for 1965 are fairly accurate and, in fact, essentially committed. Much of the project described for 1970 is presently committed and fairly well represents the coordinated planning of the generating and transmission system in the State of Florida. In the decade following 1970, however, much of the data becomes speculative due to the unpredictable nature of the load development in particular areas. Reviews of recently released economic evaluations by research specialists indicate that the Canaveral influence will spread rapidly in the east coast area and in the 1970's will affect the central belt of the State. For this reason, considerable attention was given in the 1970's to the area in Central Florida with the thought that the growth will increase at a rapid rate during that period. In the metropolitan areas and the southeast section, the generation plans basically follow the idea of adding units as necessary to keep up with the short range load forecasts, and the transmission system required is one that connects the units into the grid, and protects these units with suitable ties to other areas within the State.

SCHEDULE OF GENERATING UNITS BY AREA

1963 - 1980

FLORIDA POWER AND LIGHT COMPANY

FLORIDA POWER CORPORATION

TAMPA ELECTRIC COMPANY

ORLANDO UTILITIES COMMISSION

<u>Year</u>	<u>Total Megawatts</u>	<u>Generation in Megawatts By Load Sub-Area</u>					
		<u>Northwest</u>	<u>Central</u>	<u>East Coast</u>	<u>Tampa Bay</u>	<u>Southwest</u>	<u>Southeast</u>
1962 ..	4168	168	65	762	1321	210	1865
Scheduled	2448			615	683		1150
1965	6839	168	65	1377	2004	210	3015
Additions)			425	550	550	550	550
By Units)	4075			350	550		550
1970	10914	168	490	2277	3014	760	4115
Additions)			550	750	550	750	750
By					550		750
Units)	6400				750		1000
1975 ..	17314	168	1040	3027	4954	1510	6615
Additions)			750	1000	750	1000	1000
By				550	750		1000
Units)					750		1500
	9800				750		
1980	27114	168	1790	4577	7954	2510	10115

EXHIBIT 1

HVS/REP/MFH
2-5-63

PROPOSED SCHEDULE OF GENERATION AND LOADS

FLORIDA POWER AND LIGHT COMPANY

1963 - 1980

<u>Year</u>	<u>Location</u>	<u>Unit</u>	<u>Cumulative</u>	<u>September</u>	
		<u>Gross</u> <u>Capability</u> <u>MW</u>	<u>Gross</u> <u>Capability</u> <u>MW</u>	<u>Capability</u> <u>MW</u>	<u>Load</u> <u>MW</u>
1962	Total System		2400	2230	
	Riviera #4	300			
	Port Everglades #3	425			
	Port Everglades #4	425			
	Cape Canaveral #1	425			
1965			3975	3700	2700
	Port Everglades #5	550			
	Port Everglades #6	550			
	Southwest Area	550			
	East Coast Area	550			
1970			6175	5700	5000
	Southeast Area	750			
	Southeast Area	750			
	Southwest Area	750			
	East Coast Area	750			
	Southeast Area	1000			
1975			10175	9500	8500
	Southeast Area	1000			
	Southeast Area	1000			
	East Coast Area	1000			
	Southwest Area	1000			
	Southeast Area	1500			
1980			15675	15000	13600

EXHIBIT 2

EVS
2/5/63

PROPOSED SCHEDULE OF GENERATING UNITS AND LOADS

FLORIDA POWER CORPORATION

1963 - 1980

<u>Year</u>	<u>Location</u>	<u>Unit Gross Capability MW</u>	<u>Cumulative Generating Capability MW</u>	<u>Contract Sou. Co. MW</u>	<u>Total Capability MW</u>	<u>Forecast Demand MW</u>
1962	Total System		993	100	1093	
	Bartow #3	218				
1965			1211	100	1311	1400
	Central Florida Area	425				
	Bartow #4	550				
1970			2186	200	2386	2310
	Central Florida Area	750				
	Bartow #5	750				
1975			3686	250	3936	3700
	Central Florida Area	750				
	Central Florida Area	750				
	Bartow #6	750				
1980			5936	300	6236	5700

EXHIBIT 3

MFH
2/5/63

PROPOSED SCHEDULE OF GENERATING UNITS AND LOADS

TAMPA ELECTRIC COMPANY

1963 - 1980

<u>Year</u>	<u>Location</u>	<u>Unit Gross Capability MW</u>	<u>Cumulative Generating Capability MW</u>	<u>Forecast Demand MW</u>
1962	Total System		775	
	Cannon #4	205		
	#5	260		895
1965			1240	
	Cannon #6	550		
1970			1790	1500
	Big Bend #1	550		
	Big Bend #2	550		
1975			2890	2430
	Big Bend #3	750		
	Big Bend #4	750		
1980			4390	3900

EXHIBIT 4

REP
2/5/63

PROPOSED SCHEDULE OF GENERATING UNITS AND LOADS

ORLANDO UTILITIES COMMISSION

1963 - 1980

<u>Year</u>	<u>Location</u>	<u>Unit Gross Capability MW</u>	<u>Cumulative Generating Capability MW</u>	<u>Forecast Demand MW</u>
1962	Total System		224	
	Indian River #2	190		
1965			414	220
1970			414	363
	Indian River #3	350		
1975			764	580
	Indian River #4	350		
1980			1314	900

EXHIBIT 5

MFH/IR
2/5/63

STATE OF FLORIDA
(FEDERAL POWER COMMISSION STUDY AREA 24)
TRANSMISSION LINE ADDITIONS - 230 KV & ABOVE

Dec. 31, 1962 - Dec. 31, 1965

<u>Line</u>	<u>Voltage KV</u>	<u>Length Miles</u>	<u>Capacity MVA</u>	<u>Owner or Inter- connection</u>
Palatka Plant-Jacksonville	115/240	35	*300	FPL/Jax.
Sanford-Daytona #1	115/240	35	*300	FPL
Brevard-Cape Canaveral #1 - #2	240	8	500 ea.	FPL
Cape Canaveral-Indian River (Orlando)	240	2.5	300	FPL/ouc
Brevard-West Lake Wales	240	65	300	FPL/FPC
Lauderdale-Ranch #1	138/240	43	*500	FPL
Lauderdale-Dade #3 and #4	138/240	23	*500 ea.	FPL
Lauderdale-Port Everglades #2	138/240	7	*500 ea.	FPL
Ringling-Gannon #1	240	22	300	FPL/TEC
Bartow-Northeast UG Cable #1	230	4	300	FPC
Bartow-Northeast UG Cable #2	230	4	300	FPC
Northeast-Ulmerton #1	230	4	500	FPC
Northeast-Ulmerton #2	230	4	500	FPC
Ulmerton-Largo #1	230	6	500	FPC
Ulmerton-Curlew #1	230	12	500	FPC
Curlew-Gannon	230	46	500	FPC/TEC
North Longwood-Rio Pinar	230	13	300	FPC
Rio Pinar-ouc #5	230	5	300	FPC/ouc
Pebbledale-West Lake Wales	230	20	400	TEC/FPC
Gannon-Pebbledale	230	40	500	TEC
Gannon-River	230	15	500	TEC
Indian River-ouc #5 (Circuit #1)	230	30	300	ouc

* Rating at 240 KV

EXHIBIT 6

- B233 -

Dec. 31, 1965 - Dec. 31, 1970

<u>Line</u>	<u>Voltage KV</u>	<u>Length Miles</u>	<u>Capacity MVA</u>	<u>Owner or Inter- connection</u>
Dade-Davis #1 and #2	240	22	500 ea.	FPL
Brevard-Malabar #2	240	26	300	FPL
Sanford-Longwood	240	10	300	FPL/FPC
Cape Canaveral-Daytona #1	240	55	300	FPL
Daytona-Palarka #1	240	51	300	FPL
Lake City-Jacksonville	240	55	300	FPL/JAX
Lake City-Suwannee #1	240	40	300	FPL/FPC
Port St. Joe-Wewa	230	38	300	FPC/Gulf
Suwannee-Georgia Power	230	-	300	FPC/ Ga. Powe
Suwannee-Fort White	230	45	300	FPC
Fort White-Archer	230	35	300	FPC
Archer-Silver Springs	230	35	300	FPC
Silver Springs-Central Florida	230	35	300	FPC
Inglis-Central Florida	230/EHV	60	300	FPC
Inglis-Brooksville	230	45	300	FPC
Brooksville-Curlew	230	45	300	FPC
Bartow-Northeast UG Cable #3	230	4	250	FPC
Bartow-Northeast UG Cable #4	230	4	250	FPC
Ulmerton-Curlew #2	230	4	500	FPC
Central Fla-North Longwood	230	40	300	FPC
Gannon-Sandhill #1 and #2	230	35	300 ea	TEC
Arianz Extension	230	-	300	TEC
OUC #6 - OUC #3	230	15	300	OUC
Indian River - OUC #6 Circuit #2	230	30	300	OUC
Perry-Port St. Joe	230	115	200	FPC
St. Marks Interconnection	230	-	200	FPC/TALL

Dec. 31, 1970 - Dec. 31, 1975

<u>Line</u>	<u>Voltage KV</u>	<u>Length Miles</u>	<u>Capacity MVA</u>	<u>Owner or Inter- connection</u>
South Dade-System(5 Circuits)	240	-	800 ea	FPL
Lauderdale-Dade #5	240	23	500	FPL
Ft. Myers-Naples-Dade #1	240	135	400	FPL
Ranch-Pratt Whitney #2	240	21	300	FPL
Punta Gorda-Ringling #2	240	60	500	FPL
Punta Gorda-West Lake Wales	EHV	75	1000	FPL/FPC
Ft. Pierce-Avon Park	240	65	300	FPL/FPC
Sanford-Daytona #2	240	35	300	FPL
Daytona-Palatlka #2	240	51	300	FPL
St. Marks-Tallahassee	230	25	300	Tall: FPL
Inglis-Central Florida	EHV	60	1500	FPC
Central Florida-West Lake Wales	EHV	70	1500	FPC
Rio Pinar-Holopaw	230	45	300	FPC
West Lake Wales-Avon Park	230	25	300	FPC
Gannon-River	230	15	500	TEC
River-Apex (2 Lines)	230	24	500	TEC
Big Bend-Ariana	230	55	500	TEC

Dec. 31, 1975 - Dec. 31, 1980

~~South~~ ~~Waltney #1~~
Ft. ~~Kearney~~ ~~Waltney #2~~

~~South~~ ~~Waltney #1~~

~~South~~ ~~Waltney #1~~

~~South~~ ~~Waltney #1~~

~~South~~ ~~Waltney #1~~

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~~South~~ ~~Waltney #1~~

~~South~~ ~~Waltney #1~~

~~South~~ ~~Waltney #1~~

Voltage
KV

Length
Miles

Capacity
MVA

Owner or
Inter-
connection

240

135

400

FPL

240

40

500

FPL

240

40

500

FPL

240

63

500

FPL

240

8

500 ea.

FPL

240

55

300

FPL

240

70

1,500

FPL

EHV

125

1,500

F

EHV

120

1,500

EHV

70

1,500

EHV

15

500

230

12

500

230

18

500

230

15

500

230

35

500

230

30

500

230

16

500

230

12

500

230

12

500

230

12

500

230

12

500

FLORIDA POWER CORPORATION
FLORIDA POWER & LIGHT COMPANY
TAMPA ELECTRIC COMPANY

JOINT PLANNING STUDY
1964 - 1965

PREPARED
BY
THE FLORIDA OPERATING COMMITTEE
WITH THE
COOPERATION OF
THE ORLANDO UTILITIES COMMISSION

JUNE 1961

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June 21, 1961

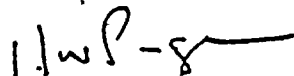
FLORIDA OPERATING COMMITTEE

Mr. J. D. Hicks, Tampa Electric Company, Tampa, Florida
Mr. Lester Ulm, Jr., Tampa Electric Company, Tampa, Florida
Mr. J. R. Brice, Tampa Electric Company, Tampa, Florida
Mr. A. P. Perez, Florida Power Corporation, St. Petersburg, Florida
Mr. W. B. Simonds, Florida Power Corporation, St. Petersburg, Florida
Mr. M. F. Hebb, Jr. Florida Power Corporation, St. Petersburg, Florida
Mr. H. V. Street, Florida Power & Light Company, Miami, Florida
Mr. K. S. Buchanan, Florida Power & Light Company, Miami, Florida

JOINT PLANNING STUDY 1964 - 65

The above report has just been completed by Messrs. Brice, Hebb and Buchanan of our respective companies, with the cooperation of the Orlando Utilities Commission. Distribution shown below is being made today in preparation for meetings and discussions between the several utilities. It is suggested that these discussions should include:

1. Consideration of using energy and demand accounting procedures based on actual schedules - such procedures are in wide use around the country. Our present method of accounting for energy flow, company by company, is already burdensome and will become more so.
2. Adoption of a calendar month for intersystem billing. This will eliminate a lot of work which now results from TEC, FPC and FPL each having a different billing month.
3. The handling and method of repayment of unintentional interchange.
4. Effect of transmission losses resulting from free flow of power - i.e. losses due to power circulating in loops or resulting from one system purchasing from another. Under what circumstances should such losses be neglected? Under what circumstances should they be accounted for?


H. W. Page
Chairman

Copies: Mr. J. D. Hicks (15)
Mr. A. P. Perez (20)
Mr. H. W. Page (20)

Distribution of Report:

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		Mr. E. C. Windisch	(1)

C O N T E N T S

	<u>Page</u>
I. Introduction	1
II. Summary	1
III. Loads and Capabilities	2
IV. 1964 Basic System	3
V. Conditions Studied	3
VI. Analysis of Conditions Studied	26
Index of Cases	26
Analysis of Cases Including Diagrams of:	28
Inter-Area Power Flows	
Inter-System Power Flows	
Transmission Flows	

Curves, Maps and Diagrams

Actual & Estimated Monthly Peak Loads, 1956 - 1966	6
Estimated Monthly Peak Loads & Planned Capabilities 1961-1966 . .	7
Load Curves for Days of Monthly Peaks of Each Company 1960 . . .	8
Nine Major Load Areas with Identification by Each	
System's Load Areas	12
September 1964 Peak Loads of Nine Major Load Areas by System . .	13
September 1964 Generating Capabilities of Nine Major Load	
Areas by System	14
January 1965 Peak Loads of Nine Major Load Areas by System . . .	15
January 1965 Generating Capabilities of Nine Major Load	
Areas by System	16
Map of 1964 Basic System	17
Tabulation of 1964 Basic System	18
State of Florida Electric System Map 1961	22
Inter-Area Power Flows, September 1964 -	
Summary of Maximum Flows	23
Range of Inter-Area Power Flows of Nine Major Load	
Areas, September 1964	24
Inter-System Power Flows, September 1964 -	
Summary of Maximum Flows	25

Tabulation of Transmission Line Losses Is Included As Last Sheet of This Report

FLORIDA POWER CORPORATION
FLORIDA POWER & LIGHT COMPANY
TAMPA ELECTRIC COMPANY

JOINT PLANNING STUDY 1964 - 1965

I. INTRODUCTION

The study represented by this Report was originally initiated by the Florida Operating Committee to determine the transmission system which would best serve, as of the end of 1963, the individual and total needs of Florida Power Corporation, Florida Power & Light Company and Tampa Electric Company - including of course, new generating capacity then planned or contracted. Such transmission system was to be compatible with the general long range program already jointly studied by the three companies and to pave the way for greater mutual cooperation and joint planning for capacity and lines to be added by the three companies in the immediate years 1964 and 1965.

The subsequent firming of additional projects of each of the three companies and the proposed integration of Orlando Utilities Commission into the 230 kv grid required changes in the study. This Report shows how the OUC facilities could fit into the integrated system planned for 1964. It covers load levels expected in Summer 1964 and Winter 1964 - 1965.

II. SUMMARY

Feasibility of including Orlando Utilities Commission in the integrated system is demonstrated, with that utility installing either a 92 mw or a 210 mw unit at its Indian River Plant in 1963.

The study indicates that the presently projected plans of the several utilities complement one another and that the basic transmission

system can meet the joint needs of the several utilities for the load levels to be experienced in 1964 - 1965. Additional study will be made to determine local needs in some areas. There will be a surplus of generating capability in the year 1964. Study should be continued to determine additional facilities which should be added by each utility in the succeeding years.

III. LOADS AND CAPABILITIES

Historical loads, load forecasts and planned capability for the four utilities are shown on pages 6 and 7. Total load and hence peaks, for the four utilities were obtained by adding figures for individual utilities. No allowance was made for diversity since very little or none is indicated in the load patterns of the 1960 monthly peaks shown on pages 8 to 11 for FPC, FPL and TEC Systems.

With the exception of cold weather, when very high loads are experienced due to space heating, the highest annual peaks occur in late Summer (September). Both of these periods were the subject of study.

For the purpose of this study, the state has been divided into the same nine major load areas used in the previously mentioned long range study. These areas are shown on page 12 with identification as to which utilities are involved in each area.

Peak loads and generating capabilities by area and by utility for September 1964 are shown on pages 13 and 14. The same data for January 1965 cold weather is shown on pages 15 and 16.

The total gross margin of the four utilities in September 1964 is given in the following tabulation together with the individual gross margins and the seasonal capability of the largest unit of each utility.

	Gross Capability MW	Estimated Peak Load MW	Gross Margin MW	Largest Unit MW
FPC	1207	1027	180	220
FPL	2904	2489	415	372
OUC	420	190	230	210
TEC	980	660	320	202
Total	5511	4366	1145	

IV. 1964 BASIC SYSTEM

The 1964 Basic System as used in this report refers to the transmission and generating facilities which will adequately serve the requirements of the integrated system at load levels expected in 1964 - 1965. Some modification may be indicated by additional study which is to be made of the local requirements for the Winter Haven-Lake Wales Area (Area VI) and Leesburg (Area III).

Major additions required to make the 1964 Basic System are shown by red over-print on the map, page 17. These additional major facilities are listed for each utility on pages 18 to 21 along with the "in service" dates for the various facilities. Generation and transmission line projects subject to final decision are so noted in this listing.

V. CONDITIONS STUDIED

Nineteen case studies were made for load conditions which might be experienced in September 1964 and one case study was made for load conditions expected in January 1965. The system performed satisfactorily for these normal and emergency conditions. The cases are listed below:

September 1964 Conditions, 4366 mw Peak Load

1964 Basic System

	Case
Normal with FPL Purchasing 100 mw from OUC	1-D-1
Outage of Sanford 165 mw & Turner 87 mw units. FPL Purchases 150 mw from OUC & FPC Purchases 50 mw from OUC	1-D-2
Outage of Indian River 92 mw and 210 mw units. OUC Purchases 25 mw from FPC and 55 mw from FPL.	1-D-3

September 1964 Conditions, 4366 mw Peak Load (Cont'd.)

1964 Basic System Except that Indian River No. 2 Unit
Is 92 mw Size

	Case
Normal with Each Utility on Zero Net Interchange	1-D-4
Outage of Turner-Piedmont 115 kv Line & Each Utility on Zero Net Interchange.	1-D-5
Outage of one Turner-North Longwood 115 kv Circuit & Each Utility on Zero Net Interchange.	1-D-6

1964 Basic System

Normal with FPC Purchasing 100 mw from OUC.	1-D-7
Outage of Sanford 165 mw Unit and Sanford-Brevard 230 kv Line. FPC Purchases 100 mw from OUC.	1-D-8
Outage of Ranch-Pratt Whitney 230 kv Line. FPL Purchases 150 mw from OUC.	1-D-9
Outage of Pratt Whitney-Melbourne 230 kv Line. FPL Purchases 100 mw from OUC.	1-D-10
Outage of Bartow 220 mw and Gannon 204 mw Units. FPC Purchases 150 mw and TEC Purchases 75 mw; FPL Sells 125 mw and OUC Sells 100 mw.	1-D-11
Outage of Bartow 220 mw and Gannon 204 mw Units. FPC Purchases 150 mw from FPL and TEC Purchases 75 mw from FPL.	1-D-12
Outage of Port Everglades 400 mw Unit and One Riviera 300 mw Unit. FPL Purchases 100 mw from FPC, 150 mw from OUC and 100 mw from TEC.	1-D-13
Outage of Port Everglades 400 mw Unit and One Riviera 300 mw Unit. FPL Purchases 100 mw from FPC and 275 mw from TEC.	1-D-14

1964 Basic System Except that North Longwood-Rio Pinar-
OUC Line Operates at 230 kv.

Normal with FPL Purchasing 100 mw from OUC.	1-C-1
Outage of Indian River-Brevard 230 kv Line. FPL Purchases 100 mw from OUC.	1-C-2
Outage of Indian River - OUC #6 230 kv Line. FPL Purchases 100 mw from OUC.	1-C-3
Outage of Indian River 210 mw Unit. OUC Purchases 25 mw from FPC and 25 mw from FPL.	1-C-4

September 1964 Conditions,

1964 Basic System Except that North Longwood-Rio Pinar-
OUC Line Operates at 230 kv. and Ridge-OUC #6, 230 kv
Line Has Been Added.

Case

Normal with FPL Purchasing 100 mw from OUC.

1-B-1

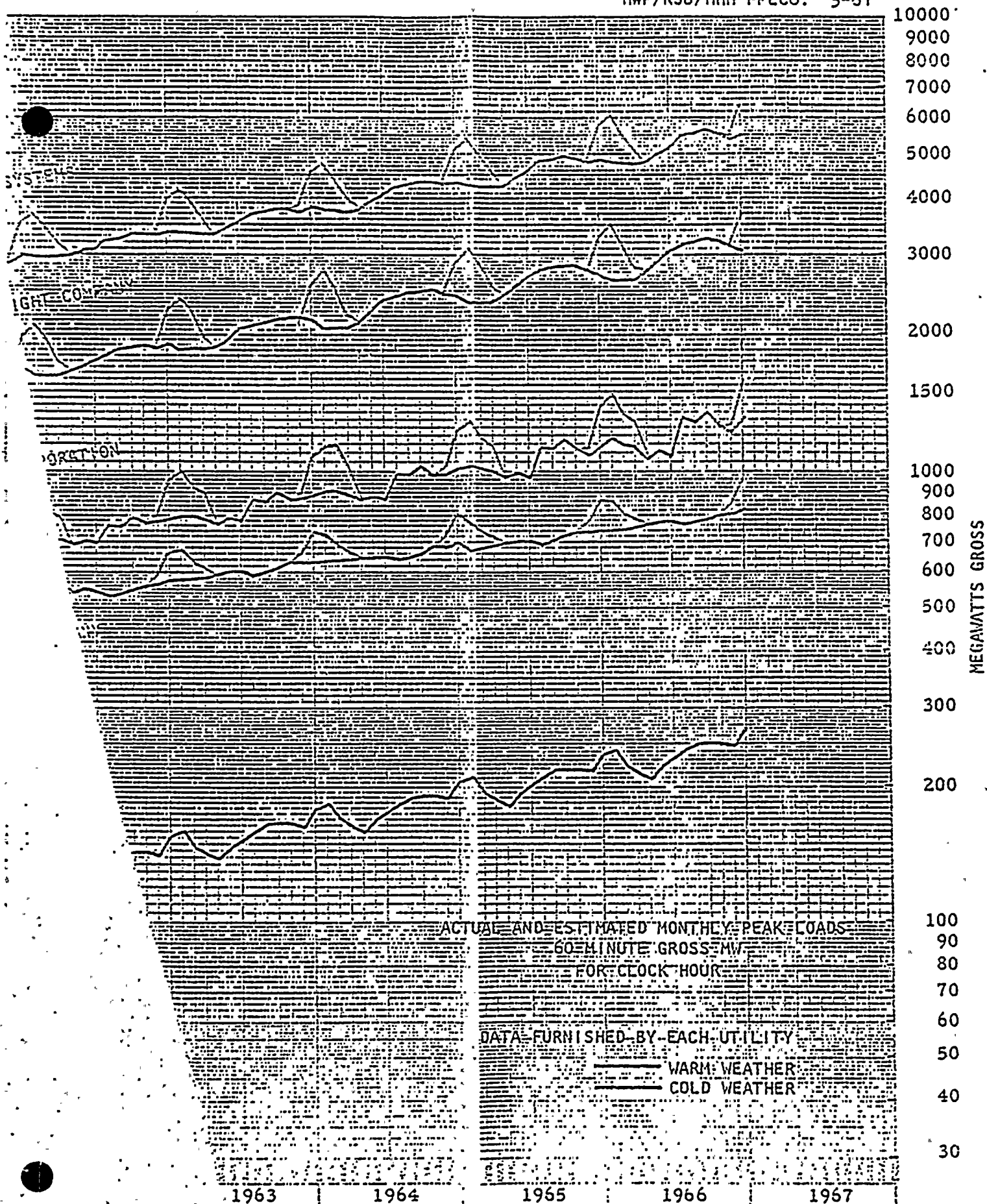
January 1965 Conditions, 5355 mw Peak Load

1964 Basic System

Normal with FPL Purchasing 100 mw from OUC and
FPC Purchasing 40 mw from TEC and 40 mw from
Southern Company.

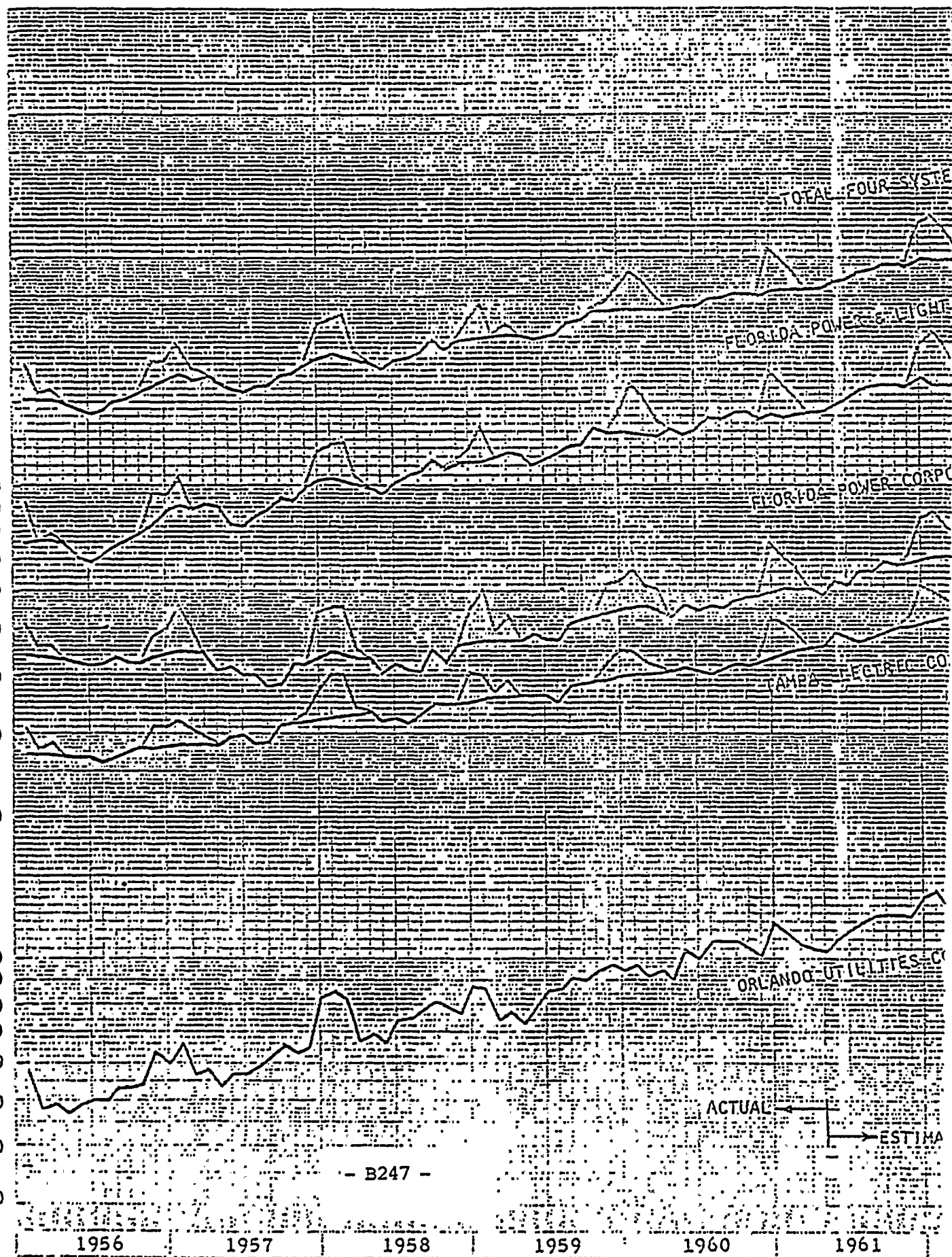
11-A-1

These cases demonstrated that the 1964 Basic System provides sufficient transmission capability to make possible large power flows, both normal and emergency, between areas and between utilities. The maximum values of these flows are summarized on pages 23 to 25.

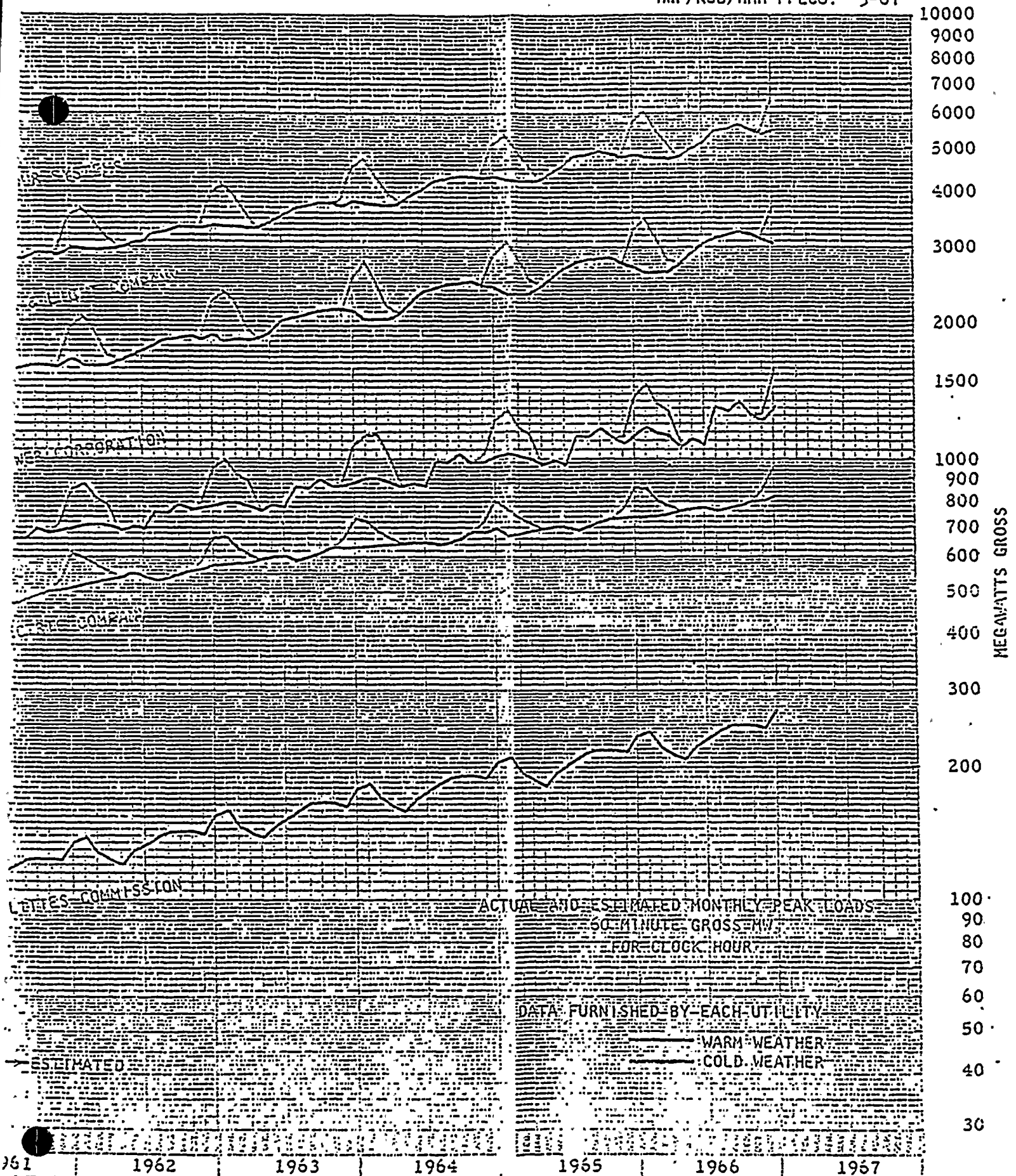


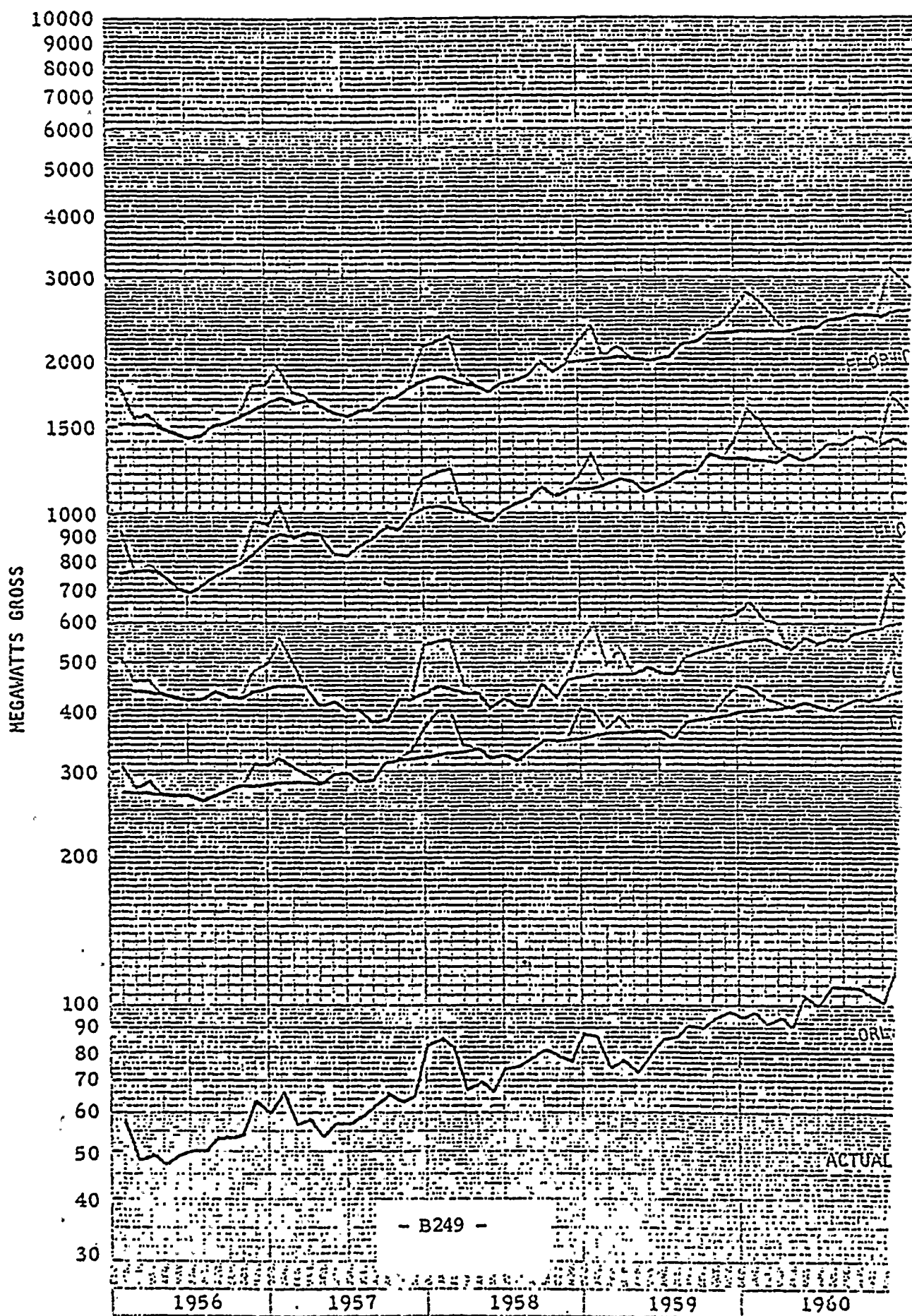
MEGAWATTS GROSS

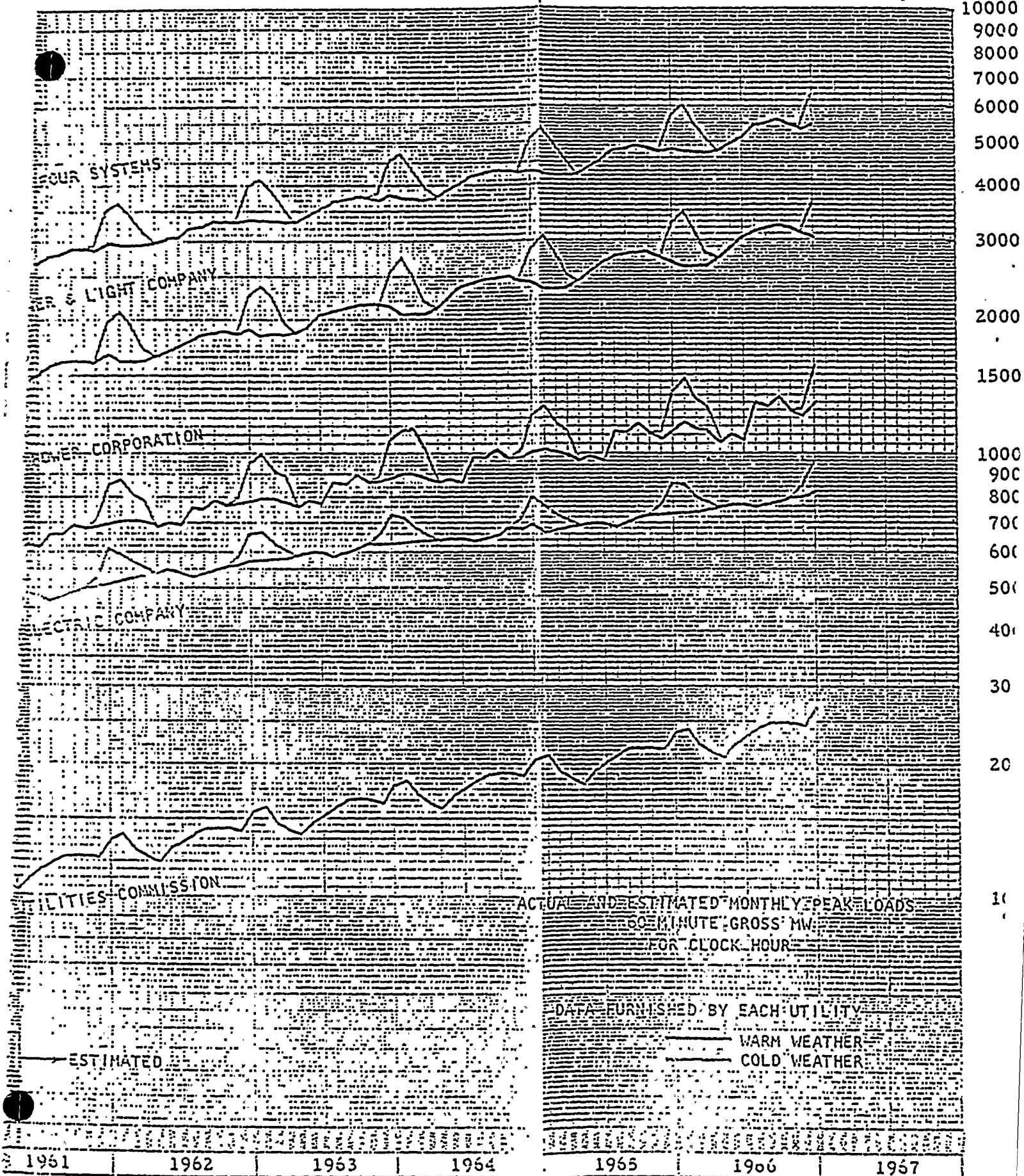
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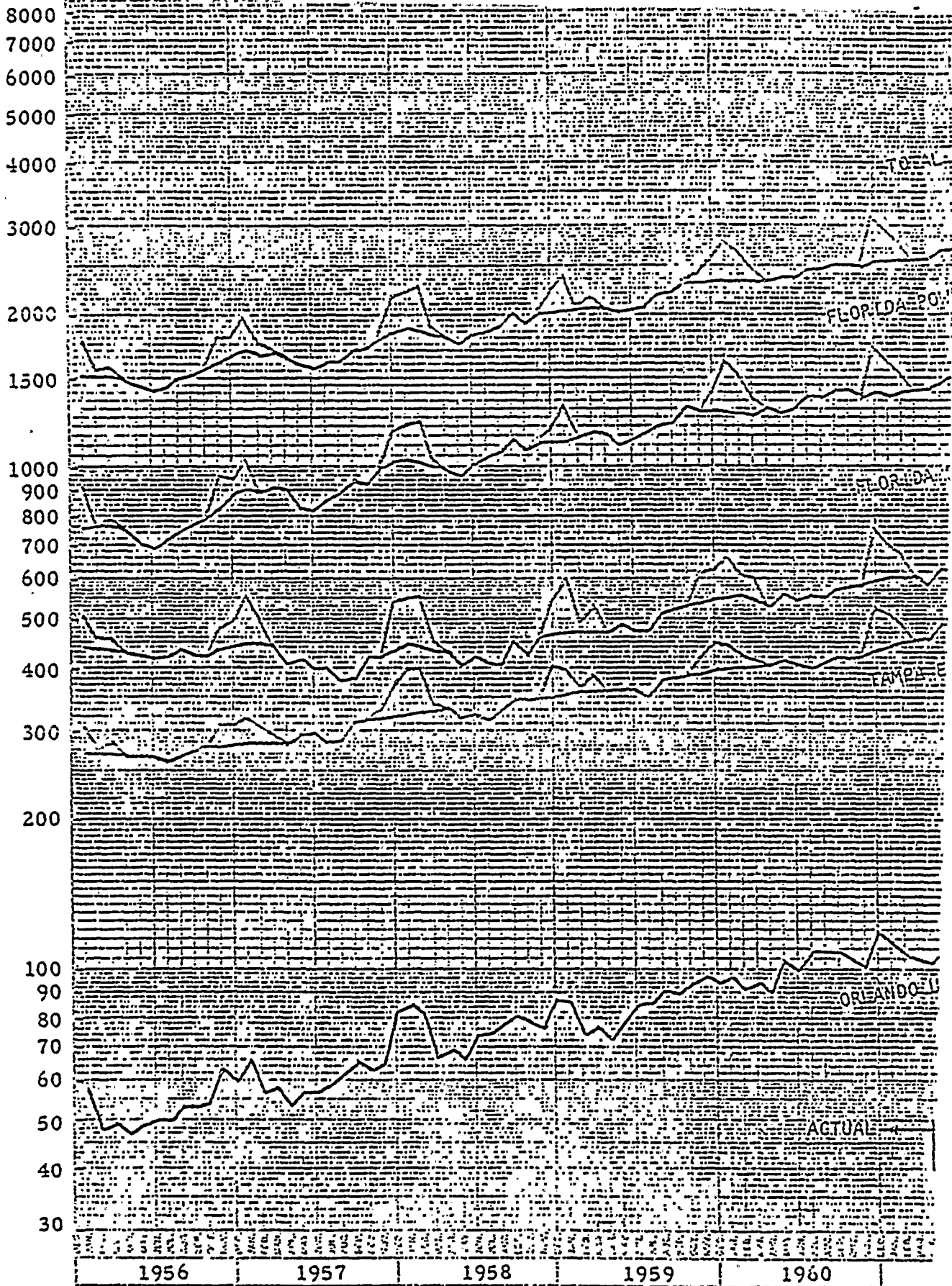
- B247 -

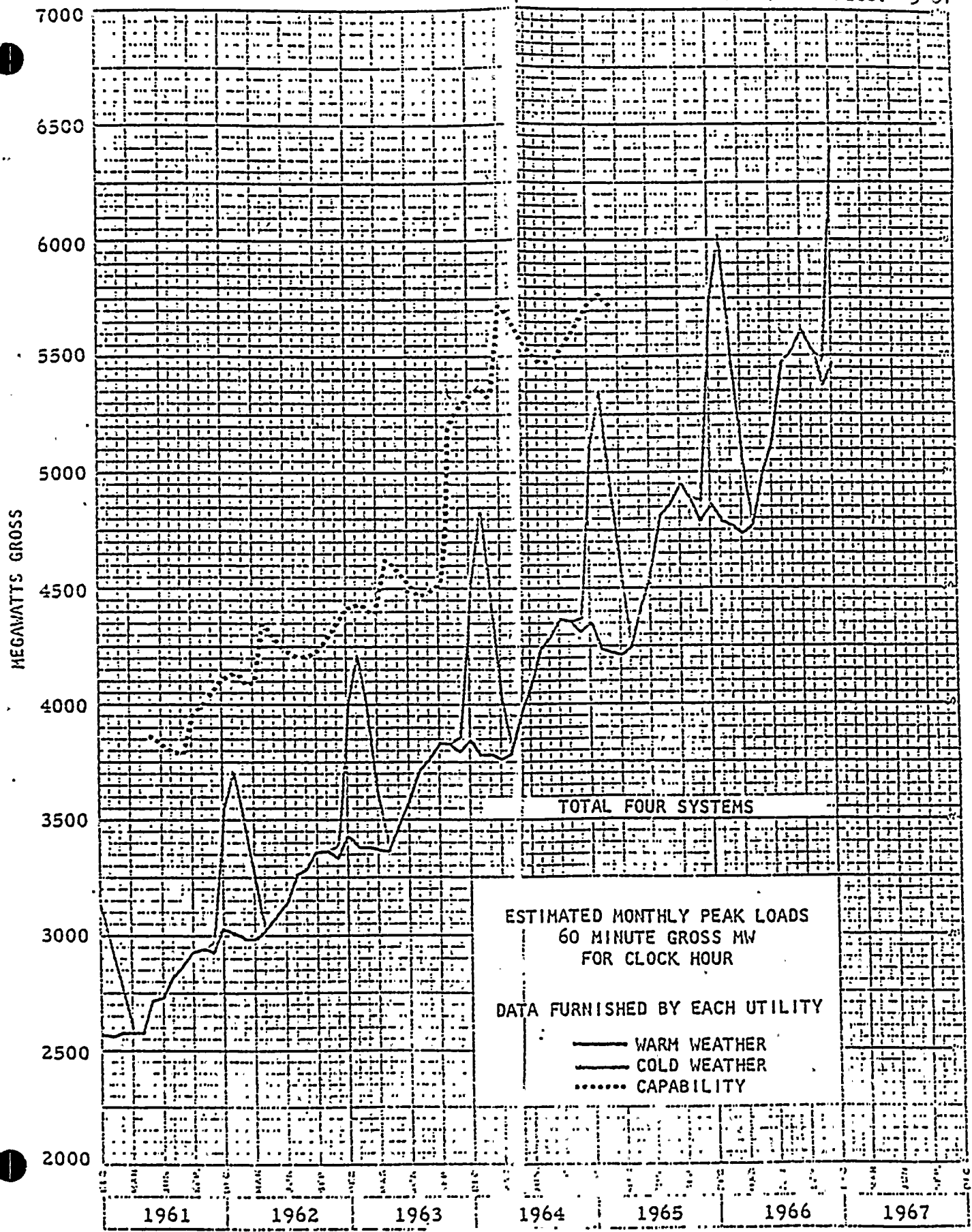


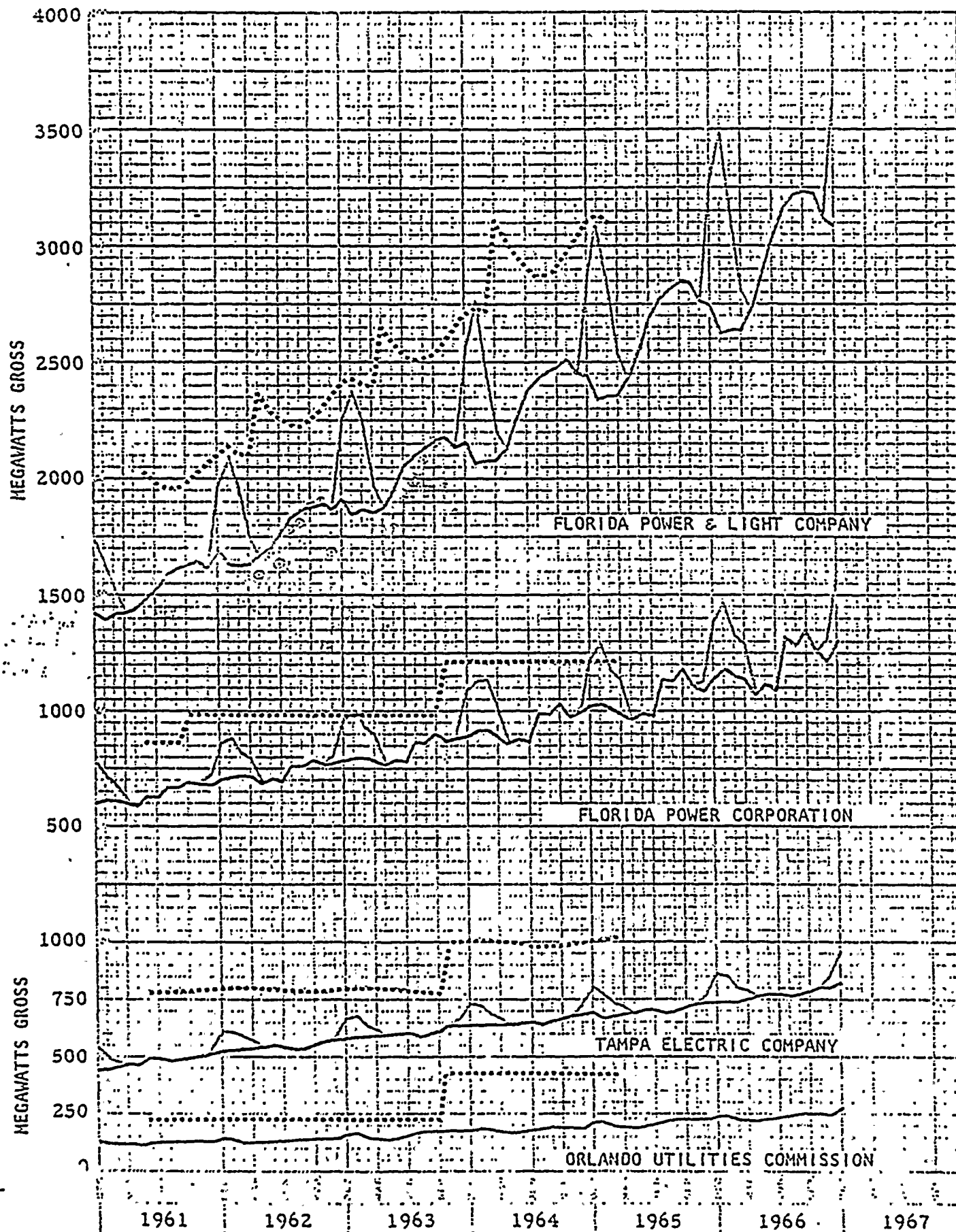




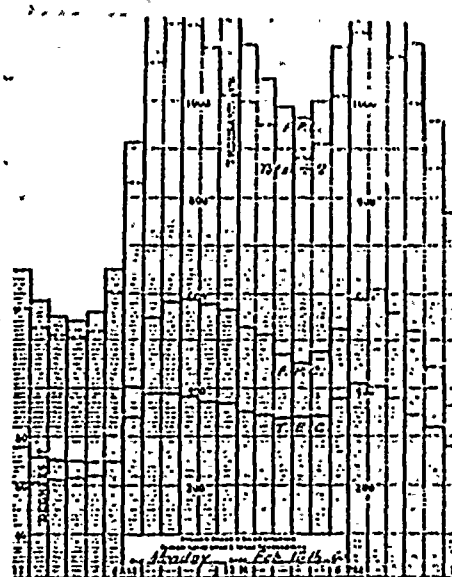
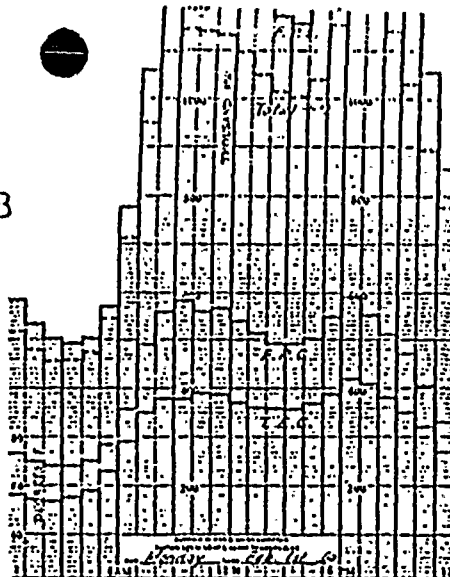
MEGAWATTS GROSS



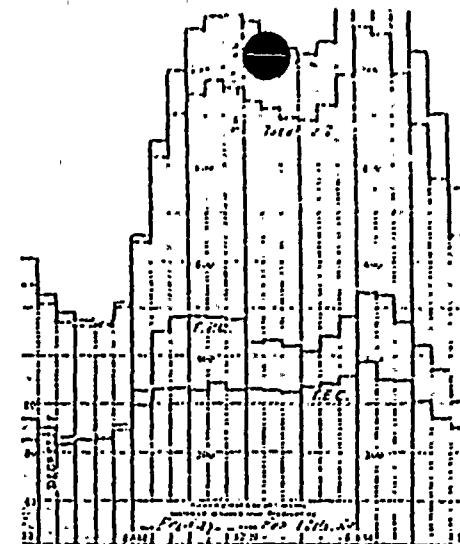




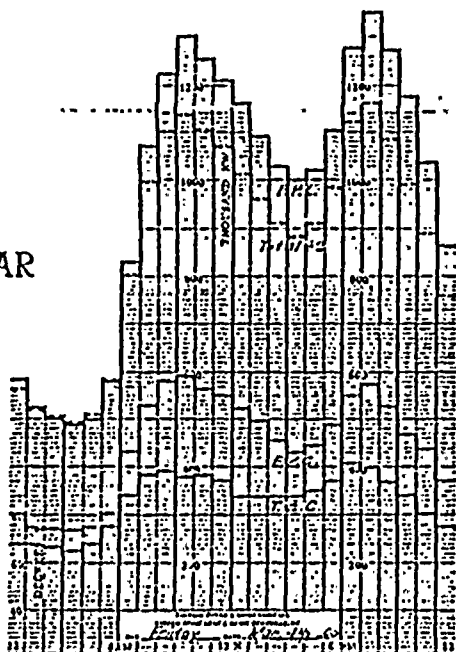
FEB



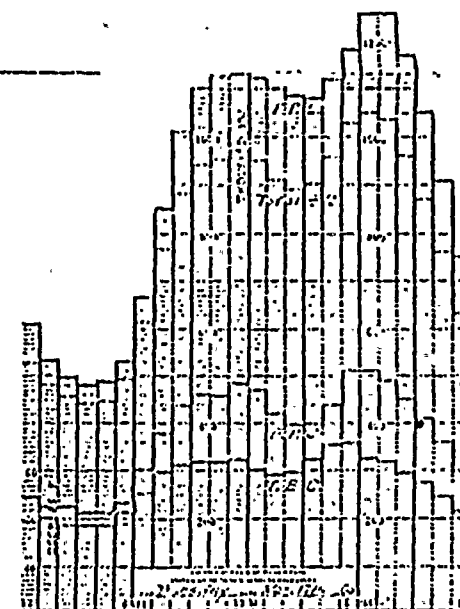
Monday Feb. 1st, 1960



MAR



Friday Mar. 4th, 1960



TEC

FPC

FPL

FPL

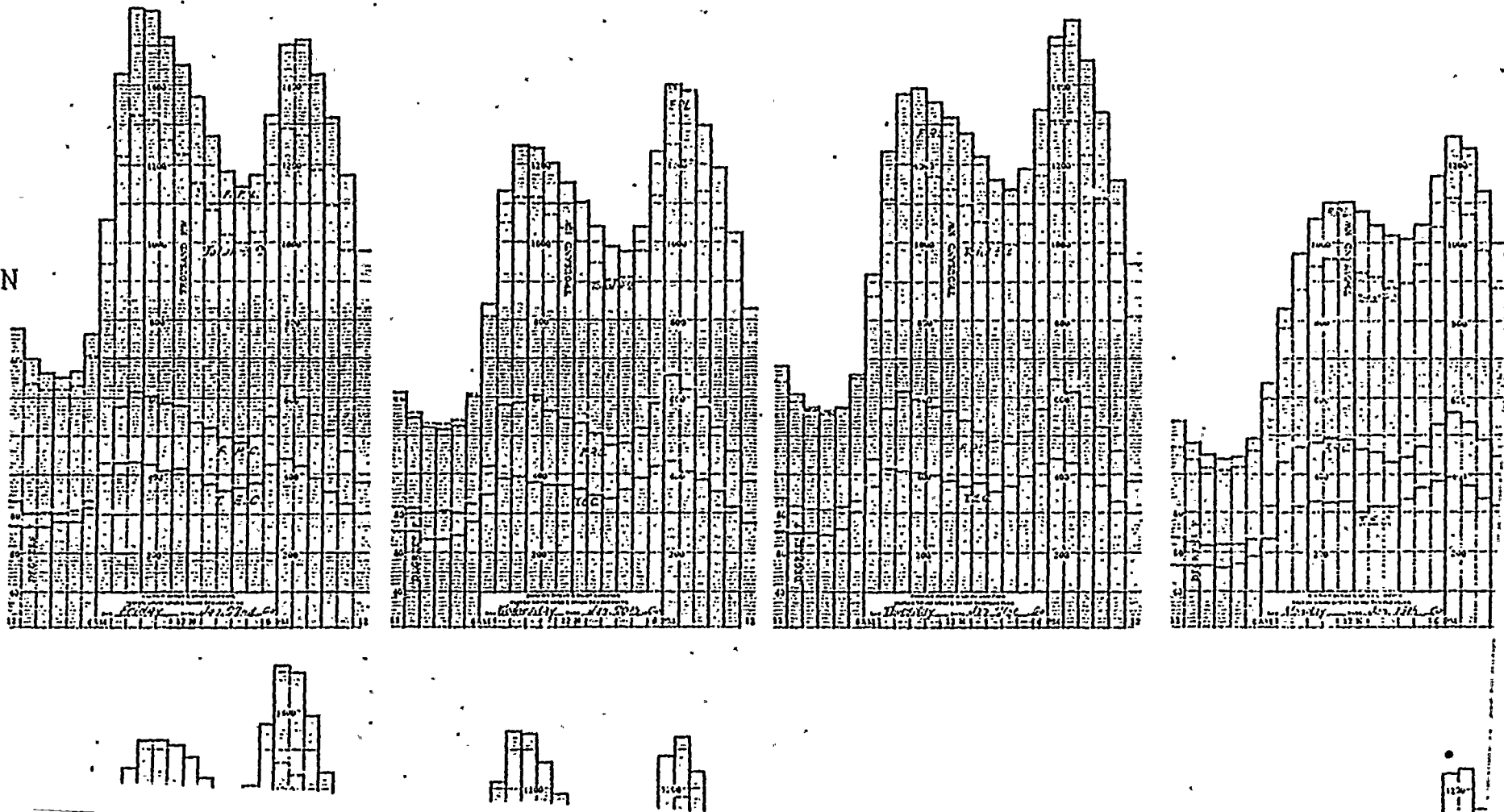
Including Page
of 1000

LOAD CURVES FOR DAYS OF MONTHLY PEAKS OF EACH COMPANY 60-MINUTE GROSS MW

WSP/1000
1/19/61

- B255 -

JAN



- B256 -

The image shows a large, complex document, likely a ledger or a form, with many columns and rows of text. The text is heavily distorted and difficult to read, appearing as a dense, illegible mass of characters and symbols. The document is oriented vertically and occupies most of the page.

Monday May 23rd, 1950

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JUN

Wednesday June 1st, 1960

The image shows a large, complex document, likely a ledger or a form, with many columns and rows of text. The text is heavily distorted and difficult to read, appearing as a series of vertical lines and blocks of characters. The document is oriented vertically, with the text running from top to bottom. The overall appearance is that of a heavily processed or corrupted scan of a document.

TEC

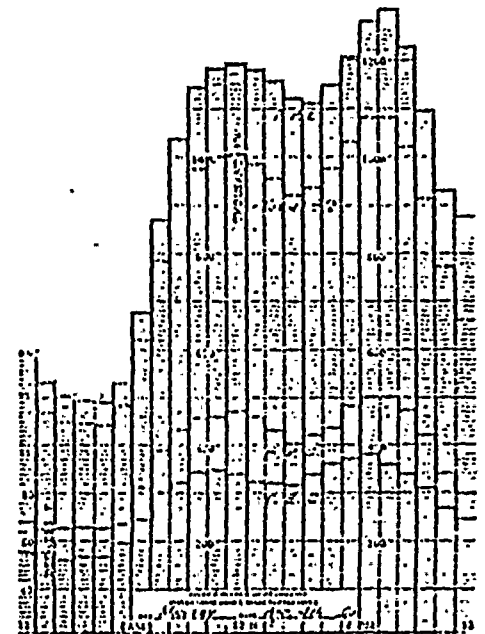
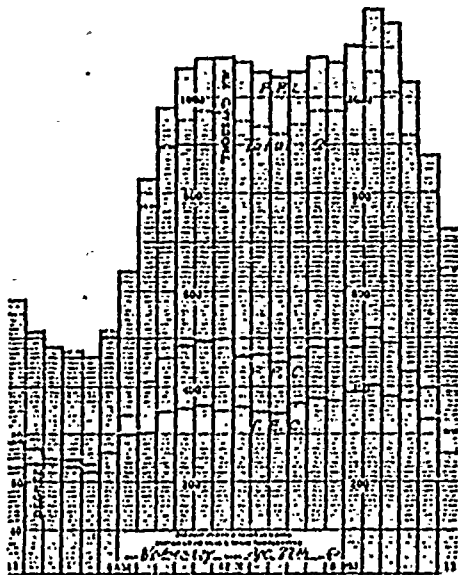
FPC

FPL

LOAD CURVES FOR DAYS OF MONTHLY PEAKS OF EACH COMPANY 60-MINUTE GROSS MW

- B257 -

APR



SEP

TEC

FPC

FPL

DEC

Thursday Dec. 22nd, 1900

FPC.

FPL

FPL

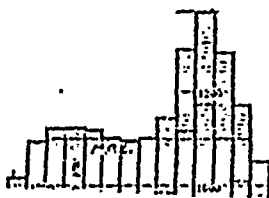
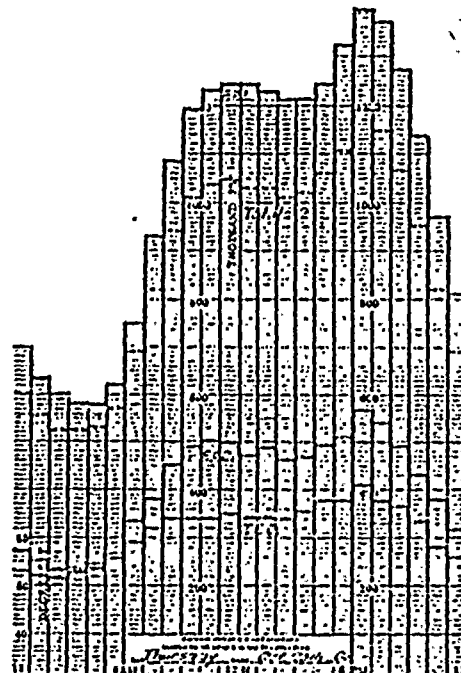
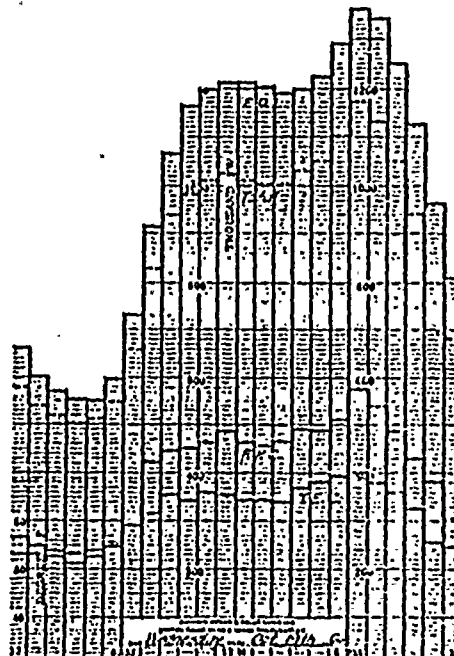
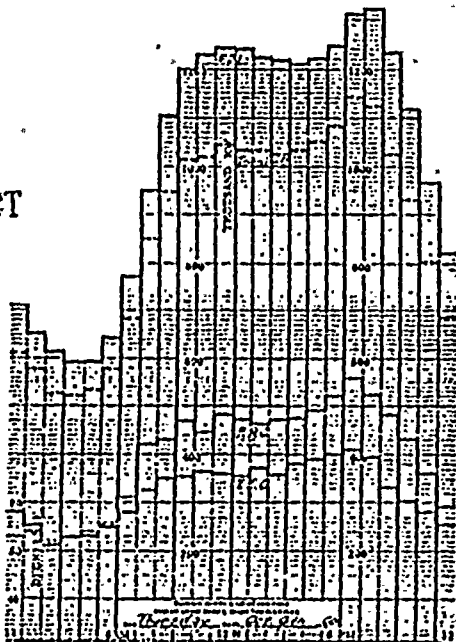
U.S. DEPARTMENT OF JUSTICE

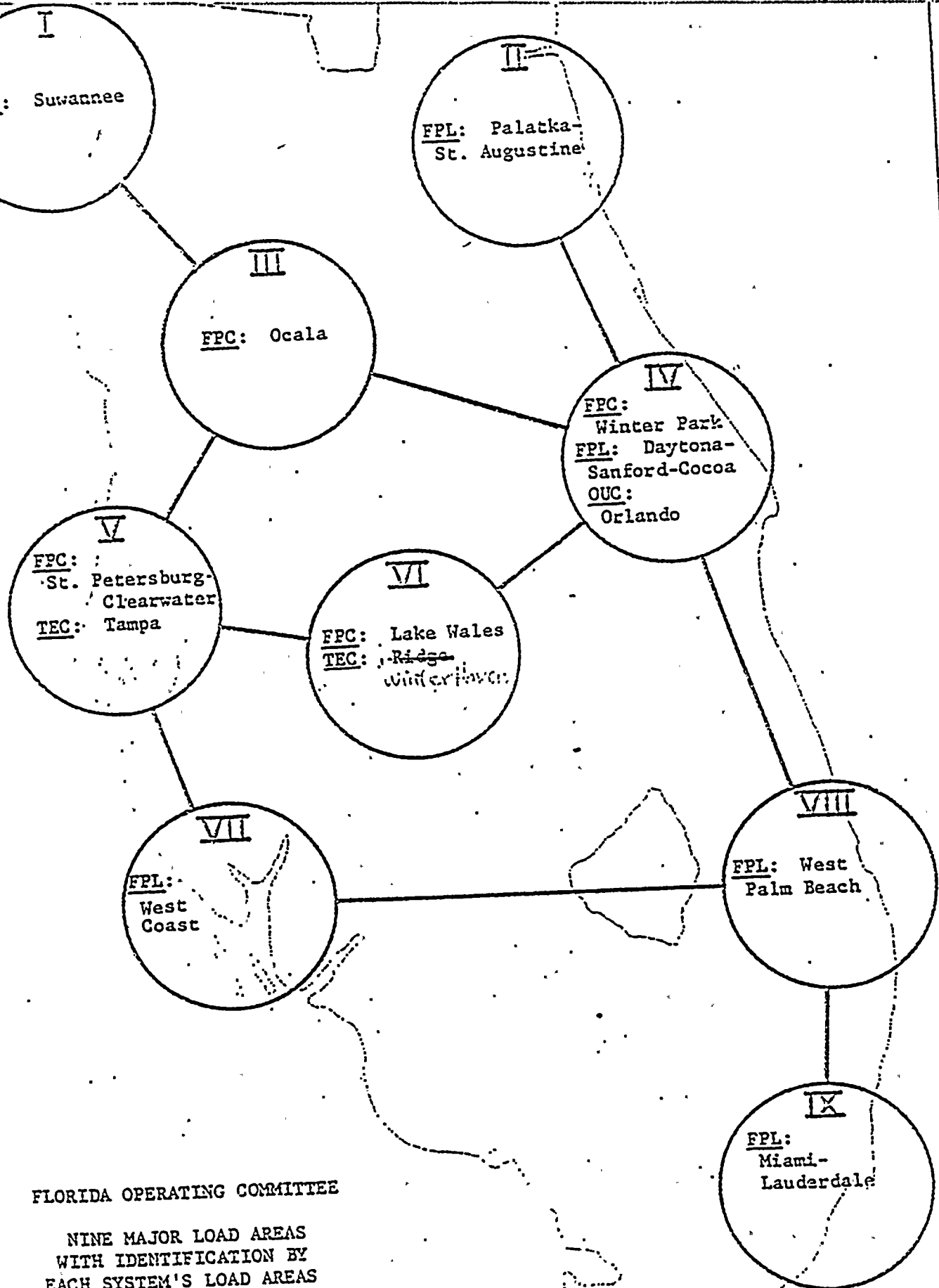
LOAD CURVES FOR DAYS OF MONTHLY PEAKS OF EACH COMPANY 60-MINUTE GROSS MW

10/1/61

- B260 -

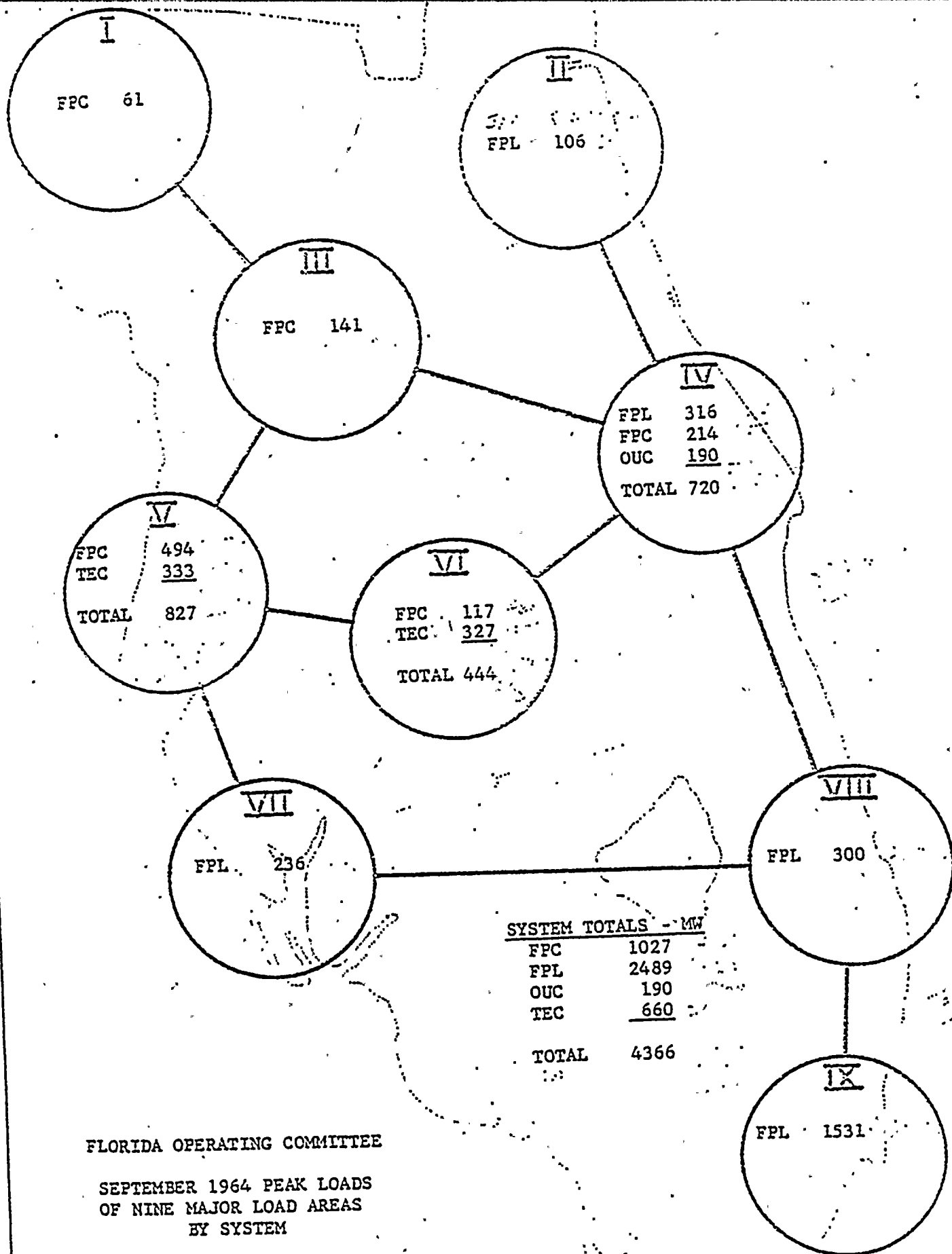
OCT





FLORIDA OPERATING COMMITTEE

NINE MAJOR LOAD AREAS
WITH IDENTIFICATION BY
EACH SYSTEM'S LOAD AREAS

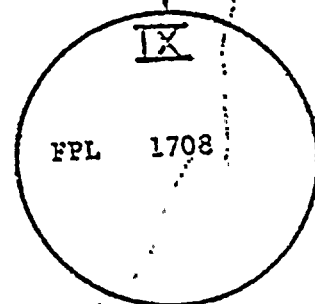
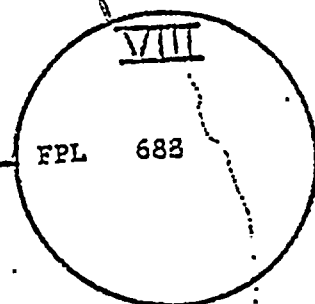
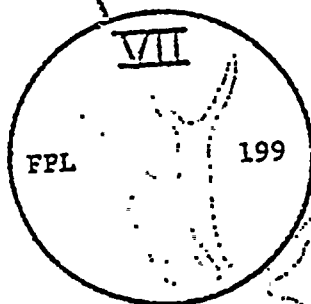
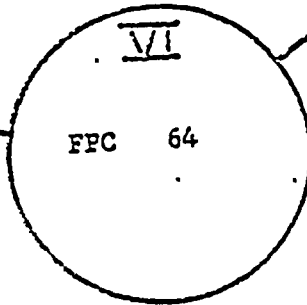
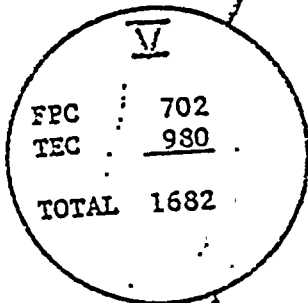
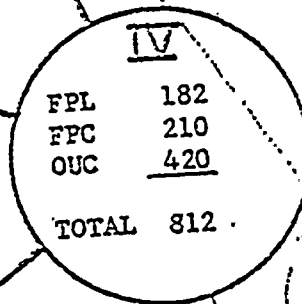
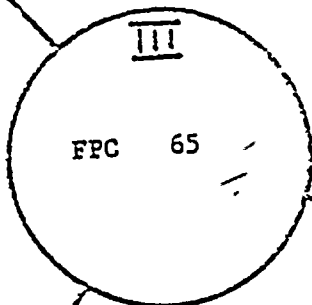
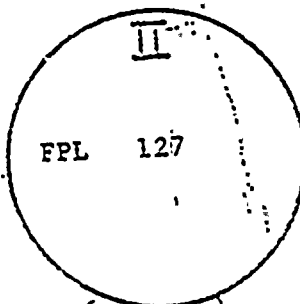
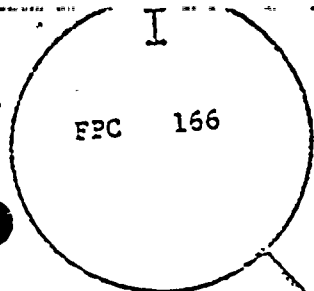


SYSTEM TOTALS - MW	
FPC	1027
FPL	2489
OUC	190
TEC	660
TOTAL	4366

FLORIDA OPERATING COMMITTEE

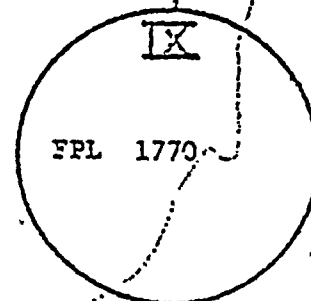
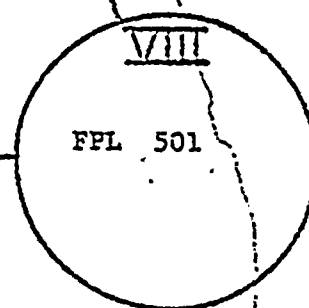
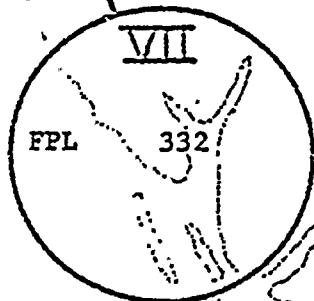
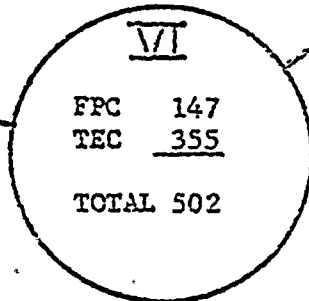
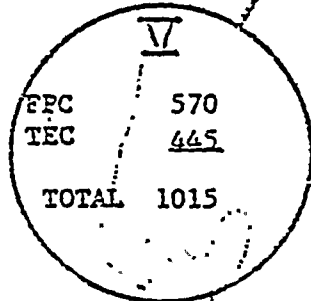
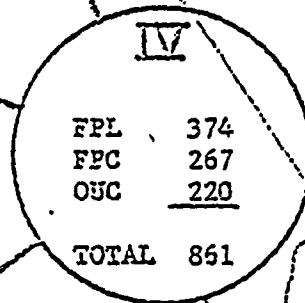
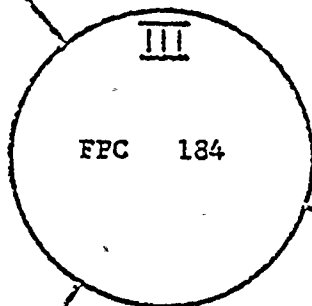
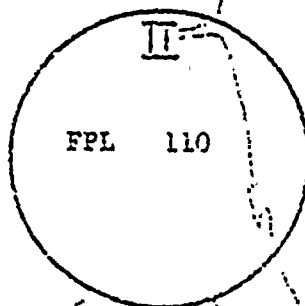
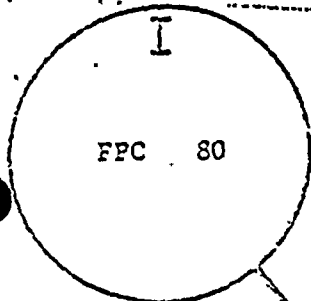
SEPTEMBER 1964 PEAK LOADS
OF NINE MAJOR LOAD AREAS
BY SYSTEM

TOTAL LOAD 4366 MW



SYSTEM TOTALS - MW	
FPC	1207
FPL	2904
OUC	420
TEC	980
TOTAL	5511

FLORIDA OPERATING COMMITTEE
SEPTEMBER 1964 GENERATING CAPABILITIES
OF NINE MAJOR LOAD AREAS
BY SYSTEM
TOTAL CAPABILITY 5511 MW



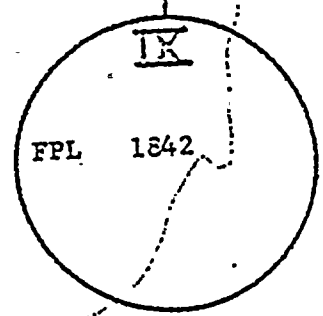
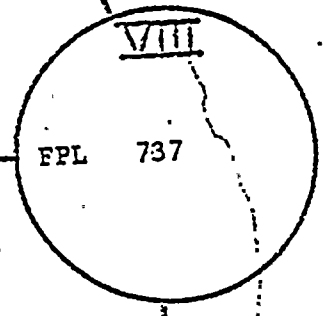
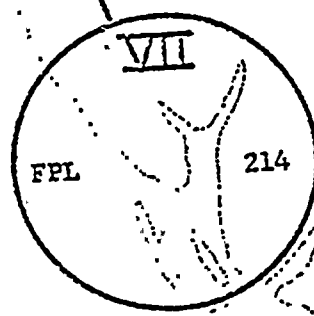
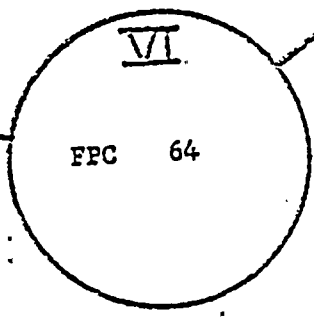
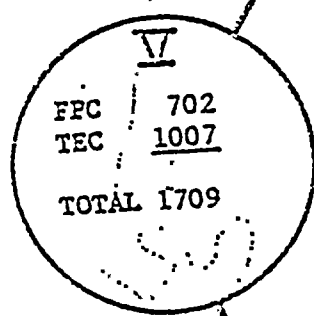
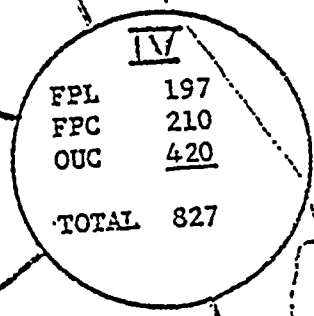
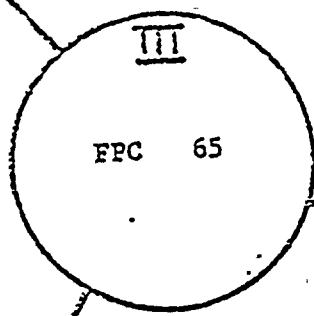
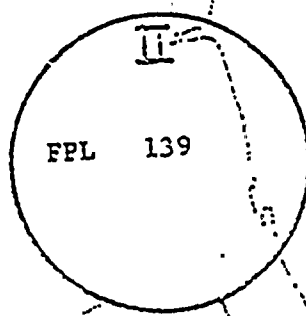
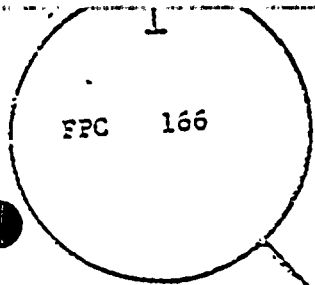
SYSTEM TOTALS - MW

FPC	1248
FPL	3087
OUC	220
TEC	800
TOTAL	5355

FLORIDA OPERATING COMMITTEE

JANUARY 1965 PEAK LOADS
OF NINE MAJOR LOAD AREAS
BY SYSTEM

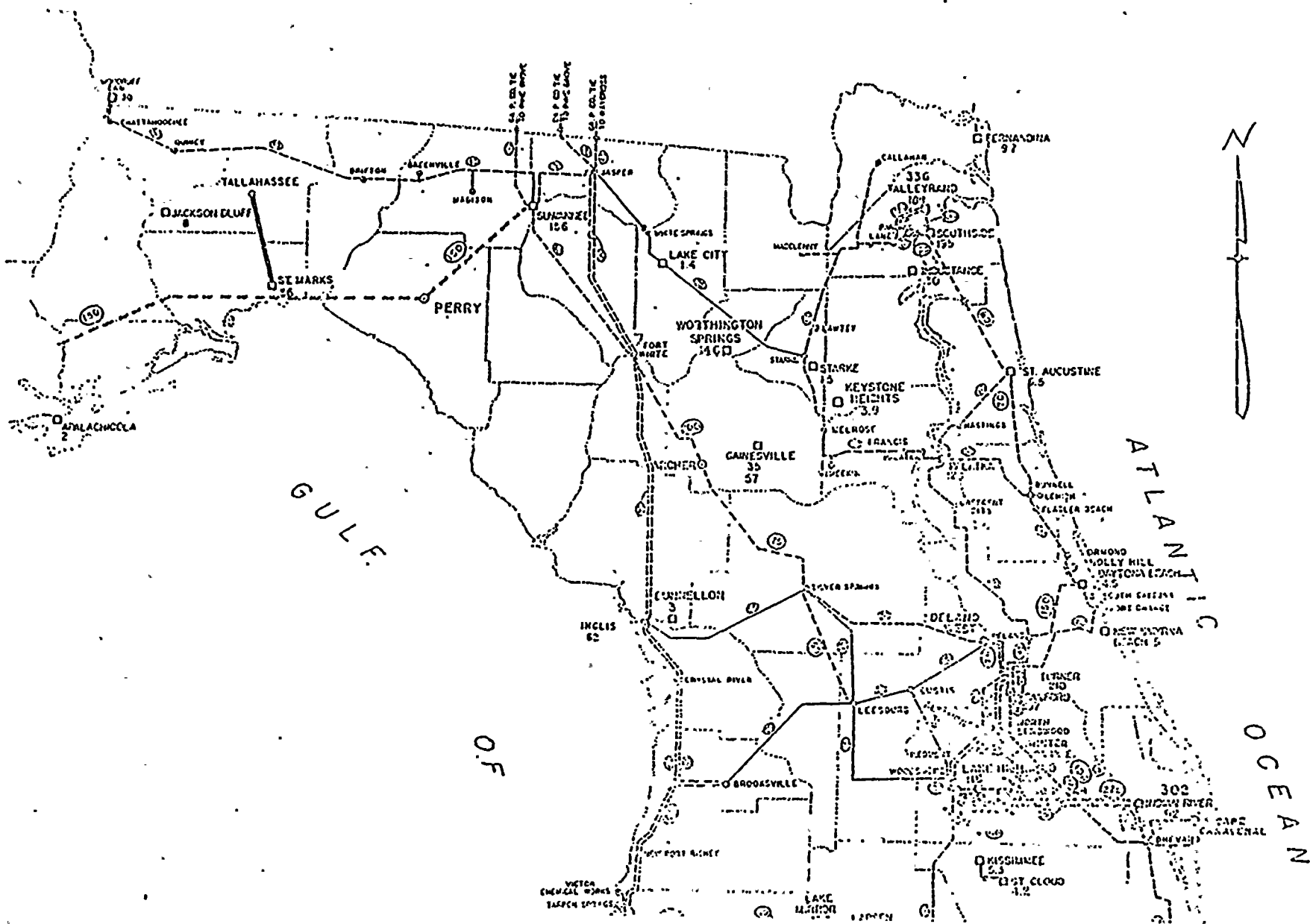
TOTAL LOAD 5355 MW



SYSTEM TOTALS - MW

FPC	1207
FPL	3129
OUC	420
TEC	1007
TOTAL	5763

FLORIDA OPERATING COMMITTEE
JANUARY 1965 GENERATING CAPABILITIES
OF NINE MAJOR LOAD AREAS
BY SYSTEM
TOTAL CAPABILITY 5763 MW



●●●●●

<u>DESCRIPTION</u>	
UNIT NO.	118 BT
CLASSIFICATION	118 BT
DATE OF ISSUE	118 BT
<div style="text-align: center;"> </div>	
IS BY OR FOR - Generally Obtained Except as Required to Enactment System of Major Facilities	
<u>UNCLASSIFIED CASES - Volume of Note Book</u>	
<u>IDENTIFICATION</u>	
<div style="text-align: center;"> </div>	
NOMINAL RATING In Memorandum Rating of Gulf Power Co. & Jacksonville Florida Operating Committee	

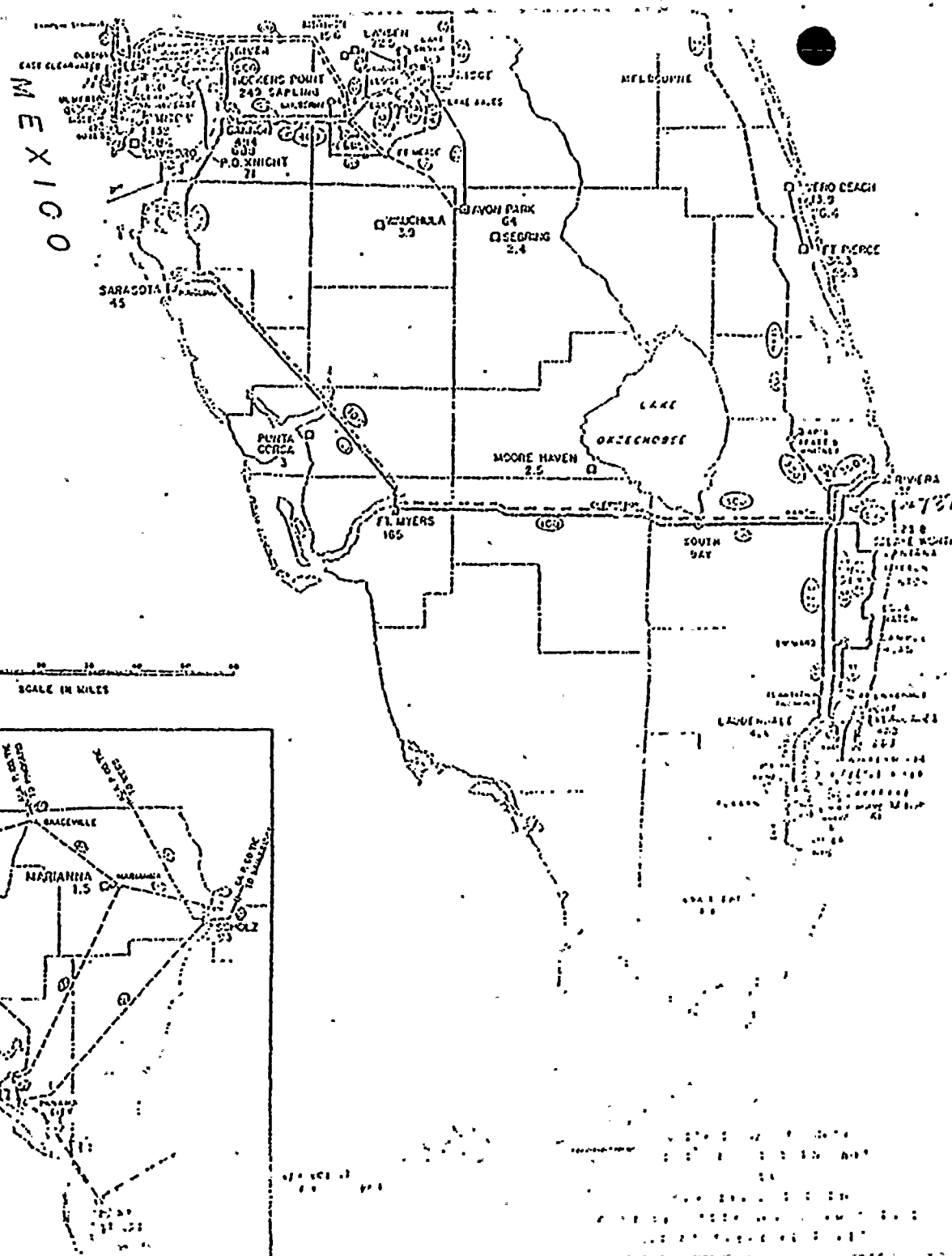
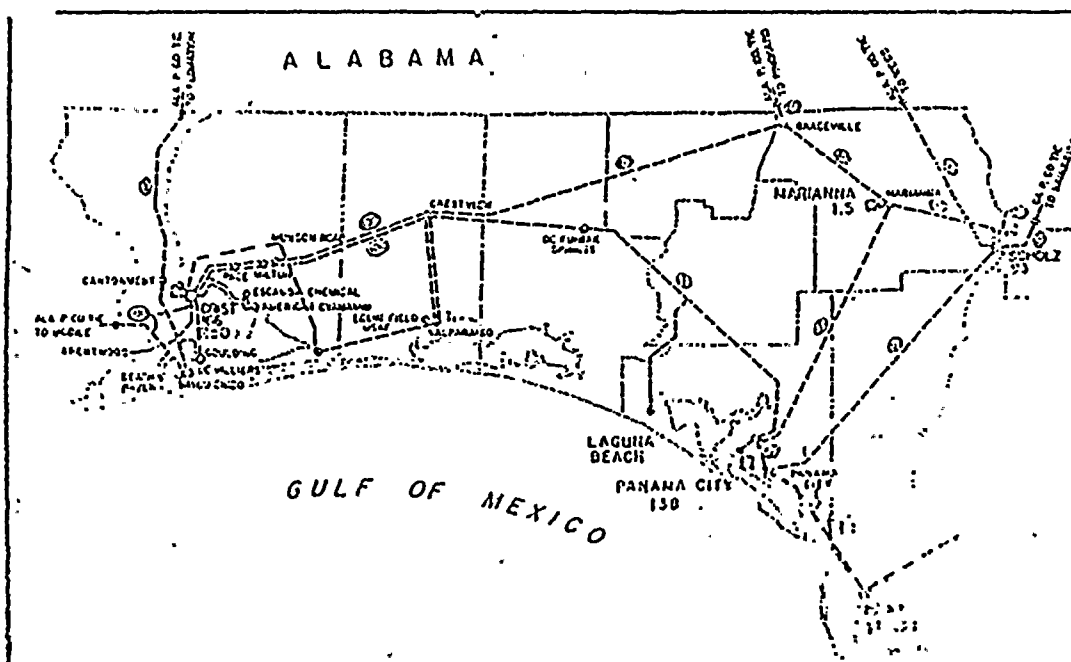
SECRET

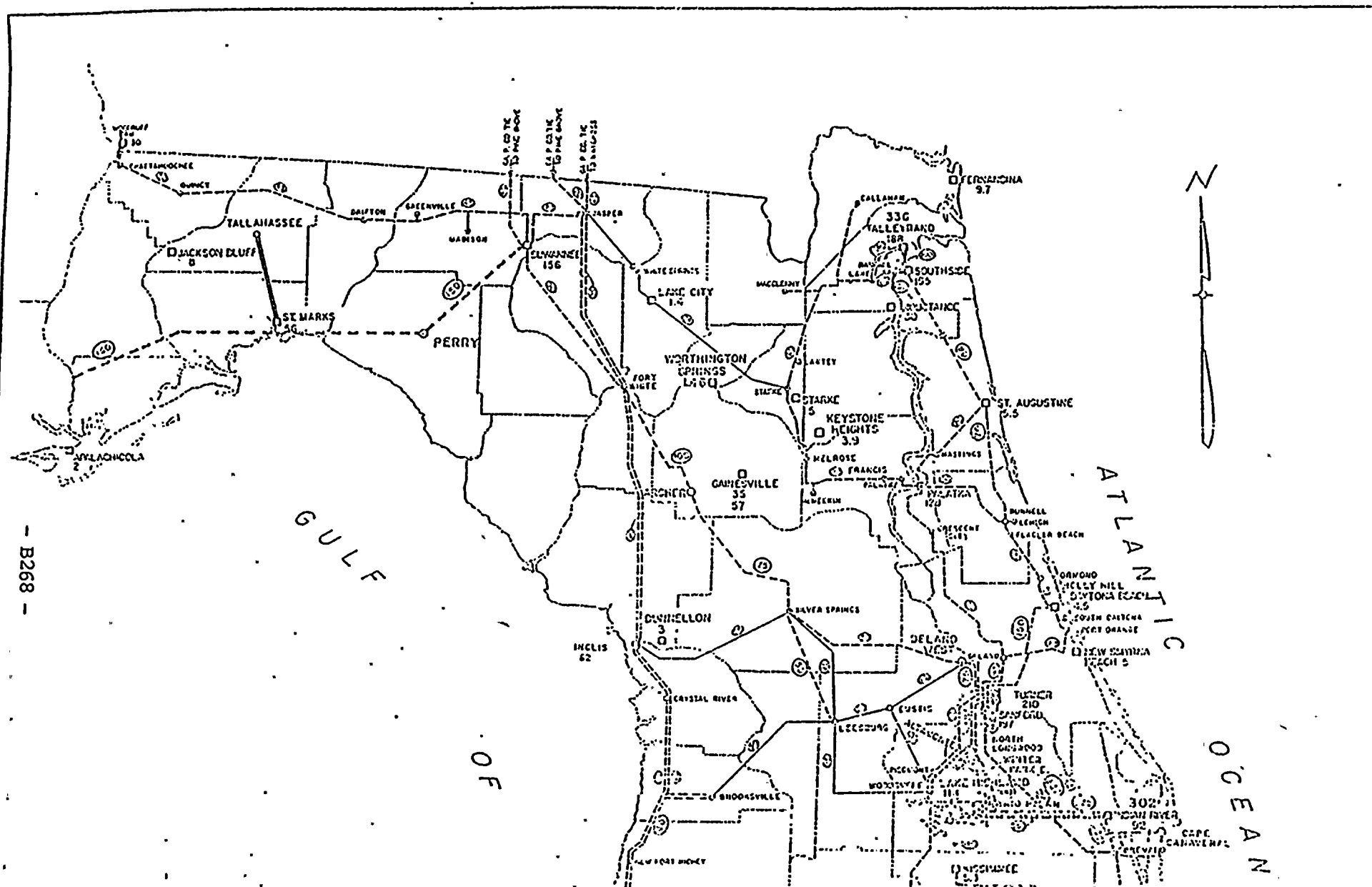
- ☒ GENERATING PLANT = Capability to Regulate Load
Inductively Coupled
 - ☐ TRANSMISSION REGULATION
 - ☐ DISTRIBUTION REGULATION
 - ☐ ☒ TRANSMISSION REGULATION ON GENERATING PLANT
WITH TRANSMISSION OF TRANSMISSION SURFACE
- RED ADDITIONS OF 1964 BASIC SYSTEM

4371

- (1) LIMITED TO 75 MW BY PRESENT AUTOTRANSFORMER CAPACITY
(2) LIMITED TO 225 MW BY AUTO TRANSFORMER CAPACITY

SCALE IN KILOMETERS





1964 BASIC SYSTEM

The 1964 Basic System is comprised of the systems as of May 1, 1961, (as shown on map on Page 22) plus following major additions and changes, with scheduled "in service" dates. Generation and transmission line projects subject to final decision are indicated by an asterisk. Interconnections are listed under both utilities.

FLORIDA POWER CORPORATION

Generating Capacity:

Capability as of 5/1/61	855 mw
Bartow #2 - 8/61.	132 mw
Bartow #3 - 10/63	220 mw
Total	1207 mw

Transmission Substations:

Ulmerton 230/115 kv, 200 mva	Spr. '63
Largo 115/69 kv, 75 mva	Spr. '63
Brooksville 115/69 kv, 75 mva	8/61
Archer 115/69 kv, 75 mva	Fall '62
Leesburg 115/69 kv, 75 mva	Unscheduled
DeLand West 115/69 kv, 30 mva	Sum. '62
Rio Pinar 115/69 kv, 75 mva	Sum. '62
Ridge 230/115 kv, 100 mva	Unscheduled
Ridge 230/69 kv, 75 mva	Unscheduled

Transmission Lines:

Bartow-Ulmerton 230 kv	Spr. '63
Ulmerton-River (TEC) 230 kv	Spr. '63
Fort White-Silver Springs 115 kv	Fall '61
Silver Springs-Leesburg 115 kv	Unscheduled
North Longwood - Rio Pinar 115 kv	Sum. '62
*Rio Pinar - Sub 3 (OUC) 115 kv	Fall '63
*Ridge-Pebble (TEC) 230 kv	1963
*Ridge-Eloise (TEC) 69 kv (Ridge-Cypress Gardens portion)	1963
Suwannee-Perry-Port St. Joe-Gulf Power Co 230 kv Complex	'62-'64
Turner-Woodsmere 115 kv (east circuit) looped through North Longwood	6/63
Higgins-Fort Meade 115 kv double circuit tapped for Sapling (TEC) 115/69 kv substation	8/61
Higgins - Inglis 115 kv looped through Brooksville	8/61

FLORIDA POWER & LIGHT COMPANY

Generating Capacity:

Capability as of 5/1/61	2129 mw
Riviera #3 - 4/62	300 mw
Riviera #4 - 4/63	300 mw
Port Everglades #3 - 3/64	400 mw
Total	3129 mw

Transmission Substations:

Brevard 230/115 kv, 150 mva	Fall '64
Broward 138/69 kv, 150 mva (75 mva increase)	5/61
Dade 138/69, 100 mva (200 mva decrease)	6/64
Flagami 138/69 kv, 150 mva	Spr. '62
Ft. Myers 230/138 kv, 150 mva	Fall '62
Ft. Myers 138/69 kv, 150 mva (50 mva increase)	Spr. '64
Greynolds 138/69 kv, 100 mva	Fall '63
Hialeah 138/69 kv, 150 mva	6/64
Little River 138/69 kv, 250 mva	Fall '62
Melbourne 230/69 kv, 150 mva	Spr. '63
Miami 138/69 kv, 200 mva	12/61
Ranch 230/138 kv, 400 mva (200 mva increase)	Fall '62
Ringling 230/138 kv, 150 mva	Fall '62
Ringling 138/69 kv, 200 mva (100 mva increase)	Fall '62
Riviera 138/69 kv, 150 mva (100 mva increase)	4/62
South Bay 138/69 kv, 50 mva	Fall '63

Transmission Lines:

*Brevard-Cape Canaveral 115 kv loop (conversion)	Fall '64
*Brevard-Indian River (OUC) 230 kv	Fall '63
Broward-Lauderdale #1, 138 kv (reconductoring)	3/64
Broward-Ranch #1, 138 kv (reconductoring)	Spr. '63
Broward-Lantana-Ranch #2, 138 kv	Spr. '62
Dade-Little River 138 kv (conversion)	Fall '62
Dade-Hialeah-Little River 138 kv (conversion)	Spr. '64
Dade-Lauderdale #3, 138/230 kv	Fall '62
Daytona-Sanford 115/230 kv (Daytona-DeLand Tap portion)	Fall '63
Flagami-Lawrence-Miami 138 kv	12/61
Ft. Myers-Ranch #2, 230 kv (138 kv operation 12/61)	Fall '62
Ft. Myers-Ringling #2, 230 kv (138 kv operation 12/61)	Fall '62
*Greynolds-Port Everglades 138 kv (conversion)	Fall '63
Lauderdale-Port Everglades #4, 138/230 kv	3/64
Lauderdale-Ranch 138/230 kv	Spr. '63
Ranch-Riviera #1, 138 kv (bundling conductor)	Spr. '62
Ranch-Riviera #2, 138 kv	Fall '61
Ranch-Riviera #3, 138 kv	4/63
Ringling-Gannon 230 kv (conversion & reconductoring)	Spr. '63
*St. Augustine-Southside (Jax) 115 kv	Spr. 64

ORLANDO UTILITIES COMMISSION:

Generating Capacity:

Capability as of 5/1/61	210 mw
*Indian River Unit #2 - Fall '63	<u>210 mw</u>
Total	420 mw

Transmission Substations:

Indian River (Sub No. 7) 230 kv	Fall '63
Substation No. 6, 230 kv	Fall '63
Substation No. 10, 115/12.5 kv (26 mva)	Spr. '63
Substation No. 3, 115/12.5 kv (26 mva increase)	Fall '63
Substation No. 1, 115/12.5 kv (26 mva increase)	Spr. '63

Transmission Lines:

*Indian River-Brevard (FPL) 230 kv	Fall '63
Indian River-Sub 6, 230 kv	Fall '63
Sub 6 - Sub 3 (2nd ckt) 115 kv	Fall '63
Sub 6 - Sub 9 (2nd ckt) 115 kv	Fall '63
Sub 9 - Sub 10 115 kv Mid Loop Tie	Spr. '63
Sub 10 - Sub 1 115 kv Mid Loop Tie	Spr. '63
*Sub 3 - Rio Pinar. (FPC) 115 kv	Fall '63

TAMPA ELECTRIC COMPANY

Generating Capacity:

Capability as of 5/1/61	804 mw
Gannon #4 - 10/63	<u>204 mw</u>
Total	1008 mw

Transmission Substations:

Sapling 115/69 kv, 60 mva	8/61
River 230/69 kv, 150 mva	1963
Gannon 230/138 kv, 200 mva	1963
Pebble 230/69 kv, 250 mva	1963

TAMPA ELECTRIC COMPANY (Cont'd.)Transmission Lines:

*Gannon-Pebble 230 kv (conversion)	1963
River - Gannon 230 kv	1963
River - Ulmerton (FPC) 230 kv	1963
*Pebble - Ridge (FPC) 230 kv.	1963
*Eloise-Ridge (FPC) 69 kv (Cypress Gardens-Ridge portion)	1963
Gannon - Ringling 230 kv (conversion & reconductoring)	Spr. '63

LEGEND

TRANSMISSION

- 110 KV
- 110 KV
- 110 KV
- 60 KV OR LESS - Generally Distorted Except as Applied to Interconnect Systems of Major Facilities

INTERCONNECTION

- INTERCONNECTION
- INTERCONNECTION
- INTERCONNECTION

GENERATING PLANTS

- GENERATING PLANT - Capability to Generate Industrial District
- TRANSMISSION SUBSTATION
- DISTRIBUTION SUBSTATION
- TRANSMISSION SUBSTATION OR GENERATING PLANT WITH TRANSMISSION OF TRANSMISSION

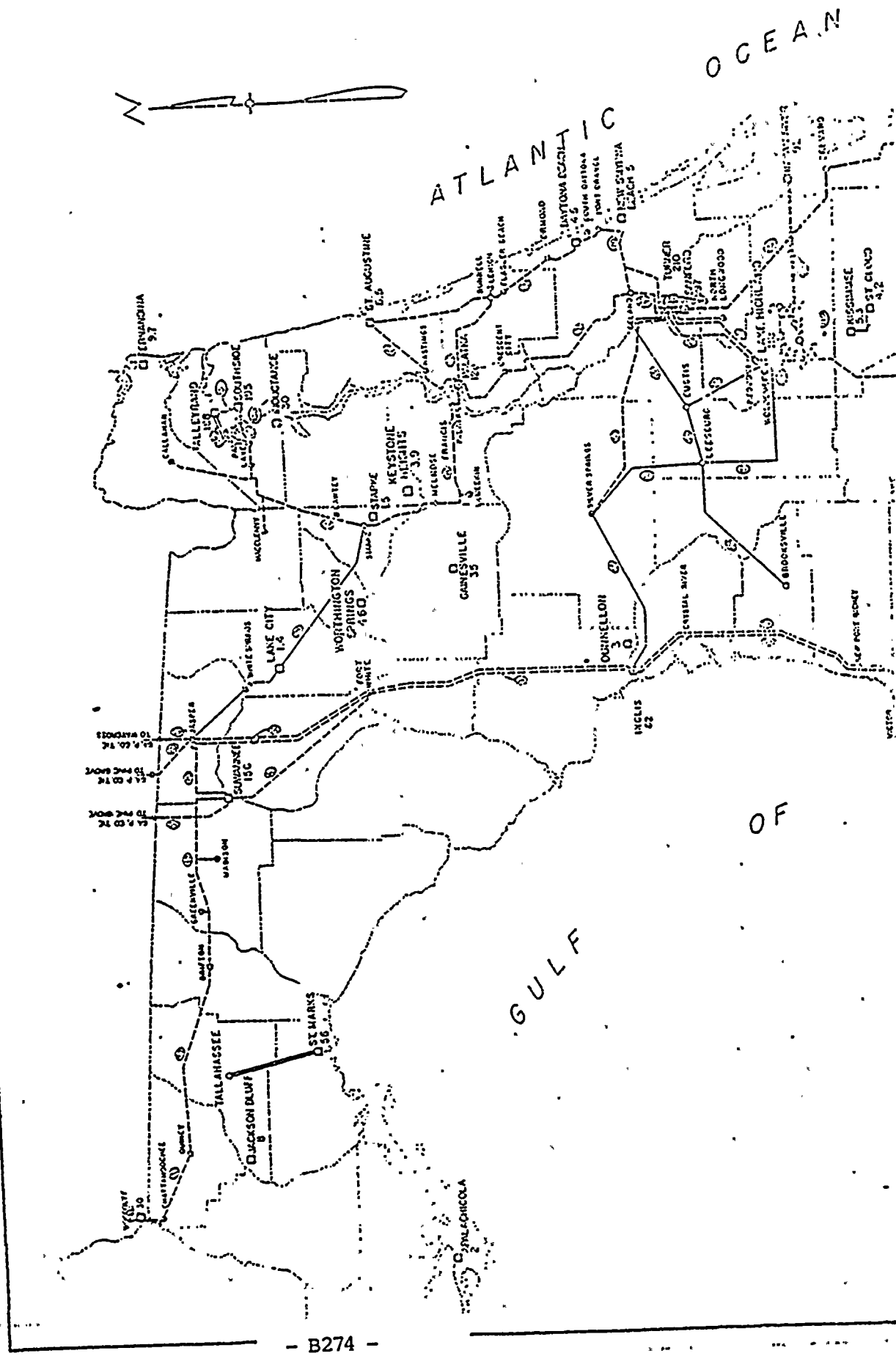
NOTES:
(1) Rated to 75 MW by present autotransformer capacity

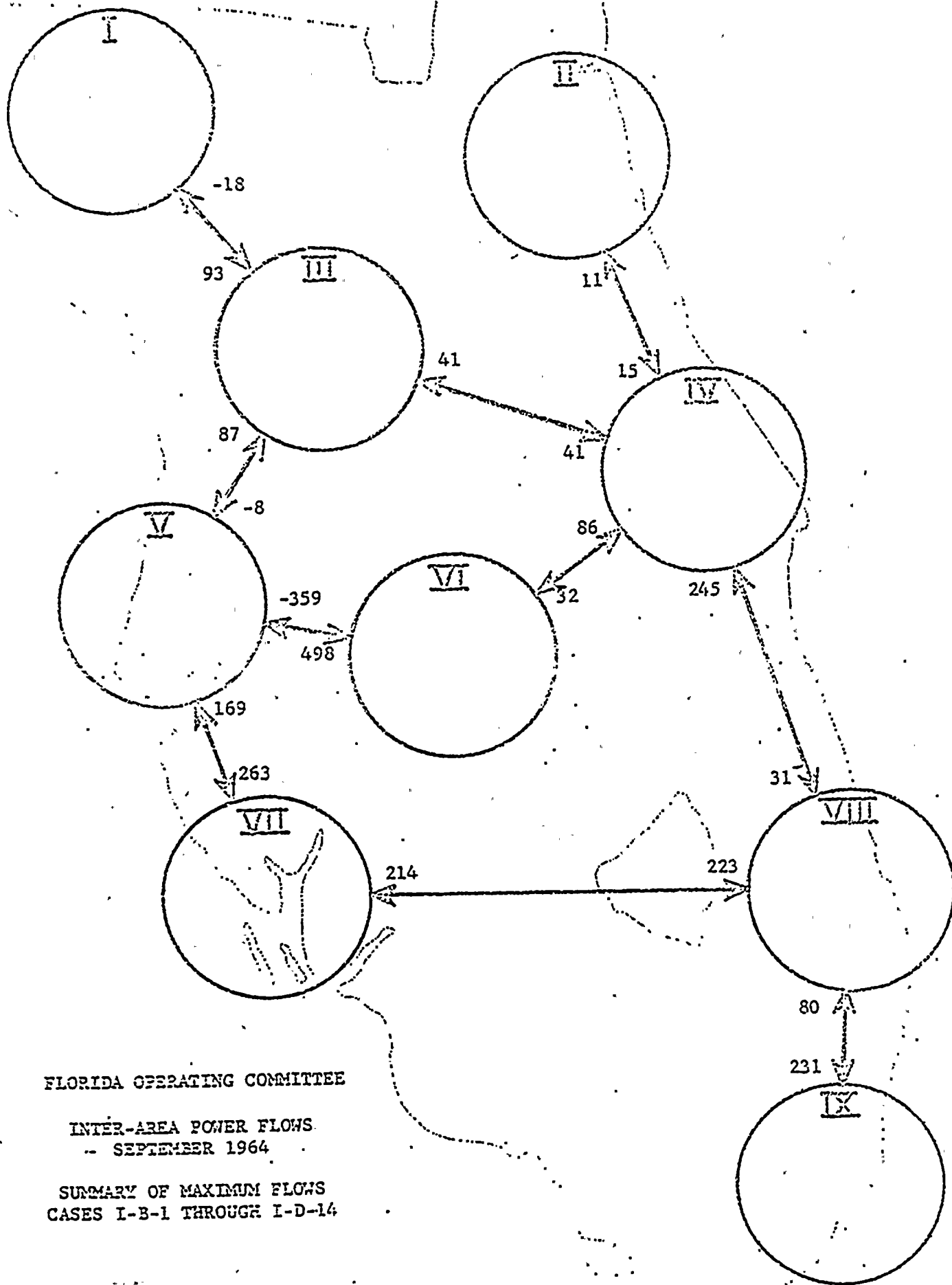
SCALE IN MILES

ALABAMA

GULF OF MEXICO

STATE OF FLORIDA
ELECTRIC SYSTEM MAP
1961

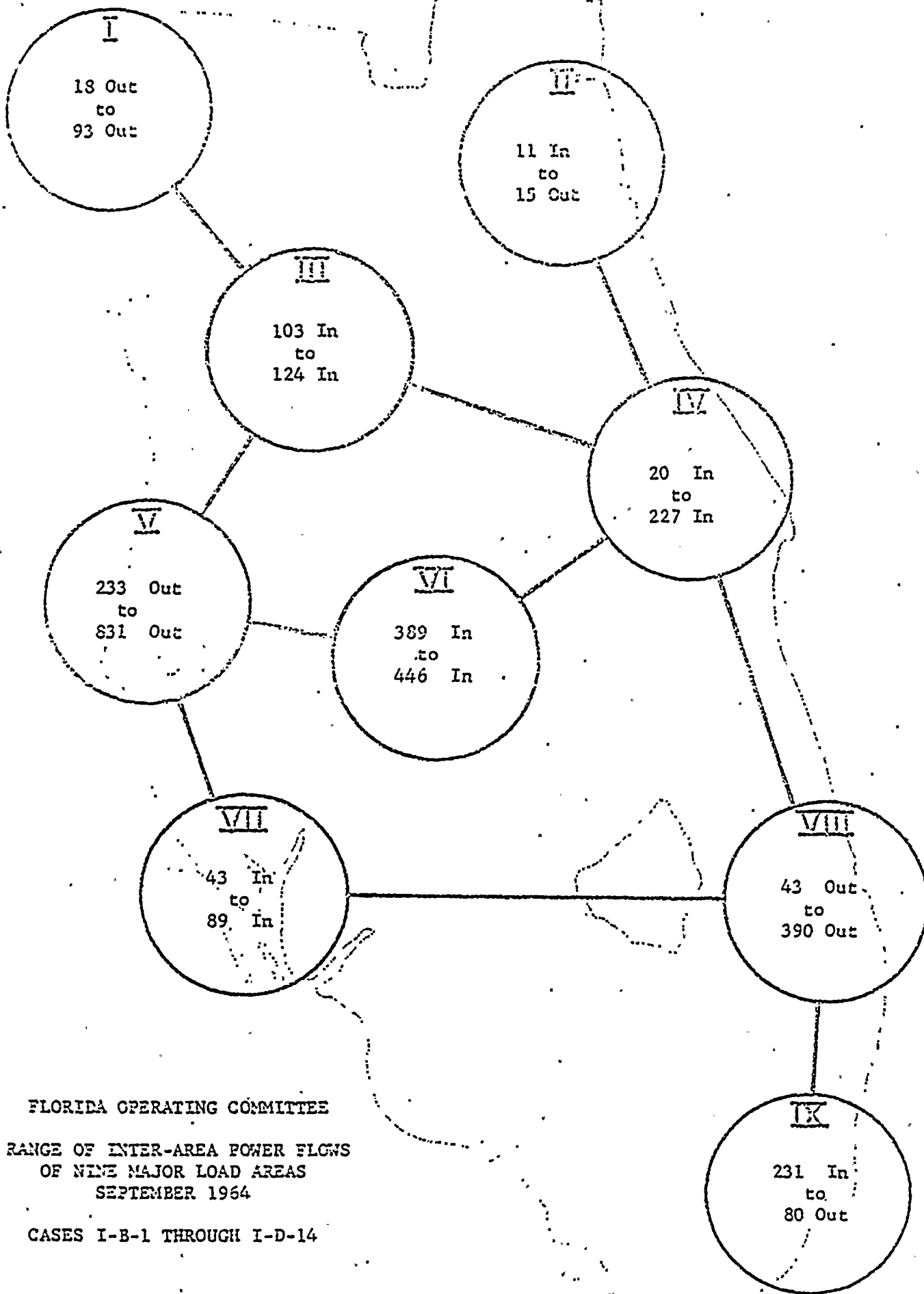


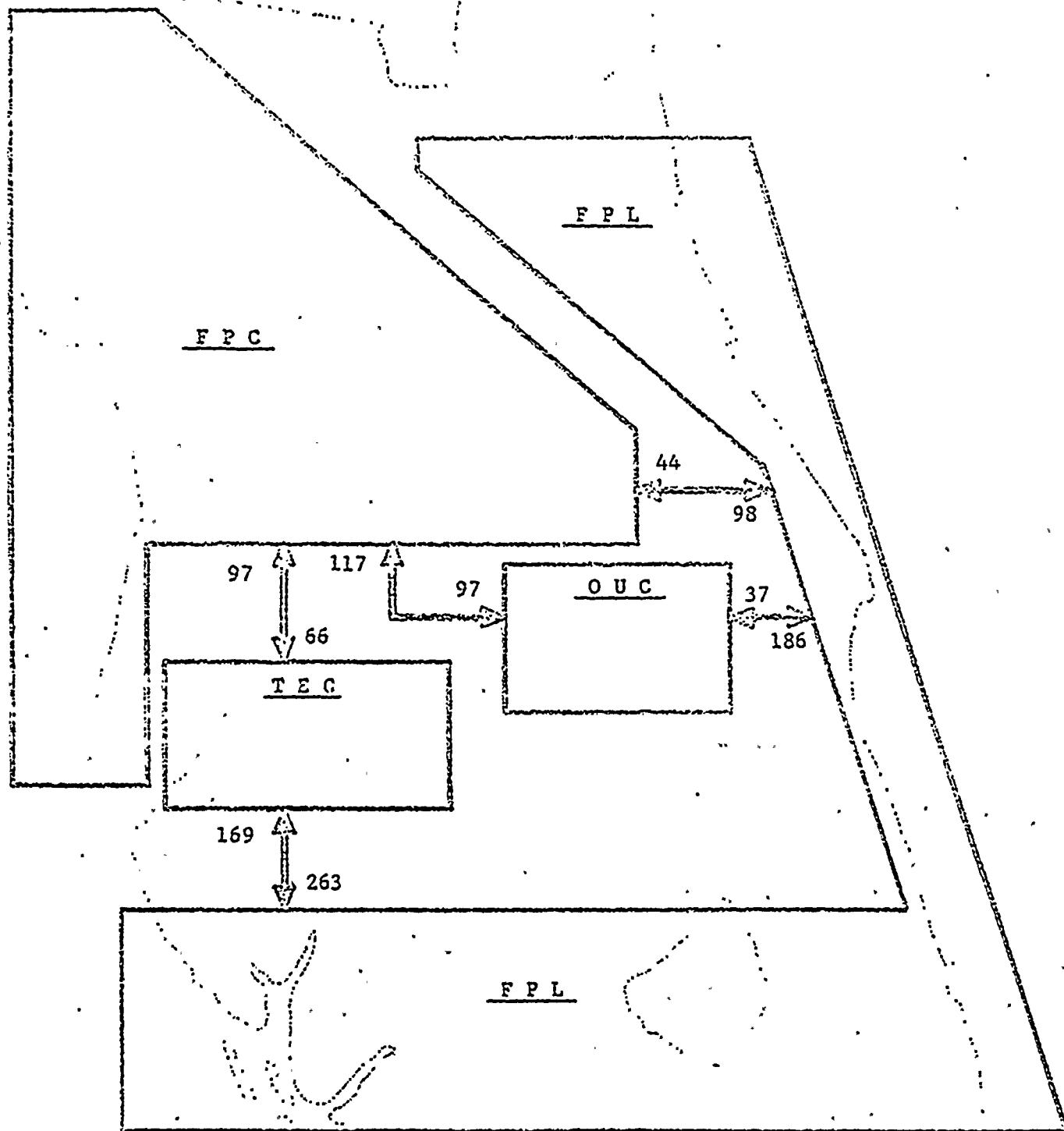


FLORIDA OPERATING COMMITTEE

INTER-AREA POWER FLOWS
-- SEPTEMBER 1964

SUMMARY OF MAXIMUM FLOWS
CASES I-B-1 THROUGH I-D-14





FLORIDA OPERATING COMMITTEE

INTER-SYSTEM POWER FLOWS - SEPT 1964
TOTAL LOAD 4366

SUMMARY OF MAXIMUM FLOWS
CASES I-B-1 THROUGH I-D-14

VI. ANALYSIS OF CONDITIONS STUDIEDIndex of CasesSeptember 1964 Conditions, 4366 MW Peak Load1964 Basic SystemCase

Normal with FPL Purchasing 100 MW from OUC

1-D-1

Outage of Sanford 165 MW and Turner 87 MW units.
FPL Purchases 150 MW from OUC and FPC Purchases
50 MW from OUC

1-D-2

Outage of Indian River 92 MW and 210 MW units.
OUC Purchases 25 MW from FPC and 55 MW from FPL

1-D-3

1964 Basic System Except that Indian River #2 Unit is
92 MW Size

Normal with Each Utility on Zero Net Interchange.

1-D-4

Outage of Turner-Piedmont 115 KV Line & Each
Utility on Zero Net Interchange

1-D-5

Outage of one Turner-North Longwood 115 KV Circuit
and Each Utility on Zero Net Interchange

1-D-6

1964 Basic System

Normal with FPC Purchasing 100 MW from OUC

1-D-7

Outage of Sanford 165 MW Unit & Sanford-Brevard
230 KV Line. FPC Purchases 100 MW from OUC

1-D-8

Outage of Ranch-Pratt Whitney 230 KV Line.
FPL Purchases 150 MW from OUC.

1-D-9

Outage of Pratt Whitney-Melbourne 230 KV Line.
FPL Purchases 100 MW from OUC.

1-D-10

Outage of Bartow 220 MW & Gannon 204 MW Units.
FPC Purchases 150 MW & TEC Purchases 75 MW;
FPL Sells 125 MW & OUC Sells 100 MW.

1-D-11

Outage of Bartow 220 MW & Gannon 204 MW Units.
FPC Purchases 150 MW from FPL & TEC Purchases
75 MW from FPL.

1-D-12

Outage of Port Everglades 400 MW Unit & One
Riviera 300 MW Unit. FPL Purchases 100 MW from
FPC, 150 MW from OUC and 100 MW from TEC.

1-D-13

Outage of Port Everglades 400 MW Unit & One Riviera
300 MW Unit. FPL Purchases 100 MW from FPC and
275 MW from TEC.

1-D-14

1964 Basic System Except that North Longwood -
Rio Pinar - OUC Line Operates at 230 KV

Case

Normal with FPL Purchasing 100 MW from OUC

I-C-1

Outage of Indian River-Brevard 230 KV Line.
FPL Purchases 100 MW from OUC

I-C-2

Outage of Indian River - OUC #6 230 kv Line.
FPL Purchases 100 MW from OUC.

I-C-3

Outage of Indian River 210 MW Unit. OUC Purchases
25 MW from FPC & 25 MW from FPL.

I-C-4

1964 Basic System Except that North Longwood-Rio Pinar-OUC
Line Operates at 230 KV and Ridge - OUC #5 230 KV Line
Has Been Added

Normal with FPL Purchasing 100 MW from OUC

I-B-1

January 1965 Conditions 5355 MW Peak Load

1964 Basic System

Normal with FPL Purchasing 100 MW from OUC &
FPC Purchasing 40 MW from TEC & 40 MW from
Southern Company.

II-A-1

GENERAL CONDITIONS:

1. Generation:

1964 Basic System, including following major additions:

- a. Bartow #2 132 mw
- b. Bartow #3 220 mw
- c. Gannon #4 204 mw
- d. Riviera #3 & #4 300 mw each
- e. Port Everglades #3 400 mw
- f. Indian River #2 210 mw

2. Transmission:

1964 Basic System, including following major additions:

- a. Bartow-Ulmerton 230 kv
- b. Ulmerton-River 230 kv
- c. River-Gannon 230 kv
- d. Gannon-Pebble-Ridge 230 kv
- e. Gannon-Ringling 138/230 kv conversion
- f. Ringling - Ft. Myers 230 kv
- g. Ft. Myers - Ranch 230 kv
- h. Indian River - OUC #6 230 kv
- i. Indian River - Brevard 230 kv
- j. Nine (9) 230/138-115-69 kv substations for interlacing the 230 kv, 138 kv, 115 kv and 69 kv networks.

3. Load:

September 1964, peak load, 4366 mw.

4. Interchange:

FPL purchasing 100 mw from OUC.

PURPOSE:

To establish a Base Case incorporating system changes and additions as listed under "1964 Basic System", (major projects repeated above) for the purpose of determining normal power flows and voltage levels under the 1964 Summer peak load conditions.

RESULTS:

There is a heavy transfer of power from Area V (Tampa Bay) eastward to Area VI (Ridge-Lake Wales) as indicated in the following tabulation of flows:

Hookers Point to Alexander & Mulberry, 69 kv	44.8 mw
Higgins to Sapling, 2 - 115 kv circuits	50.8 mw
Gannon to Pebble 230 kv	194.6 mw
Gannon to Sandhill 138 kv	112.6 mw
Total	402.8 mw

In this transfer, about 50 mw of gross interchange between FPC and TEC demonstrates the benefits of strong transmission ties.

Of the 100 scheduled purchase by FPL from OUC, 92 mw was delivered directly to FPL. FPL received a net of 72 mw in Area IV. The remaining 28 mw was received in Area VII by displacement via Areas III, VI and V. The other inter-area and inter-system power flows are summarized on accompanying diagrams.

While not critical at this load level, there is considerable transmission capacity absorbed in the flow of reactive power. When this latent capacity is needed for the movement of greater amounts of energy, it may be economically released through the installation of static capacitors at the loads. The following tabulation shows lines, loadings and voltage drops of circuits falling in this category:

	Load Flow			Nominal Rating MVA	Voltage Drop %
	MW	MVAR	MVA		
Gannon-Pebble 230 kv	195	73	208	400	4.7
Gannon-Sandhill 138 kv	113	63	129	225	9.8
Silver Sprgs.-Leesburg 115 kv	23	23	32	50	5.4
DeLand W.- S. Sprgs. 115 kv	23	19	30	50	8.2
Turner-H. Longwood 115 kv	95	42	104	160	3.4

The most critical voltage in the State was at Leesburg, where the 115 kv level dropped to 87.8% or 101 kv. Loss of the single transmission source to this substation would result in untenable voltages.

The Indian River-Brevard 230 kv tie flow of 92 mw and 3 mvar, being satisfactory, indicates that the previously considered voltage and phase angle regulator is not required in this tie under these conditions.

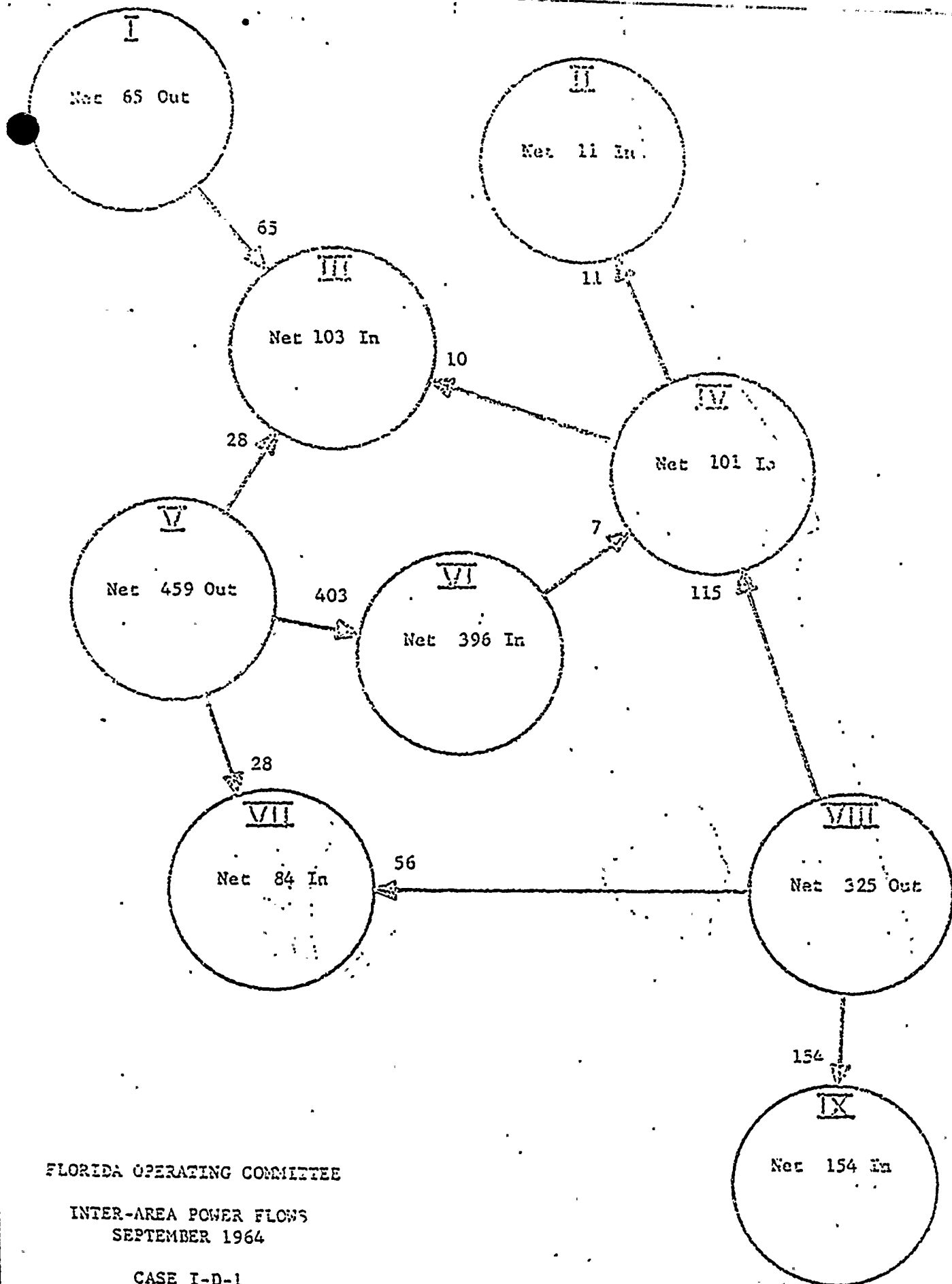
The flow of about 75 mw from OUC #6 to OUC#3 and a similar flow from OUC #6 to OUC #9 indicates the desirability of the proposed double-circuiting of these lines.

All voltages, other than the Leesburg bus are satisfactory and no lines are overloaded.

CASE 1-0-1 (Cont'd.)

CONCLUSIONS:

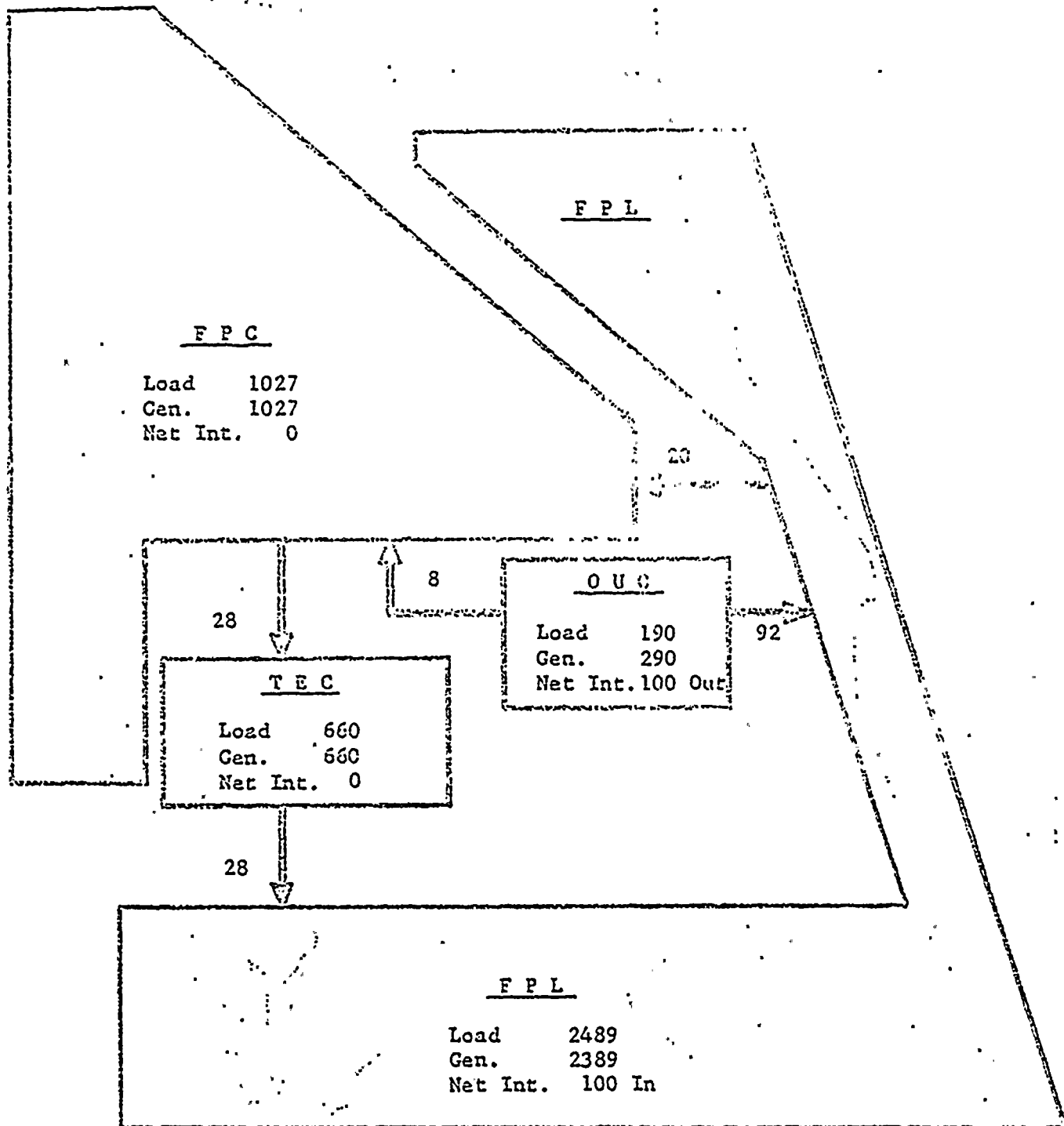
The 1964 Basic System is adequate to serve the requirements of the integrated system for the September 1964, peak load, under a generation schedule providing a 100 mw interchange from GUC to FPL.



FLORIDA OPERATING COMMITTEE

INTER-AREA POWER FLOWS
SEPTEMBER 1964

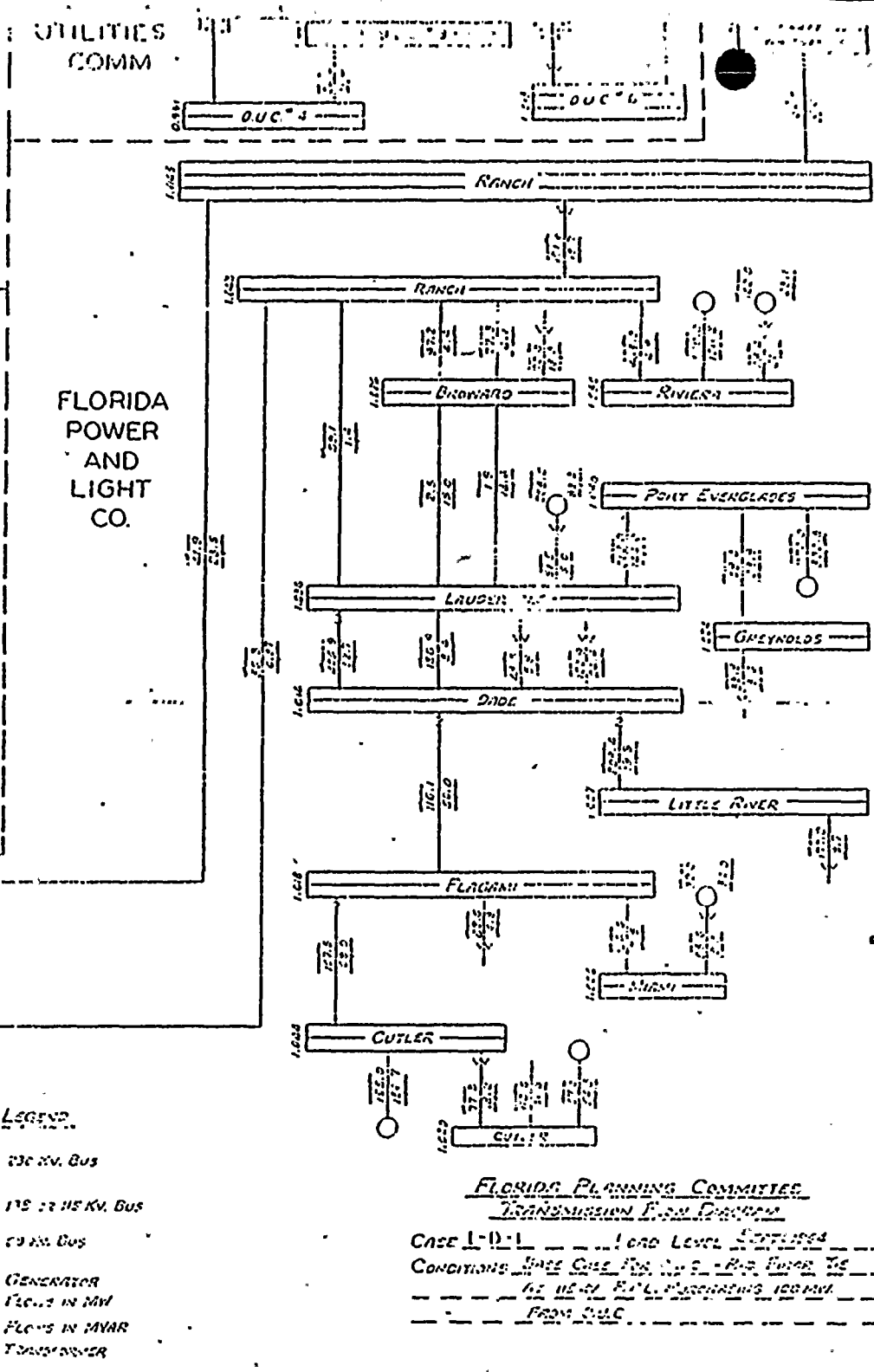
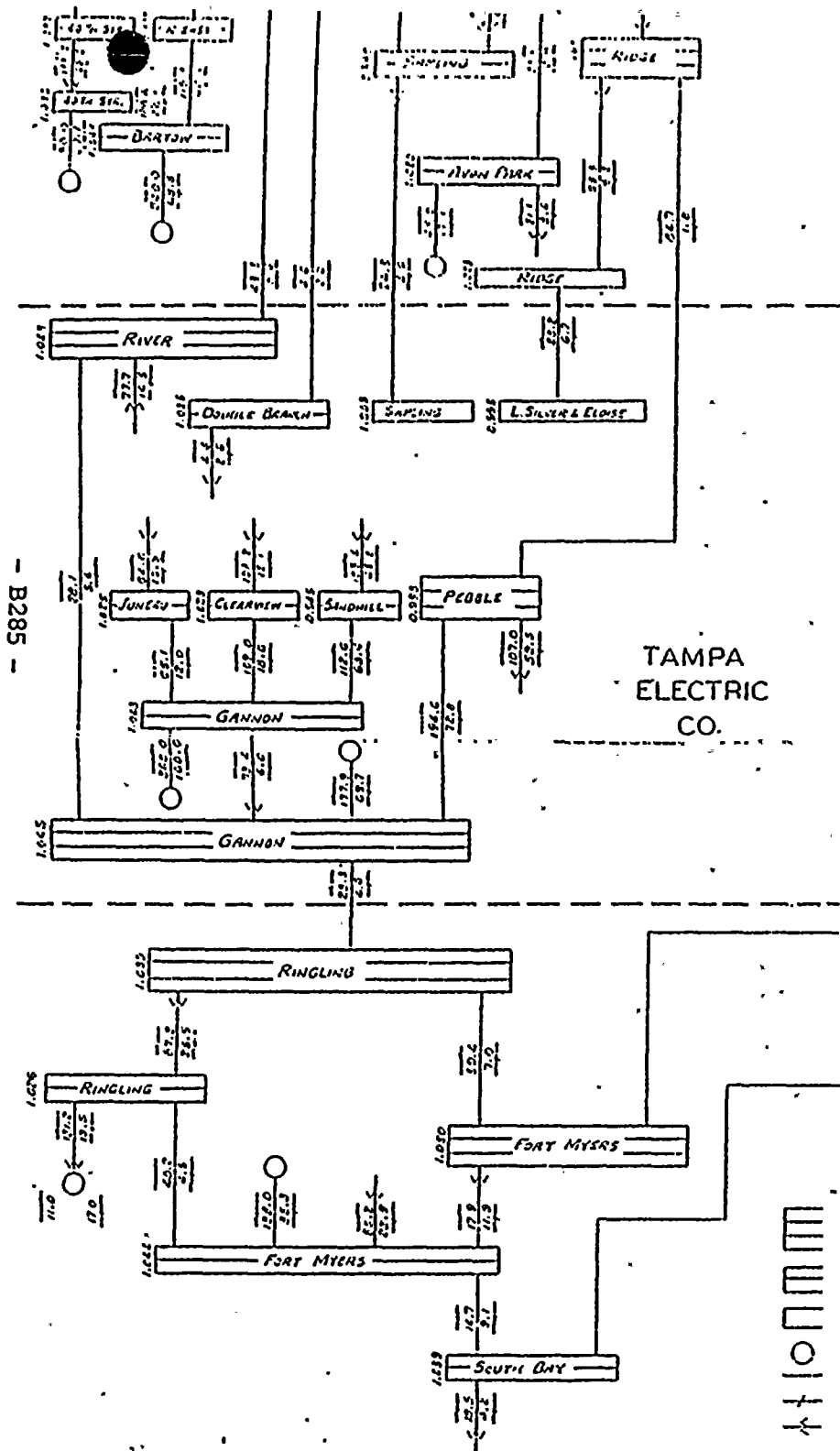
CASE I-D-1



FLORIDA OPERATING COMMITTEE

INTER-SYSTEM POWER FLOWS - SEPT 1964
TOTAL LOAD 4366

CASE I-D-1



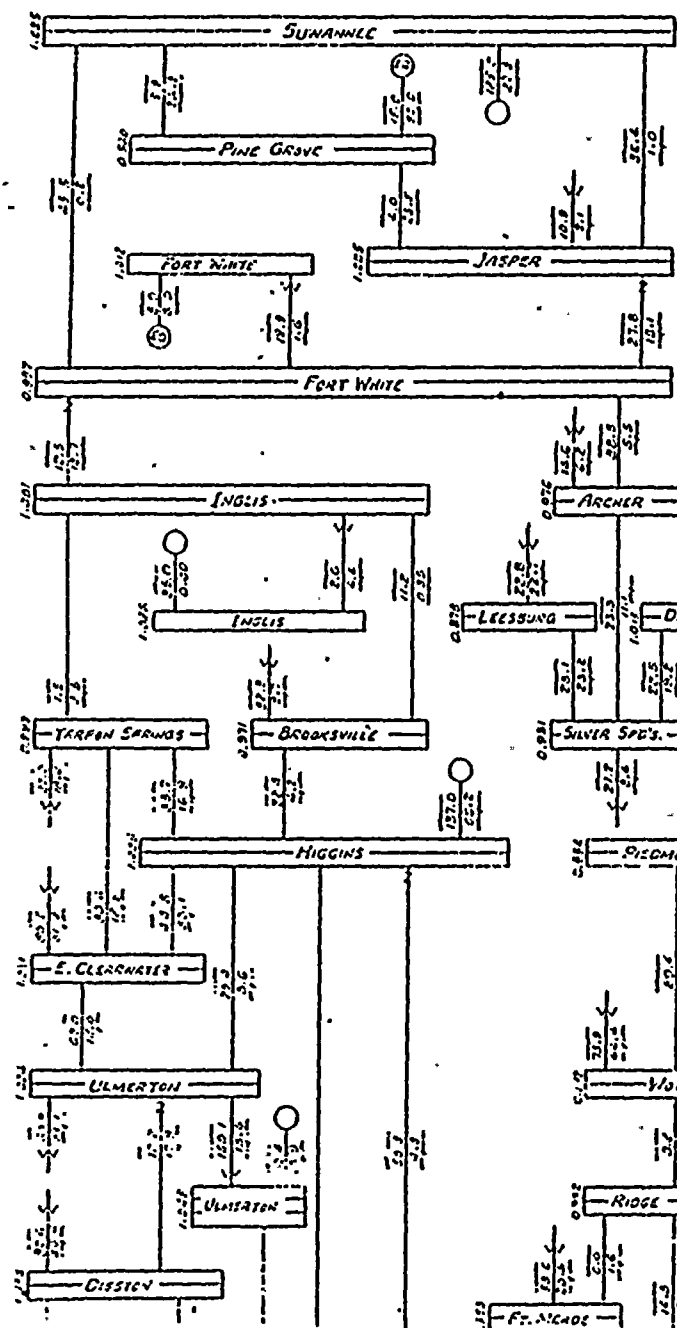
- B285 -

LEGEND.

- 138 KV. Bus
- 115 KV. Bus
- 69 KV. Bus
- GENERATOR
- FLOW IN MW
- FLOW IN MVAR
- TRANSFORMER

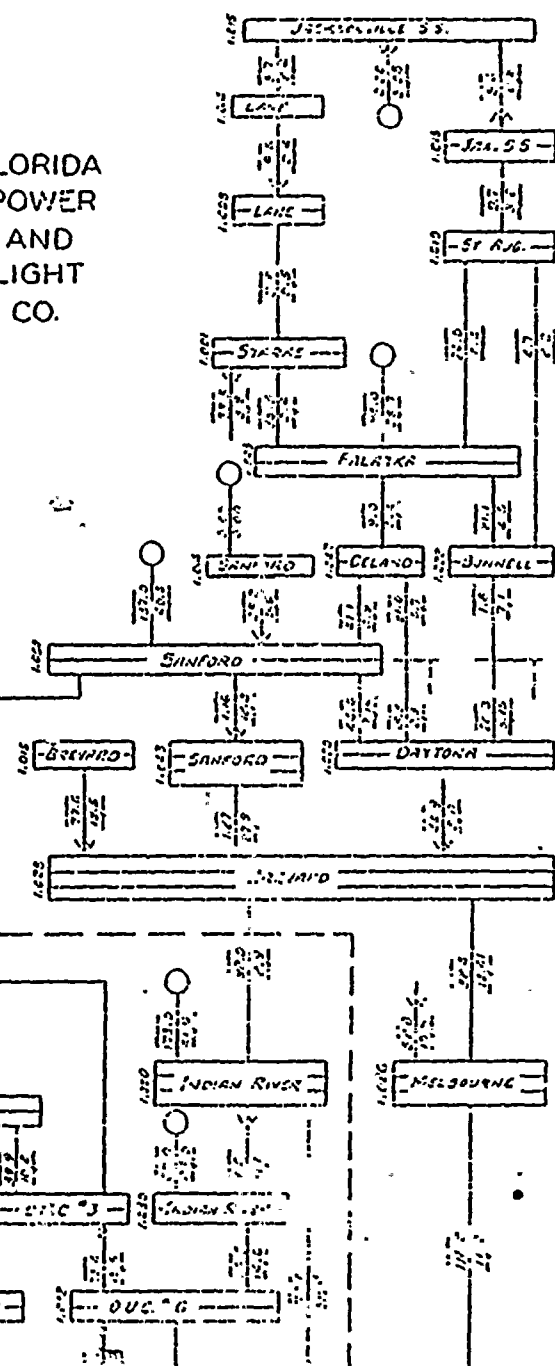
FLORIDA PLANNING COMMITTEE
TRANSMISSION FROM DALLAS

CASE 1-D-1 Load Level Estimated
CONDITIONS: Same Case For 1-D-2 - But Factor Is
1.5 MW R/L. PLANNING 100 MW
FROM S.W.C.



FLORIDA
POWER
CORP.

FLORIDA
POWER
AND
LIGHT
CO.



GENERAL CONDITIONS:

1. Generation: 1964 Basic System; Outage of Sanford 165 mw and Turner 87 mw units.
2. Transmission: 1964 Basic System.
3. Load: September 1964, peak load, 4366 mw.
4. Interchange: OUC to FPL - 150 mw
OUC to FPC - 50 mw

PURPOSE:

To evaluate the ability of the 1964 Basic System to adequately meet load requirements during the outage of a major unit at Turner and Sanford simultaneously. This condition could be brought about by the unscheduled loss of one of the generators while the other is out of service on scheduled maintenance.

RESULTS:

A tabulation of the comparison of the change of generation between the Base Case 1-D-1 and this Case serves to show the method by which this loss was made up on the system:

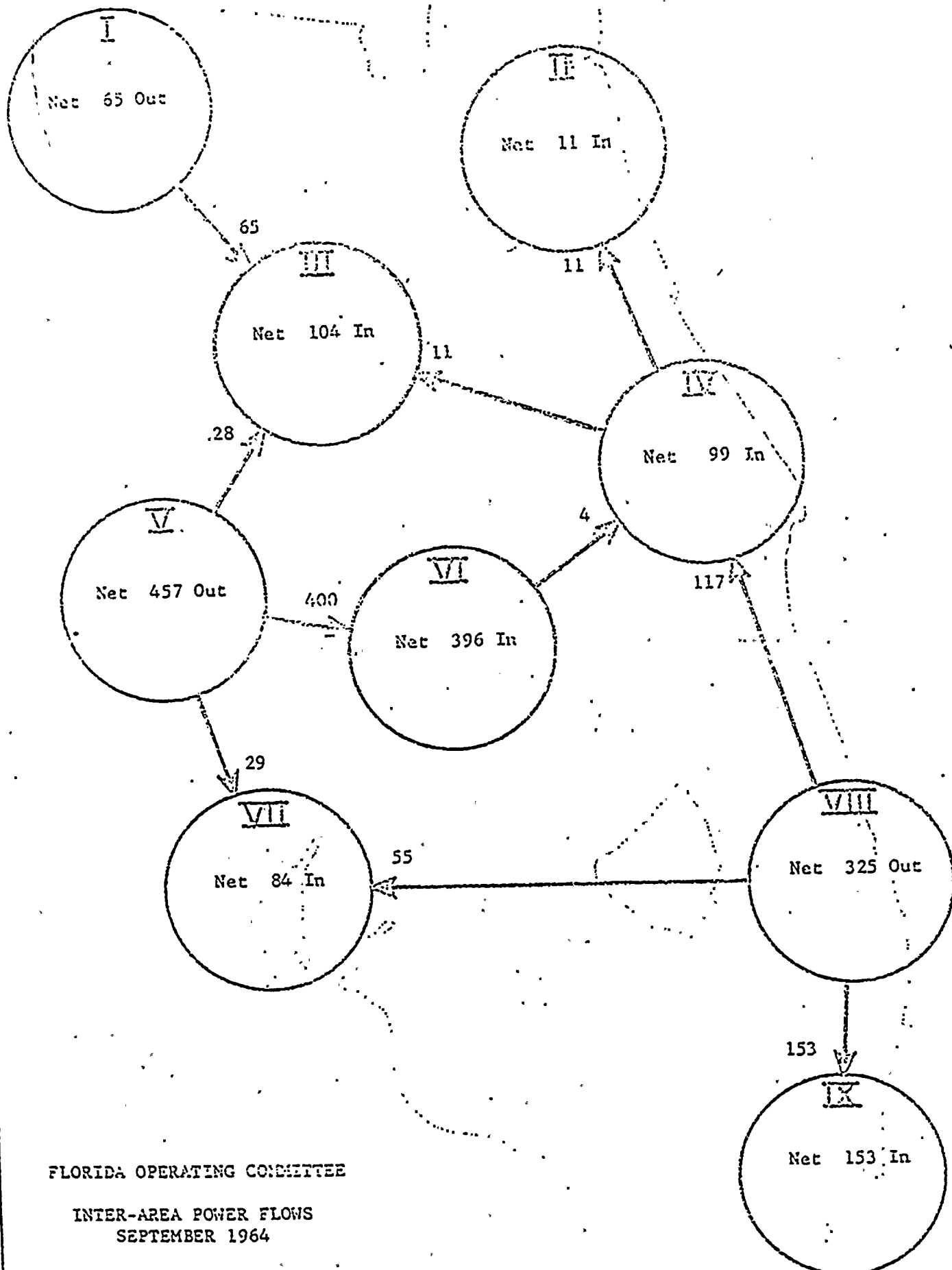
<u>Generator</u>	<u>Generation in Mw</u>		
	<u>Case 1-D-1</u>	<u>Case 1-D-2</u>	<u>Net Change</u>
Turner	160	97	-63
Sanford	137	0	-137
Total Loss, Area IV			200
Sanford (69)	0	25	25
Indian River #1	80	88	8
Indian River #2	173	193	20
Lake Highland	40	112	72
Total Make-up, Area IV			125
Palatka	94	119	25
Suwannee	125	140	15
Riviera 69 kv	102	125	23
Principal Make-up, Out-of-Area			63

Of the 200 mw loss in the area, 125 mw was made up in the area by bringing local generation up to, or near, capability. The resultant delivery of 162 mw into the area caused no voltage problems. The Indian River plant had to produce a heavy flow of vars to maintain satisfactory transmission voltage.

The three OUC interconnections performed very satisfactorily in delivering 200 mw, with flows being: Indian River - Brevard 230 kv, 121 mw; OUC #3 - Rio Pinar 115 kv, 40 mw; OUC #2 - Woodsmere 115 kv, 39 mw.

CONCLUSIONS:

The Area IV load requirements for September 1964 could be met with the 1964 Basic System, during simultaneous outages of a Turner 87 mw and Sanford 165 mw unit.

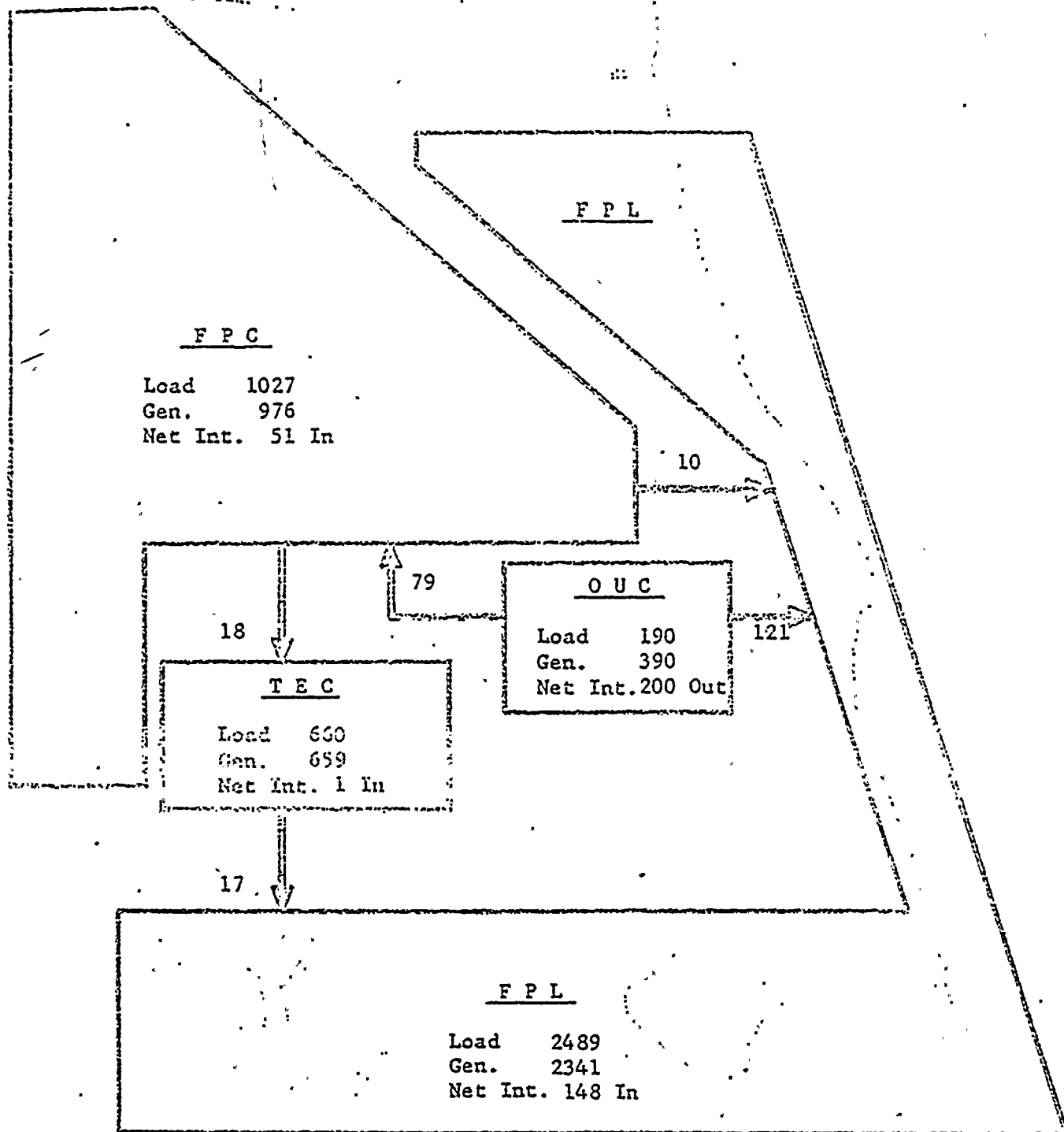


FLORIDA OPERATING COMMITTEE

INTER-AREA POWER FLOWS
SEPTEMBER 1964

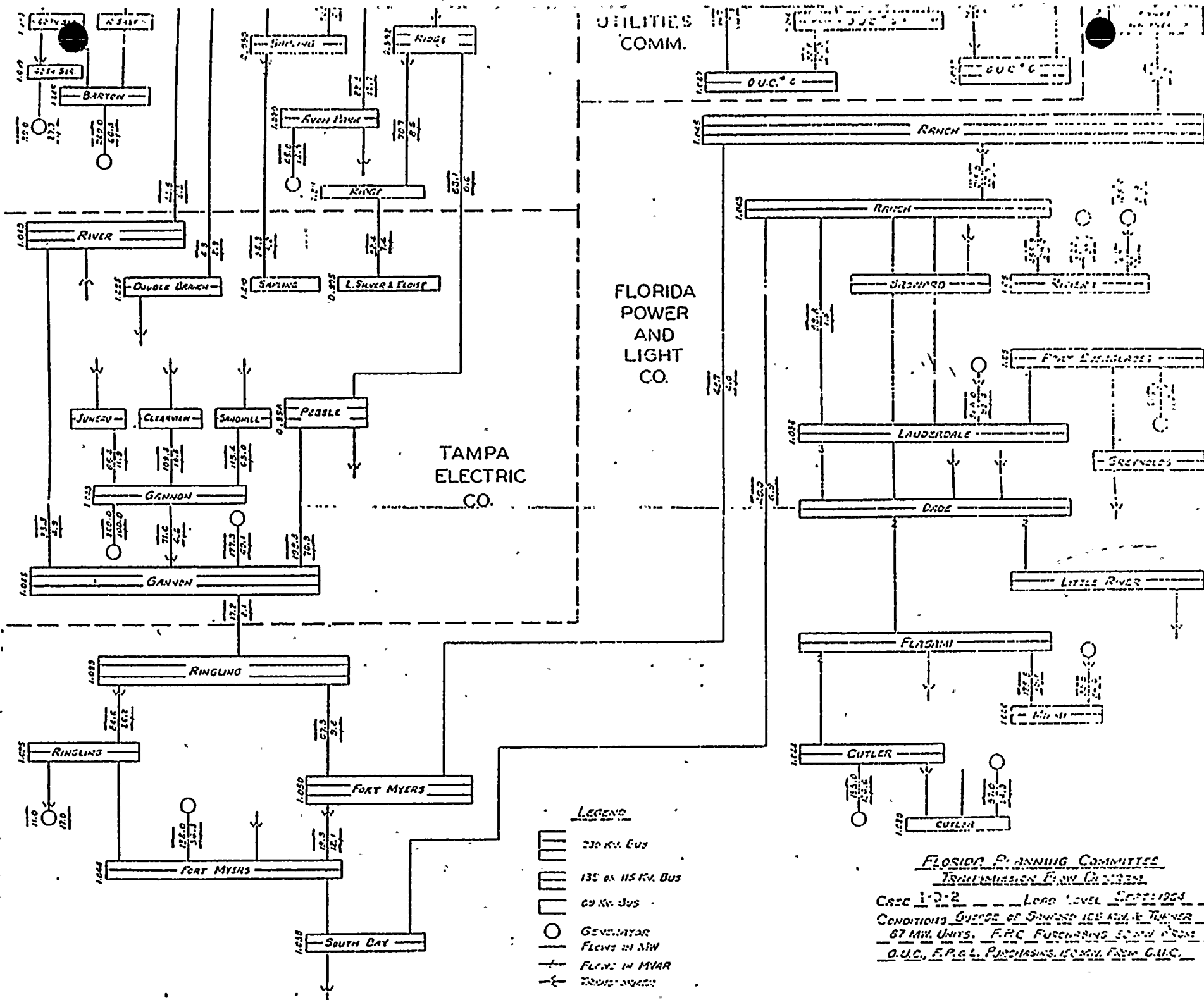
CASE I-B-1

- B289 -



FLORIDA OPERATING COMMITTEE
 INTER-SYSTEM POWER FLOWS - SEPT 1964
 TOTAL LOAD 4366

CASE I-D-2



GENERAL CONDITIONS:

1. Generation: 1964 Basic System; Outage of Indian River #1 92 mw, and #2 - 210 mw units.
2. Transmission: 1964 Basic System.
3. Load: September 1964, peak load, 4366 mw.
4. Interchange: FPL to GUC - 55 mw
FPC to GUC - 25 mw

PURPOSE:

To evaluate the ability to the 1964 Basic System to adequately meet load requirements during the outage of both generators at the Indian River Plant. This condition could be brought about by the unscheduled loss of one of the units while the other is out of service on scheduled maintenance.

RESULTS

The loss of both Indian River units was sustained by generation changes as follows:

<u>Generator</u>	<u>Generation in Mw</u>		
	<u>Case 1-D-1</u>	<u>Case 1-D-3</u>	<u>Net Change</u>
Indian River #1	80	0	-80
Indian River #2	173	0	-173
Total Loss, Area IV			253
Turner	160	170	10
Sanford 115 kv	137	155	18
Sanford 69 kv	0	25	25
Lake Highland	40	103	63
Total Make-up, Area IV			116
Palatka	94	119	25
Suwannee	125	140	15
Riviera 138 kv	520	556	36
Riviera 69 kv	102	125	23
Pt. Everglades	770	805	35
Principal Make-up, Out-of-Area			134

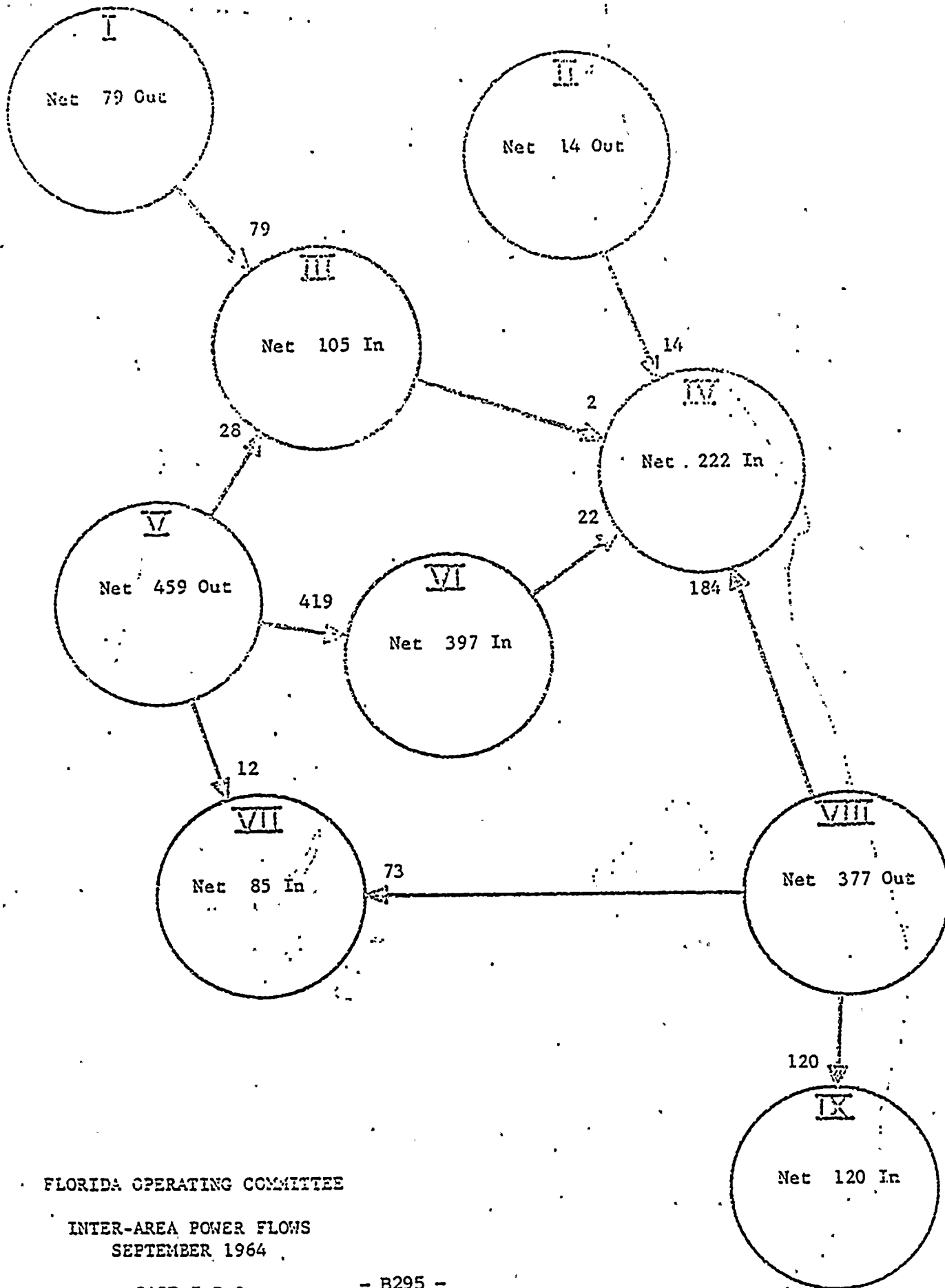
CASE 1-D-3 (Cont'd.)

This emergency condition created an additional area deficit of about 120 mw after local generation was brought up to, or near capability. Delivery of about 70 mw of this power from the Palm Beach area created a flow of 223 mw from Ranch northward on the Ranch-Pratt Whitney section of the east coast 230 kv line. This flow resulted in a reduction of transmission voltages up to 5% or 6% in the Melbourne - Indian River section, which is well within the range of the area regulating power transformers.

The delivery of 23 mw from Woodsmere to OUC #2 substation resulted in an attendant flow of 25 mvar from OUC #2 to Woodsmere. A reduction in the Lake Highland voltage would tend to reduce this var flow if were felt necessary. With OUC #6 auto-transformer boosting 115 kv bus 10% in order to maintain approximately 100% voltage, there was 24 mvar circulating in the loop between Indian River and OUC #6. If desired, this circulation of reactive could be cut in half by a 6% tap setting with resultant lowering of 115 kv system voltages about 2%.

CONCLUSIONS:

Area IV load requirements for September, 1964, could be met with the 1964 Basic System, during simultaneous outages of the two Indian River generators.

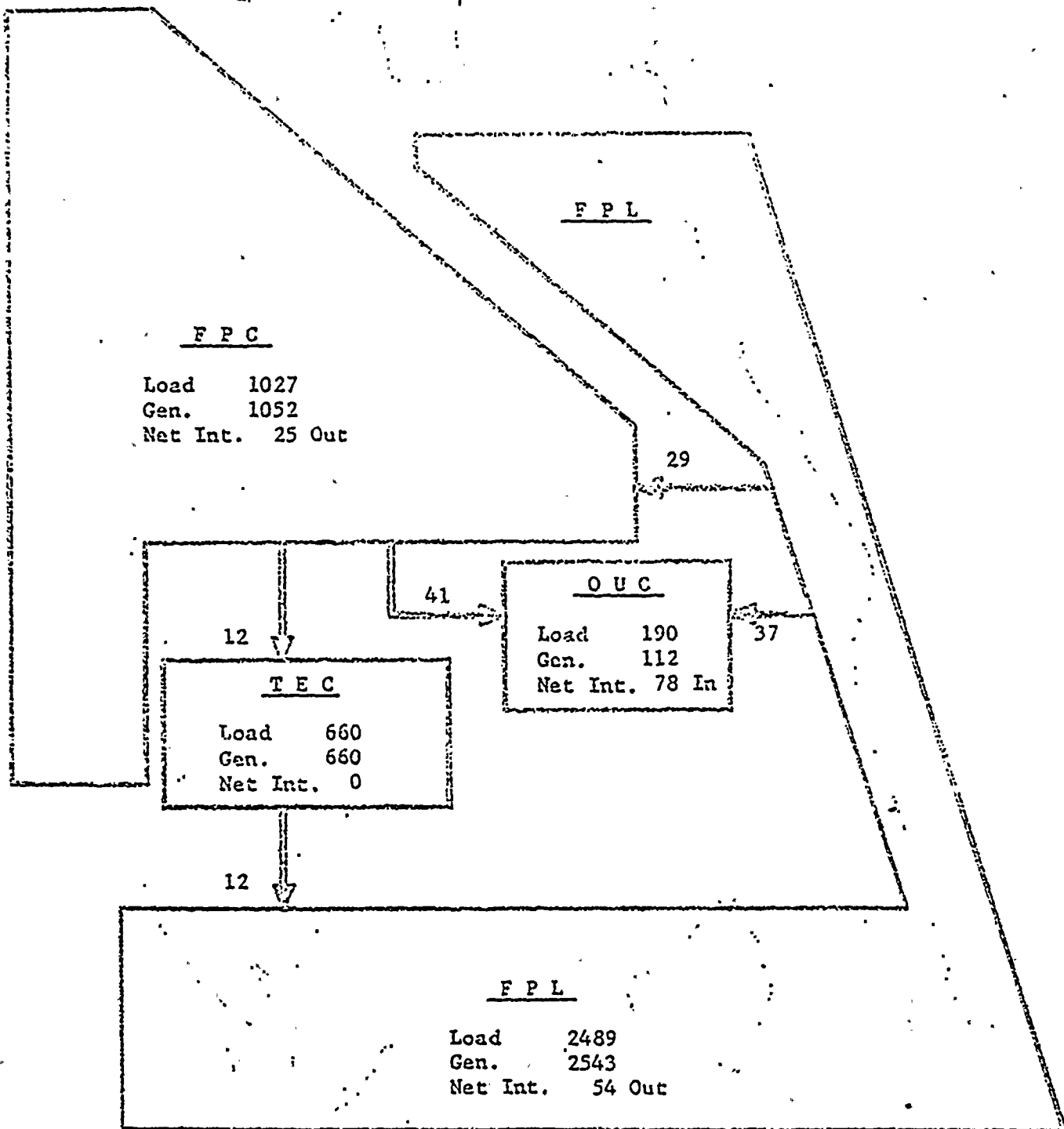


FLORIDA OPERATING COMMITTEE

INTER-AREA POWER FLOWS
SEPTEMBER 1964

CASE I-D-3

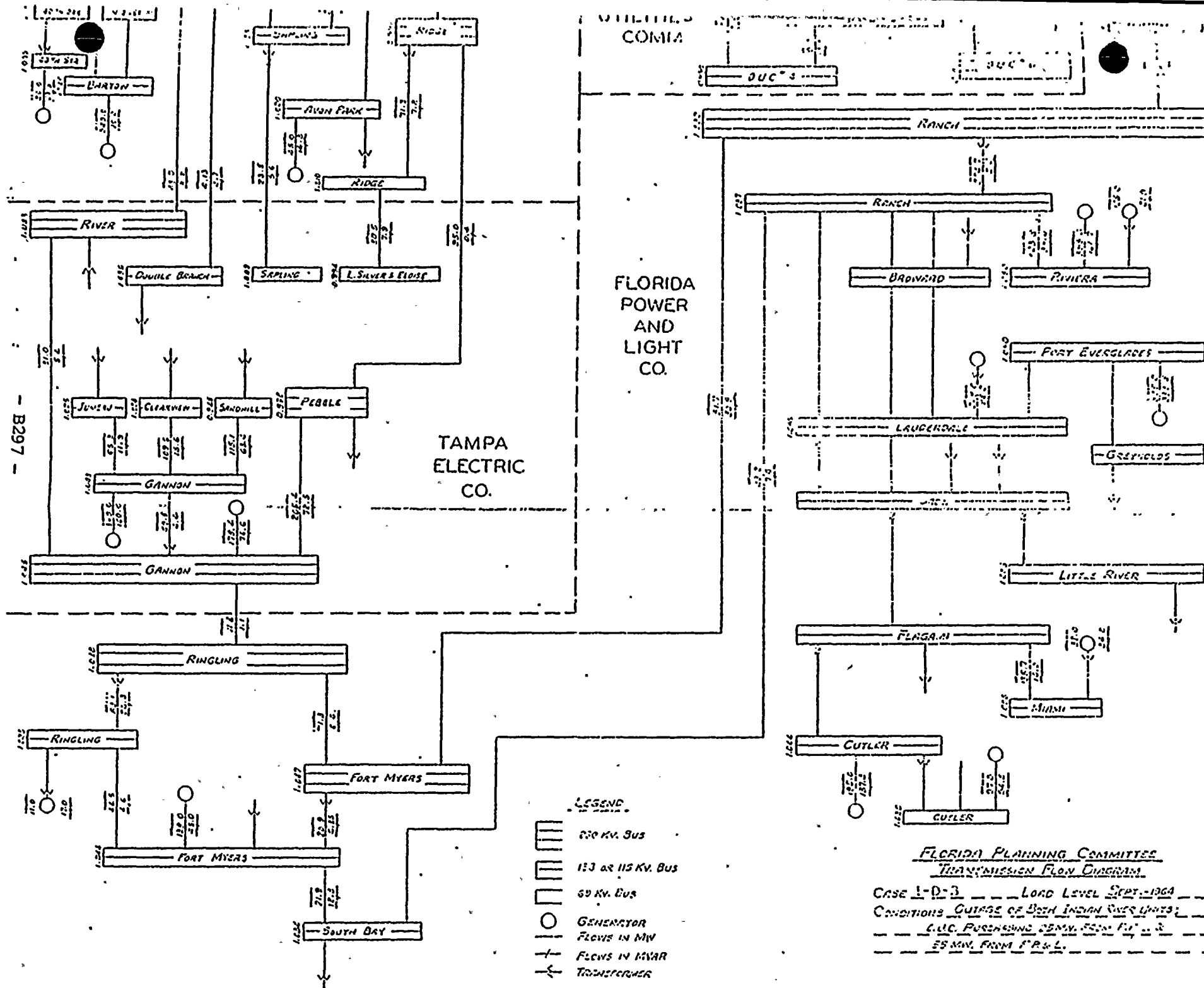
- B295 -



FLORIDA OPERATING COMMITTEE

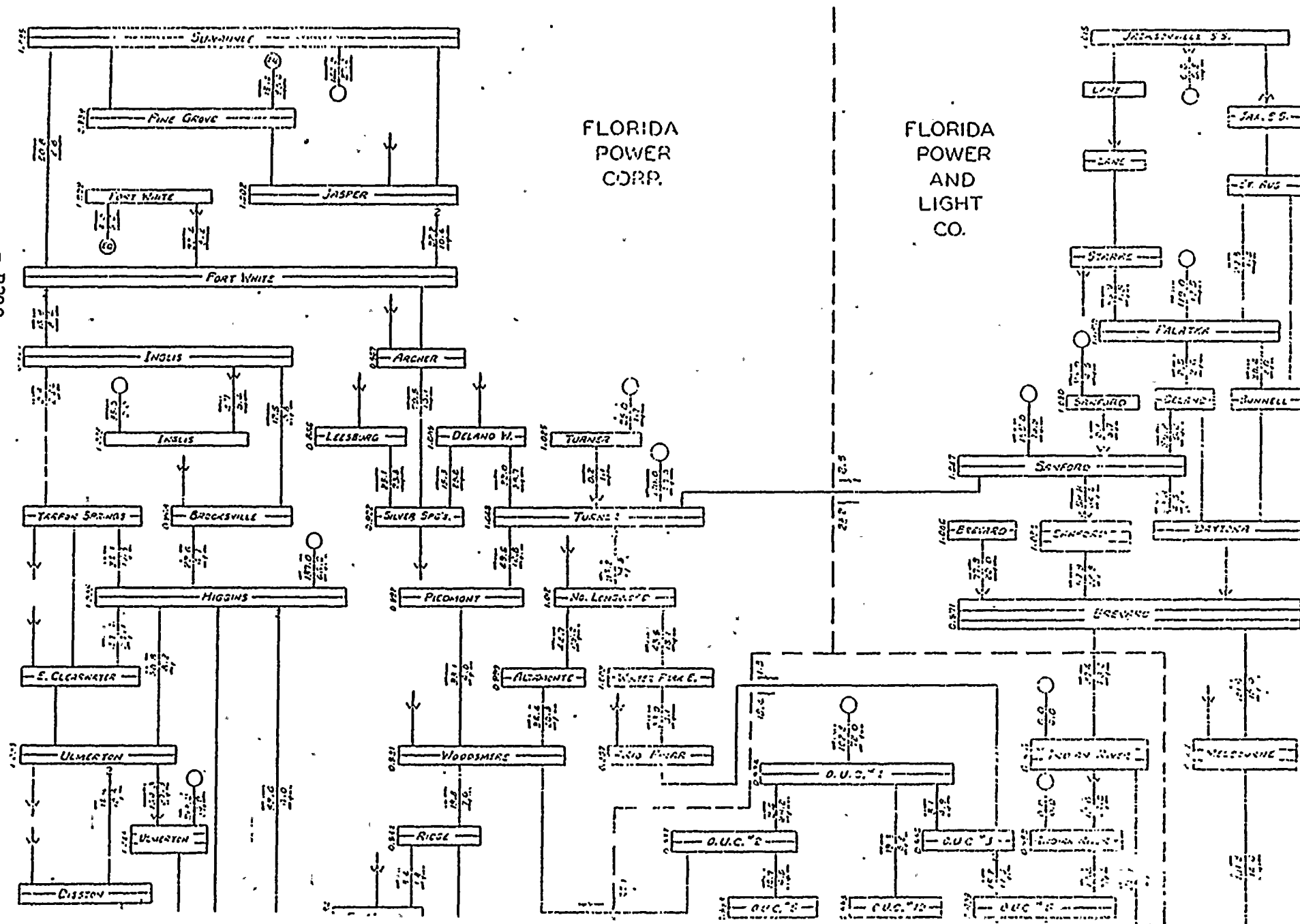
INTER-SYSTEM POWER FLOWS - SEPT 1964
TOTAL LOAD 4366

CASE I-D-3



- B297 -

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GENERAL CONDITIONS:

1. Generation : 1964 Basic System modified by: Indian River #2 unit 92 mw rather than 210 mw.
2. Transmission: 1964 Basic System
3. Load: September 1964 peak load, 4366 mw.
4. Interchange: Each system on zero net interchange

PURPOSE:

To determine normal power flows and voltages under Summer peak load conditions with each system on zero net interchange, with a modified Basic System, as noted above.

RESULTS:

Power flow into Area IV from the south was 196 mw, 74 mw more than in CASE 1-D-1, when OUC was delivering 100 mw to FPL. The Melbourne-Pratt Whitney 230 kv line carried 171 mw, which was 56 mw more than in CASE 1-D-1.

With each system on zero net interchange, approximately 20 mw circulated between FPC, FPL and OUC in Area IV. The other inter-system and inter-area power flows are summarized in accompanying diagrams.

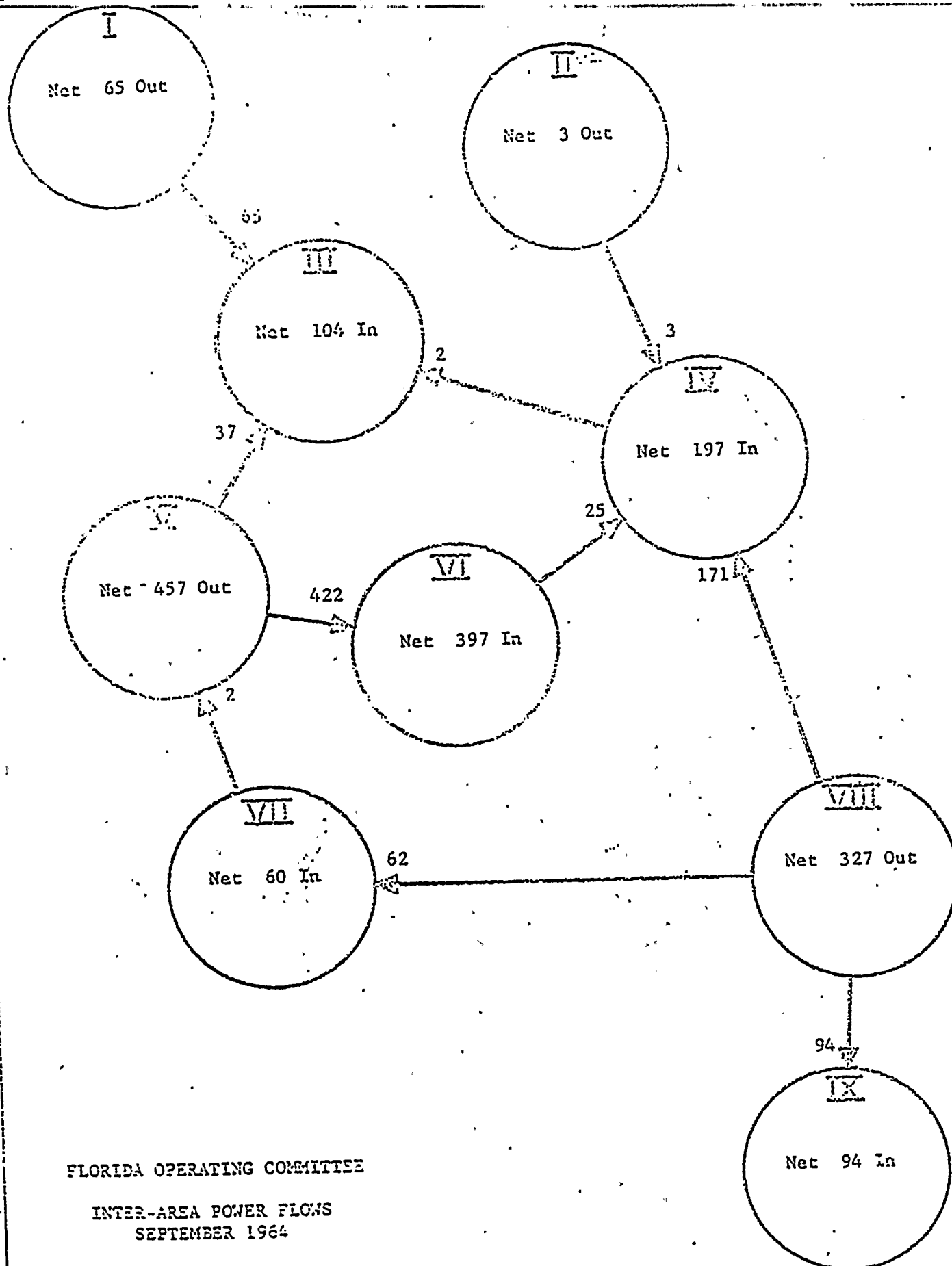
The regulating auto-transformer at the OUC #6 substation, being set to hold from 100% to 102% voltage on the 115 kv bus, balanced out at a tap setting of 7.5% boost to the 115 kv bus. This setting resulted in:

1. Indian River #2 Unit carrying maximum reactive of 63 mvar while the #1 unit (equal in size) carried only 31 mvar.
2. OUC 115 kv loop voltages being 1.3% to 1.7% higher than normals of CASE 1-D-1.
3. Reactive flow from OUC #2 substation to Woodsmere increasing to 28 mvar, 15 mvar more than in CASE 1-D-1.

Voltages and var flows within the OUC system would have been comparable to those of CASE 1-D-1, if the auto-transformer had been on 0% tap.

CONCLUSIONS:

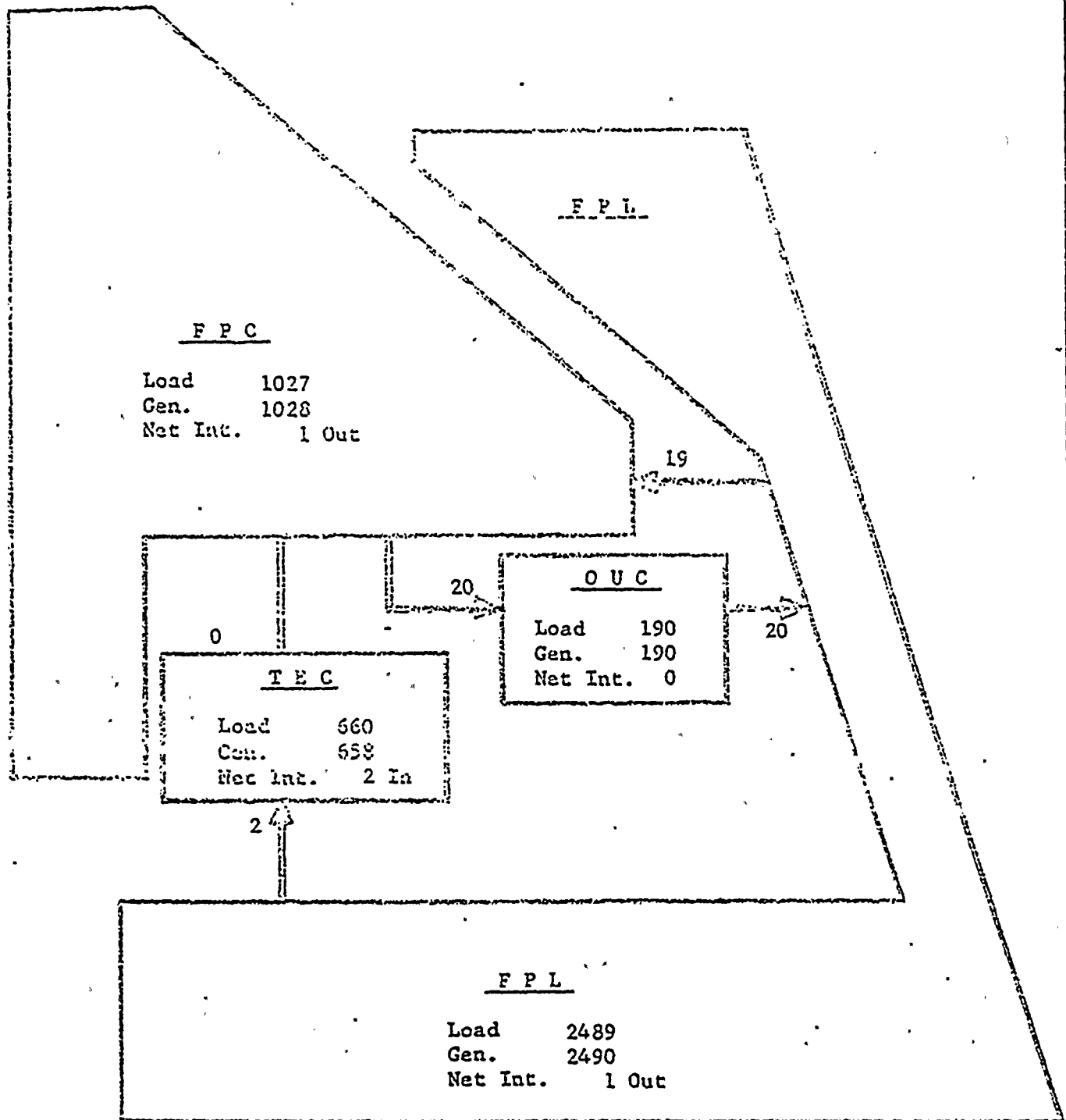
The integrated system load requirements for September 1964 could be met with the modified Basic System, with each system on zero net interchange. This case, however, serves as a basis for further analysis (see CASE 1-0-10) wherein system weaknesses are pointed out.



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INTER-AREA POWER FLOWS
SEPTEMBER 1964

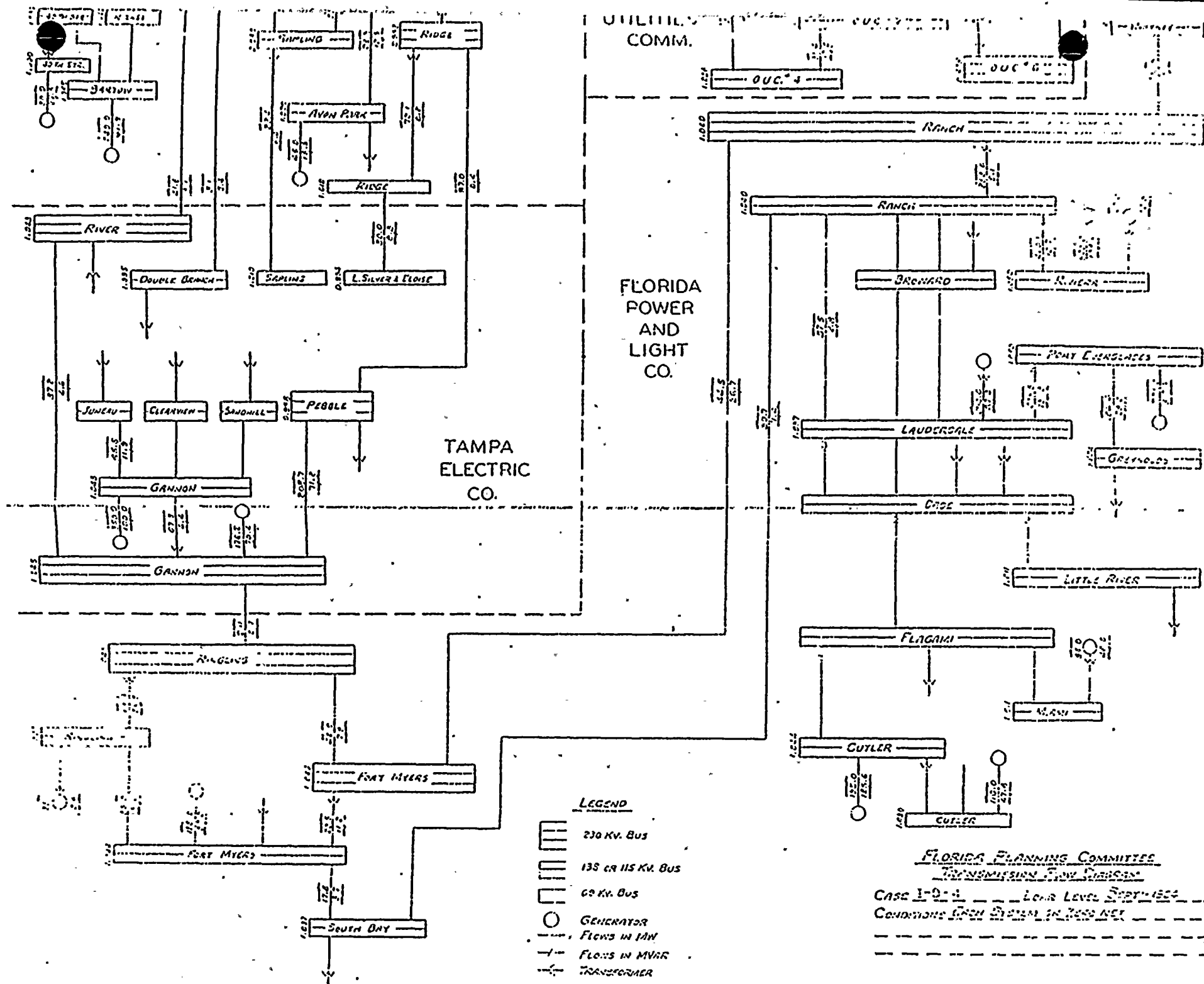
CASE I-D-4

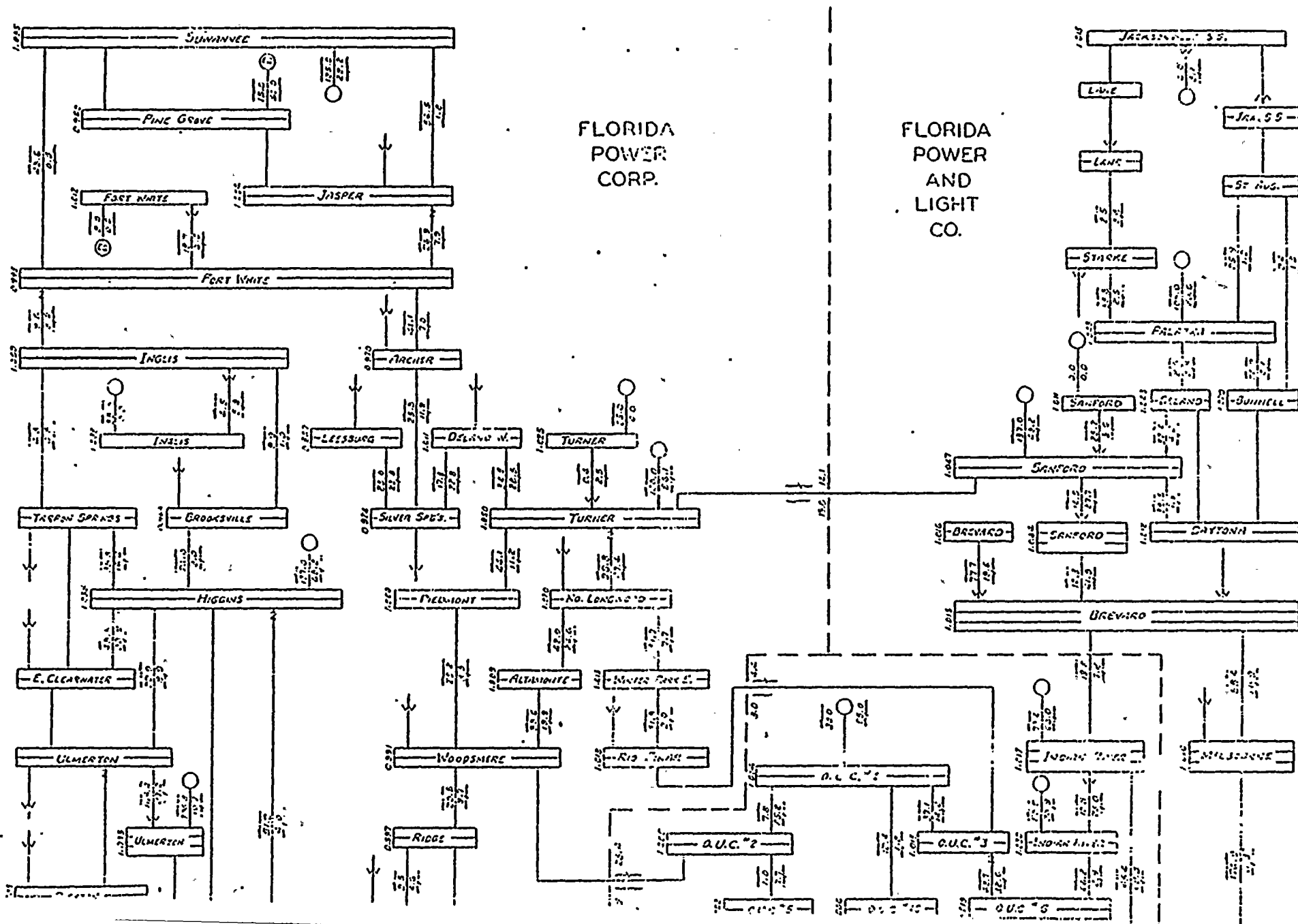


FLORIDA OPERATING COMMITTEE

INTER-SYSTEM POWER FLOWS - SEPT 1964
TOTAL LOAD 4366

CASE I-D-4





GENERAL CONDITIONS:

1. Generation: 1964 Basic System modified by: Indian River #2 Unit 92 mw rather than 210 mw.
2. Transmission: 1964 Basic System; Outage Turner - Piedmont 115 kv line.
3. Load: September 1964, peak load, 4366 mw.
4. Interchange: Each system on zero net interchange.

PURPOSE:

To determine flows and voltage with the loss of the Turner-Piedmont 115 kv line, under the operation of a modified Basic System, as described above.

RESULTS

The following tabulation of bus voltages shows the effect of the loss of the line:

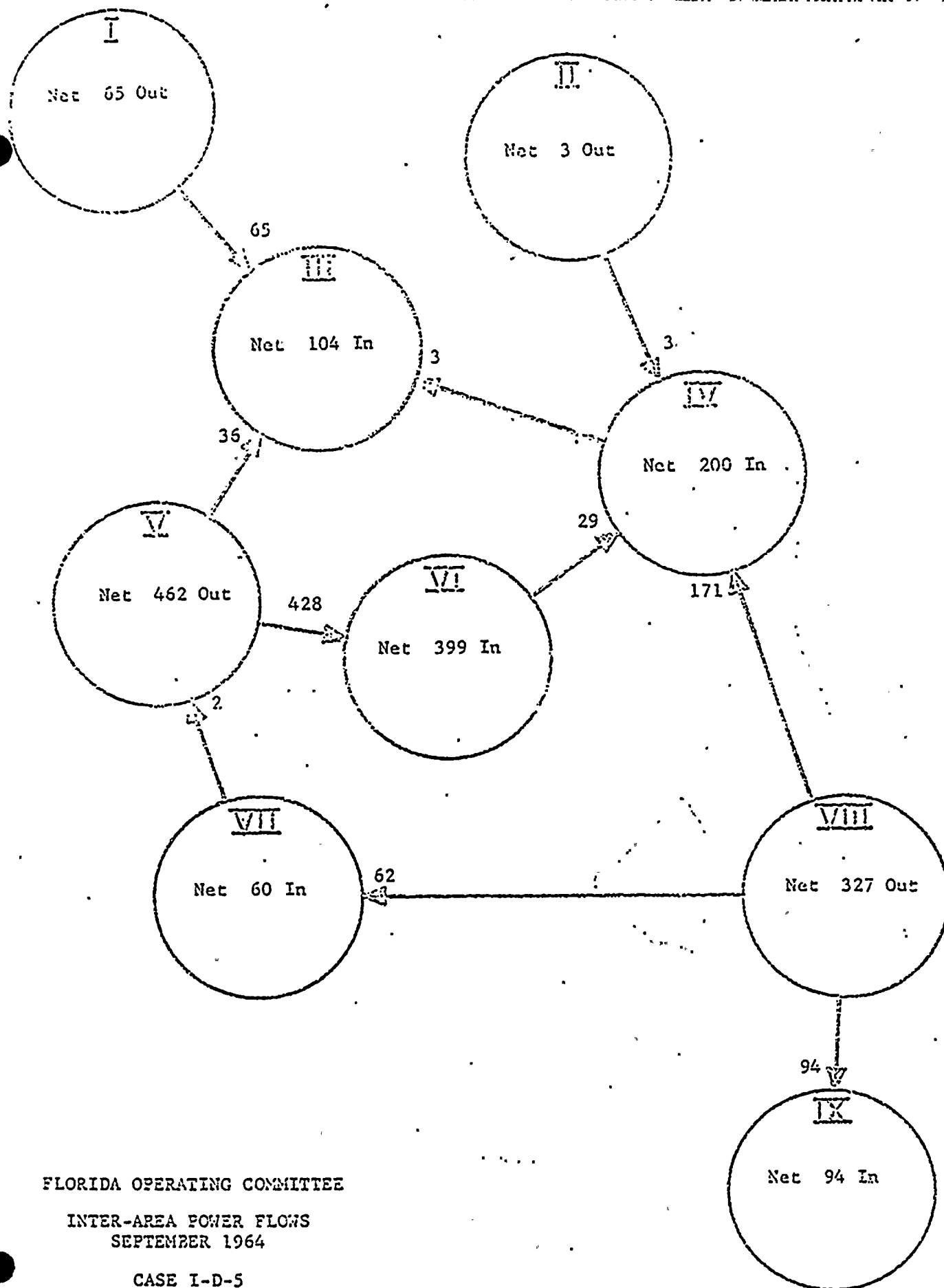
<u>Bus</u>	<u>Voltage - %</u>	
	<u>Case 1-D-4</u>	<u>Case 1-D-5</u>
Piedmont	100.0	96.8
Woodsmere	99.1	97.6
Altamonte	100.9	99.9
OUC #2	100.0	98.8

The flow of reactive from OUC #2 to Woodsmere increased from 28.4 mvar in CASE 1-D-4 to 36.7 mvar. (See discussion under Results in CASE 1-D-4).

The load in the Turner-North Longwood double circuit 115 kv line increased from 102.5 mva in CASE 1-D-4 to 135 mva. The nominal rating of this double circuit line is 160 mva.

CONCLUSIONS

The loss of the Turner-Piedmont 115 kv line under September 1964 peak load conditions and the modified Basic System, would not be critical.

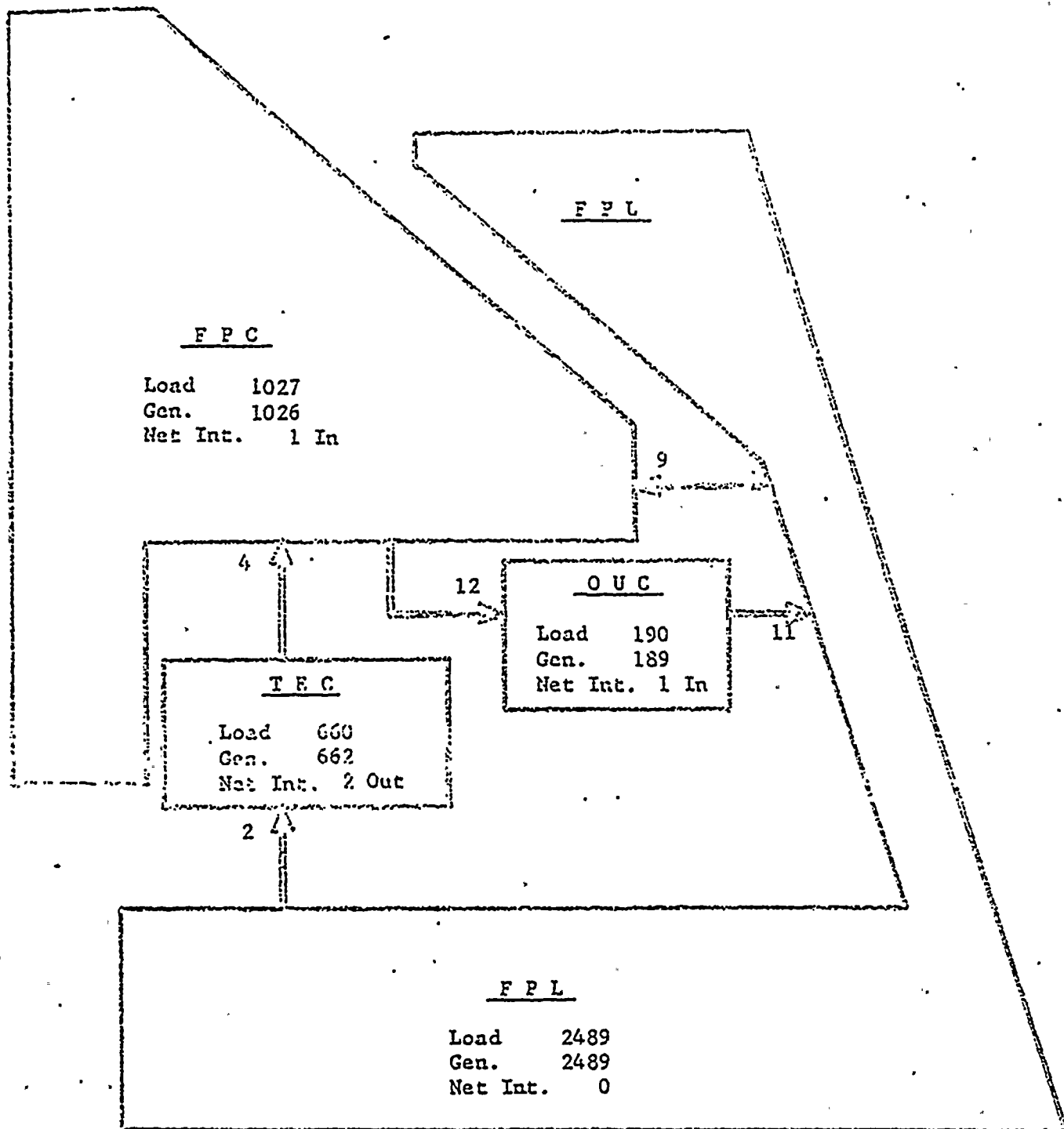


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INTER-AREA POWER FLOWS
SEPTEMBER 1964

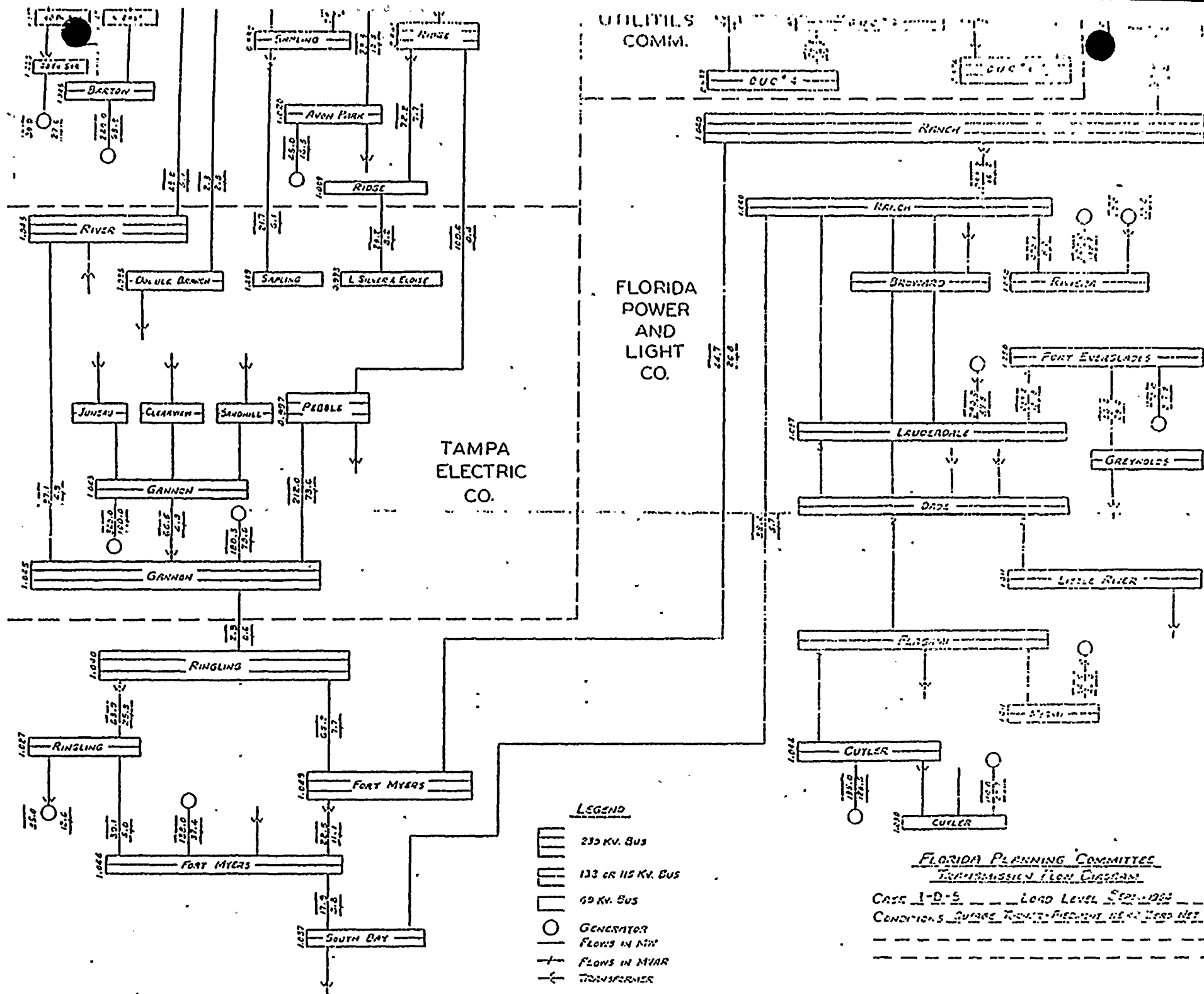
CASE I-D-5

- B306 -



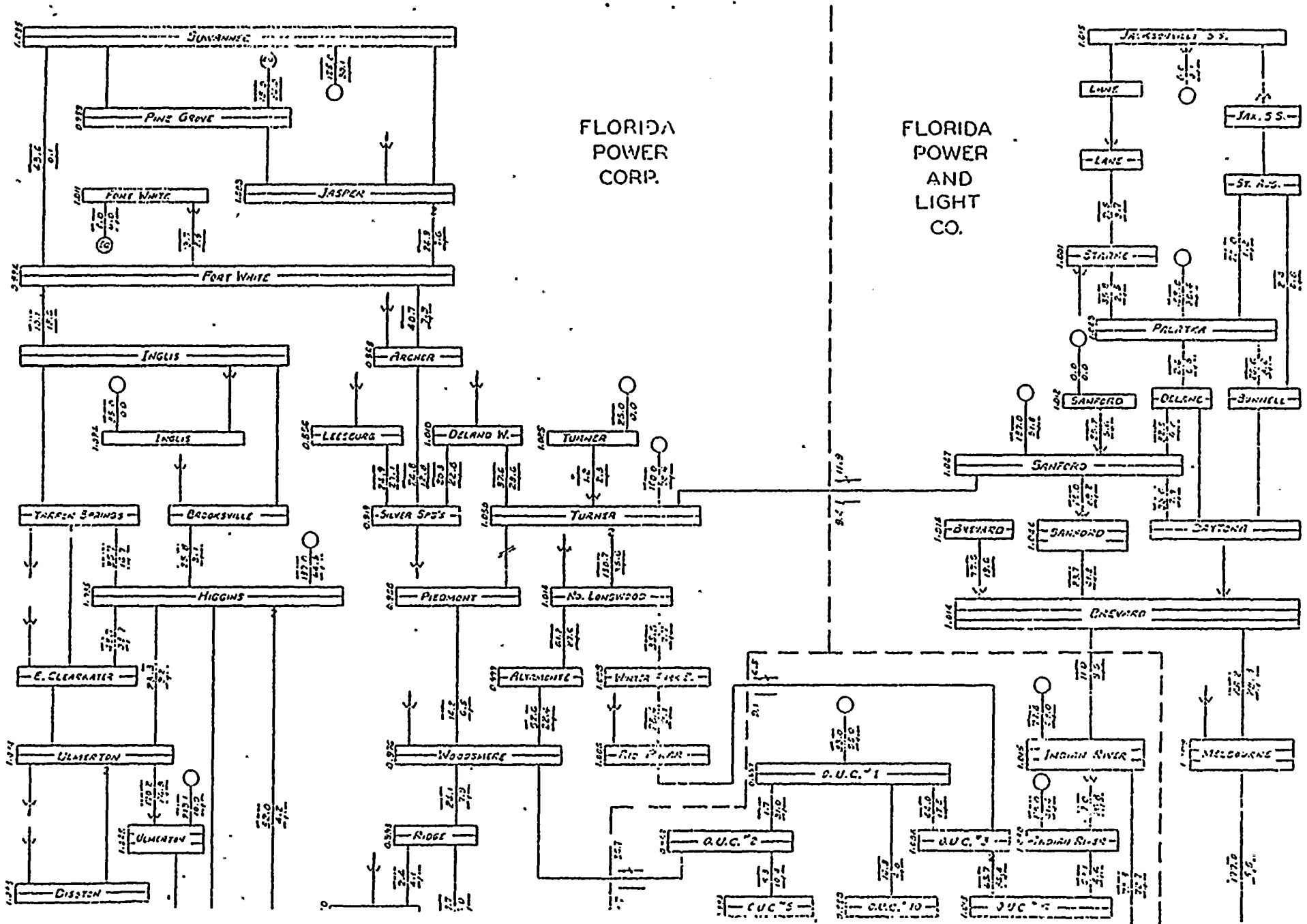
FLORIDA OPERATING COMMITTEE
INTER-SYSTEM POWER FLOWS - SEPT 1964
TOTAL LOAD 4366

CASE I-D-5



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GENERAL CONDITIONS:

1. Generation: 1964 Basic System modified by: Indian River #2 Unit 92 mw rather than 210 mw.
2. Transmission: 1964 Basic System; Outage: one circuit of Turner - North Longwood double circuit 115 kv line.
3. Load: September 1964, peak load, 4366 mw.
4. Interchange: Each system on zero net interchange.

PURPOSE:

To determine flows and voltages with the loss of one of the circuits of the Turner-North Longwood double circuit 115 kv line, under the operation of a modified Basic System, as described above.

RESULTS:

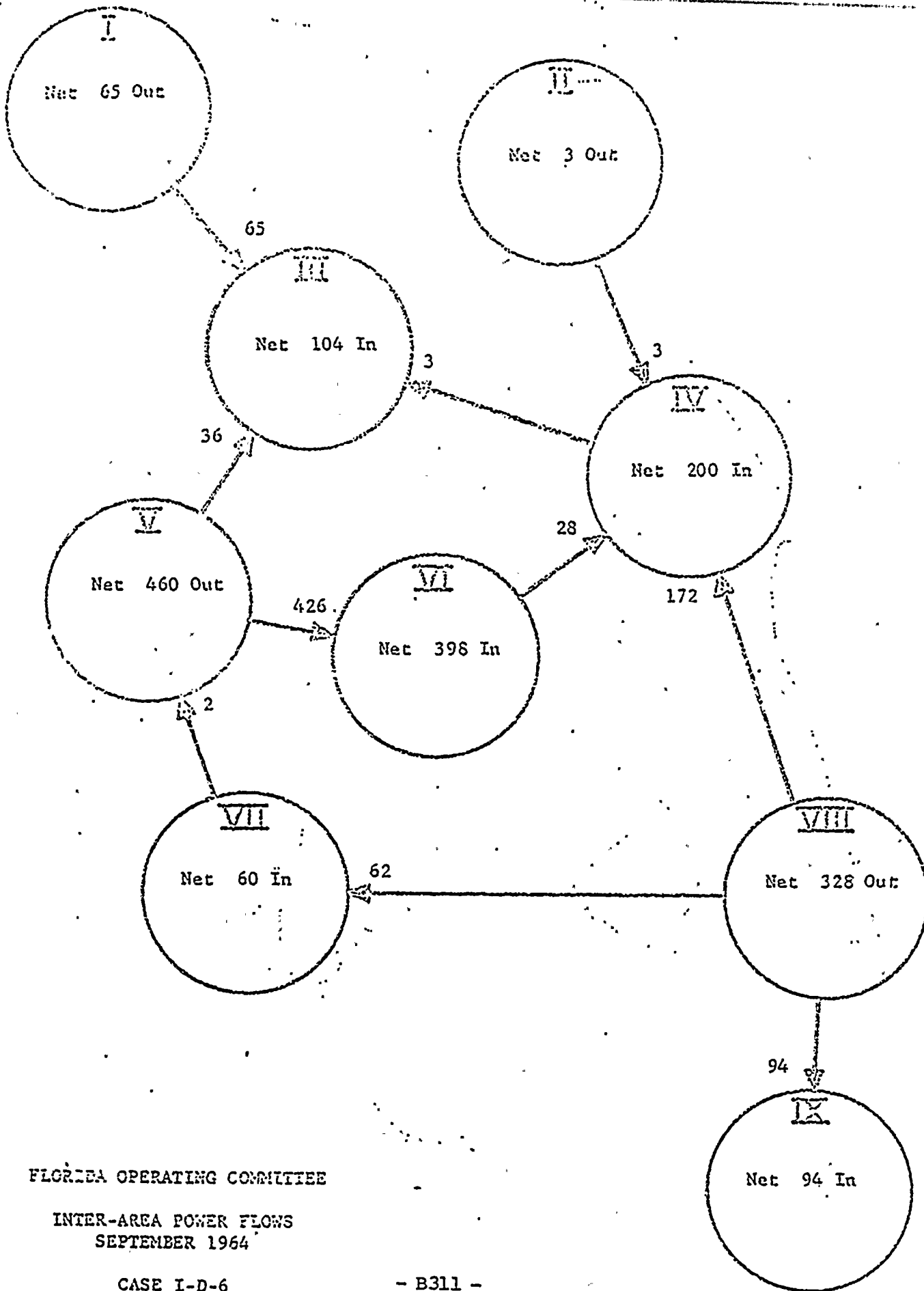
The following tabulation of bus voltages shows the effect of the loss of the line:

<u>Bus</u>	<u>Voltage - %</u>	
	<u>Case 1-D-4</u>	<u>Case 1-D-6</u>
North Longwood	102.0	100.5
Altamonte	100.9	99.5
Winter Park East	101.5	100.3
Woodsmere	99.1	98.1

The remaining circuit of the double circuit line carried 80 mva, which is its nominal rating.

CONCLUSIONS:

The loss of one circuit of the Turner-North Longwood double circuit 115 kv line, under the September 1964 peak load conditions and the modified Basic System, would not be critical.

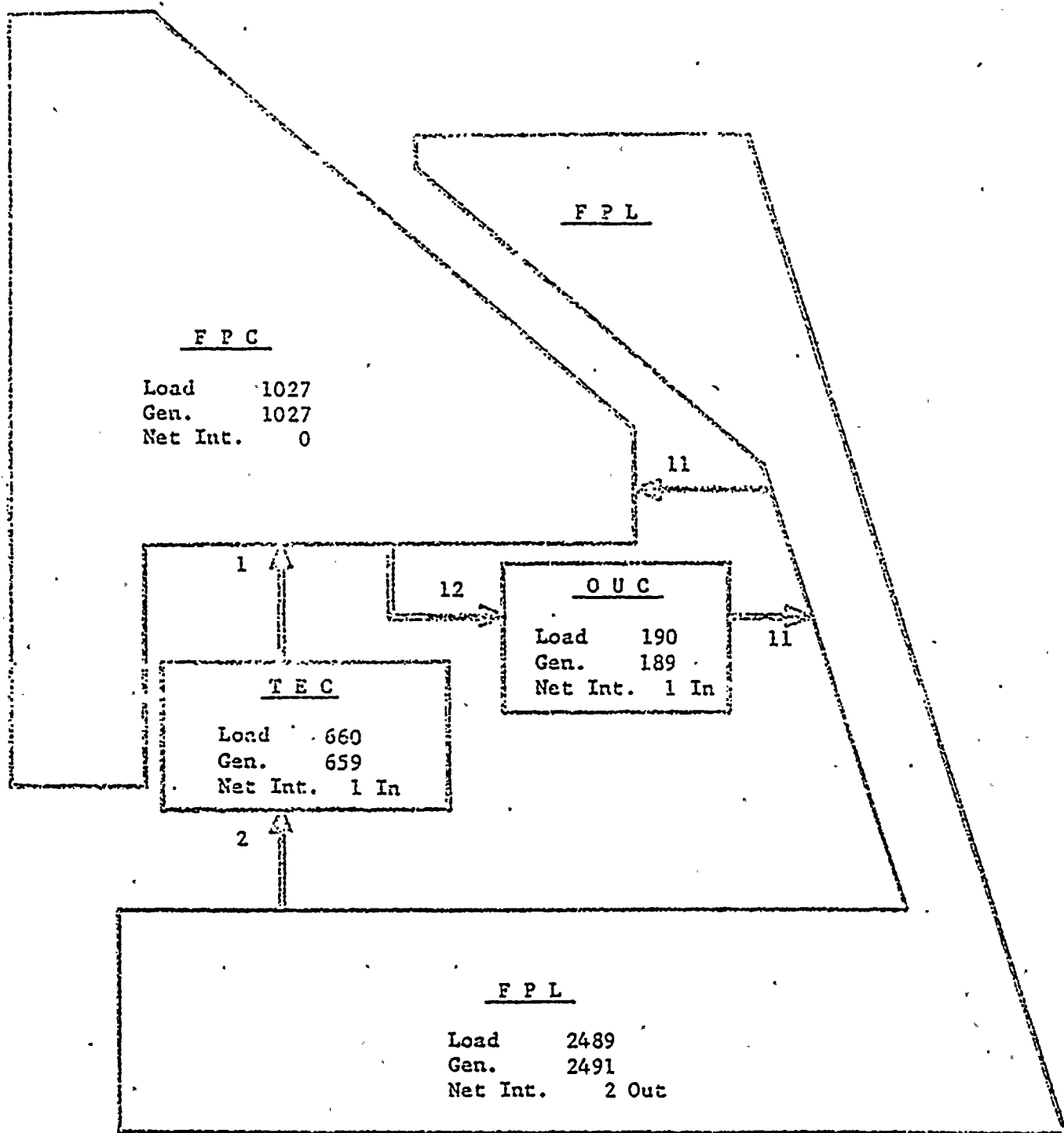


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INTER-AREA POWER FLOWS
SEPTEMBER 1964

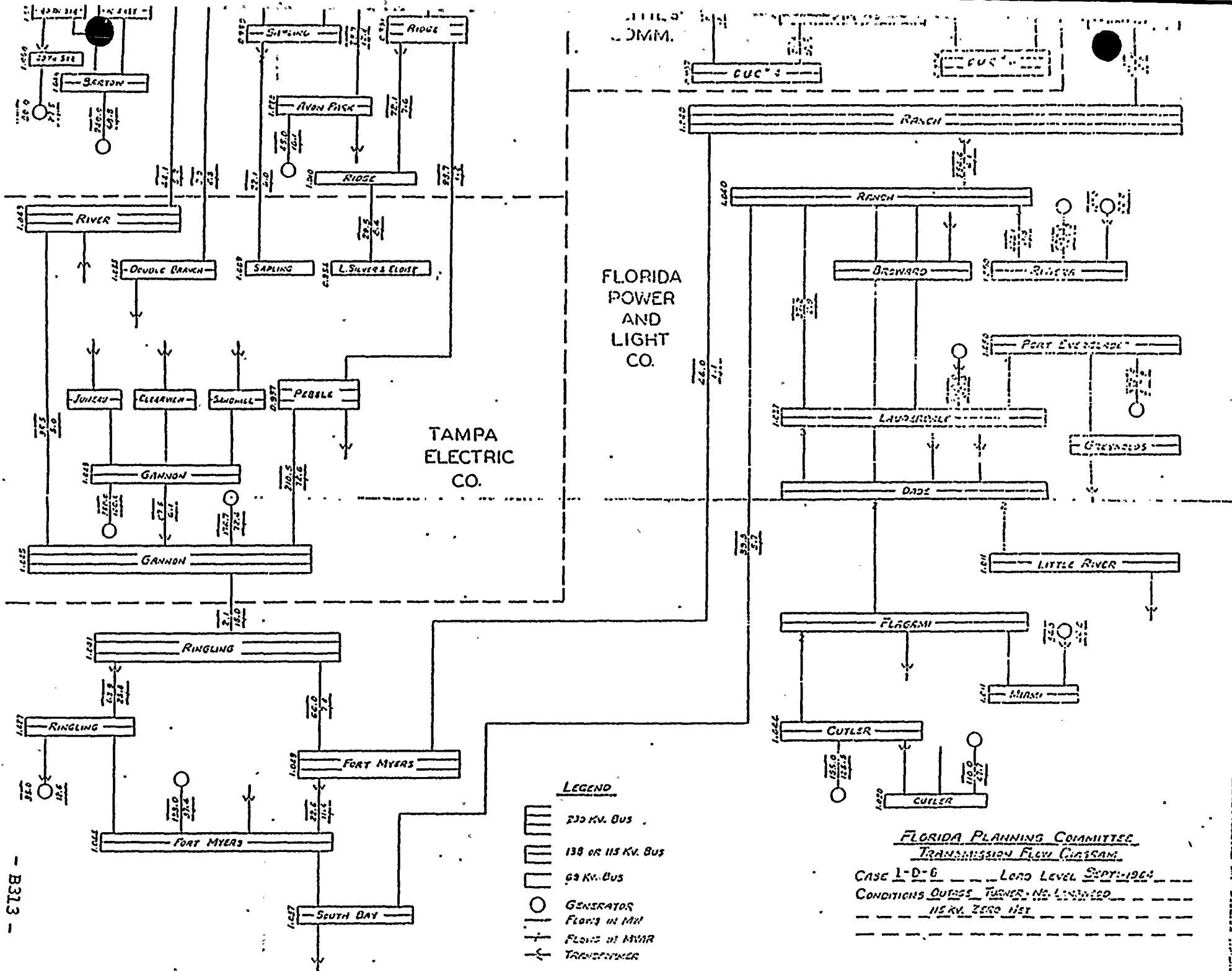
CASE I-D-6

- B311 -

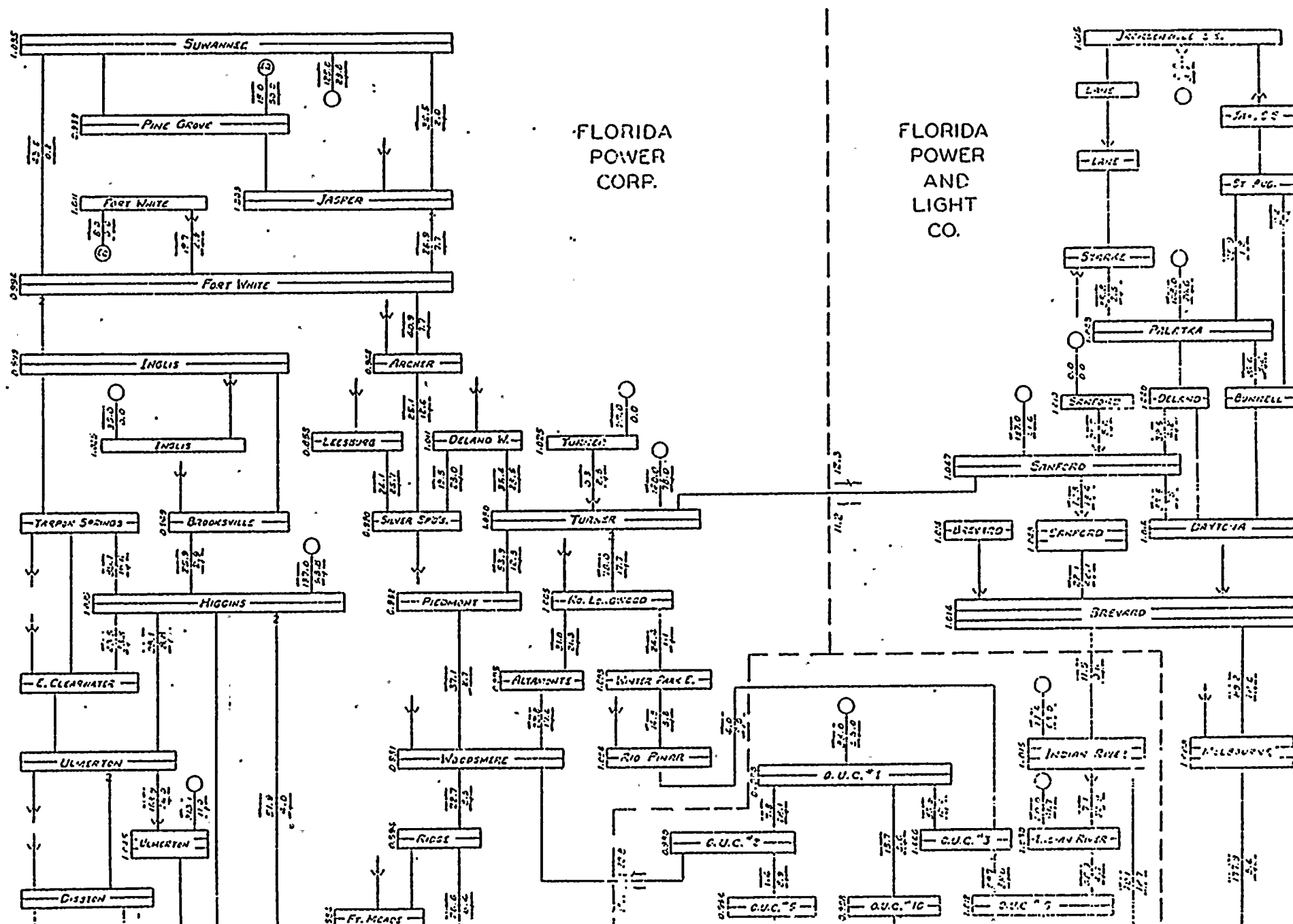


FLORIDA OPERATING COMMITTEE
 INTER-SYSTEM POWER FLOWS - SEPT 1964
 TOTAL LOAD 4366

CASE I-D-6



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GENERAL CONDITIONS:

1. Generation: 1964 Basic System except as follows:
 - a. Avon Park 51 mw unit off
 - b. Suwannee #1 & #2 37 mw units off
2. Transmission: 1964 Basic System
3. Load: September 1964, peak load, 4366 mw.
4. Interchange: OUC to FPC - 100 mw.

PURPOSE:

To evaluate the performance of the 1964 Basic System under the condition of a 100 mw delivery from OUC to FPC. The FPC generation schedule to effect this condition was arrived at by removal of the Avon Park 51 mw unit and the Suwannee #1 and #2 37 mw units. This schedule could represent a combination of maintenance and/or economy energy transfer.

RESULTS:

Power flows and voltages were satisfactory at all locations. Power flow into Areas III and IV from the south was 194 mw, 44 mw more than in CASE 1-D-1, when OUC was delivering 100 mw to FPL. The Melbourne-Pratt Whitney 230 kv line carried 150 mw, 32 mw more than in CASE 1-D-1.

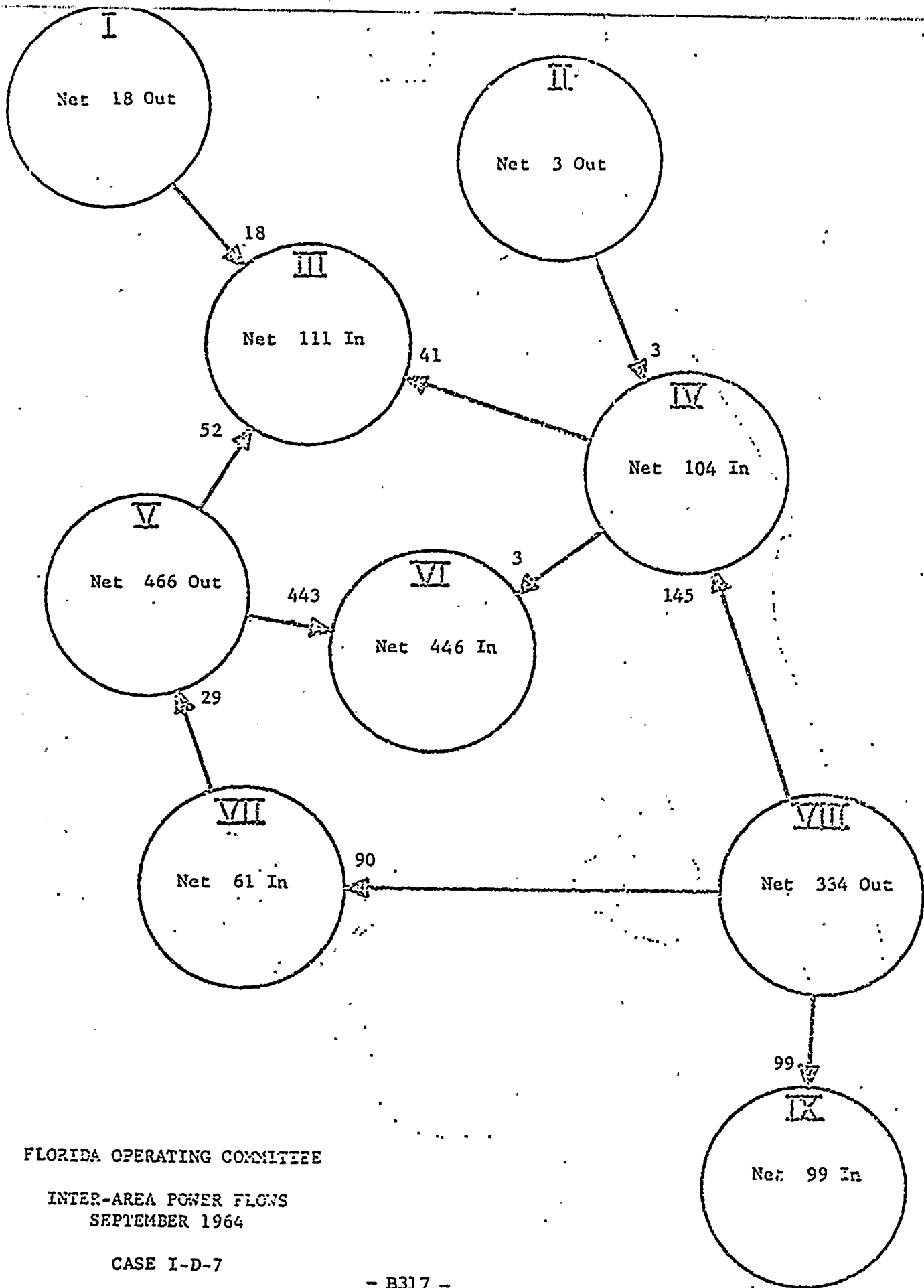
FPC received 70 mw in Area IV, with the two OUC-FPC ties carrying 14 mw each and the Sanford-Turner tie, 42 mw. The remaining 30 mw was received in Area VI via the 230 kv system of Areas VIII, VII and V. The other inter-system and inter-area power flows are summarized on accompanying diagrams.

Flow on the Indian River-Brevard 230 kv tie was 72 mw and 5 mvar to FPL, indicating that the previously considered voltage and phase angle regulator is not required under these conditions.

Although the voltages on the transmission busses in the Lake Wales area are down (as much as 8%) due to the loss of Avon Park Unit, the conditions are well within the range of the regulating power transformers.

CONCLUSIONS:

The 1964 Basic System performs satisfactorily in delivering 100 mw from CUC to FPC during the September 1964 peak load.

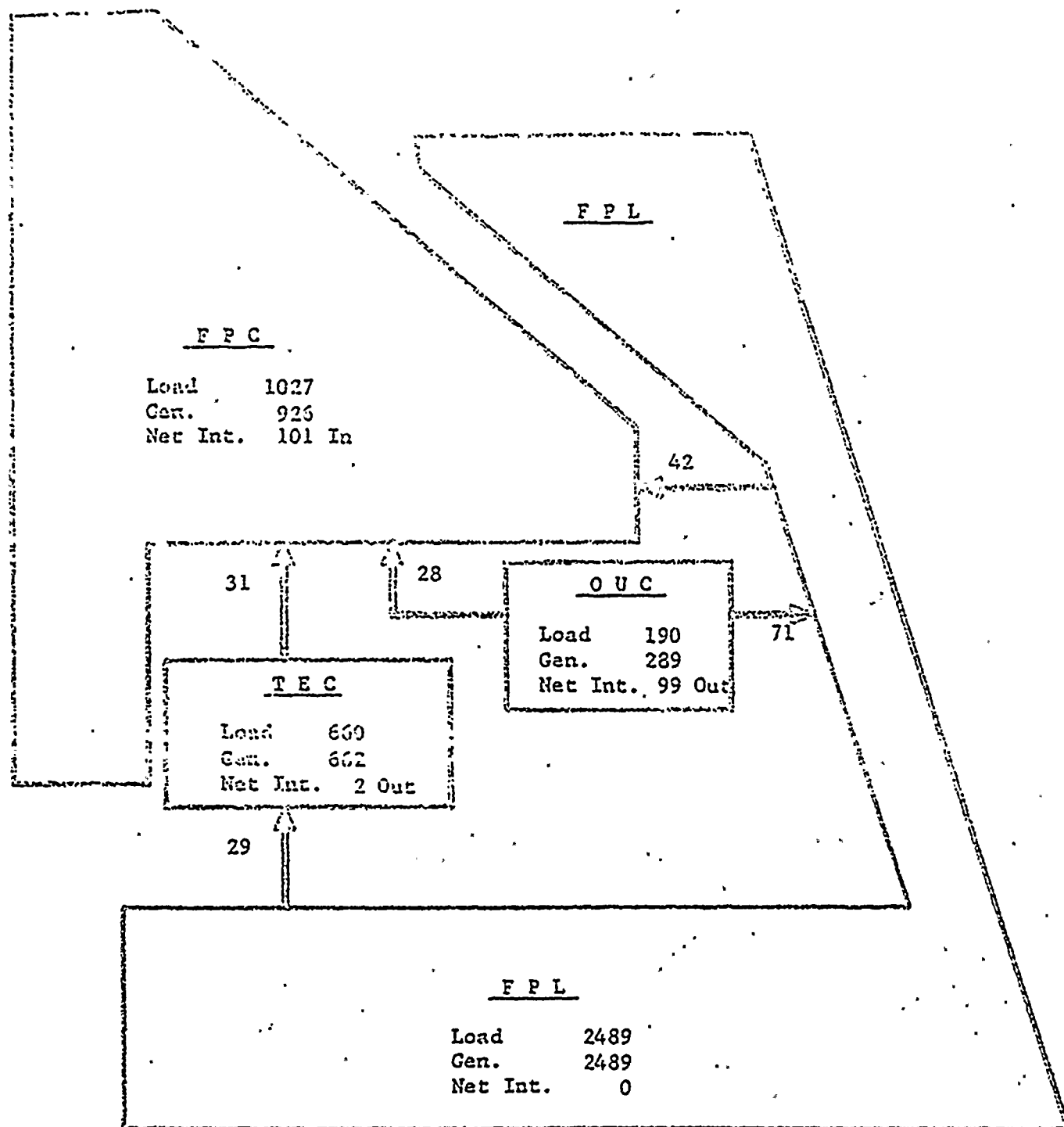


FLORIDA OPERATING COMMITTEE

INTER-AREA POWER FLOWS
SEPTEMBER 1964

CASE I-D-7

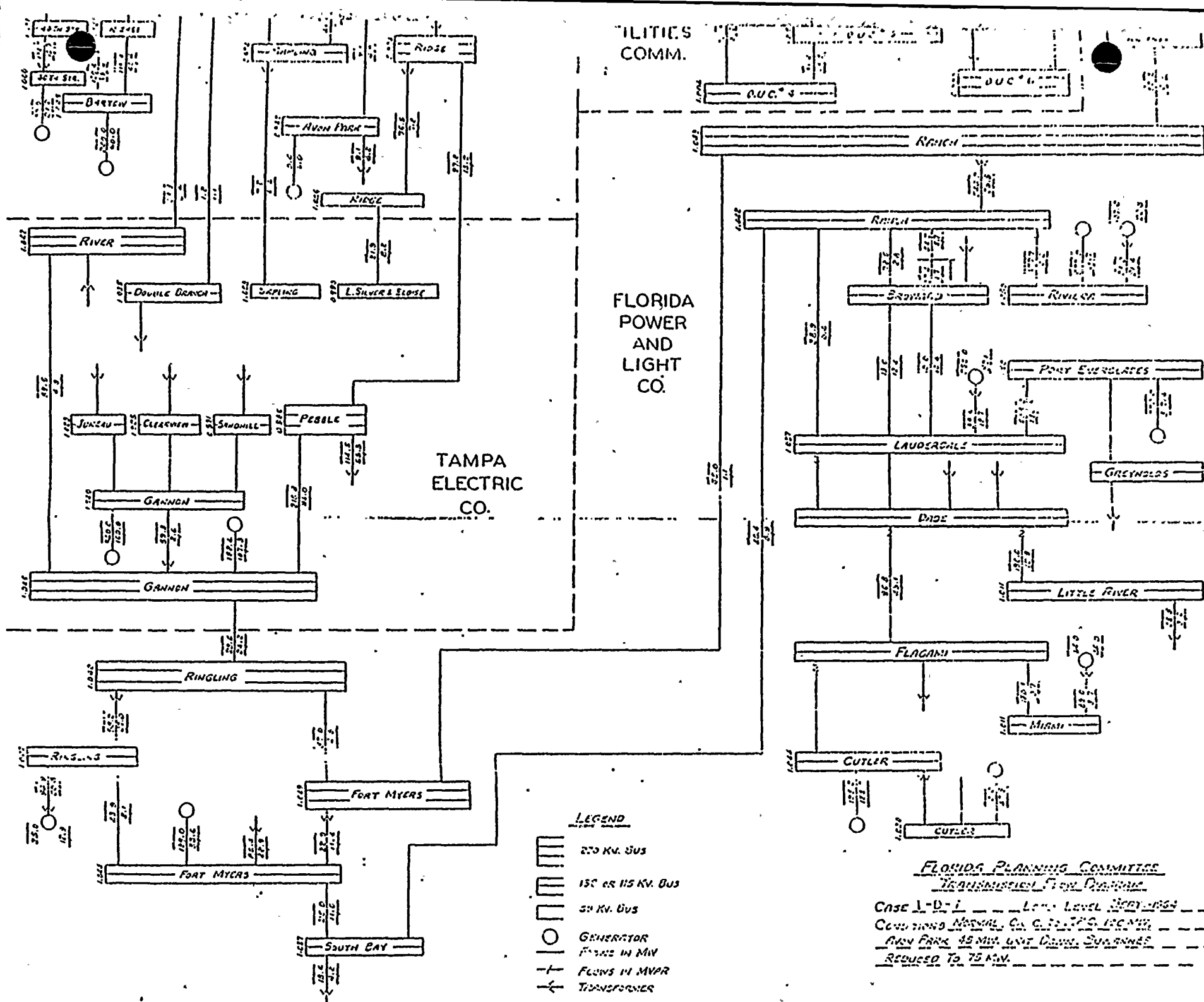
- B317 -



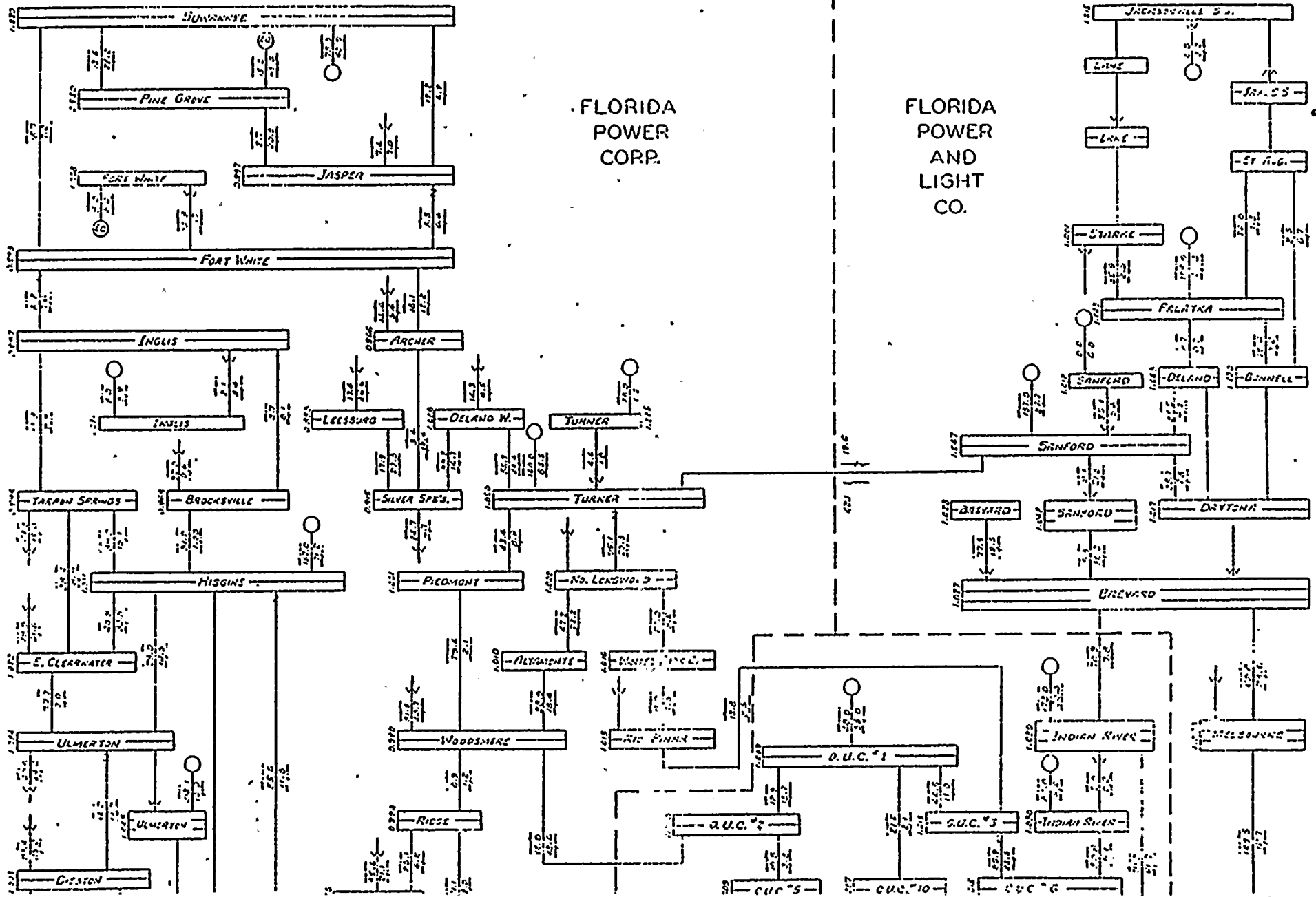
FLORIDA OPERATING COMMITTEE

INTER-SYSTEM POWER FLOWS - SEPT 1964
TOTAL LOAD 4366

CASE I-D-7



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GENERAL CONDITIONS:

- | | |
|-------------------------|------------------------------------------------------------------------------------------------------------|
| 1. <u>Generation:</u> | 1964 Basic System except as follows:
a. Suwannee #1 & #2. 37 mw units off
b. Sanford 165 mw unit off |
| 2. <u>Transmission:</u> | 1964 Basic System; Outage Sanford - Brevard 230 kv line. |
| 3. <u>Load:</u> | September 1964, peak load, 4366 mw. |
| 4. <u>Interchange:</u> | OUC to FPC 100 mw |

PURPOSE:

To demonstrate the performance of the system during the loss of the Sanford 165 mw unit, simultaneously with the loss of the Sanford - Brevard 230 kv line, under a schedule of generation whereby OUC is delivering 100 mw to FPC. This condition could hardly be realistic, but was devised primarily to examine a case of a large transfer of energy through the OUC system.

RESULTS

The Indian River #2 unit went to reactive capability (142 mvar), holding 102% voltage, and supplied 84 mvar to Brevard for support of the east coast 230 kv system voltage as required by the 225 mw delivery into Area IV on the Melbourne - Pratt Whitney 230 kv line.

Indian River received 18 mw from Brevard; added to the 100 mw FPC purchase, the total 118 mw was delivered into the FPC system as follows:

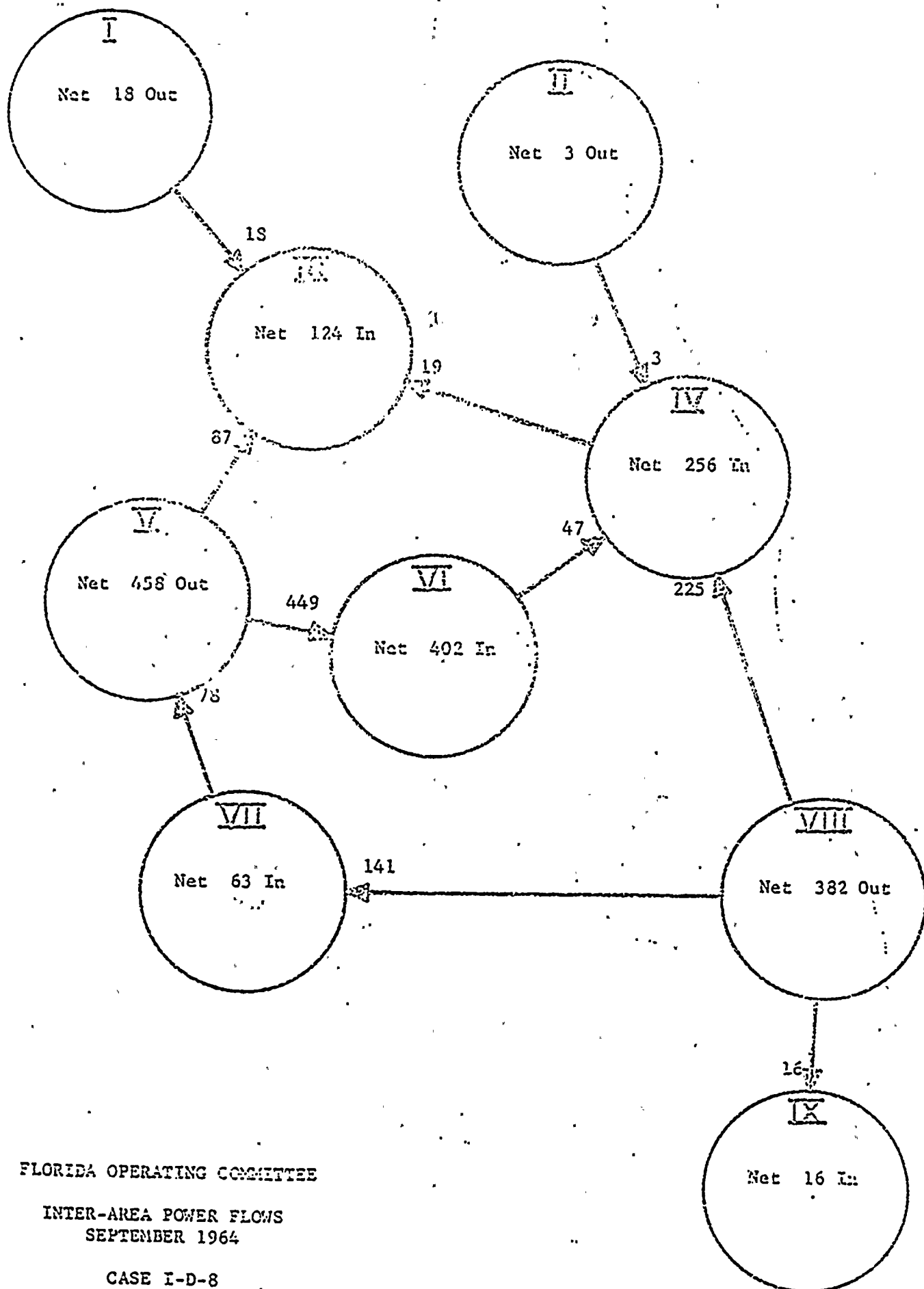
OUC #2 to Woodsmere	48.6 mw
OUC #3 to Rio Pinar	<u>67.4 mw</u>
Total	116.0 mw

Total flow from Indian River to OUC #6 substation was 265 mw, 147 mw on 230 kv and 118 mw on 115 kv.

About 75 mw was displaced through TEC and FPC from Ringling to Gannon and from Turner to Sanford. Turner and Sanford 115 kv voltages were about 3% below normal

CONCLUSIONS:

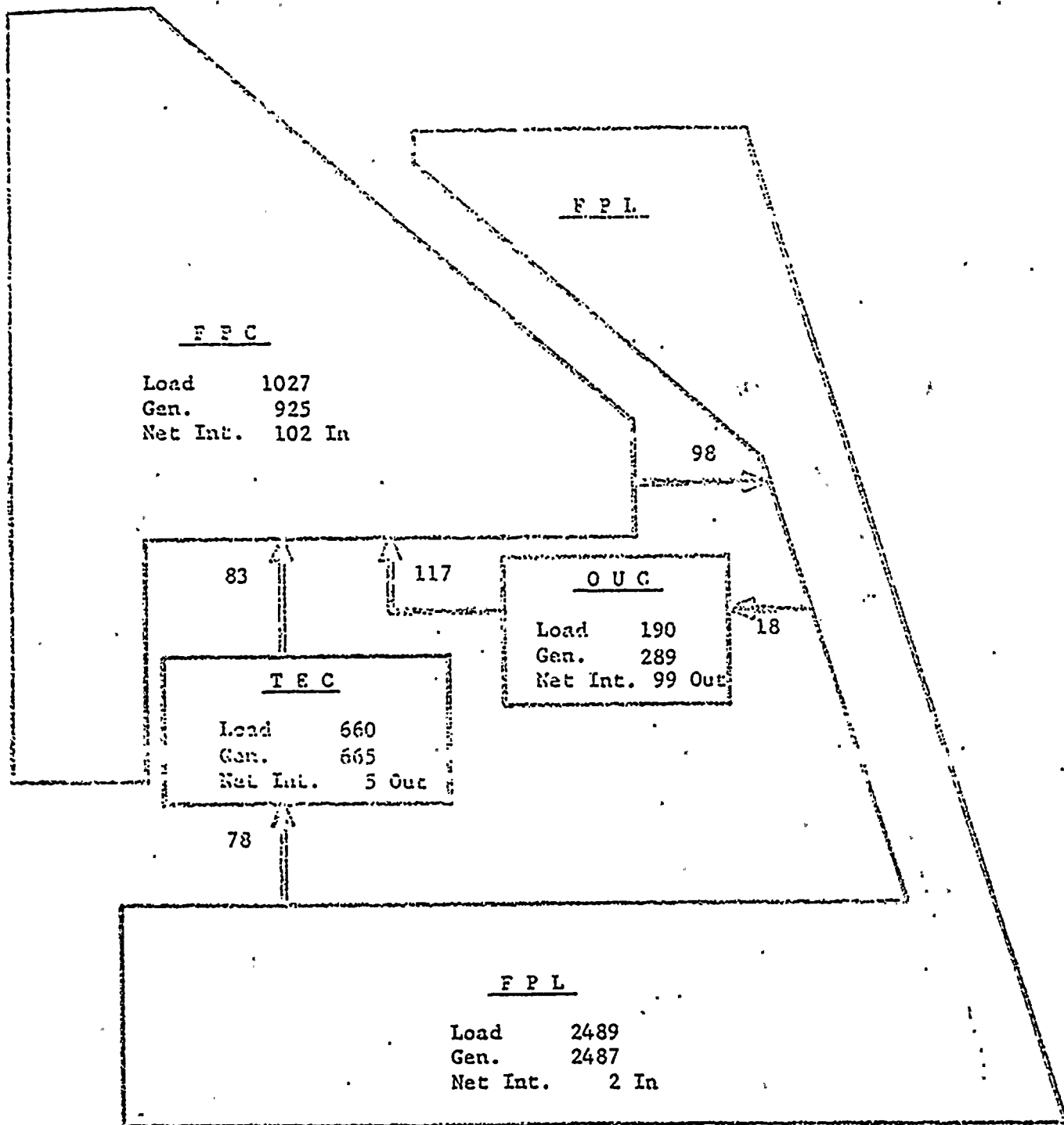
Although this is a severe condition, not apt to transpire, the system adequately met the September peak load requirements with the loss of the Sanford 165 mw unit and the Sanford - Brevard 230 kv line, during a generation schedule of FPC purchasing 100 mw from OUC.



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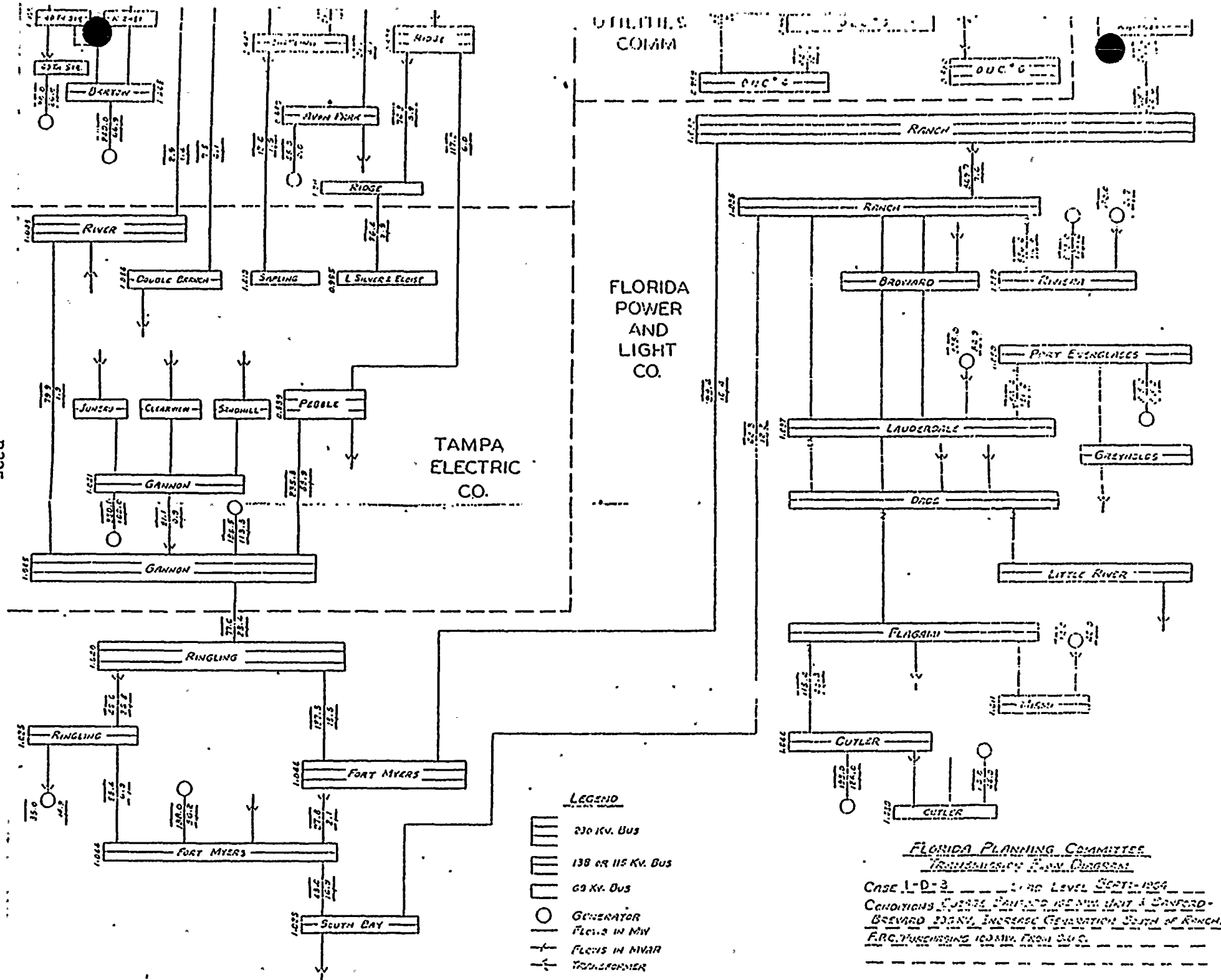
INTER-AREA POWER FLOWS
SEPTEMBER 1964

CASE I-D-8



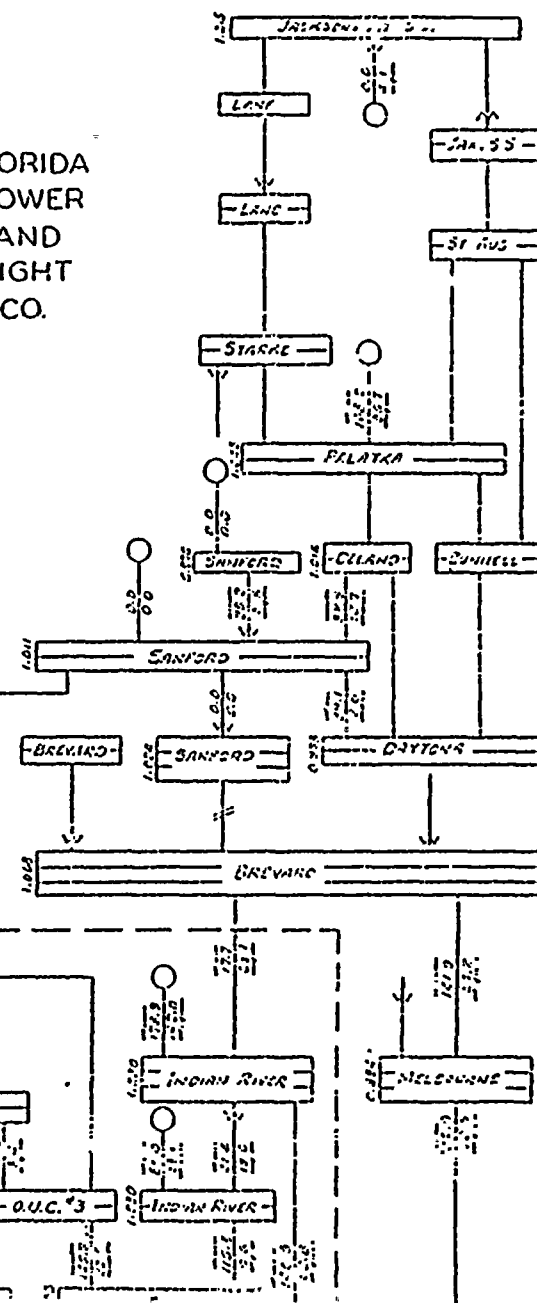
FLORIDA OPERATING COMMITTEE
 INTER-SYSTEM POWER FLOWS - SEPT 1964
 TOTAL LOAD 4366

CASE I-D-8



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GENERAL CONDITIONS:

1. Generation: 1964 Basic System
2. Transmission: 1964 Basic System; Outage Ranch - Pratt Whitney 230 kv line
3. Load: September 1964, peak load, 4366 mw
4. Interchange: OUC to FPL - 150 mw.

PURPOSE:

To determine whether or not Area IV is self-sufficient, under 1964 Basic System conditions, with the loss of the largest transmission source from the south.

RESULTS:

In CASE 1-D-1, the Ranch-Pratt Whitney 230 kv line carried 149 mw, under a generation schedule of FPL purchasing 100 mw from OUC. With the purchase increased to 150 mw, the loss of the Ranch-Pratt Whitney 230 kv line resulted in a net loss to Area IV of about 100 mw.

The following comparison of area generation illustrates the manner in which some of the area deficit was made up by bringing the local units up to, or near, capability:

<u>Generator</u>	<u>Generation - Mw</u>		
	<u>Case 1-D-1</u>	<u>Case 1-D-9</u>	<u>Net Change</u>
Palatka	94	119	25
Turner	160	171	11
Sanford	137	155	18
FPC and FPL Total			54
Indian River #2	173	195	22
Indian River #1	80	88	8
Lake Highland	40	60	20
OUC Total			50
Total Make-up, Areas II and IV			104

The remaining 45 mw deficit was adequately handled by displacement of energy through the 115 kv transmission system.

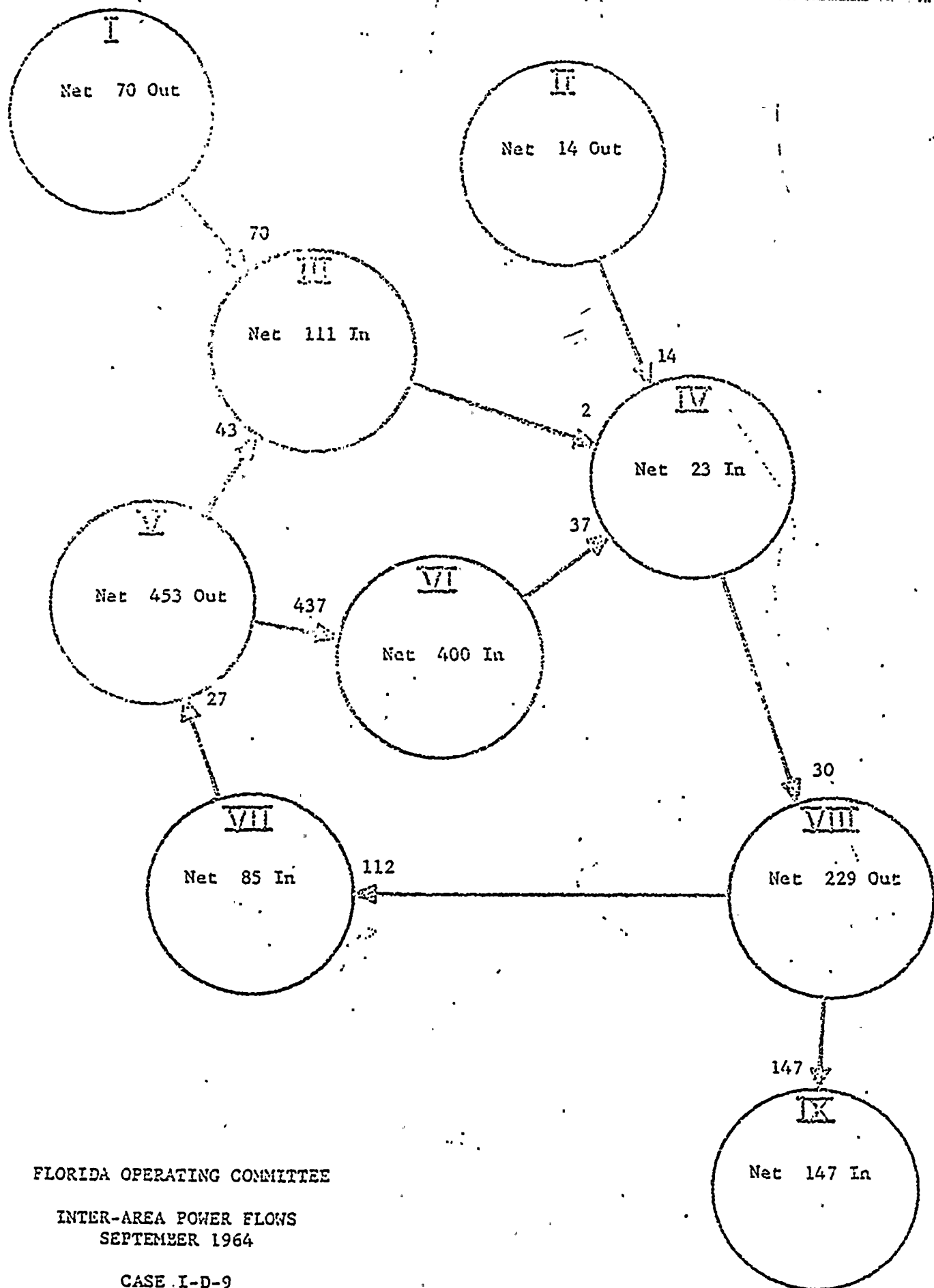
CASE 1-D-9 (Cont'd.)

Since this Case represents a single jeopardy condition, a realistic generation schedule was determined on the basis of probable operation. It was assumed, for instance, that the Sanford and Turner low pressure units would not be operating prior to the loss of this line; therefore, these units were not brought on for the emergency.

All system voltages are satisfactory, and no overloads are noted.

CONCLUSIONS:

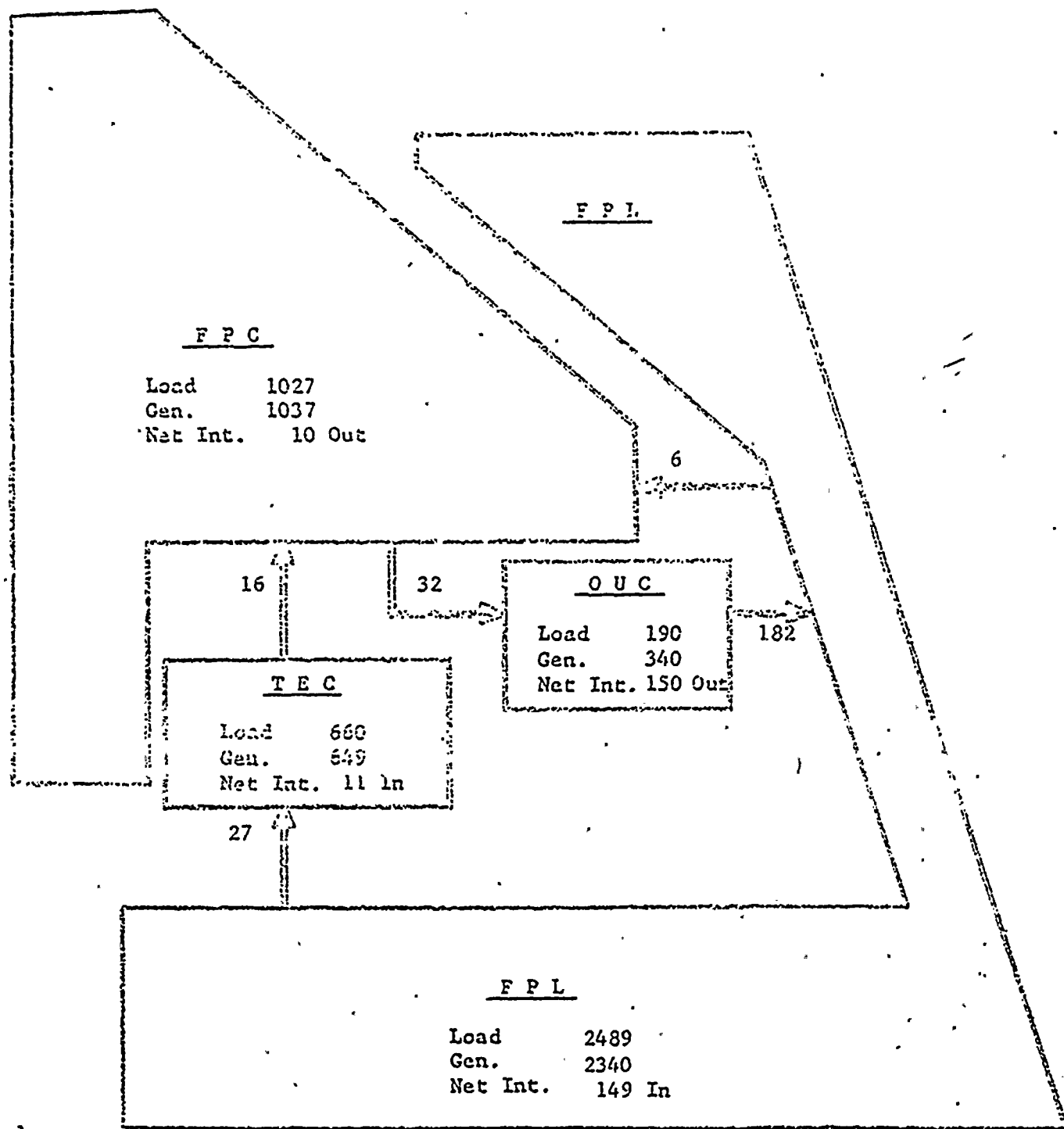
Area IV is self-sufficient with respect to the 230 kv transmission tie to the south, under September 1964, peak load conditions.



FLORIDA OPERATING COMMITTEE

INTER-AREA POWER FLOWS
SEPTEMBER 1964

CASE I-D-9

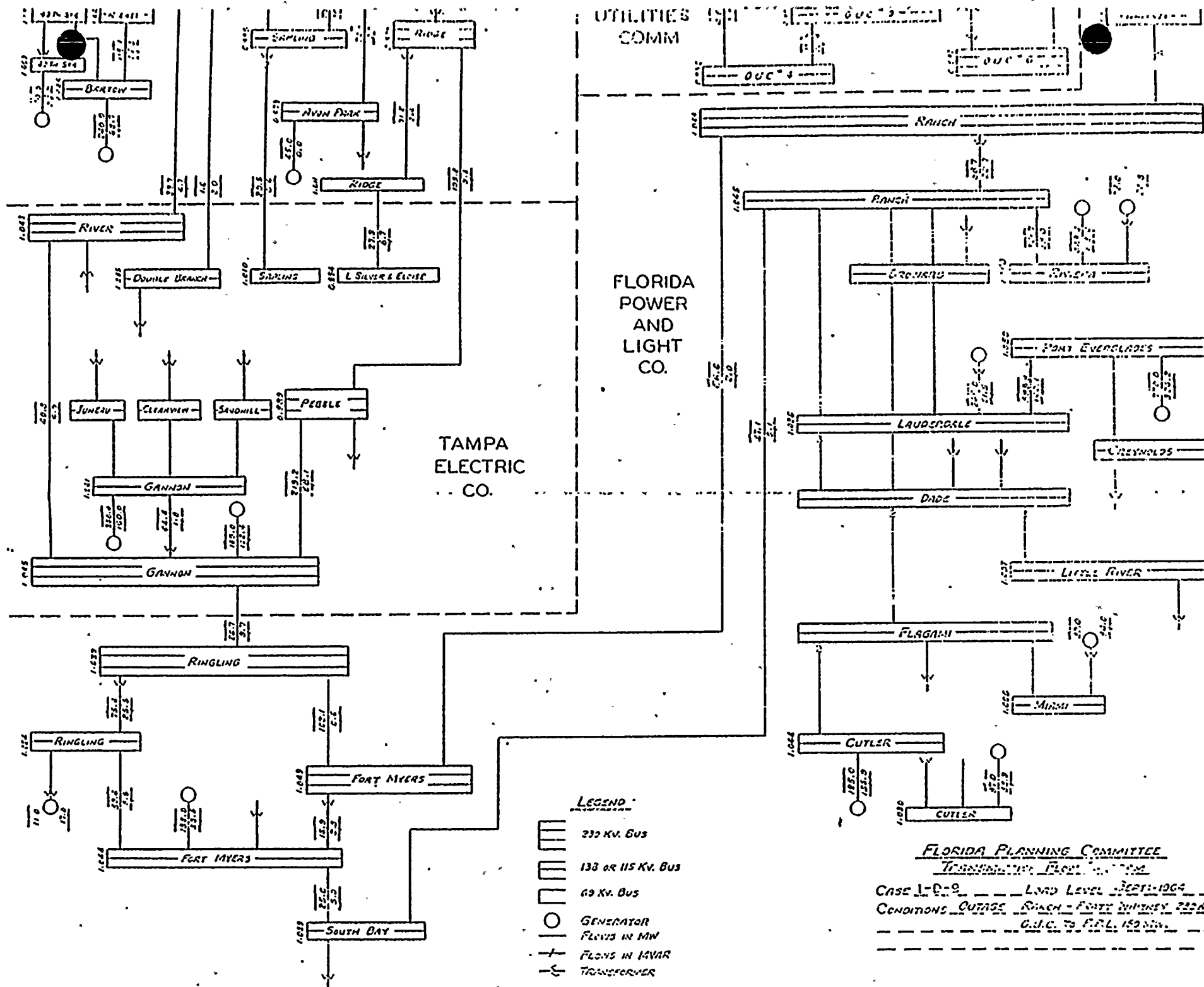


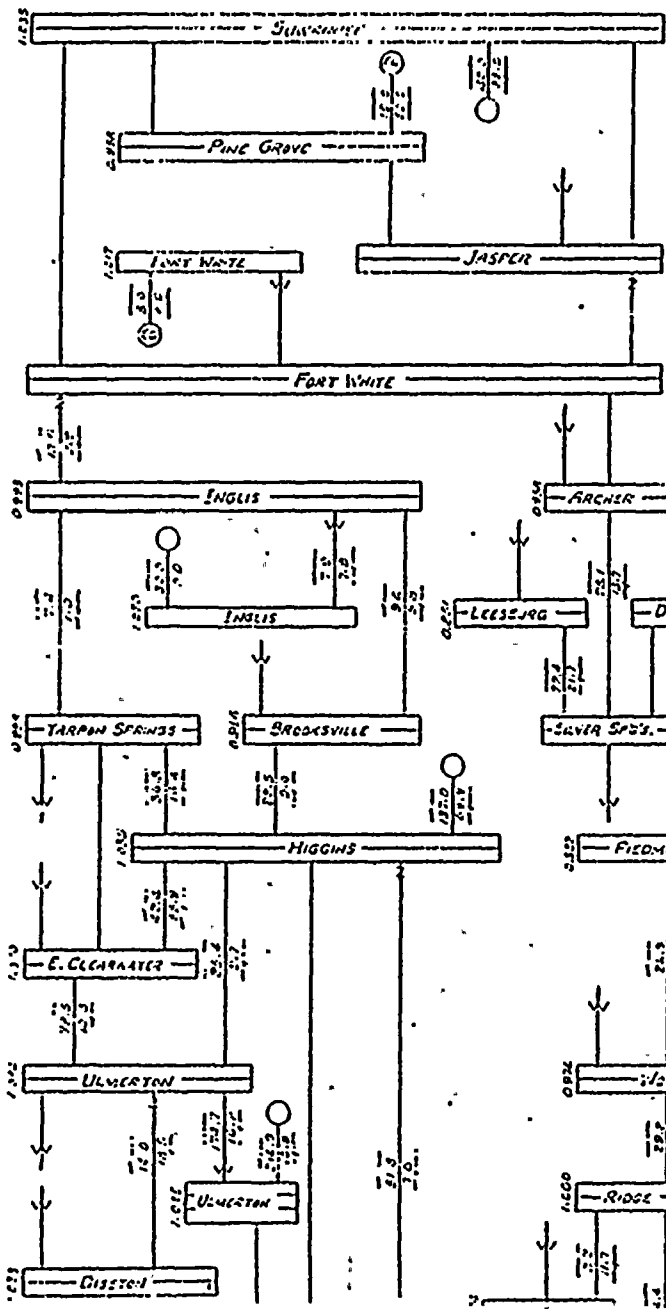
FLORIDA OPERATING COMMITTEE

INTER-SYSTEM POWER FLOWS - SEPT 1964
TOTAL LOAD 4366

CASE I-D-9

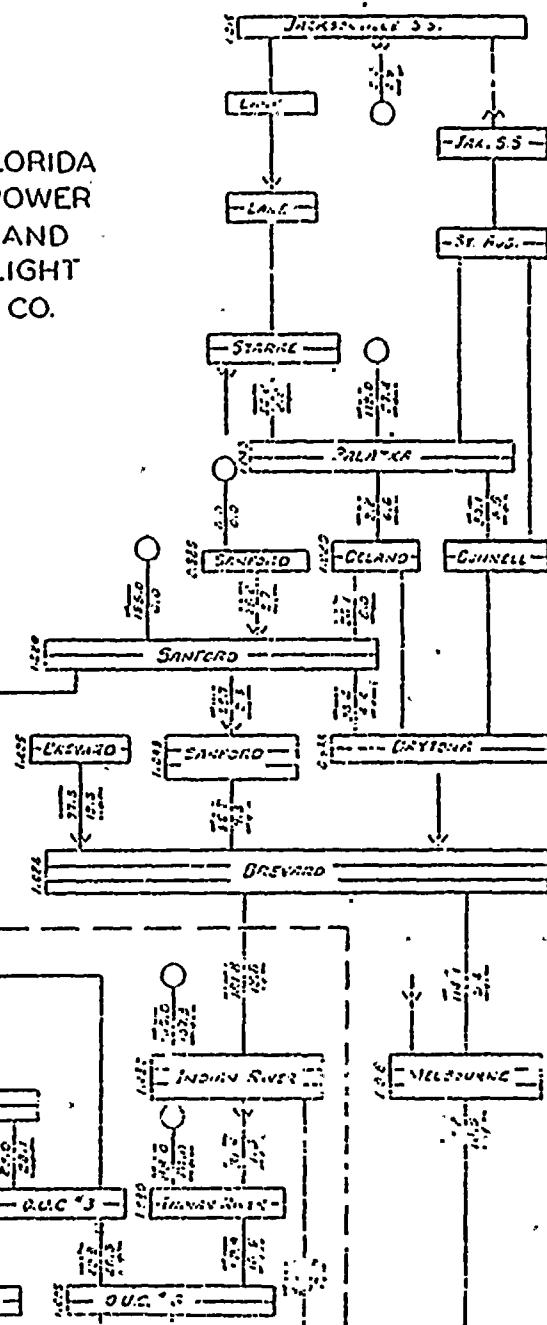
- B331 -





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CASE 1-D-10

GENERAL CONDITIONS:

1. Generation: 1964 Basic System.
2. Transmission: 1964 Basic System; Outage Pratt Whitney - Melbourne 230 kv line.
3. Load: September 1964, peak load, 4366 mw.
4. Interchange: OUC to FPL - 100 mw.

PURPOSE:

To evaluate the ability of the 1964 Basic System to protect Area IV for the loss of the Pratt Whitney - Melbourne 230 kv line.

RESULTS

As compared to CASE 1-D-9 (outage of Ranch - Pratt Whitney 230 kv line), this condition is a more severe test of the Basic Transmission System. Although the Pratt Whitney load of 30 mw is being served from the south, the net deficit of Areas II and IV is greater as compared to CASE 1-D-9, by about 39 mw, as shown on the following tabulation of generation changes:

<u>Generator</u>	<u>Generation - Mw</u>		
	<u>Case 1-D-9</u>	<u>Case 1-D-10</u>	<u>Net Change</u>
Palatka	119	108	-11
Sanford	155	147	-8
Area (FPL) Total	274	255	-19
Indian River #2	195	173	-22
Indian River #1	88	80	-8
Lake Highland	60	40	-20
Area (OUC) Total	343	293	-50
Total	617	548	-69
Pratt Whitney Deduction	-30	0	30
Net Change in Deficit			39

CASE 1-D-10 (Cont'd.)

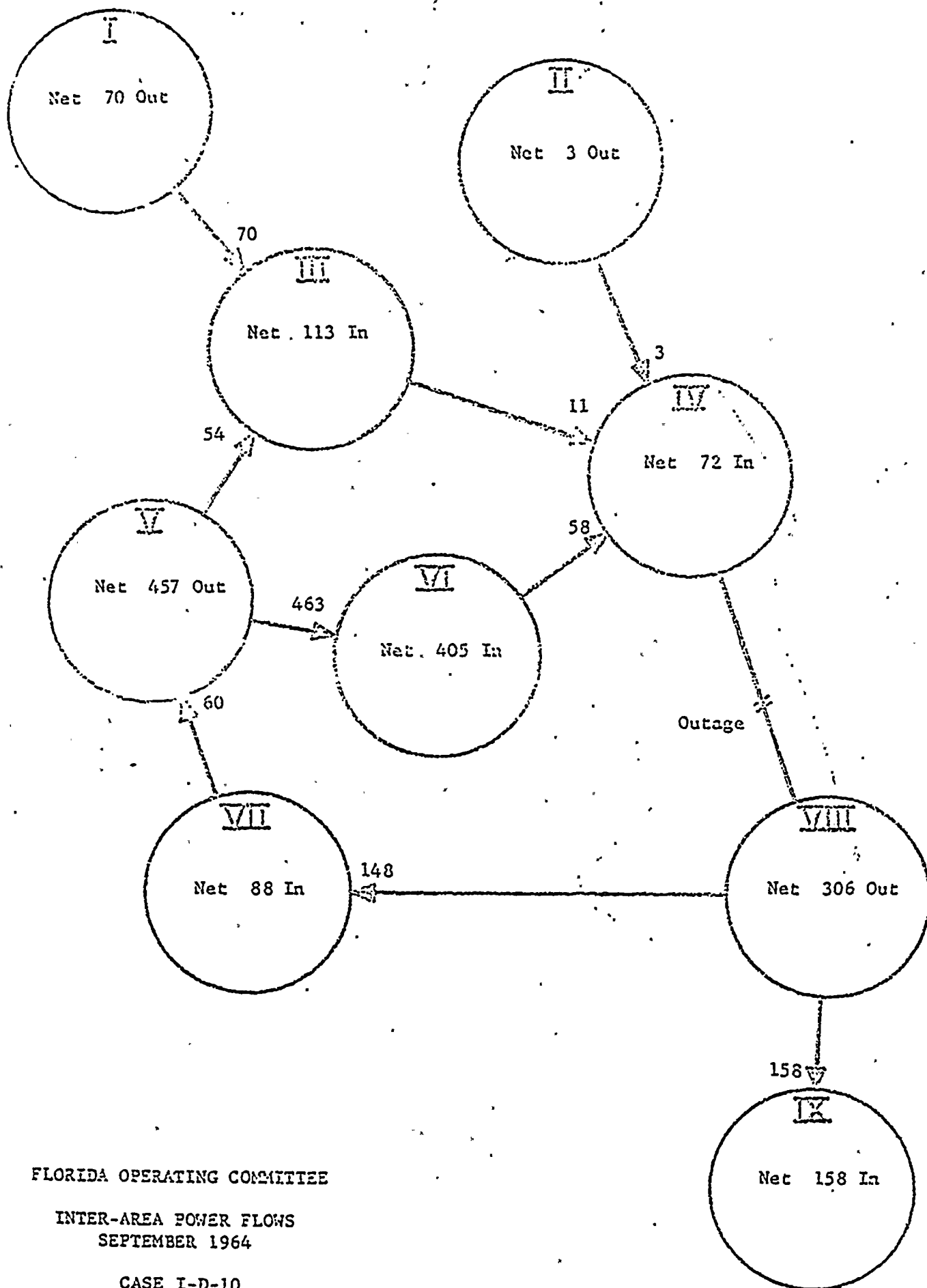
The 115 kv inter-area ties between Areas V and VI and Areas III and IV adequately handled a flow of 112 mw to the north.

There was a total flow of about 80 mvar from the OUC system, but due to a program entry omission, the Sanford 115 kv voltage was allowed to drop about 3% with an attendant 0 var generation on both CASE 1-D-9 and CASE 1-D-10. Proper var generation at Sanford would have resulted in a more reasonable var transfer from OUC. In addition to the 100 mw interchange from OUC to FPL, about 50 mw was transferred through the OUC system by displacement, west to east, bringing the Indian River - Brevard 230 kv line loading to 153 mw.

CONCLUSIONS:

The September 1964, peak load requirements can be met with the loss of the Melbourne - Pratt Whitney 230 kv line, if OUC is capable of supplying about 80 mw above its own load requirements. Based on the analysis of this Case, as compared to 1-D-1, (BASE CASE) and 1-D-4, (Each system on zero net), the transmission capacity from Areas V and VI to Areas III and IV is not sufficient to protect the system against the loss of the Ranch - Pratt Whitney or the Pratt Whitney - Melbourne sections of the east coast 230 kv line, unless the OUC system can supply about 80 mw to 100 mw to FPL.

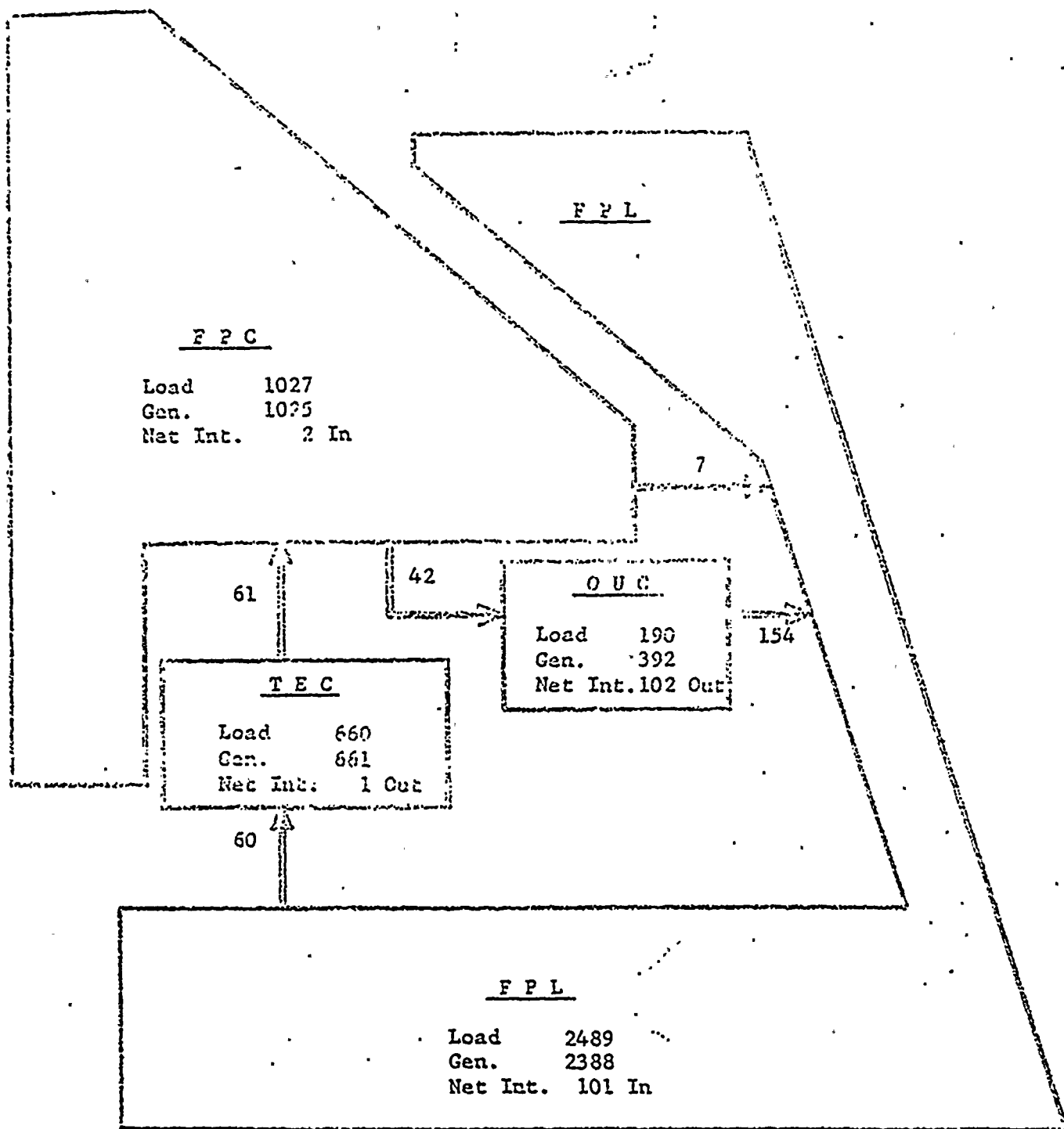
In addition to this load limitation, the Indian River - Brevard 230 kv tie is necessary, under these conditions, to deliver the interchange between OUC and FPL.



FLORIDA OPERATING COMMITTEE

INTER-AREA POWER FLOWS
SEPTEMBER 1964

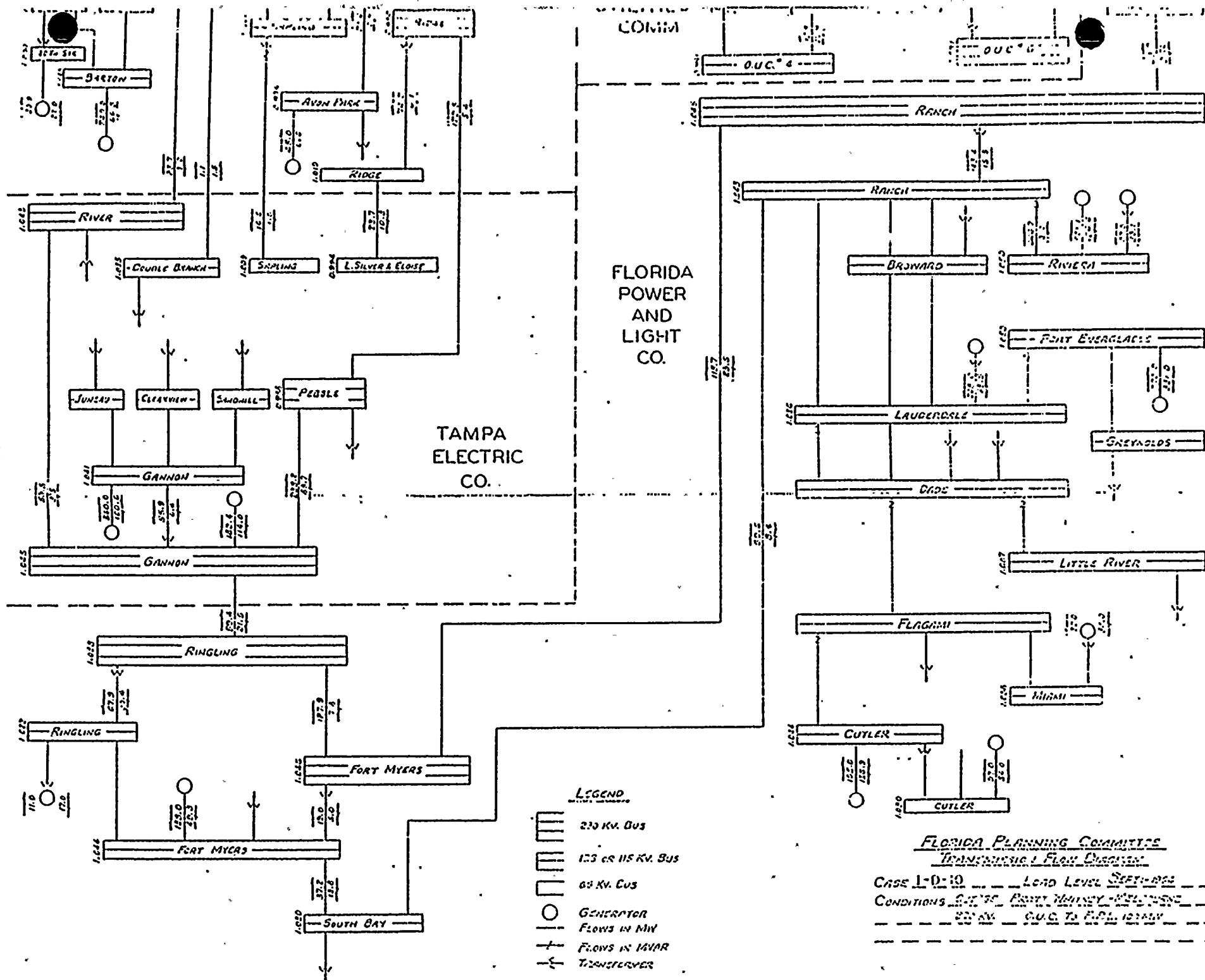
CASE I-D-10

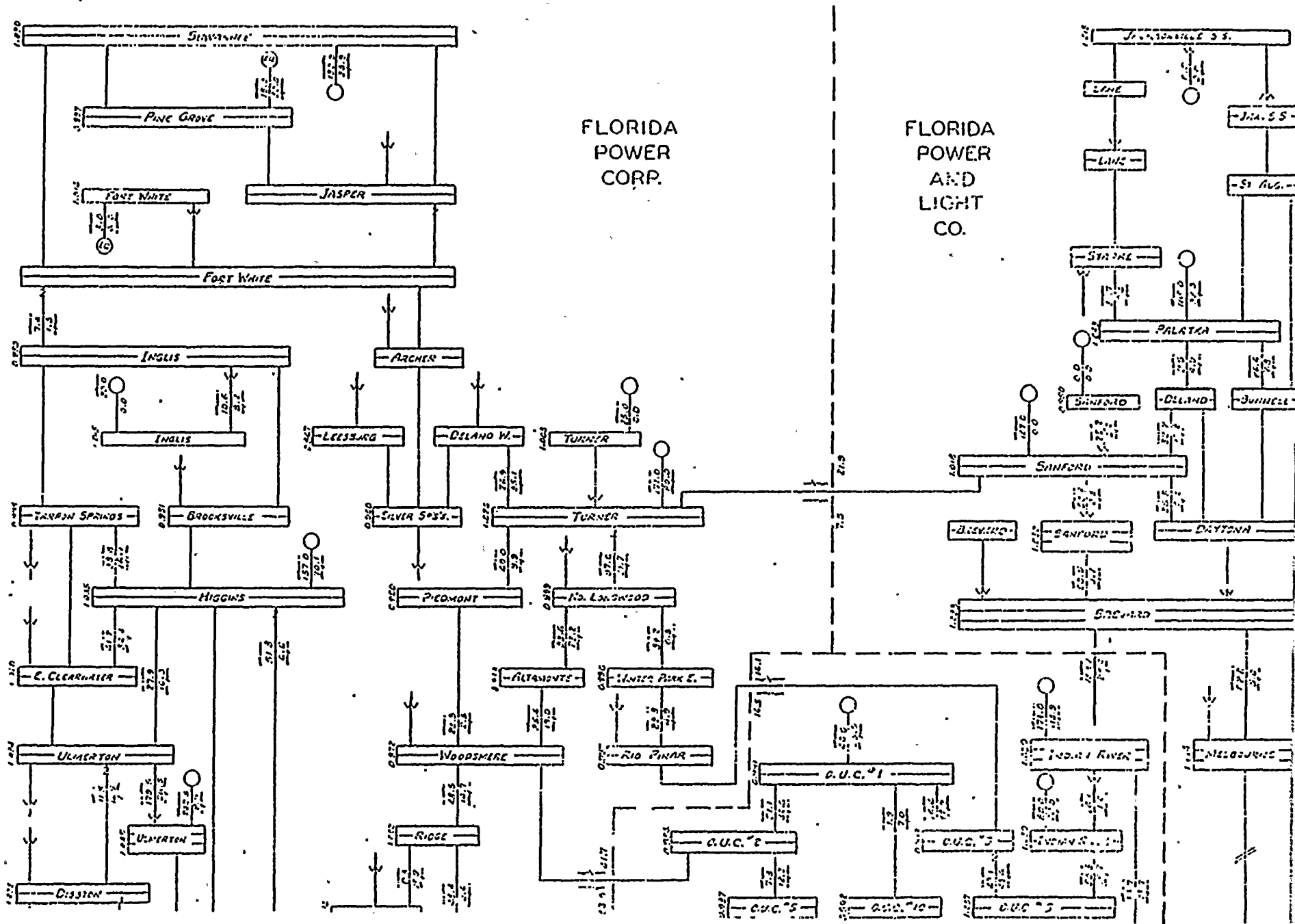


FLORIDA OPERATING COMMITTEE
 INTER-SYSTEM POWER FLOWS - SEPT 1964
 TOTAL LOAD 4365

CASE I-D-10

- B337 -





CASE 1-D-11

GENERAL CONDITIONS:

1. Generation: 1964 Basic System; Orange Bartow 220 mw and Gannon 204 mw units.
2. Transmission: 1964 Basic System
3. Load: September 1964, peak load, 4366 mw.
4. Interchanges: OUC selling 100 mw.
FPL selling 125 mw
FPC purchasing 150 mw
TEC purchasing 75 mw

PURPOSE:

To determine whether or not the 1964 Basic System could adequately relay the loss of the two largest units in the Tampa Bay area during the peak of the summer of 1964, from available generation in the state.

RESULTS:

The following is a tabulation of the change of generation between CASE 1-D-1 and CASE 1-D-11:

<u>Generator</u>	<u>Generation - Mw</u>		
	<u>Case 1-D-1</u>	<u>Case 1-D-11</u>	<u>Net Change</u>
Bartow #3 (Ulmerton)	210	0	-210
Gannon #4	178	0	-178
Total Capacity Loss			388
Bartow #1 & #2	240	264	24
Bayboro (40th Street)	30	55	25
Higgins	137	148	11
Gannon 138 kv	360	468	108
Total, Area V Make-up			168
Avon Park	45	51	6
Sarasota 69 kv	11	22	11
Fort Myers	138	155	17
Riviera 138 kv	520	569	49
Riviera 69 kv	102	130	28
Lauderdale	268	310	42
Pt. Everglades	770	818	48
Cutler 69 kv	97	122	25
Cutler 138 kv	195	223	28
Total, Out-of-Area Make-up			254
Total Make-up			422

CASE 1-D-11 (Cont'd.)

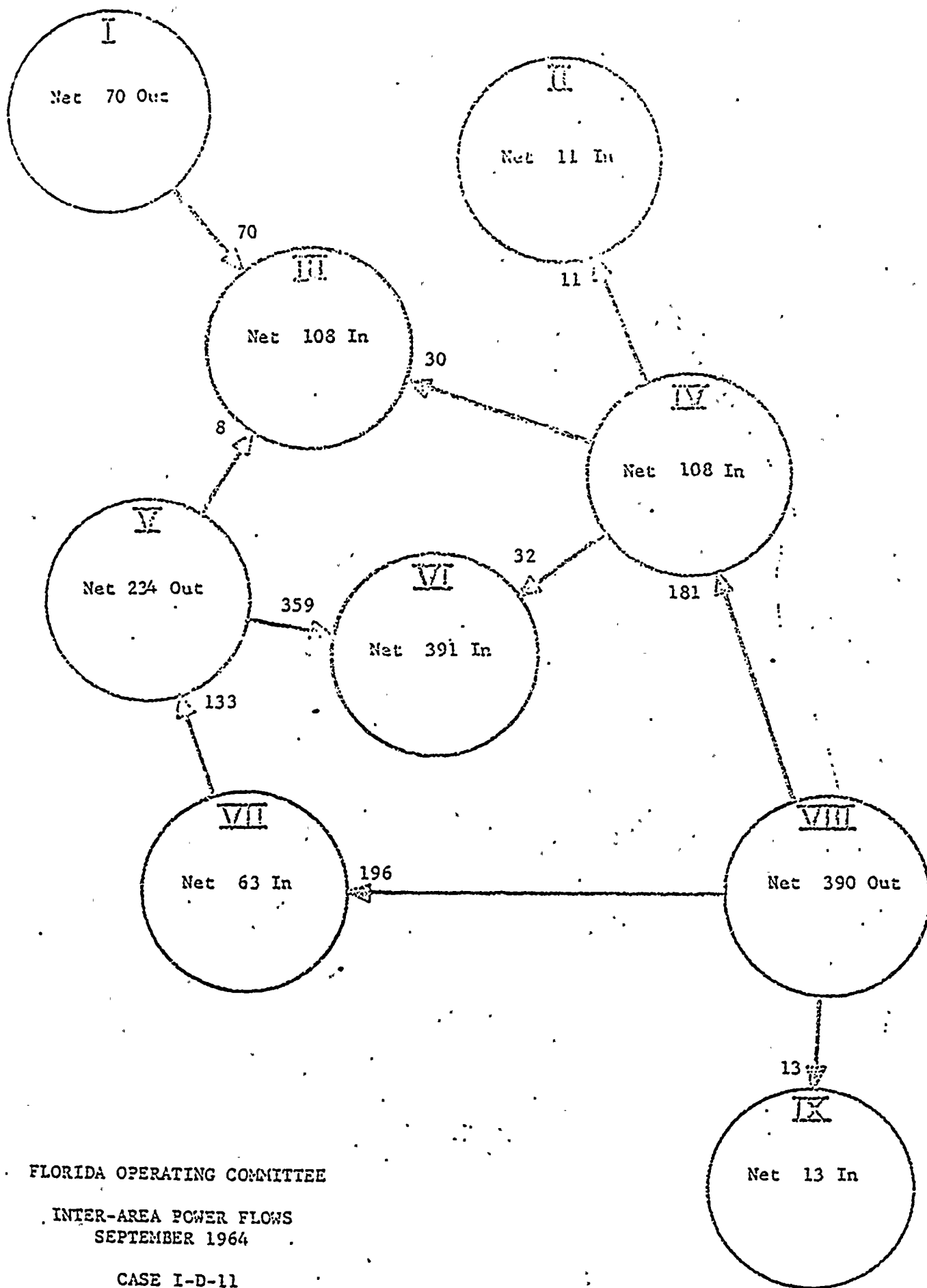
This severe loss of generation was made up by increasing the available area generation up to, or near, capability, including those in the Sarasota and Ft. Myers section, as well as some of the east coast units.

The Ranch-Ft. Myers 230 kv line delivered 141 mw and the South Bay - Ft. Myers 138 kv line 55 mw to Ft. Myers, for a total transfer of 196 mw across the state. Of this amount, 133 mw was delivered to TEC, the balance, 63 mw, being required in the FPL West Coast section.

All voltages were satisfactory and no overloaded lines were noted.

CONCLUSIONS:

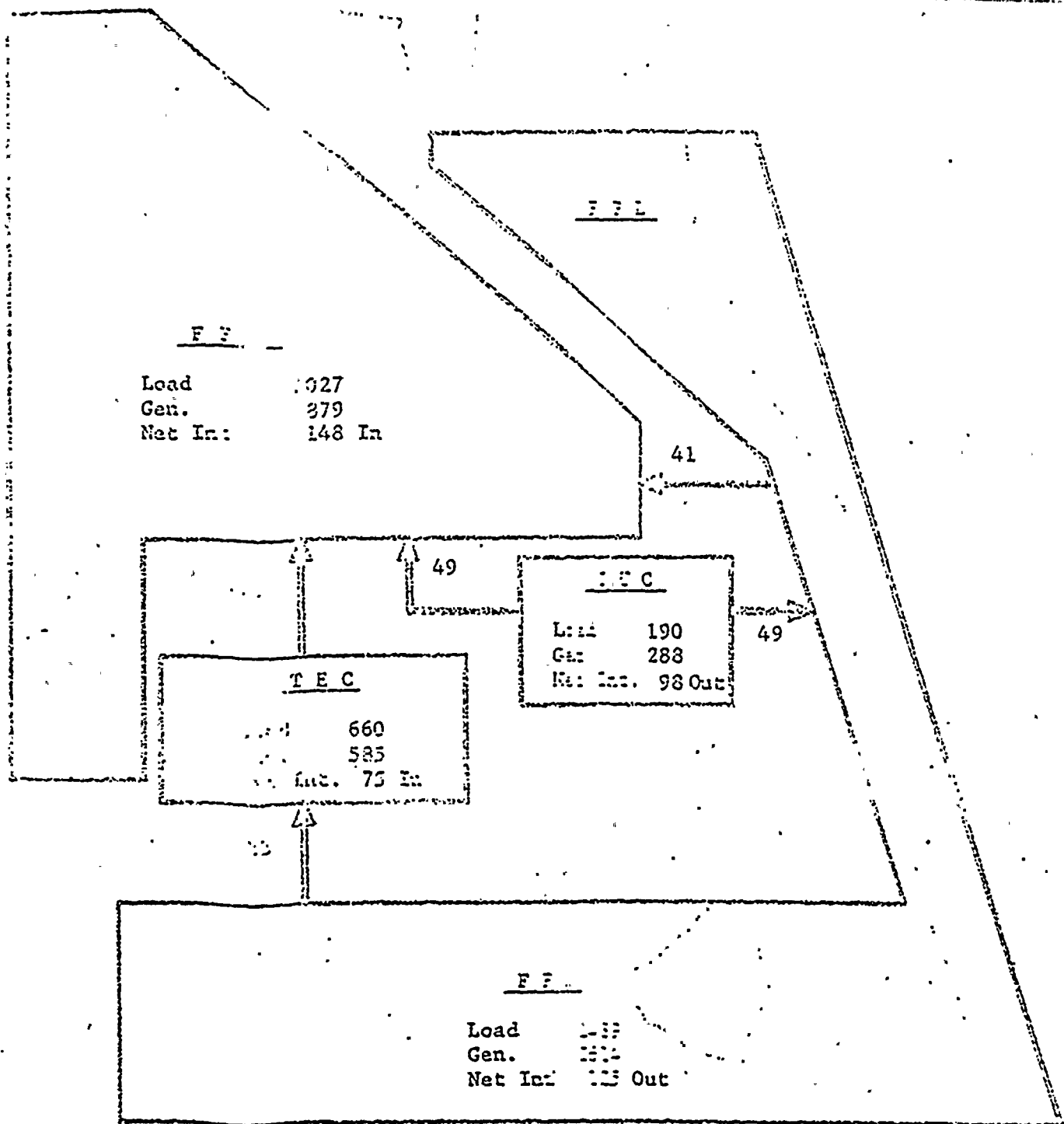
The 1964 Basic System could support the simultaneous loss of the two largest units in the Tampa Bay area during the 1964 Summer peak, with OUC delivering 100 mw and FPL delivering 125 mw to FPC and TEC collectively.



FLORIDA OPERATING COMMITTEE

INTER-AREA POWER FLOWS
SEPTEMBER 1964

CASE I-D-11

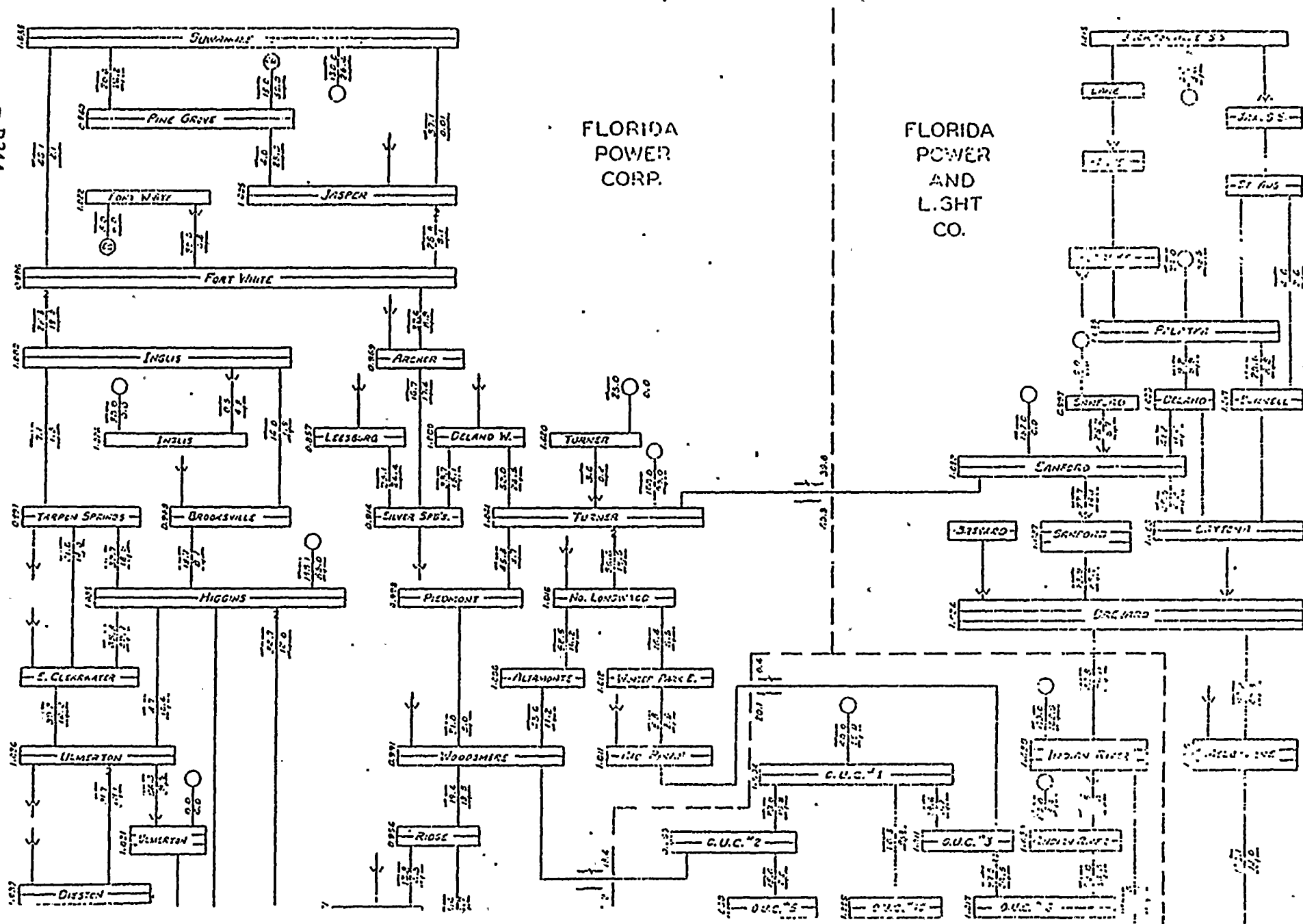


FLORIDA OPERATING COMMITTEE

INTER-SYSTEM POWER FLOWS - SEPT 1964

TOTAL LOAD 4366

SEE I-D-11



CASE 1-D-12

GENERAL CONDITIONS:

- | | |
|-------------------------|------------------------------------------------------------------|
| 1. <u>Generation:</u> | 1964 Basic System; Outage Barton 220 mw and Gannon 204 mw units. |
| 2. <u>Transmission:</u> | 1964 Basic System |
| 3. <u>Load:</u> | September 1964, peak load, 4366 mw. |
| 4. <u>Interchange:</u> | FPL to FPC - 150 mw
FPL to TEC - 75 mw |

PURPOSE:

To determine whether or not the 1964 Basic System could adequately relay the loss of the two largest units in the Tampa Bay area during the peak of the summer of 1964, from available generation on the FPL system. This Case differs from CASE 1-D-11 only in that OUC is on zero interchange.

RESULTS:

The 100 mw increase of generation on the FPL system, as compared to CASE 1-D-11, was made by bringing the Lauderdale and Sarasota plants to capability.

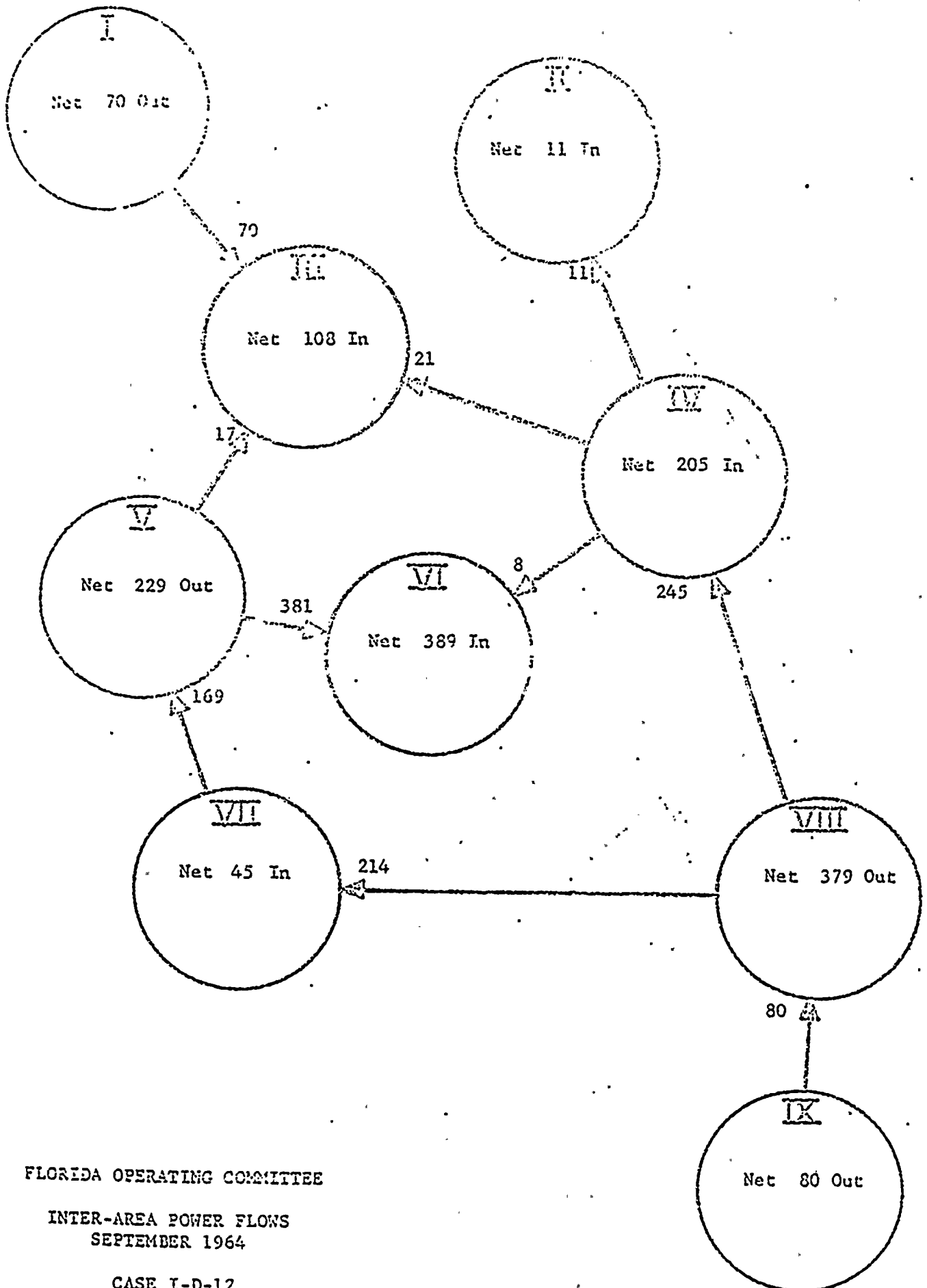
The Ranch 400 mva, 230/138 kv auto-transformer carried 450 mva, an overload of 12.5%. This overload could be taken for a short period of time, to meet the peak hour, in an emergency.

About 25 mw was transferred through the OUC system, from Indian River to the two 115 kv OUC-FPC ties on the west side of the OUC system.

The loading in the Ranch-Pratt Whitney 230 kv line increased from 220 mw in CASE 1-D-11 to 288 mw in CASE 1-D-12. The Ringling - Gannon 230 kv circuit delivered 169 mw to TEC, as compared to 133 mw in CASE 1-D-11.

CONCLUSIONS:

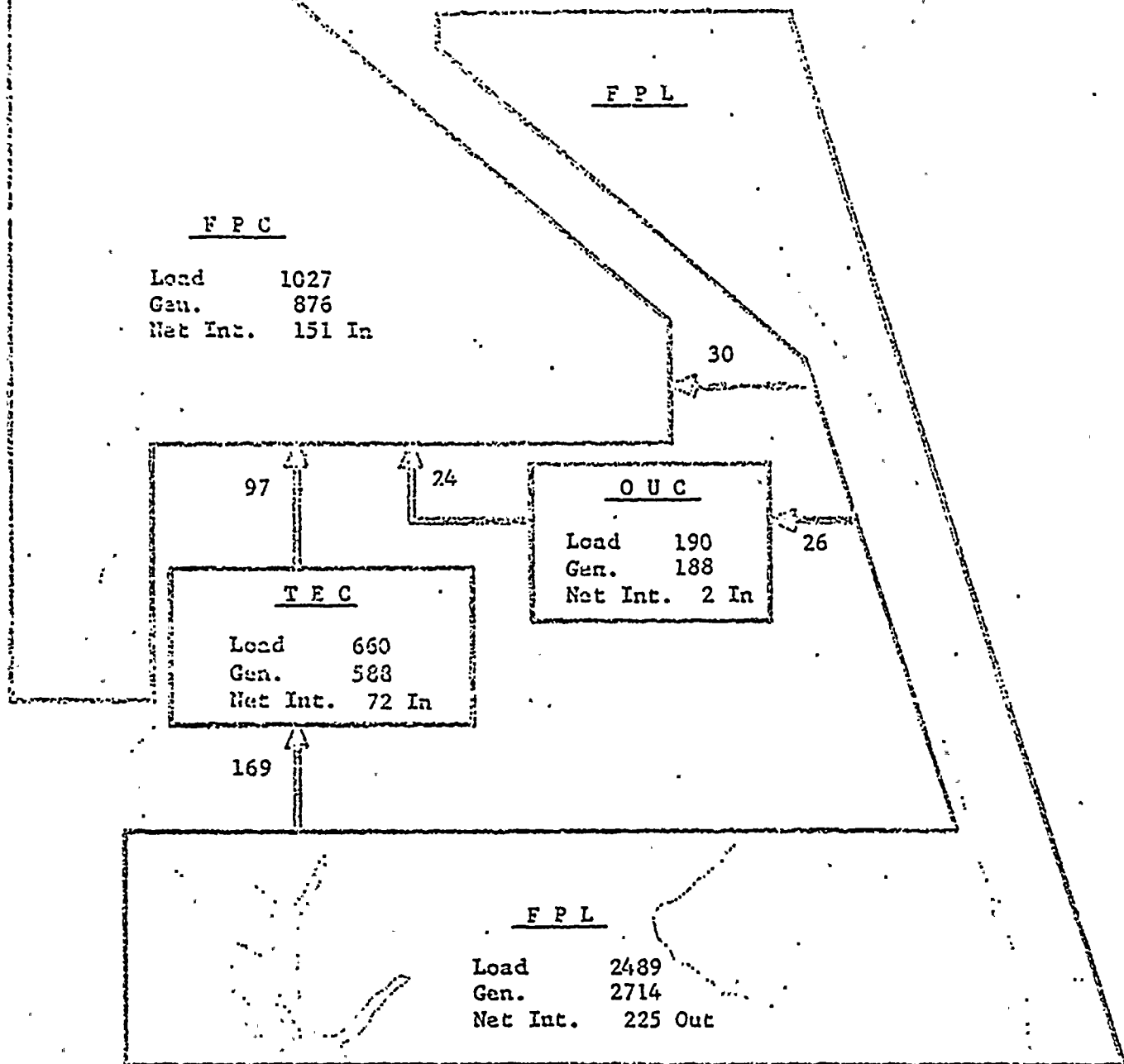
The 1964 Basic System could support the simultaneous loss of the two largest units in the Tampa Bay area during the 1964 Summer peak, with FPL supplying 225 mw to FPC and TEC collectively.



FLORIDA OPERATING COMMITTEE

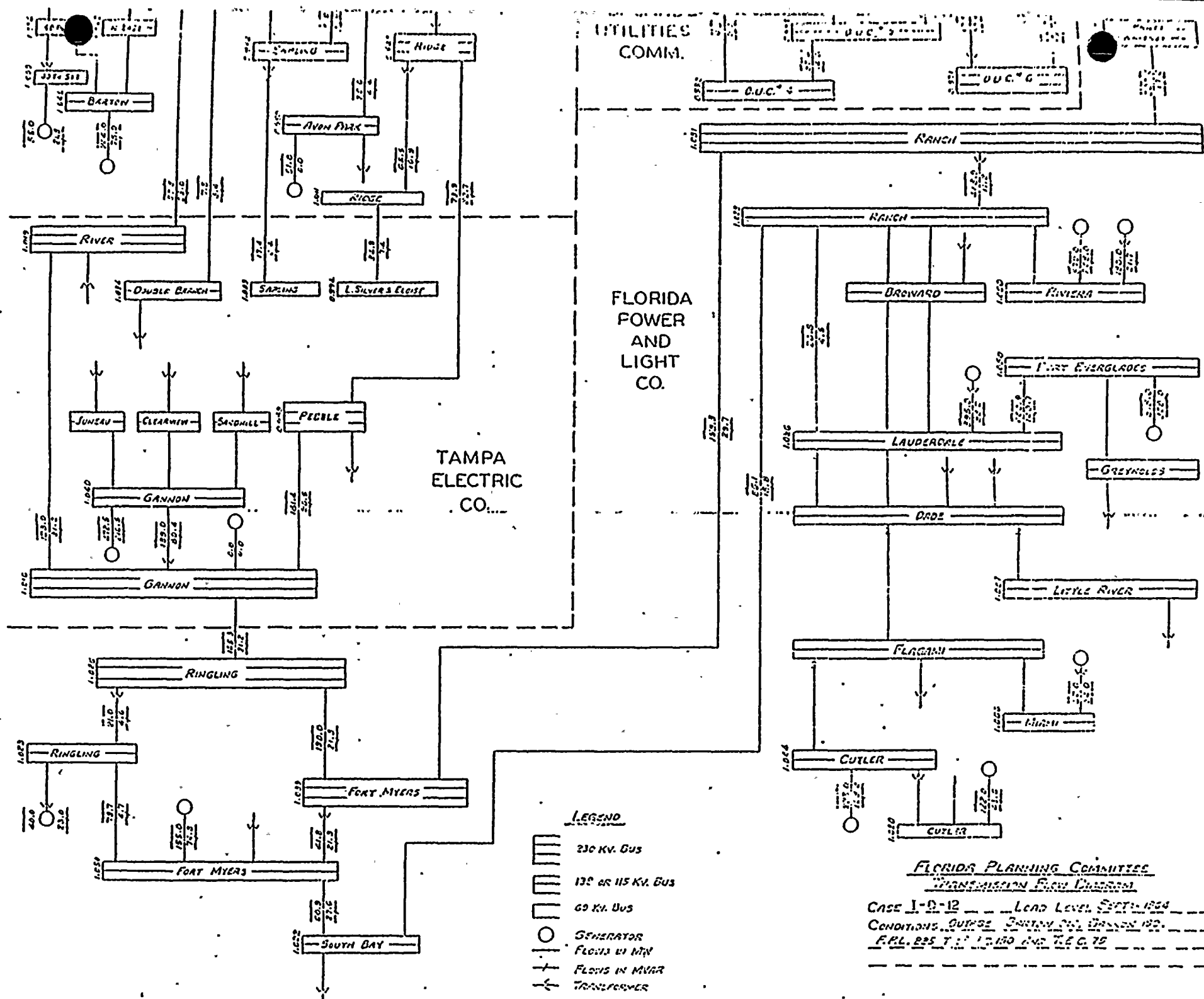
INTER-AREA POWER FLOWS
SEPTEMBER 1964

CASE I-D-12



FLORIDA OPERATING COMMITTEE
 INTER-SYSTEM POWER FLOWS - SEPT 1964
 TOTAL LOAD 4366

CASE I-D-12



LEGEND

- 230 KV. BUS
- 138 OR 115 KV. BUS
- 69 KV. BUS
- GENERATOR
- FLOWS IN MW
- FLOWS IN MW
- TRANSFORMER

FLORIDA PLANNING COMMITTEE
TRANSMISSION FLOW DIAGRAM

CASE 1-9-12 Lead Level SEPT-1954
CONDITIONS: BASED ON 1954-55
F.P.L. 225 T. 12-150 AND T.E. 6.75

GENERAL CONDITIONS:

1. Generation: 1964 Basic System; Outage Pt. Everglades 400 mw and Riviera 300 mw units.
2. Transmission: 1964 Basic System
3. Load: September 1964, peak load, 4366 mw.
4. Interchange:
OUC to FPL - 150 mw
TEC to FPL - 125 mw
FPC to FPL - 100 mw
Total FPL Purchase 375 mw

PURPOSE:

To evaluate the ability of the 1964 Basic System to withstand the simultaneous loss of the Pt. Everglades 400 mw unit and a Riviera 300 mw unit.

RESULTS:

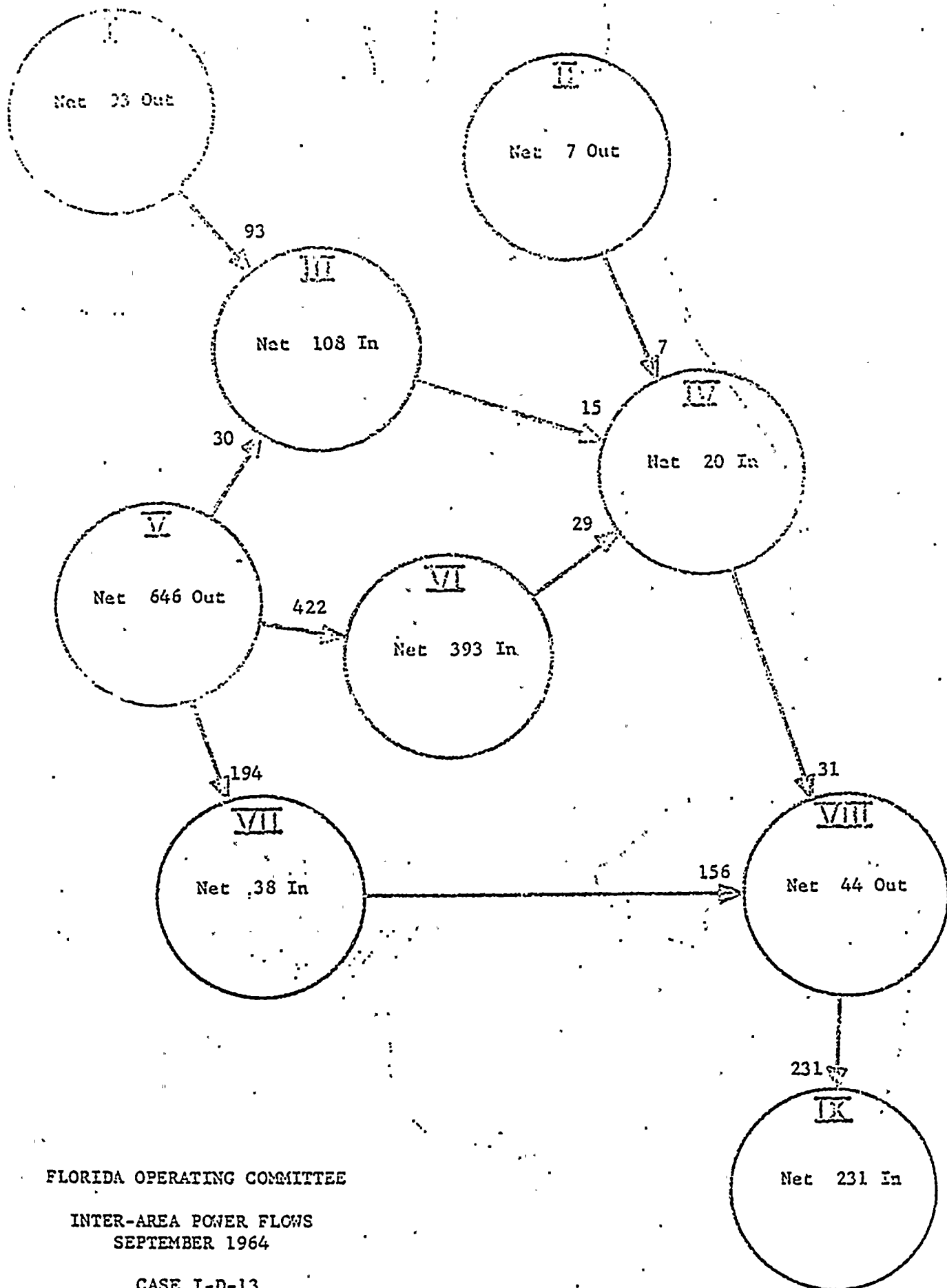
The generation schedule for this emergency involved bringing most of the FPC, TEC, and OUC generators (with the exception of P. O. Knight and Hookers Point) up to, or near capability.

A massive redistribution of flows occurred, the following highlights being noteworthy:

1. The Ranch-Pratt Whitney 230 kv line came to a float, transferring no power or vars. In addition to the 150 mw interchange between OUC and FPL, about 35 mw was transferred west to east, through the OUC system to support the area north of Melbourne.
2. 194 mw was delivered to Ringling, on the FPL - TEC 230 kv tie, and 156 mw flowed across the state on the Ranch-Ft. Myers 230 kv and Ft. Myers - South Bay 138 kv lines.
3. The Ulmerton-River 230 kv tie delivered 93 mw to TEC.

CONCLUSIONS:

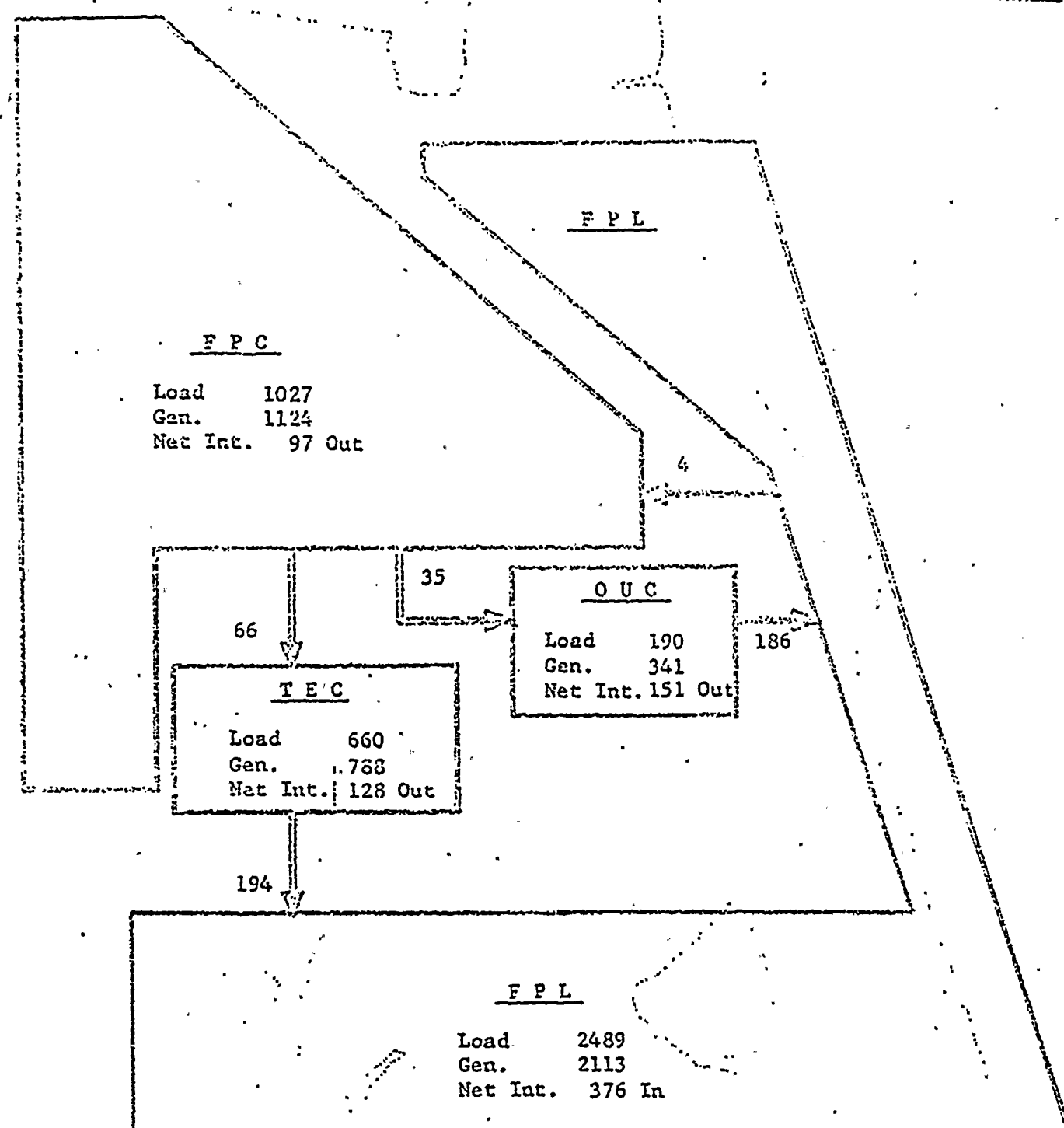
The 1964 Basic System could withstand a simultaneous loss of the Pt. Everglades 400 mw unit and a Riviera 300 mw unit during the 1964 Summer peak, with OUC delivering 150 mw, TEC delivering 125 mw and FPC delivering 100 mw to FPL.



FLORIDA OPERATING COMMITTEE

INTER-AREA POWER FLOWS
SEPTEMBER 1964

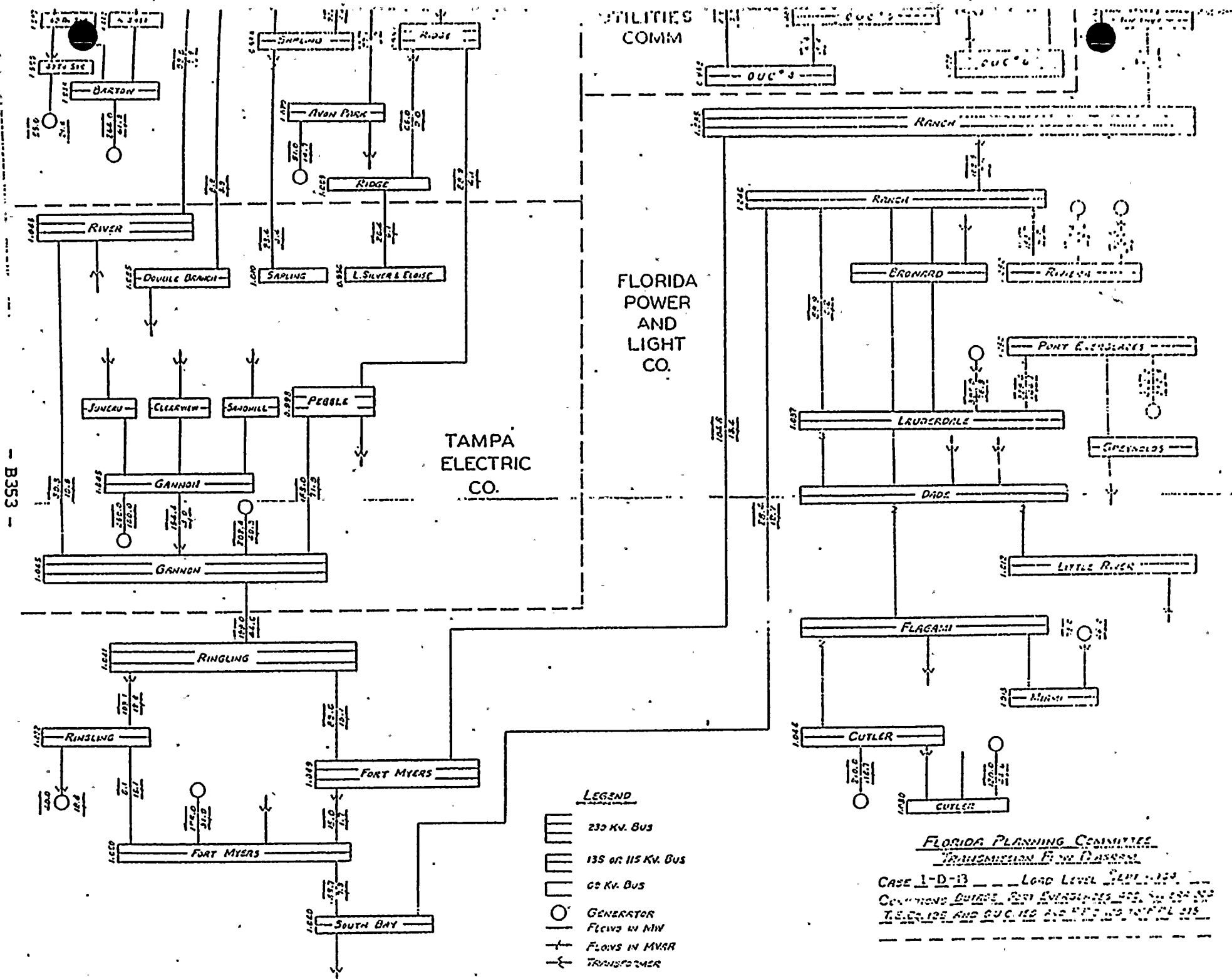
CASE I-D-13



FLORIDA OPERATING COMMITTEE

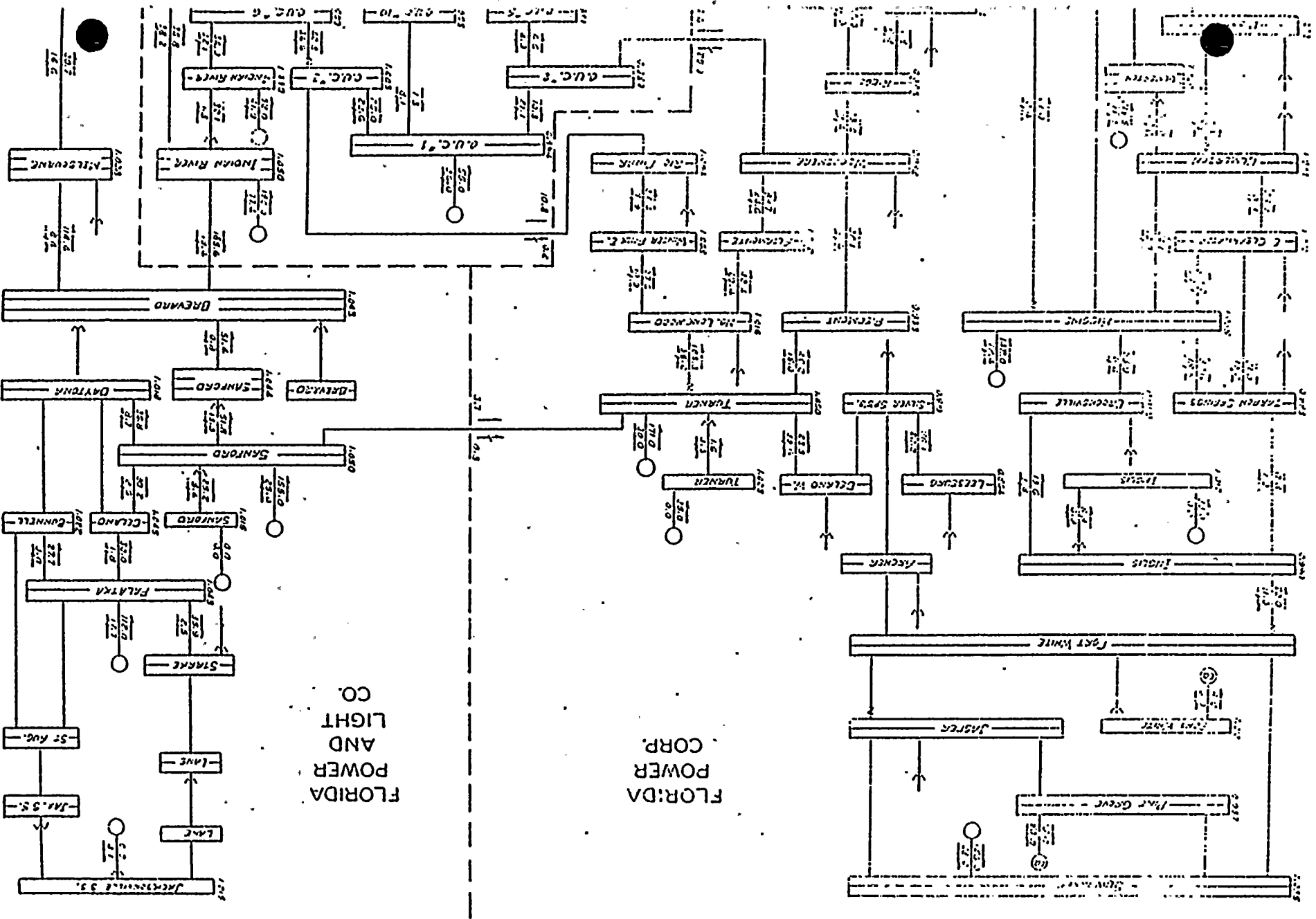
INTER-SYSTEM POWER FLOWS - SEPT. 1964
TOTAL LOAD 4366

CASE I-D-13



FLORIDA POWER CORP.

FLORIDA POWER AND LIGHT CO.



CASE 1-D-14

GENERAL CONDITIONS:

1. Generation: 1964 Basic System; Outage Pt. Everglades 400 mw and Riviera 300 mw units
2. Transmission: 1964 Basic System
3. Load: September 1964, peak load, 4266 mw
4. Interchange: TEC to FPL - 275 mw
FPC to FPL - 100 mw
Total FPL Purchase - 375 mw.

PURPOSE:

To evaluate the ability of the 1964 Basic System to withstand the simultaneous loss of the Pt. Everglades 400 mw unit and a Riviera 300 mw unit. This Case differs from CASE 1-D-13 only in that GUC is not delivering any power to FPL.

RESULTS:

All voltages are satisfactory.

The generation schedule for this emergency involved bringing most of the FPC and TEC generators up to, or near, capability. Hookers Point delivered 116 mw more than in CASE 1-D-13; Gannon, 30 mw more, and Peter O. Knight 15 mw more, to make up the total of 275 mw delivery to FPL.

The Ridge-Woodsmere 115 kv line carried 74 mw, 24 mva above its nominal rating of 50 mva. The total flow on the ties between Areas V and VI and Areas III and IV was 147 mw to the north.

A tabulation of key 230 kv lines shows the basic movement of power across the integrated system:

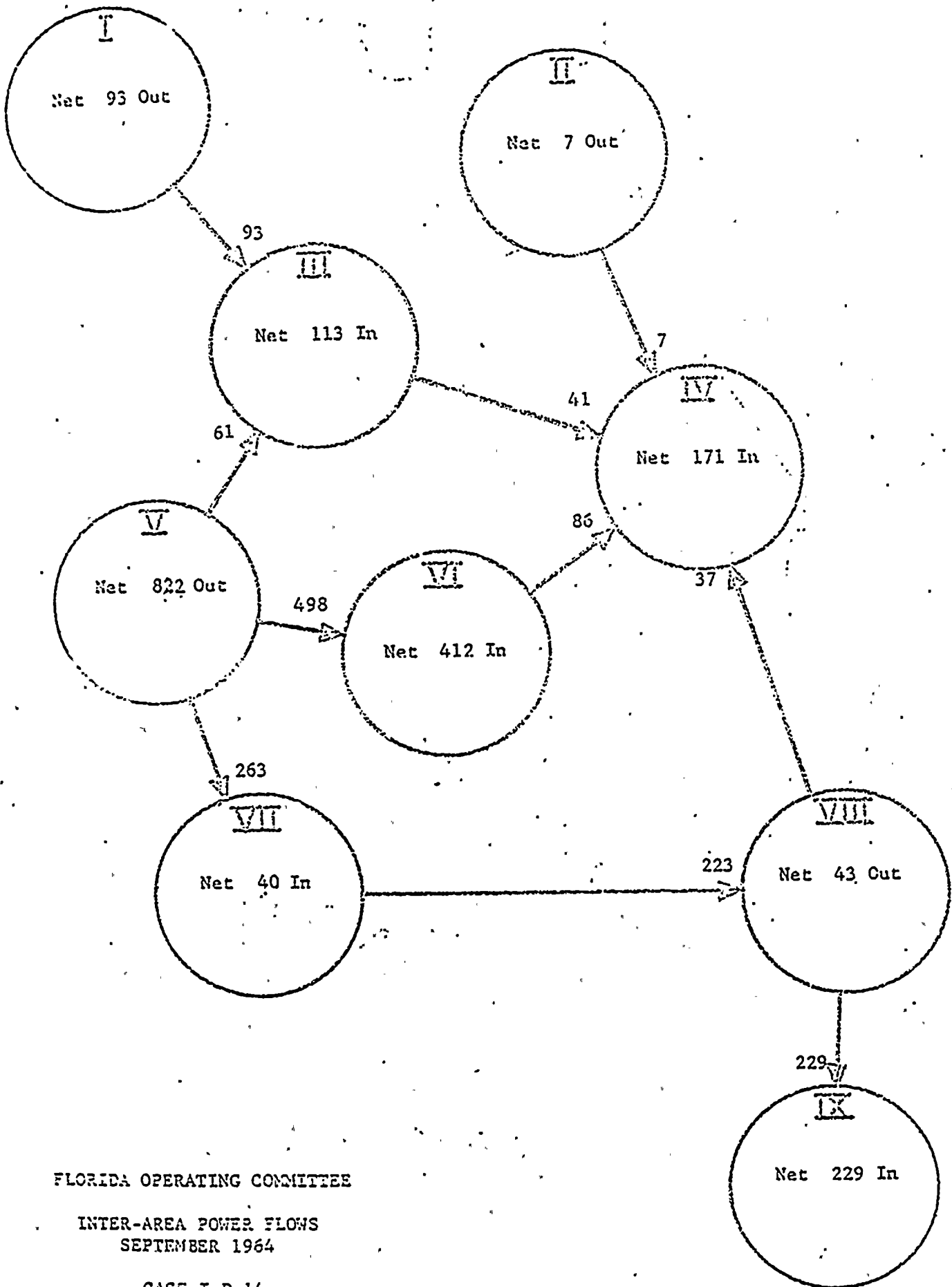
<u>230 kv Line</u>	<u>Flow Mw</u>
Ulmerton to River	91
River to Gannon	67
Gannon to Pebble	213
Gannon to Ringling	263
Ringling to Ft., Myers	144
Ft. Myers to Ranch	154

CASE 1-D-14 (Cont'd.)

There was a transfer by displacement of about 97 mw through the CUC System from west to east.

CONCLUSIONS:

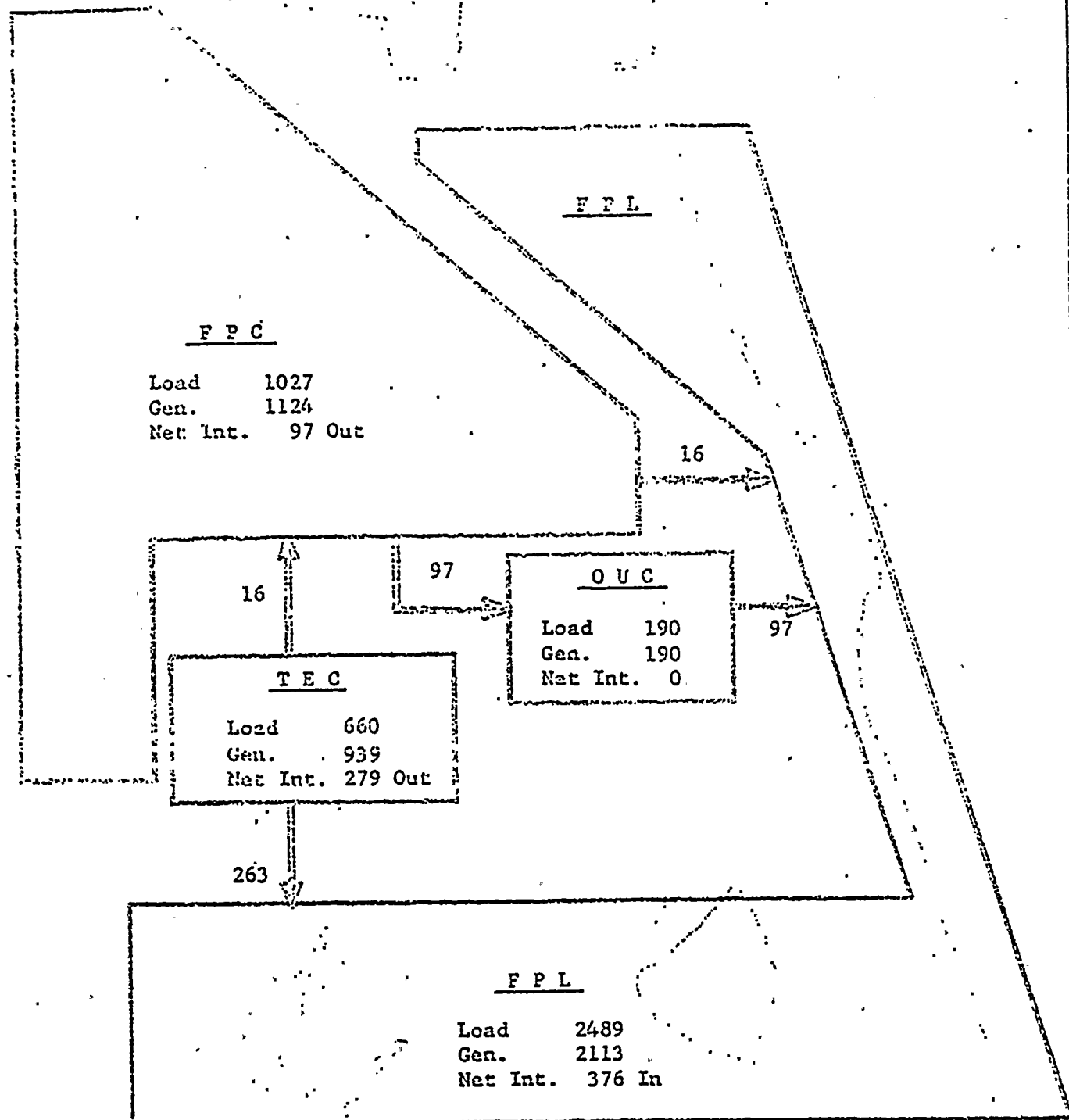
The 1964 Basic System could withstand a simultaneous loss of the Pt. Everglades 400 mw unit and a Riviera 300 mw unit during the 1964 Summer peak, with TEC delivering 275 and FPC, 100 mw to FPL.



FLORIDA OPERATING COMMITTEE

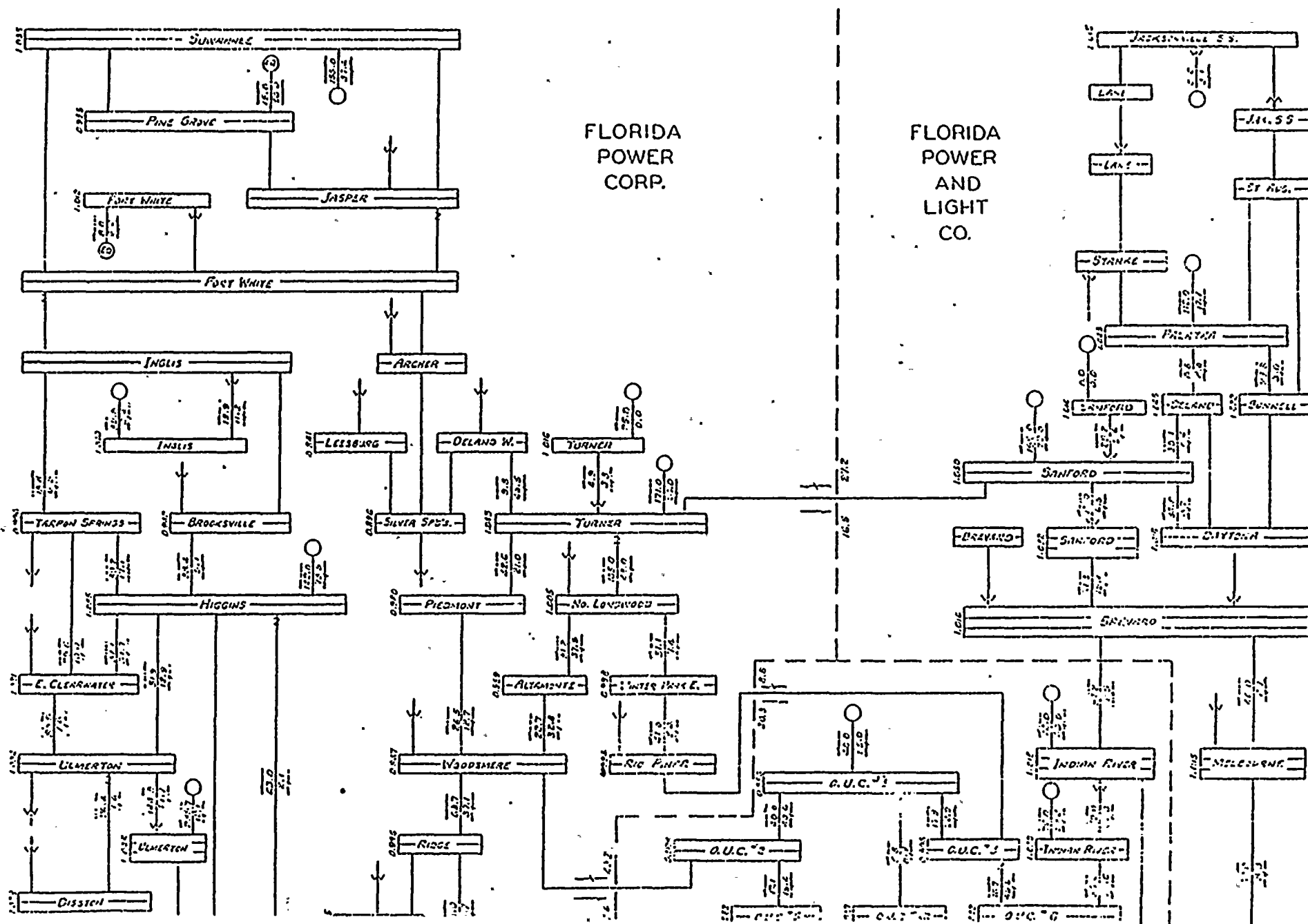
INTER-AREA POWER FLOWS
SEPTEMBER 1964

CASE I-D-14



FLORIDA OPERATING COMMITTEE
 INTER-SYSTEM POWER FLOWS - SEPT 1964
 -TOTAL LOAD 4366

CASE I-D-14



CASE 1-C-1

GENERAL CONDITIONS:

1. Generation: 1964 Basic System
2. Transmission: 1964 Basic System, modified as follows:
North Longwood-Rio Pinar-OUC circuit operating at 230 kv, terminated at the OUC #6 Substation;
2nd OUC #6 - OUC #3 115 kv circuit eliminated.
3. Load: September 1964, peak load, 4366 mw.
4. Interchange: OUC to FPL - 100 mw.

PURPOSE:

This Case, along with CASES 1-C-2, 1-C-3, and 1-C-4, is for the purpose of examining the possibility of operating the North Longwood-Rio Pinar-OUC circuit at 230 kv rather than 115 kv. This is the Base Case for the series.

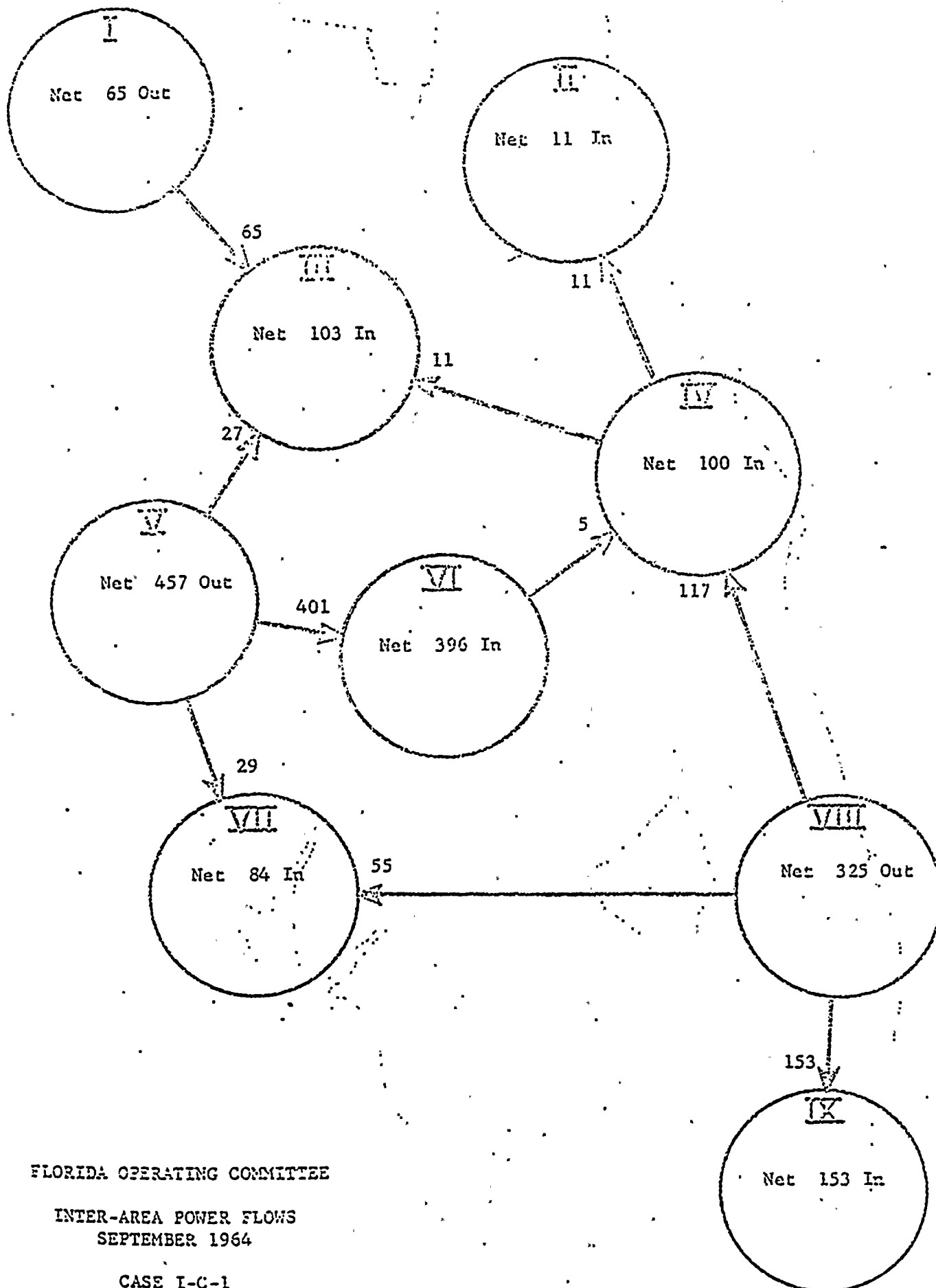
RESULTS:

All voltages satisfactory.

With the exception of minor flow changes, this Case is no different than CASE 1-D-1. Rio Pinar, being a 230 kv load bus in this Case, is receiving 32 mw from OUC as compared to 7 mw in CASE 1-D-1, because it is electrically closer to the OUC power source than in CASE 1-D-1.

CONCLUSIONS:

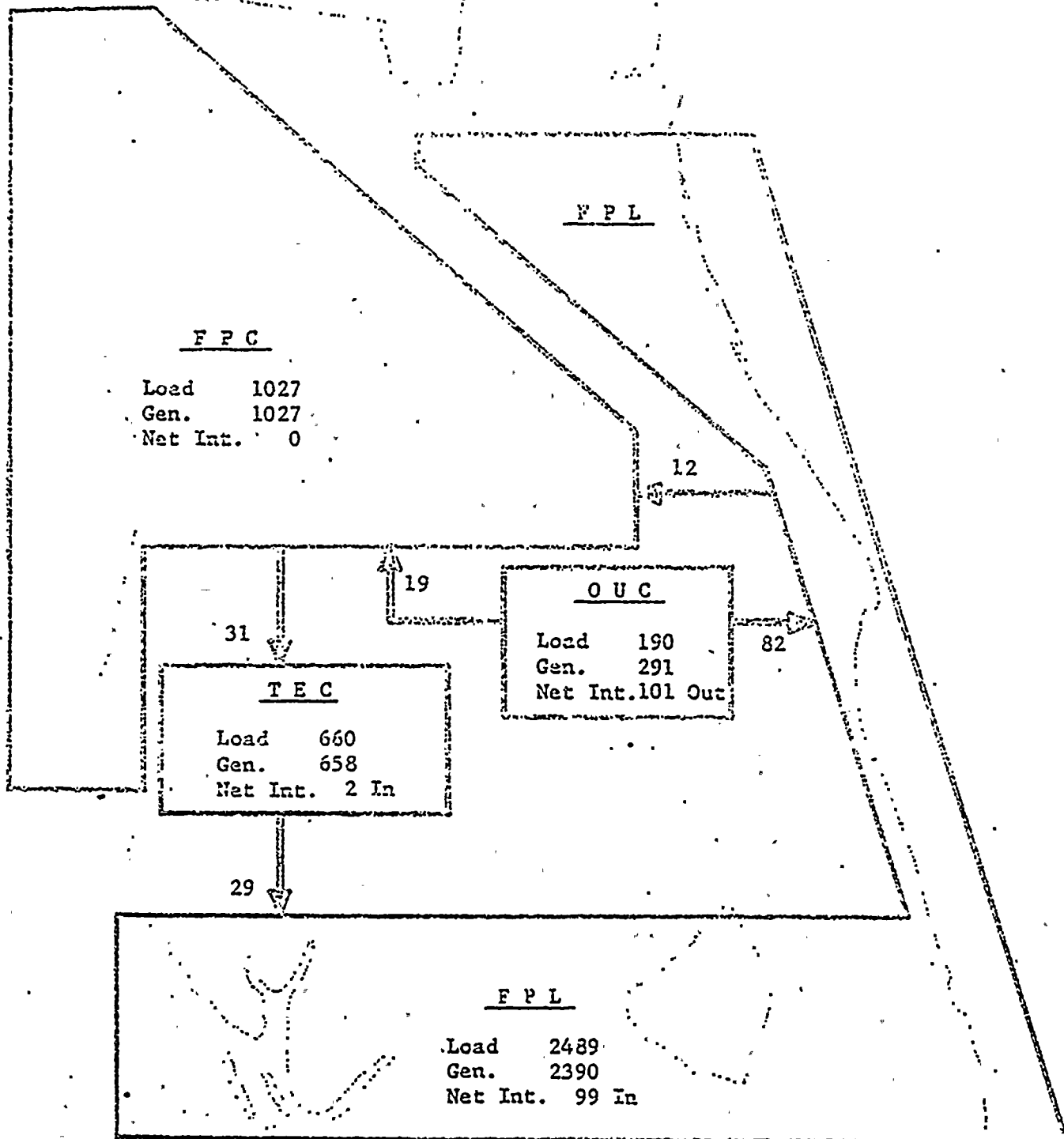
At the September 1964 load level the North Longwood-Rio Pinar-OUC line performs no differently at 230 kv than at 115 kv, with the system normal.



FLORIDA OPERATING COMMITTEE

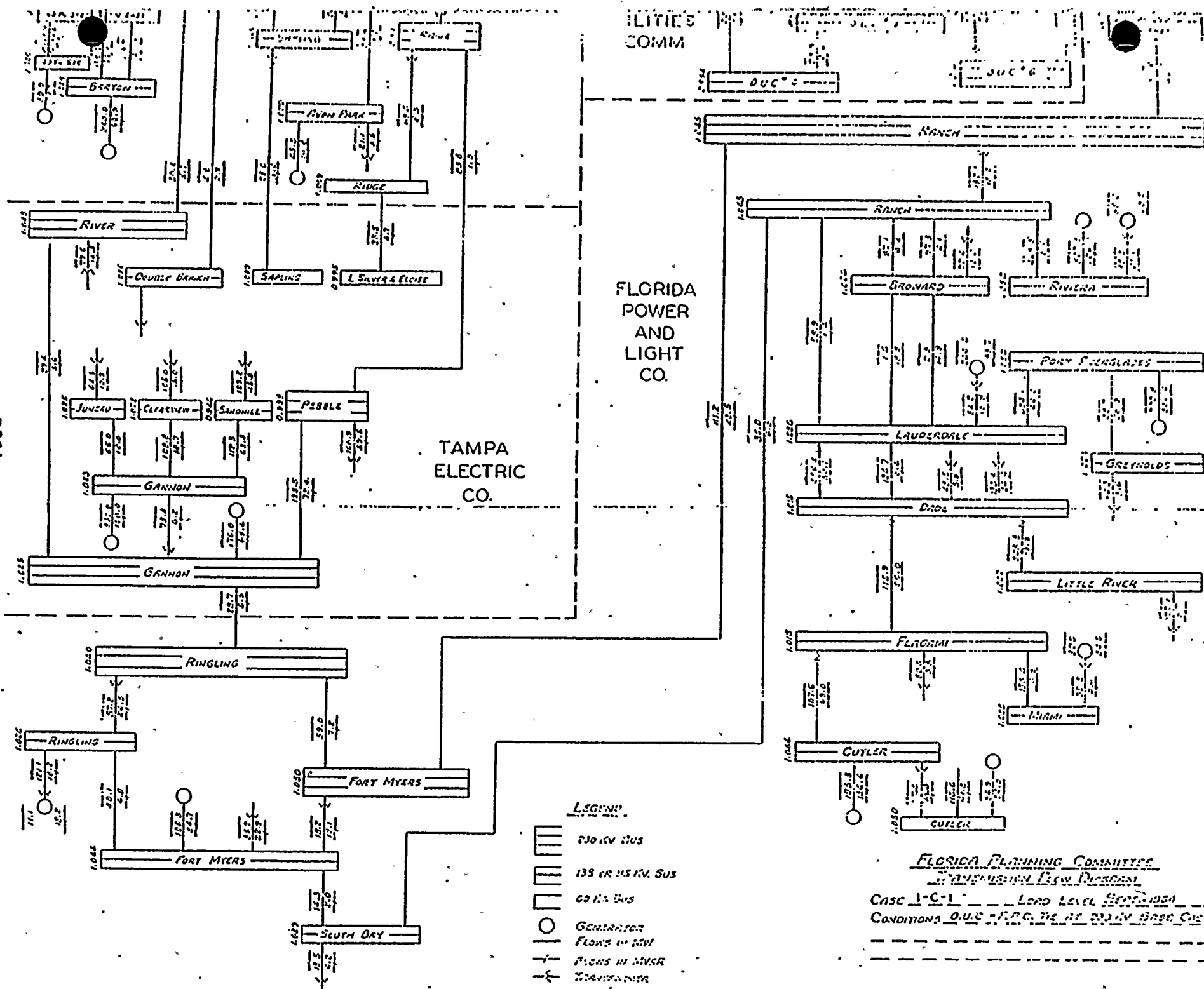
INTER-AREA POWER FLOWS
SEPTEMBER 1964

CASE I-C-1



FLORIDA OPERATING COMMITTEE
 INTER-SYSTEM POWER FLOWS - SEPT 1964
 TOTAL LOAD 4366

CASE I-C-1



LEGEND

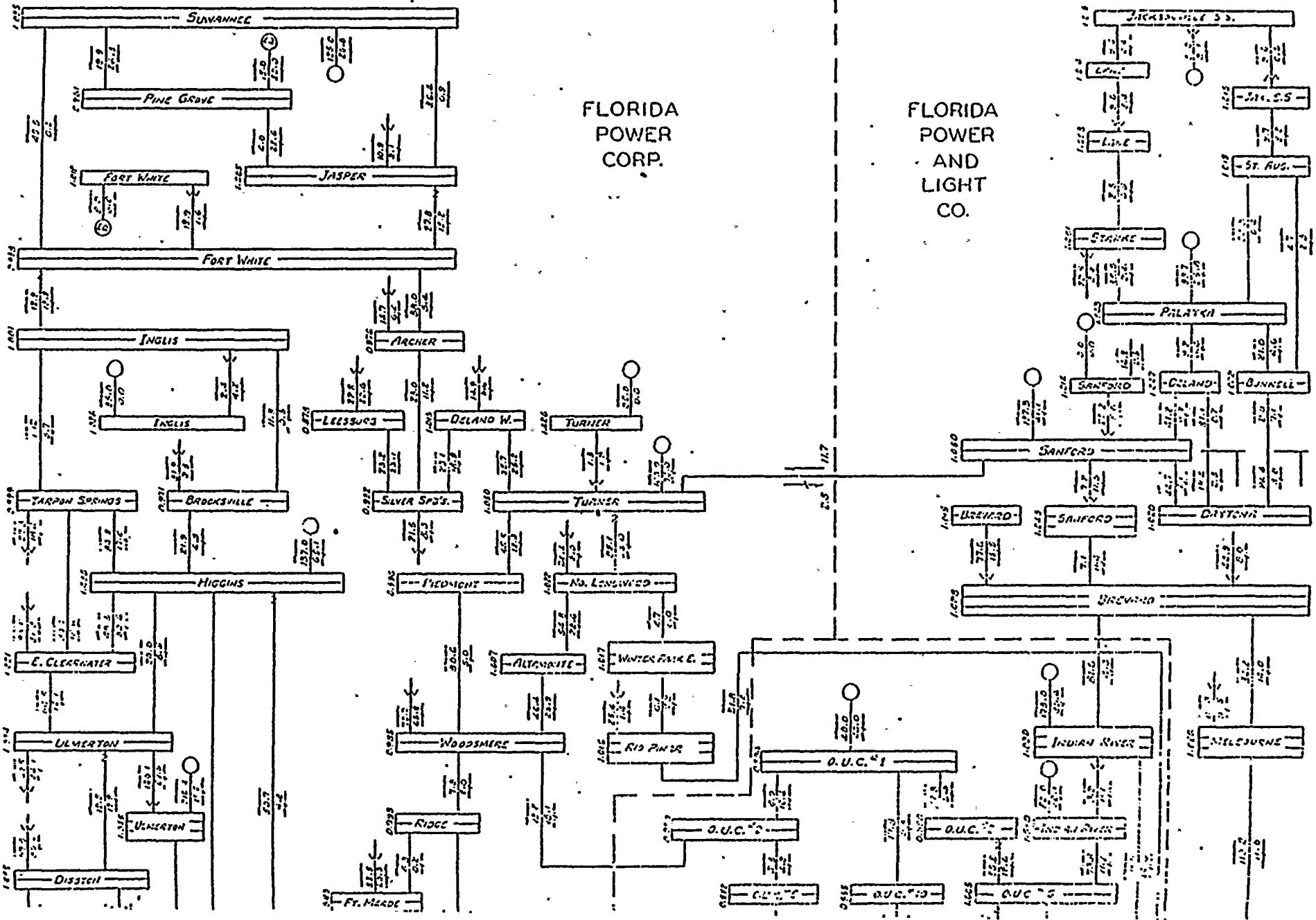
- 230 KV BUS
- 138 OR 115 KV BUS
- 69 KV BUS
- GENERATOR
- FLWS IN MW
- FLWS IN MW
- TRANSFORMER

FLORIDA PLANNING COMMITTEE
TRANSMISSION LINE DESIGN

CASE 1-C-1 - LOAD LEVEL SEPTEMBER
CONDITIONS 0.45 - F.P.C. 75 AT 230 KV BASE CASE

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AND
LIGHT
CO.



CASE 1-C-2

GENERAL CONDITIONS:

1. Generation: 1964 Basic System
2. Transmission: 1964 Basic System, modified as noted in CASE 1-C-1; Outage Indian River-Brevard 230 kv line.
3. Load: September 1964, peak load, 4366 mw.
4. Interchange: OUC to FPL - 100 mw

PURPOSE:

To test the performance of the System under an outage of the Indian River-Brevard 230 kv line.

RESULTS:

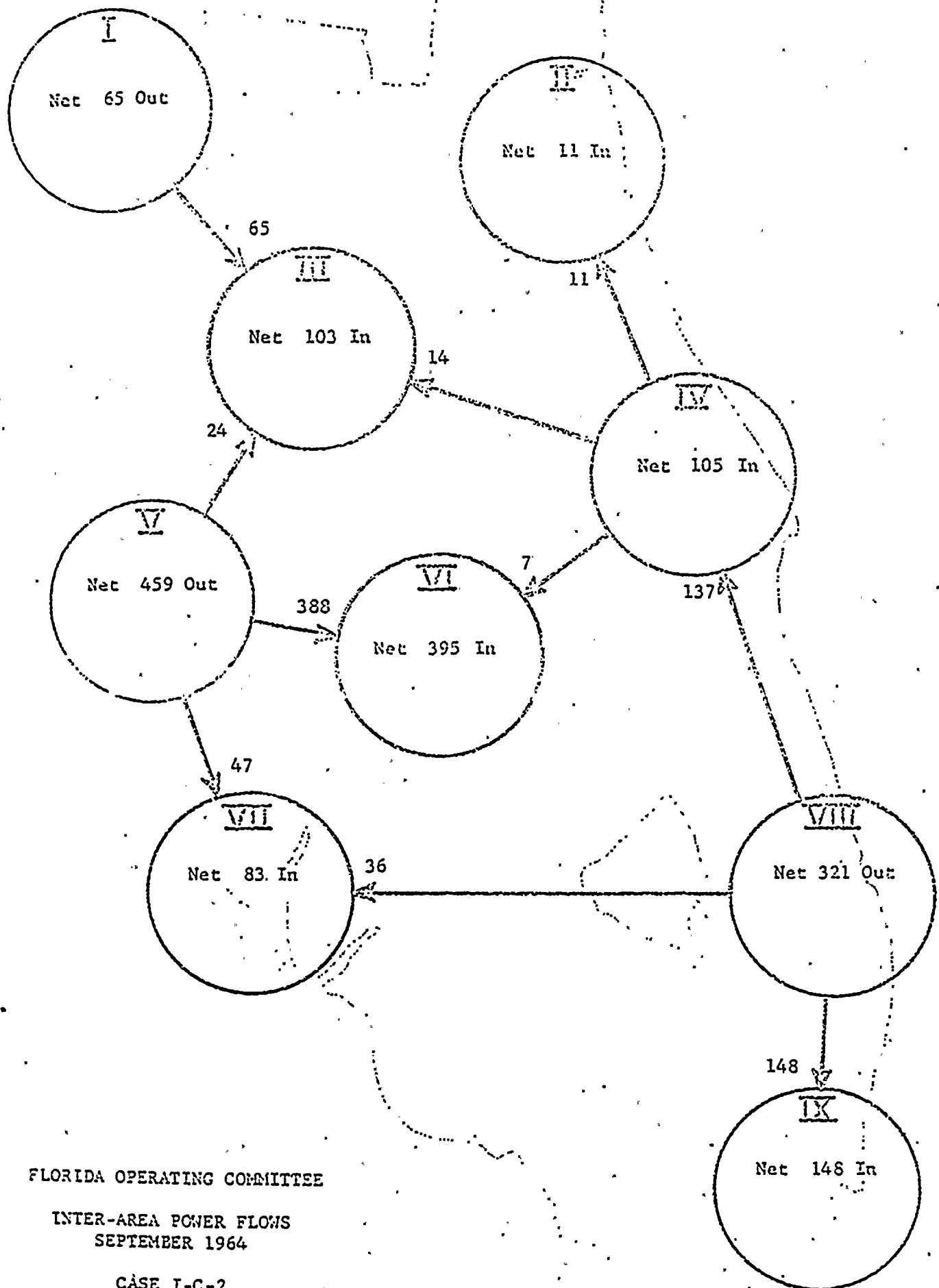
Inasmuch as the modified Base Case for this series, CASE 1-C-1, differs only slightly from BASE CASE 1-D-1, the analysis of this Case is applicable whether the North Longwood-Rio Pinar-OUC line operates at 230 kv or 115 kv.

The delivery of 100 mw into the FPC System from OUC actually tends to reduce loadings on the FPC and TEC transmission systems because the demand created in the Brevard and Melbourne load centers allows 52 mw of the Turner generation to be delivered into Sanford, while the OUC delivery is being made directly to the FPC loads south of Turner. About 47 mw of the 100 mw purchase was transferred by displacement, through FPC and TEC to FPL at Ringling.

There is a difference of 2.6% voltage and 11.22 degrees phase angle between the Indian River and Brevard 230 kv busses. If the 230 kv line were to be closed under these conditions, the system would be momentarily disturbed, but would quickly settle to the conditions shown in CASE 1-C-1. This condition does not appear to warrant consideration of the installation of a voltage and phase angle regulator in the tie line.

CONCLUSION:

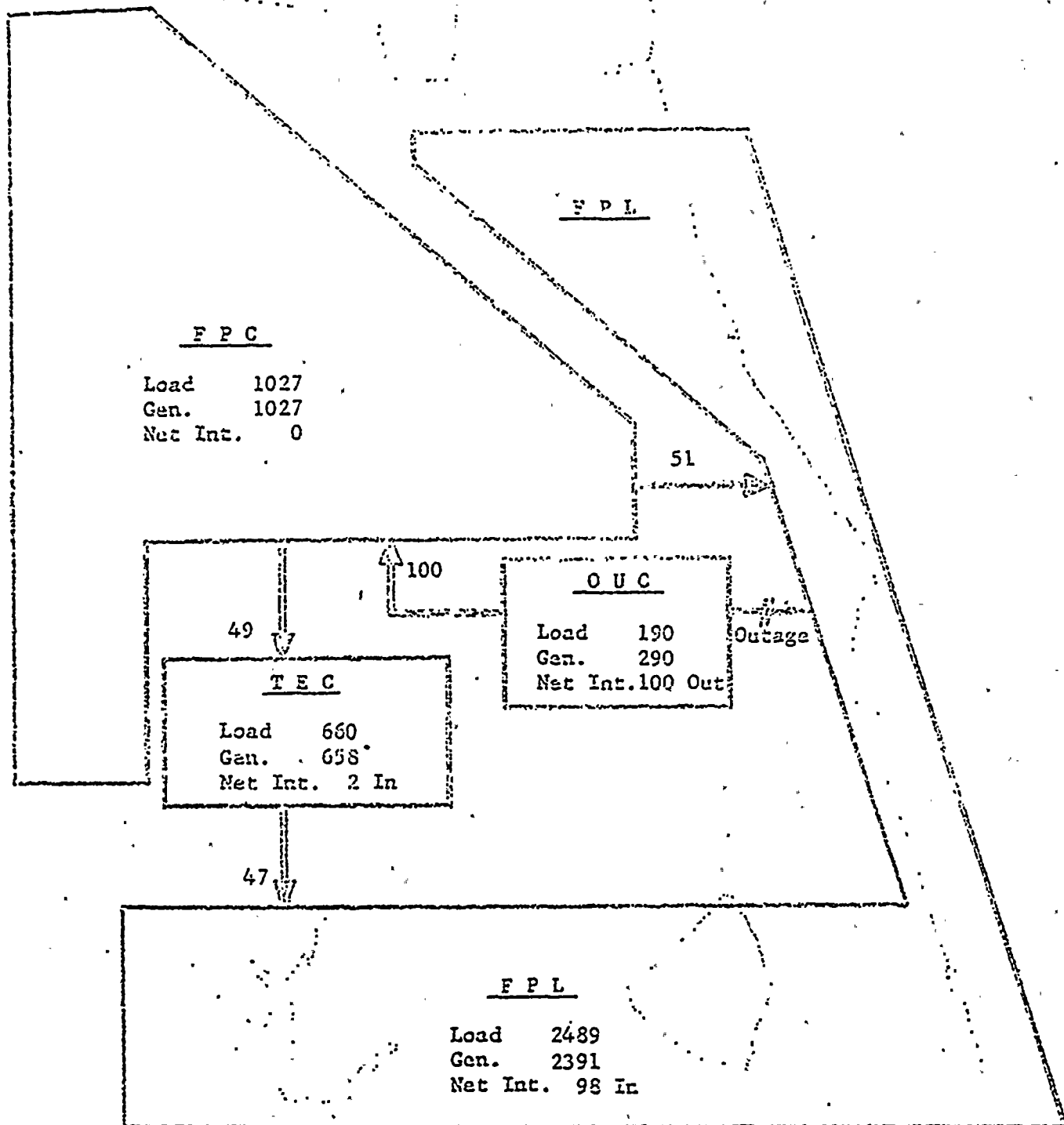
A generation schedule of FPL purchasing 100 mw from OUC could be maintained over the 1964 Summer peak with the loss of the Indian River-Brevard 230 kv line.



FLORIDA OPERATING COMMITTEE

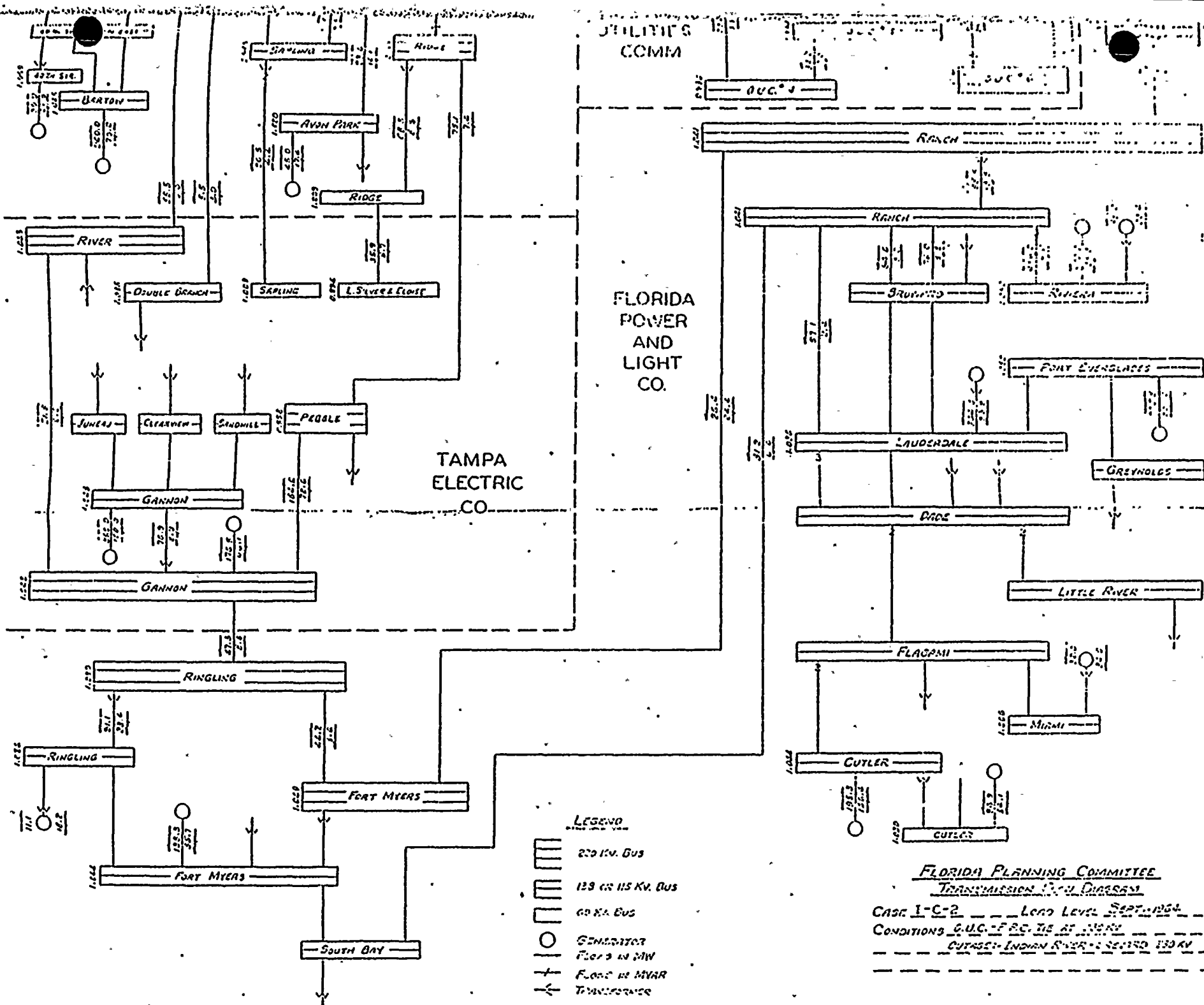
INTER-AREA POWER FLOWS
SEPTEMBER 1964

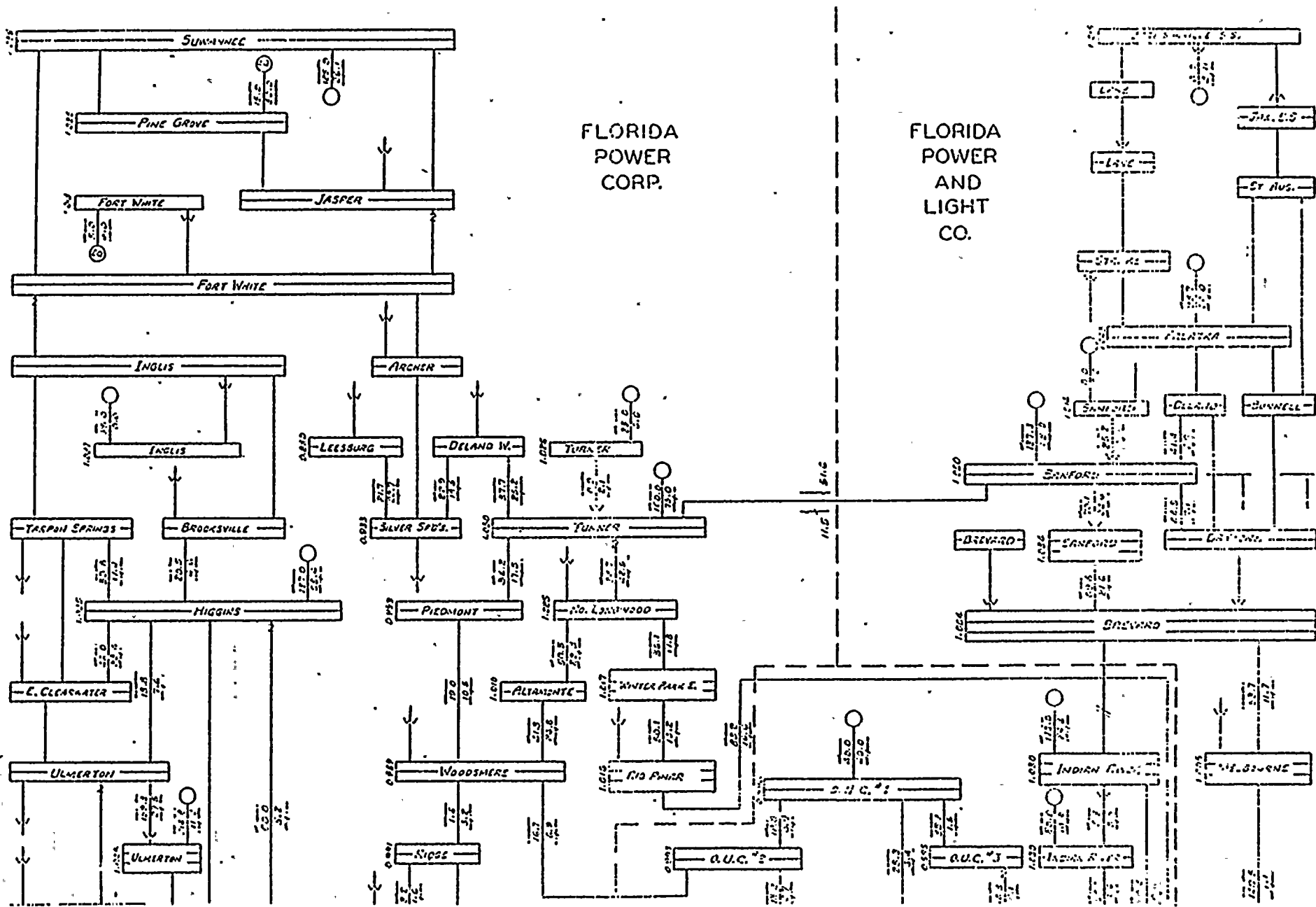
CASE I-C-2



FLORIDA OPERATING COMMITTEE
 INTER-SYSTEM POWER FLOWS - SEPT 1964
 TOTAL LOAD 4366

CASE I-C-2





CASE 1-C-3

GENERAL CONDITIONS:

1. Generation: 1964 Basic System.
2. Transmission: 1964 Basic System, modified as noted in CASE 1-C-1; Outage Indian River-OUC #6 230 kv line.
3. Load: September 1964, peak load, 4356 mw.
4. Interchange: OUC to FPL - 100 mw.

PURPOSE:

To evaluate the operation of the system under an outage of the Indian River-OUC #6 230 kv line.

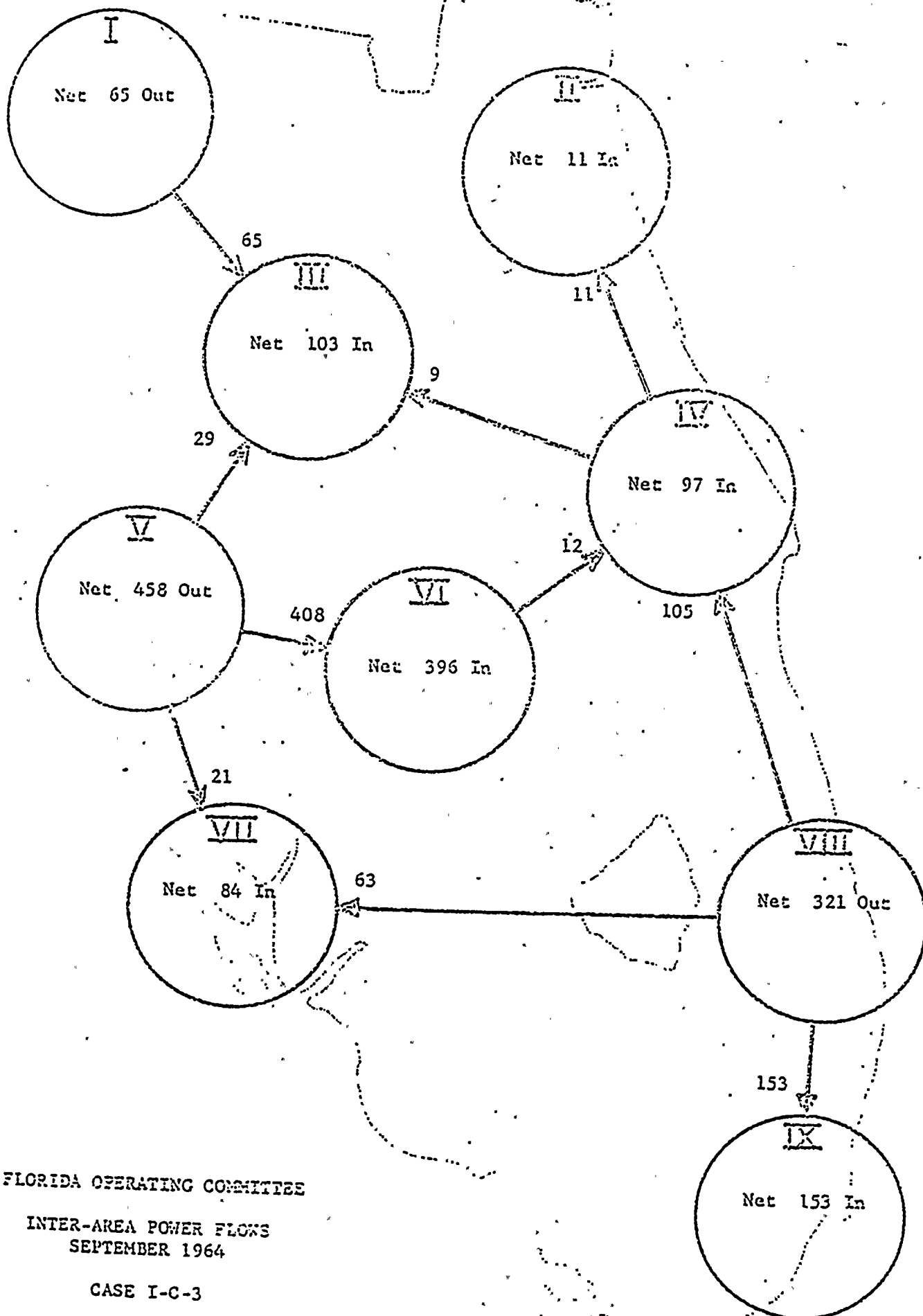
RESULTS:

The Indian River-Brevard 230 kv line delivered 124 mw to Brevard, while about 24 mw was displaced from Sanford to Turner for return to OUC on the west side of the OUC System.

All voltages are satisfactory. This 230 kv line carried 90 mw in CASE 1-C-1, while the flow on the Indian River - OUC #6 double-circuit 115 kv line was 74 mw; in this outage Case the latter line flow was increased to 122 mw.

CONCLUSIONS:

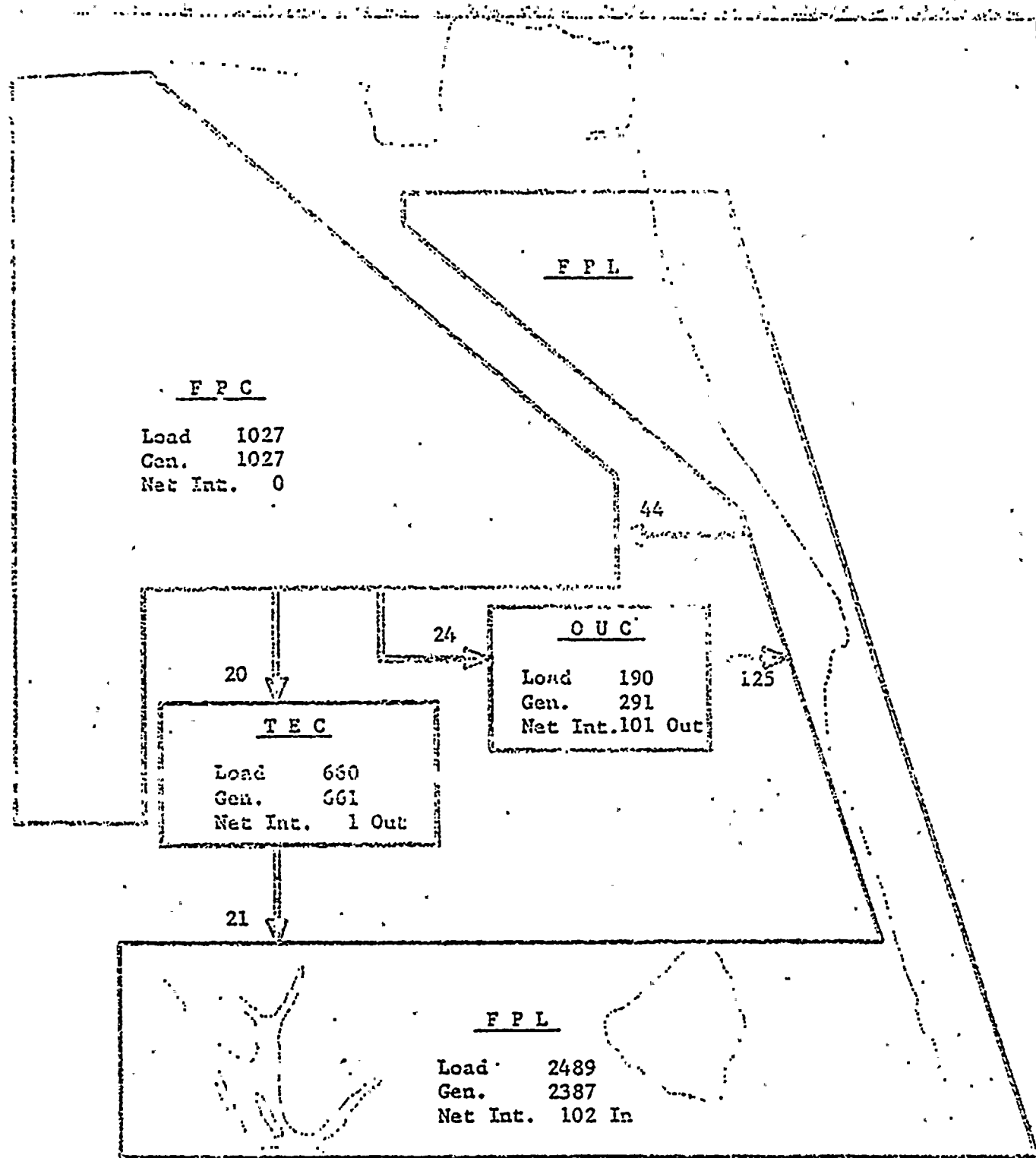
The System would perform adequately with the loss of the Indian River-OUC #6 230 kv line, during the 1964 Summer peak load, with a generation schedule of OUC selling 100 mw to FPL.



FLORIDA OPERATING COMMITTEE

INTER-AREA POWER FLOWS
SEPTEMBER 1964

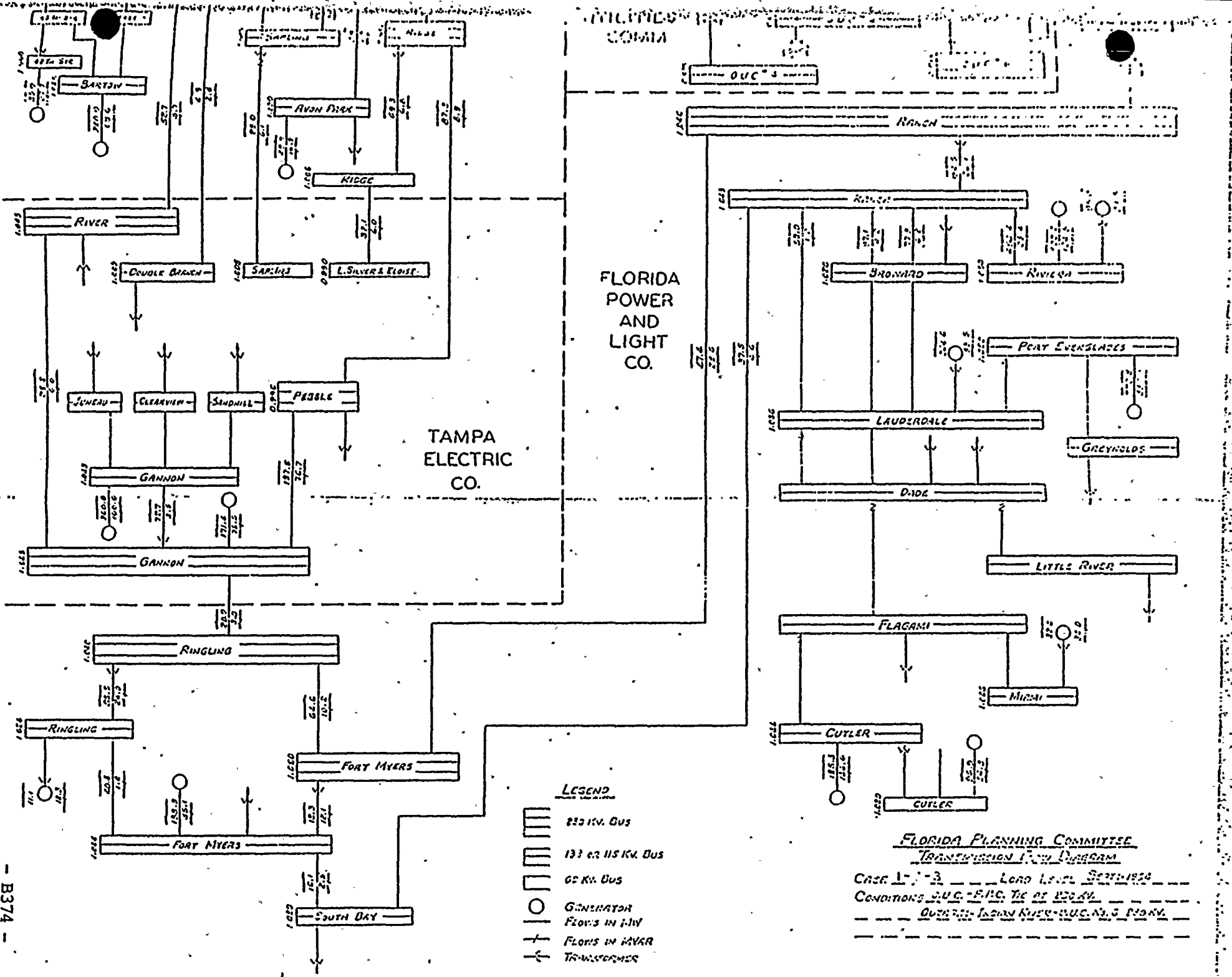
CASE I-C-3



FLORIDA OPERATING COMMITTEE

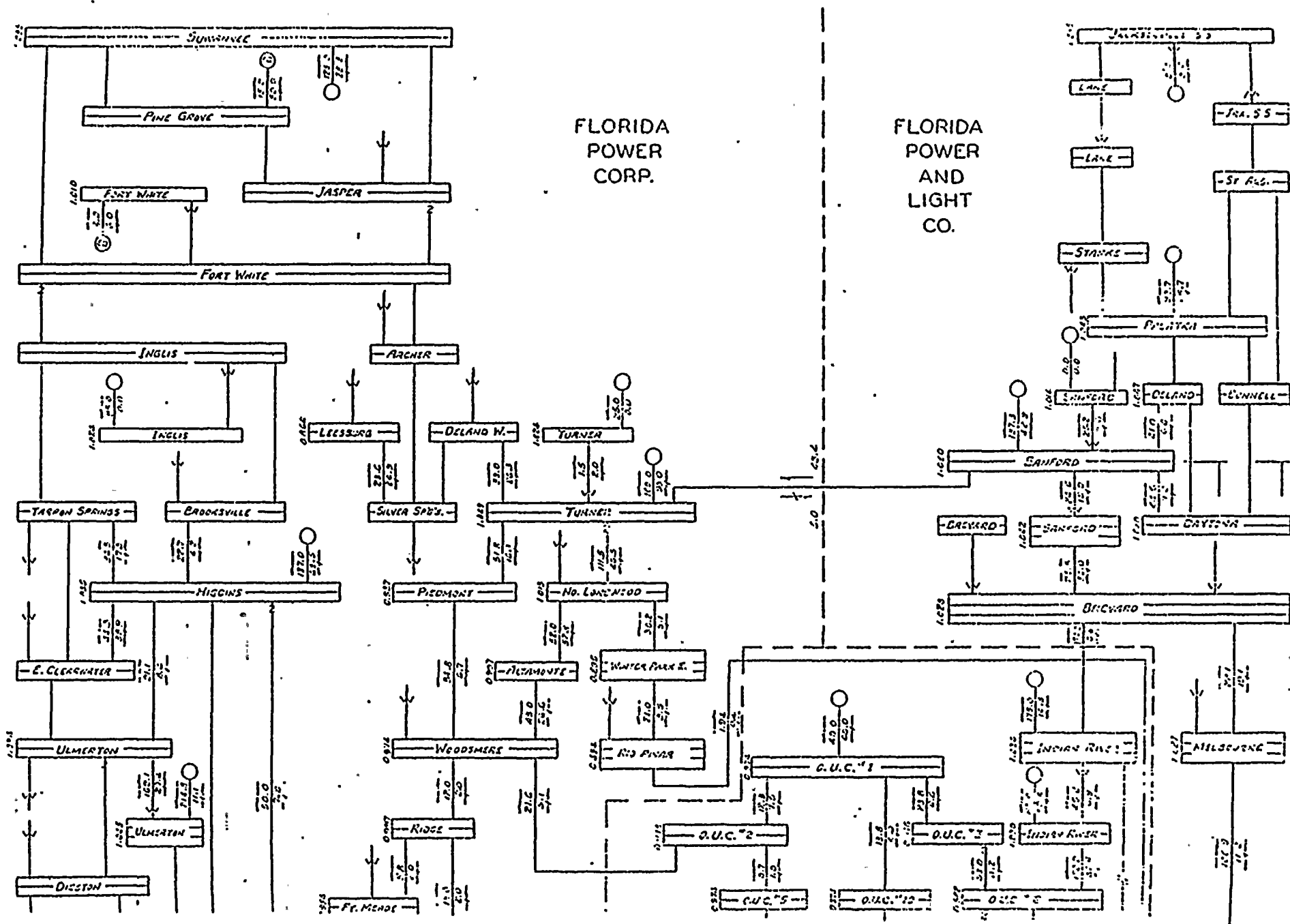
INTER-SYSTEM POWER FLOWS - SEPT 1964
TOTAL LOAD 4366

CASE I-C-3



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AND
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CASE 1-C-4

GENERAL CONDITIONS:

1. Generation:

1964 Basic System; Outage Indian River #2 -
210 mw unit.

2. Transmission:

Basic System, modified as noted in CASE 1-C-1.

3. Load:

September 1964, peak load, 4366 mw.

4. Interchange:

FPC to OUC - 25 mw.

FPL to OUC - 25 mw.

PURPOSE:

To test the performance of the System under the loss of the Indian
River #2 - 200 mw unit.

RESULTS:

Of the 173 mw loss, as compared to CASE 1-C-1, about 62 mw was made up
in Areas II and IV as follows:

<u>Generator</u>	<u>Generation - Mw</u>		
	<u>Case 1-C-1</u>	<u>Case 1-C-4</u>	<u>Net Change</u>
Indian River #1	80	82	2
Lake Highland	40	55	15
Turner 115 kv	160	171	11
Sanford 115 kv	137	155	18
Palatka	94	120	16
			62

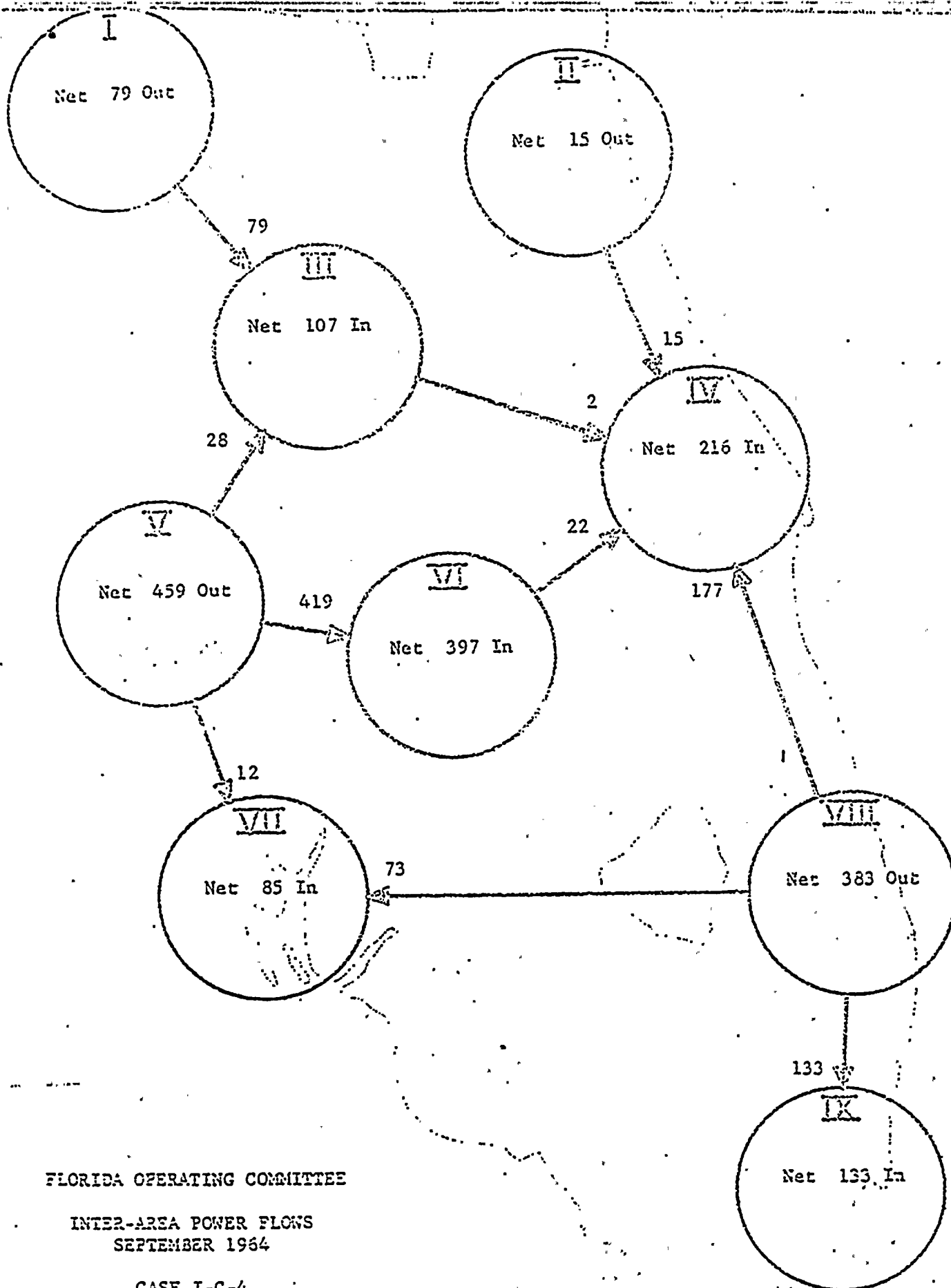
The remainder was brought into the area, mainly from the south on the
230 kv line from Ranch. The Ranch-Pratt Whitney line loading increased from
151 mw in CASE 1-C-1 to 213 mw in this Case.

OUC received the 50 mw purchase as follows:

Woodsmere to OUC #2	35 mw
Brevard to Indian River	17 mw
OUC #6 to Rio Pinar	(3)mw
NET	49 mw

CONCLUSIONS:

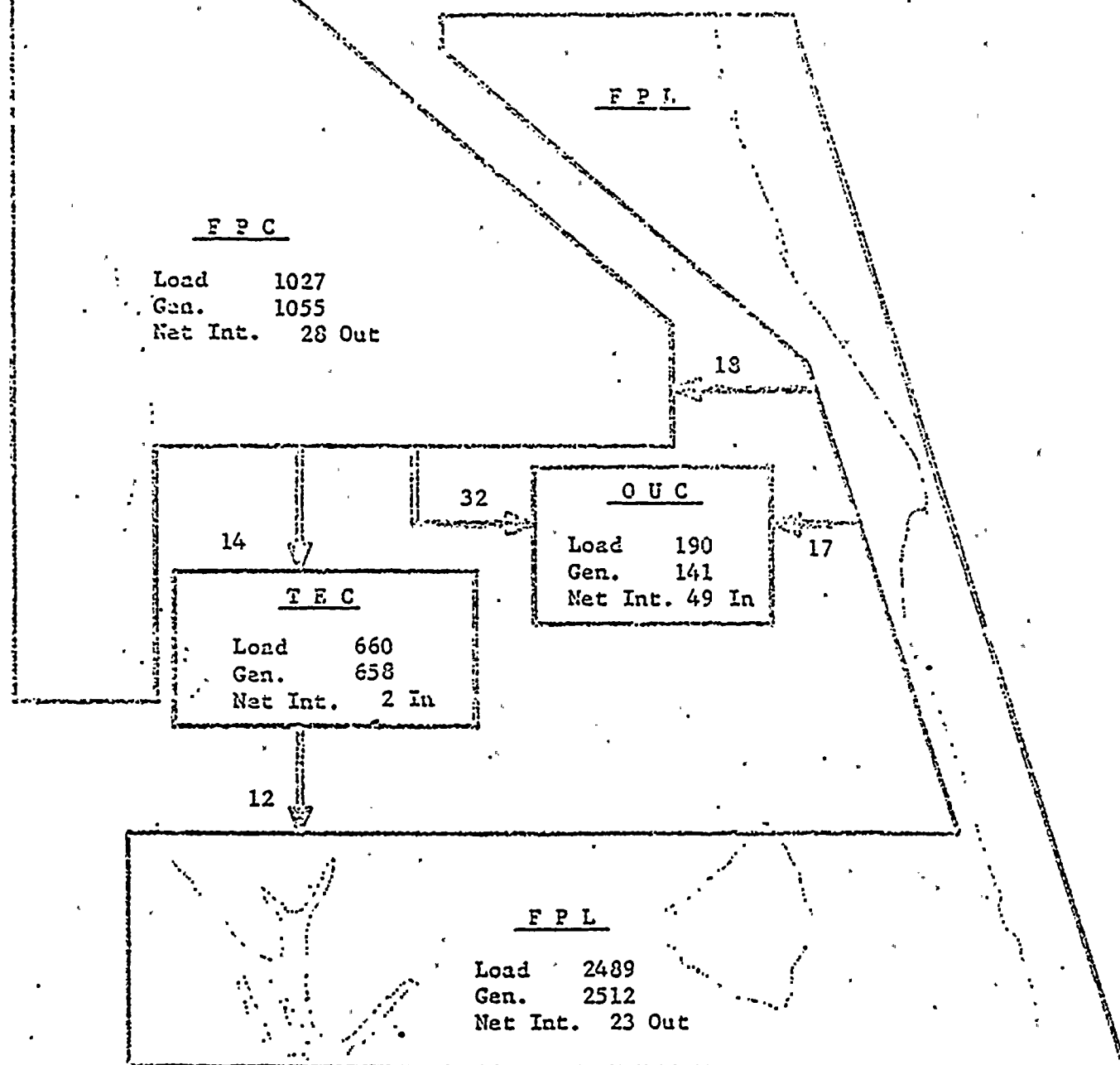
The System would perform adequately during an outage of the Indian
River #2 - 210 mw unit under 1964 summer peak load conditions.



FLORIDA OPERATING COMMITTEE

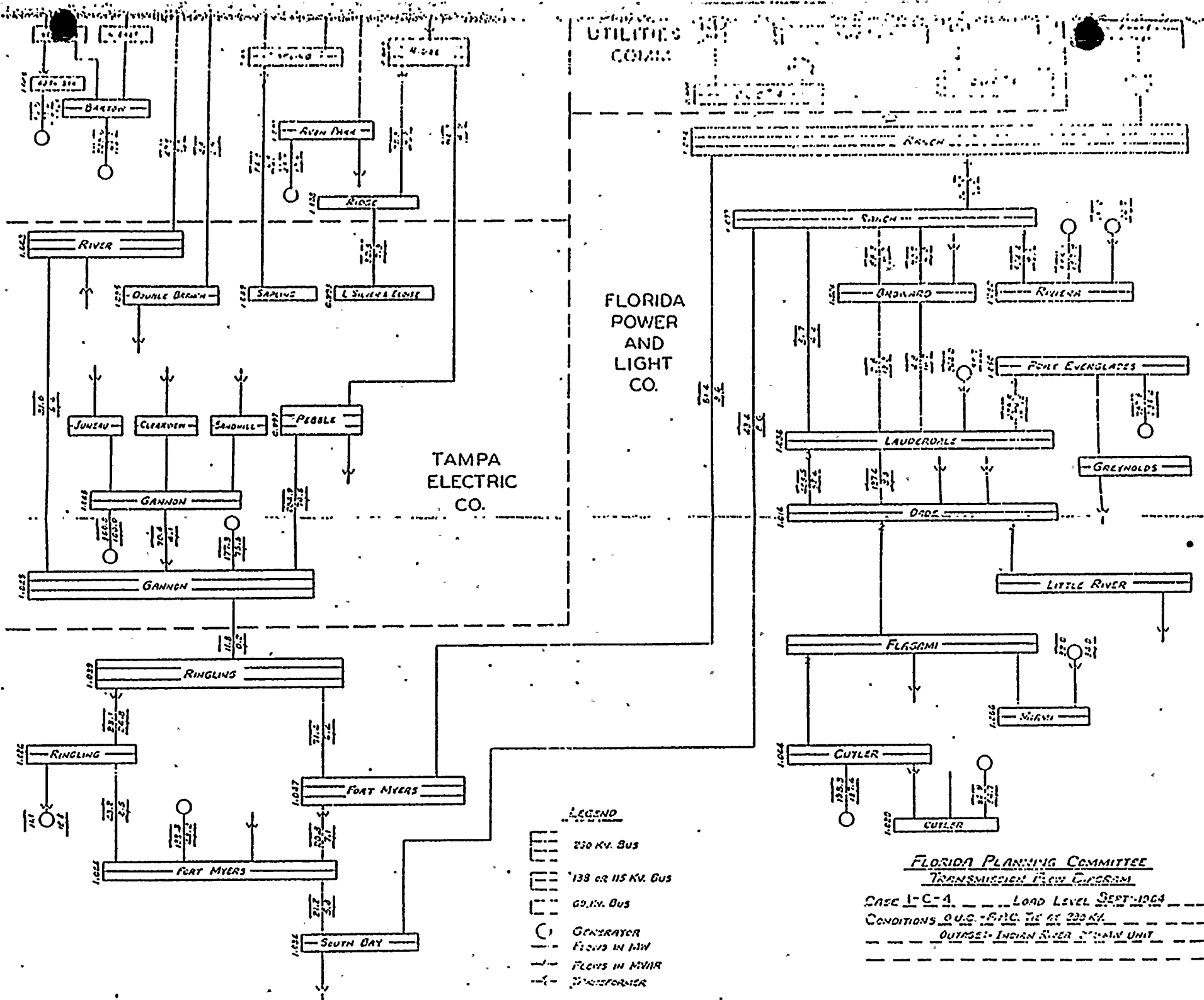
INTER-AREA POWER FLOWS
SEPTEMBER 1964

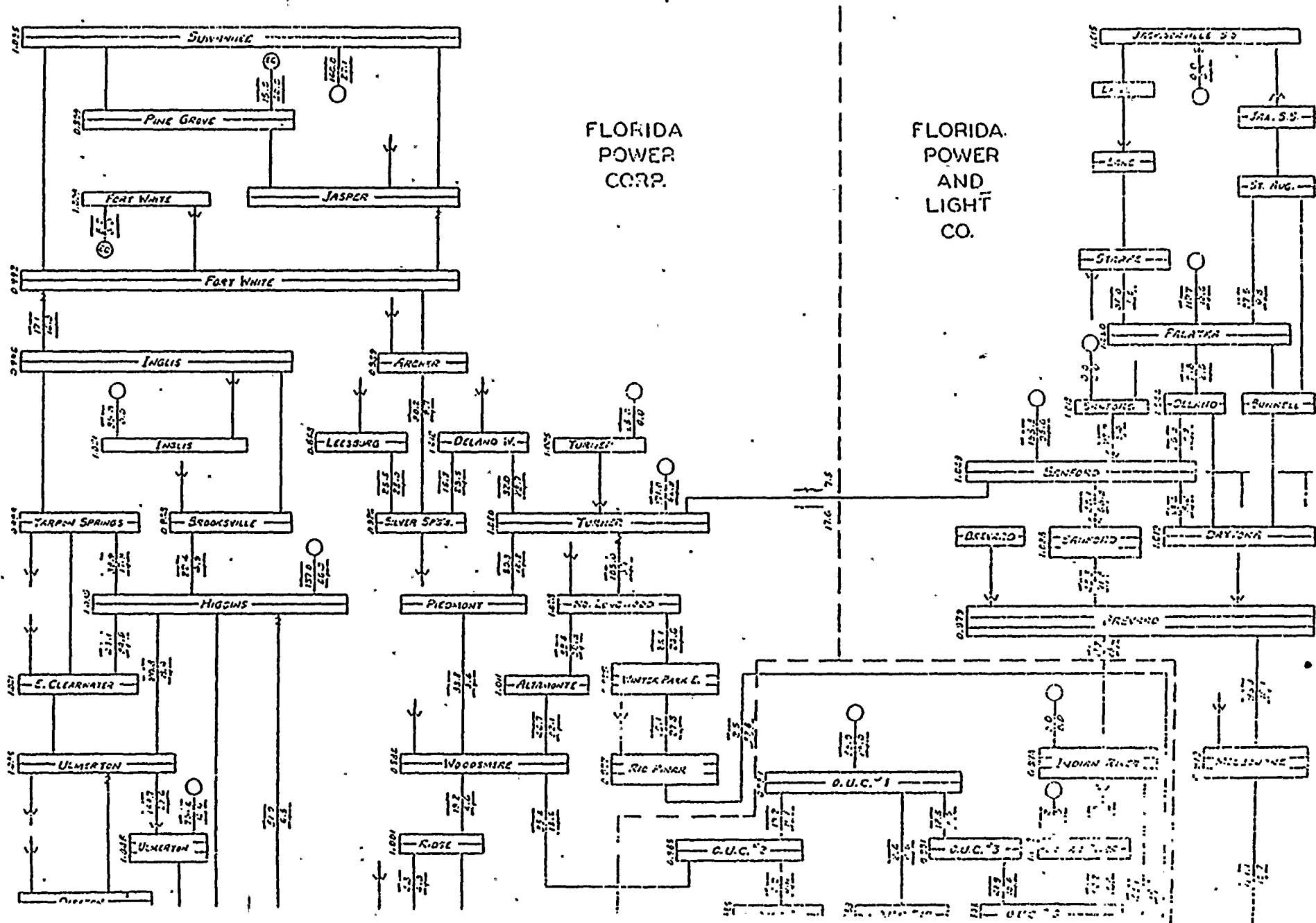
CASE I-C-4



FLORIDA OPERATING COMMITTEE
INTER-SYSTEM POWER FLOWS - SEPT 1964
TOTAL LOAD 4366

CASE I-C-4





CASE 1-R-1

GENERAL CONDITIONS:

1. Generation: 1964 Basic System.
2. Transmission: 1964 Basic System, modified as follows:
North Longwood-Rio Pinar-OUC circuit operating at 230 kv, terminated at the OUC #5 Substation (Same as CASE 1-C-1). 230 kv line added from Ridge to OUC #6.
3. Load: September, 1964, peak load, 4366 mw.
4. Interchange: OUC to FPL - 100 mw.

PURPOSE:

This Case was established for a comparison with CASE 1-C-1, in order to examine the operation of a 230 kv line from Ridge to OUC #6.

RESULTS:

The Ridge-OUC #6 - 230 kv line carried only 1.8 mw and 3.7 mvar. Since all other system flows and voltages are essentially the same as in CASE 1-C-1, no flow diagram was prepared for this Case.

CONCLUSIONS:

a 230 kv line from Ridge to OUC #6 does not change the operation of the 1964 Basic System. Further study of this line at the 1964 load level appeared to be unnecessary in order to evaluate the performance of the Basic System. The Case is being held on tape, however, for future reference. This line will be studied at other load levels.

GENERAL CONDITIONS:

- | | | | | | | | |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|------------|---------|-----------------|---------|
| 1. <u>Generation:</u> | Basic System | | | | | | |
| 2. <u>Transmission:</u> | Basic System. | | | | | | |
| 3. <u>Load:</u> | January 1965, peak load, 5355 mw
(excluding VCC 35mw) | | | | | | |
| 4. <u>Interchange:</u> | <table border="0"> <tr> <td>OUC to FPL</td> <td>- 100 mw</td> </tr> <tr> <td>TEC to FPC</td> <td>- 40 mw</td> </tr> <tr> <td>Sou. Co. to FPC</td> <td>- 40 mw</td> </tr> </table> | OUC to FPL | - 100 mw | TEC to FPC | - 40 mw | Sou. Co. to FPC | - 40 mw |
| OUC to FPL | - 100 mw | | | | | | |
| TEC to FPC | - 40 mw | | | | | | |
| Sou. Co. to FPC | - 40 mw | | | | | | |

PURPOSE:

The nineteen (19) Cases preceeding this one were all based on the September 1964 peak load which is only about 80% of the system demand likely to be imposed in January 1965, only four months later. Since no major system improvements are scheduled for this interim, the purpose of this Case is to evaluate the ability of the integrated system to supply the load with only 40 mw purchased from outside utilities (Southern Co.).

RESULTS:

Performance of the system at this load level was satisfactory in that there were no overloaded lines, and voltage levels in general compared favorably with those recorded in CASE 1-D-1. As noted in CASE 1-D-1 the power source to Leesburg would not be firm since voltage would collapse for loss of the Silver Springs-Leesburg 115 kv line. This situation would be accentuated under the higher load level.

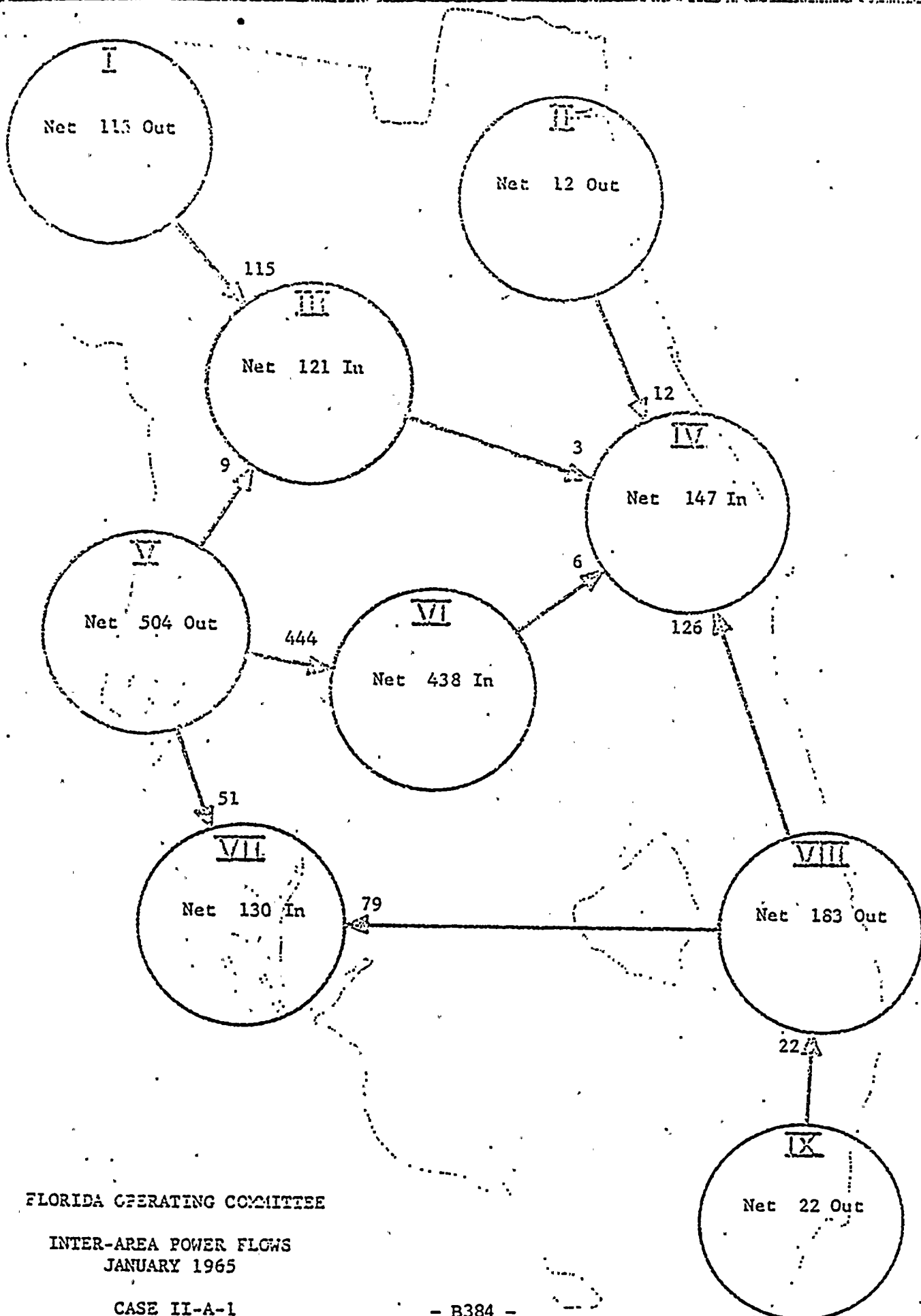
Of the 100 mw purchase from OUC to FPL, 95 mw was delivered directly to FPL. However, other inter-system flows were considerably different from the interchange schedules between systems, as shown by the accompanying diagram summary of inter-system flows.

Many of the units with the exception of those on the FPC System have some margin of capacity remaining based on maximum capability ratings.

CASE 11-A-1 (Cont'd.)

CONCLUSIONS:

The cold weather peak load forecast for January 1965 could be met by the 1964 Basic System. Although the demonstrated Case included a 40 mw purchase from the Southern Company, there is sufficient capacity within the State to meet the State requirements.

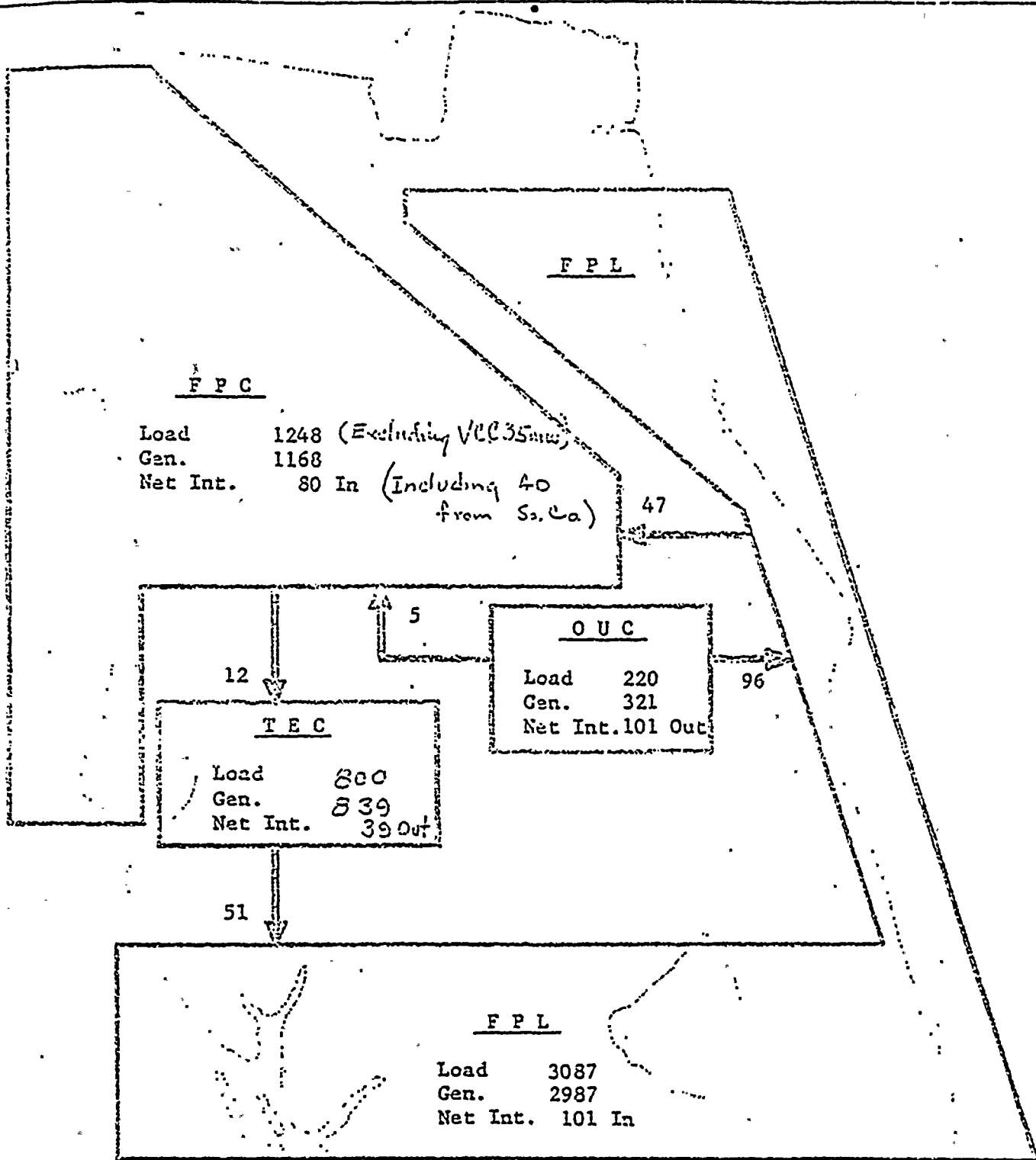


FLORIDA OPERATING COMMITTEE

INTER-AREA POWER FLOWS
JANUARY 1965

CASE II-A-1

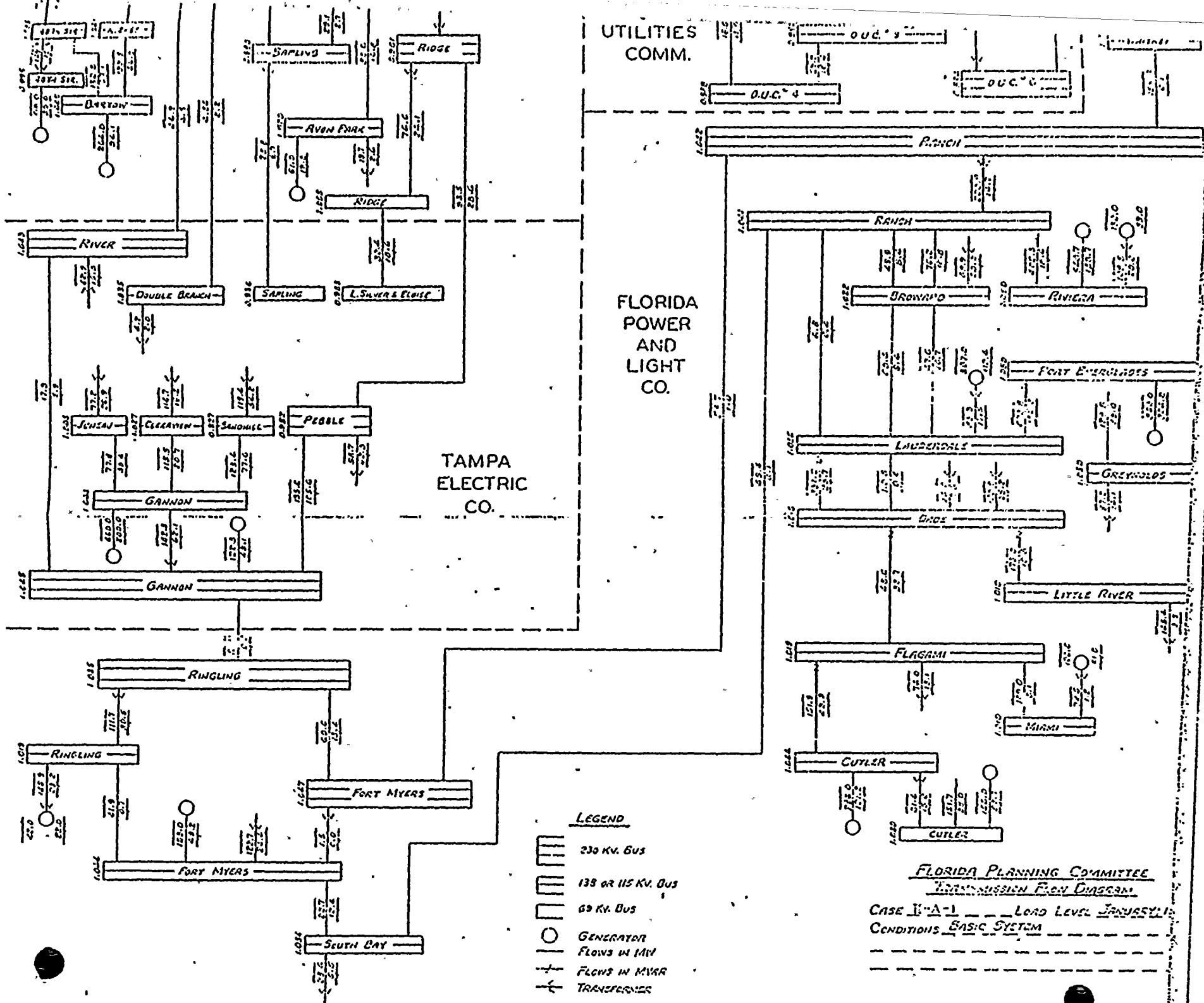
- B384 -



FLORIDA OPERATING COMMITTEE

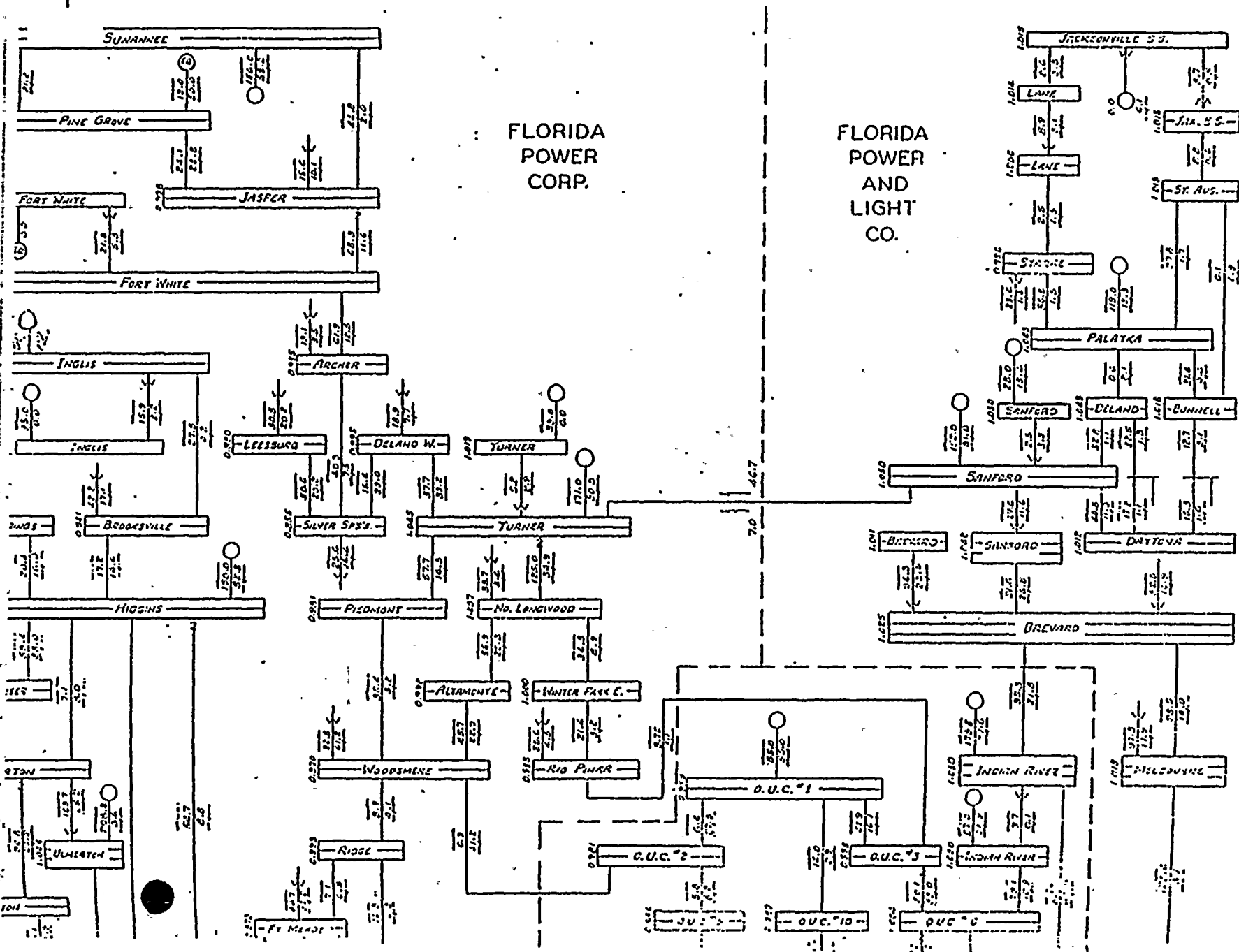
INTER-SYSTEM POWER FLOWS - JAN 1965
 TOTAL LOAD 5355

CASE II-A-1



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JOINT PLANNING STUDY 1964 - 65

TABULATION OF TRANSMISSION LINE LOSSES

TRANSMISSION LINE LOSSES - MW

Case	Total	FPC	TEC	FPL	OUC	Tie Lines
D-1	92.1	28.2	13.2	45.7	2.3	2.7
D-2	93.4	27.0	13.3	47.7	2.3	3.1
D-3	104.7	32.7	13.7	54.8	0.7	2.8
D-4	95.6	29.9	13.9	47.0	2.2	2.6
D-5	97.5	31.0	14.1	47.0	2.6	2.7
D-6	97.9	31.6	14.0	47.1	2.5	2.7
D-7	97.0	29.7	15.3	46.2	3.1	2.7
D-8	123.6	34.8	16.1	62.0	6.5	4.2
D-9	97.5	32.7	14.9	44.6	1.7	3.6
D-10	109.3	38.0	16.1	49.3	1.7	4.3
D-11	118.4	30.4	14.8	64.4	3.8	4.8
D-12	131.9	28.0	15.8	78.7	3.1	6.3
D-13	101.6	36.8	14.2	40.6	1.5	8.5
D-14	138.6	58.5	18.5	46.9	1.4	13.3
C-1	91.9	28.1	13.1	45.8	2.3	2.6
C-2	93.1	26.3	12.7	47.1	4.2	2.8
C-3	95.4	30.1	13.4	45.4	3.5	2.9
C-4	104.6	32.3	13.7	54.0	1.7	2.8
D-1	91.6	28.1	12.8	45.8	2.3	2.7
I-A-1	123.5	48.4	17.1	51.3	3.0	3.7

TRANSMISSION LINE LOSSES - MVAR, NET (1)

Case	Total	FPC	TEC	FPL	OUC	Tie Lines
D-1	8.5	-59.6	69.5	34.1	-3.8	-32.2
D-2	23.3	-61.8	70.5	49.5	-5.0	-30.3
D-3	93.1	-46.8	73.0	108.3	-10.5	-31.3
D-4	27.9	-54.9	74.1	42.8	-2.1	-32.4
D-5	40.4	-47.9	75.6	43.6	0.7	-32.0
D-6	37.6	-49.7	74.9	44.0	0.2	-32.1
D-7	36.6	-54.9	84.4	35.5	2.6	-31.4
D-8	214.2	-41.6	89.4	162.6	26.9	-23.6
D-9	29.7	-46.1	80.7	26.1	-5.3	-26.1
D-10	100.8	-33.8	88.7	74.9	-5.7	-23.7
D-11	159.4	-65.3	85.2	154.6	7.5	-23.1
D-12	262.7	-68.4	92.3	251.2	4.1	-16.8
D-13	-5.1	-41.0	75.4	-27.4	-9.2	-7.2
D-14	119.8	10.0	90.3	15.5	-7.6	11.2
C-1	2.0	-63.8	69.0	35.0	-4.9	-33.7
C-2	23.9	-67.5	66.3	48.0	7.0	-30.2
C-3	24.5	-56.6	70.8	31.7	9.4	-31.3
C-4	87.4	-51.3	72.8	102.2	-4.1	-32.6
D-1	-15.7	-63.8	66.5	35.0	-4.9	-48.9
I-A-1	115.8	7.1	92.4	41.8	1.8	-27.7

(1) Net MVAR transmission line losses equal transmission reactive losses less line charging less static capacitors (total for four systems, 213 mvar)

Mr. Page —
Mr. Fite signed
this letter +
it went out
ex

November 3, 1964

The Honorable J. Dillon Kennedy, Commissioner
City of Jacksonville
Utilities Division
Jacksonville, Florida

Dear Dillon:

Our company, along with Tampa Electric Company, Florida Power Corporation and Orlando Utilities Commission, is preparing to make a long range power supply study to be used as a guide for generating and transmission additions, as we grow with Florida. Knowing your interest in these matters, we are writing this letter to invite you to participate with us.

This will be a digital computer study to be made using the facilities of General Electric Company and data furnished by each participant. It will cover the period beginning 1967 and extending through 1980, or from the 1967 load level of approximately 6600 mw to a projected load level of 24000 mw for the combined systems. It will develop the transmission system required to coordinate to mutual advantage, the present and projected plans of each participant for generating unit additions, and will point the way for lowered reserves and resultant savings in capital costs. It will also determine how long a 240 kv grid will serve the requirements of the several systems, and if and when by 1980, the transmission systems must be strengthened by superimposing extra high voltage lines, of say, 500 kv.

The cost of computer facilities and services is estimated to be approximately \$50000 and it is proposed that this cost be shared on the basis of:

Florida Power & Light Company	44% or \$22000
Florida Power Corporation	20% or \$10000
Tampa Electric Company	16% or \$ 8000
Orlando Utilities Commission	8% or \$ 4000
City of Jacksonville	12% or \$ 6000

The above figures are arrived at by dividing the \$50000, 70% on the basis of last summer's peaks and 30% shared equally. The

only cost over and above the computer facilities and services should be for the manhours involved in data preparation and follow up by each participant.

Messrs. Bostwick and McCall attended the Florida Operating Committee meeting in St. Petersburg on October 29, and were briefed on the technical details, and were given a memorandum covering the scope of the proposed study.

We hope to hear from you at an early date. In the meantime, if there are any questions, please give us a call.

Best regards,

Robert H. Flite
President & General Manager

RHF:et

FLORIDA POWER & LIGHT COMPANY



P. O. Box 3100
MIAMI, FLORIDA 33101

July 8, 1966

Mr. Lester Ulm, Jr., Chairman
Long-Range Study Administering Committee of
Florida Operating Committee
P. O. Box 111
Tampa, Florida

INTERIM REPORT LONG RANGE GENERATION - TRANSMISSION PLANNING STUDY

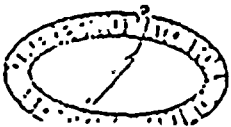
Dear Mr. Ulm:

In accordance with the Administering Committee's directive, the subject Interim Report has been prepared to summarize the course and progress of the study over the past nineteen months, and to present the current results.

Note should be taken of the fact that the evaluation of various fossil-nuclear mixes of the several generation expansion programs is based on:

- 1) Investment cost data for fossil units being as of September 17, 1965, and thus not reflecting currently higher costs.
- 2) Fossil fuel cost being a composite cost suitable for use in the preliminary production costing of the several generation expansion programs, whereas the final production costing will be using the fuel cost estimated for each site selected for expansion in the final generation programs.

It is believed that, within the scope of this study, the use of the above discussed fossil costs has not resulted, to date, in any invalid results. However, caution should be used in the use



Mr. Lester Ulm, Jr.

- 2 -

July 8, 1966.

of any of the results of this report out of the context of the Long-Range Study.

Respectfully submitted,

Long-Range Study Group of
Florida Operating Committee

K. S. Buchanan
K. S. Buchanan, Chairman

J. R. Brice
J. R. Brice

E. C. Nalle
E. C. Nalle

J. G. Raine
J. G. Raine

Irving Reedy
Irving Reedy

J. K. Wiley
J. K. Wiley

KSB:JL
ENCL

INTERIM REPORT

LONG RANGE
GENERATION--TRANSMISSION
PLANNING STUDY

by

LONG RANGE STUDY GROUP

of

FLORIDA OPERATING COMMITTEE

JULY, 1966

INTERIM REPORT

LONG RANGE GENERATION-TRANSMISSION PLANNING STUDY BY LONG-RANGE STUDY GROUP OF FLORIDA OPERATING COMMITTEE

GENERAL OBJECTIVE

- Part 1 - Provide alternate designs and evaluate total cost of generation and transmission plans to serve the load of the five participating utilities for the 1968 - 1982 period, treating the utilities as a single unit.
- Part 2 - Provide a State Transmission Design for the generation plans of the individual utilities, such plans being based on interconnections being adequate for the sharing of installed and spinning generation reserves and on each utility normally supplying its own energy requirements. The total cost for comparison with (1) above would be calculated.

GENERAL ASSUMPTIONS FOR STUDY

Load Characteristics

- 1. A composite hourly load model for the group would be calculated from three years of historical data.
- 2. The monthly and yearly total load forecast would be the composite of the individual company forecast.
- 3. The individual company production cost for serving its load in Part (2) would use the same load pattern as the composite hourly load model.

Generation Plans

- 1. A system risk level index would be used to define generation size and timing to obtain comparative risks in all alternate plans of Part (1). The index is expressed as the average number of years between each single day of having insufficient generation to carry the peak hour load.
- 2. Outage rates for units would be agreed upon for both fossil and nuclear units.
- 3. A calculation of the theoretical risk which was taken by the utilities as a group for the period 1955-1963 would be made to provide background for selecting the risk levels to be used for future planning.
- 4. All costing factors, such as unit costs, fuel costs, fixed charges, etc. would be a weighted value of the individual utility costs based on the ratio of the individual utility load to the total load.

GENERAL ASSUMPTIONS FOR STUDY (Continued)

Generation Plans

5. Nuclear costs would be agreed upon based upon manufacturers supplied data modified to reflect the financing cost used for the study.
6. In siting and assignment of units to individual utilities for the various alternate plans, each utility would in their final year have installed on its system adequate generation to serve its own load. In general, each utility would install new generation approximately equal to its load growth in the 1968-1982 period.

Transmission Plans

1. Transmission designs for 230 kv and 230/500 kv would be made for selected generation plans.
2. The transmission system designs will be sufficient to transfer power into a major load area to withstand: (1) During peak months, the forced outage of the area's two largest units; and (2) During off peak months, the outage of the area's three largest units - one scheduled maintenance outage and two forced outages.

Economic Comparison

1. Annual costs by years would be calculated for generation investment cost, total production cost, and transmission system cost. Present worth arithmetic would be used for the total comparison.

RESULTS AND TENTATIVE OBSERVATIONS

1. Load Characteristics

The long range forecast for the individual utility and the totals are tabulated in Table 1, and illustrated in Figure 1A. The per-unit hourly load models for the annual peak week occurring in January and the summer peak week occurring in August-September are shown in Figure 1B.

2. Generation Plans

Table 2 tabulates the unit sizes and time of addition for the various plans investigated. In general, the installation of the units within the year are timed to minimize total costs but provide the same measure of system risk. A system risk level index of 10 years per day is being used. The unit forced outage rates are given in Exhibit 5.

The curves of Figure 2 illustrate the pattern of investment costs for these plans when all units added are fossil units, and where 50% of the additions are nuclear units. The costs are plotted against "average size of 1971-82 additions". See Exhibits 1 and 2 for rate of return and fixed charge rate data and generating plant investment costs used in the investment costing.

3. Nuclear Investigation

To evaluate the effects of nuclear power, Expansion Plan 9 was examined on the basis of 0%, 25%, 50% and 75% of the unit additions being nuclear. Three selected years were examined for a total yearly investment cost and total production cost. The costing results are tabulated in Table 3 and illustrated in Figure 3A. The annual load duration curves of Figure 3B illustrate the extent of base-load operation of nuclear units in 1974, 1978 and 1982 for the three nuclear-fossil mixes.

Based on these results, further study was devoted to expansion plans with 50% of the additional units being nuclear.

4. Final Alternate Plans

Plans 6, 7, and 9 were selected for complete evaluation with 50% nuclear additions. Figure 4 illustrates the costs. These results indicate a possible need for defining a plan with somewhat larger units which would indicate some kind of turn up in the total cost curve. This is being examined.

To the total investment and production costs plotted in Figure 4, would be added the transmission costs to handle the various different unit sizes in the plans. The study is proceeding to define these transmission systems in order to arrive at the total cost.

RESULTS AND TENTATIVE OBSERVATIONS (Continued)

5. Generation Plan 2-A

This plan covers the situation where each utility plans its own generation to supply its load. Table 5 shows the individual utility plans. This Plan 2-A will be costed and production costs run and a transmission design made to arrive at a total cost.

6. Capacity Factor and Total Costs

Out of the tremendous amount of theoretical data available from the calculations, it is possible to identify many interesting conclusions. Figure 5 shows the calculated capacity factor and bus cost for 800 megawatt units of both nuclear and fossil design which might be installed in 1973. The assumptions as to future fossil and nuclear fuel costs are a major factor in these results.

1. Select various nuclear and fossil designs and calculate the resulting capacity factor and bus cost for each design.

2. Select two designs from 1. and design a 100% transmission system and an economy 100% transmission system and calculate the resulting bus cost.

3. Calculate transmission costs for 100%.

4. Add the transmission costs to the bus cost for each design and compare the results for each design.

5. Select the design with the lowest total cost and compare the results for each design.

6. Select the design with the lowest total cost and compare the results for each design.

7. Select the design with the lowest total cost and compare the results for each design.

8. Select the design with the lowest total cost and compare the results for each design.

OUTLINE OF PROCEDURE FOR STUDY

The following illustrates the logical sequence for the study covering the group planning effort:

1. Define the load model.
2. Define generation plans on a probability basis.
3. Calculate investment cost of alternate generation plans.
4. Select a plan from (3) and calculate costs for various percentage of nuclear additions.
5. Run production cost for plans selected in (4) with various nuclear mixes.
6. Select percent nuclear mix from (5) and using that percentage mix, redefine selected generation plans of (3), calculate investment and production cost for fifteen years of the study.
7. Select two plans from (6) and design a 230 kv transmission system and an alternate 230/500 kv transmission system to provide an adequate design.
8. Calculate transmission costs for (7).
9. Make final production costs calculation on the plans of (7) with proper consideration of transmission losses.

The following procedure illustrates the logical sequence for costing the generation and transmission for the approach where each utility plans and provides its own generation:

1. Each utility provides a generation expansion plan for the study.
2. With the generation of (1) above, design a total transmission system for the group to adequately meet all transmission requirements of each utility.
3. Run production cost calculations for each utility serving its own load.

TABLE 1

LOAD FORECAST FOR LONG RANGE STUDY

January Loads

Megawatts - Gross Input to System

<u>YEAR</u>	<u>OUC</u>	<u>JAX</u>	<u>TECO</u>	<u>FPC</u>	<u>FPL</u>	<u>TOTAL</u>
1969	263	715	1,125	1,600	4,550	8,253
70	290	779	1,230	1,750	5,100	9,149
71	319	849	1,355	1,980	5,600	10,103
72	350	925	1,490	2,200	6,200	11,165
73	382	1,008	1,635	2,400	6,900	12,325
74	416	1,099	1,795	2,700	7,650	13,660
75	452	1,198	1,960	3,000	8,500	15,110
76	489	1,306	2,160	3,400	9,400	16,755
77	527	1,424	2,370	3,800	10,330	18,451
78	565	1,552	2,600	4,200	11,340	20,257
79	605	1,692	2,850	4,700	12,410	22,257
80	646	1,845	3,120	5,200	13,600	24,411
81	687	2,011	3,400	5,800	14,800	26,698
82	728	2,172	3,725	6,500	15,950	29,075
83	768	2,390	4,070	7,200	17,200	31,628

TABLE 2
Sheet 1

FLORIDA STUDY GROUP EXPANSION PLANS

- PART 2 - PLANS OF INDIVIDUAL UTILITIES					- PART 1 - "ONE SYSTEM CONCEPT" PLANS				
2	2-A	3	4	5	*S-A	6	7	8	9
1968	1-650	1-430	1-650	1-650	1-650	1-430	1-430	1-430	1-430
1969	2-650	2-650	2-650	2-650	2-650	1-650	2-540	2-650	2-650
	3-540	3-540				2-540	3-650	3-540	3-540
1970	4-750/820	4-730/760	3-540	3-540	3-540	3-650	4-730/760	4-730/760	4-730/760
	5-530	5-530	4-750/820	4-750/820	4-820				
	6-430	6-430							
1971	7-750/820	7-730/760	5-820	5-820	5-820	4-820	5-300	5-450	5-6
	8-580/640	8-580/640	6-570	6-430		5-820	6-300	6-450	650
	9-400/440	9-400/440					7-300	7-450	
1972	10-820	10-820	7-570	7-640	6-820	6-820	8-300	8-430	7-1150
			8-820	8-430	7-820	7-820	9-300	9-430	7-8
							10-300	10-430	700
							11-300		
1973	11-820	11-820	9-820	9-640	8-1150	8-1150	12-16	11-500	8-1150
	12-550	12-550	10-820	10-430	9-1150		300	12-500	9-10
	13-540	13-540		11-640				13-500	800
	14-530	14-530							
1974	15-1050/1150	15-1050/1150	11-1150	12-570	10-1150	9-1150	17-21	14-630	9-2000
				13-820		10-1150	300	15-630	11-12
								16-630	950
1975	16-1050/1150	16-1050/1150	12-1150	14-570	11-1150	11-1150	22-27	17-550	11-2000
	17-860	17-860	13-1150	15-820	12-1150		300	18-550	13-14
				16-570				19-550	950
1976	18-1150	18-1150	14-1150	17-820	13-1150	12-1500	28-640	20-22	12-2000
	19-550	19-550	15-1150	18-570	13-1500	29-640	610		15-16
				19-820		30-640			1000

TABLE 2
Sheet 1

TABLE 2
Sheet 2

	2	2-A	3	4	5	*5-A	6	7	8	9
1977	20-98G/1080 21-780	20-930/1080 21-780 22-1050/1150	16-1150 17-1150	20-570 21-820	14-1500 15-1500	14-1500	31-640 32-640 33-640	23-25 680	13-2000	17-18 1100
1978	22-1050/1150 23-750	23-1050/1150 24-750	18-1150 19-1150	22-1150 23-820 24-1150	16-1500 17-1500	15-1500 16-1500	34-37 640	26-28 830	14-2500	19-20 1200
1979	24-1150 25-1050/1150 26-1080 27-400/440	25-1150 26-1080 27-400/440	20-1150 21-1150	25-820 26-1150	18-1500	17-1500	38-41 650	29-31 880	15-2500	21-22 1375
1980	28-1150 29-780	28-1150 29-780	22-1150 23-1150	27-820 28-1150 29-820	19-1500 20-1500	18-1500 19-1500	42-45 640	32-34 950	16-2500	23-24 1450
1981	30-1050/1150 31-980/1080 32-1000	30-1050/1150 31-980/1080 32-1000	24-1150 25-1150 26-1150	30-1150 31-820 32-1150	21-1500 22-1500	20-1500 21-1500	46-49 640	35-37 1000	17-2500 18-2500	25-26 1550
1982	33-1050/1150 34-980/1080	33-1050/1150 34-980/1080	27-1150 28-1150	33-820 34-1150 35-820	23-1500 24-1500	22-1500 23-1500	50-54 640	38-40 1225	19-2500	27-28 1900
Total										
Capacity MW	36,680	36,340	35,850	35,500	36,940	35,790	34,630	36,585	40,050	37,700
Capacity Added	28,610	28,270	27,780	27,430	28,870	27,720	26,560	28,515	31,980	29,630
P.W. of Yearly Costs, Millions \$ 100% Fossil	--	--	663.8	663.2	673.6	--	683.8	657.0	708.4	653.0
Same Except 50% Nuclear							908.1	859.4	875.4	842.3

NOTES: Nuclear units are dual rated as 750/820 MW with 10% stretch after 2 1/2 years.

* Same as 5 except with forced outage rates on 200 MW and larger reduced by 33 1/3%.

TABLE 2
Sheet 2

TABLE 3

KSB
3/14/66
Rev. 4/1/66
Rev. 4/23/66

FLORIDA STUDY GROUP
TOTAL PRODUCTION & YEARLY INVESTMENT COSTS (MILLIONS)
GENERATION EXPANSION PLAN 9 WITH
0%, 25%, 50% & 75% OF 1971-1982 UNITS NUCLEAR

YEAR	NUCLEAR PERCENTAGE	TOTAL PRODUCTION COST *	TOTAL YEARLY INVESTMENT COST	TOTAL YEARLY COST	PRESENT WORTH OF TOTAL YEARLY COST
1974	0	\$ 226.532	\$ 66.970	\$ 293.502	\$ 181.587
	25	219.208	76.130	295.338	182.723
	50	209.311	85.858	295.169	182.618
	75	203.789	92.370	296.159	183.230
1978	0	325.477	130.112	455.589	214.234
	25	298.485	150.233	448.718	211.000
	50	271.135	171.439	442.574	208.112
	75	254.689	188.909	443.598	208.462
1982	0	456.156	216.128	672.284	240.277
	25	399.080	249.826	648.906	231.919
	50	344.432	285.625	630.057	225.193
	75	312.102	316.615	628.717	224.703
(1974+	0	1008.165	413.210	1421.375	636.098
(1978+	25	916.773	476.189	1392.962	625.642
(1982	50	824.878	542.922	1367.800	615.913
	75	770.580	597.894	1368.474	616.395

* Figures reflect corrections for data errors as follows:

- 1) Plan 9-A & 9-B, New F8, New F16 & New F24 Units -
O&M Costs reduced to 0.3846 of yearly value
to reflect Interval 9 installation (in 1974, 1978 and 1982,
respectively).
- 2) Plan 9-C, New N8, New N16 & New N24 Units -
Fuel Cap. Chgs., Nuclear Ins. Cost and O&M
Costs reduced to 0.3846 of yearly value to
reflect Interval 9 installation (in 1974, 1978 and 1982,
respectively).
- 3) Plan 9-B, New F2 -
Fuel Cap. Chgs. changed to zero (in 1978 and 1982).
- 4) Plans 9-A, 9-B & 9-C, All Nuclear units -
Fuel Cap. Chgs. revised to 4/12/66 values

TABLE 4

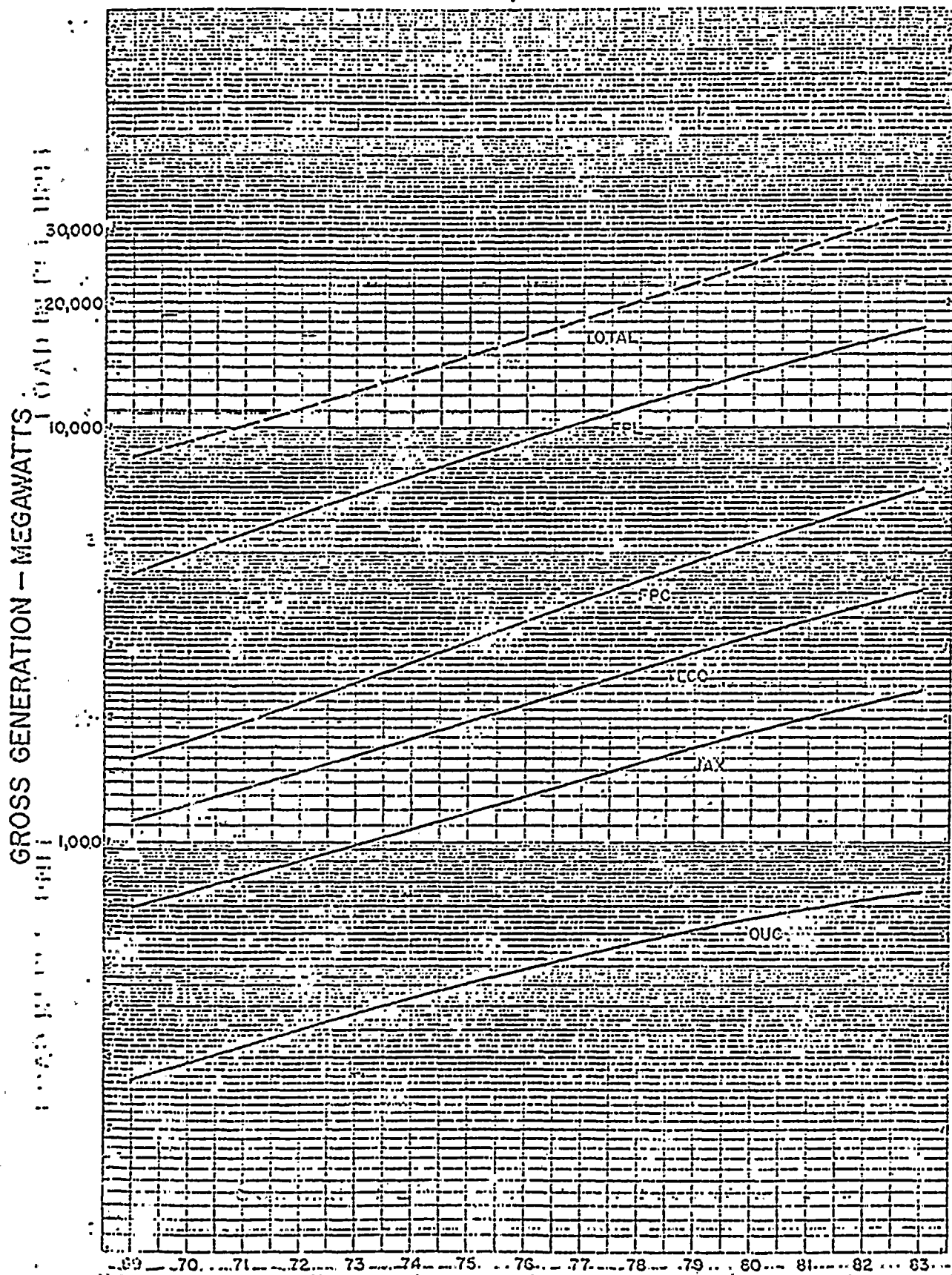
KSB
4-6-66PLAN 2 - AGENERATING UNIT ADDITIONS AND RETIREMENTS*

STUDY YEAR	FP&L	FPC	TECo	JAX	OUC	NET TOTAL	CUMULATIVE TOTAL
1968	430	-	-	-	-	430	430
69	650	540	-	-	-	1,190	1,620
70	730/760	-	430-70	530	-	1,620	3,240
71	730/760	580/640-40	-	-30	400/440	1,640	4,880
72	820-50	-	-	-	-	770	5,650
<hr/>							
73	820	540-40	550	530	-	2,530	8,180
74	1050/1150-50	-	-	-40	-	990	9,170
75	1050/1150	860	-	-	-	1,910	11,080
76	1150	-	550	-	-	1,700	12,780
77	1050/1150-40	980/1080	-	780	-	2,870	15,650
<hr/>							
78	1050/1150-80	-	750	-	-	1,820	17,470
79	1150	1080	-	-	400/440	2,640	20,110
80	1150-80	-	-	780	-	1,950	22,060
81	1050/1150-90	980/1080	1000	-30	-	3,050	25,110
82	1050/1150-150	980/1080	-230	-40	-	1,610	26,720
<hr/>							
TOTALS	14,390	6700	3280	2620	880	26,720	27,870
(1968- 1982)	-630	-80	-300	-140			

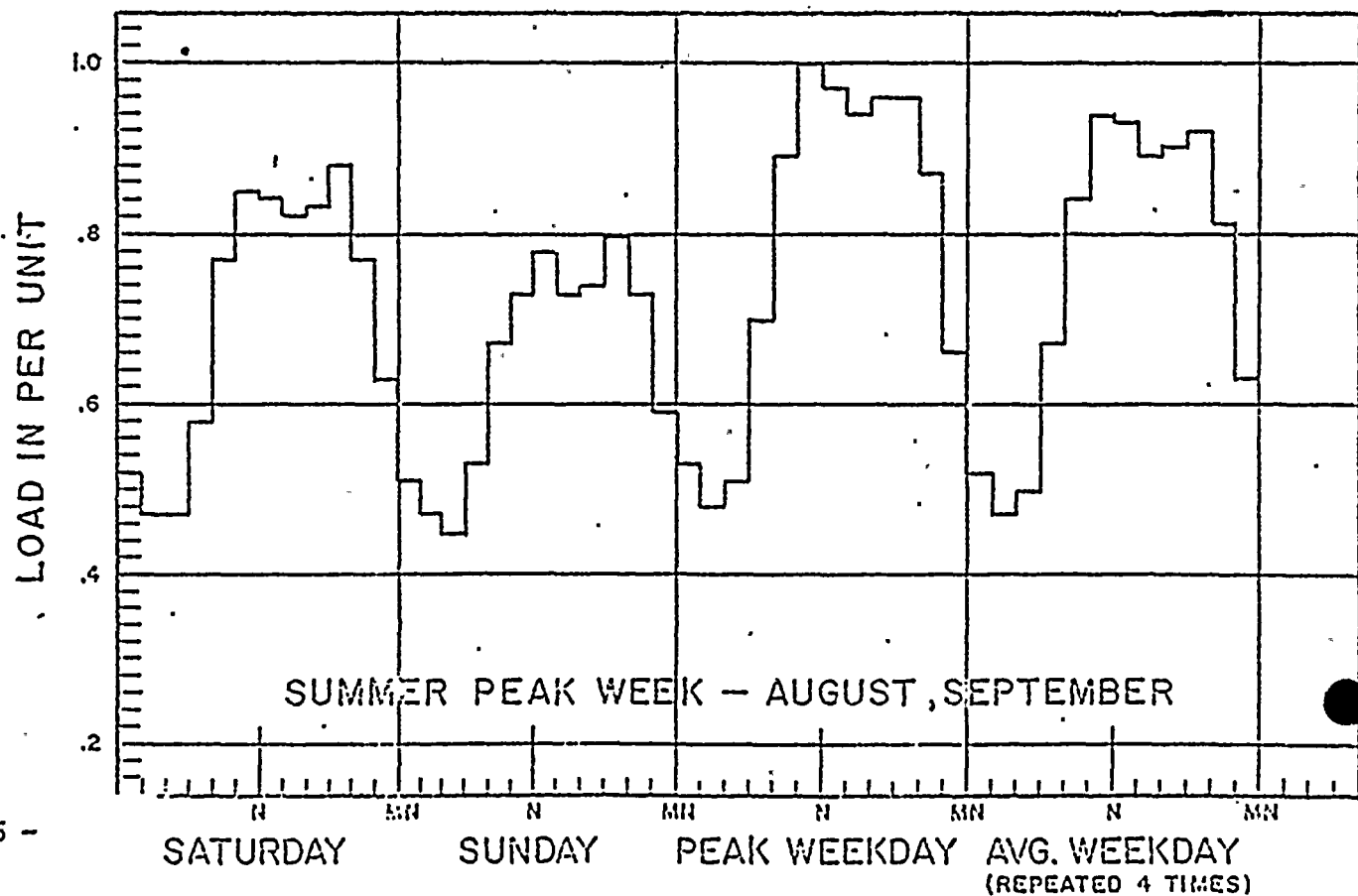
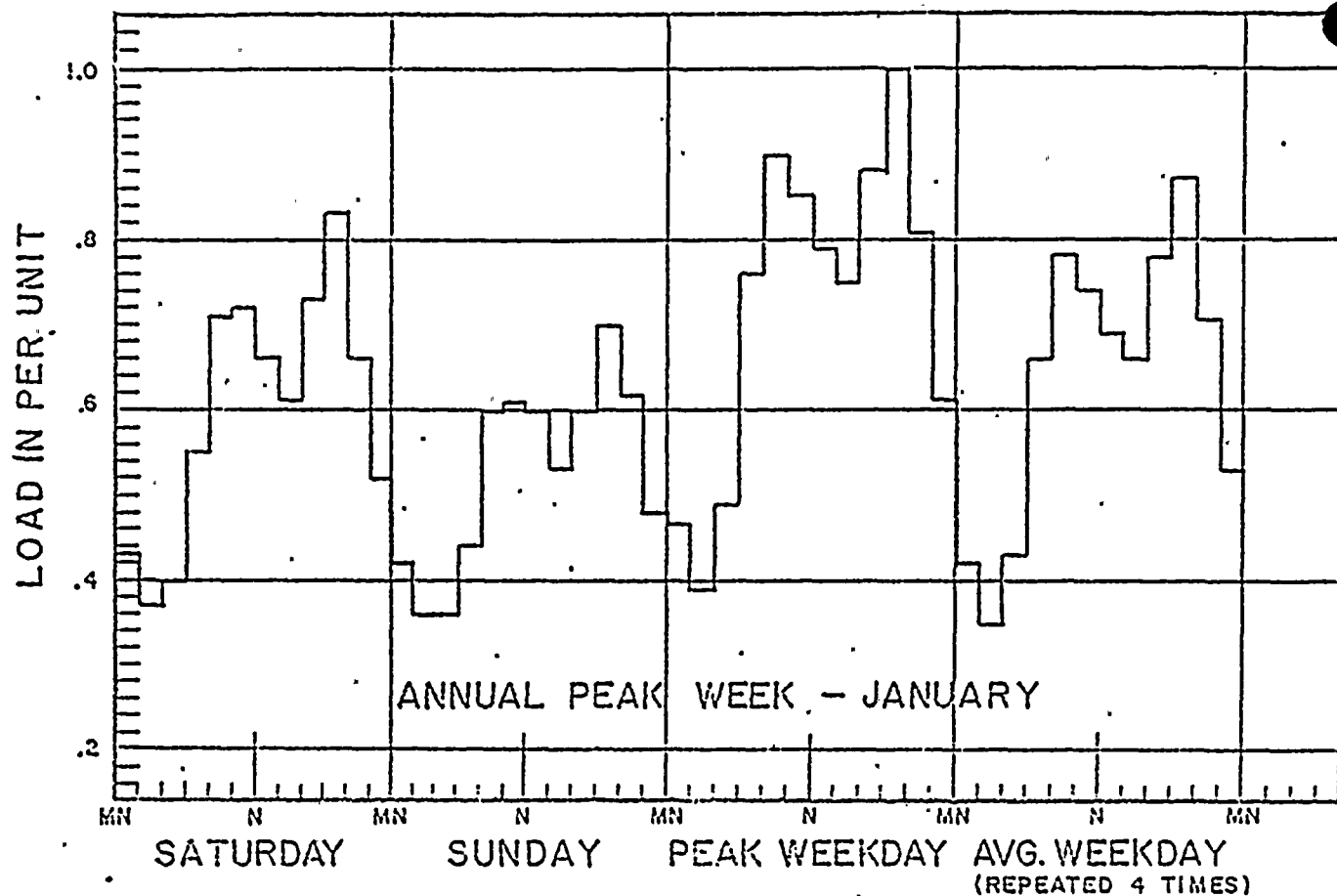
*ADDITIONS: FP&L - Beginning of Interval 9 (NOVEMBER)
 TECo. - Beginning of Interval 8 (OCTOBER)
 FPC, JAX, - Beginning of Interval 1 (APRIL)
 OUC

RETIREMENTS: ALL - Beginning of Interval 1 (APRIL), e.g. TECo's
 70 mw,
 April 1970

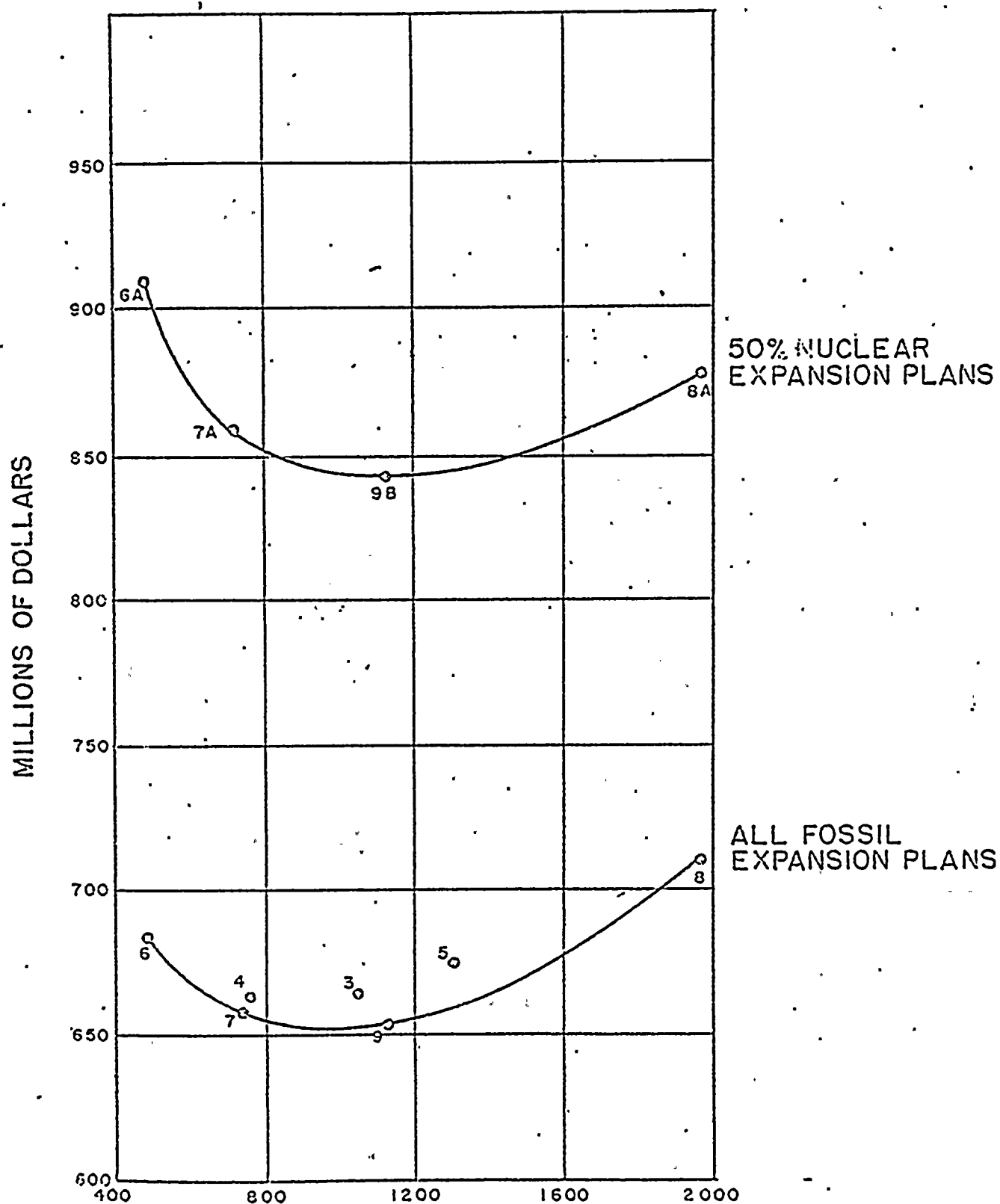
FLORIDA PLANNING STUDY LOAD FORECAST



1968 - 1982 WEEKLY LOAD MODELS FOR PRODUCTION COSTING



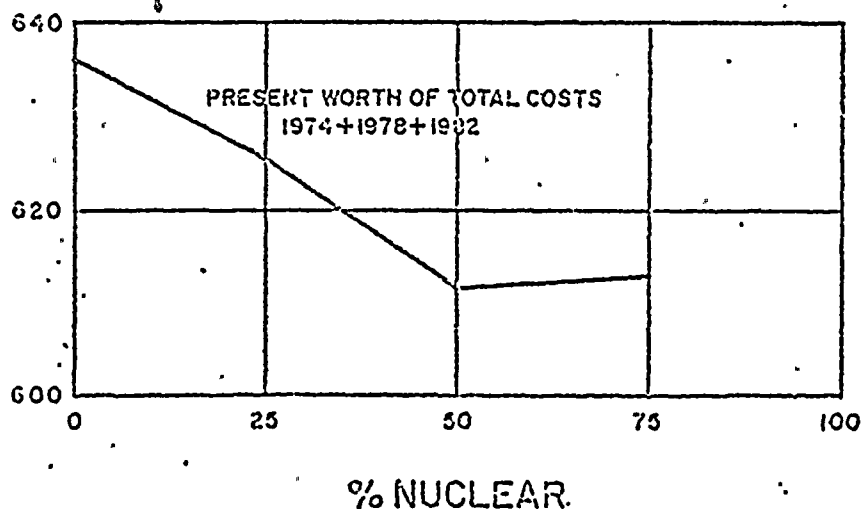
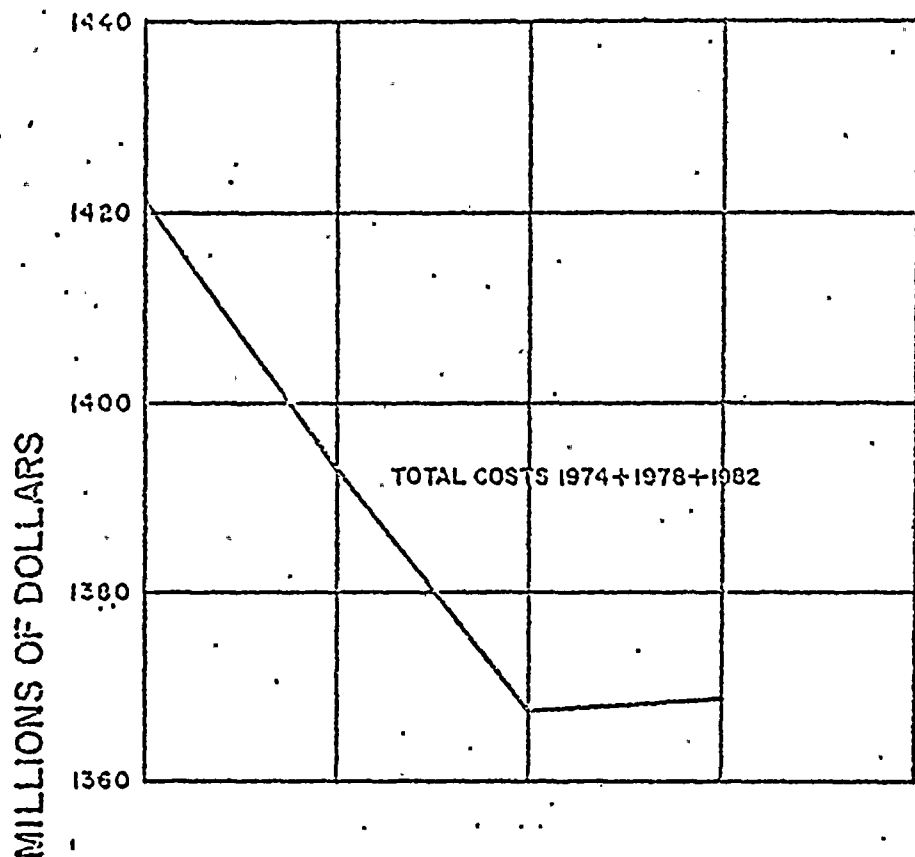
PRESENT WORTH OF TOTAL YEARLY INVESTMENT COST
1968-1982
GENERATION EXPANSION PLANS 3-9, 6-A, 7-A, 8-A, & 9-B



AVERAGE SIZE OF 1971-1982 ADDITIONS - MW

FIGURE 3A.

TOTAL PRODUCTION AND YEARLY INVESTMENT COSTS
GENERATION EXPANSION PLAN 9 WITH
0%, 25%, 50% AND 75% OF 1971-1982 UNITS NUCLEAR
THREE YEAR TOTALS — 1971 + 1978 + 1982



EXPANSION PLAN 9 NUCLEAR MIX ENERGY DURATION PATTERN

MW

38,000

36,000

34,000

32,000

30,000

28,000

26,000

24,000

22,000

20,000

18,000

16,000

14,000

12,000

10,000

8000

6000

4000

2000

0

0% 50% 100%

1974

0% 50% 100%

1978

0% 50% 100%

1982

MAX. SCHED.
CAPABILITY

STATE PEAK
LOAD

1982
LOAD

DURATION
CURVE

MAX. SCHED.
CAPABILITY

STATE PEAK
LOAD

1978
LOAD

DURATION
CURVE

75% NUC.

50% NUC.

75% NUC.

50% NUC.

25% NUC.

MAX. SCHED.
CAPABILITY

STATE PEAK
LOAD

1974
LOAD

DURATION
CURVE

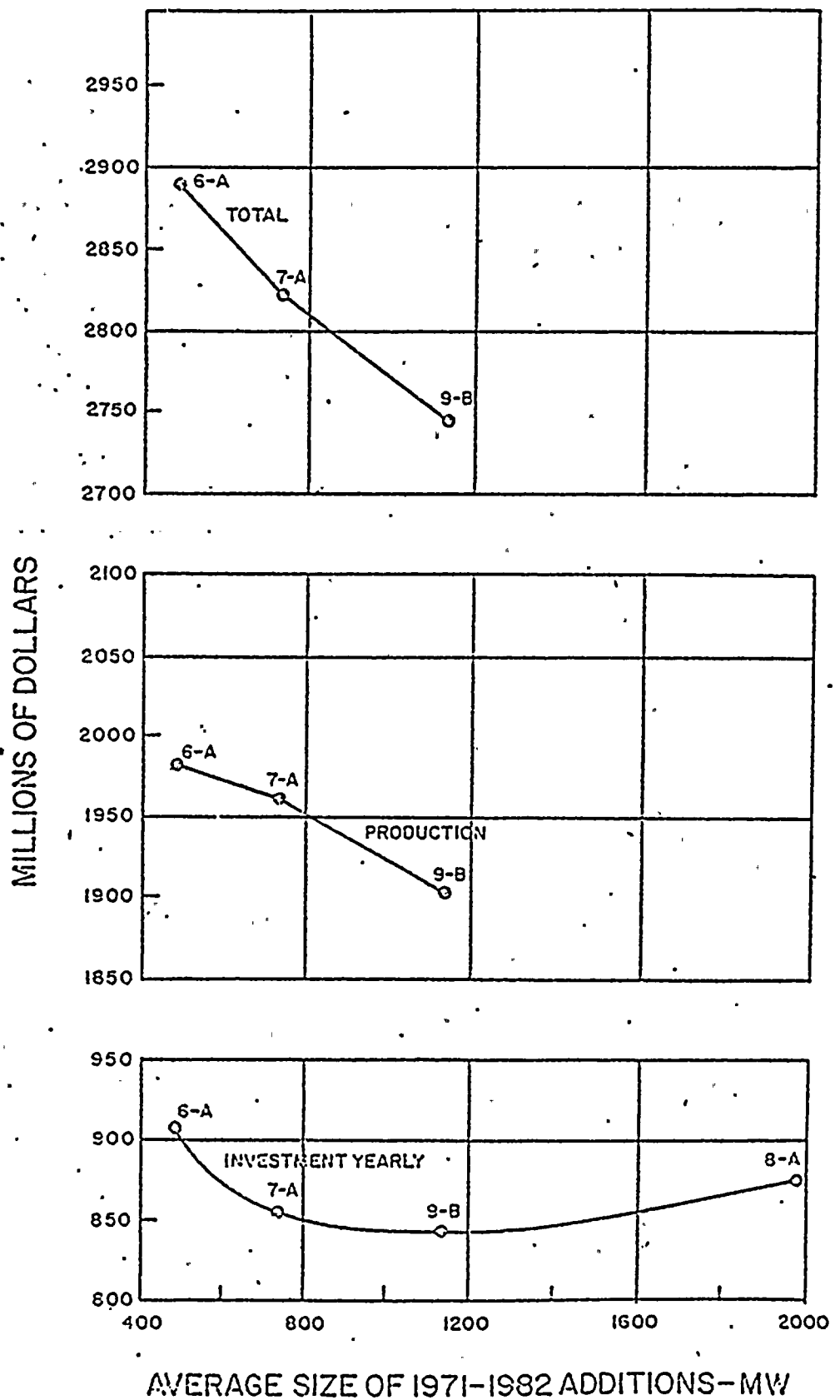
75% NUC.

50% NUC.

25% NUC.

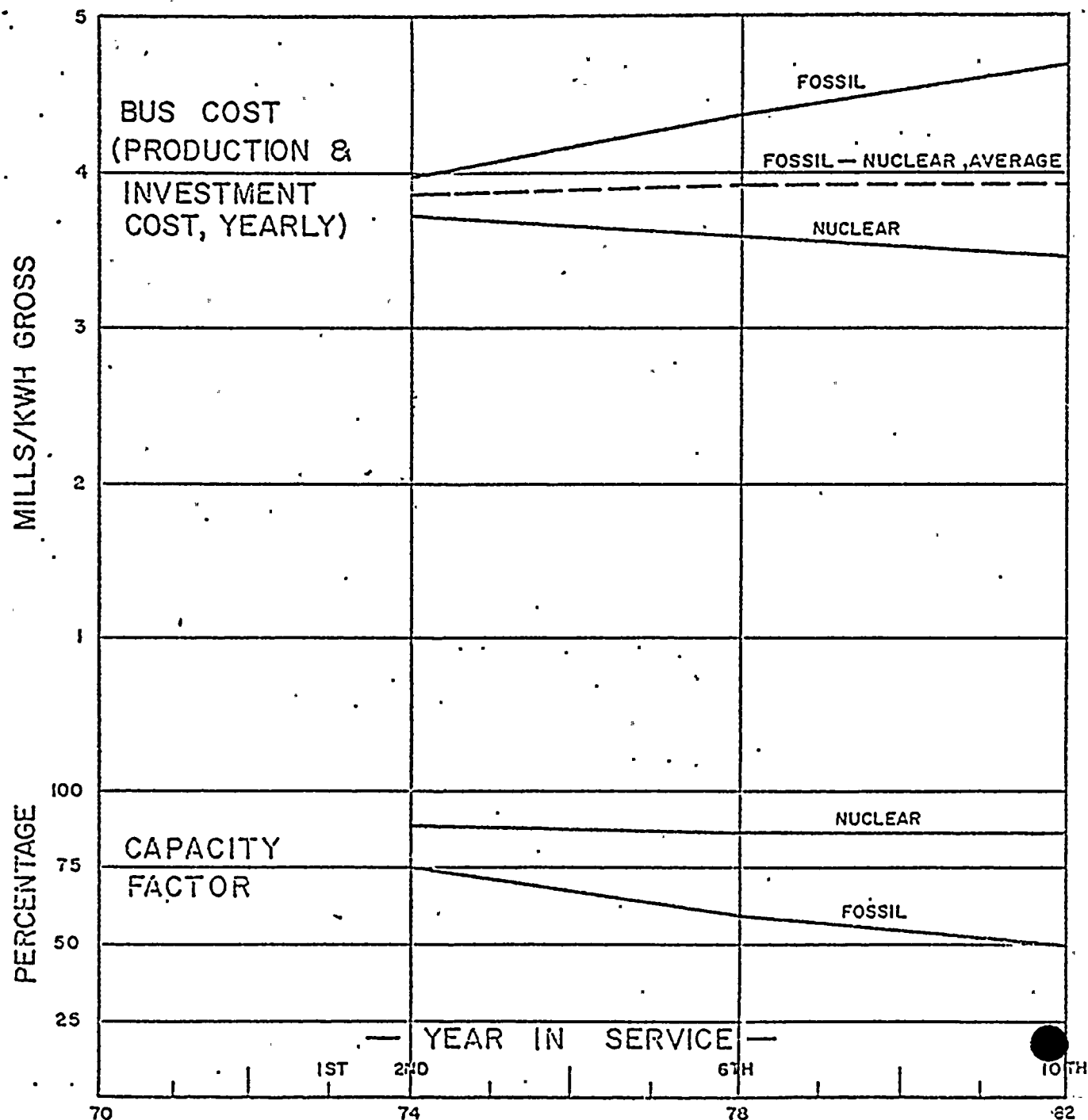
1. COST

PRESENT WORTH OF TOTAL PRODUCTION AND YEARLY INVESTMENT COSTS GENERATION EXPANSION PLANS 6-A, 7-A, 8-A AND 9-B (50% NUCLEAR EXPANSIONS)



2 - 800 MW UNITS NUCLEAR & FOSSIL

(1973 INSTALLATION)
(PLAN 9-B, 50% NUCLEAR)
(EXPANSION)



— STUDY YEAR —

SUMMARY OF EXHIBITS

- 1 -- RATE OF RETURN & FIXED CHARGE RATES, TOTALS
- 2 -- NUCLEAR & FOSSIL PLANT COSTS
- 3 -- FOSSIL FUEL PRICES
- 4 -- NUCLEAR FUEL PRICES
- 5 -- OUTAGE RATES

Rev. 7/15/65
9/17/65

LONG-RANGE STUDY

SUMMARY OF RATES OF RETURN AND FIXED CHARGE RATES

Rate of return and fixed charge rates are to be weighted averages of the rates of the individual utilities. The weighting factors are proportional to the 1968 - 1982 load growths of the five utilities.

	Factors	Rate of Return		Depreciable Property Fixed Charge Rate, Levelized		Non-Depreciable Property Fixed Charge Rate	
		Individual	Weighted Average	Individual	Weighted Average	Individual	Weighted Average
FP&L	.540	7.12	3.84	13.41	7.24	13.35	7.21
FPC	.240	7.08	1.70	11.69	2.81	12.32	2.96
TECo	.126	6.97	.88	12.06	1.52	11.70	1.47
JAX	.072	6.89	.50	14.79	1.06	11.46	.82
OUC	.022	8.00	.18	8.40	.18	8.00	.18
	<u>1.000</u>		<u>7.10</u>		<u>12.81</u>		<u>12.64</u>

4/27/65
Rev. 8/30/65

11 FIXED CHARGE RATES

Annual fixed charge rates for use in the Long-Range Planning Study are tabulated below. The number on the left of the slash mark is the first year percentage and the number on the right is the lifetime levelized percentage.

Item	FP&L	OUC	JAX	FPC	TECo
Return - %	7.12/7.12	8.0/5.4	6.89/6.89*	7.10/5.18	6.97/
Depreciation-%	4.0/1.55	3.0/3.0	3.33/3.33	2.5/2.5	3.00/
Federal Tax -% @ 48%	4.33/2.84	--	--	4.48/3.27	4.03/
Property Tax - %	{ 1.9/1.9		4.39/4.39	.7/.7	.60/
Insurance - %			.18/.18	.04/.04	.10/
Total	17.35/13.41	11.0/8.4	14.79/14.79	14.82/11.69	14.70/12.0

*Paid to City of Jacksonville General Fund in lieu of taxes. This represents a 4% amount to conform with group practice plus 0.39% representing State sales tax (7/28/65 ECN)

LONG-RANGE STUDY

SUMMARY OF GENERATING PLANT INVESTMENT COSTS \$/KW
 (For Use in Long-Range Study)

I - FOSSIL(1) UNITS

Unit Size MW	FP&L		FPC	TECo.		JAX	OUC	AVERAGE BASIC(4) COST	AVERAGE TOTAL(5) COST
	ORIGINAL	BASIC(2)	BASIC (ORIGINAL)	ORIGINAL	BASIC(3)	BASIC (ORIGINAL)	(ORIGINAL)		
450(430)	\$62.00	\$63.20	\$78.00C	\$69.10C	\$68.20	\$82.00	\$83.67	\$69.18	
540(530)	58.50*	59.60	\$6880/7.100C	66.60C	65.70	80.00	80.00	64.76	
640 (780)	57.00	58.10	66.40	63.00C	62.20	77.00*	77.00	62.38	
820(860)	54.50	55.50	65.00	61.70*C	60.90	75.00	75.00	60.29	
1080(1000)	53.00	54.20	63.80/67.00C	58.50C	57.70	71.00	71.00	58.91	
1150	52.00	53.00	63.50/66.00C	-	59.00	70.00	70.00	58.17	
1500	50.00	50.90	62.00/65.00C	-	53.00	68.00	68.00	55.79	

II - NUCLEAR UNITS

Unit Size MW	ORIGINAL	BASIC(6)	AVERAGE BASIC(7) COST	AVERAGE TOTAL(5) COST
430	\$110.80	\$125.900		\$120.40
570	103.80	119.006		114.056
640	100.50*	115.222		109.561
820	93.00	106.620		101.289
1150	85.90	98.484		93.560

NOTES: General -- ORIGINAL - fossil unit data as submitted by each utility; nuclear unit data from GE Nuclear Power Plant Data, as revised 10/20/65 to include change in turnkey prices and change to 80° F cooling water.

BASIC - cost exclusive of site, site preparation, high voltage switchyard and step-up transformer, but including interest during construction.

* - Interpolated Value

- (1) - Fossil cost data are for oil or gas fired units except data suffixed by "C", which are for coal fired units.
- (2) - FP&L original cost data less cost of high voltage switchyard and step-up transformer (@ \$2.40/kw for 430 mw unit to \$2.00/kw for 1500 mw unit) plus interest during construction @ 6%.
- (3) - TECo. original cost data less cost of step-up transformer (@ \$0.90/kw for 430 mw unit to \$0.80/kw for 1000 mw unit).
- (4) - Weighted average based on:
- | | | |
|------|---|-------|
| FP&L | = | 54.0% |
| FPC | = | 24.6% |
| TEC | = | 12.6% |
| JAX | = | 7.2% |
| OUC | = | 2.2% |
- (5) - Average basic cost plus average cost of site, and site preparation.
- (6) - Original cost data plus interest during construction @ 6%.
- (7) - Two-unit average based on cost of second unit being 90% of cost of first unit.

FLORIDA STUDY GROUP LONG-RANGE GENERATING PLANT INVESTMENT COSTS

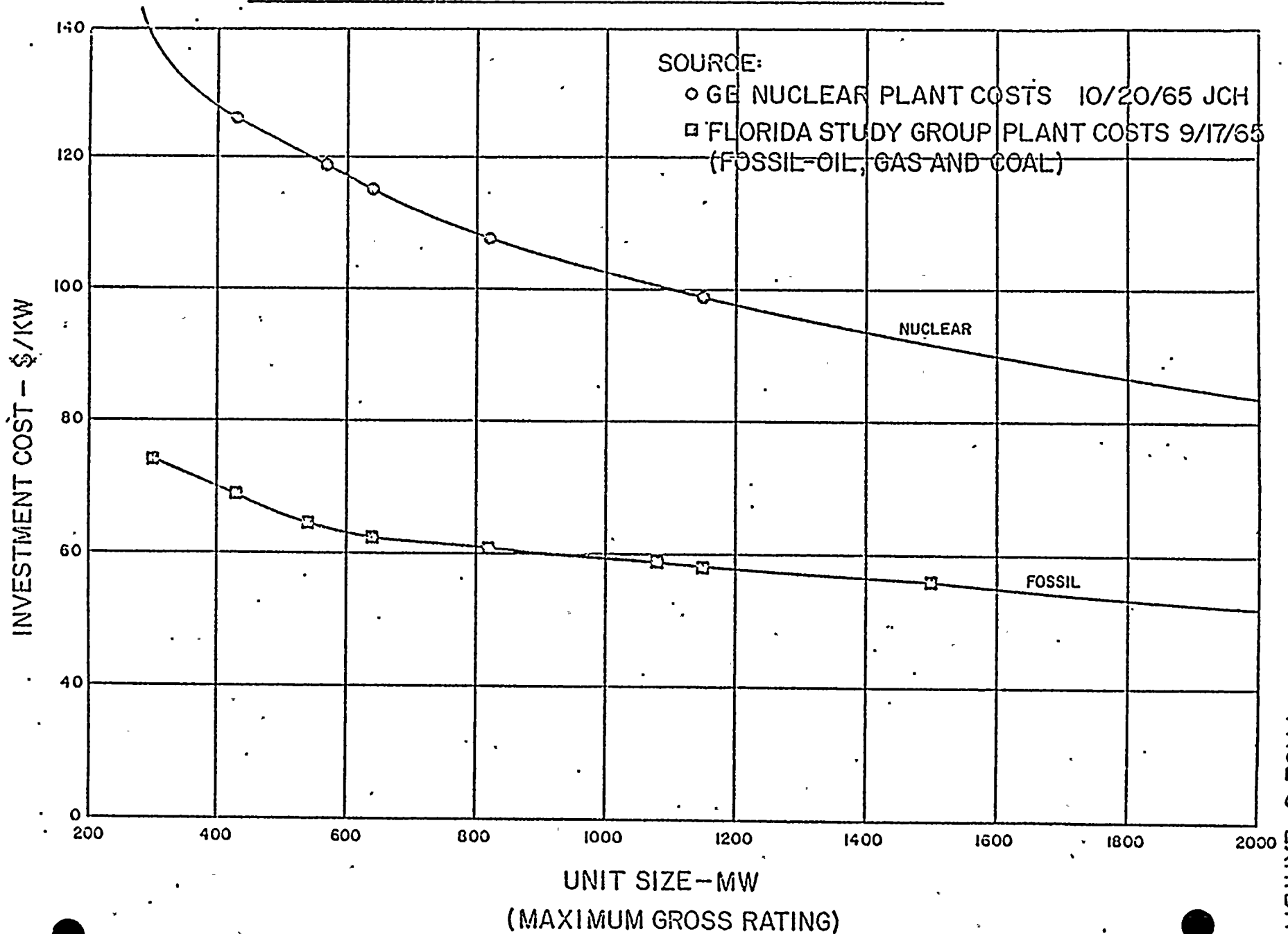


EXHIBIT 3
FOSSIL FUEL PRICES
\$/MBTU

<u>FP&L</u>	<u>FPC</u>	<u>TECO</u>	<u>JAX</u>	<u>OUC</u>	<u>TOTAL</u>
.3182	.2957	.2581	.3300	.3450	.3067

Note: Individual company fuel price is average of existing fuel prices for individual units, averaged by number of units.

Total fuel price is weighted average of individual company averages. Weighting is proportional to company total generation. This price is assumed to remain level from 1968 through 1982.

EXHIBIT 3

EXHIBIT 4

NUCLEAR FUEL PRICES

The nuclear fuel prices used in the study consist of a variable fuel cost and a fixed fuel cost as illustrated on Figure 1 and Figure 2 of this exhibit. Figure 3 illustrates what the total fuel cost would be for a 9% fixed charge rate. Figures 4, 5, and 6 tabulate in greater detail the individual assumptions used in making the fuel cost calculation.

Basically, this data represents the GE handbook prices for fabrication for core 1, core 11, and core 111, and uses Grahams long range forecast for core IV and V and Grahams forecast for other cost components as tabulated in the Figure 4 and 5.

The basic data made available was for a unit installed in 1970. The plot of the variable fuel cost versus years in Figure 1 indicates that a deflation factor may be used to simplify the variation of the variable fuel cost by years. Figure 2 shows the pattern of the annual fixed charges by years for the 1970 unit. This series of nonuniform annual fixed charges was reduced to a constant annual fixed charge using present worth techniques.

To determine the starting point for variable cost for all units installed after 1970, it was determined that the curve of Figure 1 was sufficiently close to the long term trend of Figure 3 and starting values for first-year fuel costs were selected from this curve for units.

For the selection of the fixed fuel rate for units installed after 1970, it was determined that there is a trend downward in fixed charges proportional to the trend of fuel costs as shown in Figure 3. The dash curve pattern plotted then in Figure 2 gives the fixed charges to be used for all years after installation for units installed in any particular year.

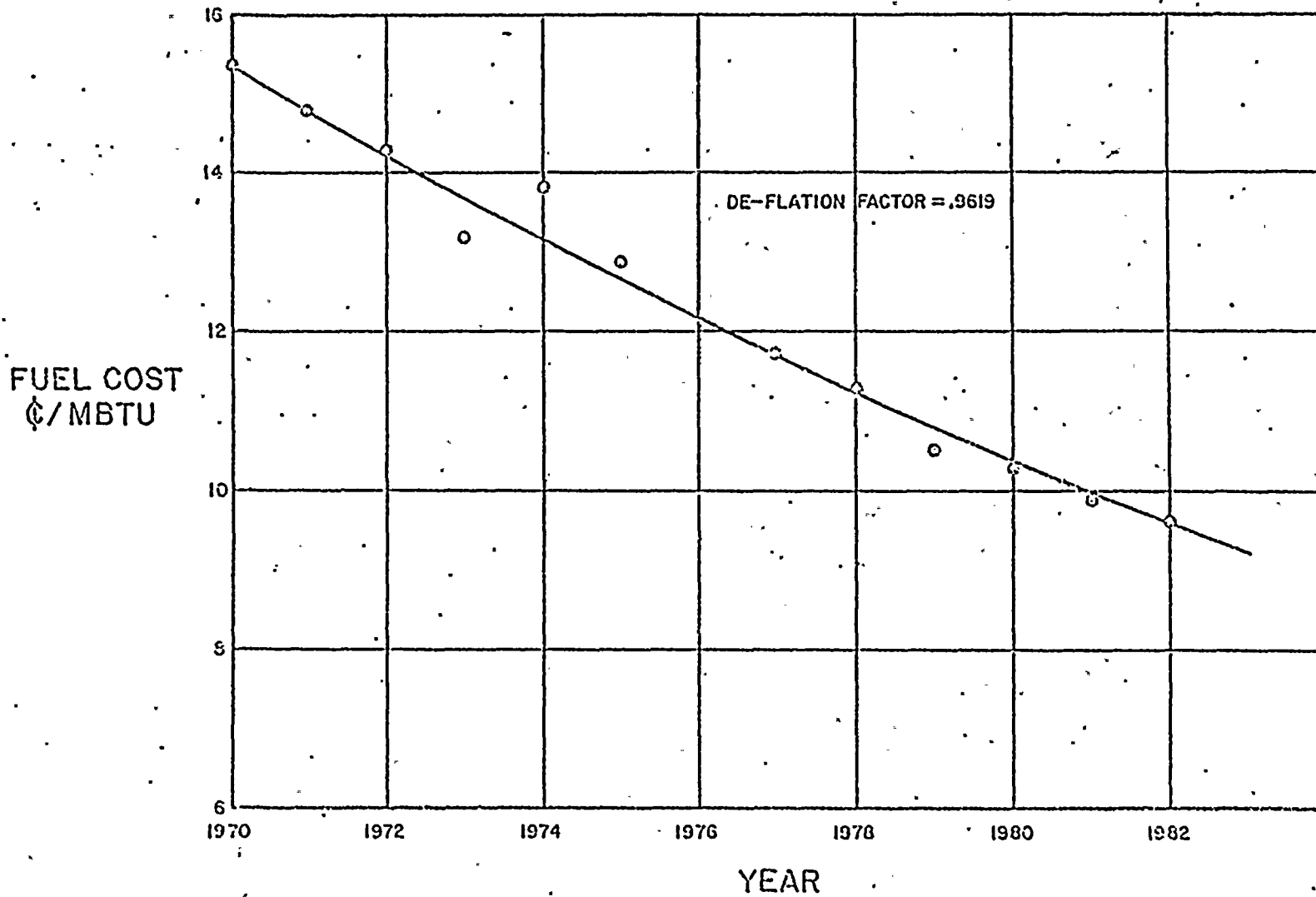
From the various data on different unit sizes, it was concluded that the variations in variable fuel costs were insignificant and that the fixed charges could be reduced to a \$/MW without sacrificing any material accuracy.

FUEL COST
2/7/70

EXHIBIT 4



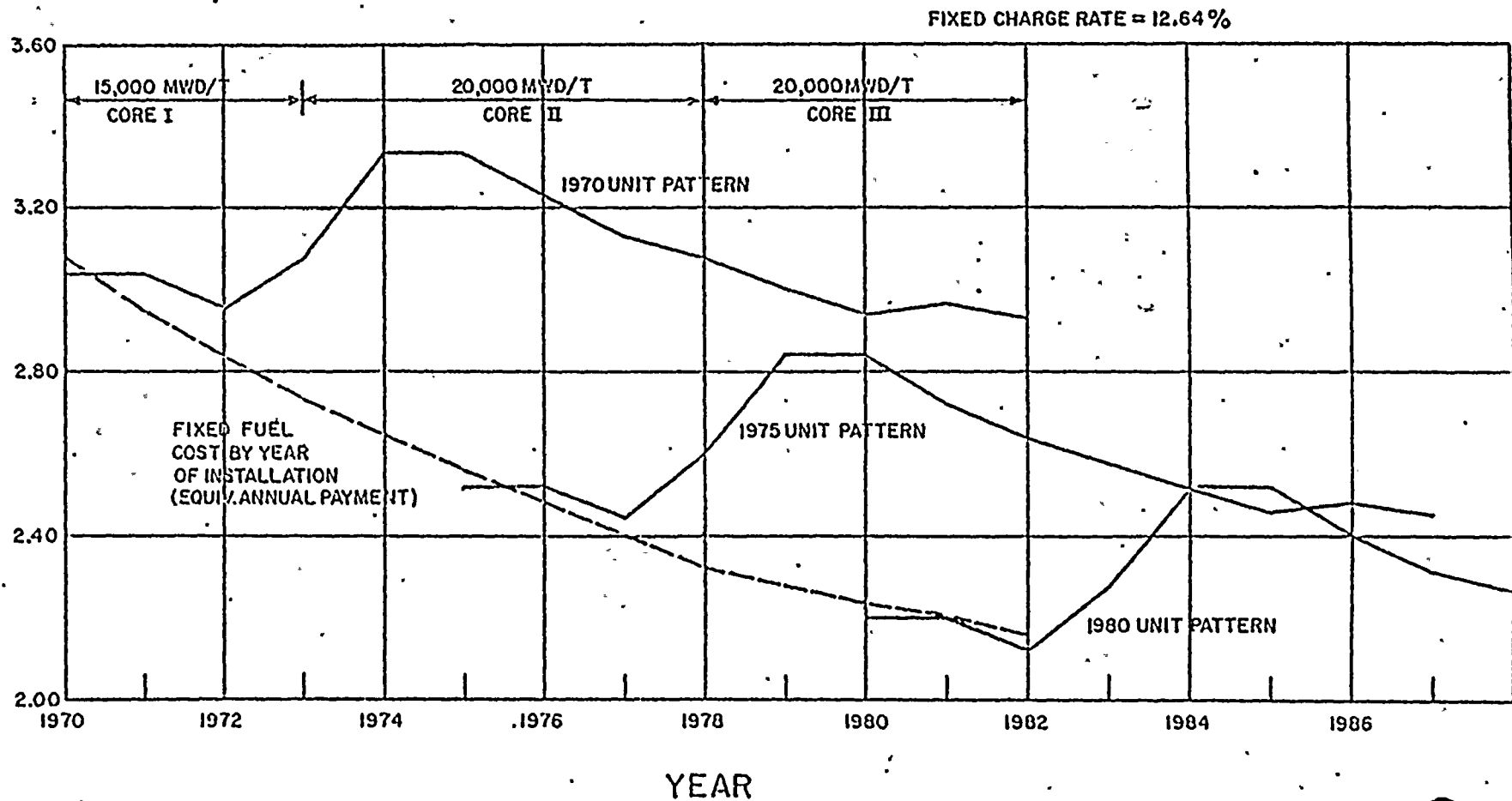
NUCLEAR VARIABLE FUEL COSTS IN ¢/MBTU



- B420 -

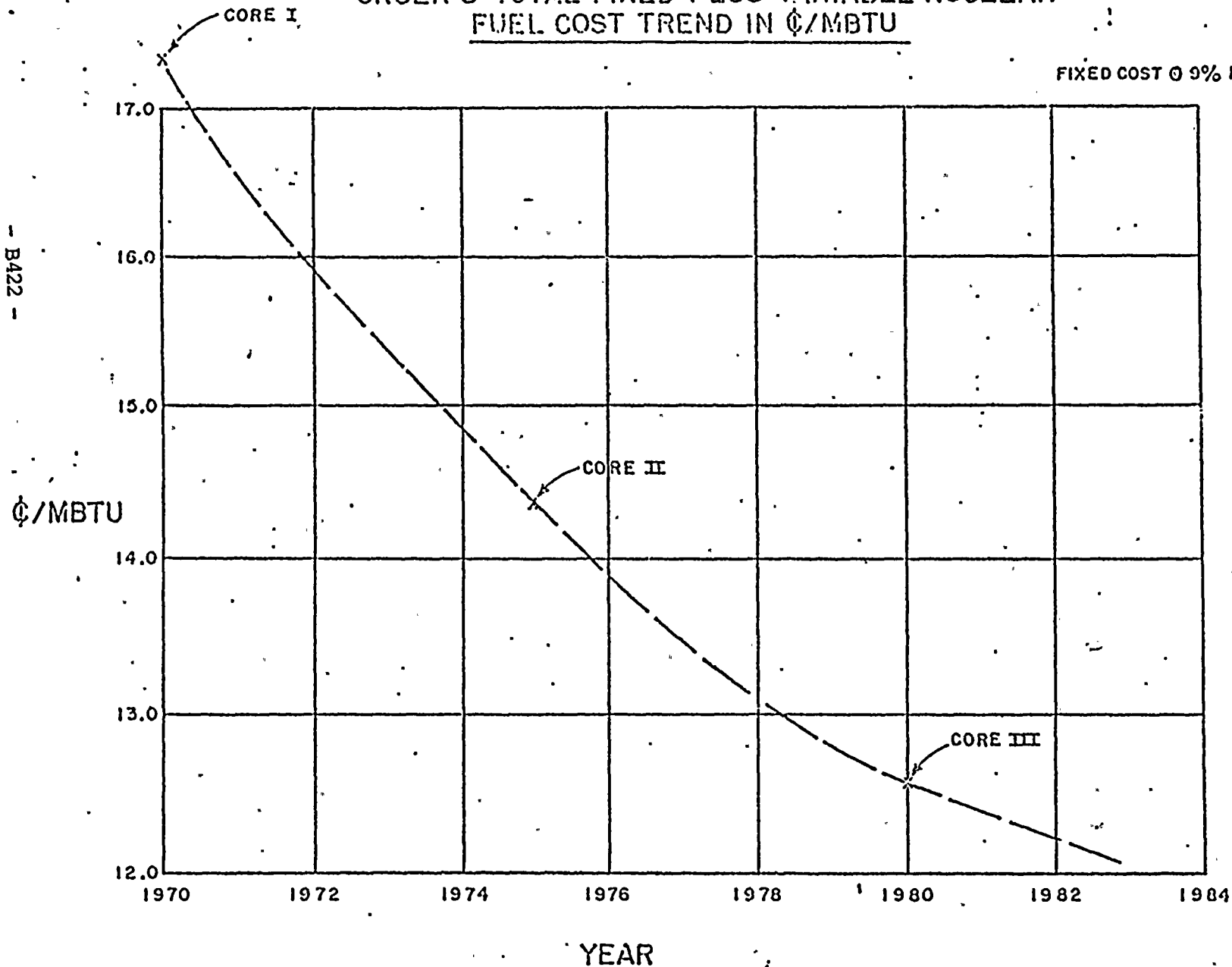
NUCLEAR FIXED FUEL COSTS IN \$/KW ON MAXIMUM GROSS RATING

- B421 -



UNGER'S TOTAL FIXED PLUS VARIABLE NUCLEAR
FUEL COST TREND IN ¢/MBTU

FIXED COST @ 9% F.C. RATE



FUEL CYCLE COST ASSUMPTIONS

Principal Assumptions

Year of Operation	Ore Concentration \$/lb U ₃ O ₈	Conversion U ₃ O ₈ to UF ₆ \$/lb U	Enrichment Services \$/lb U	Recovery \$/kg U	Plutonium Credit \$/GR FN
1970	5.00	1.00	30.00	41.50	9.00
1975	4.50	0.50	25.00	41.50	7.25
1980			20.00	36.40	7.25
1985			17.50		10.25
1990			15.00		9.50

Fabrication Price

Estimated Plant Rating MWe	Fab. Price; \$/lb U in Year of Operation				
	1970*	1975*	1980*	1985**	1990**
200	\$47.40	\$44.60	\$40.70	\$17.50	\$15.00
300	44.90	42.10	38.20		
400	44.00	41.20	37.00		
500	43.50	40.60	36.30		
600	43.10	40.10	35.90		
700	42.90	39.70	35.50		
800	42.70	39.40	35.10		
900	42.60	39.30	35.00		
1000	42.60	39.30	35.00		

*Handbook Listed (Core I - 1970) (Core II - 1975) (Core III - 1980)

**From Long Range Forecast (Core IV - 1985) (Core V - 1990)

EXHIBIT 4
Fig. 5

Other

1. 1% Spare Fuel has been assumed.
2. Fuel Cycle Financing Rate:

Pre-Irradiation Inventory	5%
Irradiation and Post-Irradiation Inventory	9%
3. Exposure:

First Core	15,000 MWDt/ST
All Subsequent Cores	20,000 MWDt/ST
4. All Private Ownership
5. Net Plant Heat Rate = 10,970 Btu/kwh from 200 through 1000 MWe.
6. Capacity Factor = 80%. 14.32
7. Batch Loading (Computer Run): 13.82
 - First Core Initial Reload - two years after start of commercial operation.
 - Annual Batch Reloading thereafter
 - Batches 1 & 2 reinserted as part of Batches 5 & 6
 - Transition from Handbook Core Fabrication Prices to R.H. Graham Long Range Forecast is made with 4th core
8. Financing cost on the first core load prior to initial commercial operation (approximately 0.5¢/MBtu) is not included but has been assumed as a Purchaser cost assigned to the plant construction and testing period.

ALLOCATION OF COSTS TO GENERATION

1000 MWe

<u>Year of Operation</u>	<u>Fixed MS/yr</u>	<u>Variable ¢/MBtu</u>	<u>Total</u>	
			<u>Mills/kwh</u>	<u>¢/MBtu</u>
1970	2.360	15.28	2.013	18.35
1971	2.356	15.24	2.007	18.30
1972	2.300	14.11	1.877	17.11
1973	2.389	13.02	1.772	16.15
1974	2.582	13.66	1.867	17.02
1975	2.565	12.76	1.767	16.11
1976	2.498	12.11	1.687	15.38
1977	2.433	11.60	1.620	14.77
1978	2.378	11.22	1.571	14.32
1979	2.315	10.65	1.500	13.68
1980	2.285	10.21	1.446	13.19
1981	2.297	9.85	1.409	12.85
1982	2.274	9.46	1.362	12.42
1983	2.241	8.94	1.300	11.85
1984	2.185	8.35	1.227	11.19
1985	2.076	7.83	1.155	10.54
1986	1.975	7.38	1.091	9.95
1987	1.893	7.17	1.042	9.50
1988	1.833	6.80	1.008	9.19
1989	1.794	6.68	0.989	9.01
1990	1.861	6.41	0.968	8.83

Lbs of U = 461, 100

Initial Enrichment Ave = 2.00%

7008.0×10^6 kwh/yr

EXHIBIT 5

FORCED OUTAGE DATA

Unit Size Range (1) (MW)	Florida Pool, 1955 - 1963		Forced Outage Rate (%)		Forced Outage Rate (%)	
	No. Of Units	Unit Years	Forced Outage Rate (%)	EEL 1960-63 Average	N.P.S. Advisory Committee Report No. 24 ⁽²⁾	As Used In Study Mature Initial (1st Yr)
0-59	--	--	<u>1.4*</u>	--	1.5	1.3 1.6
50-89	10	66	<u>1.4</u>	1.7	1.5	1.3 1.6
90-129	9	48	<u>1.3</u>	1.7	1.5 - 3.9	1.3 1.6
130-199	2	4	2.8**	<u>2.2</u>	3.9	2.2 2.75
200-389	3	6	0.5**	<u>4.2</u>	3.9 - 5.5/4.4/4.0	4.2 5.25
450-500				**	5.4/4.4/4.0	5.5/4.4/4.0 6.9/5.5/5.0
501-800				**	5.2/4.8	5.2/4.8 6.5/6.0
801-1100					5.9/5.3	5.9/5.3 7.4/6.6
1101-1400					5.7	5.7 7.1
Over 1400					6.0	6.0 7.5

* Assumed equal to 60-89 size range

** Insufficient data to be significant

(1) Sizes through 389 mw - nameplate capacity

Sizes larger than 389 mw - capability

(2) Rate for various years of installation as 1960/1970/1980 or 1970/1980.

6-16-66

Exhibit 5

AND 10/10/01

The advantages of granting FP&LCo. a franchise and leasing or selling the City's system to FP&LCo. as opposed to continuing to own and maintain City's own system or as opposed to buying power and reselling same.

270210

The City may net more income for their general fund by selling or leasing their facilities to FP&LCo. and receiving a 6% franchise tax on commercial and residential KWH's sold.

State here amount we will pay for lease or payments in event of sale.

(Estimated electric assets \$5,000,000. Can we capitalize and receive

approximately 7% return, if so can we pay 6% of electric assets as lease).

PP&LCo. can provide lower rates for the citizens. Mass production and diversities provide greater economy. Small plants are not flexible.

270211

State here the amount the people of Homestead area can save on electric bills in one year - in 10 years.

The citizens may become discontent in learning that the people outside the City's service area pays less for power.

KRS 10/18/67

FP&LCo. rates have decreased over 35% in the past 10 years while labor, materials, equipment and most fuels have risen in costs.

Charts showing drop in rates.

Try to get charts on labor, materials and equipment.

Charts showing rise at well-head while electric rates go down.

270212

The City must expect to pay more for equipment, materials, fuels and labor in the future than they have in the past. It will be difficult to keep the rates the same.

The Homestead area would be more attracted to new business and industry with FP&LCo. power capabilities.

KRS 10/10/01

By leasing or selling facilities, the City could be relieved of all liabilities pertaining to their electric system.

270213

The officials of the City would be able to devote their entire efforts to serving the needs of the people as opposed to over-seeing a business and even more important, the elective officials could be relieved of all responsibilities and accusations when outages and other malfunctions occur on the system.

The electric employees of Homestead could benefit from being placed on FP&LCo.'s payroll. Comparison of all salaries, fringe benefits, etc.

AKB/10/10/01

With FP&LCo.'s new Turkey Point Plant, and from other work planned in the area, the citizens of Homestead could expect more reliable service. With modern equipment and better trained personnel, FP&LCo. would up-date the City's existing distribution system which should provide greater reliability of service and safer operation.

270214

FP&LCo. will have troublemen on duty 24 hours a day in this area.

The location of the City's plant within City Limits may become objectionable as expansion becomes necessary. Today's public is becoming conscious of noise and pollution. Plant nuisances are always present.

KRS 10/12/61

1. Land and other fixed assets appear to include other than electric facilities

270215

2. Construction ^{IN} and progress (1964 construction fund) \$2,122,561.02.

3. What is the book value of total electric system? Show distribution facilities separately.

4. What is the appraised value of total electric system? Show distribution facilities separately.

NOV 10/10/51

5. What are ^{Values of} ~~the~~ inventories on hand?

270216

6. What is the total debt on electric facilities only?
Revenue Certificates
Bonds outstanding, etc.

7. How much insurance is in force on physical facilities, electric only.
A. Is this 100% coverage ?
80% ?

8. What percent of KWH's sold to customers was
A. Commercial
B. Residential
C. Industrial
D. Others (other than to City)

E. How many commercial customers?

How many residential customers?

How many industrial customers?

How many other customers - other than City?

270217

9. KWH's unaccounted for is approximately 8% of the total KWH's generated.

Is this High?

From the engineers point of view, how much could FP&LCo. reduce this?

10. Are charges to and from the Electric Department allocated properly?

11. How many employees from each department should be charged full time with the electric operation ?

270218

What are their salaries?

The above questions include administrative, billing, reading, maintenance, and repair of equipment, etc.

What does the employees pension plan consists of?

What fringe benefits do the employees receive?

12. What is utility tax fund - State?

KRB 10/18/61

270219

13. If the generators at the Homestead Plant should be shut down, how much of the 5,810,900 KWH's would still be required at this location?

Thursday
Oct 18, 1973

Division Hqs meeting

Ben Fugate

Oct 18, 22 of notes - process

We claim it is anti-union

Anti-Union - Anti-Union

However

Dept of Justice

(We are not doing "union" action)
a 11, will be doing in future

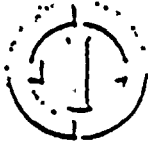
etc. not action

All sorts of anti-union action

Question is whether we limit
to and/or can support
to others

Cities want to have citizenship
and authority, etc.

Justice Dept seems to want to be
a step - a step along way
to be a step in the future
to be a step in the future



EDISON ELECTRIC INSTITUTE

150 THIRD AVENUE • NEW YORK, N. Y. 10017 980-4100

September 16, 1968

To: Policy Committee on Atomic Power

Messrs: J K Horton, Chairman

G L Andrus

J H Campbell

W L Cisler

W J Clapp

D C Cook

C B Delafield

R H Fite

S R Knapp

B B Parker

R T Person

R G Rinchliffe

L H Roddis

S L Sibley

J H Ward

F M Warren

William Webster

Gentlemen:

The attached may be of interest to you.

Sincerely,

John J. Kearney

John J. Kearney, Secretary
Policy Committee on Atomic Power

JJK:fc
Attachment

2-16-68

Remarks by the Honorable John B. Anderson COPY
Member, Joint Committee on Atomic Energy OWS
Before the Briefing Conference on Nuclear Powering the Nation
The Sheraton-Park Hotel, Washington, D.C.
September 6, 1968

CHANGING TIMES FOR THE NUCLEAR POWER INDUSTRY

One glance at the agenda for this briefing conference on nuclear power suggested that a not inappropriate title for my remarks today might be "Changing Times." This afternoon's agenda is perhaps most indicative of what I mean. There's a safeguards panel at 2 p.m.; an antitrust panel at 4. Neither topic, until recently at least, has been what might be termed a clubhouse word in the nuclear fraternity.

Another subject of uncommon interest at this time, and one which I am confident has been getting its share of attention at this conference, is thermal pollution, so-called. From the standpoint of public notoriety it too is a topic of relatively recent vintage, although of course the engineers have been wrestling with it for years. Certainly it has never before received the public attention it has gotten in recent months.

Other items of more than passing interest at this time are such things as compulsory sharing of ownership of nuclear plants; proposed revision of the so-called "practical value" provisions of the Atomic Energy Act; improvements in the AEC's regulatory procedures; and the future role of the ACRS (I suppose I should say "future role, if any" of the ACRS in view of Craig Hosmer's semi-serious — at least I think it was only semi-serious — proposal to abolish the ACRS.)

This list obviously is not exhaustive. One might also include such items as the proposal to authorize the imposition of civil fines upon AEC licensees; the question of possibly increased financial protection requirements under the Price-Anderson Act; and the matter of transferring the AEC's gaseous diffusion plants to private industry, a subject on which I anticipate early initial Joint Committee hearings after preliminary consultation with the General Accounting Office and the Department of Justice.

The fact that so many matters of this significance are being given varying degrees of legislative consideration is ample evidence that evolution of the nuclear industry, and of the licensing process, is proceeding apace. Indeed, the number of proposals now under active consideration would suggest that we are now entering a phase of rather rapid and significant change in the process. I think it is fair to say that there has never been a period in the history of this program where more demands were being made for a critical re-evaluation of the premises upon which the licensing of reactors is currently based.

During the time allotted to me today I would like to discuss with you some of the legislative proposals presently pending in Congress which, if enacted, could have a substantial impact on the licensing process. Depending on whether and in what form some of these measures are enacted, they could well influence the direction which additional legislation on the licensing process will take.

Legislative Proposals of Interest to Nuclear Power Industry

Legislative proposals of immediate relevance are S. 2564, commonly referred to as the Aiken-Kennedy bill, and the various proposals dealing with what has come to be referred to as the "practical value" problem. In the latter category we have a bill representing the AEC's answer to this question as well as identical bills introduced in the House and Senate by several members of the Joint Committee which reflect a somewhat different approach to the

problem. Whether it is to be taken seriously or not there is a third proposal representing the views of Representative Saylor and others, whose solution is to make the practical provision of the Act utterly impractical by requiring Congress to approve each and every license proposed to be issued by the AEC for the commercial generation of electric power.

Still another bill introduced by Representative Saylor would establish a Federal Committee on Nuclear Development "to review and re-evaluate the existing civilian nuclear program of the United States." Finally, and not directly related to any of those I just mentioned, there is the measure proposed by the AEC to eliminate the mandatory requirement for an ACRS review and report on all license applications for power and test reactors. All of these proposals are pending before the Joint Committee.

Bills of principal interest pending before other committees of Congress include the Administration's proposed Electric Power Reliability Act as well as several variations thereof introduced by individual congressmen and senators. There are also bills sponsored by Senator Muskie and Representative Dingell which deal with the problem of thermal effects and which appear to be aimed in substantial part, if not almost exclusively, at the AEC. Undaunted, Representative Saylor has another bill, this one before the Ways and Means Committee, which would impose an excise tax on the electrical output of nuclear power plants.

Proposed "Electric Powerplant Siting Act of 1968"

Finally in this category there is S. 3330, styled by its authors as the proposed "Electric Powerplant Siting Act of 1968." This proposal would impose severe constraints, if not to say a moratorium, on the licensing of nuclear powerplants while the Federal Power Commission conducts a two-year powerplant siting study and formulates a national powerplant siting plan. Even after completion and submission to Congress of FPC's siting plan the AEC could not issue a license for a nuclear powerplant unless the applicant demonstrated that his proposed site was in accordance with the plan and that his proposed facility represented the "ultimate maximum utilization of the power potential of the site." Just why nuclear plants are to be singled out for this extraordinary treatment, when the problems that apparently impelled introduction of the bill admittedly are not peculiar to nuclear plants, has never been explained. Worse yet the bill's sponsors, who ostensibly are proponents of enhanced electric power reliability, either by design but more likely through inattention have drafted their measure so as to effectively preclude the issuance of operating licenses for nuclear plants that have been fully constructed and await only an operating authorization from the AEC. This doesn't exactly comport with my notions of electric reliability. If this bill is enacted as drafted I have a suspicion that the FPC may find itself conducting its siting study by the light of a flickering candle.

It is abundantly clear to anyone who has taken the time to familiarize himself with the nation's burgeoning energy requirements that we face a monumental task if these demands are to be met. I won't belabor the obvious to this knowledgeable audience by recounting the projected growth of power demand for the next 20 or 30 years. Nor will I attempt to outline the difficulties presently being experienced in keeping up with the demand. Suffice it to say that the task confronting the nation, and more particularly the electric utility industry, is such that full use of all our energy resources — coal, oil, gas, hydro and nuclear — will be required if this power is going to be available when and in the amounts needed.

Participation by Small Electrical Utilities In Nuclear Power

Time does not permit a detailed discussion of each of the legislative proposals I have

mentioned. Let me begin, however, with the so-called Aiken-Kennedy Bill, S. 2564, and its companion bills in the House, H.R. 13828 and 15273. Their stated purpose is "to insure a reasonable opportunity for all electrical utilities to participate in the benefits of nuclear power." To this end the legislation would require, among other things, that the AEC withhold any license for a nuclear powerplant unless it finds that the license applicant, first, has granted to all other utilities an opportunity to participate to a fair and reasonable extent in the ownership of the reactor, and second, has agreed to make the output of the plant available for sale to other utilities on fair and nondiscriminatory terms. Other important findings which the AEC would be required to make in each instance relate to the financial and technical feasibility of the proposed facility; the adequacy of the plant's capacity in terms of its capability to meet reasonable demands for electric energy within the region to be served, including the demands of other utilities; and the adequacy of transmission capacity in terms of its capability to serve all who are participating in the ownership or output of the plant. With respect to certain specified matters relating to the facility — regional power resources development, water and related land resource development, and antitrust considerations — the AEC would be required to request the advice of the Federal Power Commission, the Water Resources Council, and the Attorney General, respectively, and give "due consideration" to their advice in determining whether or not to approve an application for a license.

In many respects this measure marks the resurgence of the "public power versus private power" infighting that characterized the debate over the Atomic Energy Act of 1954. That issue laid more or less dormant for 13 years, but has now been resurrected — with a vengeance! The smaller utilities, principally those publicly and cooperatively owned, want a piece of the action — they want to participate in the economies of scale associated with large-scale nuclear facilities. In many cases they don't have the energy demands or the capital to permit construction and operation of large plants, nuclear or conventional, and apparently in some cases have been rebuffed in their efforts to obtain participation in joint ventures being organized for this purpose in their region. Because nuclear power was developed with the assistance of substantial Government funds, they feel that as a matter of Federal law they should have the right to participate in nuclear facilities being built by others. Without enactment of the Aiken-Kennedy bill they contend that they will be unable to compete with the investor-owned utilities, and will inevitably fade from the scene.

The investor-owned utilities, on the other hand, argue at no less a decibel level that permitting other utilities to zero in on a system's newest and most economical plant would be grossly unfair and discriminatory to that system's regular customers, who must pay rates based on system-wide costs, including the costs of older and less efficient plants. They also believe that enactment of the Aiken-Kennedy bill would lead to intolerable delays in the licensing process, with the result that investor-owned utilities, in the interests of electric reliability, will turn to other means of power generation than nuclear energy. They contend, moreover, that the purchase by municipally and cooperatively-owned utilities of power at regulated wholesale rates, together with special tax and other advantages which they enjoy, will permit them to compete very effectively for the electric dollar.

The federal agencies interested in or affected by S. 2564 who testified during the Joint Committee's extensive hearings on this bill did not speak with one voice. Indeed, in the case of one important agency — the Federal Power Commission — it became necessary to schedule the Chairman one day and another commissioner the next to learn the varying views within that agency on S. 2564. One or two other agencies adhered to the party line imposed by the Bureau of the Budget by perfunctorily genuflecting in the direction of the Administration's Reliability Bill, but the burden of their testimony left little doubt that they favored S. 2564 in addition to, if not in lieu of, the so-called Reliability Bill.

Administration's Proposed Electric Power Reliability Act

For the most part, however, the bulk of the agencies involved, while supporting the basic objectives of Aiken-Kennedy, said that enactment of the Reliability Bill would be the preferable course. In their view the Reliability Bill would not only achieve a number of the same objectives as S. 2564, but do so without singling out a particular energy source for special treatment. The concern was expressed that S. 2564, by increasing the disparities in regulation between nuclear and conventional plants, could lead to plant choices based on considerations extraneous to those normally considered in deciding the type of plant to be built, namely, economic and other inherent advantages.

For the benefit of that rare individual in this audience who is not familiar with the Reliability Bill, I should point out that under that bill regional planning councils, which would be open to membership by each electrical system in a region regardless of the nature of its ownership or operation — that is, whether privately, cooperatively or publicly owned, and whether or not engaged in the generation of electricity as well as in the distribution thereof — would be established for planning and coordination among utilities. Coordination plans adopted by these planning groups would be subject to FPC approval, disapproval or modification. FPC could compel participation in the council if an electric utility unreasonably refused to participate. According to the FPC it could under this new authority direct any person engaged in the generation or transmission of electrical energy to establish physical connection of its facilities with those of one or more other persons engaged in the generation, transmission or sale of electrical energy, and to sell energy to or exchange energy with such persons. The Commission could also, as I understand it, prescribe the terms and conditions of the arrangement to be made between the parties affected by the order.

Joint Committee Action on S. 2564 (Aiken-Kennedy Bill)

The Joint Committee has yet to meet in mark-up session to grapple with S. 2564, although I anticipate such a meeting may be held in the coming weeks. For whatever it is worth my own best estimate is that, at the present time at least, and in its present form, S. 2564 at best — and I would underscore the words "at best" — could not be reported from the Committee without sharply held majority and minority views. In the absence of anything approaching unanimity within the Committee, I think it is quite likely that S. 2564 will be tabled for the time being, if not indefinitely. My personal view is that such action — or rather, nonaction — is to be devoutly hoped for. In my opinion, and I'm being as charitable as I can, the bill is impractical in the extreme.

If pigeon-holing S. 2564 has no other advantages, at least it would permit a period of time to elapse during which other developments — including possible passage of the Reliability Bill and hopefully increased voluntary cooperation between the industry's various segments — might make further consideration of this or any other similarly unprecedented measure totally unnecessary. This period might be used by S. 2564's proponents to marshal the data that was so obviously lacking during our hearings. In some respects it was somewhat amusing, in others quite disturbing, to learn that this clamor for participation in nuclear plants is based not on technical analyses or detailed cost comparisons, but rather on the premise that "if it's good enough for the large utilities, it's good enough for us." The loophole in this logic is that it ignores one important factor — namely, that some of the investor-owned utilities seem to have gotten aboard the nuclear bandwagon for pretty much the same reason: if it's good enough for Commonwealth Edison, Consolidated Edison, TVA and others, it ought to be good enough for us.

- B476 -

Meanwhile, back at the reactor manufacturers', the working engineers are laboring feverishly to fill the orders their sales engineers have managed to get signed on the dotted line in record numbers. It is our every hope and expectation that the products of their efforts will operate as reliably, efficiently, and economically as predicted.

Nevertheless, it remains to be seen whether several years from now the smaller utilities will be breaching a huge sigh of relief over the possible demise of S. 1564 somewhat reminiscent of that which they express whenever they are reminded that, but for Chet Holifield and some other restraining influences, a number of them might have purchased their own Hallam, Elk River, LaCrosse, or Piqua reactors when participation in nuclear power was last so much in vogue among the small utilities.

Legislation Concerning "Practical Value"

Legislation with considerably greater prospects for early passage is that dealing with the so-called "practical value" problem. Two main legislative proposals in this regard are before the Joint Committee, both of which would have the effect of eliminating from the Atomic Energy Act the outmoded requirement for a finding of practical value. One, representing the views of the AEC, would eliminate any distinction between commercial and developmental reactors by lumping them together under a new licensing section, essentially the equivalent of the present commercial licensing section.

The other proposal, the so-called Holifield-Anderson bill, is co-sponsored by Representatives Holifield and Price and Senators Anderson and Aiken. It would retain a licensing distinction between strictly commercial plants and those whose principal purpose is the performance of substantial research and development, but in effect would put a reverse twist on the "practical value" presumption. Under the law as it is presently written, nuclear powerplants are to be licensed under the research and development provisions until that reactor type has been found by the Commission to have "practical value," in which case it becomes subject to the commercial licensing section. No such finding has ever been made, and meanwhile close to 55 atomic power plants have been licensed as developmental. Under the Holifield-Anderson bill, a powerplant would be licensable under the commercial licensing section unless the license applicant demonstrated and the Commission determined that the plant was principally for the performance of substantial R&D, in which case it would be licensed as a developmental facility. Where such an affirmative determination was made, the license application would not be subject to some of the additional requirements — such as preclicensing antitrust review — which would be applicable to commercial license applications. While the Holifield-Anderson bill is perhaps less cumbersome than the AEC's proposal in that it does not entail nearly as many amendments to the Act as the latter, there seems to be little significant difference between them as to the end result: with respect to abolishing the "practical value" requirement.

Principal Differences Between Major Legislative Proposals

- B477 -

In other areas, however, there are some important differences between the measures. For one thing, Holifield-Anderson would confer upon the AEC regulatory authority and responsibility for controlling the thermal effects of heated liquid effluents discharged from licensed nuclear powerplants. The AEC's proposal is silent on this issue. For another thing, while both proposals would retain present Section 105 c., the preclicensing antitrust review provision of the Act, the Holifield-Anderson bill would require that the Attorney General make known his views in this regard at a considerably earlier time than is now required by the Act or as it would be amended by the AEC proposal. I believe this is an important feature because adverse advice from the Attorney General under any of these provisions could induce a utility to withdraw its application for a license. Even if the application were not withdrawn, conceivably such advice could lead to compulsory sharing of the plant's output, with the result that the licensee would not have the entire bloc of power from that plant that he had been counting on. In either event any undue delay in learning that other arrangements for additional power will have to be made could have unfortunate consequences with respect to the reliability of the license applicant's electric service. Time, therefore, is of the essence in such matters, and for this reason I think the six-month time limit that would be imposed on the Attorney General under Holifield-Anderson is an exceedingly worthwhile proposal.

Two other differences between these bills deserve mention. Under Holifield-Anderson, but not under the AEC's proposal, the Attorney General or his designee would be required to participate as a party in the licensing proceedings in the event that his advice is adverse to the license applicant. This too seems to be an eminently fair requirement. I think it hardly an undue burden to ask the Department's Antitrust Division to support on the record any views it may have regarding the possible anticompetitive impact of a proposed license.

Finally, whereas the Holifield-Anderson measure contemplates mandatory antitrust review at the construction permit stage and, under certain circumstances, discretionary review at the operating license stage, the AEC bill by its terms appears to require such review at both stages. Moreover, the AEC bill makes it clear that with respect to both license applications pending at the time of enactment of its measure and applications for operating licenses filed thereafter pursuant to construction authorizations granted prior to enactment, the requirements of the new consolidated licensing section, including anticipatory antitrust review, would be fully applicable. In my mind this poses a significant policy issue about which I shall have more to say in a moment.

Elimination of Requirement for a Finding of "Practical Value"

The question of whether the requirement for a finding of "practical value" should be discarded seems to be beyond debate. Few would contend, I suspect, that it has any particular relevance today in view of the unexpected way the atomic power industry has developed. When roughly 75 light water reactor powerplants, almost all of them in the 500 to 1000 megawatt or more range, have been sold on a strictly commercial basis in the last three years, it seems incongruous that they should continue to be licensed as "R&D" facilities. A change in the law is obviously called for in this respect.

A more substantial question is whether all of the requirements which accompany the present commercial licensing section should be retained. A central question in this regard is whether the prelicensing antitrust review provision should be retained or discarded. It too may have become an anachronism. The fears that originally motivated its inclusion in the Act have been largely dispelled. One might legitimately inquire why the atomic power industry should be subjected to any greater antitrust review than other industries which, like nuclear power, are fully subject to the various antitrust laws but which, unlike the nuclear power industry, generally need not undergo preliminary antitrust scrutiny.

Retention Of Prelicensing Antitrust Review Requirement

On the other hand, retention of the provision until the industry is fully on its feet would be a safeguard against anticompetitive influences that presently cannot be foreseen. In addition, its retention could have the effect of permitting those utilities which had been refused participation in joint nuclear ventures to raise the question of their exclusion as an antitrust issue in appropriate cases. However, whereas under S. 2564 the license applicant would have the burden of showing compliance with the many conditions prescribed by that bill, under the anticipatory antitrust review procedure the burden clearly would be on others to demonstrate that issuance of the license as requested would somehow tend to create or maintain a situation inconsistent with the antitrust laws. If this not inconsiderable burden can be carried in a particular case then it might be desirable to authorize the Commission to require the license applicant to permit reasonable participation in the project by one or more aggrieved parties, assuming, of course, that they have the wherewithal to do so. In such cases it might also be appropriate, in view of the AEC's obvious lack of expertise in such matters, to repose with the FPC the responsibility for determining the rates and other conditions of participation where the affected parties themselves are unable to come to negotiated agreement on these details. But whether it is the FPC or the

AEC which makes this decision, I believe construction of the facility should not be delayed pending final resolution of these matters.

Provision for Early AEC Determination of Antitrust Issues

If this special antitrust review procedure is retained, I believe very serious consideration should be given to incorporating in the Act those provisions of the Holifield-Anderson bill calling for earlier rendition by the Attorney General of his views and participation by him or his designee in the licensing proceeding. Moreover, I believe that either by statute or regulation a mechanism should be provided whereby a license applicant may request and receive an early separate hearing on the antitrust issue and perhaps on the apparently related issue of financial qualification. Certainly he should not be required to wait anywhere from six to nine additional months for completion of the AEC-ACRS safety review to obtain a definitive Commission determination on these collateral matters. As originally suggested by Wayne Aspinall in 1966, the AEC's rules of practice presently provide for such a procedure with respect to the question of site selection when requested by the applicant, and I see no reason why an analogous procedure could not be established for antitrust matters. It might also be desirable, however, to realign the composition of the licensing board handling so specialized a matter as antitrust to assure that a majority of its members are legally trained.

As I mentioned a moment ago, another important question that will confront Congress if the antitrust review procedure is to be retained is whether this requirement and other commercial licensing requirements should be fully applicable to licensees who possess a construction permit but not an operating license at the time of enactment. This same question will arise if the thermal effects provisions of the Holifield-Anderson bill are enacted. I for one have serious reservations about changing the rules of the game, so to speak, in the middle of the game. At this time I am not persuaded that a licensee should have to follow a procedure at the operating license stage entirely different from that which he was required to follow at the construction permit stage and on which he based his plans and underlying contractual arrangements.

When the time arrives for a utility to file an application for an operating license it may have been banking on that bloc of power for upwards of 6 or 7 years. In the interim there may well have been unexpected delays in construction. Even under present licensing procedures, the safety review at the operating license stage may consume considerably more time than the utility had contemplated when it ordered the facility and scheduled it for addition to its system. Under these circumstances, to compound matters by subjecting that licensee to the additional potential delays that might be involved in these new procedures could work a heavy burden on it and have adverse consequences for its customers. Worse yet, if the licensee were required by the AEC to assign a share of that plant's output to another system, the licensee would have little or no time to make arrangements for substitute capacity. That such a turn of events could wreak near havoc to a utility's most carefully laid advance plans seems almost beyond debate.

Little wonder, then, why the industry reacted with surprise and consternation last month when the Commission, in an almost offhand manner, announced during Joint Committee hearings that it planned to review its policy concerning license conversion when it makes a finding of "practical value." A firm policy against requiring conversion of outstanding developmental licenses to commercial licenses has been embodied in the Commission's regulations for the past 12 years, and AEC licensees understandably feel that they had been led to believe they would not have to change horses in midstream. I expect, therefore, to see this issue explored in some depth at the Committee's forthcoming hearings on the entire "practical value" question.

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Regulation Of Thermal Effects of Nuclear Powerplants

As to the matter of regulating thermal effects, it seems to me that the exercise by the Commission of regulatory responsibility over this aspect of nuclear power is virtually inevitable. The Commission, of course, already exercises regulatory controls from the standpoint of potential radiological—as contrasted with thermal—effects that might result from the discharge of effluents from nuclear powerplants. Representative Dingell, chairman of the House Subcommittee on Fisheries and Wildlife Conservation, has introduced legislation in the House which would generally bar the AEC from issuing any license or permit for a nuclear plant unless the Secretary of the Interior first certified to the Commission that heated liquid effluents discharged from the proposed plant would not reduce the quality of adjoining waters below applicable water quality standards. Further, the AEC would be required to include in its licenses any reasonable terms and conditions which the Secretary might prescribe to control such discharges. More recently Senator Muskie, chairman of the Senate Subcommittee on Air and Water Pollution, succeeded in getting passed in the Senate a bill which would require AEC cooperation with — some say AEC subjugation to — the Interior Department as respects the thermal effects of licensed nuclear powerplants.

Both men, and they are not alone, have repeatedly taken the AEC to task for its position that it is without legal authority to regulate nuclear plants from this standpoint. Finally, after the AEC sought and obtained a Justice Department legal opinion supporting that position and continued to show no particular interest in seeking whatever legislative authority it lacked, Messrs. Muskie and Dingell took the steps I have described. This was followed by introduction of the Holifield-Anderson bill. This bill would also require the AEC to obtain the aid and expert advice of the Interior Department respecting thermal effects, but this advice would be entitled to no more nor any less consideration than the advice which the AEC regulatory staff obtains from other agencies, such as the U. S. Geological Survey, the Coast and Geodetic Survey, and the Fish and Wildlife Service. In no event would the views of Interior be legally binding on the AEC or, thereby, the license applicant. The bill would spell out the authority of the Commission to withhold or to condition a license on the basis of thermal effects considerations, but would make it unequivocally clear that the authority to control thermal effects is merely another tool which the AEC would employ to regulate the nuclear industry from the standpoint of what Congress deems to be the national interest. One distinct advantage of the Holifield-Anderson measure is that it would establish a fixed time within which the Secretary of the Interior must furnish his advice to the AEC, an important consideration in view of the need to avoid any unnecessary delays in getting new generating capacity into operation.

Environmental Considerations Common To All Energy Sources

If the Commission and the nuclear industry feel excessively put upon in this regard, they shouldn't. Nuclear power is not the lone target of the conservationists and others who are genuinely concerned about the effects on the environment of large powerplants. Coal and other fossil-fueled plants have to contend not only with the agonizing problem of air pollution, but share as well—although to somewhat a lesser degree—nuclear's problem of thermal pollution. (Chances are, moreover, that greater attention will be focused on the thermal effects of conventional plants once nuclear stations are regulated from this standpoint.) Hydroelectric projects, undeservedly or not, seem to be a special rallying point for citizens' groups who are up in arms over esthetics and related land use considerations, and in many cases can be licensed, if at all, only after costly litigation and protracted delays. Pumped storage projects by their very nature require unnatural—and often unwanted—reservoirs. Nuclear plants, in addition to being confronted by ecologists concerned over the potentially harmful effects of thermal pollution, have to contend with visceral public fears associated with the atom. Despite signs that nuclear plants are en-

joying increased public acceptance, there's still an element of truth to the cartoon in my office of the woman who reminded her fellow members of the World Betterment League, "Of course, I'm for peaceful uses of atomic energy, but I warn the government it'll be war if they try to build a power station in our neighborhood."

As Charles F. Lucas, Chairman and chief executive officer of the Consolidated Edison Company, remarked last year, "There isn't a power-supply problem in our service area for which we have a solution that everyone will applaud. But I don't think we should feel too sorry for ourselves; the highway builders have the same problem, and the steel manufacturers, and certainly the mining industry. Almost every form of economic activity runs into this very real concern of Americans for protecting their environment." By the same token I think it worthwhile to repeat the words to the wise which Mr. Lucas expressed earlier this year for the benefit of those who would pursue their conservation goals without regard to the side-effects of their excessive zeal: "There is a natural temptation, I think, to go overboard for protection of the environment. To be for natural beauty and social justice is like being for motherhood and the flag. But we must remember ... that the basic job entrusted to (electric public utilities) by society is the provision of plentiful, reliable, economic electric energy. We cannot perform that job without some impact on the environment."

Unfinished Regulatory Business on JCAE Report

The Commission has been subjected to considerable criticism in regard to thermal pollution, some of it misguided, some not. Enactment of legislation giving the Commission authority to oversee the industry from this standpoint should put to rest much of this criticism. As a minimum it should prevent any recurrence of instances in which concerned citizens and state and local governments were rebuffed in their efforts to express themselves on this important, and to them most germane, matter. It is not surprising that they cannot comprehend why the atomic safety and licensing boards lack jurisdiction over a matter so intimately related to other matters which the boards do entertain as their hearings. One unfortunate by-product of all this controversy has been the adverse publicity which attended it, and which in some cases seems to have gotten associated in the public mind with the quite unrelated issues of radiological health and safety. Perhaps even more unfortunately, the time may well be past for securing the optimum legislative solution to the AEC's thermal effects problem.

I can only hope that options are not similarly foreclosed or limited in other areas deserving of attention, such as the fundamental question of separating the AEC's regulatory responsibility from its developmental and operational responsibilities. In my estimation, suggestions that consideration of this question can be put off for another 5 or 10 years simply aren't realistic. In this connection, I perceive no reason why any anxiety over a possible decrease in the interchange of technical information and ideas between a more independent licensing authority and the AEC's Division of Reactor Development and Technology cannot be overcome through the creation of a statutory committee not unlike the AEC-Defense Department Military Liaison Committee, and not unlike — and probably at least as fully effective as — the Reactor Safety Steering Committee which presently serves the purpose of bridging the gap between the separated regulatory staff and the reactor safety research staff.

Also, it strikes me that something is amiss when the Commission's rules for the conduct of licensing proceedings are formulated and administered in such a manner that they give every appearance of placing the burden of proof, so to speak, as to safety of the plant on the Director of Regulation, rather than on the applicant where it belongs. This appearance, I might add, has not been confined to uncontested cases. Again, when a committee is established by statute to serve in an advisory capacity to the Commission but

(Over)

ends up being more the adviser than the advisor. It seems to me that we may have strayed from the original intent of the legislation. These are a few of the questions that appear to require further consideration in connection with reactor licensing. I will not take the time to review the questions that prevail with regard to other matters such as materials licensing.

In closing I would just like to utter a clarifying word or two about further congressional consideration of these questions and some other unfinished regulatory business on the docket. Contrary to the notion that may prevail in some quarters, the Joint Committee does not have a stand-pat attitude on the current regulatory and licensing regime. Any failure on the part of the Committee to follow up last year's detailed two-part hearings in this regard can be attributed more to the press of other important and not unrelated legislative business -- including some of the bills I've discussed today -- than to any uncontrolled enthusiasm for the present regulatory arrangement in all its aspects. On the contrary; if anything, the developments that have occurred since the time of our last hearings, particularly in terms of increasing licensing delays, leave little doubt that further attention will have to be devoted to this area.

In fact, we have not been entirely idle on this score in the intervening months. The Committee has met informally with interested groups to obtain their candid views as to where the regulatory program ought to be headed. The Commission itself, meanwhile, in apparent recognition that the regulatory program has achieved something less than nirvana, has appointed an in-house review group to conduct its own examination to assure that procedures keep pace with the rapid expansion of the industry. This introspection is highly commendable but cannot be a substitute for outside review, and certainly cannot be the basis for legislative change.

I trust that, on the basis of what I have said this afternoon, you will agree with me that these are indeed "changing times" for the nuclear industry. Thank you.



ARMOUR

JUL 13 '68

ARMOUR AND COMPANY
CHICAGO, ILLINOIS 60690

WILLIAM WOOD PRINCE
CHAIRMAN OF THE BOARD

July 11, 1966.

Dear "Mac":

In view of what you told me of power costs the other day in St. Louis, the enclosed letter may be meaningless. On the other hand, our discussions with Sargent & Lundy and with my friends at Commonwealth Edison, make me believe that there may be a chance of achievement.

It is also possible, if it were desirable, that I could convince another chemical company whose management I know exceedingly well, to build at a nearby site and take a similar load.

I do hope we can make a success of this, because it would be I think quite important to the State of Florida, and a very significant step in the industry.

Sincerely yours,

Bill

Mr. McGregor Smith, Chmn.,
Florida Power & Light Co.,
25 S. E. 2d Avenue,
Miami, Florida, 33101.



ARMOUR

ARMOUR AND COMPANY
CHICAGO, ILLINOIS 60690

WILLIAM WOOD PRINCE
CHAIRMAN OF THE BOARD

July 11, 1966.

Dear "Mac":

Armour and Company is considering building a Chemical processing plant in Florida. The primary economics are dependent on a price for electric energy at the site of not to exceed 3-1/2 mills per kilowatt-hour. Our Consulting Utility Engineers, Sargent & Lundy, have advised us that the load which our plant will demand should permit such a price if the energy is supplied by a large nuclear power plant.

The plant will utilize electric furnaces. The character of the load is essentially constant. The load will be maintained steadily at full capacity 24 hours a day. Due to scheduled overhaul of the furnaces, the load will be approximately 400,000 k.w. for seven months and 325,000 k.w. for five months, resulting in an annual capacity factor of about 92 percent.

The location of our plant will be approximately 50 miles southeast of Tampa, and could be

placed at a site at which it could be served by your Company, as well as by either the Florida Power Co., or the Tampa Electric Co., thus making it convenient for load interchange.

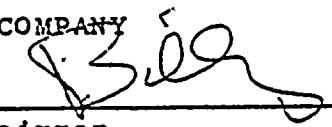
Our Consultants have tentatively recommended a coastsides nuclear plant of some 800,000 k.w., one-half of which would be for the supply to Armour and Company's chemical plant, and the balance to take care of the approximately annual load-growth in Florida.

We are attaching a list of certain facts that you might find useful.

We look forward to discussing this matter with you in the near future.

Very truly yours,

ARMOUR AND COMPANY


Chairman

Mr. McGregor Smith, Chairman,
Florida Power & Light Co.,
25 S.E. 2d Avenue,
Miami, Florida, 33101.

Enclosure.

7-11-66FACT LIST

1. The plant would be located about 50 miles southeast of Tampa.
2. The initial installation will have a maximum electrical demand of 400,000 kw.
3. The power factor of the load will approximate unity.
4. While maximum reliability of the power supply is important, reasonable interruptions can be tolerated without injury to the process. Scheduled outages would be permissible.

A firm supply of 200,000 kw should be maintained, but the remainder may be considered as interruptable.

5. The plant life is expected to be 15 to 20 years and a 15-year contract would be acceptable.
6. Power should be delivered at 13,800 or 22,000 volts for distribution throughout the plant.
7. The plant has modest process steam requirements.
8. The plant is expected to employ about 250 men.

SEP 15 '66

ARMOUR

ARMOUR AND COMPANY

OFFICE OF VICE PRESIDENT

401 N. WABASH AVE., CHICAGO, ILL.
MAIL: BOX 9222, CHICAGO, ILL. 60690
AREA CODE 312-943-3100

September 13, 1966

Mr. McGregor Smith
Florida Power & Light Company
Miami, Florida

Dear Mr. Smith:

It was a pleasure for Mr. Wilson, Mr. Polak, and I to meet with you and your associates in Miami in late August to consider the question of your being able to serve our projected process loads at an energy rate structure which would be consistent with our requirements.

Inasmuch as we have not heard anything in the interim from any of your people, it occurred to me that I should write you at this time confirming our very definite continued interest in pursuing this matter with you. We are quite anxious to ascertain, within the near future, that our requirements can be met. If, as discussed during our meeting, some advantages would accrue by our guaranteeing the fuel cycle cost to you, we would appreciate any discussion which you may wish relative to this matter. Additionally, we at Armour in Chicago and our colleagues at Sargent & Lundy are at your disposal at any time that you think a meeting for further suggestions would be appropriate.

Would you be kind enough at your early convenience to advise that you are studying your ability to meet our requirements, and when we might next expect to have a progress report.

We look forward to visiting you again and would like to request another ride in the "swamp buggy."

Sincerely,



M. E. Lewis

MEL:MF

September 16, 1966

Mr. M. E. Lewis, Vice President
Armour and Company
Box 9222
Chicago, Illinois 60690

Dear Mr. Lewis:

Thanks for your letter of September 13.

The morning after we met with you and your associates, I called Mr. MacInnes, President of Tampa Electric Company, and told him that you folks would be getting in touch with him to discuss a 400,000 kw load in his territory. I told Mr. MacInnes of our meeting and development that the load apparently would be in Tampa Electric's territory, and I explained that we would be willing to work with him by investing in a joint plant or purchasing a large block to help make the project economically feasible.

After meeting with your officials in New York, Mr. MacInnes reported back that they were getting together the necessary studies and would be getting in touch with us again as to the possibility or necessity of our participating in this project. Since the plant will be out of our territory we could not afford to serve it, but if we can back up Tampa Electric in some manner, we shall be glad to do so and I think it will be the best solution.

We certainly enjoyed visiting with you fine folks and do hope you will have occasion to be back down this way again. In the meantime, we would be glad to have any suggestions you may have as we are anxious to see this project develop in Florida.

Very best regards.

Sincerely yours,

McGregor Smith

McGS-bjc



TAMPA ELECTRIC COMPANY

P. O. Box 111

TAMPA, FLORIDA 33601

OFFICE OF THE PRESIDENT

September 19, 1966

Dear Mac:

✓ Thank you very much for your letter of September 16 with your interchange of correspondence with Mr. Lewis of Armour and Company.

Since our visit with them which I told you about on the telephone, we have been working diligently with consulting engineers to determine if it is possible to serve that load with their required cost. Comparisons are being made between fossil fuel, mainly coal, and nuclear, and everything I know of to come up with an answer. We are not sufficiently advanced to talk with you as to surplus power sales or where we could fit the thing together. As soon as we reach that point, we will be in touch with you.

The coal-fired plant has the additional advantage of getting some steam for a possible coke manufacturing process at the site, as well as the possibility of an advantageous ammonia plant.

I tried to talk to you on the phone this morning about another matter, but found you were "bird watching" at Turkey Point--will replace the call tomorrow.

Best wishes and kind personal regards.

Sincerely,

Mac

W. C. MacInnes

Mr. McGregor Smith
Chairman of the Board
Florida Power & Light Company
P. O. Box 3110
Miami, Florida 33101



September 16, 1966

Mr. W. C. MacInnes, President
Tampa Electric Company
P. O. Box 111
Tampa, Florida

Dear Mac:

Attached is copy of a letter from Mr. M. E. Lewis,
Vice President of Armour and Company, and a copy of my
reply.

I had assumed that since the plant was to be in
your territory, there was nothing more for us to do
right now. Have there been some developments that
would cause these people to come back again to us?

Very best regards.

Sincerely yours,

McGregor Smith

McGS-bjc

Attach.

