BULK POWER TRANSMISSION STUDY

Volume IV

Public Utility Commission of Texas

Electric Division

Economic Analysis Section

May 1988

CONTENTS

Volume IV

Public Utility Commission of Texas

7800 Shoal Creek Boulevard · Suite 400N
Austin, Texas 78757 · 512/458-0100

Dennis L. Thomas
Chairman

Jo Campbell
Commissioner

Marta Greytok
Commissioner

TO: ALL BULK POWER TRANSMISSION PROJECT REVIEW PARTICIPANTS

Since the review meetings held in early December 1987, the project staff has made several substantive revisions to the final report, based on questions and comments at the meeting or subsequently submitted by letter. These changes were necessary to reflect some corrections in the input data, additional loadflow analyses performed by LCRA and the City of Austin, and a more up-to-date assessment of the future course of the natural gas market in Texas.

You are invited to attend a joint meeting of the review committees to be held on *Friday, April 29, at 9:00 a.m. in the Commissioner's Hearing Room at 7800 Shoal Creek Blvd.,* here in Austin. At the meeting, project staff members will discuss the changes which have been made in the final report in the past few months.

Under separate cover, you will receive copies of the revised Chapters 4 and 5 which, as you may recall, contain all of the results from the MAPS/MWFLOW computer model scenarios. The findings and conclusions contained in Chapters 1 and 8 (which are based on 4 and 5) will also be revised to reflect these new model runs and other comments elicited from the earlier reviews. These topics will be discussed in detail at the April 29 meeting. The final report, including any necessary "last minute" changes, will be presented to the Commissioners at their administrative meeting scheduled for Wednesday, May 4.

If, in the meantime, you have any questions or comments about the study or the new model runs, please give me a call at (512) 458-0102.

Sincerely,

Bill Moore

Bill Moore, Economist
Electric Division

cc: Chairman Thomas
Commissioner Campbell
Commissioner Greytok
Coyle Kelly, Executive Director
Jay Zarnikau, Acting Electric Director

Electric Reliability Council of Texas

ERCOT

Tom Sweatman
Executive Director

May 3, 1988

Mr. Bill Moore
Project Director
Public Utility Commission
7800 Shoal Creek Blvd., Suite 400N
Austin, Texas 78757

Dear Bill:

ERCOT appreciates the opportunity to provide comments on the PUC's Bulk Power Transmission Study. Our comments are enclosed.

ERCOT especially appreciates the willingness of the PUC Staff to listen to our concerns and address the many problems that have arisen during the course of the Study. We look forward to this continued spirit of cooperation.

Sincerely,

R. T. Sweatman
Executive Director

RTS:nc
ENCL:noted

7200 MoPac Expressway, Suite 250 Austin, Texas 78731 (512) 343-7215 FAX: (512) 343-8134

ERCOT Response to Final Draft
of the Texas PUC Bulk Power Transmission Study

ERCOT commends the efforts of the PUC staff in its attempts to estimate the "fuel and cost savings which may be realized through enhanced operating coordination of the interconnected utilities in Texas". While ERCOT believes the Staff's assumptions and conclusions overstate realizable savings, as shown by the calculations below, the study indicates that existing ERCOT economy programs are achieving most of the economically obtainable savings.

The most accurately modeled year, historical 1986, indicates a maximum savings potential of $51.2 million. However, this ignores the cost of transmission losses, additional capacity to supply the increased losses, wheeling, and a central dispatching center. It also fails to recognize the savings from existing ERCOT economy programs. When these factors are taken into account, the actual savings opportunity becomes:

• Maximum 1986 savings indicated by the Study -----	$51,200,000
• Cost of Losses and wheeling associated with estimated transfers[1] -----	(10,810,000)
• Added capacity to supply increased losses[2] ------	(12,870,000)
• Estimated cost of operating a central dispatching office (facility with dispatch computer, data links from all control areas, 24-hour staffing with design and computational capability)[3] --------------------	(10,100,000)
• Maximum unrealized savings from study -----------	$17,420,000
• Savings from existing ERCOT economy programs ----	$12,160,000

The net savings estimated by the Study under ideal dispatch conditions are close to those currently being realized with existing ERCOT economy programs.

Reliability may be jeopardized with the level of transfers proposed by the Study. The Staff only looked at line outage contingencies in a 1990 sensitivity case using non-simultaneous transfer limits, but even those constraints were not modeled in the 1986 case. However, ERCOT protects the system against other types of outages as well, such as loss of a single generating plant, any two generating units, or a switchyard bus. Therefore, the level of transfers proposed by the Study may not be achievable without a significant loss of reliability.

Besides the 1986 case, all other cases are for future years and are based on suppositions of various fuel price scenarios. The ERCOT economy programs now in place will optimize the savings in those years, as they are doing now, whether fuel prices are at the levels theorized by the staff or at any other level.

Perhaps of most importance, the Study points out that "in order to realize all the benefits of power pooling if natural gas prices begin to escalate and diverge, the transmission network will need reinforcement with additional high voltage lines, particularly between TUEC and HL&P." Also, the Study "assumes there are cost free technical solutions for any reactive problems associated with higher line loading." The cost of such additions have not been addressed in either this Study or the calculations in this response. These costs are large and must be weighed against any assumed benefits.

NOTES:

1. Actual losses and wheeling costs incurred within existing ERCOT economy programs over the last 12 months were used to estimate losses and wheeling for this level of transfers. Computations using the Staff's numbers indicate even higher levels of losses.

2. The Staff determined that losses in the 1990 case increase 143 MW going from "own load" to "pool" operation. The capacity cost calculation is determined using $450/kw capacity cost with a fixed charge rate of 20%.

3. Building, computer, support facilities:

$25,000,000 @ 20% fixed charge rate ----	$ 5,000,000
O&M, personnel, communication ----------	5,100,000
	$10,100,000

Central and South West Services, Inc.
2121 San Jacinto Street • Suite 2500
P. O. Box 660164 • Dallas, Texas 75266-0164
214-754-1000

May 3, 1988

Mr. Bill Moore
Electric Division
Public Utility Commission of Texas
7800 Shoal Creek Blvd. Suite 400N
Austin, Texas 78757

Dear Bill:

Central and South West Services appreciates the major effort expended by you and your staff in addressing the major weaknesses identified with the earlier version of the Bulk Power Transmission Study. The revised study is an improvement over the previous study in both technical results.

All of the comments which follow are intended to only add constructive elements to specific sections of the report.

Chapter 4 Reference Case Assumptions and Results
4.2.1 Overall Savings:

In the last sentence of the fourth paragraph, the word "TUEC" was omitted after the words "For example, the model shows..."

4.2.3 Monthly Interchange:

In the second to the last paragraph in this section, the statement "C&SW does its maintenance scheduling for all four of its operating companies" is not true. The CSW Operating Companies prepare their own maintenance scheduled and C&SW Services reviews them on a consolidated basis to insure that there is adequate capacity at all times for the centralized operations of the CSW System.

4.2.5 Transmission Limitations:

Words contained in the second paragraph of this section describing Tables 4.2-15 and 4.2-16 say that these tables show "... loads during the summer peak hour as reported in the ERCOT loadflow results." The only portion of the tables that these words could be referring to is a column labelled "Line Rating(MW)" which implies a maximum load limit and not the actual loadings during the summer peak. Either words used in the text or the labelling in the tables need to be changed to reflect the information shown on the tables.

Chapter 5 Alternative Scenarios
5.1.2 ERCOT Transfer Limitation with Outage:

There is no text which introduces or describes Table 5.1-2.

The last words in the second paragraph should be "180.0 million" not "$180.0 billion."

5.4.1 Impacts of Losing Nuclear Units: Own-Load Operations:

Table 5.4-1 indicates that LCRA's 1990 operating costs will change as a result of losing a unit of STP. LCRA is not a participant in this project so their operating costs should be the same as the reference case results ($170.9 million) shown here.

5.6.1 1990 Low Cogeneration
5.6.2 1990 High Cogeneration:

The sign on the fuel displacement axis of Figures 5.6-1 and 5.6-2 is opposite that supported by the study results. In cases having less cogeneration then the reference case more utility fuel is consumed as shown by comparing Tables 4.2-11 and 5.6-1, which would imply negative rather than positive fuel displacement. In cases having more cogeneration than the reference case less utility fuel is consumed, as shown by comparing Tables 4.2-11 and 5.6-2, which would imply positive rather than negative fuel displacement.

5.8 DC Interconnection to Adjacent Power Pools:

The first paragraph contains several statements about historical events leading up to the construction and operation of the existing ERCOT/SPP interconnection that are either incomplete or incorrect. The 1981 settlement of the interconnection issue did not involve the U.S. Department of Energy or all ERCOT utilities. It did involve the PUCT, several ERCOT and SPP utilities, the U.S. Department of Justice, the U.S. Securities and Exchange Commission (SEC), and the Federal Energy Regulatory Commission. The SEC never ordered CSW to divest itself of any of its operating companies and WTU did not attempt to electrically interconnect ERCOT with the SPP. WTU connected a load outside of Texas into the ERCOT grid which put ERCOT into interstate operation and resulted in the litigation.

The fourth paragraph, beginning with the words "After considering...", also contains some incorrect statements. In the second sentence, some, but not all ERCOT companies, raised questions concerning jurisdictional conflicts with FERC. ERCOT as an entity did not take a position on this issue. In the last sentence it is incorrectly stated that ERCOT is a power pool, and if it was, it would not automatically subject it to FERC jurisdiction. Interconnection of ERCOT utilities and other utilities may not subject those ERCOT utilities to FERC jurisdiction if the interconnection is ordered by FERC via the PURPA regulations referred to in the previous sentence.

Specific changes that we recommend be made to this section of the report were given to you at the April 29 meeting as a marked up copy.

I appreciate the opportunity to provide you these comments.

Very truly yours,

Chris A. Shields

Chris A. Shields

CAS/pd

The Light company
Houston Lighting & Power

P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

May 6, 1988

Mr. Bill Moore, Economist
Public Utility Commission of Texas
7800 Shoal Creek Blvd., Suite 450N
Austin, Texas 78731

Dear Mr. Moore:

Houston Lighting & Power Company (HL&P) appreciates the opportunity to comment on the latest marked up version of the Bulk Power Transmission Study provided April 29, 1988. The Company continues to support the PUC's goal to investigate the feasibility of improving the efficiency of energy usage on a statewide basis. As stated in our comments submitted January 21, 1988, it is in the best interest of the states' utilities to determine whether opportunities exist for enhanced bulk power transfers in Texas. While some of our previous comments have been addressed in the marked up draft, many of the remaining comments are still valid. In addition, HL&P has contributed to and supports the comments submitted by ERCOT.

A new area of concern has been introduced by the latest revision which recommends that utilities should consider bringing cogenerators into the ERCOT energy broker system. Currently, all of the savings associated with a Buy/Sell transaction are shared among the ratepayers of the Buying and Selling utilities. HL&P is concerned that introducing cogenerators into the broker system as Sellers would reduce the overall ratepayers savings. Any movement in this direction needs to be researched thoroughly to ensure that all Texas ratepayers will receive the maximum savings.

It is also important to note that a basic conclusion in this report is that additional high voltage transmission lines are necessary to achieve the proposed level of transactions. Based on recent regulatory history, certifications of inter-utility high voltage transmission lines are at a standstill. The Zenith-Twin Oak and Salem-Zenith lines are two such examples.

In summary, HL&P views the study as a significant effort into the investigation of the existence of opportunities to increase bulk power transfer transactions. Furthermore, quantification and investigation into the costs of such implementation is needed before any conclusion can be drawn regarding the impact to the ratepayer. Such implementation costs will likely be significant for dispatching facilities and transmission lines. Lastly, it is the Company's belief that the current ERCOT brokerage system has been providing significant savings to Texas ratepayers and will continue to do so.

HL&P looks forward to contributing to the next phase of this investigative process. Thank you for the opportunity to offer these brief comments.

Sincerely,

H. W. Roesler
Director, Regulatory Relations

JGW/bd

cc: R. S. Letbetter
J. D. Greenwade
D. E. Simmons
D. R. Betterton
S. C. Schaeffer
J. H. Stout
C. F. Ham
S. A. Miller
J. G. White

Lower Colorado River Authority

Post Office Box 220 Austin, Texas 78767 • (512) 473-3200

May 5, 1988

Mr. Bill Moore
Public Utility Commission of Texas
7800 Shoal Creek Blvd., Suite 400N
Austin, TX 78757

Dear Bill:

I understand the tremendous effort you and your staff have invested in an attempt to respond to all of the ERCOT comments to your December presentation. The fact that you were able to accommodate the fuel and heat rate changes alone is impressive.

In January I ran several load flow studies that indicated that the generation schedule produced by MAPS/MW flow would result in many overloaded transmission lines even without contingencies. I suggested in the comments I sent in that, simply entering the lines that overloaded in my study into your monitored list would not solve the reliability problem. This is exactly what you have done, and as I stated in January, the effect that this will have is to generate a new pattern of power shipments that would result in a new set of overloaded lines. It is not possible in the time allowed to verify this by means of a study; however, there is no reason to doubt its validity. I would also like to reiterate that finding overloads in a BASE or NO CONTINGENCY case is indicative of an extremely unreliable system as base transfer limits are generally much higher than contingency transfer limits.

Finally, one must understand that base case transmission line loading is only one of the many limits on a transmission system. Studies must be run to examine contingencies by the thousands not dozens. Stability and fault duty studies must be run. Perhaps the most easily overlooked type of problem that could be the most disasters are reactive in nature. The Studies you have done do not take these things into account. For these reasons I feel very strongly that the savings you allude to in the report are substantially higher than what could actually be achieved without major transmission construction projects, a prospect that is not likely in todays regulatory and low load growth environment.

Thank you for the opportunity to comment and I look forward to working with you next year.

Sincerely,

Brady J. Belk, P. E.
Supervising Engineer

cc: ERCOT Engineering Subcommittee Members

BJB:ras

TU ELECTRIC

May 5, 1988

Mr. Bill Moore
Public Utility Commission of Texas
7800 Shoal Creek Blvd., Suite 450N
Austin, Texas 78757

Subject: Final Draft of the PUCT Bulk Power Transmission Study

Dear Mr. Moore:

TU Electric appreciates the opportunity to provide comments on the subject study. As a participant in economy energy transfers throughout ERCOT, we are very interested in potential savings by member utilities that could ultimately benefit our customers. However, as you are well aware, the task to realistically uncover the true savings is not an easy one and there are many differing opinions on the best approach.

TU Electric is of the opinion that perhaps the best way to optimize the operation of ERCOT is through the continuation and enhancement of programs experienced such as the "brokerage system", which do not require drastic changes in its current operation but rather evolve and progress according to measurable benefits actually realized. These programs not only foster closer cooperation among the utilities (an absolute necessary ingredient for any savings), but also provide a mechanism for utilities within ERCOT to adapt to the marketplace as factors such as fuel costs dictate.

Again, thanks for the opportunity to provide input into your study and please accept our comments attached.

Yours very truly,

Dwight T. Royall

Dwight T. Royall, Manager
Regulatory Services

sld
Attachment

2001 Bryan Tower Dallas, Texas 75201 214 653-4600

TU Electric's Response to the Final Draft of the Bulk Power Transmission Study

In response to the draft PUCT staff Bulk Power Transmission Study, TU Electric believes that the results obtained are based on unrealistic assumptions and are both erroneous and deficient and therefore do not constitute adequate support for implementing costly changes to the ERCOT bulk power system or its present operations. Although the Commission staff made a significant effort during the limited time and with limited resources, the potential savings expressed in the report have been significantly overstated due to unrealistic assumptions, and many expenses important to the analysis were not quantified. Most importantly, if the identified power transfers were implemented, the operating reliability and stability of the bulk power system would be seriously jeopardized.

When using complex bulk power system models, it is imperative that the input assumptions and corresponding output accurately reflect actual system conditions and constraints of the bulk power system. It is the opinion of TU Electric that the study has not met this basic requirement. Errors in the study's assumptions and logic are listed below:

1. The divergent fuel cost scenario assumed in the study is unrealistic.

   Average gas fuel costs were used instead of marginal fuel costs. Since fuel costs are the largest single marginal factor affecting the price of electricity, utility practice is to load up their most efficient units that burn the cheapest fuels. These generating units are, for the most part, base-loaded and are fueled by solid fuels, such as lignite and coal. As a result, most ERCOT utilities depend on natural gas-fired power plants to provide the generation that would be available for bulk power transfers. However, these gas-fired plants must first use the portion of the gas under committed fuel supply contracts during a given year, and the balance of the gas requirement is purchased from the natural gas spot market. The energy produced from this marginally priced spot market fuel is the only energy that is actually available for bulk power transfers.

In its divergent fuel cost scenario, the study has incorrectly used average gas fuel costs rather than marginal gas fuel costs for each utility to determine the opportunity for savings. If each utility has the same fuel procurement strategy, this assumption could possibly lead to acceptable results. However, due to the location, size and fuel availability for each utility's power plants, different strategies have been utilized (i.e. some have more take-or-pay contracts than others and long-term commitments were made in both rising and declining gas markets). This has led to the current differences in average fuel prices for the various utilities, while prices for marginal gas fuel, based on spot market gas, are essentially the same for all utilities in the State.

Since all utilities in ERCOT are in the same spot market for marginal gas, the utilities are paying about the same competitive price for marginal fuel. The main driving force, therefore, in the GE model used in this study then becomes any efficiency differences between individual generating units. The importance of this distinction is revealed in the convergent fuel scenario which has savings amounting to only a fraction of those from the divergent scenario.

2. ERCOT system reliability was not maintained.
The transfers in the base scenarios as modeled for this study reflect all ERCOT transmission facilities to be in service and operating normally. Even the alternative sensitivity case (which resulted in a 28.9% reduction in transfers) assumed that no more than one line in the entire ERCOT system would be out of service at any time.

In order to meet the ERCOT planning criteria, and more importantly, to maintain system reliability, the transmission system must be planned to withstand the occurrence of substantially more severe contingencies, including the loss of transmission lines while other lines are out of service due to maintenance, as well as the loss of an entire generating plant. Of course to maintain the ability to sustain outages, operators must ensure that the system is operated at less than full capability to retain adequate margins to accommodate higher flows caused by the next contingency.

It should also be noted that in the alternate case, reliance upon the transfer limits from the 1987 ERCOT Transfer Limitation Study is inappropriate, primarily because the limits in that study are non-simultaneous limits which apply only to individual transfers between two systems in the absence of all other power transfers. In addition, the 1987 results cannot be reliably extrapolated to future years due to changes in system configuration and operational dispatch from that which existed in the 1987 ERCOT Transfer Limitation Study.

3. Several future lines may not be built.

The study assumes that all future lines proposed by ERCOT utilities will be built. However, the successful construction of all these lines is highly questionable. For instance, certification of the Salem-Zenith double-circuit 345 kV Line has been denied twice, and the City of Austin's proposed 345 kV loop was recently deemed unnecessary by their City Council. Failure to add these lines to the ERCOT system will significantly reduce the quantity of economy transfers.

There is significant uncertainty associated even with 1990 facility additions, but additions scheduled in later years are even more speculative.

4. <u>All costs were not considered</u>.

The study has not taken into account several important items that have an effect on the achievable savings. Listed below are some of those items that have not already been discussed.

- The cost of establishing and operating a control center necessary to implement a statewide single-area dispatch center.

- Costs of increased transmission losses and wheeling associated with the proposed power transfers.

- Costs to construct capacity needed to supply increased peak period losses and to maintain existing reserve margins and the associated levels of reliability.

- Existing economy bulk power transfers between individual companies and through the ERCOT broker.

- Costs to construct the additional transmission facilities required to accommodate the level of transfers shown in the report and to provide adequate voltage support.

- System stability.

It should be pointed out that ERCOT's present mode of operation employs a sophisticated computer based system which allows economy energy transactions to take place. This system allows energy to be "brokered" between utilities, resulting in savings to the customers of ERCOT utilities throughout the State. In this current mode of operation, many of the goals of the Bulk Power Transmission Study are already being achieved in a realistic manner through existing economy energy transfers within ERCOT.

In summary, the potential savings claimed in the Bulk Power Transmission Study are significantly overstated. If all costs were considered, realistic assumptions were made, and the ERCOT transmission system reliability was maintained, it is expected that there would be little, if any, additional savings to be gained by changing the current mode of ERCOT's operation.

WTU WEST TEXAS UTILITIES COMPANY
P.O. BOX 841 / ABILENE, TEXAS 79604 / (915) 672-3251

James C. Armke
Manager
System Planning

April 28, 1988

Mr. Bill Moore
Electric Division
Public Utility Commission of Texas
7800 Shoal Creek Blvd. Suite 400 N
Austin, TX 78757

Dear Bill:

WTU appreciates the effort made by the Commission Staff in revising the Bulk Power Study. WTU believes that the Staff has adequately dealt with many of the issues raised after the December review meetings. WTU also appreciates and accepts your invitation to have a representative attend a joint meeting of the review committees on April 29.

WTU offers the following comments regarding the revised Bulk Power Study report.

1. Referencing my letter to you dated January 14, 1988, WTU still contends that the efficiencies assumed for cogenerators may be overly optimistic and should be verified with actual performance data. Perhaps such data could be obtained from the existing cogeneration projects listed on Table 4.1-1.

2. Page 4-74 states that 'wheeling charges only affect the savings allocation, not the overall savings'. WTU does not believe this to be true for every transaction. It is likely that the wheeling costs and loss payments for some firm transactions will be large enough to cause utilities to reject a purchase opportunity.

3. Again referencing my letter of January 14, WTU continues to believe that the assumption given on page 4-98 concerning cost free solutions for reactive problems is inappropriate and misleading.

4. In the average gas price case for the 1986 own load study, the CSW companies are shown on Table 4.2-21 to consume 188,815 billion BTU of gas and 33,064 billion BTU of coal which is sufficient to have met the take-or-pay fuel constraints. However, the incremental gas price case for pool operation results on Table 4.2-22 show the gas consumption to be reduced to 155,963 billion BTU or 82.6 percent of the previous level and the coal consumption to be reduced to 5,894 billion BTU or 17.8 percent of the previous level. WTU is concerned that the latter case almost certainly violates must burn coal constraints and may not meet take-or-pay gas constraints.

I again wish to thank you for providing WTU with an opportunity to submit comments. Please let me know if there are any questions.

Sincerely,

JCA/dh

Gulf Coast Cogeneration Association

Section 4.1.6 - Cogeneration

The trend in the development of cogeneration contracts is to include dispatchability. I think that it should be that, although for convenience in the study, cogeneration units have been assigned a "must run" status, this is probably not an accurate model of how the plants operate. Unfortunately, because of the confidentiality provisions of the contracts, it may be difficult to obtain the information needed to be more accurate.

On page 4-13 the fuel chargeable to power is assumed to be 7645 Btu/Kwh. For a gas turbine plant with no condensing steam turbine

$$FCP = F - \frac{H/n}{P}$$

where

F: Fuel input, btu/hr

H: Process heat delivered, btu/hr

n: Efficiency of process heat boilers or furnaces that are replaced by the cogeneration plant output, typically 0.80 - 0.85

P: Power output, kw

For a facility providing all process heat, FCP will be 5,000 - 6,000 Btu/kwh. As the amount of steam condensed to make power increases, the effective heat rate approaches that of a combined cycle unit, 8000 to 8500 Btu/kwh. In my judgement, the FCP quoted may be high; there are a number of cogeneration facilities in Texas with all of the steam going to process.

The main place that the figure is used is to calculate the fuel savings due to cogeneration. Because the plants having condensing steam turbine capability are typically dispatched, the differential between the assumed utility heat rate and the cogeneration FCP may be substantially understated. A substantial use of condensing steam turbine capacity would tend to occur when the utility loads are highest when utility marginal heat rates are the highest.

I believe that the calculation of energy savings and potential energy savings using the model developed would be an important tool in future policy determination and I hope that it would be included in future studies.

I would like to make these recommendations:

1) The present study should note that the fuel savings due to cogeneration may be understated.

2) A more accurate model of the operating characteristics of cogeneration plants be developed.

You are to be congratulated for a good and useful study.

Sincerely,

Tommy John
President, Gulf Coast Cogeneration
Association

HL&P LOWEST AVAILABLE DISCRETIONNARY/INTERRUPTIBLE GAS PRICE

by 1986 Month

1986 Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
HL&P TOTAL GAS:												
Total. Avail. (BBtu)	38,316	29,316	37,510	44,820	43,369	40,770	37,913	40,827	43,470	34,038	33,660	32,643
Avg. Daily. Qty. (BBtu/d)	1,236	1,047	1,210	1,494	1,399	1,359	1,223	1,317	1,449	1,098	1,122	1,053
WACOG ($/MMbtu)	2.2844	2.1437	2.1226	1.7117	1.7165	1.6369	1.6918	1.5884	1.6468	1.7597	1.7442	1.6644
TUFCO SPOT GAS SUPPLIES												
Total. Avail. (BBtu)	3,864	3,569	4,680	6,919	10,559	7,095	7,192	4,656	3,154	2,652	7,240	2,159
Avg. Daily. Qty. (BBtu/d)	125	127	151	231	341	237	232	150	105	86	241	70
WACOG ($/MMbtu)	2.1056	2.0116	1.9327	1.7364	1.5154	1.5017	1.5065	1.5419	1.5348	1.4717	1.7009	1.5034
HL&P LOWEST AVAIL DISC/INT												
PRICE(*) ($/MMBtu)	2.0300	1.9500	1.7600(2)	1.5270(3)	1.4300(4)	1.3850	1.4400	1.5000	1.4500	1.4160	1.4000	1.4350
HL&P PUBLISHED BID PRICE	(1)	(1)	(1)	(1)	1.4275	1.3950	1.4350	1.478	1.4860	1.4360	1.4210	1.4400

Notes:

(*) This price reflects HL&P's lowest price for (available) discretionary or interruptible supplies
Of which the total quantity is greater than or equal to TUFCO's total spot supplies for the month.

1) HL&P's Bid Program began in May 1986, therefore bid price figures for prior month are unavailable.

2) Re: Amendment #2 to Mar/86 Gas Supply Report dated 3/24/86

3) Re: Amendment #1 to Apr/86 Gas Supply Report dated 4/21/86

4) Re: Amendment #1 to May/86 Gas Supply Report dated 5/07/86

1986
INCREMENTAL NATURAL GAS
FUEL PRICES
($/MMBtu)

	COA	LCRA	CPSB
Jan	3.00	2.05	2.89
Feb	3.00	2.05	2.70
Mar	2.10	2.05	2.08
Apr	1.64	1.56	1.79
May	1.60	1.55	1.53
Jun	1.57	1.55	1.55
Jul	1.60	1.55	1.61
Aug	1.68	1.55	1.61
Sep	1.62	1.55	1.61
Oct	1.60	1.55	1.60
Nov	1.60	1.55	1.60
Dec	1.65	1.55	1.65
Avg	1.89	1.68	1.72

Central and South West Services, Inc.
2121 San Jacinto Street • Suite 2500
P. O. Box 660164 • Dallas, Texas 75266-0164
214-754-1000

January 26, 1988

Mr. Bill Moore
Electric Division
Public Utility Commission of Texas
7800 Shoal Creek Boulevard
Suite 400N
Austin, Texas 78757

Dear Mr. Moore:

Please find attached (Attachment 1) 1986 incremental fuel prices for CPL and WTU power plants that you requested for purposes of dispatch modeling in your bulk power transactions study.

The weighted average prices shown in the Attachment 1 for WTU are comprised of both firm and spot gas. These prices are the same as those used in the CSW centralized dispatch of 1986. The 1986 CSW dispatch process also included a careful monitoring of "must burn" fuel consumption at the WTU power plants. In contrast, the current CSW dispatch uses spot gas prices rather than weighted average prices for WTU. If the weighted average prices are used in your study, you will need to monitor the fuel burn results to insure that the Rio Pecos plant consumes 10 billion cubic feet (BCF) of gas and the remaining plants consume an aggregate of at least 15 BCF. The total gas burn on the WTU power plants must be at least 25 BCF in 1986.

Of the two fuel price choices (spot or weighted average) we recommend that the spot market prices be used in your 1986 study because they are easier to apply and will better reflect the savings potential that existed in 1986.

Also attached (Attachment 2) is a monthly 1986 compilation of net energy transfers across the Oklaunion HVDC tie caused by centralized dispatch of the CSW System. As you did in previous studies, it will be necessary for you to model these CSW economy energy transactions to approximate the CSW pool operations in 1986.

If any of this information requires further explanation, please feel free to call me at (214) 754-1434.

Very truly yours,

Chris A. Shields

Chris A. Shields

CAS/pd

Attachments

ATTACHMENT 1

Plant*	($ per MMBTU) 1986 Spot Fuel Price	1986 Weighted Average Fuel Price
Abilene	3.30	3.13
Paint Creek	2.50	2.76
Lake Pauline	2.97	3.21
Oak Creek	2.11	2.53
Concho	3.03	3.05
Rio Pecos	0.22	0.22
San Angelo	1.75	2.07
Fort Phantom	1.74	2.73
La Palma	1.67	NA
J L Bates	1.67	NA
Laredo	1.67	NA
L C Hill	1.67	NA
Nueces Bay	1.67	NA
B M Davis	1.67	NA
Victoria	1.67	NA
E S Joslin	1.67	NA
Coleto Creek (Coal)	NA	2.54

* All plants are gas-fired unless otherwise noted.
NA Not applicable

ATTACHMENT 2

Net Oklaunion HVDC Transactions in 1986

	Net MWH	Net Flow Direction
January	103,614	South
February	24,500	South
March	(15,877)	North
April	3,709	South
May	(2,725)	North
June	26,754	South
July	24,072	South
August	6,145	South
September	(3,567)	North
October	(16,820)	North
November	198	South
December	(49,873)	North
	100,130	South

FORECAST OF NATURAL GAS
FUEL PRICES
($/MMBtu)

Utility	Type		1988	1990	1995
TU Elec	Contract		2.58	3.09	4.55
	Spot		2.12	2.46	3.78
	WACOG		2.44	2.88	4.09
HLP	Contract		2.41	2.46	3.78
	Spot		2.12	2.46	3.78
	WACOG		2.21	2.46	3.78
LCRA	Contract		2.12	2.46	3.78
	Spot		2.12	2.46	3.78
	WACOG		2.12	2.46	3.78
COA	Contract		2.07*	2.46	3.78
	Spot		2.07*	2.46	3.78
	WACOG		2.07*	2.46	3.78
CPL	Contract		2.43	3.25	3.84
	Spot		2.12	2.46	3.78
	WACOG		2.30	2.99	3.82
		**Rio Pecos	Other WTU		
WTU	Contract	0.22	3.32	3.60	4.66
	Spot	0	2.12	2.46	3.78
	WACOG	0.22	2.60	2.79	3.96
CPSB	Contract				
	Spot				
	WACOG				

* COA has "all requirements" contracts which expire after 1988.
** WTU's Rio Pecos Plant gas contract expires after 1988.

DRI (November, 1987) is used for spot price after 1988 as well as for contract price where no contracts are held.

TEXAS INDUSTRIAL ENERGY CONSUMERS

TIEC

January 15, 1988

Mr. Bill Mcore
Economist
Public Utility Commission of Texas
7800 Shoal Creek Boulevard, Suite 400N
Austin, Texas 78757

Dear Mr. Moore:

Per your request at the December 9, 1987 Review Meeting, Texas Industrial Energy Consumers (TIEC) has reviewed the November 1987 draft of the Bulk Power Transmission Study ("the Study") prepared by the Staff of the Public Utility Commission of Texas (PUC). The following comments represent the general consensus of our membership, which consists of large power consumers and industrial cogenerators, based on the publicly available portion of the Study. As Appendix C was only made available to TIEC's consultants earlier this week, TIEC may provide additional comments following a more detailed analysis of these materials.

TIEC commends the PUC on conducting this important research project in such a careful and comprehensive manner. The PUC has identified an area that holds promise for lower power costs to all Texas ratepayers as well as making a major contribution to the state's economy. While there are already significant economy power transactions, including "bulletin board" sales, among utilities in the Electric Reliability Council of Texas (ERCOT), the Study demonstrates that the Texas transmission grid can be even more fully utilized.

As documented in the Study, each region of Texas possesses different advantages in electric power production. History has shown that these regional advantages, as well as electric power needs, can change rapidly over time. Bulk power movements can serve to moderate costs in regions where power production is expensive. It can also be used to distribute temporary excess generating capacity to systems exposed to capacity shortages. Finally, the transmission grid is essential to maintain statewide reliability in emergencies.

TIEC regards the electric transmission grid as a major resource of Texas. The transmission grid was expensive to construct and absorbs further resources in annual operations and maintenance costs. With this resource linking the diverse economic and climatic regions of the state in place, every effort should be made to obtain a full measure of value for the ratepayers and economy of Texas.

The potential savings in electricity costs identified in the Study that could result from a more full utilization of the Texas transmission grid are striking. While TIEC recognizes that a number of simplifying assumptions were necessary in the Study, we believe that substantial savings will persist even if further refinements in methodology are made. Indeed, there were areas overlooked, such as potential gains from more flexible use of the state's large cogeneration resources, that could no doubt increase the estimated savings.

The current findings of the study more than justify moving ahead to develop an implementation plan that will allow the savings and benefits to be realized. While continued development of analytical capability and data bases at the PUC is necessary, TIEC regards the potential savings identified in the Study to be so compelling that the PUC should not postpone action.

It appears that the major impediment to a full utilization of the Texas transmission grid is institutional rather than physical. TIEC understands there are complex and controversial issues that must be resolved before the movement of bulk power in Texas can reach its full potential. Among these are the necessity of maintaining the integrity of the ERCOT transmission grid and determining the proper allocation of costs. Accordingly, TIEC recommends that the next step be to ascertain what actions must be taken to eliminate these institutional barriers.

In addition to the savings identified in the Study, unlocking the barriers to bulk power transfers could increase the productivity of Texas industry and encourage economic growth. The cost and reliability of electric power is crucial to industrial concerns. As national and international competition becomes increasingly intense, effective utilization of the Texas transmission grid to lower electricity costs and improve reliability would both retain and attract industry. Such utilization includes not only transactions involving power produced by utilities, but also that by cogenerators which concurrently reduces the net energy costs to the host manufacturing facilities.

In summary, the findings of the Study offer such a preponderance of evidence that potential savings and benefits exist that efforts to move towards implementation should not await further study. TIEC recommends that the PUC immediately turn to the task of identifying and eliminating institutional barriers so that a more full utilization of the Texas transmission grid can become reality. TIEC stands ready to participate in this process.

Sincerely,

Robert L. Wright

Robert L. Wright

cc: Chairman Dennis Thomas
Commissioner Jo Campbell
Commissioner Marta Greytok
TIEC Executive Committee

City of Austin

Founded by Congress, Republic of Texas, 1839
Municipal Building, Eighth at Colorado, P.O. Box 1088, Austin, Texas 78767 Telephone 512/499-2000

January 14, 1988

Mr. Bill Moore
Public Utility Commission of Texas
7800 Shoal Creek Blvd., Suite 400
Austin, Texas 78757

Dear Bill:

The City of Austin Electric Utility Department has reviewed the final draft of the Bulk Transmission Study as it affects the City of Austin electric system and offers the following comments:

1) The City of Austin transmission system will not be built as originally submitted for this study. The City Council stopped construction of a major portion of this transmission plan this past September as identified in the draft report. Therefore, the City of Austin Electric Utility Department does not have the import/export capability that was used for the study.

2) Due to the transmission import limit there is significant "must run" generation in the Austin service area. This generation can be in excess of 400 megawatts and was not modeled in the study.

3) The study did not include losses and wheeling when determining if a transaction would be made between two utilities. The assumption that wheeling costs cancel and therefore result in a zero dollar amount in ERCOT is partially correct. The fact is that even though wheeling costs cancel for ERCOT as a whole, a transaction will not occur between two utilities if wheeling and loss expenses negate the cost savings associated with that transaction. Ausin would like to see the study repeated with wheeling and losses as this would present a much more realistic picture of the savings.

4) Austin was a joint participant in performing 2,158 alternating current load flows which modeled the power transactions identified by the Bulk Power Study. The load flows indicate that 18 percent of the power transactions result in overloaded transmission circuits and transformers in the ERCOT system. In addition there are an extremely large number of busses identified as having voltages less than 90 percent or more than 110 percent of nominal. These problems occurred under normal conditions.

001/91/DB

The transmission systems owned by the various utilities require maintenance outages and incurr forced outages during normal operation. The unacceptable overloads and voltage problems identified in the AC load flows would be greater under the real operating conditions of simultaneous outages.

The City of Austin Electric Utility Department supports the concept of the study being performed by the Public Utility Commission staff. The Department also recognizes the complexity and difficulty of the study. Austin urges the Public Utility Commission staff to be very cautious in their published results as invalid information could lead to a decision which would be harmful to Texas rate payers rather than beneficial. A continued study should be performed. Austin will work with the Public Utility Commission staff in order to produce the most accurate study possible. This would result in a final product which is to the advantage of electric rate payers in Texas

Thank you for your attention to these comments.

Sam R. Jones, P.E., Director
System Engineering & Control
Electric Utility Department

xc: John Moore
R. John Miner
Laura Doll
Joe Malaski

001/91/DB

Central and South West Services, Inc.

2121 San Jacinto Street • Suite 2500
P. O. Box 660164 • Dallas, Texas 75266-0164
214-754-1000

Mr. Bill Moore
Electric Division
Public Utility Commission of Texas
7800 Shoal Creek Boulevard, Suite 400N
Austin, Texas 78757

Dear Mr. Moore:

Since our meeting on December 7, 1987, I have read your November 1987 draft report of the Bulk Power Transmission Study in its entirety. I congratulate you and Mr. Panjavan on what I believe to be a very good job given the recognized limitations on tools and information you had to work with.

The major two weaknesses in the study that I see as having the greatest impact upon the credibility of the results are in the use of average rather than marginal fuel prices for economic dispatch and the overly optimistic interpretation of maximum transfer limits on transmission.

I pointed out my concerns about the use of weighted average fuel prices and suggested an alternative study method that would more properly use the MAPS/MWFLOW program's limited fuel modeling capabilities to Jeff Phelps in an October 20, 1986 letter. Recognizing the production costing weaknesses of MAPS/MWFLOW, I believe the scope of study should have been narrowed to identifying economy energy transfers only. This requires a model of incremental or marginal costs rather than total production costs. I was pleased to see that you addressed my concern in your "1990 Incremental Gas Prices" scenario study. However, using a rather wide range of forecasts for incremental gas prices among the utilities of $1.41 to $2.49 per million BTU probably overstates the savings to be expected from pooled operations. Utilities do not have to agree on their economic outlooks for the gas market but differences in opinion should not be translated into realizable savings. You too must have observed this because you did an additional fuel price study scenario for the year 1990 in which the utilities' gas prices were equalized at $2.58 and another scenario with prices equalized at $2.10. I believe that these later two scenarios are better than the base cases using average weighted gas prices. Unfortunately readers of this report will assume that the base cases are the best estimates of the potential savings.

Because fuel modeling is so important to study results, I was surprised to not see anything in the report that describes the fuel price model prepared by the staff. Information on your model that I reviewed earlier and commented on in my October 20, 1986 letter, should be included in the Appendix of this report. Of course I do not believe that this model should have been used because its intent was to develop weighted average fuel prices for purposes of dispatch. In addition to making the study report complete in its assumptions, inclusion of a description of your fuel model can point out the rather complex fuel contracts and operations of the ERCOT utilities. I would also mention that because many generating units are supplied by several fuel contracts, many which may have minimum takes or take-or-pay requirements, it can not be assumed that these fuel limits are being honored by modeling a blended fuel price at each unit. I assume that in developing your weighted average fuel prices with your staff developed fuel model, you had information on the utilities' limited fuel contracts. If you have not already done so, it may be beneficial to review the fuel burn results of MAPS/MWFLOW and compare these requirements with the requirements of the limited fuel contracts. Total burn requirements from MAPS/MWFLOW should be greater than the sum of the minimum and take-or-pay contract amounts. This type of reasonableness check will give you an idea if fuel dispatch is constraining the economic dispatch. For utilities that are large energy importers in the pool dispatch this could be very important. For companies that are large exporters, minimum and take-or-pay constraints may not be a problem, however, their ability to contract sufficient quantities of fuel with sufficient lead time for these energy exports may be difficult.

In regards to transfer limits used in MAPS/MWFLOW, I believe that there is enough doubt about these transfer limits to have warranted additional sensitivity scenarios. Information available to you on transfer capabilities may have been inappropriately applied to this study. Someone with intimate knowledge of the ERCOT load flow data, the Transfer Limit Study, and the MAPS/MWFLOW transmission model should have been involved in developing the transfer limit data. Development of a wider range of transfer limit scenarios, such as what was done for fuel prices, would have illustrated the sensitivity of results to transfer limit assumptions more completely.

In the area of scenario developments, I realize that when you begin combining scenarios the number of combinations possible can be unmanageable, however, it would have been interesting to have seen the results of a few of the more obvious combinations of consistent fuel price and load assumptions that you would expect to see in more global economic scenarios.

In addition to the above rather general comments I have some specific comments on sections of the report.

<u>1.3 Methodology</u>:

This section is lacking a brief description of MAPS/MWFLOW limitations which are well described in Appendix A. Most casual readers of this report will probably only read Chapters 1 and 8 and by doing so will miss important information about MAPS/MWFLOW capabilities. I believe the first three lines in the first paragraph on page A-41 of Appendix A are worth repeating here.

Correction is needed here in the last paragraph on page 1-10 to say that Central and South West (note South West is two words) Corporation (CSW) is the holding company and its subsidiary Central and South West Services Inc. (CSWS) performs generation resource coordination services for CSW electric operating subsidiaries. Two of these operating subsidiaries are within ERCOT and two are outside ERCOT.

<u>1.8 Summary of Recommendations</u>:

In the preamble to the list of recommendations, it is worth repeating here words such as those in the portion of the Appendix A paragraph referred to above beginning with the sentence "Conclusions and recommendations from this study....".

It is not clear how the first recommendation can be made from this study. As stated on page 2-2, this study is concerned with the "short-term goal" to minimize cost and not the "long-term goal" of "resource planning to yield optimum supply level and fuel mix" . This recommendation can not be based upon results from this study's limited scope. Also, doesn't the licensing regulations for constructing new power plants already require investigation of all alternative sources of generating capacity including purchased power?

2.5 Previous Studies:

In the last paragraph of the preamble on page 2-9, the statement is made that PSO and SWEPCO "belong to the Southwest Power Pool". I would prefer to see the words "are members of the Southwest Power Pool (SPP)" used here. Also, it may not be understood by readers unfamiliar with the National Electric Reliability Council that SPP is a member of this council just as ERCOT. Although SPP has the words power pool in it's name, it is not a centrally coordinated energy dispatch pool.

Regarding the discussion that begins on page 2-15 about a previous ERCOT study done by Stagg Systems Inc., I would like to offer some clarifying remarks. The purpose of these studies was to investigate the CSW System cost savings which would result from forming independent noninterconnected centrally coordinated energy dispatch pools in ERCOT and SPP. This study, commissioned by HL&P, was developed to see if the CSW System operating companies would have greater or less cost savings as members of these two hypothetical noninterconnected power pools or as members of the then planned CSW interconnected system pool.

Chapter 3 Configuration of the Electric Power Industry in Texas:

I realize that when this study began, 1986 and 1987 were forecast years, however now that the report is being published in 1988, is there any benefit to show forecasted 1985-1987 information in the tables throughout this chapter? It may be confusing to the reader to distinguish what information is historical and what is forecast. Because the study results address no year prior to 1988, is there a need to show old forecasts of the years 1985-1987?

4.1 Study Procedures:

In the description of the model of the ERCOT system in section 4.1.3 (page 4-4) it may be appropriate to explain here in a little more detail how the CSW System was modeled. That is, because PSO and SWEPCO are part of the existing CSW pool but cannot be explicitly included in the ERCOT MAPS/MWFLOW model, their interaction with CPL and WTU is modeled by hourly non-firm purchases and sales entering or leaving the CPL/WTU system via the existing HVDC interconnection between ERCOT and SPP. I have recommended throughout this study that the existing CSW pool operations be modeled and the above described modeling compromise was agreed to between the staff and myself.

5.7 Winter Supply Disruption:

On page 5-91 a calculation is performed that shows that ERCOT could accommodate a complete gas curtailment for two days based upon ERCOT systemwide oil inventory at its power plants. It is somewhat misleading to use averages when some power plants having less than two days oil supply would be out of service early and the resulting loss of associated capacity would cause power shortages prior to two days. Utilities with plants having in excess of two days oil inventory may be unwilling to sell power either because they may be already capacity strained or unwilling to deplete their remaining oil inventory for customers outside their service territories.

5.8 DC Interconnection to Adjacent Power Pools:

The ERCOT/SPP interconnection settlement agreement referenced on page 5-93 also involved the U.S. Department of Justice, Federal Energy Regulatory Commission, several electric utilities in SPP as well as the PUCT, SEC, CSW and other ERCOT utilities. DOE was not involved in this settlement.

Chapter 6 Environmental and Health Issues:

In the discussion of the history of high voltage transmission health issues beginning on page 6-2 the very last sentence states that "it became apparent that good research was needed". This implies that all research done in the early 1970's was bad. A better choice for the word "good" would be "additional".

In the legal case referred to on page 6-12, you may want to note that the $25 million award to the school for damages associated with the proposed routing of a 345KV line was ultimately overturned by a higher court.

Thank you for the opportunity to comment on your report.

Sincerely,

Chris A. Shields

Chris A. Shields
Senior Planning Engineer

CAS/pmw

CENTRAL POWER AND LIGHT COMPANY / Home Office: P. O. Box 2121, Corpus Christi, Texas 78403, 512-881-5300

January 13, 1988

Mr. Bill Moore
Electric Division
Public Utility Commission of Texas
7800 Shoal Creek Blvd., Suite 540N
Austin, Texas 78757

Dear Bill,

Central Power and Light Company feels that you did an excellent job on the Bulk Power Transmission Study given the limitations that the MAPS/MWFLOW program has. However, CPL would like to reiterate some of the comments that it and other ERCOT companies have made concerning why we believe the savings are overstated. A complete list of these comments is attached.

CPL sincerely appreciates your allowing us to express our views on this very important subject.

Sincerely,

Joe Shafer
Director, System Engineering

DKK/dvb
attmt.
87DKK294

CPL RESPONSE

PUC BULK POWER TRANSMISSION STUDY

CPL would like to reiterate some of the comments that it and other ERCOT companies have made concerning the PUC Bulk Power Transmission Study. Again, CPL feels the potential savings shown in the study are significantly overstated. The reasons for these overstatements are listed in general, fuel, and as system limitation comments.

GENERAL COMMENTS

- Some of the savings are already being realized. TU is now buying a significant amount of cogeneration. The ERCOT brokerage is being utilized more and more. ERCOT has been doing joint planning such as construction of STP, Limestone, Fayette, San Miguel, and Oklaunion.

FUEL COMMENTS

- The PUC study is incorrect because gas generation is dispatched on incremental fuel costs and not average fuel costs as was done in the study.

- Since take or pay contracts were not represented, a large portion of savings shown may not exist. If the program could honor these take or pay requirements, some of the transfers may have not happened.

- Since the study didn't take into account system losses, a real world dispatch may be completely different. Because the model used is an economic model and disregards losses, if two companies have the same fuel cost, the company with the best heat rate will sell to the other company. The savings shown in the study are therefore too high.

- As ERCOT buys and sells more electricity among itself, gas differentials will be reduced as gas companies lower their prices to meet their competition from other parts of the state.

COMMENTS ON SYSTEM TRANSMISSION LIMITS

- While the study monitors some of the transmission lines, there is no way for it to take into account all the dynamic limitations that system operators have to deal with.

- The study ignores stability and voltage limits. Currently CPL is limited on how much power it can import into its Valley area. The PUC study did not and could not represent the CPL requirement that generation be brought on in the Valley for internal CPL system security reasons. This is typical of the dispatch limitation that can't be represented in a study but that our dispatchers deal with on a day to day basis.

- The study ignores the fact that loss of a generator might be the worst contingency. Currently CPL has to run a second unit for system security in the Laredo area in anticipation of loss of the Laredo #3 unit. The PUC study could not and did not represent this CPL internal system limitation.

- The study monitors transmission limits for the peak period only. However, a more severe situation could happen on an off peak hour due to a different generation pattern which results in transmission thermal limits, stability, or voltage limitations.

- As mentioned above, many of the internal Company limits could not be represented, thereby making the study different from what the dispatcher would see in his dynamic day to day operations.

- The study incorrectly assumes too much capability is available from South Texas to North Texas. A large portion of the capability is already being used with TU's purchase of power from cogenerators in Houston's area.

87DKK294

The Light company
Houston Lighting & Power

P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

January 21, 1988

Mr. Bill Moore, Economist
Public Utility Commission of Texas
7800 Shoal Creek Blvd., Suite 450N
Austin, Texas 78731

Re: HL&P's Comments on the PUC's Draft Bulk Power Transmission Study Report

Dear Mr. Moore:

Houston Lighting & Power Company (HL&P) appreciates the opportunity to comment on the Commission's draft report of the Bulk Power Transmission Study. The Company is highly supportive of the PUC's goal to investigate the feasibility of improving the efficiency of energy usage on a statewide basis. It is in the best interests of the state's utilities to determine whether opportunities exist for enhanced bulk power transfers in Texas. If such opportunities do exist, electric utility customers benefit through the savings associated with such transfers, provided the reliability of the state's utility systems are not adversely impacted.

While HL&P is supportive of the Commission's goal and the PUC Staff's efforts to evaluate the opportunities of bulk power transfers, the Company is concerned about the level of savings identified in the report based on a central pool dispatch arrangement. The Company's primary concerns are essentially three-fold:

1. In the report, the fuel price models are oversimplied and produce inflated savings projections;

2. Due to differences in methodology in calculating heat rates between utilities, TU Electric's heat rates are overstated by approximately 5 percent. This discrepancy likewise results in inflated savings projections; and

3. The transmission network analysis performed by the staff uses modeling techniques which result in greatly overstated transfer capabilities, thus raising concern about the reliability effects of the stated energy transactions on the state's transmission grid.

Because HL&P is of the opinion that the projected savings in the report are mitigated when more accurate fuel costs and heat rates are inputted, it is felt that other methods such as the current brokerage arrangement of economy energy transfers between ERCOT utilities is more appropriate for optimizing generation dispatch. The current arrangement has proved successful in providing significant savings to our customers and others in ERCOT which the Company believes will continue. In fact, the report admits that "it is quite possible that with close coordination in system operation evolving through the brokerage system, the total savings and operating costs could approach the levels reported in the study." HL&P also recognizes, however, that changed circumstances in the marketplace (i.e., fuel costs, etc.) could indicate a benefit at some future point in time to switch to a central dispatch pool arrangement. Consequently, the Company will continue working with the PUC Staff and other utilities as needed to reassess future conditions. If a central pool arrangement does subsequently become advantageous to our ratepayers as evidenced by supporting data, HL&P would favor such an arrangement provided, of course, the integrity and reliability of the system is maintained.

In HL&P's judgement, this study seriously overstates the potential savings of central dispatch and, as indicated by the staff's recommendations, considerably more study is needed before valid results can be derived.

With those thoughts in mind, the Company respectfully offers the enclosed comments for your consideration.

Sincerely,

Scott A Miller

Scott Miller
Staff Regulatory Analyst

SM/bd

HL&P's Comments on the PUC Bulk Power Draft Report

Fuel Prices

1. The MAPS model utilized in the report uses the weighted average cost of fuel rather than incremental cost to assess cost savings from pool operation. The following example will illustrate the erronous results associated with this approach.

   To begin with, assume two identical systems operating under independent dispatch with an interconnection capable of transferring 200 units as referenced below:

System A

System A has available:
100 units of fuel @ $1/unit
200 units of fuel @ $2/unit

- If output level is 100 units, then:

a) Total fuel cost = (100*$1) = $100
b) Weighted avg. cost of fuel = 100/100 = $1/unit
c) Incremental cost of fuel = $2/unit

System B

System B has available:
100 units of fuel @ $1/unit
200 units of fuel @ $2/unit

- If output level is 300 units, then:

a) Total fuel cost = (100*1)+(200*2) = $500
b) Weight avg. cost of fuel = 500/300 = $1.67/unit
c) Decremental cost of fuel = $2/unit

For this scenario, if the weighted avg. cost of fuel is used by the MAPS Model, the result of pool dispatch will be a transfer of output units from System A @ $1/unit to System B @ $1.67/unit. The interconnection between systems will limit the transfer to 200 units. MAPS will produce the following results.

System A	System B
- Output level = 300 units	- Output level = 100 units
Total fuel cost = 300*1.00 = $300	Total fuel cost = 100*1.67 = $167

Projected Savings = ($100+$500)-($300+$167)
= $133

It would appear from the MAPS program that pool operation would save the customers of these two systems $133, or approximately 22% of their original fuel cost. Upon taking a closer look at this transaction, however, these results are misleading. For example, if you apply the fuel cost table to the new output levels, you get a different set of total fuel costs than MAPS calculated. Even more obvious is the fact that System A is now producing exactly what System B was before MAPS applied pool dispatch and vice versa. Consequently, it is clear that there is <u>no difference in cost</u> and <u>no cost savings</u> between the independent and pool dispatch scenarios. So, why does MAPS project significant savings?

The answer is two-fold. First, it is not differences in the weighted average cost that should drive transfers. Transfers should result from incremental/decremental cost differences. For this example, the incremental and decremental costs are identical and, therefore, no transfers should result from pool operation. Second, the MAPS Model used by the staff can only model one fuel cost per generator. It assumes that the incremental/decremental fuel cost is always equal to a constant weighted average cost of fuel for that generator. In reality, incremental/decremental costs are rarely equal to weighted average costs and usually are not equal to each other. For these reasons, the model used in this study is seriously flawed. The staff will never be able to achieve valid results using WACOF or a single fuel price model.

2. Section 4.2.7, entitled "Historical Year Test Case," evaluates the transactions and savings that could conceivably have been realized during 1986. It appears from the projected dollar savings that the staff assumed a differential in fuel cost between HL&P and TU Electric of approximately $1/MBTU. In view of the fact that both TU Electric and HL&P have documentation regarding the pricing and availability of natural gas supplies during 1986, it would seem appropriate to use such information in developing this case. We suggest using the actual prices quoted to HL&P during 1986 by gas suppliers for additional quantities of gas based on discretionary purchases by HL&P. Likewise, the cost-savings projected for TU Electric should be based on comparable reductions in the amount of discretionary gas purchases by TU Electric. Similar historical incremental/decremental price information should be obtained from each of the other utilities involved in the study. HL&P believes

that when this information is placed into the appropriate model, projected savings will be greatly reduced.

Fuel Supply

In the report there are a number of transactions which require a significant increase in the generation of natural gas for wheeling from HL&P to other utilities based on an economic incentive criteria. There are a number of problems associated with the projected increase in the level of natural gas generation identified in the report. To begin with, there are not enough gas quantities available in today's market to accomplish the generation transfers between utilities. HL&P believes that the surplus of gas reserves is declining and will continue to do so because of the lack of redevelopment of gas reserves coupled with the problem of declining reserves. Another problem deals with the gas pipeline limitations that exist in interconnecting the utilities. Specifically, the pipeline delivery network identified in the study will not allow for the efficient displacement of gas from one utility to another because of the physical limitations of the pipeline network. Lastly, the study fails to recognize contractural constraints for utility gas contracts and, particularly the take-or-pay obligations of those contracts. This, in turn, limits the number of transactions which can be accommodated by the utilities and will indirectly affect the savings projected in the report.

Heat Rates

1. The two most important factors in any economic dispatch study are the incremental fuel costs and the incremental heat rate data modelled in the study. Since each utility utilizes different economic dispatch programs, calculation and use of incremental heat rates may be slightly different. The most potential for discrepancy is in conversion of heat rate test data to model parameters and, particularly, adjustment of these parameters to actual fuel use for a given period of time. It is, therefore, recommended that the PUC Staff verify the heat rate data supplied by the ERCOT utilities to insure that this information was applied in a consistent manner.

   From a review of input data, TUEC heat rates appear consistently high (approximately 5 percent) as compared to HL&P units of similar size and design. HL&P believes that this difference is simply the result of different modeling adjustments and results in overstated savings in the report.

Transmission

1. The Company is concerned that the Staff used a very limited number of contingency cases in evaluating transmission system limitations. As was conveyed to the staff early in the project, the only prudent way to evaluate the capabilities of the transmission system is to study all contingency conditions covered by the ERCOT Planning

Criteria such as those studies performed by the ERCOT Engineering Subcommittee. Furthermore, all transmission and substation facilities must be monitored to insure that no problems exist. HL&P believes that if the staff were to take the results of their study and apply them in AC load-flow cases with each of the standard ERCOT contingency tests, they would find significant transfer limitations not reflected in the current study. Preliminary AC load flow studies of the results of the 1990 pool dispatch model have already found over 350 cases where line overloads existed but were not detected by the staff's model. Of particular concern is the fact that thousands of voltage problems were detected, a parameter that was excluded from the staff's study.

HL&P considered it critically important that an analyses should be made which monitors all lines and models all of the typical ERCOT contingency conditions before accepting the results of this study. It is the Company's expectation that the report will be substantially affected through a reduction in projected cost savings.

2. Of particular concern is the omission of testing for one of the most common contingencies, loss of generation. Failure to test the system against this type of contingency infringes on the most fundamental reason for interconnected operation, the sharing of generation reserves during emergencies. ERCOT Planning Criteria requires that, as a minimum, the system be able to withstand the

loss of an entire plant. For HL&P, the largest plant represents about 1800MW of generation. Due to the configuration of the interconnected system, about two-thirds of this amount, 1200MW, will flow through the transmission network to HL&P from the other interconnected utilities. Failure to allow for this type of contingency, by reserving adequate transmission capacity for such emergencies, would severely jeopardize the reliability of service to our customers.

3. Another item of concern relates to the fact that the report has quoted potential savings in Paragraph 1.5.1 which do not reflect any allowances for contingencies. By citing such numbers prominently in the summary of study results, it is implied that such savings are reasonably achievable. It is HL&P's position that quoting such numbers based on zero contingencies is misleading. The Company feels that the report, as currently written, suggests that utilities operate their system in such a way that contingencies such as those outlined in the ERCOT Planning Criteria could result in significant outages. It is HL&P's suggestion that <u>no</u> projected savings be identified by this study, unless the ERCOT Planning Criteria contingencies have been taken into account. Furthermore, as noted in one of our other comments, even the contingency scenario under the category "Transmission System Limitations" does not impose a sufficient number of contingency conditions to fully analyze the limitations of the transmission network. The only way to do a reasonable and accurate assessment of transmission system

limitations is to run AC load-flow cases and do full contingency analysis for each scenario studied.

4. The MAPS-MWFLOW program used in the PUCT Bulk Power Transmission Study utilizes generation shift factors, a form of distribution factors, in calculating loadings of transmission components. This technique, while suitable for small power transfers, becomes increasingly prone to error as the magnitude of the transfers is increased. This technique may be inaccurate when used to analyze the large power transfers suggested by the Bulk Power Transmission Study. The accepted industry practice for transmission system modeling is the use of an iterative solution AC load flow. It is our position that the results of the MAPS-MWFLOW program should be fully verified by iterative AC load flows prior to issuing a final report.

5. The exclusion of reactive sources in the MAPS-MWFLOW model results in seriously flawed results. The assumption that there are cost free technical solutions for any reactive problems (as mentioned on Page 4-96) will result in overly optimistic levels of cost savings. Reactive concerns are two fold. First, increasing line loading also increases reactive losses which must be supplied to prevent voltage collapse. Second, areas that take generation off line to accommodate economy purchased power suffer a reduction in reactive sources. Insufficient reactive sources will cause low voltage and possibly voltage collapse following generation and/or transmission

contingencies. This can result in the need for costly static VAR compensation, a reduction in transfer capability or "must running" additional generation, all of which significantly offset projected savings.

6. ERCOT system dynamic stability following system disturbances such as transmission and/or generation outages is an increasingly important concern when transferring large amounts of power, as projected by this study. Before it can be accurately stated that such large transfers are possible, careful analysis must be performed to assure that such transfers can be made without endangering system stability. This restriction on the validity of this study should be clearly identified in the report.

7. The ERCOT Power Transfer Task Force Working Papers on transfer capabilities appear to have been utilized improperly in making this study. The transfer capabilities in the PTTF report are not cumulative. Each transfer capability is calculated with the assumption that no other transfers are occurring; however, the staff has applied them in a cumulative fashion in projecting potential savings.

8. In a recent presentation regarding the draft report, the staff indicated that the transfer capability limits determined by the ERCOT Power Transfer Task Force were not given strong consideration in the Bulk Power Transmission Study, because the limits are based

on summer peak conditions and the majority of economic transfers occur during off-peak hours. However, the assumption that off-peak transfer capability is always larger than on-peak transfer capability is incorrect. For example, HL&P's ability to wheel power to TU Electric is severely reduced when the Limestone Generating Plant is off-line for maintenance, which normally occurs during off-peak hours. It is the Company's position that even though the ERCOT transfer limitation scenario has been improperly applied, it has considerably more validity than the other contingency scenario studied.

9. The MAPS-MWFLOW study includes the Salem to Zenith, Salem to Twin Oak, and Limestone to Watermill transmission lines which have not been certificated by the PUC. The study also includes the McNeil to Austrop, and Lytton to Trading Post 345kv circuits which the City of Austin has recently cancelled. Removing these transmission lines would reduce transfer capability substantially, and lower the pooling cost savings calculated by the MAPS-MWFLOW study.

10. On page 5-6, the report states that the overload limits of several lines in the TU Electric area were "relaxed" by the staff in order to get the program to solve properly. No further comments on this appear in the report, but an examination of Appendix C reveals numerous adjusted line ratings. For the 1988 case, it appears that the overload limits for six 138kv lines and one 345kv line were raised. For the 1990 case, limits for two 138kv lines and

twenty-eight 345kv lines were raised. It remains unclear why the overload limits of these lines had to be raised, but the use of inaccurate and physically impossible ratings (i.e. 9999MW) for these lines raises questions as to the validity of the cost-savings projected in the 1988 and 1990 studies. Additionally, it appears from the line loading graphs included in Appendix C that in the solved cases, overloads do exist on these lines, even in the "limited" cases with no contingencies. The report states that relaxed constraints are an indication of "weak areas in the network that may need upgrading." If in fact the thirty 138kv and 345kv lines relaxed in the 1990 case need to be upgraded, it should be noted that significant costs will be incurred to upgrade these transmission lines.

11. In Paragraph 8.2.3 the report states that "the transmission system appears to be adequate to accommodate a higher level of transactions which will permit a better matching of system demands and available capacity." The Company is concerned that this conclusion may be premature, in light of the fact that no AC load flow studies or contingency analyses were performed in accordance with ERCOT Planning Criteria. Only after such studies have been performed is it reasonable to draw conclusions regarding the adequacy of the ERCOT transmission network. Delays in the construction of the Salem-Zenith 345kv and Salem-Twin Oak 345kv interconnections, in conjunction with increased levels of cogeneration wheeling, have already placed the ERCOT transmission network near the limit of

reliable operation. There have been numerous occasions where economy energy transfers between ERCOT utilities have been interrupted due to transmission constraints. As transfer levels increase, it can be reasonably expected that such interruptions will occur more frequently. There is considerable evidence on record before the Commission that the transmission network cannot support higher levels of transactions without improvements. It is the Company's suggestion that the referenced statement be replaced with a comment that the transmission system may not be able to support higher levels of transactions, and that this study has not completely considered such or the effects on the reliability of the state's transmission grid.

12. The importance of incremental transmission losses are said to be relatively minor in the Bulk Power Transmission Study report. The report also states, however, that a 20 percent increase in losses are projected for the 1990 summer peak hour. If these projected losses materialize, it would result in significant additional energy and capacity costs. Since the MAPS program does not model incremental losses, it is premature to conclude that such losses are "minor."

13. The report states that "the primary impediments to interconnection of all utilities in Texas are the complex technical, legal and institutional questions concerning the intra-state nature of ERCOT." The primary issue, however, is whether the potential cost savings of

power transfers justify the high cost of additional interregional transmission interconnection facilities.

Current ERCOT Bulletin Board/Broker Transactions

1. HL&P has been a strong supporter and participant in ERCOT's Economy Interchange Transaction Programs. The ERCOT bulletin board and broker have encouraged over 50 million dollars in economy energy transactions to take place during 1987 which have saved over 12 million dollars in fuel costs after deducting compensation for losses and wheeling. The level of all transactions combined was over 3,500,000 mwh.

   HL&P anticipates that the amount of transactions and savings could be higher through increased participation of all ERCOT members and continued present differences in incremental fuel pricing. The Company further believes that the order of magnitude of fuel savings considering all constraints (including fuel contracts and transmission), which would presently be available by common dispatch of ERCOT members, is more comparable to the above level of savings than that projected by the PUC Draft Study Report.

2. In Section 1.7 the report states "it is quite possible that with close coordination in system operation evolving through the brokerage system, the total savings and operating costs could approach the levels reported in this study." We would suggest that

"broker system" be replaced with "brokerage system/bulletin board." Both of these mechanisms provide for enhanced economy transfers within ERCOT.

Costs of Pool Operation

1. Any integrated pool operation of ERCOT member systems as contemplated by the "Bulk Power Transmission Study" will require considerable expense for many of the member systems. HL&P estimates that the costs of an integrated pool dispatch would include the following in addition to or replacing existing security center costs:

- Pool Dispatch Facility w/proper computer hardware, software and communications	$50,000,000
- Staff and Operations costs for integrated pool operation	$10,000,000/Yr to $15,000,000/Yr

Cogeneration Contributions to Operational Reliability

1. Several operational issues regarding cogeneration reliability need to be stated as assumptions affecting reliability in the study. While the importance of dispatching cogenerators is discussed on page 3-25, and it is noted that no dispatchability of cogeneration is assumed in the study, a statement should be inserted in the report such that "considerably more coordination of dispatching cogeneration must take place if ERCOT were to operate as a power

pool." In addition, key operating assumptions regarding cogeneration such as voltage control and spinning reserve requirements are ignored. For coordinated dispatch, where units are committed mainly for economics, all units (including cogeneration) must be subject to operational requirements of the utility (i.e., spinning reserve and voltage control contributions, etc.).

Pricing Policy for Transmission Wheeling

1. The statements made in the text on pages 7-7 and 8-5 (Section 8.2.7) regarding marginal versus embedded cost methodology on which to base transmission wheeling charges is beyond the scope of this study and is not substantiated in the report. ERCOT has been and still is the leader among most areas of the United States where there are no transmission wheeling charges (except third party loss compensation) for emergency and totally interruptible (by buyer or seller) energy transactions. Even most power pools cannot boast this advantage since they first participate in transmission equalization of embedded costs prior to pool operations. Only then do they use marginal transmission costs for pricing transmission wheeling.

   In ERCOT, all firm transactions other than Emergency Transactions require the collection of wheeling charges since the transmission system must be reserved for these firm transactions to assure adequate reliability in the interconnected system. This is true because the utility purchasing the firm power counts these firm transactions toward meeting their daily capacity obligation and, thus, it would be deficient if the transmission were interruptible. On the other hand, if only marginal costs were considered in calculating transmission wheeling charges, any existing transmission capacity would be reserved for emergencies or used by the individual utilities for their own use (since they have no benefit for reserving for third party use). If such were the case, this would discourage future firm transactions. HL&P believes that the existing ERCOT wheeling charge methodology provides a reasonable compromise in allowing utilities to recover a major portion of their embedded costs associated with providing transmission wheeling services.

Utility Operational Problems

1. The ERCOT wide responsive spinning reserve modeled in the study must be at least 2250 MW in 1988 and potentially 2700 MW in 1990 and 1995 to provide adequate reliability. The amounts modeled in the study are inadequate. The allocation of spinning reserve should be as widespread as possible, but exact allocation is not critical as long as adequate transmission capacity is reserved between load centers to transfer reserve where needed in emergencies.

2. The number of starts imposed on small HL&P steam units and gas turbines in the joint dispatch study is unrealistic. We would expect 150-200 to be the maximum number of starts which could be

experienced on steam units and 250-300 on gas turbines. Generating units experiencing starting frequencies at this level would have considerably higher variable maintenance costs which were not modelled in the study.

Environmental and Health Issues

1. The first paragraph of Section 6.3 p. 6-12 should be changed as follows to update and clarify the Klein Case:

"The health and environmental issues surrounding the construction and operation of high voltage transmission lines have become increasingly controversial through the nation. In recent years, this has been no less true in the state of Texas where in one case, based at least in part on assertions of potential health effects on school children, a jury trial in a condemnation case in a county civil court at law resulted in a judgment against the location of a 345 KV line an award of exemplary damages of $25 million against the utility for "Abuse of Discretion." Although the jury did not find that the line constituted any health risk to any person, and the exemplary damages award has since been reversed by a higher court, the utility applied for and received certification and constructed an alternate routing of that segment of the line in order to maintain service during the pendency of appeals. As a result of this and other issues, a task force has been established by the Commission to review all aspects of current transmission certification policies."

Public Utility Commission of Texas
7800 Shoal Creek Boulevard · Suite 400N
Austin, Texas 78757 · 512/458-0100

Dennis L. Thomas
Chairman
Jo Campbell
Commissioner
Marta Greytok
Commissioner

November 23, 1987

Mr. Tom Sweatman, Executive Director
Electric Reliability Council of Texas
7200 MoPac Blvd., Suite 250
Austin, TX 78731

Dear Mr. Sweatman:

This letter is to confirm our telephone conversation from last Friday. As we discussed, the staff of the Bulk Power Transmission Study has completed the final draft of the final report and submitted it to the Commissioners for their review and comment. In the meantime, we are setting up a series of review meetings with committees from ERCOT, from the cogeneration community, and from consumer groups.

The meeting with the ERCOT group is scheduled for Monday, December 7, 1987 at 9:00 a.m. in Hearing Room B at our offices here in Austin. A tentative agenda for the meeting is:

9:00 a.m. -- Presentation of study results by project staff
Distribution of project materials/reports

11:00 a.m. -- Break for committee review of written material
Lunch

2:00 p.m. -- Reconvene for discussion and questions

5:00 p.m. -- Adjourn

It is my hope that the Commission will let us distribute the entire draft report with the clear understanding that it is subject to final revisions. If, following the review meetings, there are areas of interpretation or conclusions which are in dispute, we may wish to add a section to the report which reproduces written comments to that effect. I would assume that committee members would have three or four weeks to submit their final comments, if they have any.

Many thanks for doing the legwork on your end to get the committee together and advise them of the meeting schedule, as well as your own participation in the review process. We look forward to seeing you at the meeting. If, in the meantime, there are any questions, please give me a call at (512) 458-0102.

Sincerely,

Bill Moore

Bill Moore, Economist
Electric Division

Public Utility Commission of Texas

7800 Shoal Creek Boulevard · Suite 400N
Austin, Texas 78757 · 512/458-0100

Dennis L. Thomas
Chairman

Jo Campbell
Commissioner

Marta Greytok
Commissioner

November 23, 1987

Mr. Bob Wright, Consultant
3904 John Stockbauer, No. 109
Victoria, TX 77904

Dear Mr. Wright:

This letter is to confirm our telephone conversation from last Friday. As we discussed, the staff of the Bulk Power Transmission Study has completed the final draft of the final report and submitted it to the Commissioners for their review and comment. In the meantime, we are setting up a series of review meetings with committees from ERCOT, from the cogeneration community, and from consumer groups.

The meeting with the cogeneration group is scheduled for Wednesday, December 9, 1987 at 9:00 a.m. in Hearing Room B at our offices here in Austin. A tentative agenda for the meeting is:

9:00 a.m. -- Presentation of study results by project staff
Distribution of project materials/reports

11:00 a.m. -- Break for committee review of written material
Lunch

2:00 p.m. -- Reconvene for discussion and questions

5:00 p.m. -- Adjourn

It is my hope that the Commission will let us distribute the entire draft report with the clear understanding that it is subject to final revisions. If, following the review meetings, there are areas of interpretation or conclusions which are in dispute, we may wish to add a section to the report which reproduces written comments to that effect. I would assume that committee members would have three or four weeks to submit their final comments, if they have any.

Many thanks for doing the legwork on your end to get the committee together and advise them of the meeting schedule, as well as your own participation in the review process. We look forward to seeing you at the meeting. If, in the meantime, there are any questions, please give me a call at (512) 458-0102.

Sincerely,

Bill Moore

Bill Moore, Economist
Electric Division

Public Utility Commission of Texas
7800 Shoal Creek Boulevard · Suite 400N
Austin, Texas 78757 · 512/458-0100

Dennis L. Thomas
Chairman
Jo Campbell
Commissioner
Marta Greytok
Commissioner

November 23, 1987

Mr. Tom Smith, Executive Director
Public Citizen of Texas
1611 E. First St.
Austin, TX 78702

Dear Mr. Smith:

This letter is to confirm our telephone conversation from last Friday. As we discussed, the staff of the Bulk Power Transmission Study has completed the final draft of the final report and submitted it to the Commissioners for their review and comment. In the meantime, we are setting up a series of review meetings with committees from ERCOT, from the cogeneration community, and from consumer groups.

The meeting with the consumer group committee is scheduled for Tuesday, December 15, 1987 at 9:00 a.m. in Hearing Room B at our offices here in Austin. A tentative agenda for the meeting is:

9:00 a.m. -- Presentation of study results by project staff
Distribution of project materials/reports

11:00 a.m. -- Break for committee review of written material
Lunch

2:00 p.m. -- Reconvene for discussion and questions

5:00 p.m. -- Adjourn

It is my hope that the Commission will let us distribute the entire draft report with the clear understanding that it is subject to final revisions. If, following the review meetings, there are areas of interpretation or conclusions which are in dispute, we may wish to add a section to the report which reproduces written comments to that effect. I would assume that committee members would have three or four weeks to submit their final comments, if they have any.

Many thanks for doing the legwork on your end to get the committee together and advise them of the meeting schedule, as well as your own participation in the review process. We look forward to seeing you at the meeting. If, in the meantime, there are any questions, please give me a call at (512) 458-0102.

Sincerely,

Bill Moore

Bill Moore, Economist
Electric Division

AGENDA
Bulk Power Study Review Meetings
December 7 & 9, 1987

9:00am	Welcome and introductory remarks -- Dennis Thomas or Coyle Kelly
9:10	History, issues, and objectives; qualitative considerations; economic theory and previous studies; configuration of electric power industry in Texas -- Bill Moore
9:25	Methodology; MAPS/MWFLOW model; base case assumptions and data sources; base case results -- Sarut Panjavan
10:05	Alternative scenarios; transmission limitations; alternative coordination arrangements; demand forecasts; fuel scenarios; cogeneration scenarios -- Sarut Panjavan
10:25	Nuclear power uncertainties; winter fuel supply disruption; DC interconnections; nontechnical impediments to bulk power transfers; environmental and health issues -- Bill Moore
10:45	Summary, conclusions, and recommendations -- Bill Moore
11:00am	Break for committee discussions and lunch
2:00pm	Reconvene for discussion, questions and answers
5:00pm	Adjourn

Lower Colorado River Authority
Post Office Box 220 Austin, Texas 78767 • (512) 473-3200

January 22, 1988

Mr. Bill Moore
Public Utility Commission of Texas
7800 Shoal Creek Blvd.
Austin, TX 78757

SUBJECT: Bulk Power Study Comments

SUMMARY: The generation schedules used in the Bulk Power Study conducted by the TPUC that projected a 6 percent savings in the cost of producing electricity in ERCOT is most likely not achievable. If the ERCOT system was operated in the manner the study assumed, dangerous thermal overloads would result even under ideal (no outage) conditions.

Dear Bill:

I appreciate the large amount of work done by your staff to compile the data that I needed to review some of the technical aspects of your Bulk Power Study.

Briefly, a full AC load flow was established using each of the load levels and generation patterns from your 1990 study. The modeling was done on a PRIME computer using the Power Technologies Inc. Power System Simulation software package. Each load flow represents a BASE case and every element of the transmission network is considered to be in service. There are NO CONTINGENCIES modeled in the analysis I performed.

The cases examined show that the thermal limits of the transmission system are exceeded in approximately 18 percent of the 2,158 individual cases.

The first attachment illustrates which cases had thermal overloads. It is a series of plots of the load levels used for each hour of each interval. The black dots on the figures indicate one or more elements of the transmission system had a thermal overload that resulted from the particular generation pattern used in that particular case. Some of the intervals had no problems and some had very few. Others, such as intervals 13 through 18 had a significant number of problems. It is obvious that more overloads do occur at the higher ERCOT load levels; however, there is not a clear relationship between load and the number of overloads. A comparison of interval 4 with interval 24, two intervals with similar load levels, shows that the number of problems is not purely a function of load.

Generally the limits set on power exchanges between areas is such that the capability of the transmission system will not be exceeded under contingency. A power exchange limit that meets this constraint is usually substantially less than what could be achieved under ideal conditions, that is, all parts of the network in service. A generation schedule that results in thermal overloads under ideal conditions is well beyond what would be reasonable to impose on the network.

The second attachment is a summary listing of every element of the ERCOT network that overloads along with a listing of the intervals and hours that cause the overload. Most of the lines and transformers listed were not included in the list of monitored lines in your study; however, some were. It is not clear why the monitored lines did not effectively act as a generation constraint. If the study was completely rerun with all of the lines and transformers listed here included in the list of monitored lines, the resulting generation schedules would have to be substantially different than the ones that resulted in the projected savings identified in your report.

It is my opinion that the new schedules would result in another set of problem lines, thus one is brought back to the understanding that in a network as tight as the ERCOT system, there are very few lines that are not candidates for an overload under some set of conditions. The ERCOT Power Transfer Task Force has for years monitored every line in ERCOT when conducting their studies, as the members of that task force have never been able to identify a significant number of lines that could not overload under some set of circumstances.

In reviewing these cases it is clear that there are tremendous reactive (voltage) problems in the vast majority of the cases. The time allowed does not permit a detailed study of these problems, and it is reasonable to assume a significant number of the voltage problems could be resolved by "tuning" each particular case. For this reason, all voltage problems have been suppressed from the attachments to this letter to avoid confusion. The absence of voltage problems from the attachments does not mean there were not any. The number of both high (greater than 110% of nominal) and low (less than 90% of nominal) voltages would lead me to believe that there probably are cases for which the problems can not be eliminated.

The work done in analyzing one year's worth of generation patterns produced by the MAPS/MW flow program has involved several Man*Weeks and several hundred CPU hours of computer time. This study has not considered reactive problems, contingency analysis, fault analysis, or stability analysis. All of these types of study would have to be done to maintain the level of reliability currently enjoyed by ERCOT. The resources that would have to be dedicated to conduct any one of these additional studies would be many times what has been invested in this simple base case analysis. Each type of analysis would result in additional constraints in dispatching ERCOT generation. Every additional constraint results in a less economic dispatch.

Conclusion:

> The results of this study indicate that the GE MAPS/MW flow program did not produce a generation schedule that adequately considers the limitations of the transmission network. In my opinion, there are three major short comings in your modeling of the transmission system. The first is with the GE program and its reliance on distribution factors to determine transmission flows. The second is the assumption that monitoring a short list of lines can reliably indicate limits for a network such as ERCOT's. Finally, it is not reasonable to assume that a few dozen contingencies represent the vast number of events that must be allowed for in the operation of a transmission system. As your study was conducted, generation schedules were produced that would result in overloads on the transmission system even without contingency.

I would be happy to discuss the studies that have been done with you or your staff at your convenience.

Sincerely,

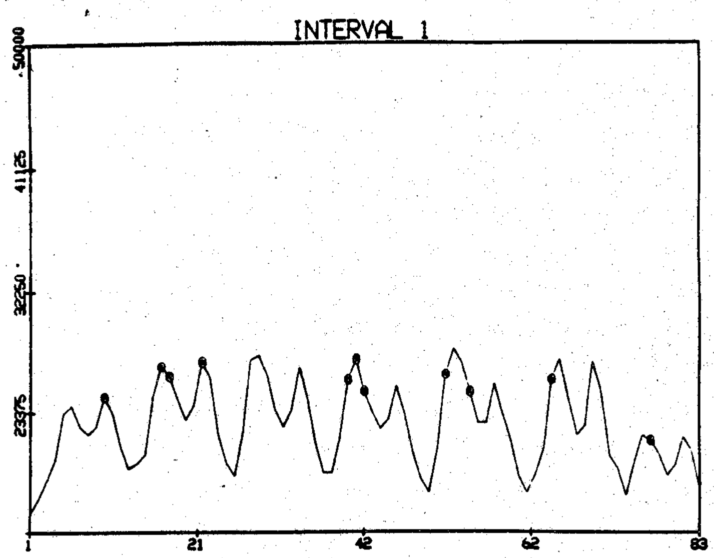
Brady J. Belk

Brady J. Belk, P.E.
Supervising Engineer

Attachments

cc: ERCOT Engineering Subcommittee Members

BJB:ras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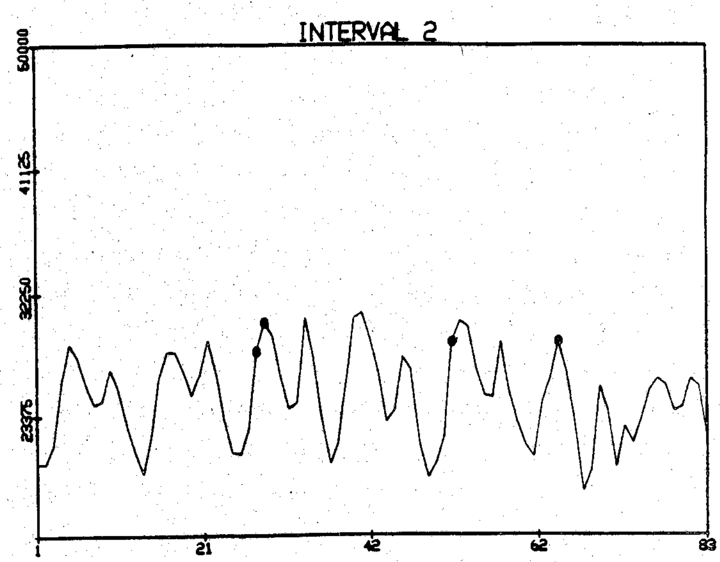
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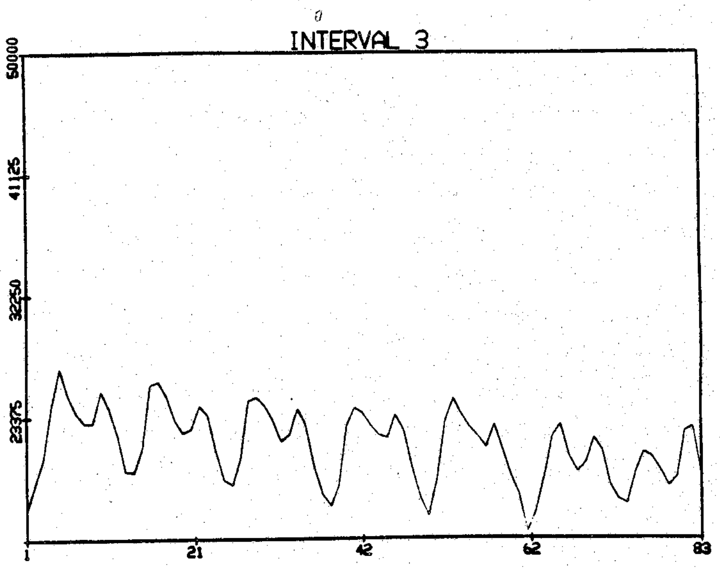
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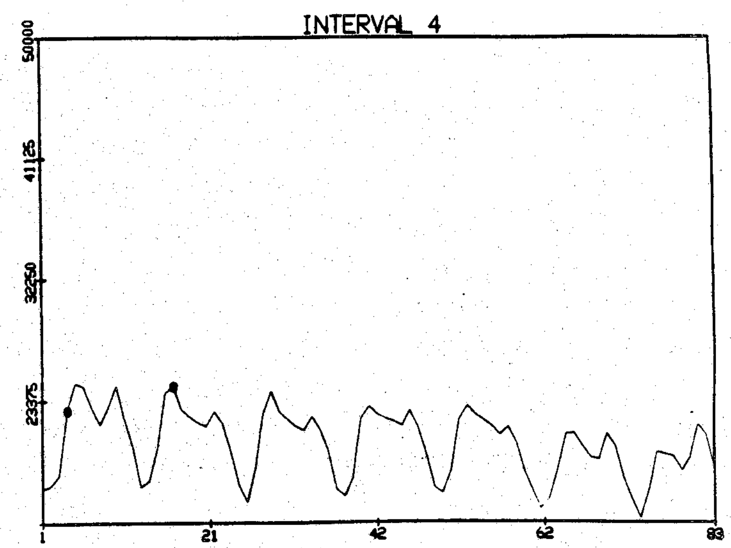
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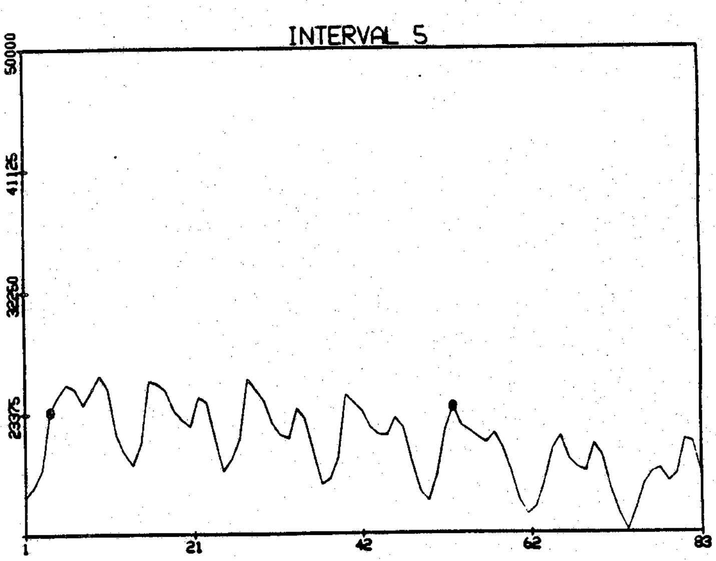
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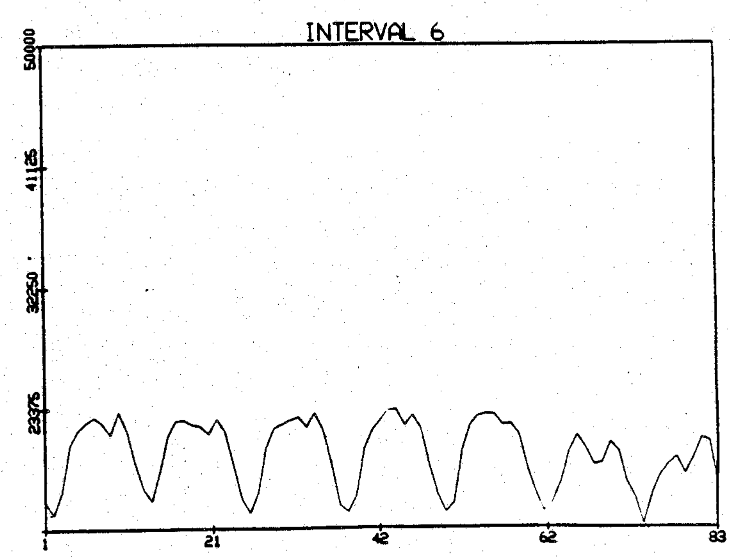
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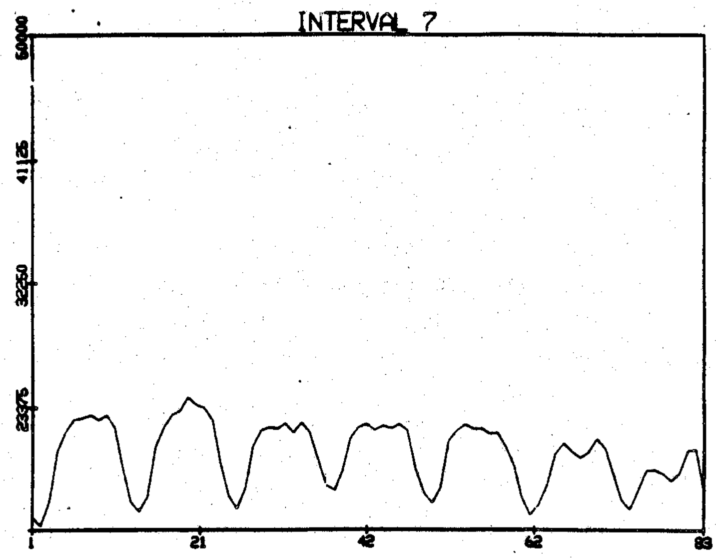
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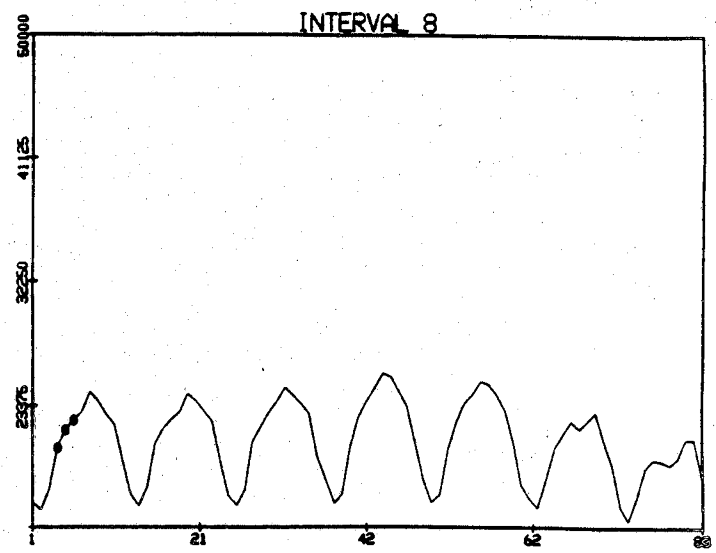
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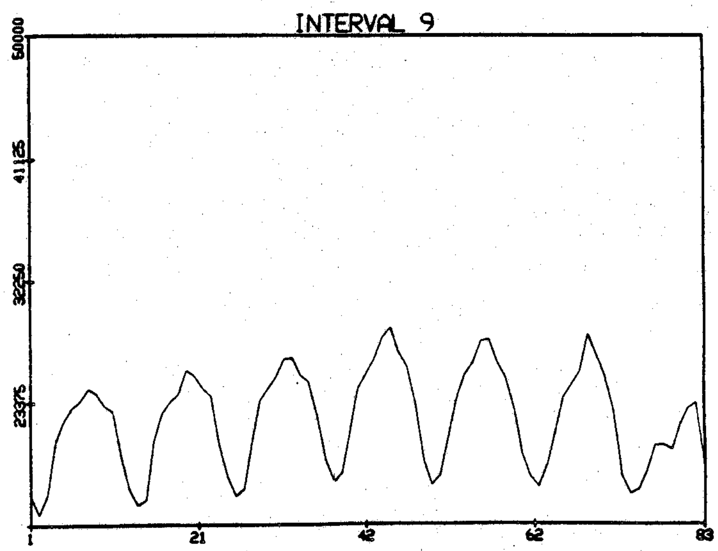
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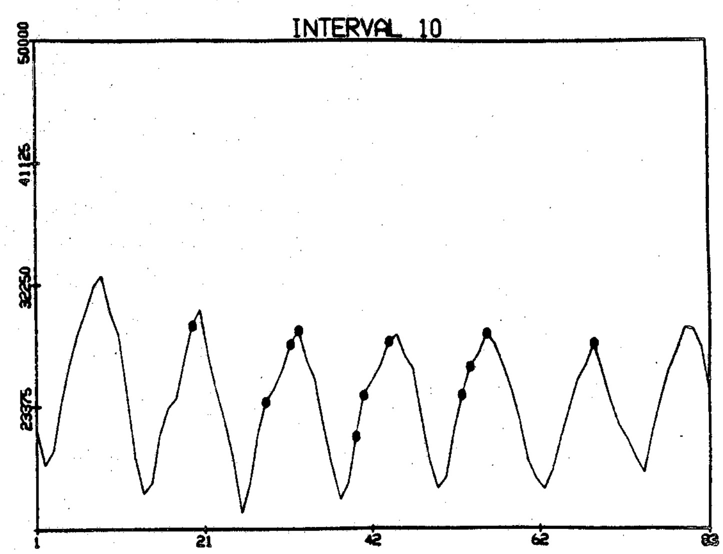
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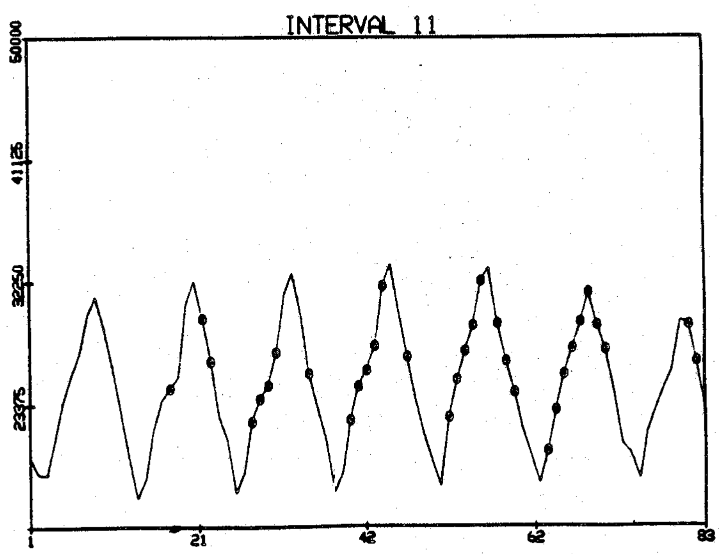
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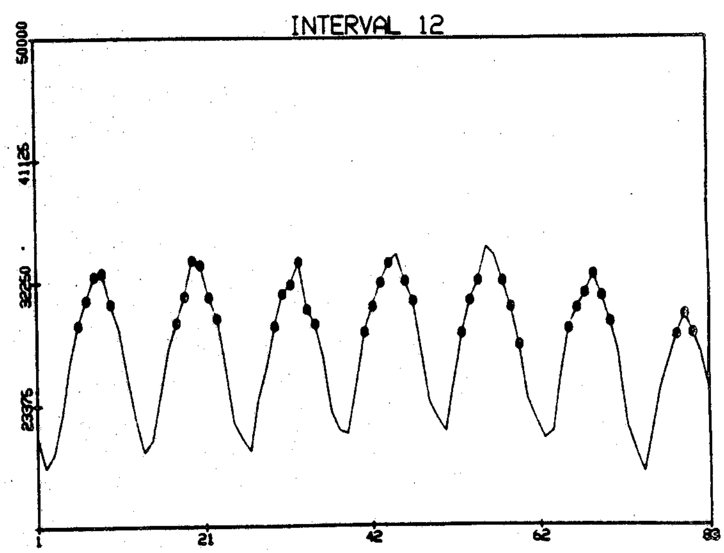
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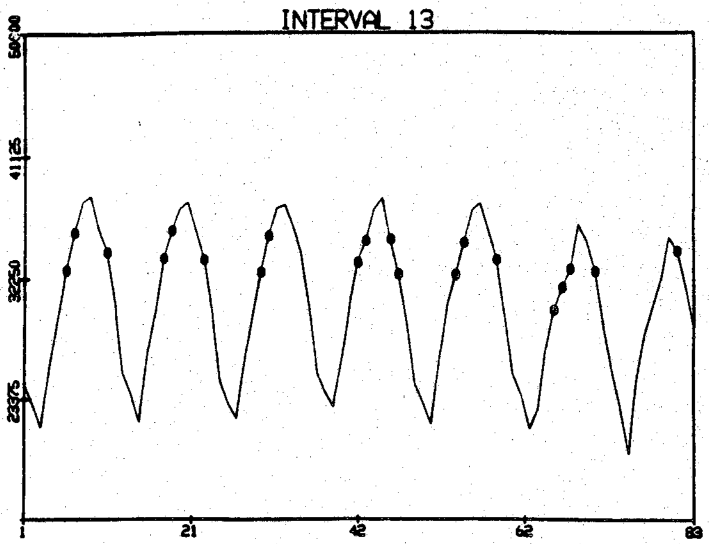
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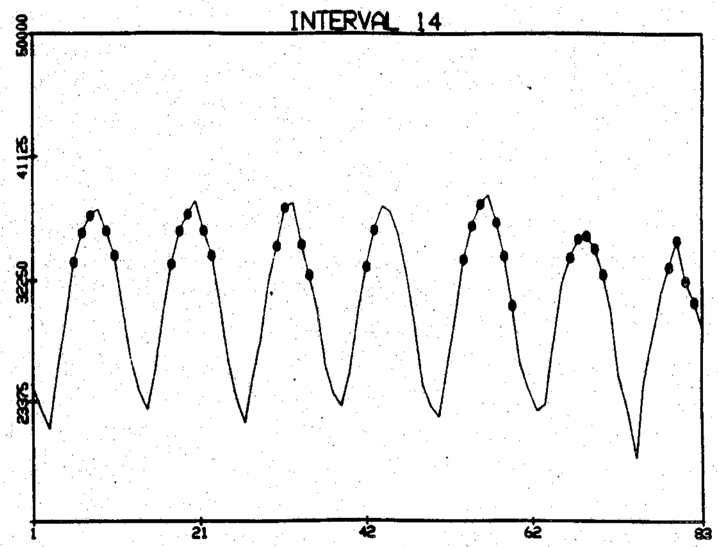
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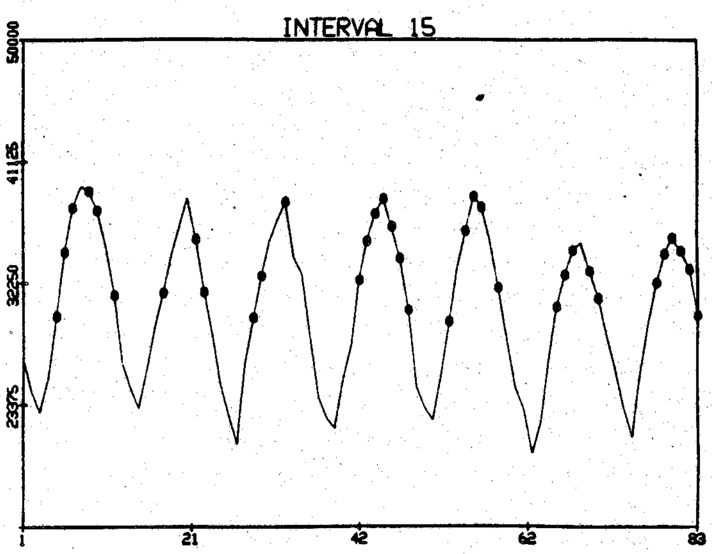
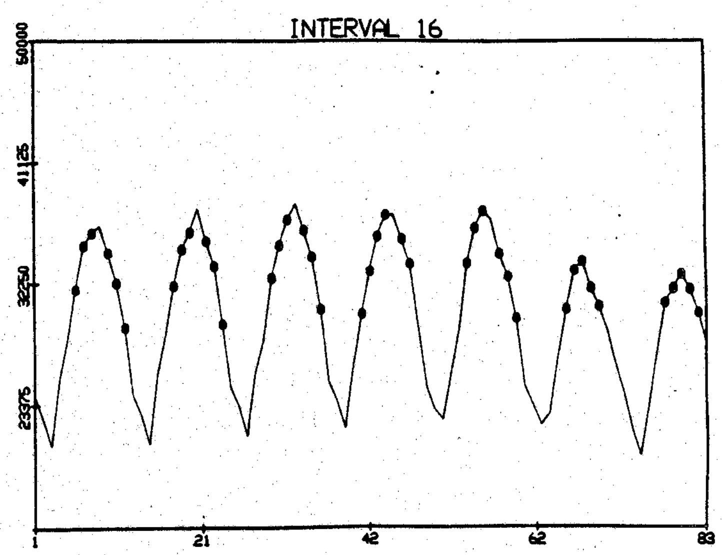
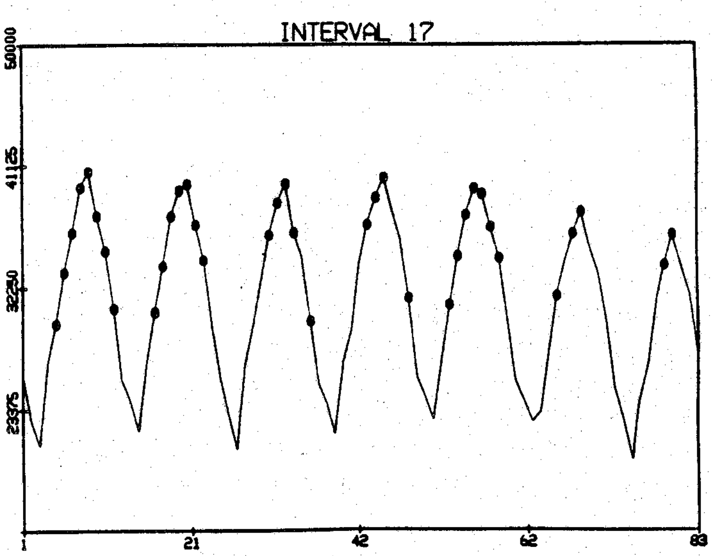

INTERVAL 15
50000
41125
32250
23375
1
21
42
62
83


INTERVAL 16
50000
41125
32250
23375
1
21
42
62
83


INTERVAL 17
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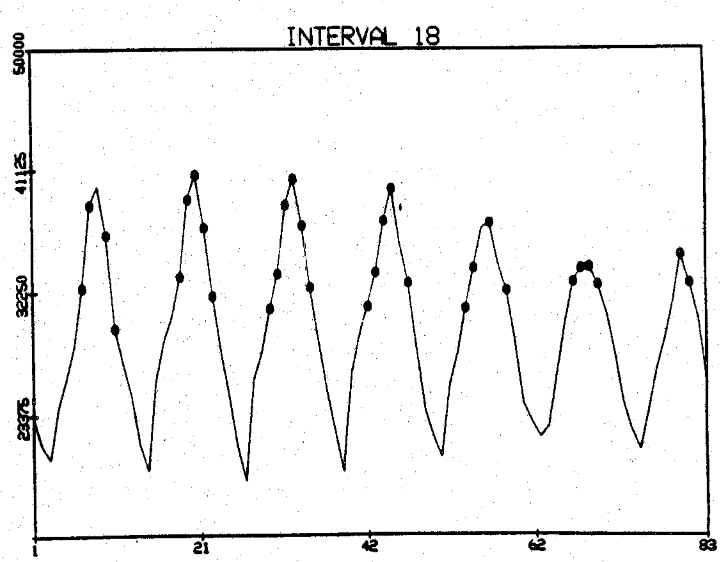
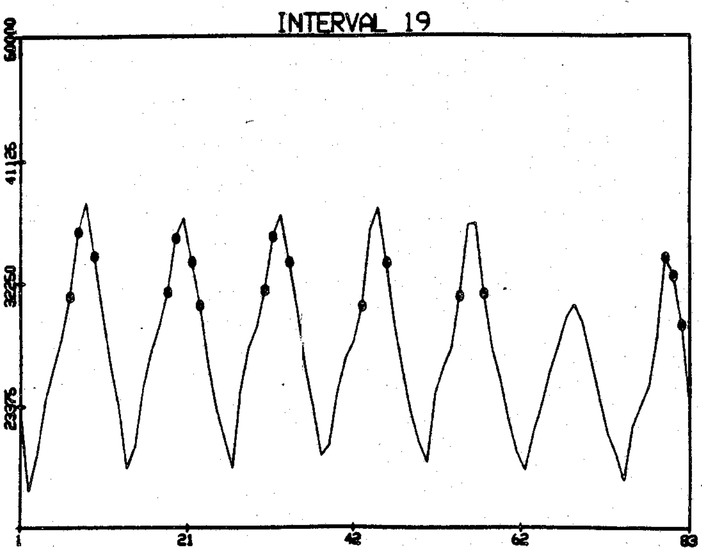
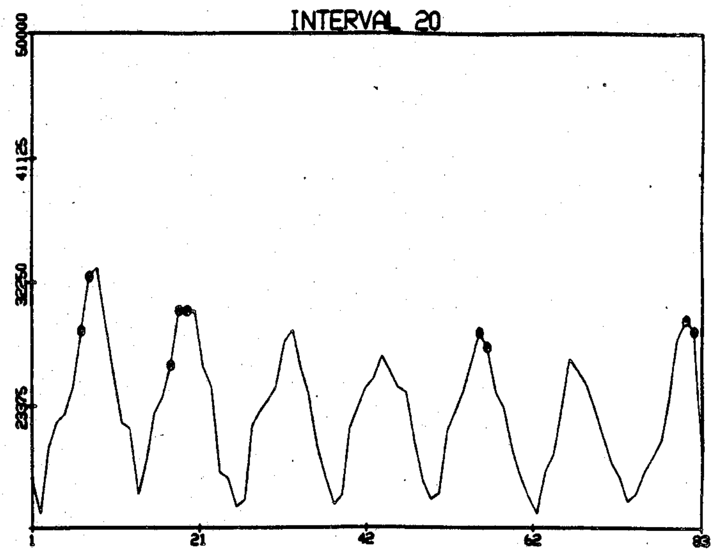
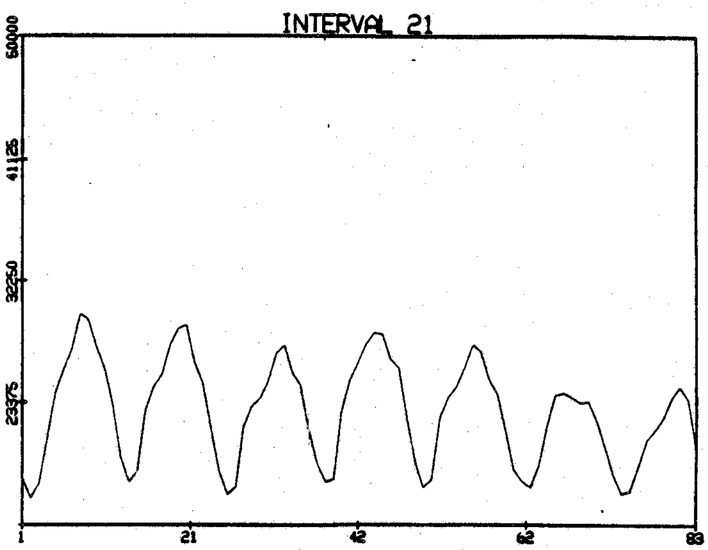
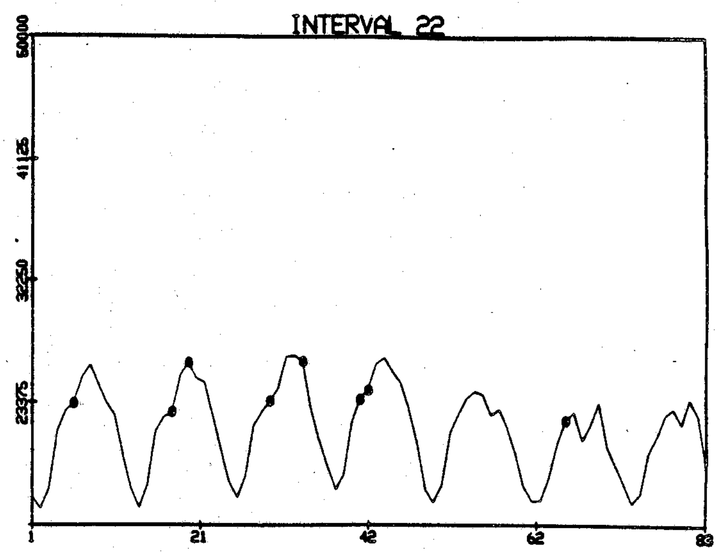
32250
23375
1
21
42
62
83

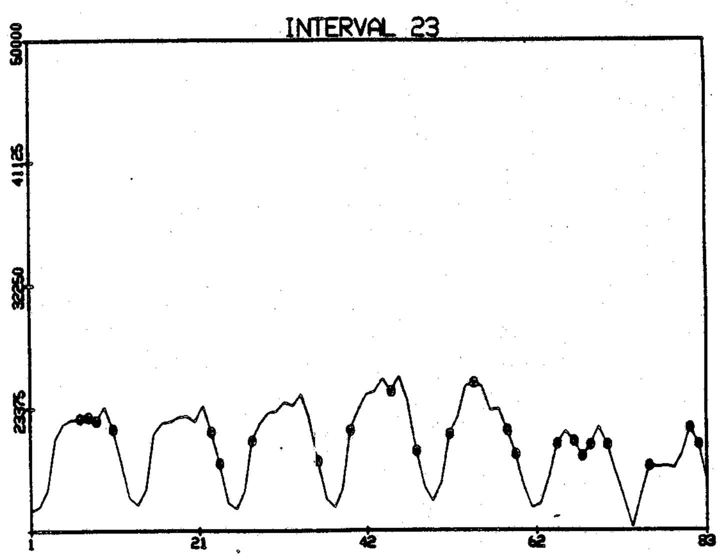

INTERVAL 18
50000
41125
32250
23375
1
21
42
62
83

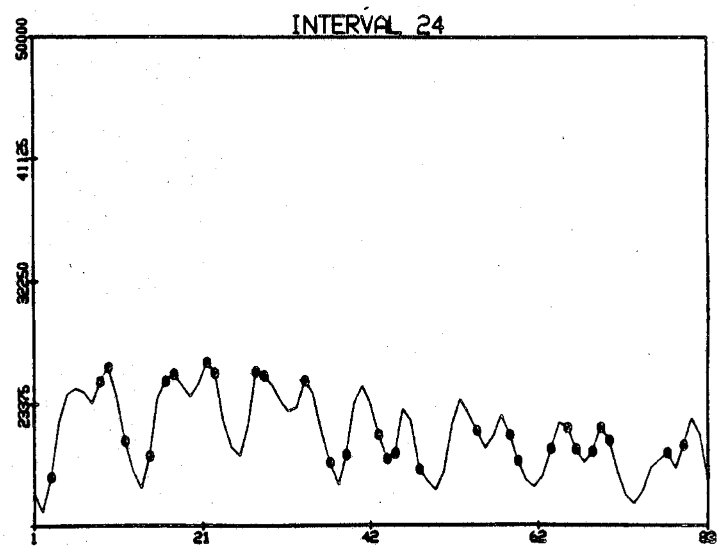

INTERVAL 19
50000
41125
32250
23375
1
21
42
62
83

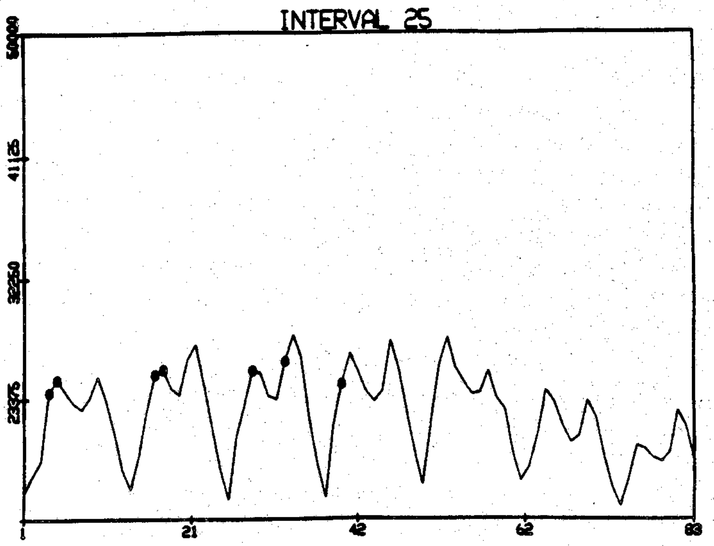

INTERVAL 20
50000
41125
32250
23375
1
21
42
62
83

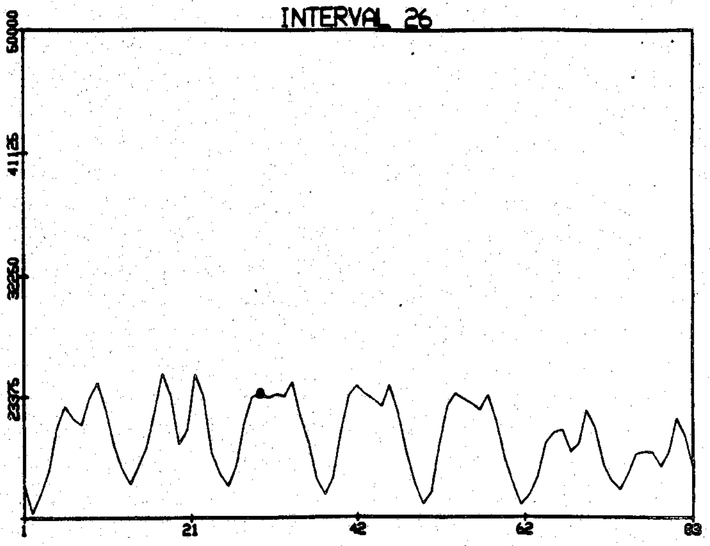

INTERVAL 21
50000
41125
32250
23375
1
21
42
62
83


INTERVAL 22
50000
41125
32250
23375
1
21
42
62
83


INTERVAL 23
50000
41125
32250
23375
1
21
42
62
83


INTERVAL 24
50000
41125
32250
23375
1
21
42
62
83


INTERVAL 25
50000
41125
32250
23375
1
21
42
62
83


INTERVAL 26
50000
41125
32250
23375
1
21
42
62
83

LINES LOADED ABOVE 100. %

RNDRK 138 RNDRK WH 138 / 1/

THIS ITEM APPEARS AS A PROBLEM IN 85 OF 388 CASES. HIGH= 113 LO= 100 AVERAGE= 105 ***

CASES THAT ARE MORE THAN 5% WORSE THAN THE AVERAGE ARE LISTED BELOW

LOADED	111%	IN CASE NO. 1918	91	GENERATORS ON	78	BUSES	INTERVAL	12	HOUR 6	LOAD= 29210.9 SO TEX 5 @ 2500.
LOADED	112%	IN CASE NO. 1947	95	GENERATORS ON	82	BUSES	INTERVAL	12	HOUR 35	LOAD= 29227.2 SO TEX 5 @ 2500.
LOADED	113%	IN CASE NO. 1965	94	GENERATORS ON	82	BUSES	INTERVAL	12	HOUR 53	LOAD= 28543.4 SO TEX 5 @ 2500.
LOADED	111%	IN CASE NO. 1978	93	GENERATORS ON	80	BUSES	INTERVAL	12	HOUR 66	LOAD= 28838.3 SO TEX 5 @ 2500.
LOADED	113%	IN CASE NO. 2548	98	GENERATORS ON	86	BUSES	INTERVAL	19	HOUR 55	LOAD= 31346.4 SO TEX 5 @ 2500.

RNDRK S 138 MCNEIL 8 138 / 1/

THIS ITEM APPEARS AS A PROBLEM IN 193 OF 388 CASES. HIGH= 118 LO= 100 AVERAGE= 104 ***

CASES THAT ARE MORE THAN 5% WORSE THAN THE AVERAGE ARE LISTED BELOW

LOADED	110%	IN CASE NO. 2167	104	GENERATORS ON	87	BUSES	INTERVAL	15	HOUR 6	LOAD= 34534.4 SO TEX 5 @ 2500.
LOADED	110%	IN CASE NO. 2242	104	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR 82	LOAD= 34555.8 SO TEX 5 @ 2500.
LOADED	111%	IN CASE NO. 2334	111	GENERATORS ON	93	BUSES	INTERVAL	17	HOUR 7	LOAD= 36235.4 SO TEX 5 @ 2500.
LOADED	115%	IN CASE NO. 2338	105	GENERATORS ON	89	BUSES	INTERVAL	17	HOUR 11	LOAD= 34901.6 SO TEX 5 @ 2500.
LOADED	115%	IN CASE NO. 2339	99	GENERATORS ON	84	BUSES	INTERVAL	17	HOUR 12	LOAD= 30733.0 SO TEX 5 @ 2500.
LOADED	114%	IN CASE NO. 2344	98	GENERATORS ON	83	BUSES	INTERVAL	17	HOUR 17	LOAD= 30470.6 SO TEX 5 @ 2500.
LOADED	117%	IN CASE NO. 2350	101	GENERATORS ON	86	BUSES	INTERVAL	17	HOUR 23	LOAD= 34213.1 SO TEX 5 @ 2500.
LOADED	111%	IN CASE NO. 2358	110	GENERATORS ON	92	BUSES	INTERVAL	17	HOUR 31	LOAD= 36010.4 SO TEX 5 @ 2500.
LOADED	112%	IN CASE NO. 2361	111	GENERATORS ON	93	BUSES	INTERVAL	17	HOUR 34	LOAD= 36203.8 SO TEX 5 @ 2500.
LOADED	113%	IN CASE NO. 2375	101	GENERATORS ON	86	BUSES	INTERVAL	17	HOUR 48	LOAD= 31471.6 SO TEX 5 @ 2500.
LOADED	115%	IN CASE NO. 2380	99	GENERATORS ON	84	BUSES	INTERVAL	17	HOUR 53	LOAD= 31000.2 SO TEX 5 @ 2500.
LOADED	111%	IN CASE NO. 2385	114	GENERATORS ON	94	BUSES	INTERVAL	17	HOUR 58	LOAD= 36616.8 SO TEX 5 @ 2500.
LOADED	118%	IN CASE NO. 2386	102	GENERATORS ON	86	BUSES	INTERVAL	17	HOUR 59	LOAD= 34358.2 SO TEX 5 @ 2500.
LOADED	114%	IN CASE NO. 2393	100	GENERATORS ON	85	BUSES	INTERVAL	17	HOUR 66	LOAD= 31629.1 SO TEX 5 @ 2500.
LOADED	114%	IN CASE NO. 2407	110	GENERATORS ON	92	BUSES	INTERVAL	17	HOUR 81	LOAD= 36010.8 SO TEX 5 @ 2500.
LOADED	110%	IN CASE NO. 2441	100	GENERATORS ON	84	BUSES	INTERVAL	18	HOUR 31	LOAD= 33578.5 SO TEX 5 @ 2500.
LOADED	110%	IN CASE NO. 2445	100	GENERATORS ON	84	BUSES	INTERVAL	18	HOUR 35	LOAD= 32552.0 SO TEX 5 @ 2500.
LOADED	110%	IN CASE NO. 2453	99	GENERATORS ON	83	BUSES	INTERVAL	18	HOUR 43	LOAD= 33661.4 SO TEX 5 @ 2500.
LOADED	110%	IN CASE NO. 2457	97	GENERATORS ON	81	BUSES	INTERVAL	18	HOUR 47	LOAD= 32880.7 SO TEX 5 @ 2500.
LOADED	110%	IN CASE NO. 2469	96	GENERATORS ON	80	BUSES	INTERVAL	18	HOUR 59	LOAD= 32315.3 SO TEX 5 @ 2500.
LOADED	110%	IN CASE NO. 2548	98	GENERATORS ON	86	BUSES	INTERVAL	19	HOUR 55	LOAD= 31346.4 SO TEX 5 @ 2500.

ASHERTN4 138 LAREDO 4 138 / 8/

LOADED	113%	IN CASE NO. 1076	68	GENERATORS ON	64	BUSES	INTERVAL	1	HOUR 78	LOAD= 21340.3 MARTINLK @ 2034.
LOADED	117%	IN CASE NO. 1265	84	GENERATORS ON	72	BUSES	INTERVAL	4	HOUR 17	LOAD= 24419.2 W A P 8 @ 1808.

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                 LINES LOADED ABOVE 100. %

                 LAREDO 4 138 BRUNI  4 138 / 8/
                 __________________________________
 LOADED   119% IN CASE NO. 1076   68 GENERATORS ON    64 BUSES   INTERVAL    1  HOUR 78 LOAD= 21340.3  MARTINLK @ 2034.

                 BRUNI  4 138 FALF   4 138 / 8/
                 __________________________________
 LOADED   129% IN CASE NO. 1076   68 GENERATORS ON    64 BUSES   INTERVAL    1  HOUR 78 LOAD= 21340.3  MARTINLK @ 2034.
 LOADED   222% IN CASE NO. 1265   84 GENERATORS ON    72 BUSES   INTERVAL    4  HOUR 17 LOAD= 24419.2  W A P   8 @ 1808.
 LOADED   100% IN CASE NO. 2170  128 GENERATORS ON   100 BUSES   INTERVAL   15  HOUR  9 LOAD= 38985.6  SO TEX 5 @ 2500.

                 ALICE  2  69 FREER  2  69 / 8/
                 __________________________________
 LOADED   108% IN CASE NO. 1076   68 GENERATORS ON    64 BUSES   INTERVAL    1  HOUR 78 LOAD= 21340.3  MARTINLK @ 2034.
 LOADED   183% IN CASE NO. 1265   84 GENERATORS ON    72 BUSES   INTERVAL    4  HOUR 17 LOAD= 24419.2  W A P   8 @ 1808.

                 ARTESIA2  69 ASHERTN2  69 / 8/
                 __________________________________
 LOADED   125% IN CASE NO. 1265   84 GENERATORS ON    72 BUSES   INTERVAL    4  HOUR 17 LOAD= 24419.2  W A P   8 @ 1808.

                 ZAPATA 4 138 FALCON 4 138 / 8/
                 __________________________________
 LOADED   133% IN CASE NO. 1265   84 GENERATORS ON    72 BUSES   INTERVAL    4  HOUR 17 LOAD= 24419.2  W A P   8 @ 1808.

                 BATES  4 138 GARZA  4 138 / 8/
                 __________________________________
 LOADED   135% IN CASE NO. 1265   84 GENERATORS ON    72 BUSES   INTERVAL    4  HOUR 17 LOAD= 24419.2  W A P   8 @ 1808.

                 FALCON 4 138 GARZA  4 138 / 8/
                 __________________________________
 LOADED   133% IN CASE NO. 1265   84 GENERATORS ON    72 BUSES   INTERVAL    4  HOUR 17 LOAD= 24419.2  W A P   8 @ 1808.

                 WTSN C 8 100 JEWETT   138 /11/
                 __________________________________
THIS ITEM APPEARS AS A PROBLEM IN    100 OF    388 CASES.      HIGH= 133   LO= 100   AVERAGE= 110
CASES THAT ARE MORE THAN    5% WORSE THAN THE AVERAGE ARE LISTED BELOW                                           ***
 LOADED   117% IN CASE NO. 1947   95 GENERATORS ON    82 BUSES   INTERVAL   12  HOUR 35 LOAD= 29227.2  SO TEX 5 @ 2500.
 LOADED   117% IN CASE NO. 1965   94 GENERATORS ON    82 BUSES   INTERVAL   12  HOUR 53 LOAD= 28543.4  SO TEX 5 @ 2500.
 LOADED   124% IN CASE NO. 2167  104 GENERATORS ON    87 BUSES   INTERVAL   15  HOUR  6 LOAD= 34534.4  SO TEX 5 @ 2500.
 LOADED   124% IN CASE NO. 2173   98 GENERATORS ON    82 BUSES   INTERVAL   15  HOUR 12 LOAD= 31371.7  SO TEX 5 @ 2500.
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LINES LOADED ABOVE 100. %

WTSN C 8 100 JEWETT 138 /11/ CONT.

LOADED	118%	IN CASE NO.	2191	101	GENERATORS ON	85	BUSES	INTERVAL	15	HOUR	30	LOAD=	32758.2	SO TEX 5 @	2500.
LOADED	122%	IN CASE NO.	2203	100	GENERATORS ON	84	BUSES	INTERVAL	15	HOUR	42	LOAD=	32448.8	SO TEX 5 @	2500.
LOADED	120%	IN CASE NO.	2204	103	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR	43	LOAD=	35267.1	SO TEX 5 @	2500.
LOADED	124%	IN CASE NO.	2208	102	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR	47	LOAD=	34047.5	SO TEX 5 @	2500.
LOADED	116%	IN CASE NO.	2220	99	GENERATORS ON	83	BUSES	INTERVAL	15	HOUR	59	LOAD=	31893.9	SO TEX 5 @	2500.
LOADED	116%	IN CASE NO.	2228	101	GENERATORS ON	85	BUSES	INTERVAL	15	HOUR	67	LOAD=	32821.9	SO TEX 5 @	2500.
LOADED	119%	IN CASE NO.	2229	103	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR	68	LOAD=	34590.0	SO TEX 5 @	2500.
LOADED	119%	IN CASE NO.	2231	101	GENERATORS ON	85	BUSES	INTERVAL	15	HOUR	70	LOAD=	33089.6	SO TEX 5 @	2500.
LOADED	119%	IN CASE NO.	2240	103	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR	80	LOAD=	34348.6	SO TEX 5 @	2500.
LOADED	118%	IN CASE NO.	2241	105	GENERATORS ON	87	BUSES	INTERVAL	15	HOUR	81	LOAD=	35529.0	SO TEX 5 @	2500.
LOADED	124%	IN CASE NO.	2242	104	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR	82	LOAD=	34555.8	SO TEX 5 @	2500.
LOADED	121%	IN CASE NO.	2243	101	GENERATORS ON	85	BUSES	INTERVAL	15	HOUR	83	LOAD=	33258.6	SO TEX 5 @	2500.
LOADED	120%	IN CASE NO.	2255	97	GENERATORS ON	82	BUSES	INTERVAL	16	HOUR	11	LOAD=	32294.7	SO TEX 5 @	2500.
LOADED	118%	IN CASE NO.	2539	107	GENERATORS ON	92	BUSES	INTERVAL	19	HOUR	46	LOAD=	33737.3	SO TEX 5 @	2500.
LOADED	133%	IN CASE NO.	2548	98	GENERATORS ON	86	BUSES	INTERVAL	19	HOUR	55	LOAD=	31346.4	SO TEX 5 @	2500.
LOADED	119%	IN CASE NO.	2575	96	GENERATORS ON	84	BUSES	INTERVAL	19	HOUR	83	LOAD=	29346.3	SO TEX 5 @	2500.
LOADED	122%	IN CASE NO.	2594	74	GENERATORS ON	63	BUSES	INTERVAL	20	HOUR	18	LOAD=	26353.4	SO TEX 5 @	2500.
LOADED	124%	IN CASE NO.	2595	84	GENERATORS ON	71	BUSES	INTERVAL	20	HOUR	19	LOAD=	30287.0	SO TEX 5 @	2500.

LEON 138 LNGLVL M 138 / 1/

THIS ITEM APPEARS AS A PROBLEM IN 138 OF 388 CASES. HIGH= 116 LO= 100 AVERAGE= 106 ***
CASES THAT ARE MORE THAN 5% WORSE THAN THE AVERAGE ARE LISTED BELOW

LOADED	112%	IN CASE NO.	1790	81	GENERATORS ON	71	BUSES	INTERVAL	10	HOUR	44	LOAD=	28076.5	SO TEX 5 @	2500.
LOADED	112%	IN CASE NO.	1898	99	GENERATORS ON	84	BUSES	INTERVAL	11	HOUR	69	LOAD=	31502.3	COM PEAK @	2070.
LOADED	113%	IN CASE NO.	1983	92	GENERATORS ON	80	BUSES	INTERVAL	12	HOUR	71	LOAD=	29319.6	SO TEX 5 @	2500.
LOADED	112%	IN CASE NO.	2063	100	GENERATORS ON	84	BUSES	INTERVAL	13	HOUR	68	LOAD=	33011.0	COM PEAK @	2070.
LOADED	115%	IN CASE NO.	2204	103	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR	43	LOAD=	35267.1	SO TEX 5 @	2500.
LOADED	112%	IN CASE NO.	2208	102	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR	47	LOAD=	34047.5	SO TEX 5 @	2500.
LOADED	113%	IN CASE NO.	2251	101	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR	7	LOAD=	35046.7	SO TEX 5 @	2500.
LOADED	116%	IN CASE NO.	2252	107	GENERATORS ON	87	BUSES	INTERVAL	16	HOUR	8	LOAD=	35999.5	SO TEX 5 @	2500.
LOADED	115%	IN CASE NO.	2254	100	GENERATORS ON	83	BUSES	INTERVAL	16	HOUR	10	LOAD=	34499.9	SO TEX 5 @	2500.
LOADED	115%	IN CASE NO.	2255	97	GENERATORS ON	82	BUSES	INTERVAL	16	HOUR	11	LOAD=	32294.7	SO TEX 5 @	2500.
LOADED	113%	IN CASE NO.	2262	97	GENERATORS ON	82	BUSES	INTERVAL	16	HOUR	18	LOAD=	32090.1	SO TEX 5 @	2500.
LOADED	113%	IN CASE NO.	2263	101	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR	19	LOAD=	34780.9	SO TEX 5 @	2500.
LOADED	116%	IN CASE NO.	2264	107	GENERATORS ON	87	BUSES	INTERVAL	16	HOUR	20	LOAD=	36015.0	SO TEX 5 @	2500.
LOADED	116%	IN CASE NO.	2266	104	GENERATORS ON	86	BUSES	INTERVAL	16	HOUR	22	LOAD=	35366.8	SO TEX 5 @	2500.
LOADED	113%	IN CASE NO.	2267	99	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR	23	LOAD=	33537.1	SO TEX 5 @	2500.
LOADED	114%	IN CASE NO.	2274	99	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR	30	LOAD=	32671.3	SO TEX 5 @	2500.
LOADED	114%	IN CASE NO.	2275	103	GENERATORS ON	85	BUSES	INTERVAL	16	HOUR	31	LOAD=	35083.0	SO TEX 5 @	2500.
LOADED	115%	IN CASE NO.	2276	118	GENERATORS ON	93	BUSES	INTERVAL	16	HOUR	32	LOAD=	36942.1	SO TEX 5 @	2500.
LOADED	116%	IN CASE NO.	2278	109	GENERATORS ON	89	BUSES	INTERVAL	16	HOUR	34	LOAD=	36184.5	SO TEX 5 @	2500.
LOADED	114%	IN CASE NO.	2279	100	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR	35	LOAD=	34208.2	SO TEX 5 @	2500.

LINES LOADED ABOVE 100. %

LEON 138 LNGLVL M 138 / 1/ CONT.

LOADED	113%	IN CASE NO.	2286	99	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR	42	LOAD=	33196.5	SO TEX 5 @ 2500.
LOADED	115%	IN CASE NO.	2287	106	GENERATORS ON	87	BUSES	INTERVAL	16	HOUR	43	LOAD=	35732.9	SO TEX 5 @ 2500.
LOADED	113%	IN CASE NO.	2288	121	GENERATORS ON	94	BUSES	INTERVAL	16	HOUR	44	LOAD=	37303.9	SO TEX 5 @ 2500.
LOADED	116%	IN CASE NO.	2290	105	GENERATORS ON	86	BUSES	INTERVAL	16	HOUR	46	LOAD=	35530.7	SO TEX 5 @ 2500.
LOADED	114%	IN CASE NO.	2291	99	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR	47	LOAD=	33702.6	SO TEX 5 @ 2500.
LOADED	114%	IN CASE NO.	2298	100	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR	54	LOAD=	33746.9	SO TEX 5 @ 2500.
LOADED	115%	IN CASE NO.	2299	110	GENERATORS ON	89	BUSES	INTERVAL	16	HOUR	55	LOAD=	36337.2	SO TEX 5 @ 2500.
LOADED	113%	IN CASE NO.	2300	123	GENERATORS ON	96	BUSES	INTERVAL	16	HOUR	56	LOAD=	37587.9	SO TEX 5 @ 2500.
LOADED	116%	IN CASE NO.	2302	101	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR	58	LOAD=	34454.9	SO TEX 5 @ 2500.
LOADED	113%	IN CASE NO.	2303	97	GENERATORS ON	83	BUSES	INTERVAL	16	HOUR	59	LOAD=	32767.8	SO TEX 5 @ 2500.

LNGLVL M 138 STPHVIL 138 / 1/

THIS ITEM APPEARS AS A PROBLEM IN 232 OF 388 CASES. HIGH= 122 LO= 100 AVERAGE= 107

CASES THAT ARE MORE THAN 5% WORSE THAN THE AVERAGE ARE LISTED BELOW ***

LOADED	117%	IN CASE NO.	1790	81	GENERATORS ON	71	BUSES	INTERVAL	10	HOUR	44	LOAD=	28076.5	SO TEX 5 @ 2500.
LOADED	114%	IN CASE NO.	1815	80	GENERATORS ON	71	BUSES	INTERVAL	10	HOUR	69	LOAD=	27979.3	SO TEX 5 @ 2500.
LOADED	113%	IN CASE NO.	1870	81	GENERATORS ON	71	BUSES	INTERVAL	11	HOUR	41	LOAD=	24696.9	COM PEAK @ 2070.
LOADED	117%	IN CASE NO.	1898	99	GENERATORS ON	84	BUSES	INTERVAL	11	HOUR	69	LOAD=	31502.3	COM PEAK @ 2070.
LOADED	114%	IN CASE NO.	1899	89	GENERATORS ON	78	BUSES	INTERVAL	11	HOUR	70	LOAD=	29139.6	COM PEAK @ 2070.
LOADED	113%	IN CASE NO.	1900	86	GENERATORS ON	76	BUSES	INTERVAL	11	HOUR	71	LOAD=	27364.9	COM PEAK @ 2070.
LOADED	113%	IN CASE NO.	1978	93	GENERATORS ON	80	BUSES	INTERVAL	12	HOUR	66	LOAD=	28838.3	SO TEX 5 @ 2500.
LOADED	119%	IN CASE NO.	1983	92	GENERATORS ON	80	BUSES	INTERVAL	12	HOUR	71	LOAD=	29319.6	SO TEX 5 @ 2500.
LOADED	113%	IN CASE NO.	1991	91	GENERATORS ON	80	BUSES	INTERVAL	12	HOUR	80	LOAD=	28368.4	SO TEX 5 @ 2500.
LOADED	114%	IN CASE NO.	1992	93	GENERATORS ON	80	BUSES	INTERVAL	12	HOUR	81	LOAD=	29899.7	SO TEX 5 @ 2500.
LOADED	116%	IN CASE NO.	2037	103	GENERATORS ON	86	BUSES	INTERVAL	13	HOUR	42	LOAD=	33378.0	COM PEAK @ 2070.
LOADED	114%	IN CASE NO.	2038	106	GENERATORS ON	88	BUSES	INTERVAL	13	HOUR	43	LOAD=	34969.5	COM PEAK @ 2070.
LOADED	117%	IN CASE NO.	2063	100	GENERATORS ON	84	BUSES	INTERVAL	13	HOUR	68	LOAD=	33011.0	COM PEAK @ 2070.
LOADED	113%	IN CASE NO.	2203	100	GENERATORS ON	84	BUSES	INTERVAL	15	HOUR	42	LOAD=	32448.8	SO TEX 5 @ 2500.
LOADED	120%	IN CASE NO.	2204	103	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR	43	LOAD=	35267.1	SO TEX 5 @ 2500.
LOADED	117%	IN CASE NO.	2208	102	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR	47	LOAD=	34047.5	SO TEX 5 @ 2500.
LOADED	114%	IN CASE NO.	2218	114	GENERATORS ON	93	BUSES	INTERVAL	15	HOUR	57	LOAD=	37773.4	SO TEX 5 @ 2500.
LOADED	119%	IN CASE NO.	2251	101	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR	7	LOAD=	35046.7	SO TEX 5 @ 2500.
LOADED	122%	IN CASE NO.	2252	107	GENERATORS ON	87	BUSES	INTERVAL	16	HOUR	8	LOAD=	35999.5	SO TEX 5 @ 2500.
LOADED	121%	IN CASE NO.	2254	100	GENERATORS ON	83	BUSES	INTERVAL	16	HOUR	10	LOAD=	34499.9	SO TEX 5 @ 2500.
LOADED	120%	IN CASE NO.	2255	97	GENERATORS ON	82	BUSES	INTERVAL	16	HOUR	11	LOAD=	32294.7	SO TEX 5 @ 2500.
LOADED	118%	IN CASE NO.	2262	97	GENERATORS ON	82	BUSES	INTERVAL	16	HOUR	18	LOAD=	32090.1	SO TEX 5 @ 2500.
LOADED	119%	IN CASE NO.	2263	101	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR	19	LOAD=	34780.9	SO TEX 5 @ 2500.
LOADED	121%	IN CASE NO.	2264	107	GENERATORS ON	87	BUSES	INTERVAL	16	HOUR	20	LOAD=	36015.0	SO TEX 5 @ 2500.
LOADED	121%	IN CASE NO.	2266	104	GENERATORS ON	86	BUSES	INTERVAL	16	HOUR	22	LOAD=	35366.8	SO TEX 5 @ 2500.
LOADED	119%	IN CASE NO.	2267	99	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR	23	LOAD=	33537.1	SO TEX 5 @ 2500.
LOADED	120%	IN CASE NO.	2274	99	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR	30	LOAD=	32671.3	SO TEX 5 @ 2500.
LOADED	119%	IN CASE NO.	2275	103	GENERATORS ON	85	BUSES	INTERVAL	16	HOUR	31	LOAD=	35083.0	SO TEX 5 @ 2500.

LINES LOADED ABOVE 100. %

LNGLVL M 138 STPHVIL 138 / 1/ CONT.

LOADED 120%	IN CASE NO. 2276	118 GENERATORS ON	93 BUSES	INTERVAL 16	HOUR 32	LOAD= 36942.1	SO TEX 5 @ 2500.
LOADED 121%	IN CASE NO. 2278	109 GENERATORS ON	89 BUSES	INTERVAL 16	HOUR 34	LOAD= 36184.5	SO TEX 5 @ 2500.
LOADED 119%	IN CASE NO. 2279	100 GENERATORS ON	84 BUSES	INTERVAL 16	HOUR 35	LOAD= 34208.2	SO TEX 5 @ 2500.
LOADED 119%	IN CASE NO. 2286	99 GENERATORS ON	84 BUSES	INTERVAL 16	HOUR 42	LOAD= 33196.5	SO TEX 5 @ 2500.
LOADED 121%	IN CASE NO. 2287	106 GENERATORS ON	87 BUSES	INTERVAL 16	HOUR 43	LOAD= 35732.9	SO TEX 5 @ 2500.
LOADED 119%	IN CASE NO. 2288	121 GENERATORS ON	94 BUSES	INTERVAL 16	HOUR 44	LOAD= 37303.9	SO TEX 5 @ 2500.
LOADED 121%	IN CASE NO. 2290	105 GENERATORS ON	86 BUSES	INTERVAL 16	HOUR 46	LOAD= 35530.7	SO TEX 5 @ 2500.
LOADED 119%	IN CASE NO. 2291	99 GENERATORS ON	84 BUSES	INTERVAL 16	HOUR 47	LOAD= 33702.6	SO TEX 5 @ 2500.
LOADED 119%	IN CASE NO. 2298	100 GENERATORS ON	84 BUSES	INTERVAL 16	HOUR 54	LOAD= 33746.9	SO TEX 5 @ 2500.
LOADED 120%	IN CASE NO. 2299	110 GENERATORS ON	89 BUSES	INTERVAL 16	HOUR 55	LOAD= 36337.2	SO TEX 5 @ 2500.
LOADED 119%	IN CASE NO. 2300	123 GENERATORS ON	96 BUSES	INTERVAL 16	HOUR 56	LOAD= 37587.9	SO TEX 5 @ 2500.
LOADED 122%	IN CASE NO. 2302	101 GENERATORS ON	84 BUSES	INTERVAL 16	HOUR 58	LOAD= 34454.9	SO TEX 5 @ 2500.
LOADED 119%	IN CASE NO. 2303	97 GENERATORS ON	83 BUSES	INTERVAL 16	HOUR 59	LOAD= 32767.8	SO TEX 5 @ 2500.
LOADED 113%	IN CASE NO. 2350	101 GENERATORS ON	86 BUSES	INTERVAL 17	HOUR 23	LOAD= 34213.1	SO TEX 5 @ 2500.
LOADED 115%	IN CASE NO. 2453	99 GENERATORS ON	83 BUSES	INTERVAL 18	HOUR 43	LOAD= 33661.4	SO TEX 5 @ 2500.
LOADED 114%	IN CASE NO. 2457	97 GENERATORS ON	81 BUSES	INTERVAL 18	HOUR 47	LOAD= 32880.7	SO TEX 5 @ 2500.
LOADED 114%	IN CASE NO. 2465	97 GENERATORS ON	81 BUSES	INTERVAL 18	HOUR 55	LOAD= 33948.3	SO TEX 5 @ 2500.
LOADED 116%	IN CASE NO. 2467	117 GENERATORS ON	91 BUSES	INTERVAL 18	HOUR 57	LOAD= 37231.3	SO TEX 5 @ 2500.
LOADED 115%	IN CASE NO. 2595	84 GENERATORS ON	71 BUSES	INTERVAL 20	HOUR 19	LOAD= 30287.0	SO TEX 5 @ 2500.
LOADED 116%	IN CASE NO. 2890	60 GENERATORS ON	55 BUSES	INTERVAL 23	HOUR 65	LOAD= 20799.6	SO TEX 5 @ 2500.
LOADED 114%	IN CASE NO. 2892	61 GENERATORS ON	55 BUSES	INTERVAL 23	HOUR 67	LOAD= 20959.7	SO TEX 5 @ 2500.
LOADED 114%	IN CASE NO. 2894	61 GENERATORS ON	55 BUSES	INTERVAL 23	HOUR 69	LOAD= 20711.0	SO TEX 5 @ 2500.
LOADED 114%	IN CASE NO. 2896	61 GENERATORS ON	55 BUSES	INTERVAL 23	HOUR 71	LOAD= 20736.2	SO TEX 5 @ 2500.
LOADED 115%	IN CASE NO. 2906	65 GENERATORS ON	59 BUSES	INTERVAL 23	HOUR 82	LOAD= 21973.5	SO TEX 5 @ 2500.
LOADED 113%	IN CASE NO. 2974	55 GENERATORS ON	48 BUSES	INTERVAL 24	HOUR 66	LOAD= 21646.3	SO TEX 5 @ 2500.
LOADED 113%	IN CASE NO. 2978	55 GENERATORS ON	48 BUSES	INTERVAL 24	HOUR 70	LOAD= 21671.2	SO TEX 5 @ 2500.

LAMPSAS8 138 GOLDTWT8 138

THIS ITEM APPEARS AS A PROBLEM IN 77 OF 388 CASES. HIGH= 136 LO= 101 AVERAGE= 108

CASES THAT ARE MORE THAN 5% WORSE THAN THE AVERAGE ARE LISTED BELOW ***

LOADED 117%	IN CASE NO. 1918	91 GENERATORS ON	78 BUSES	INTERVAL 12	HOUR 6	LOAD= 29210.9	SO TEX 5 @ 2500.
LOADED 114%	IN CASE NO. 1946	96 GENERATORS ON	82 BUSES	INTERVAL 12	HOUR 34	LOAD= 30285.7	SO TEX 5 @ 2500.
LOADED 115%	IN CASE NO. 1947	95 GENERATORS ON	82 BUSES	INTERVAL 12	HOUR 35	LOAD= 29227.2	SO TEX 5 @ 2500.
LOADED 114%	IN CASE NO. 1953	94 GENERATORS ON	82 BUSES	INTERVAL 12	HOUR 41	LOAD= 28634.1	SO TEX 5 @ 2500.
LOADED 117%	IN CASE NO. 1965	94 GENERATORS ON	82 BUSES	INTERVAL 12	HOUR 53	LOAD= 28543.4	SO TEX 5 @ 2500.
LOADED 114%	IN CASE NO. 2254	100 GENERATORS ON	83 BUSES	INTERVAL 16	HOUR 10	LOAD= 34499.9	SO TEX 5 @ 2500.
LOADED 116%	IN CASE NO. 2255	97 GENERATORS ON	82 BUSES	INTERVAL 16	HOUR 11	LOAD= 32294.7	SO TEX 5 @ 2500.
LOADED 115%	IN CASE NO. 2274	99 GENERATORS ON	84 BUSES	INTERVAL 16	HOUR 30	LOAD= 32671.3	SO TEX 5 @ 2500.
LOADED 114%	IN CASE NO. 2298	100 GENERATORS ON	84 BUSES	INTERVAL 16	HOUR 54	LOAD= 33746.9	SO TEX 5 @ 2500.
LOADED 116%	IN CASE NO. 2302	101 GENERATORS ON	84 BUSES	INTERVAL 16	HOUR 58	LOAD= 34454.9	SO TEX 5 @ 2500.
LOADED 124%	IN CASE NO. 2548	98 GENERATORS ON	86 BUSES	INTERVAL 19	HOUR 55	LOAD= 31346.4	SO TEX 5 @ 2500.
LOADED 119%	IN CASE NO. 2594	74 GENERATORS ON	63 BUSES	INTERVAL 20	HOUR 18	LOAD= 26353.4	SO TEX 5 @ 2500.

LINES LOADED ABOVE 100. %

LAMPSAS8 138 GOLDTWT8 138 CONT.

LOADED	136%	IN CASE NO.	2595	84	GENERATORS ON	71	BUSES	INTERVAL	20	HOUR 19	LOAD= 30287.0	SO TEX 5 @ 2500.

MASON4 138 GILLSPE8 138 / 6/

LOADED	101%	IN CASE NO.	1981	109	GENERATORS ON	89	BUSES	INTERVAL	12	HOUR 69	LOAD= 32791.5	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO.	1983	92	GENERATORS ON	80	BUSES	INTERVAL	12	HOUR 71	LOAD= 29319.6	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO.	2252	107	GENERATORS ON	87	BUSES	INTERVAL	16	HOUR 8	LOAD= 35999.5	SO TEX 5 @ 2500.
LOADED	104%	IN CASE NO.	2254	100	GENERATORS ON	83	BUSES	INTERVAL	16	HOUR 10	LOAD= 34499.9	SO TEX 5 @ 2500.
LOADED	104%	IN CASE NO.	2255	97	GENERATORS ON	82	BUSES	INTERVAL	16	HOUR 11	LOAD= 32294.7	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO.	2264	107	GENERATORS ON	87	BUSES	INTERVAL	16	HOUR 20	LOAD= 36015.0	SO TEX 5 @ 2500.
LOADED	108%	IN CASE NO.	2266	104	GENERATORS ON	86	BUSES	INTERVAL	16	HOUR 22	LOAD= 35366.8	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO.	2267	99	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR 23	LOAD= 33537.1	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2274	99	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR 30	LOAD= 32671.3	SO TEX 5 @ 2500.
LOADED	100%	IN CASE NO.	2275	103	GENERATORS ON	85	BUSES	INTERVAL	16	HOUR 31	LOAD= 35083.0	SO TEX 5 @ 2500.
LOADED	102%	IN CASE NO.	2276	118	GENERATORS ON	93	BUSES	INTERVAL	16	HOUR 32	LOAD= 36942.1	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO.	2278	109	GENERATORS ON	89	BUSES	INTERVAL	16	HOUR 34	LOAD= 36184.5	SO TEX 5 @ 2500.
LOADED	104%	IN CASE NO.	2279	100	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR 35	LOAD= 34208.2	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2286	99	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR 42	LOAD= 33196.5	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO.	2287	106	GENERATORS ON	87	BUSES	INTERVAL	16	HOUR 43	LOAD= 35732.9	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2288	121	GENERATORS ON	94	BUSES	INTERVAL	16	HOUR 44	LOAD= 37303.9	SO TEX 5 @ 2500.
LOADED	107%	IN CASE NO.	2290	105	GENERATORS ON	86	BUSES	INTERVAL	16	HOUR 46	LOAD= 35530.7	SO TEX 5 @ 2500.
LOADED	102%	IN CASE NO.	2291	99	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR 47	LOAD= 33702.6	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2298	100	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR 54	LOAD= 33746.9	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2299	110	GENERATORS ON	89	BUSES	INTERVAL	16	HOUR 55	LOAD= 36337.2	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO.	2300	123	GENERATORS ON	96	BUSES	INTERVAL	16	HOUR 56	LOAD= 37587.9	SO TEX 5 @ 2500.
LOADED	109%	IN CASE NO.	2302	101	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR 58	LOAD= 34454.9	SO TEX 5 @ 2500.
LOADED	110%	IN CASE NO.	2595	84	GENERATORS ON	71	BUSES	INTERVAL	20	HOUR 19	LOAD= 30287.0	SO TEX 5 @ 2500.

LINES LOADED ABOVE 100. %

UVALDE 4 138 ASPHALT4 138 / 8/

LOADED	101%	IN CASE NO.	1981	109	GENERATORS ON	89	BUSES	INTERVAL	12	HOUR 69	LOAD= 32791.5	SO TEX 5 @ 2500.
LOADED	107%	IN CASE NO.	2252	107	GENERATORS ON	87	BUSES	INTERVAL	16	HOUR 8	LOAD= 35999.5	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2254	100	GENERATORS ON	83	BUSES	INTERVAL	16	HOUR 10	LOAD= 34499.9	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO.	2264	107	GENERATORS ON	87	BUSES	INTERVAL	16	HOUR 20	LOAD= 36015.0	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO.	2266	104	GENERATORS ON	86	BUSES	INTERVAL	16	HOUR 22	LOAD= 35366.8	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO.	2276	118	GENERATORS ON	93	BUSES	INTERVAL	16	HOUR 32	LOAD= 36942.1	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO.	2278	109	GENERATORS ON	89	BUSES	INTERVAL	16	HOUR 34	LOAD= 36184.5	SO TEX 5 @ 2500.
LOADED	104%	IN CASE NO.	2287	106	GENERATORS ON	87	BUSES	INTERVAL	16	HOUR 43	LOAD= 35732.9	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO.	2288	121	GENERATORS ON	94	BUSES	INTERVAL	16	HOUR 44	LOAD= 37303.9	SO TEX 5 @ 2500.
LOADED	107%	IN CASE NO.	2290	105	GENERATORS ON	86	BUSES	INTERVAL	16	HOUR 46	LOAD= 35530.7	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2299	110	GENERATORS ON	89	BUSES	INTERVAL	16	HOUR 55	LOAD= 36337.2	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2300	123	GENERATORS ON	96	BUSES	INTERVAL	16	HOUR 56	LOAD= 37587.9	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO.	2302	101	GENERATORS ON	84	BUSES	INTERVAL	16	HOUR 58	LOAD= 34454.9	SO TEX 5 @ 2500.

E LEVEE 138 GRNVL W 138 / 1/

LOADED	101%	IN CASE NO.	2167	104	GENERATORS ON	87	BUSES	INTERVAL	15	HOUR 6	LOAD= 34534.4	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO.	2171	113	GENERATORS ON	92	BUSES	INTERVAL	15	HOUR 10	LOAD= 37549.9	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO.	2205	112	GENERATORS ON	92	BUSES	INTERVAL	15	HOUR 44	LOAD= 37302.8	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO.	2207	107	GENERATORS ON	89	BUSES	INTERVAL	15	HOUR 46	LOAD= 36355.7	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO.	2216	106	GENERATORS ON	88	BUSES	INTERVAL	15	HOUR 55	LOAD= 36054.1	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2241	105	GENERATORS ON	87	BUSES	INTERVAL	15	HOUR 81	LOAD= 35529.0	SO TEX 5 @ 2500.
LOADED	102%	IN CASE NO.	2242	104	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR 82	LOAD= 34555.8	SO TEX 5 @ 2500.
LOADED	100%	IN CASE NO.	2243	101	GENERATORS ON	85	BUSES	INTERVAL	15	HOUR 83	LOAD= 33258.6	SO TEX 5 @ 2500.
LOADED	100%	IN CASE NO.	2334	111	GENERATORS ON	93	BUSES	INTERVAL	17	HOUR 7	LOAD= 36235.4	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO.	2338	105	GENERATORS ON	89	BUSES	INTERVAL	17	HOUR 11	LOAD= 34901.6	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2350	101	GENERATORS ON	86	BUSES	INTERVAL	17	HOUR 23	LOAD= 34213.1	SO TEX 5 @ 2500.
LOADED	100%	IN CASE NO.	2361	111	GENERATORS ON	93	BUSES	INTERVAL	17	HOUR 34	LOAD= 36203.8	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO.	2386	102	GENERATORS ON	86	BUSES	INTERVAL	17	HOUR 59	LOAD= 34358.2	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO.	2407	110	GENERATORS ON	92	BUSES	INTERVAL	17	HOUR 81	LOAD= 36010.8	SO TEX 5 @ 2500.

LINES LOADED ABOVE 100. %

E LEVEE 138 GRNVL E 138 / 1/

LOADED	107%	IN CASE NO.	2167	104	GENERATORS ON	87	BUSES	INTERVAL	15	HOUR 6	LOAD= 34534.4	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO.	2168	115	GENERATORS ON	94	BUSES	INTERVAL	15	HOUR 7	LOAD= 37768.0	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2170	128	GENERATORS ON	100	BUSES	INTERVAL	15	HOUR 9	LOAD= 38985.6	SO TEX 5 @ 2500.
LOADED	112%	IN CASE NO.	2171	113	GENERATORS ON	92	BUSES	INTERVAL	15	HOUR 10	LOAD= 37549.9	SO TEX 5 @ 2500.
LOADED	104%	IN CASE NO.	2173	98	GENERATORS ON	82	BUSES	INTERVAL	15	HOUR 12	LOAD= 31371.7	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO.	2191	101	GENERATORS ON	85	BUSES	INTERVAL	15	HOUR 30	LOAD= 32758.2	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO.	2194	122	GENERATORS ON	96	BUSES	INTERVAL	15	HOUR 33	LOAD= 38190.3	SO TEX 5 @ 2500.
LOADED	102%	IN CASE NO.	2203	100	GENERATORS ON	84	BUSES	INTERVAL	15	HOUR 42	LOAD= 32448.8	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO.	2204	103	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR 43	LOAD= 35267.1	SO TEX 5 @ 2500.
LOADED	111%	IN CASE NO.	2205	112	GENERATORS ON	92	BUSES	INTERVAL	15	HOUR 44	LOAD= 37302.8	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2206	123	GENERATORS ON	96	BUSES	INTERVAL	15	HOUR 45	LOAD= 38390.8	SO TEX 5 @ 2500.
LOADED	107%	IN CASE NO.	2207	107	GENERATORS ON	89	BUSES	INTERVAL	15	HOUR 46	LOAD= 36355.7	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO.	2208	102	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR 47	LOAD= 34047.5	SO TEX 5 @ 2500.
LOADED	107%	IN CASE NO.	2216	106	GENERATORS ON	88	BUSES	INTERVAL	15	HOUR 55	LOAD= 36054.1	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2217	124	GENERATORS ON	97	BUSES	INTERVAL	15	HOUR 56	LOAD= 38554.6	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO.	2218	114	GENERATORS ON	93	BUSES	INTERVAL	15	HOUR 57	LOAD= 37773.4	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2228	101	GENERATORS ON	85	BUSES	INTERVAL	15	HOUR 67	LOAD= 32821.9	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO.	2229	103	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR 68	LOAD= 34590.0	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO.	2231	101	GENERATORS ON	85	BUSES	INTERVAL	15	HOUR 70	LOAD= 33089.6	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO.	2239	99	GENERATORS ON	83	BUSES	INTERVAL	15	HOUR 79	LOAD= 32258.3	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO.	2240	103	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR 80	LOAD= 34348.6	SO TEX 5 @ 2500.
LOADED	109%	IN CASE NO.	2241	105	GENERATORS ON	87	BUSES	INTERVAL	15	HOUR 81	LOAD= 35529.0	SO TEX 5 @ 2500.
LOADED	108%	IN CASE NO.	2242	104	GENERATORS ON	86	BUSES	INTERVAL	15	HOUR 82	LOAD= 34555.8	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO.	2243	101	GENERATORS ON	85	BUSES	INTERVAL	15	HOUR 83	LOAD= 33258.6	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO.	2334	111	GENERATORS ON	93	BUSES	INTERVAL	17	HOUR 7	LOAD= 36235.4	SO TEX 5 @ 2500.
LOADED	112%	IN CASE NO.	2338	105	GENERATORS ON	89	BUSES	INTERVAL	17	HOUR 11	LOAD= 34901.6	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO.	2339	99	GENERATORS ON	84	BUSES	INTERVAL	17	HOUR 12	LOAD= 30733.0	SO TEX 5 @ 2500.
LOADED	102%	IN CASE NO.	2344	98	GENERATORS ON	83	BUSES	INTERVAL	17	HOUR 17	LOAD= 30470.6	SO TEX 5 @ 2500.
LOADED	100%	IN CASE NO.	2345	101	GENERATORS ON	86	BUSES	INTERVAL	17	HOUR 18	LOAD= 33756.5	SO TEX 5 @ 2500.
LOADED	109%	IN CASE NO.	2350	101	GENERATORS ON	86	BUSES	INTERVAL	17	HOUR 23	LOAD= 34213.1	SO TEX 5 @ 2500.
LOADED	104%	IN CASE NO.	2358	110	GENERATORS ON	92	BUSES	INTERVAL	17	HOUR 31	LOAD= 36010.4	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO.	2361	111	GENERATORS ON	93	BUSES	INTERVAL	17	HOUR 34	LOAD= 36203.8	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2375	101	GENERATORS ON	86	BUSES	INTERVAL	17	HOUR 48	LOAD= 31471.6	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO.	2380	99	GENERATORS ON	84	BUSES	INTERVAL	17	HOUR 53	LOAD= 31000.2	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2381	104	GENERATORS ON	88	BUSES	INTERVAL	17	HOUR 54	LOAD= 34516.3	SO TEX 5 @ 2500.
LOADED	102%	IN CASE NO.	2385	114	GENERATORS ON	94	BUSES	INTERVAL	17	HOUR 58	LOAD= 36616.8	SO TEX 5 @ 2500.
LOADED	111%	IN CASE NO.	2386	102	GENERATORS ON	86	BUSES	INTERVAL	17	HOUR 59	LOAD= 34358.2	SO TEX 5 @ 2500.
LOADED	104%	IN CASE NO.	2393	100	GENERATORS ON	85	BUSES	INTERVAL	17	HOUR 66	LOAD= 31629.1	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO.	2395	111	GENERATORS ON	93	BUSES	INTERVAL	17	HOUR 68	LOAD= 36107.6	SO TEX 5 @ 2500.
LOADED	112%	IN CASE NO.	2407	110	GENERATORS ON	92	BUSES	INTERVAL	17	HOUR 81	LOAD= 36010.8	SO TEX 5 @ 2500.

LINES LOADED ABOVE 100. %

CROCKETT 138 JEWETT 138 / 1/

LOADED	101%	IN CASE NO. 2167	104 GENERATORS ON	87 BUSES	INTERVAL	15	HOUR 6	LOAD= 34534.4	SO TEX 5 @ 2500.
LOADED	102%	IN CASE NO. 2173	98 GENERATORS ON	82 BUSES	INTERVAL	15	HOUR 12	LOAD= 31371.7	SO TEX 5 @ 2500.
LOADED	102%	IN CASE NO. 2242	104 GENERATORS ON	86 BUSES	INTERVAL	15	HOUR 82	LOAD= 34555.8	SO TEX 5 @ 2500.

NORWDDPL 138 DEN DR E 138 / 1/

LOADED	104%	IN CASE NO. 2171	113 GENERATORS ON	92 BUSES	INTERVAL	15	HOUR 10	LOAD= 37549.9	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO. 2205	112 GENERATORS ON	92 BUSES	INTERVAL	15	HOUR 44	LOAD= 37302.8	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO. 2241	105 GENERATORS ON	87 BUSES	INTERVAL	15	HOUR 81	LOAD= 35529.0	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO. 2334	111 GENERATORS ON	93 BUSES	INTERVAL	17	HOUR 7	LOAD= 36235.4	SO TEX 5 @ 2500.
LOADED	102%	IN CASE NO. 2338	105 GENERATORS ON	89 BUSES	INTERVAL	17	HOUR 11	LOAD= 34901.6	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO. 2361	111 GENERATORS ON	93 BUSES	INTERVAL	17	HOUR 34	LOAD= 36203.8	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO. 2386	102 GENERATORS ON	86 BUSES	INTERVAL	17	HOUR 59	LOAD= 34358.2	SO TEX 5 @ 2500.
LOADED	106%	IN CASE NO. 2407	110 GENERATORS ON	92 BUSES	INTERVAL	17	HOUR 81	LOAD= 36010.8	SO TEX 5 @ 2500.

BONVIL 9 100 HEARNE 9 100 /11/

LOADED	101%	IN CASE NO. 2173	98 GENERATORS ON	82 BUSES	INTERVAL	15	HOUR 12	LOAD= 31371.7	SO TEX 5 @ 2500.

HEARNE 9 100 SILCTY 9 100 /11/

LOADED	100%	IN CASE NO. 2173	98 GENERATORS ON	82 BUSES	INTERVAL	15	HOUR 12	LOAD= 31371.7	SO TEX 5 @ 2500.

ASPHALT4 138 BRACKVL4 138 / 8/

LOADED	105%	IN CASE NO. 2252	107 GENERATORS ON	87 BUSES	INTERVAL	16	HOUR 8	LOAD= 35999.5	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO. 2254	100 GENERATORS ON	83 BUSES	INTERVAL	16	HOUR 10	LOAD= 34499.9	SO TEX 5 @ 2500.
LOADED	104%	IN CASE NO. 2264	107 GENERATORS ON	87 BUSES	INTERVAL	16	HOUR 20	LOAD= 36015.0	SO TEX 5 @ 2500.
LOADED	104%	IN CASE NO. 2266	104 GENERATORS ON	86 BUSES	INTERVAL	16	HOUR 22	LOAD= 35366.8	SO TEX 5 @ 2500.
LOADED	102%	IN CASE NO. 2276	118 GENERATORS ON	93 BUSES	INTERVAL	16	HOUR 32	LOAD= 36942.1	SO TEX 5 @ 2500.
LOADED	104%	IN CASE NO. 2278	109 GENERATORS ON	89 BUSES	INTERVAL	16	HOUR 34	LOAD= 36184.5	SO TEX 5 @ 2500.
LOADED	102%	IN CASE NO. 2287	106 GENERATORS ON	87 BUSES	INTERVAL	16	HOUR 43	LOAD= 35732.9	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO. 2288	121 GENERATORS ON	94 BUSES	INTERVAL	16	HOUR 44	LOAD= 37303.9	SO TEX 5 @ 2500.
LOADED	105%	IN CASE NO. 2290	105 GENERATORS ON	86 BUSES	INTERVAL	16	HOUR 46	LOAD= 35530.7	SO TEX 5 @ 2500.
LOADED	102%	IN CASE NO. 2299	110 GENERATORS ON	89 BUSES	INTERVAL	16	HOUR 55	LOAD= 36337.2	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO. 2300	123 GENERATORS ON	96 BUSES	INTERVAL	16	HOUR 56	LOAD= 37587.9	SO TEX 5 @ 2500.
LOADED	103%	IN CASE NO. 2302	101 GENERATORS ON	84 BUSES	INTERVAL	16	HOUR 58	LOAD= 34454.9	SO TEX 5 @ 2500.

LINES LOADED ABOVE 100. %

CNC.W T4 138 ASHERTN4 138 / 8/

LOADED	100%	IN CASE NO. 2252	107	GENERATORS ON	87	BUSES	INTERVAL	16	HOUR	8	LOAD= 35999.5	SO TEX 5 @ 2500.

SANDOW 138 ELGIN SS 138 / 1/

LOADED	102%	IN CASE NO. 2338	105	GENERATORS ON	89	BUSES	INTERVAL	17	HOUR	11	LOAD= 34901.6	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO. 2344	98	GENERATORS ON	83	BUSES	INTERVAL	17	HOUR	17	LOAD= 30470.6	SO TEX 5 @ 2500.
LOADED	104%	IN CASE NO. 2350	101	GENERATORS ON	86	BUSES	INTERVAL	17	HOUR	23	LOAD= 34213.1	SO TEX 5 @ 2500.
LOADED	101%	IN CASE NO. 2380	99	GENERATORS ON	84	BUSES	INTERVAL	17	HOUR	53	LOAD= 31000.2	SO TEX 5 @ 2500.
LOADED	104%	IN CASE NO. 2386	102	GENERATORS ON	86	BUSES	INTERVAL	17	HOUR	59	LOAD= 34358.2	SO TEX 5 @ 2500.

TRANSFORMERS LOADED ABOVE 100. %

HEARNE 8 100 HEARNE 9 100 /11/

THIS ITEM APPEARS AS A PROBLEM IN 103 OF 388 CASES. HIGH= 114 LO= 100 AVERAGE= 105

CASES THAT ARE MORE THAN 5% WORSE THAN THE AVERAGE ARE LISTED BELOW ***

LOADED	111%	IN CASE NO. 2167	104 GENERATORS ON	87 BUSES	INTERVAL	15	HOUR 6	LOAD= 34534.4	SO TEX 5 @ 2500.
LOADED	114%	IN CASE NO. 2173	98 GENERATORS ON	82 BUSES	INTERVAL	15	HOUR 12	LOAD= 31371.7	SO TEX 5 @ 2500.
LOADED	111%	IN CASE NO. 2203	100 GENERATORS ON	84 BUSES	INTERVAL	15	HOUR 42	LOAD= 32448.8	SO TEX 5 @ 2500.
LOADED	113%	IN CASE NO. 2208	102 GENERATORS ON	86 BUSES	INTERVAL	15	HOUR 47	LOAD= 34047.5	SO TEX 5 @ 2500.
LOADED	111%	IN CASE NO. 2231	101 GENERATORS ON	85 BUSES	INTERVAL	15	HOUR 70	LOAD= 33089.6	SO TEX 5 @ 2500.
LOADED	111%	IN CASE NO. 2240	103 GENERATORS ON	86 BUSES	INTERVAL	15	HOUR 80	LOAD= 34348.6	SO TEX 5 @ 2500.
LOADED	112%	IN CASE NO. 2242	104 GENERATORS ON	86 BUSES	INTERVAL	15	HOUR 82	LOAD= 34555.8	SO TEX 5 @ 2500.
LOADED	112%	IN CASE NO. 2243	101 GENERATORS ON	85 BUSES	INTERVAL	15	HOUR 83	LOAD= 33258.6	SO TEX 5 @ 2500.
LOADED	114%	IN CASE NO. 2255	97 GENERATORS ON	82 BUSES	INTERVAL	16	HOUR 11	LOAD= 32294.7	SO TEX 5 @ 2500.
LOADED	111%	IN CASE NO. 2262	97 GENERATORS ON	82 BUSES	INTERVAL	16	HOUR 18	LOAD= 32090.1	SO TEX 5 @ 2500.
LOADED	111%	IN CASE NO. 2291	99 GENERATORS ON	84 BUSES	INTERVAL	16	HOUR 47	LOAD= 33702.6	SO TEX 5 @ 2500.
LOADED	111%	IN CASE NO. 2302	101 GENERATORS ON	84 BUSES	INTERVAL	16	HOUR 58	LOAD= 34454.9	SO TEX 5 @ 2500.
LOADED	112%	IN CASE NO. 2303	97 GENERATORS ON	83 BUSES	INTERVAL	16	HOUR 59	LOAD= 32767.8	SO TEX 5 @ 2500.
LOADED	113%	IN CASE NO. 2324	96 GENERATORS ON	82 BUSES	INTERVAL	16	HOUR 81	LOAD= 32984.5	SO TEX 5 @ 2500.
LOADED	113%	IN CASE NO. 2325	95 GENERATORS ON	81 BUSES	INTERVAL	16	HOUR 82	LOAD= 31885.6	SO TEX 5 @ 2500.

MINERVA 138 MINERVA 69 / 1/

THIS ITEM APPEARS AS A PROBLEM IN 51 OF 388 CASES. HIGH= 109 LO= 100 AVERAGE= 104

CASES THAT ARE MORE THAN 5% WORSE THAN THE AVERAGE ARE LISTED BELOW ***

TRANSFORMERS LOADED ABOVE 100. %

TDAD TR 100 TRINIDAD 138 / 1/

LOADED	103%	IN	CASE NO.	2170	128	GENERATORS ON	100	BUSES	INTERVAL	15	HOUR	9	LOAD=	38985.6	SO TEX 5	@	2500.
LOADED	101%	IN	CASE NO.	2206	123	GENERATORS ON	96	BUSES	INTERVAL	15	HOUR	45	LOAD=	38390.8	SO TEX 5	@	2500.
LOADED	101%	IN	CASE NO.	2217	124	GENERATORS ON	97	BUSES	INTERVAL	15	HOUR	56	LOAD=	38554.6	SO TEX 5	@	2500.
LOADED	107%	IN	CASE NO.	2334	111	GENERATORS ON	93	BUSES	INTERVAL	17	HOUR	7	LOAD=	36235.4	SO TEX 5	@	2500.
LOADED	103%	IN	CASE NO.	2335	143	GENERATORS ON	107	BUSES	INTERVAL	17	HOUR	8	LOAD=	39499.2	SO TEX 5	@	2500.
LOADED	101%	IN	CASE NO.	2336	149	GENERATORS ON	110	BUSES	INTERVAL	17	HOUR	9	LOAD=	40705.9	SO TEX 5	@	2500.
LOADED	106%	IN	CASE NO.	2337	124	GENERATORS ON	99	BUSES	INTERVAL	17	HOUR	10	LOAD=	37451.4	SO TEX 5	@	2500.
LOADED	104%	IN	CASE NO.	2346	123	GENERATORS ON	98	BUSES	INTERVAL	17	HOUR	19	LOAD=	37385.9	SO TEX 5	@	2500.
LOADED	103%	IN	CASE NO.	2347	142	GENERATORS ON	107	BUSES	INTERVAL	17	HOUR	20	LOAD=	39278.5	SO TEX 5	@	2500.
LOADED	102%	IN	CASE NO.	2359	133	GENERATORS ON	102	BUSES	INTERVAL	17	HOUR	32	LOAD=	38386.4	SO TEX 5	@	2500.
LOADED	101%	IN	CASE NO.	2360	144	GENERATORS ON	108	BUSES	INTERVAL	17	HOUR	33	LOAD=	39818.8	SO TEX 5	@	2500.
LOADED	108%	IN	CASE NO.	2361	111	GENERATORS ON	93	BUSES	INTERVAL	17	HOUR	34	LOAD=	36203.8	SO TEX 5	@	2500.
LOADED	104%	IN	CASE NO.	2370	117	GENERATORS ON	96	BUSES	INTERVAL	17	HOUR	43	LOAD=	36763.6	SO TEX 5	@	2500.
LOADED	101%	IN	CASE NO.	2371	137	GENERATORS ON	104	BUSES	INTERVAL	17	HOUR	44	LOAD=	38779.5	SO TEX 5	@	2500.
LOADED	103%	IN	CASE NO.	2382	124	GENERATORS ON	99	BUSES	INTERVAL	17	HOUR	55	LOAD=	37497.2	SO TEX 5	@	2500.
LOADED	101%	IN	CASE NO.	2383	143	GENERATORS ON	107	BUSES	INTERVAL	17	HOUR	56	LOAD=	39460.9	SO TEX 5	@	2500.
LOADED	104%	IN	CASE NO.	2384	140	GENERATORS ON	106	BUSES	INTERVAL	17	HOUR	57	LOAD=	39009.7	SO TEX 5	@	2500.
LOADED	108%	IN	CASE NO.	2385	114	GENERATORS ON	94	BUSES	INTERVAL	17	HOUR	58	LOAD=	36616.8	SO TEX 5	@	2500.
LOADED	105%	IN	CASE NO.	2395	111	GENERATORS ON	93	BUSES	INTERVAL	17	HOUR	68	LOAD=	36107.6	SO TEX 5	@	2500.
LOADED	103%	IN	CASE NO.	2396	126	GENERATORS ON	99	BUSES	INTERVAL	17	HOUR	69	LOAD=	37704.0	SO TEX 5	@	2500.
LOADED	101%	IN	CASE NO.	2418	134	GENERATORS ON	101	BUSES	INTERVAL	18	HOUR	8	LOAD=	38547.6	SO TEX 5	@	2500.
LOADED	102%	IN	CASE NO.	2430	138	GENERATORS ON	103	BUSES	INTERVAL	18	HOUR	20	LOAD=	38938.4	SO TEX 5	@	2500.
LOADED	102%	IN	CASE NO.	2442	135	GENERATORS ON	102	BUSES	INTERVAL	18	HOUR	32	LOAD=	38537.7	SO TEX 5	@	2500.
LOADED	101%	IN	CASE NO.	2444	118	GENERATORS ON	93	BUSES	INTERVAL	18	HOUR	34	LOAD=	37060.9	SO TEX 5	@	2500.
LOADED	102%	IN	CASE NO.	2454	121	GENERATORS ON	94	BUSES	INTERVAL	18	HOUR	44	LOAD=	37387.4	SO TEX 5	@	2500.
LOADED	107%	IN	CASE NO.	2467	117	GENERATORS ON	91	BUSES	INTERVAL	18	HOUR	57	LOAD=	37231.3	SO TEX 5	@	2500.

SANDOW 345 SANDOW 138 / 1/

LOADED	100%	IN	CASE NO.	2336	149	GENERATORS ON	110	BUSES	INTERVAL	17	HOUR	9	LOAD=	40705.9	SO TEX 5	@	2500.
LOADED	102%	IN	CASE NO.	2431	158	GENERATORS ON	113	BUSES	INTERVAL	18	HOUR	21	LOAD=	40764.1	SO TEX 5	@	2500.
LOADED	100%	IN	CASE NO.	2442	135	GENERATORS ON	102	BUSES	INTERVAL	18	HOUR	32	LOAD=	38537.7	SO TEX 5	@	2500.
LOADED	102%	IN	CASE NO.	2443	151	GENERATORS ON	111	BUSES	INTERVAL	18	HOUR	33	LOAD=	40426.4	SO TEX 5	@	2500.

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:          :                 TUE, JAN 12 1988  17:1Ø GENERATION=  26912.9 LOAD=  25929.2 INTERCHANGE=       Ø.Ø LOSSES=    982.9
:__________: NO. 1ØØ9   77 GENERATORS ON    7Ø BUSES                          INTERVAL        1  HOUR 1Ø LOAD= 24542.8  MARTINLK @ 2Ø34.
                                                                                   1 TRANSFORMER PROBLEM(S)   Ø LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø3.% OF MAX LOAD/11/

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:          :                 TUE, JAN 12 1988  17:15 GENERATION=  2895Ø.8 LOAD=  28138.2 INTERCHANGE=       Ø.Ø LOSSES=    811.9
:__________: NO. 1Ø16   83 GENERATORS ON    74 BUSES                          INTERVAL        1  HOUR 17 LOAD= 2682Ø.5  MARTINLK @ 2Ø34.
                                                                                   Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  17:21 GENERATION=  28285.2 LOAD=  27395.1 INTERCHANGE=       Ø.Ø LOSSES=    889.3
:__________: NO. 1Ø17   83 GENERATORS ON    74 BUSES                          INTERVAL        1  HOUR 18 LOAD= 26Ø54.2  MARTINLK @ 2Ø34.
                                                                                   Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø5.% OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  17:26 GENERATION=  29289.2 LOAD=  28486.6 INTERCHANGE=       Ø.Ø LOSSES=    8Ø1.8
:__________: NO. 1Ø21   85 GENERATORS ON    75 BUSES                          INTERVAL        1  HOUR 22 LOAD= 27179.6  MARTINLK @ 2Ø34.
                                                                                   Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1ØØ.% OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  17:32 GENERATION=  27962.3 LOAD=  27115.3 INTERCHANGE=       Ø.Ø LOSSES=    846.2
:__________: NO. 1Ø39   81 GENERATORS ON    73 BUSES                          INTERVAL        1  HOUR 4Ø LOAD= 25765.7  MARTINLK @ 2Ø34.
                                                                                   Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  17:38 GENERATION=  295Ø4.Ø LOAD=  28629.1 INTERCHANGE=       Ø.Ø LOSSES=    873.2
:__________: NO. 1Ø4Ø   85 GENERATORS ON    75 BUSES                          INTERVAL        1  HOUR 41 LOAD= 27326.5  MARTINLK @ 2Ø34.
                                                                                   Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/

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:          :                    TUE, JAN 12 1988  17:44 GENERATION=  27247.4 LOAD=  26279.6 INTERCHANGE=      Ø.Ø LOSSES=    967.2
:__________: NO. 1Ø41    8Ø GENERATORS ON    72 BUSES                       INTERVAL       1  HOUR 42 LOAD= 249Ø5.2  MARTINLK @ 2Ø34.
                                                                                  1 TRANSFORMER PROBLEM(S)   Ø LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø1.X OF MAX LOAD/11/

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:          :                    TUE, JAN 12 1988  17:5Ø GENERATION=  28354.2 LOAD=  275Ø4.3 INTERCHANGE=      Ø.Ø LOSSES=    849.3
:__________: NO. 1Ø51    82 GENERATORS ON    73 BUSES                       INTERVAL       1  HOUR 52 LOAD= 26166.7  MARTINLK @ 2Ø34.
                                                                                  Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 11Ø.X OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/

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:          :                    TUE, JAN 12 1988  17:57 GENERATION=  27257.1 LOAD=  26238.Ø INTERCHANGE=      Ø.Ø LOSSES=   1Ø18.6
:__________: NO. 1Ø54    81 GENERATORS ON    73 BUSES                       INTERVAL       1  HOUR 55 LOAD= 24861.2  MARTINLK @ 2Ø34.
                                                                                  1 TRANSFORMER PROBLEM(S)   Ø LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø1.X OF MAX LOAD/11/

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:          :                    TUE, JAN 12 1988  18:Ø2 GENERATION=  28127.9 LOAD=  27175.9 INTERCHANGE=      Ø.Ø LOSSES=    951.2
:__________: NO. 1Ø64    81 GENERATORS ON    73 BUSES                       INTERVAL       1  HOUR 65 LOAD= 25828.2  MARTINLK @ 2Ø34.
                                                                                  Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø7.X OF MAX LOAD/ 1/

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:          :                    TUE, JAN 12 1988  18:Ø9 GENERATION=  23412.1 LOAD=  22658.1 INTERCHANGE=      Ø.Ø LOSSES=    753.7
:__________: NO. 1Ø76    68 GENERATORS ON    64 BUSES                       INTERVAL       1  HOUR 78 LOAD= 2134Ø.3  MARTINLK @ 2Ø34.
                                                                                  Ø TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

ASHERTN4 138 TO LAREDO 4 138 LINE @ 113.X OF MAX LOAD/ 8/    LAREDO 4 138 TO BRUNI  4 138 LINE @ 119.X OF MAX LOAD/ 8/
BRUNI  4 138 TO FALF   4 138 LINE @ 129.X OF MAX LOAD/ 8/    ALICE  2  69 TO FREER  2  69 LINE @ 1Ø8.X OF MAX LOAD/ 8/

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:         :                 TUE, JAN 12 1988  18:15 GENERATION=  3Ø238.7 LOAD=  29374.6 INTERCHANGE=      Ø.Ø LOSSES=    864.1
:_________: NO. 111Ø   83 GENERATORS ON    76 BUSES                        INTERVAL      2  HOUR 28 LOAD= 28Ø95.1  COM PEAK @ 2Ø7Ø.
                                                                                 Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø2.X OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/

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:         :                 TUE, JAN 12 1988  18:2Ø GENERATION=  32118.6 LOAD=  31389.7 INTERCHANGE=      Ø.Ø LOSSES=    728.Ø
:_________: NO. 1111   87 GENERATORS ON    79 BUSES                        INTERVAL      2  HOUR 29 LOAD= 3Ø172.9  COM PEAK @ 2Ø7Ø.
                                                                                 Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/
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:         :                 TUE, JAN 12 1988  18:25 GENERATION=  3Ø7Ø2.7 LOAD=  29994.1 INTERCHANGE=      Ø.Ø LOSSES=    7Ø7.8
:_________: NO. 1134   85 GENERATORS ON    78 BUSES                        INTERVAL      2  HOUR 52 LOAD= 28733.9  COM PEAK @ 2Ø7Ø.
                                                                                 Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø3.X OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1ØØ.X OF MAX LOAD/ 1/

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:         :                 TUE, JAN 12 1988  18:31 GENERATION=  3Ø759.6 LOAD=  2999Ø.2 INTERCHANGE=      Ø.Ø LOSSES=    768.7
:_________: NO. 1147   84 GENERATORS ON    77 BUSES                        INTERVAL      2  HOUR 65 LOAD= 28729.8  COM PEAK @ 2Ø7Ø.
                                                                                 Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/
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:         :                 TUE, JAN 12 1988  18:37 GENERATION=  24825.2 LOAD=  24133.5 INTERCHANGE=      Ø.Ø LOSSES=    689.5
:_________: NO. 1252   77 GENERATORS ON    67 BUSES                        INTERVAL      4  HOUR  4 LOAD= 22691.4  W A P  8 @ 18Ø8.
                                                                                 Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/

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:          :                   TUE, JAN 12 1988  18:44 GENERATION=  26387.9 LOAD=  25607.7 INTERCHANGE=       0.0 LOSSES=    778.0
:__________: NO. 1265   84 GENERATORS ON    72 BUSES                   INTERVAL       4  HOUR 17 LOAD= 24419.2  W A P  8 @ 1808.
                                                                           0 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

ARTESIA2  69 TO ASHERTN2  69 LINE @ 125.% OF MAX LOAD/ 8/    ASHERTN4 138 TO LAREDO 4 138 LINE @ 117.% OF MAX LOAD/ 8/
BRUNI  4 138 TO FALF   4 138 LINE @ 222.% OF MAX LOAD/ 8/    ZAPATA 4 138 TO FALCON 4 138 LINE @ 133.% OF MAX LOAD/ 8/
BATES  4 138 TO GARZA  4 138 LINE @ 135.% OF MAX LOAD/ 8/    FALCON 4 138 TO GARZA  4 138 LINE @ 133.% OF MAX LOAD/ 8/
ALICE  2  69 TO FREER  2  69 LINE @ 183.% OF MAX LOAD/ 8/

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:          :                   TUE, JAN 12 1988  18:49 GENERATION=  25613.0 LOAD=  24974.2 INTERCHANGE=       0.0 LOSSES=    638.3
:__________: NO. 1335   89 GENERATORS ON    80 BUSES                   INTERVAL       5  HOUR  4 LOAD= 23558.3  MARTINLK @ 2034.
                                                                           0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 106.% OF MAX LOAD/ 1/

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:          :                   TUE, JAN 12 1988  18:55 GENERATION=  25907.0 LOAD=  25240.4 INTERCHANGE=       0.0 LOSSES=    666.0
:__________: NO. 1384   87 GENERATORS ON    77 BUSES                   INTERVAL       5  HOUR 53 LOAD= 23832.7  MARTINLK @ 2034.
                                                                           0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/

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:          :                   TUE, JAN 12 1988  19:01 GENERATION=  22672.5 LOAD=  21869.2 INTERCHANGE=       0.0 LOSSES=    801.3
:__________: NO. 1584   68 GENERATORS ON    64 BUSES                   INTERVAL       8  HOUR  4 LOAD= 20357.1  CEDARP 8 @ 1500.
                                                                           1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 102.% OF MAX LOAD/11/
WTSN C 8 100 TO JEWETT   138 LINE @ 101.% OF MAX LOAD/11/

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:          :                   TUE, JAN 12 1988  19:06 GENERATION=  23985.8 LOAD=  23110.4 INTERCHANGE=       0.0 LOSSES=    873.1
:__________: NO. 1585   75 GENERATORS ON    70 BUSES                   INTERVAL       8  HOUR  5 LOAD= 21636.7  CEDARP 8 @ 1500.
                                                                           1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 103.% OF MAX LOAD/11/
WTSN C 8 100 TO JEWETT   138 LINE @ 105.% OF MAX LOAD/11/

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:          :                     TUE, JAN 12 1988  19:12 GENERATION=  24659.8 LOAD=  23795.1 INTERCHANGE=      Ø.Ø LOSSES=    862.3
:__________: NO. 1586   79 GENERATORS ON    74 BUSES                   INTERVAL      8  HOUR  6 LOAD= 22342.5  CEDARP 8 @ 15ØØ.
                                                                          1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)
HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø3.% OF MAX LOAD/11/
WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø3.% OF MAX LOAD/11/
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:          :                     TUE, JAN 12 1988  19:18 GENERATION=  31435.4 LOAD=  3Ø517.9 INTERCHANGE=      Ø.Ø LOSSES=    915.Ø
:__________: NO. 1766   87 GENERATORS ON    76 BUSES                   INTERVAL     1Ø  HOUR 2Ø LOAD= 29273.9  SO TEX 5 @ 25ØØ.
                                                                          Ø TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)
LEON     138 TO LNGLVL M 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø8.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/
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:          :                     TUE, JAN 12 1988  19:23 GENERATION=  25747.5 LOAD=  25Ø65.5 INTERCHANGE=      Ø.Ø LOSSES=    68Ø.5
:__________: NO. 1775   68 GENERATORS ON    62 BUSES                   INTERVAL     1Ø  HOUR 29 LOAD= 23652.1  SO TEX 5 @ 25ØØ.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)
LNGLVL M 138 TO STPHVIL  138 LINE @ 1ØØ.% OF MAX LOAD/ 1/
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:          :                     TUE, JAN 12 1988  19:28 GENERATION=  3ØØ68.5 LOAD=  29163.3 INTERCHANGE=      Ø.Ø LOSSES=    9Ø2.8
:__________: NO. 1778   8Ø GENERATORS ON    71 BUSES                   INTERVAL     1Ø  HOUR 32 LOAD= 27877.2  SO TEX 5 @ 25ØØ.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
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:          :                     TUE, JAN 12 1988  19:33 GENERATION=  3115Ø.8 LOAD=  3Ø181.9 INTERCHANGE=      Ø.Ø LOSSES=    966.4
:__________: NO. 1779   83 GENERATORS ON    72 BUSES                   INTERVAL     1Ø  HOUR 33 LOAD= 28927.7  SO TEX 5 @ 25ØØ.
                                                                          Ø TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)
LEON     138 TO LNGLVL M 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø6.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1ØØ.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø2.% OF MAX LOAD
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:          :                TUE, JAN 12 1988  19:38 GENERATION=  23159.0 LOAD=  22636.1 INTERCHANGE=       0.0 LOSSES=    521.6
:__________: NO. 1786   64 GENERATORS ON    59 BUSES                        INTERVAL      10  HOUR 40 LOAD= 21147.8  SO TEX 5 @ 2500.
                                                                                  0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 102.X OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  19:43 GENERATION=  26236.7 LOAD=  25514.8 INTERCHANGE=       0.0 LOSSES=    720.5
:__________: NO. 1787   72 GENERATORS ON    63 BUSES                        INTERVAL      10  HOUR 41 LOAD= 24115.4  SO TEX 5 @ 2500.
                                                                                  0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.X OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  19:48 GENERATION=  30346.8 LOAD=  29355.9 INTERCHANGE=       0.0 LOSSES=    987.9
:__________: NO. 1790   81 GENERATORS ON    71 BUSES                        INTERVAL      10  HOUR 44 LOAD= 28076.5  SO TEX 5 @ 2500.
                                                                                  0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 112.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 117.X OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  19:53 GENERATION=  26266.6 LOAD=  25553.0 INTERCHANGE=       0.0 LOSSES=    712.1
:__________: NO. 1799   72 GENERATORS ON    63 BUSES                        INTERVAL      10  HOUR 53 LOAD= 24154.8  SO TEX 5 @ 2500.
                                                                                  0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 102.X OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  19:58 GENERATION=  28401.1 LOAD=  27573.2 INTERCHANGE=       0.0 LOSSES=    825.5
:__________: NO. 1800   77 GENERATORS ON    68 BUSES                        INTERVAL      10  HOUR 54 LOAD= 26237.7  SO TEX 5 @ 2500.
                                                                                  0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 102.X OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  20:03 GENERATION=  30868.1 LOAD=  29952.6 INTERCHANGE=       0.0 LOSSES=    913.2
:__________: NO. 1802   82 GENERATORS ON    71 BUSES                        INTERVAL      10  HOUR 56 LOAD= 28691.0  SO TEX 5 @ 2500.
                                                                                  0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 104.X OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 101.X OF MAX LOAD/ 1/

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:          :                   TUE, JAN 12 1988  20:08 GENERATION=  30214.7 LOAD=  29262.4 INTERCHANGE=        0.0 LOSSES=    949.5
:__________: NO. 1815   80 GENERATORS ON    71 BUSES                      INTERVAL       10  HOUR 69 LOAD= 27979.3  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON      138 TO LNGLVL M 138 LINE @ 108.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 114.X OF MAX LOAD/ 1/

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:          :                   TUE, JAN 12 1988  20:14 GENERATION=  26611.7 LOAD=  25913.5 INTERCHANGE=        0.0 LOSSES=    698.4
:__________: NO. 1847   81 GENERATORS ON    71 BUSES                      INTERVAL       11  HOUR 18 LOAD= 24526.6  COM PEAK @ 2070.
                                                                                0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.X OF MAX LOAD/ 1/

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:          :                   TUE, JAN 12 1988  20:19 GENERATION=  31702.7 LOAD=  30840.9 INTERCHANGE=        0.0 LOSSES=    859.1
:__________: NO. 1851   90 GENERATORS ON    78 BUSES                      INTERVAL       11  HOUR 22 LOAD= 29606.8  COM PEAK @ 2070.
                                                                                0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 100.X OF MAX LOAD/ 1/

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:          :                   TUE, JAN 12 1988  20:25 GENERATION=  28628.6 LOAD=  27816.8 INTERCHANGE=        0.0 LOSSES=    811.4
:__________: NO. 1852   85 GENERATORS ON    75 BUSES                      INTERVAL       11  HOUR 23 LOAD= 26488.8  COM PEAK @ 2070.
                                                                                0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.X OF MAX LOAD/ 1/

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:          :                   TUE, JAN 12 1988  20:30 GENERATION=  24157.3 LOAD=  23573.8 INTERCHANGE=        0.0 LOSSES=    583.6
:__________: NO. 1857   74 GENERATORS ON    67 BUSES                      INTERVAL       11  HOUR 28 LOAD= 22114.5  COM PEAK @ 2070.
                                                                                0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 105.X OF MAX LOAD/ 1/

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:          :                   TUE, JAN 12 1988  20:35 GENERATION=  25912.4 LOAD=  25177.6 INTERCHANGE=        0.0 LOSSES=    734.8
:__________: NO. 1858   79 GENERATORS ON    69 BUSES                      INTERVAL       11  HOUR 29 LOAD= 23767.7  COM PEAK @ 2070.
                                                                                0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON      138 TO LNGLVL M 138 LINE @ 103.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 108.X OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  2Ø:41 GENERATION=  26937.4 LOAD=  26136.8 INTERCHANGE=      Ø.Ø LOSSES=    8ØØ.4
:__________: NO. 1859   81 GENERATORS ON    71 BUSES                        INTERVAL      11  HOUR 3Ø LOAD= 24756.8  COM PEAK @ 2Ø7Ø.
                                                                                Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON      138 TO LNGLVL M 138 LINE @ 1Ø4.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 11Ø.X OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  2Ø:47 GENERATION=  29329.2 LOAD=  28438.Ø INTERCHANGE=      Ø.Ø LOSSES=    89Ø.6
:__________: NO. 186Ø   86 GENERATORS ON    76 BUSES                        INTERVAL      11  HOUR 31 LOAD= 27129.4  COM PEAK @ 2Ø7Ø.
                                                                                Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON      138 TO LNGLVL M 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø6.X OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  2Ø:53 GENERATION=  27749.1 LOAD=  26959.1 INTERCHANGE=      Ø.Ø LOSSES=    788.Ø
:__________: NO. 1864   84 GENERATORS ON    74 BUSES                        INTERVAL      11  HOUR 35 LOAD= 256Ø4.6  COM PEAK @ 2Ø7Ø.
                                                                                Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø3.X OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  2Ø:59 GENERATION=  24267.4 LOAD=  23688.2 INTERCHANGE=      Ø.Ø LOSSES=    579.3
:__________: NO. 1869   74 GENERATORS ON    67 BUSES                        INTERVAL      11  HOUR 4Ø LOAD= 22232.3  COM PEAK @ 2Ø7Ø.
                                                                                Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø3.X OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  21:Ø6 GENERATION=  26911.8 LOAD=  26Ø78.8 INTERCHANGE=      Ø.Ø LOSSES=    832.8
:__________: NO. 187Ø   81 GENERATORS ON    71 BUSES                        INTERVAL      11  HOUR 41 LOAD= 24696.9  COM PEAK @ 2Ø7Ø.
                                                                                Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON      138 TO LNGLVL M 138 LINE @ 1Ø7.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 113.X OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  21:12 GENERATION=  28047.7 LOAD=  27214.2 INTERCHANGE=       0.0 LOSSES=    832.0
:__________: NO. 1871   84 GENERATORS ON    74 BUSES                      INTERVAL      11  HOUR 42 LOAD= 25867.7  COM PEAK @ 2070.
                                                                               0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 104.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 109.% OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  21:18 GENERATION=  29867.8 LOAD=  28954.9 INTERCHANGE=       0.0 LOSSES=    912.4
:__________: NO. 1872   86 GENERATORS ON    76 BUSES                      INTERVAL      11  HOUR 43 LOAD= 27662.5  COM PEAK @ 2070.
                                                                               0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 105.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 110.% OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  21:25 GENERATION=  34061.6 LOAD=  33139.9 INTERCHANGE=       0.0 LOSSES=    919.3
:__________: NO. 1873  107 GENERATORS ON    87 BUSES                      INTERVAL      11  HOUR 44 LOAD= 31977.2  COM PEAK @ 2070.
                                                                               0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 105.% OF MAX LOAD/ 1/
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:          :                TUE, JAN 12 1988  21:33 GENERATION=  29015.1 LOAD=  28160.7 INTERCHANGE=       0.0 LOSSES=    853.9
:__________: NO. 1876   87 GENERATORS ON    77 BUSES                      INTERVAL      11  HOUR 47 LOAD= 26843.4  COM PEAK @ 2070.
                                                                               0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 100.% OF MAX LOAD/ 1/
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:          :                TUE, JAN 12 1988  21:39 GENERATION=  24518.1 LOAD=  23913.7 INTERCHANGE=       0.0 LOSSES=    604.7
:__________: NO. 1881   75 GENERATORS ON    68 BUSES                      INTERVAL      11  HOUR 52 LOAD= 22464.7  COM PEAK @ 2070.
                                                                               0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 102.% OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  21:44 GENERATION=  27402.8 LOAD=  26589.5 INTERCHANGE=       0.0 LOSSES=     812.2
:__________: NO. 1882   83 GENERATORS ON     73 BUSES                         INTERVAL       11  HOUR 53 LOAD= 25223.6  COM PEAK @ 2070.
                                                                                   0 TRANSFORMER PROBLEM(S)    2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 103.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 108.X OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  21:50 GENERATION=  29534.6 LOAD=  28611.7 INTERCHANGE=       0.0 LOSSES=     922.5
:__________: NO. 1883   87 GENERATORS ON     77 BUSES                         INTERVAL       11  HOUR 54 LOAD= 27308.3  COM PEAK @ 2070.
                                                                                   0 TRANSFORMER PROBLEM(S)    2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 106.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 112.X OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  21:55 GENERATION=  31234.7 LOAD=  30368.6 INTERCHANGE=       0.0 LOSSES=     865.1
:__________: NO. 1884   89 GENERATORS ON     78 BUSES                         INTERVAL       11  HOUR 55 LOAD= 29119.7  COM PEAK @ 2070.
                                                                                   0 TRANSFORMER PROBLEM(S)    2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 105.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 111.X OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  22:00 GENERATION=  34405.7 LOAD=  33482.6 INTERCHANGE=       0.0 LOSSES=     922.5
:__________: NO. 1885  110 GENERATORS ON     89 BUSES                         INTERVAL       11  HOUR 56 LOAD= 32330.5  COM PEAK @ 2070.
                                                                                   0 TRANSFORMER PROBLEM(S)    1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 104.X OF MAX LOAD/ 1/
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:          :                 TUE, JAN 12 1988  22:05 GENERATION=  31439.1 LOAD=  30487.7 INTERCHANGE=       0.0 LOSSES=     950.2
:__________: NO. 1887   88 GENERATORS ON     77 BUSES                         INTERVAL       11  HOUR 58 LOAD= 29242.7  COM PEAK @ 2070.
                                                                                   0 TRANSFORMER PROBLEM(S)    2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 104.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 110.X OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  22:11 GENERATION=  28713.0 LOAD=  27860.8 INTERCHANGE=        0.0 LOSSES=    851.5
:__________: NO. 1888   85 GENERATORS ON    75 BUSES                     INTERVAL       11  HOUR 59 LOAD= 26534.3  COM PEAK @ 2070.
                                                                              0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 104.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 110.X OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  22:17 GENERATION=  26443.2 LOAD=  25662.9 INTERCHANGE=        0.0 LOSSES=    780.1
:__________: NO. 1889   80 GENERATORS ON    70 BUSES                     INTERVAL       11  HOUR 60 LOAD= 24268.1  COM PEAK @ 2070.
                                                                              0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 106.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 112.X OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  22:22 GENERATION=  22029.7 LOAD=  21560.2 INTERCHANGE=        0.0 LOSSES=    469.8
:__________: NO. 1893   72 GENERATORS ON    65 BUSES                     INTERVAL       11  HOUR 64 LOAD= 20038.4  COM PEAK @ 2070.
                                                                              0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 101.X OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  22:27 GENERATION=  25091.5 LOAD=  24451.4 INTERCHANGE=        0.0 LOSSES=    640.3
:__________: NO. 1894   75 GENERATORS ON    68 BUSES                     INTERVAL       11  HOUR 65 LOAD= 23019.1  COM PEAK @ 2070.
                                                                              0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 101.X OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  22:33 GENERATION=  27758.2 LOAD=  26942.8 INTERCHANGE=        0.0 LOSSES=    814.7
:__________: NO. 1895   84 GENERATORS ON    74 BUSES                     INTERVAL       11  HOUR 66 LOAD= 25587.7  COM PEAK @ 2070.
                                                                              0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 105.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 110.X OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  22:38 GENERATION=  29644.3 LOAD=  28775.4 INTERCHANGE=       Ø.Ø LOSSES=    866.9
:__________: NO. 1896    86 GENERATORS ON     76 BUSES                        INTERVAL       11  HOUR 67 LOAD= 27477.1  COM PEAK @ 2Ø7Ø.
                                                                                    Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 112.% OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  22:43 GENERATION=  31455.8 LOAD=  3Ø59Ø.9 INTERCHANGE=       Ø.Ø LOSSES=    863.9
:__________: NO. 1897    88 GENERATORS ON     78 BUSES                        INTERVAL       11  HOUR 68 LOAD= 29349.1  COM PEAK @ 2Ø7Ø.
                                                                                    Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø7.% OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  22:49 GENERATION=  33655.9 LOAD=  32679.2 INTERCHANGE=       Ø.Ø LOSSES=    975.9
:__________: NO. 1898    99 GENERATORS ON     84 BUSES                        INTERVAL       11  HOUR 69 LOAD= 315Ø2.3  COM PEAK @ 2Ø7Ø.
                                                                                    Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 112.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 117.% OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  22:55 GENERATION=  31374.9 LOAD=  3Ø387.6 INTERCHANGE=       Ø.Ø LOSSES=    986.5
:__________: NO. 1899    89 GENERATORS ON     78 BUSES                        INTERVAL       11  HOUR 7Ø LOAD= 29139.6  COM PEAK @ 2Ø7Ø.
                                                                                    Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 114.% OF MAX LOAD/ 1/

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:          :                 TUE, JAN 12 1988  23:Ø1 GENERATION=  29599.7 LOAD=  28666.5 INTERCHANGE=       Ø.Ø LOSSES=    932.9
:__________: NO. 19ØØ    86 GENERATORS ON     76 BUSES                        INTERVAL       11  HOUR 71 LOAD= 27364.9  COM PEAK @ 2Ø7Ø.
                                                                                    Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø8.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 113.% OF MAX LOAD/ 1/

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:         :              TUE, JAN 12 1988  23:06 GENERATION=  31293.6 LOAD=  30400.6 INTERCHANGE=      0.0 LOSSES=    892.1
:_________: NO. 1910   89 GENERATORS ON    77 BUSES                  INTERVAL      11  HOUR 82 LOAD= 29153.0  COM PEAK @ 2070.
                                                                           0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 101.% OF MAX LOAD/ 1/

:         :              TUE, JAN 12 1988  23:12 GENERATION=  28665.8 LOAD=  27844.9 INTERCHANGE=      0.0 LOSSES=    820.6
:_________: NO. 1911   85 GENERATORS ON    75 BUSES                  INTERVAL      11  HOUR 83 LOAD= 26517.8  COM PEAK @ 2070.
                                                                           0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 102.% OF MAX LOAD/ 1/

:         :              TUE, JAN 12 1988  23:18 GENERATION=  31560.6 LOAD=  30456.7 INTERCHANGE=      0.0 LOSSES=   1101.6
:_________: NO. 1918   91 GENERATORS ON    78 BUSES                  INTERVAL      12  HOUR  6 LOAD= 29210.9  SO TEX 5 @ 2500.
                                                                           0 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 109.% OF MAX LOAD/11/    RNDRK    138 TO RNDRK WH 138 LINE @ 111.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 104.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 117.% OF MAX LOAD

:         :              TUE, JAN 12 1988  23:23 GENERATION=  33228.9 LOAD=  32207.2 INTERCHANGE=      0.0 LOSSES=   1018.8
:_________: NO. 1919   97 GENERATORS ON    82 BUSES                  INTERVAL      12  HOUR  7 LOAD= 31015.7  SO TEX 5 @ 2500.
                                                                           0 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 101.% OF MAX LOAD/11/    RNDRK    138 TO RNDRK WH 138 LINE @ 104.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 102.% OF MAX LOAD

:         :              TUE, JAN 12 1988  23:28 GENERATION=  34879.1 LOAD=  33862.8 INTERCHANGE=      0.0 LOSSES=   1014.3
:_________: NO. 1920  109 GENERATORS ON    89 BUSES                  INTERVAL      12  HOUR  8 LOAD= 32722.7  SO TEX 5 @ 2500.
                                                                           0 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 101.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 101.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 102.% OF MAX LOAD
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:          :                TUE, JAN 12 1988  23:33 GENERATION=  35173.2 LOAD=  34Ø99.6 INTERCHANGE=      Ø.Ø LOSSES=   1Ø71.3
:__________: NO. 1921  1Ø9 GENERATORS ON     89 BUSES                    INTERVAL     12  HOUR  9 LOAD= 32966.8  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø2.% OF MAX LOAD/11/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1ØØ.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø4.% OF MAX LOAD

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:          :                TUE, JAN 12 1988  23:39 GENERATION=  32971.9 LOAD=  3191Ø.2 INTERCHANGE=      Ø.Ø LOSSES=   1Ø59.Ø
:__________: NO. 1922   98 GENERATORS ON     83 BUSES                    INTERVAL     12  HOUR 1Ø LOAD= 3Ø7Ø9.5  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø3.% OF MAX LOAD/11/    RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø4.% OF MAX LOAD

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:          :                TUE, JAN 12 1988  23:44 GENERATION=  31633.6 LOAD=  3Ø589.2 INTERCHANGE=      Ø.Ø LOSSES=   1Ø42.Ø
:__________: NO. 193Ø   93 GENERATORS ON     8Ø BUSES                    INTERVAL     12  HOUR 18 LOAD= 29347.4  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø3.% OF MAX LOAD/11/    RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø7.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø6.% OF MAX LOAD

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:          :                TUE, JAN 12 1988  23:5Ø GENERATION=  33445.2 LOAD=  3245Ø.7 INTERCHANGE=      Ø.Ø LOSSES=    991.9
:__________: NO. 1931   98 GENERATORS ON     83 BUSES                    INTERVAL     12  HOUR 19 LOAD= 31266.9  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/

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:          :                TUE, JAN 12 1988  23:55 GENERATION=  35935.5 LOAD=  34942.7 INTERCHANGE=      Ø.Ø LOSSES=    99Ø.3
:__________: NO. 1932  121 GENERATORS ON     99 BUSES                    INTERVAL     12  HOUR 2Ø LOAD= 33835.9  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø1.% OF MAX LOAD

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:          :                 WED, JAN 13 1988  00:00 GENERATION=  35708.6 LOAD=  34624.0 INTERCHANGE=       0.0 LOSSES=   1081.9
:__________: NO. 1933  116 GENERATORS ON    94 BUSES                     INTERVAL       12  HOUR 21 LOAD= 33507.3  SO TEX 5 @ 2500.
                                                                              0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 101.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 107.% OF MAX LOAD

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:          :                 WED, JAN 13 1988  00:05 GENERATION=  33495.7 LOAD=  32386.4 INTERCHANGE=       0.0 LOSSES=   1106.2
:__________: NO. 1934   98 GENERATORS ON    84 BUSES                     INTERVAL       12  HOUR 22 LOAD= 31200.6  SO TEX 5 @ 2500.
                                                                              0 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 105.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 102.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 107.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 105.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 110.% OF MAX LOAD

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:          :                 WED, JAN 13 1988  00:11 GENERATION=  31995.9 LOAD=  30857.0 INTERCHANGE=       0.0 LOSSES=   1136.4
:__________: NO. 1935   95 GENERATORS ON    82 BUSES                     INTERVAL       12  HOUR 23 LOAD= 29623.6  SO TEX 5 @ 2500.
                                                                              0 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 109.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 102.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 107.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 110.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 104.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 111.% OF MAX LOAD

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:          :                 WED, JAN 13 1988  00:16 GENERATION=  31412.9 LOAD=  30326.1 INTERCHANGE=       0.0 LOSSES=   1084.2
:__________: NO. 1942   95 GENERATORS ON    82 BUSES                     INTERVAL       12  HOUR 30 LOAD= 29076.2  SO TEX 5 @ 2500.
                                                                              0 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 107.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 101.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 110.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 103.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 110.% OF MAX LOAD

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:         :                WED, JAN 13 1988  00:22 GENERATION=  33643.3 LOAD=  32596.5 INTERCHANGE=      0.0 LOSSES=   1044.3
:_________: NO. 1943   99 GENERATORS ON    84 BUSES                    INTERVAL       12  HOUR 31 LOAD= 31417.0  SO TEX 5 @ 2500.
                                                                            0 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 104.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 104.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 101.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 107.% OF MAX LOAD

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:         :                WED, JAN 13 1988  00:27 GENERATION=  34393.5 LOAD=  33238.9 INTERCHANGE=      0.0 LOSSES=   1151.4
:_________: NO. 1944  103 GENERATORS ON    87 BUSES                    INTERVAL       12  HOUR 32 LOAD= 32079.3  SO TEX 5 @ 2500.
                                                                            0 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 108.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 101.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 103.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 110.% OF MAX LOAD
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:         :                WED, JAN 13 1988  00:32 GENERATION=  35810.4 LOAD=  34827.5 INTERCHANGE=      0.0 LOSSES=    980.9
:_________: NO. 1945  118 GENERATORS ON    96 BUSES                    INTERVAL       12  HOUR 33 LOAD= 33717.2  SO TEX 5 @ 2500.
                                                                            0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 101.% OF MAX LOAD
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:         :                WED, JAN 13 1988  00:38 GENERATION=  32730.3 LOAD=  31499.3 INTERCHANGE=      0.0 LOSSES=   1228.3
:_________: NO. 1946   96 GENERATORS ON    82 BUSES                    INTERVAL       12  HOUR 34 LOAD= 30285.7  SO TEX 5 @ 2500.
                                                                            1 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 102.% OF MAX LOAD/11/
WTSN C 8 100 TO JEWETT   138 LINE @ 115.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 102.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 108.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 110.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 104.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 114.% OF MAX LOAD

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:          :               WED, JAN 13 1988  00:43 GENERATION=  31702.7 LOAD=  30472.6 INTERCHANGE=       0.0 LOSSES=   1226.1
:__________: NO. 1947   95 GENERATORS ON     82 BUSES                     INTERVAL       12  HOUR 35 LOAD= 29227.2  SO TEX 5 @ 2500.
                                                                               1 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 104.% OF MAX LOAD/11/
WTSN C 8 100 TO JEWETT   138 LINE @ 117.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 101.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 107.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 112.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 103.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 115.% OF MAX LOAD

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:          :               WED, JAN 13 1988  00:49 GENERATION=  31031.4 LOAD=  29897.1 INTERCHANGE=       0.0 LOSSES=   1132.3
:__________: NO. 1953   94 GENERATORS ON     82 BUSES                     INTERVAL       12  HOUR 41 LOAD= 28634.1  SO TEX 5 @ 2500.
                                                                               1 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 101.% OF MAX LOAD/11/
WTSN C 8 100 TO JEWETT   138 LINE @ 112.% OF MAX LOAD/11/    RNDRK    138 TO RNDRK WH 138 LINE @ 110.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 103.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 114.% OF MAX LOAD

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:          :               WED, JAN 13 1988  00:54 GENERATION=  32806.2 LOAD=  31714.3 INTERCHANGE=       0.0 LOSSES=   1088.9
:__________: NO. 1954   95 GENERATORS ON     82 BUSES                     INTERVAL       12  HOUR 42 LOAD= 30507.5  SO TEX 5 @ 2500.
                                                                               0 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 104.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 103.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 108.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 105.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 108.% OF MAX LOAD

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:          :               WED, JAN 13 1988  00:59 GENERATION=  34475.6 LOAD=  33356.0 INTERCHANGE=       0.0 LOSSES=   1115.9
:__________: NO. 1955  103 GENERATORS ON     87 BUSES                     INTERVAL       12  HOUR 43 LOAD= 32200.0  SO TEX 5 @ 2500.
                                                                               0 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 103.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 104.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 103.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 101.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 109.% OF MAX LOAD

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:          :                WED, JAN 13 1988  01:05 GENERATION=  35809.5 LOAD=  34748.5 INTERCHANGE=      0.0 LOSSES=   1058.3
:__________: NO. 1956  116 GENERATORS ON    94 BUSES                         INTERVAL      12  HOUR 44 LOAD= 33635.5  SO TEX 5 @ 2500.
                                                                                  0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 100.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 105.% OF MAX LOAD

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:          :                WED, JAN 13 1988  01:10 GENERATION=  34626.0 LOAD=  33478.8 INTERCHANGE=      0.0 LOSSES=   1144.3
:__________: NO. 1958  104 GENERATORS ON    88 BUSES                         INTERVAL      12  HOUR 46 LOAD= 32326.6  SO TEX 5 @ 2500.
                                                                                  0 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 105.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 102.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 102.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 101.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 109.% OF MAX LOAD
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:          :                WED, JAN 13 1988  01:16 GENERATION=  33240.0 LOAD=  32079.8 INTERCHANGE=      0.0 LOSSES=   1156.6
:__________: NO. 1959   97 GENERATORS ON    83 BUSES                         INTERVAL      12  HOUR 47 LOAD= 30884.4  SO TEX 5 @ 2500.
                                                                                  0 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 109.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 104.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 109.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 106.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 103.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 112.% OF MAX LOAD

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:          :                WED, JAN 13 1988  01:21 GENERATION=  31015.2 LOAD=  29809.4 INTERCHANGE=      0.0 LOSSES=   1203.2
:__________: NO. 1965   94 GENERATORS ON    82 BUSES                         INTERVAL      12  HOUR 53 LOAD= 28543.4  SO TEX 5 @ 2500.
                                                                                  1 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 103.% OF MAX LOAD/11/
WTSN C 8 100 TO JEWETT   138 LINE @ 117.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 105.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 113.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 105.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 117.% OF MAX LOAD
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:          :                WED, JAN 13 1988  01:27 GENERATION=  33289.6 LOAD=  32117.5 INTERCHANGE=      0.0 LOSSES=   1169.5
:__________: NO. 1966   97 GENERATORS ON    83 BUSES                      INTERVAL      12  HOUR 54 LOAD= 30923.3  SO TEX 5 @ 2500.
                                                                                 0 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 110.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 105.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 110.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 106.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 103.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 113.% OF MAX LOAD

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:          :                WED, JAN 13 1988  01:32 GENERATION=  34641.3 LOAD=  33495.3 INTERCHANGE=      0.0 LOSSES=   1142.9
:__________: NO. 1967  104 GENERATORS ON    88 BUSES                      INTERVAL      12  HOUR 55 LOAD= 32343.7  SO TEX 5 @ 2500.
                                                                                 0 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 104.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 100.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 106.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 102.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 109.% OF MAX LOAD

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:          :                WED, JAN 13 1988  01:38 GENERATION=  34651.9 LOAD=  33480.6 INTERCHANGE=      0.0 LOSSES=   1168.0
:__________: NO. 1970  102 GENERATORS ON    86 BUSES                      INTERVAL      12  HOUR 58 LOAD= 32328.5  SO TEX 5 @ 2500.
                                                                                 0 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 109.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 100.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 102.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 110.% OF MAX LOAD
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:          :                WED, JAN 13 1988  01:43 GENERATION=  32777.3 LOAD=  31636.2 INTERCHANGE=      0.0 LOSSES=   1138.6
:__________: NO. 1971   95 GENERATORS ON    81 BUSES                      INTERVAL      12  HOUR 59 LOAD= 30427.1  SO TEX 5 @ 2500.
                                                                                 0 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 110.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 101.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 107.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 103.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 109.% OF MAX LOAD

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:          :                     WED, JAN 13 1988  01:48 GENERATION=  30037.5 LOAD=  28966.3 INTERCHANGE=       0.0 LOSSES=   1068.9
:__________: NO. 1972   91 GENERATORS ON    79 BUSES                     INTERVAL      12  HOUR 60 LOAD= 27674.1  SO TEX 5 @ 2500.
                                                                              1 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 100.% OF MAX LOAD/11/
WTSN C 8 100 TO JEWETT   138 LINE @ 104.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 101.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 106.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 102.% OF MAX LOAD

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:          :                     WED, JAN 13 1988  01:53 GENERATION=  31246.9 LOAD=  30095.4 INTERCHANGE=       0.0 LOSSES=   1148.8
:__________: NO. 1978   93 GENERATORS ON    80 BUSES                     INTERVAL      12  HOUR 66 LOAD= 28838.3  SO TEX 5 @ 2500.
                                                                              1 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 101.% OF MAX LOAD/11/
WTSN C 8 100 TO JEWETT   138 LINE @ 111.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 108.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 113.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 111.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 103.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 112.% OF MAX LOAD

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:          :                     WED, JAN 13 1988  01:59 GENERATION=  32663.8 LOAD=  31552.9 INTERCHANGE=       0.0 LOSSES=   1107.8
:__________: NO. 1979   94 GENERATORS ON    80 BUSES                     INTERVAL      12  HOUR 67 LOAD= 30341.1  SO TEX 5 @ 2500.
                                                                              0 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 105.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 102.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 107.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 107.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 107.% OF MAX LOAD

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:          :                     WED, JAN 13 1988  02:04 GENERATION=  33697.4 LOAD=  32613.4 INTERCHANGE=       0.0 LOSSES=   1080.9
:__________: NO. 1980   98 GENERATORS ON    83 BUSES                     INTERVAL      12  HOUR 68 LOAD= 31434.5  SO TEX 5 @ 2500.
                                                                              0 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 102.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 100.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 104.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 101.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 104.% OF MAX LOAD

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:         :              WED, JAN 13 1988  02:10 GENERATION=  35039.7 LOAD=  33929.7 INTERCHANGE=       0.0 LOSSES=    1107.7
:_________: NO. 1981  109 GENERATORS ON    89 BUSES                      INTERVAL       12  HOUR 69 LOAD= 32791.5  SO TEX 5 @ 2500.
                                                                                 0 TRANSFORMER PROBLEM(S)   8 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 100.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 103.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 109.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 100.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 100.% OF MAX LOAD/ 1/    MASON4   138 TO GILLSPE8 138 LINE @ 101.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 106.% OF MAX LOAD        UVALDE 4 138 TO ASPHALT4 138 LINE @ 100.% OF MAX LOAD/ 8/

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:         :              WED, JAN 13 1988  02:15 GENERATION=  33618.9 LOAD=  32422.6 INTERCHANGE=       0.0 LOSSES=    1193.3
:_________: NO. 1982   98 GENERATORS ON    83 BUSES                      INTERVAL       12  HOUR 70 LOAD= 31237.6  SO TEX 5 @ 2500.
                                                                                 0 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 111.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 103.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 107.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 103.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 109.% OF MAX LOAD
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:         :              WED, JAN 13 1988  02:20 GENERATION=  31798.8 LOAD=  30562.4 INTERCHANGE=       0.0 LOSSES=    1231.8
:_________: NO. 1983   92 GENERATORS ON    80 BUSES                      INTERVAL       12  HOUR 71 LOAD= 29319.6  SO TEX 5 @ 2500.
                                                                                 1 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 103.% OF MAX LOAD/11/
WTSN C 8 100 TO JEWETT   138 LINE @ 113.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 113.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 119.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 110.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/    MASON4   138 TO GILLSPE8 138 LINE @ 101.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 112.% OF MAX LOAD
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:         :              WED, JAN 13 1988  02:26 GENERATION=  30627.3 LOAD=  29639.8 INTERCHANGE=       0.0 LOSSES=     984.7
:_________: NO. 1991   91 GENERATORS ON    80 BUSES                      INTERVAL       12  HOUR 80 LOAD= 28368.4  SO TEX 5 @ 2500.
                                                                                 0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 107.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 113.% OF MAX LOAD/ 1/

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:          :           WED, JAN 13 1988  Ø2:31 GENERATION=  32199.7 LOAD=  31124.8 INTERCHANGE=      Ø.Ø LOSSES=   1Ø72.3
:          :                                                INTERVAL        12  HOUR 81 LOAD= 29899.7  SO TEX 5 @ 25ØØ.
:__________: NO. 1992   93 GENERATORS ON    8Ø BUSES                Ø TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 114.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø2.% OF MAX LOAD
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:          :           WED, JAN 13 1988  Ø2:36 GENERATION=  3ØØØ8.9 LOAD=  29783.7 INTERCHANGE=      Ø.Ø LOSSES=   1Ø22.6
:          :                                                INTERVAL        12  HOUR 82 LOAD= 28516.8  SO TEX 5 @ 25ØØ.
:__________: NO. 1993   91 GENERATORS ON    8Ø BUSES                Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
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:          :           WED, JAN 13 1988  Ø2:42 GENERATION=  35Ø92.4 LOAD=  34Ø52.3 INTERCHANGE=      Ø.Ø LOSSES=   1Ø38.9
:          :                                                INTERVAL        13  HOUR  6 LOAD= 32917.9  COM PEAK @ 2Ø7Ø.
:__________: NO. 2ØØ1  1Ø2 GENERATORS ON    86 BUSES                1 TRANSFORMER PROBLEM(S)   Ø LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1ØØ.% OF MAX LOAD/11/
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:          :           WED, JAN 13 1988  Ø2:47 GENERATION=  37676.1 LOAD=  36678.7 INTERCHANGE=      Ø.Ø LOSSES=    996.5
:          :                                                INTERVAL        13  HOUR  7 LOAD= 35625.7  COM PEAK @ 2Ø7Ø.
:__________: NO. 2ØØ2  11Ø GENERATORS ON    91 BUSES                Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
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:          :           WED, JAN 13 1988  Ø2:53 GENERATION=  36416.4 LOAD=  35323.1 INTERCHANGE=      Ø.Ø LOSSES=   1Ø92.1
:          :                                                INTERVAL        13  HOUR 11 LOAD= 34228.1  COM PEAK @ 2Ø7Ø.
:__________: NO. 2ØØ6  1Ø4 GENERATORS ON    87 BUSES                Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/
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:          :                WED, JAN 13 1988  Ø2:58 GENERATION=  35971.2 LOAD=  34858.1 INTERCHANGE=      Ø.Ø LOSSES=   1111.9
:__________: NO. 2Ø13  1Ø3 GENERATORS ON    86 BUSES                     INTERVAL       13  HOUR 18 LOAD= 33748.7  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 112.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  Ø3:Ø4 GENERATION=  37864.3 LOAD=  36814.8 INTERCHANGE=      Ø.Ø LOSSES=   1Ø48.4
:__________: NO. 2Ø14  111 GENERATORS ON    92 BUSES                     INTERVAL       13  HOUR 19 LOAD= 35765.8  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/
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:          :                WED, JAN 13 1988  Ø3:Ø9 GENERATION=  358Ø8.8 LOAD=  34746.9 INTERCHANGE=      Ø.Ø LOSSES=   1Ø6Ø.8
:__________: NO. 2Ø18  1Ø3 GENERATORS ON    86 BUSES                     INTERVAL       13  HOUR 23 LOAD= 33634.1  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø7.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  Ø3:15 GENERATION=  34912.3 LOAD=  33839.2 INTERCHANGE=      Ø.Ø LOSSES=   1Ø72.1
:__________: NO. 2Ø25  1Ø2 GENERATORS ON    86 BUSES                     INTERVAL       13  HOUR 3Ø LOAD= 32698.4  COM PEAK @ 2Ø7Ø.
                                                                              1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø1.% OF MAX LOAD/11/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø2.% OF MAX LOAD/ 1/
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:          :                WED, JAN 13 1988  Ø3:2Ø GENERATION=  37458.5 LOAD=  36419.1 INTERCHANGE=      Ø.Ø LOSSES=   1Ø38.3
:__________: NO. 2Ø26  1Ø8 GENERATORS ON    89 BUSES                     INTERVAL       13  HOUR 31 LOAD= 35358.Ø  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  Ø3:26 GENERATION=  35632.5 LOAD=  34498.6 INTERCHANGE=      Ø.Ø LOSSES=   1132.5
:__________: NO. 2Ø37  1Ø3 GENERATORS ON    86 BUSES                    INTERVAL      13  HOUR 42 LOAD= 33378.Ø  COM PEAK @ 2Ø7Ø.
                                                                            1 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1ØØ.% OF MAX LOAD/11/
LEON     138 TO LNGLVL M 138 LINE @ 111.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 116.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  Ø3:31 GENERATION=  37158.7 LOAD=  36Ø42.3 INTERCHANGE=      Ø.Ø LOSSES=   1115.3
:__________: NO. 2Ø38  1Ø6 GENERATORS ON    88 BUSES                    INTERVAL      13  HOUR 43 LOAD= 34969.5  COM PEAK @ 2Ø7Ø.
                                                                            Ø TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 114.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  Ø3:37 GENERATION=  37276.1 LOAD=  3613Ø.2 INTERCHANGE=      Ø.Ø LOSSES=   1144.3
:__________: NO. 2Ø41  1Ø5 GENERATORS ON    87 BUSES                    INTERVAL      13  HOUR 46 LOAD= 35Ø6Ø.1  COM PEAK @ 2Ø7Ø.
                                                                            1 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

MINERVA  138 TO MINERVA   69 XFMR @ 1ØØ.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø4.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  Ø3:42 GENERATION=  348Ø1.2 LOAD=  337Ø8.5 INTERCHANGE=      Ø.Ø LOSSES=   1Ø91.2
:__________: NO. 2Ø42  1ØØ GENERATORS ON    84 BUSES                    INTERVAL      13  HOUR 47 LOAD= 32563.6  COM PEAK @ 2Ø7Ø.
                                                                            1 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø2.% OF MAX LOAD/11/
LEON     138 TO LNGLVL M 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø6.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  Ø3:48 GENERATION=  34755.6 LOAD=  33714.Ø INTERCHANGE=      Ø.Ø LOSSES=   1Ø4Ø.7
:__________: NO. 2Ø49  1ØØ GENERATORS ON    84 BUSES                    INTERVAL      13  HOUR 54 LOAD= 32569.1  COM PEAK @ 2Ø7Ø.
                                                                            Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø3.% OF MAX LOAD/ 1/

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:          :                     WED, JAN 13 1988  03:53 GENERATION=  37044.2 LOAD=  35961.0 INTERCHANGE=       0.0 LOSSES=   1081.9
:__________: NO. 2050  104 GENERATORS ON     86 BUSES                        INTERVAL       13  HOUR 55 LOAD= 34885.6  COM PEAK @ 2070.
                                                                                   0 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

LEON      138 TO LNGLVL M 138 LINE @ 101.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 106.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/

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:          :                     WED, JAN 13 1988  03:59 GENERATION=  35819.8 LOAD=  34763.1 INTERCHANGE=       0.0 LOSSES=   1055.5
:__________: NO. 2054  101 GENERATORS ON     84 BUSES                        INTERVAL       13  HOUR 59 LOAD= 33650.9  COM PEAK @ 2070.
                                                                                   0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 100.% OF MAX LOAD/ 1/

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:          :                     WED, JAN 13 1988  04:05 GENERATION=  32216.0 LOAD=  31233.0 INTERCHANGE=       0.0 LOSSES=    982.2
:__________: NO. 2061   96 GENERATORS ON     81 BUSES                        INTERVAL       13  HOUR 66 LOAD= 30011.4  COM PEAK @ 2070.
                                                                                   1 TRANSFORMER PROBLEM(S)   0 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 100.% OF MAX LOAD/11/

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:          :                     WED, JAN 13 1988  04:11 GENERATION=  34038.0 LOAD=  32853.6 INTERCHANGE=       0.0 LOSSES=   1183.2
:__________: NO. 2062   99 GENERATORS ON     84 BUSES                        INTERVAL       13  HOUR 67 LOAD= 31682.3  COM PEAK @ 2070.
                                                                                   1 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 106.% OF MAX LOAD/11/
LEON      138 TO LNGLVL M 138 LINE @ 103.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 108.% OF MAX LOAD/ 1/

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:          :                     WED, JAN 13 1988  04:16 GENERATION=  35376.4 LOAD=  34142.6 INTERCHANGE=       0.0 LOSSES=   1232.3
:__________: NO. 2063  100 GENERATORS ON     84 BUSES                        INTERVAL       13  HOUR 68 LOAD= 33011.0  COM PEAK @ 2070.
                                                                                   2 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 106.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 101.% OF MAX LOAD/ 1/

LEON      138 TO LNGLVL M 138 LINE @ 112.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 117.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  04:21 GENERATION=  34982.1 LOAD=  33949.6 INTERCHANGE=       0.0 LOSSES=   1033.2
:__________: NO. 2066  100 GENERATORS ON    84 BUSES                   INTERVAL       13  HOUR 71 LOAD= 32812.1  COM PEAK @ 2070.
                                                                           0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  04:27 GENERATION=  36378.0 LOAD=  35359.6 INTERCHANGE=       0.0 LOSSES=   1017.2
:__________: NO. 2076  102 GENERATORS ON    85 BUSES                   INTERVAL       13  HOUR 82 LOAD= 34265.8  COM PEAK @ 2070.
                                                                           0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 100.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  04:32 GENERATION=  35760.1 LOAD=  34674.8 INTERCHANGE=       0.0 LOSSES=   1084.0
:__________: NO. 2084  103 GENERATORS ON    88 BUSES                   INTERVAL       14  HOUR  6 LOAD= 33559.6  COM PEAK @ 2070.
                                                                           0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  04:37 GENERATION=  37812.9 LOAD=  36727.4 INTERCHANGE=       0.0 LOSSES=   1084.4
:__________: NO. 2085  111 GENERATORS ON    93 BUSES                   INTERVAL       14  HOUR  7 LOAD= 35675.8  COM PEAK @ 2070.
                                                                           0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  04:43 GENERATION=  38983.3 LOAD=  37926.8 INTERCHANGE=       0.0 LOSSES=   1055.3
:__________: NO. 2086  123 GENERATORS ON    98 BUSES                   INTERVAL       14  HOUR  8 LOAD= 36912.1  COM PEAK @ 2070.
                                                                           0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 101.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  04:49 GENERATION=  37961.3 LOAD=  36849.6 INTERCHANGE=       0.0 LOSSES=   1110.4
:__________: NO. 2088  112 GENERATORS ON    94 BUSES                   INTERVAL       14  HOUR 10 LOAD= 35801.5  COM PEAK @ 2070.
                                                                           0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 101.% OF MAX LOAD/ 1/

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:          :            WED, JAN 13 1988  Ø4:54 GENERATION=  3628Ø.7 LOAD=  35126.1 INTERCHANGE=      Ø.Ø LOSSES=   1152.9
:__________: NO. 2Ø89  1Ø4 GENERATORS ON    88 BUSES                    INTERVAL       14  HOUR 11 LOAD= 34Ø25.Ø  COM PEAK @ 2Ø7Ø.
                                                                              1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1ØØ.% OF MAX LOAD/11/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :            WED, JAN 13 1988  Ø5:ØØ GENERATION=  35612.8 LOAD=  3452Ø.7 INTERCHANGE=      Ø.Ø LOSSES=   1Ø9Ø.8
:__________: NO. 2Ø96  1Ø2 GENERATORS ON    88 BUSES                    INTERVAL       14  HOUR 18 LOAD= 334ØØ.9  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :            WED, JAN 13 1988  Ø5:Ø7 GENERATION=  37882.4 LOAD=  3682Ø.1 INTERCHANGE=      Ø.Ø LOSSES=   1Ø62.Ø
:__________: NO. 2Ø97  111 GENERATORS ON    93 BUSES                    INTERVAL       14  HOUR 19 LOAD= 35771.3  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :            WED, JAN 13 1988  Ø5:15 GENERATION=  39Ø46.3 LOAD=  38ØØ8.2 INTERCHANGE=      Ø.Ø LOSSES=   1Ø37.3
:__________: NO. 2Ø98  123 GENERATORS ON    98 BUSES                    INTERVAL       14  HOUR 2Ø LOAD= 36996.2  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/

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:          :            WED, JAN 13 1988  Ø5:23 GENERATION=  37963.5 LOAD=  36859.7 INTERCHANGE=      Ø.Ø LOSSES=   11Ø2.3
:__________: NO. 21ØØ  112 GENERATORS ON    94 BUSES                    INTERVAL       14  HOUR 22 LOAD= 35812.4  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :            WED, JAN 13 1988  Ø5:29 GENERATION=  363Ø1.Ø LOAD=  35144.6 INTERCHANGE=      Ø.Ø LOSSES=   1154.6
:__________: NO. 21Ø1  1Ø3 GENERATORS ON    88 BUSES                    INTERVAL       14  HOUR 23 LOAD= 34Ø44.Ø  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  05:34 GENERATION=  36837.6 LOAD=  35761.5 INTERCHANGE=       0.0 LOSSES=   1075.0
:__________: NO. 2109  107 GENERATORS ON    90 BUSES                     INTERVAL      14  HOUR 31 LOAD= 34680.0  COM PEAK @ 2070.
                                                                               0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 101.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  05:40 GENERATION=  39483.8 LOAD=  38476.8 INTERCHANGE=       0.0 LOSSES=   1005.9
:__________: NO. 2110  127 GENERATORS ON   101 BUSES                     INTERVAL      14  HOUR 32 LOAD= 37479.4  COM PEAK @ 2070.
                                                                               0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 101.% OF MAX LOAD/ 1/
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:          :             WED, JAN 13 1988  05:45 GENERATION=  37035.0 LOAD=  35888.0 INTERCHANGE=       0.0 LOSSES=   1145.4
:__________: NO. 2112  107 GENERATORS ON    90 BUSES                     INTERVAL      14  HOUR 34 LOAD= 34810.4  COM PEAK @ 2070.
                                                                               0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 101.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  05:51 GENERATION=  34956.9 LOAD=  33775.7 INTERCHANGE=       0.0 LOSSES=   1179.8
:__________: NO. 2113  103 GENERATORS ON    88 BUSES                     INTERVAL      14  HOUR 35 LOAD= 32632.8  COM PEAK @ 2070.
                                                                               1 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 102.% OF MAX LOAD/11/
LNGLVL M 138 TO STPHVIL  138 LINE @ 102.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 103.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  05:56 GENERATION=  35431.1 LOAD=  34306.6 INTERCHANGE=       0.0 LOSSES=   1122.9
:__________: NO. 2120  102 GENERATORS ON    88 BUSES                     INTERVAL      14  HOUR 42 LOAD= 33180.2  COM PEAK @ 2070.
                                                                               0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/
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:          :                 WED, JAN 13 1988  Ø6:Ø2 GENERATION=  37874.8 LOAD=  36858.1 INTERCHANGE=      Ø.Ø LOSSES=   1Ø15.6
:__________: NO. 2121  112 GENERATORS ON    94 BUSES                INTERVAL      14  HOUR 43 LOAD= 3581Ø.5  COM PEAK @ 2Ø7Ø.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  Ø6:Ø7 GENERATION=  35889.1 LOAD=  348Ø7.1 INTERCHANGE=      Ø.Ø LOSSES=   1Ø81.Ø
:__________: NO. 2132  1Ø3 GENERATORS ON    88 BUSES                INTERVAL      14  HOUR 54 LOAD= 33696.2  COM PEAK @ 2Ø7Ø.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.X OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  Ø6:12 GENERATION=  382Ø5.4 LOAD=  37165.1 INTERCHANGE=      Ø.Ø LOSSES=   1Ø4Ø.Ø
:__________: NO. 2133  114 GENERATORS ON    95 BUSES                INTERVAL      14  HOUR 55 LOAD= 36127.Ø  COM PEAK @ 2Ø7Ø.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.X OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  Ø6:17 GENERATION=  397Ø2.Ø LOAD=  38672.8 INTERCHANGE=      Ø.Ø LOSSES=   1Ø28.2
:__________: NO. 2134  13Ø GENERATORS ON   1Ø3 BUSES                INTERVAL      14  HOUR 56 LOAD= 37681.5  COM PEAK @ 2Ø7Ø.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  Ø6:23 GENERATION=  38495.9 LOAD=  37393.8 INTERCHANGE=      Ø.Ø LOSSES=   11Ø1.2
:__________: NO. 2136  118 GENERATORS ON    97 BUSES                INTERVAL      14  HOUR 58 LOAD= 36362.8  COM PEAK @ 2Ø7Ø.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  Ø6:26 GENERATION=  36164.8 LOAD=  35Ø15.7 INTERCHANGE=      Ø.Ø LOSSES=   1147.2
:__________: NO. 2137  1Ø3 GENERATORS ON    88 BUSES                INTERVAL      14  HOUR 59 LOAD= 33911.1  COM PEAK @ 2Ø7Ø.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø3.X OF MAX LOAD/ 1/ .

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:          :                 WED, JAN 13 1988  Ø6:3Ø GENERATION=  32672.5 LOAD=  316Ø3.2 INTERCHANGE=      Ø.Ø LOSSES=   1Ø68.2
:__________: NO. 2138   98 GENERATORS ON    84 BUSES                  INTERVAL      14  HOUR 6Ø LOAD= 3Ø393.Ø  COM PEAK @ 2Ø7Ø.
                                                                          1 TRANSFORMER PROBLEM(S)   Ø LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1ØØ.% OF MAX LOAD/11/
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:          :                 WED, JAN 13 1988  Ø6:33 GENERATION=  35977.2 LOAD=  349Ø1.2 INTERCHANGE=      Ø.Ø LOSSES=   1Ø74.5
:__________: NO. 2145  1Ø3 GENERATORS ON    88 BUSES                  INTERVAL      14  HOUR 67 LOAD= 33793.2  COM PEAK @ 2Ø7Ø.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
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:          :                 WED, JAN 13 1988  Ø6:36 GENERATION=  37245.Ø LOAD=  362Ø1.3 INTERCHANGE=      Ø.Ø LOSSES=   1Ø42.5
:__________: NO. 2146  1Ø8 GENERATORS ON    91 BUSES                  INTERVAL      14  HOUR 68 LOAD= 35133.3  COM PEAK @ 2Ø7Ø.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/
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:          :                 WED, JAN 13 1988  Ø6:38 GENERATION=  37497.8 LOAD=  364Ø2.3 INTERCHANGE=      Ø.Ø LOSSES=   1Ø93.7
:__________: NO. 2147  1Ø9 GENERATORS ON    91 BUSES                  INTERVAL      14  HOUR 69 LOAD= 3534Ø.5  COM PEAK @ 2Ø7Ø.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/
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:          :                 WED, JAN 13 1988  Ø6:41 GENERATION=  3664Ø.4 LOAD=  355Ø9.8 INTERCHANGE=      Ø.Ø LOSSES=   1128.9
:__________: NO. 2148  1Ø5 GENERATORS ON    89 BUSES                  INTERVAL      14  HOUR 7Ø LOAD= 3442Ø.5  COM PEAK @ 2Ø7Ø.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
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:          :                 WED, JAN 13 1988  Ø6:44 GENERATION=  34885.5 LOAD=  33729.5 INTERCHANGE=      Ø.Ø LOSSES=   1153.4
:__________: NO. 2149  1Ø3 GENERATORS ON    88 BUSES                  INTERVAL      14  HOUR 71 LOAD= 32585.2  COM PEAK @ 2Ø7Ø.
                                                                          1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø2.% OF MAX LOAD/11/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/
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:          :                WED, JAN 13 1988  Ø6:47 GENERATION=  35385.Ø LOAD=  34224.1 INTERCHANGE=       Ø.Ø LOSSES=   1159.6
:__________: NO. 2157  1Ø2 GENERATORS ON    87 BUSES                       INTERVAL      14  HOUR 8Ø LOAD= 33Ø95.1  COM PEAK @ 2Ø7Ø.
                                                                                  1 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø1.% OF MAX LOAD/11/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1ØØ.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  Ø6:5Ø GENERATION=  37234.2 LOAD=  36Ø82.4 INTERCHANGE=       Ø.Ø LOSSES=   1151.3
:__________: NO. 2158  1Ø7 GENERATORS ON    9Ø BUSES                       INTERVAL      14  HOUR 81 LOAD= 35Ø1Ø.8  COM PEAK @ 2Ø7Ø.
                                                                                  Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  Ø6:54 GENERATION=  34525.8 LOAD=  33233.6 INTERCHANGE=       Ø.Ø LOSSES=   129Ø.8
:__________: NO. 2159  1Ø1 GENERATORS ON    87 BUSES                       INTERVAL      14  HOUR 82 LOAD= 32Ø73.8  COM PEAK @ 2Ø7Ø.
                                                                                  1 TRANSFORMER PROBLEM(S)   Ø LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø6.% OF MAX LOAD/11/

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:          :                WED, JAN 13 1988  Ø6:57 GENERATION=  329ØØ.3 LOAD=  31767.6 INTERCHANGE=       Ø.Ø LOSSES=   1131.5
:__________: NO. 216Ø   98 GENERATORS ON    84 BUSES                       INTERVAL      14  HOUR 83 LOAD= 3Ø562.4  COM PEAK @ 2Ø7Ø.
                                                                                  1 TRANSFORMER PROBLEM(S)   Ø LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø2.% OF MAX LOAD/11/

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:          :                WED, JAN 13 1988  Ø6:59 GENERATION=  321Ø1.1 LOAD=  31Ø95.3 INTERCHANGE=       Ø.Ø LOSSES=   1ØØ3.6
:__________: NO. 2166   94 GENERATORS ON    78 BUSES                       INTERVAL      15  HOUR  5 LOAD= 29869.4  SO TEX 5 @ 25ØØ.
                                                                                  1 TRANSFORMER PROBLEM(S)   Ø LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1ØØ.% OF MAX LOAD/11/

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:          :              WED, JAN 13 1988  Ø7:Ø3 GENERATION=  37145.Ø LOAD=  3562Ø.2 INTERCHANGE=       Ø.Ø LOSSES=   1522.Ø
:__________: NO. 2167  1Ø4 GENERATORS ON    87 BUSES                   INTERVAL      15  HOUR  6 LOAD= 34534.4  SO TEX 5 @ 25ØØ.
                                                                          2 TRANSFORMER PROBLEM(S)   8 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 111.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø9.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 124.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø9.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  W 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø7.% OF MAX LOAD/ 1/    CROCKETT 138 TO JEWETT   138 LINE @ 1Ø1.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø7.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 11Ø.% OF MAX LOAD/ 1/

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:          :              WED, JAN 13 1988  Ø7:Ø6 GENERATION=  39986.4 LOAD=  38756.6 INTERCHANGE=       Ø.Ø LOSSES=   1226.4
:__________: NO. 2168  115 GENERATORS ON    94 BUSES                   INTERVAL      15  HOUR  7 LOAD= 37768.Ø  SO TEX 5 @ 25ØØ.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/
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:          :              WED, JAN 13 1988  Ø7:Ø9 GENERATION=  41275.8 LOAD=  39937.8 INTERCHANGE=       Ø.Ø LOSSES=   1334.9
:__________: NO. 217Ø  128 GENERATORS ON   1ØØ BUSES                   INTERVAL      15  HOUR  9 LOAD= 38985.6  SO TEX 5 @ 25ØØ.
                                                                          1 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

TDAD TR  1ØØ TO TRINIDAD 138 XFMR @ 1Ø3.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1ØØ.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
BRUNI  4 138 TO FALF   4 138 LINE @ 1ØØ.% OF MAX LOAD/ 8/
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:          :              WED, JAN 13 1988  Ø7:12 GENERATION=  3996Ø.3 LOAD=  38545.3 INTERCHANGE=       Ø.Ø LOSSES=   1411.7
:__________: NO. 2171  113 GENERATORS ON    92 BUSES                   INTERVAL      15  HOUR 1Ø LOAD= 37549.9  SO TEX 5 @ 25ØØ.
                                                                          2 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø3.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø4.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø5.% OF MAX LOAD/11/    NORWDDPL 138 TO DEN DR E 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  W 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  E 138 LINE @ 112.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  Ø7:16 GENERATION=  341Ø4.7 LOAD=  32552.3 INTERCHANGE=       Ø.Ø LOSSES=   1549.2
:__________: NO. 2173   98 GENERATORS ON     82 BUSES                     INTERVAL       15  HOUR 12 LOAD= 31371.7  SO TEX 5 @ 25ØØ.
                                                                                2 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 114.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø5.% OF MAX LOAD/ 1/

BONVIL 9 1ØØ TO HEARNE 9 1ØØ LINE @ 1Ø1.% OF MAX LOAD/11/    WTSN C 8 1ØØ TO JEWETT   138 LINE @ 124.% OF MAX LOAD/11/
HEARNE 9 1ØØ TO SILCTY 9 1ØØ LINE @ 1ØØ.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø8.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/
CROCKETT 138 TO JEWETT   138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  Ø7:19 GENERATION=  34Ø55.Ø LOAD=  32716.2 INTERCHANGE=       Ø.Ø LOSSES=   1335.8
:__________: NO. 2179   98 GENERATORS ON     82 BUSES                     INTERVAL       15  HOUR 18 LOAD= 3154Ø.7  SO TEX 5 @ 25ØØ.
                                                                                2 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø8.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø1.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 113.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø8.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  Ø7:22 GENERATION=  37721.3 LOAD=  36533.5 INTERCHANGE=       Ø.Ø LOSSES=   1184.6
:__________: NO. 2183  1Ø4 GENERATORS ON     86 BUSES                     INTERVAL       15  HOUR 22 LOAD= 35475.9  SO TEX 5 @ 25ØØ.
                                                                                Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø6.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  Ø7:25 GENERATION=  34Ø9Ø.6 LOAD=  32778.Ø INTERCHANGE=       Ø.Ø LOSSES=   13Ø9.4
:__________: NO. 2184   98 GENERATORS ON     82 BUSES                     INTERVAL       15  HOUR 23 LOAD= 316Ø4.1  SO TEX 5 @ 25ØØ.
                                                                                1 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø7.% OF MAX LOAD/11/
WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø5.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 1Ø7.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 112.% OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  07:28 GENERATION=  32009.1 LOAD=  30936.1 INTERCHANGE=      0.0 LOSSES=   1070.1
:__________: NO. 2190   93 GENERATORS ON    77 BUSES                          INTERVAL      15  HOUR 29 LOAD= 29705.3  SO TEX 5 @ 2500.
                                                                                   1 TRANSFORMER PROBLEM(S)   0 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 103.% OF MAX LOAD/11/

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:          :                  WED, JAN 13 1988  07:31 GENERATION=  35326.7 LOAD=  33897.3 INTERCHANGE=      0.0 LOSSES=   1426.6
:__________: NO. 2191  101 GENERATORS ON    85 BUSES                          INTERVAL      15  HOUR 30 LOAD= 32758.2  SO TEX 5 @ 2500.
                                                                                   2 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 110.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 104.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 118.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 105.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 110.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  E 138 LINE @ 101.% OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  07:37 GENERATION=  40470.6 LOAD=  39166.2 INTERCHANGE=      0.0 LOSSES=   1300.2
:__________: NO. 2194  122 GENERATORS ON    96 BUSES                          INTERVAL      15  HOUR 33 LOAD= 38190.3  SO TEX 5 @ 2500.
                                                                                   1 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

MINERVA  138 TO MINERVA   69 XFMR @ 100.% OF MAX LOAD/ 1/
LEON     138 TO LNGLVL M 138 LINE @ 100.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 105.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 101.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 103.% OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  07:46 GENERATION=  35064.9 LOAD=  33597.1 INTERCHANGE=      0.0 LOSSES=   1464.8
:__________: NO. 2203  100 GENERATORS ON    84 BUSES                          INTERVAL      15  HOUR 42 LOAD= 32448.8  SO TEX 5 @ 2500.
                                                                                   2 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 111.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 105.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 122.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 108.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 113.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  E 138 LINE @ 102.% OF MAX LOAD/ 1/

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:          :               WED, JAN 13 1988  Ø7:56 GENERATION=  37864.7 LOAD=  3633Ø.9 INTERCHANGE=       Ø.Ø LOSSES=   153Ø.8
:__________: NO. 22Ø4  1Ø3 GENERATORS ON    86 BUSES                    INTERVAL      15  HOUR 43 LOAD= 35267.1  SO TEX 5 @ 25ØØ.
                                                                               2 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 11Ø.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø8.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 12Ø.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 115.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 12Ø.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø5.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø5.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/

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:          :               WED, JAN 13 1988  Ø8:Ø6 GENERATION=  39746.2 LOAD=  383Ø5.5 INTERCHANGE=       Ø.Ø LOSSES=   1437.4
:__________: NO. 22Ø5  112 GENERATORS ON    92 BUSES                    INTERVAL      15  HOUR 44 LOAD= 373Ø2.8  SO TEX 5 @ 25ØØ.
                                                                               2 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø4.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø4.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø8.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø8.% OF MAX LOAD/ 1/    NORWDDPL 138 TO DEN DR E 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  W 138 LINE @ 1Ø5.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  E 138 LINE @ 111.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/
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:          :               WED, JAN 13 1988  Ø8:13 GENERATION=  4Ø67Ø.2 LOAD=  3936Ø.9 INTERCHANGE=       Ø.Ø LOSSES=   13Ø6.Ø
:__________: NO. 22Ø6  123 GENERATORS ON    96 BUSES                    INTERVAL      15  HOUR 45 LOAD= 3839Ø.8  SO TEX 5 @ 25ØØ.
                                                                               1 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

TDAD TR  1ØØ TO TRINIDAD 138 XFMR @ 1Ø1.% OF MAX LOAD/ 1/
LEON     138 TO LNGLVL M 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø9.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  Ø8:21 GENERATION=  38877.8 LOAD=  37386.9 INTERCHANGE=       Ø.Ø LOSSES=    1487.9
:__________: NO. 22Ø7  1Ø7 GENERATORS ON     89 BUSES                   INTERVAL      15  HOUR 46 LOAD= 36355.7  SO TEX 5 @ 25ØØ.
                                                                               2 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø7.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø5.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 113.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 111.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  W 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø7.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  Ø8:25 GENERATION=  36712.6 LOAD=  35148.Ø INTERCHANGE=       Ø.Ø LOSSES=    1561.8
:__________: NO. 22Ø8  1Ø2 GENERATORS ON     86 BUSES                   INTERVAL      15  HOUR 47 LOAD= 34Ø47.5  SO TEX 5 @ 25ØØ.
                                                                               2 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 113.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø8.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 124.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 111.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 117.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  E 138 LINE @ 1ØØ.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  Ø8:28 GENERATION=  32643.Ø LOAD=  31492.1 INTERCHANGE=       Ø.Ø LOSSES=    1148.3
:__________: NO. 22Ø9   95 GENERATORS ON     79 BUSES                   INTERVAL      15  HOUR 48 LOAD= 3Ø278.5  SO TEX 5 @ 25ØØ.
                                                                               1 TRANSFORMER PROBLEM(S)   Ø LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø5.% OF MAX LOAD/11/
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:          :                 WED, JAN 13 1988  Ø8:32 GENERATION=  317Ø3.7 LOAD=  3Ø657.5 INTERCHANGE=       Ø.Ø LOSSES=    1Ø43.4
:__________: NO. 2214   92 GENERATORS ON     76 BUSES                   INTERVAL      15  HOUR 53 LOAD= 29418.1  SO TEX 5 @ 25ØØ.
                                                                               1 TRANSFORMER PROBLEM(S)   Ø LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø2.% OF MAX LOAD/11/

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:          :              WED, JAN 13 1988  08:39 GENERATION=  38555.0 LOAD=  37094.3 INTERCHANGE=        0.0 LOSSES=    1457.7
:__________: NO. 2216  106 GENERATORS ON    88 BUSES                   INTERVAL        15  HOUR 55 LOAD= 36054.1  SO TEX 5 @ 2500.
                                                                             2 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 105.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 105.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 114.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 106.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 112.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  W 138 LINE @ 101.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 107.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 100.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 107.% OF MAX LOAD/ 1/
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:          :              WED, JAN 13 1988  08:42 GENERATION=  40822.3 LOAD=  39519.9 INTERCHANGE=        0.0 LOSSES=    1298.2
:__________: NO. 2217  124 GENERATORS ON    97 BUSES                   INTERVAL        15  HOUR 56 LOAD= 38554.6  SO TEX 5 @ 2500.
                                                                             2 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 101.% OF MAX LOAD/ 1/    MINERVA  138 TO MINERVA   69 XFMR @ 100.% OF MAX LOAD/ 1/

LEON     138 TO LNGLVL M 138 LINE @ 103.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 109.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 103.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 101.% OF MAX LOAD/ 1/

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:          :              WED, JAN 13 1988  08:46 GENERATION=  40148.7 LOAD=  38762.1 INTERCHANGE=        0.0 LOSSES=    1383.7
:__________: NO. 2218  114 GENERATORS ON    93 BUSES                   INTERVAL        15  HOUR 57 LOAD= 37773.4  SO TEX 5 @ 2500.
                                                                             2 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 100.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 100.% OF MAX LOAD/ 1/

LEON     138 TO LNGLVL M 138 LINE @ 109.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 114.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 106.% OF MAX LOAD/ 1/
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:          :              WED, JAN 13 1988  08:50 GENERATION=  34467.3 LOAD=  33058.9 INTERCHANGE=        0.0 LOSSES=    1405.0
:__________: NO. 2220   99 GENERATORS ON    83 BUSES                   INTERVAL        15  HOUR 59 LOAD= 31893.9  SO TEX 5 @ 2500.
                                                                             2 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 110.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 102.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 116.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 106.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 112.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  08:54 GENERATION=  32796.8 LOAD=  31695.9 INTERCHANGE=       0.0 LOSSES=   1098.0
:__________: NO. 2227   95 GENERATORS ON    79 BUSES                        INTERVAL      15  HOUR 66 LOAD= 30488.7  SO TEX 5 @ 2500.
                                                                                  1 TRANSFORMER PROBLEM(S)   0 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 103.% OF MAX LOAD/11/

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:          :                WED, JAN 13 1988  08:58 GENERATION=  35309.1 LOAD=  33959.2 INTERCHANGE=       0.0 LOSSES=   1346.8
:__________: NO. 2228  101 GENERATORS ON    85 BUSES                        INTERVAL      15  HOUR 67 LOAD= 32821.9  SO TEX 5 @ 2500.
                                                                                  2 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 109.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 103.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 116.% OF MAX LOAD/11/    E LEVEE  138 TO GRNVL  E 138 LINE @ 103.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  09:02 GENERATION=  37136.3 LOAD=  35674.1 INTERCHANGE=       0.0 LOSSES=   1459.2
:__________: NO. 2229  103 GENERATORS ON    86 BUSES                        INTERVAL      15  HOUR 68 LOAD= 34590.0  SO TEX 5 @ 2500.
                                                                                  2 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 110.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 107.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 119.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 102.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 105.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 106.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 100.% OF MAX LOAD/ 1/
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:          :                WED, JAN 13 1988  09:05 GENERATION=  35654.2 LOAD=  34218.6 INTERCHANGE=       0.0 LOSSES=   1432.4
:__________: NO. 2231  101 GENERATORS ON    85 BUSES                        INTERVAL      15  HOUR 70 LOAD= 33089.6  SO TEX 5 @ 2500.
                                                                                  2 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 111.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 105.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 119.% OF MAX LOAD/11/    E LEVEE  138 TO GRNVL  E 138 LINE @ 105.% OF MAX LOAD/ 1/

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:         :              WED, JAN 13 1988  Ø9:Ø9 GENERATION=  33612.2 LOAD=  323Ø5.7 INTERCHANGE=       Ø.Ø LOSSES=   13Ø3.3
:_________: NO. 2232   98 GENERATORS ON    82 BUSES                       INTERVAL      15  HOUR 71 LOAD= 31117.3  SO TEX 5 @ 25ØØ.
                                                                               1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø9.% OF MAX LOAD/11/
WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø8.% OF MAX LOAD/11/

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:         :              WED, JAN 13 1988  Ø9:12 GENERATION=  3477Ø.9 LOAD=  33412.4 INTERCHANGE=       Ø.Ø LOSSES=   1355.7
:_________: NO. 2239   99 GENERATORS ON    83 BUSES                       INTERVAL      15  HOUR 79 LOAD= 32258.3  SO TEX 5 @ 25ØØ.
                                                                               2 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø9.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø3.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 115.% OF MAX LOAD/11/    E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/

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:         :              WED, JAN 13 1988  Ø9:17 GENERATION=  3689Ø.3 LOAD=  3544Ø.2 INTERCHANGE=       Ø.Ø LOSSES=   1447.4
:_________: NO. 224Ø  1Ø3 GENERATORS ON    86 BUSES                       INTERVAL      15  HOUR 8Ø LOAD= 34348.6  SO TEX 5 @ 25ØØ.
                                                                               2 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 111.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø7.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 119.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1ØØ.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø8.% OF MAX LOAD/ 1/
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:         :              WED, JAN 13 1988  Ø9:23 GENERATION=  38Ø61.9 LOAD=  36585.Ø INTERCHANGE=       Ø.Ø LOSSES=   1474.Ø
:_________: NO. 2241  1Ø5 GENERATORS ON    87 BUSES                       INTERVAL      15  HOUR 81 LOAD= 35529.Ø  SO TEX 5 @ 25ØØ.
                                                                               2 TRANSFORMER PROBLEM(S)   8 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø8.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø7.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 118.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø9.% OF MAX LOAD/ 1/    NORWDDPL 138 TO DEN DR E 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  W 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø7.% OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  Ø9:27 GENERATION=  37173.4 LOAD=  3564Ø.9 INTERCHANGE=      Ø.Ø LOSSES=   1529.7
:__________: NO. 2242  1Ø4 GENERATORS ON     86 BUSES                INTERVAL      15  HOUR 82 LOAD= 34555.8  SO TEX 5 @ 25ØØ.
                                                                         2 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 112.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø9.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 124.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  W 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø8.% OF MAX LOAD/ 1/
CROCKETT 138 TO JEWETT   138 LINE @ 1Ø1.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 11Ø.% OF MAX LOAD/ 1/
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:          :                  WED, JAN 13 1988  Ø9:3Ø GENERATION=  35837.2 LOAD=  34382.7 INTERCHANGE=      Ø.Ø LOSSES=   1451.6
:__________: NO. 2243  1Ø1 GENERATORS ON     85 BUSES                INTERVAL      15  HOUR 83 LOAD= 33258.6  SO TEX 5 @ 25ØØ.
                                                                         2 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 112.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø6.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 121.% OF MAX LOAD/11/    E LEVEE  138 TO GRNVL  W 138 LINE @ 1ØØ.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/
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:          :                  WED, JAN 13 1988  Ø9:34 GENERATION=  32329.Ø LOAD=  31124.3 INTERCHANGE=      Ø.Ø LOSSES=   12Ø1.8
:__________: NO. 2244   93 GENERATORS ON     77 BUSES                INTERVAL      15  HOUR 84 LOAD= 29899.2  SO TEX 5 @ 25ØØ.
                                                                         1 TRANSFORMER PROBLEM(S)   Ø LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø7.% OF MAX LOAD/11/
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:          :                  WED, JAN 13 1988  Ø9:37 GENERATION=  34349.8 LOAD=  32998.9 INTERCHANGE=      Ø.Ø LOSSES=   1347.9
:__________: NO. 225Ø   97 GENERATORS ON     82 BUSES                INTERVAL      16  HOUR  6 LOAD= 31832.1  SO TEX 5 @ 25ØØ.
                                                                         2 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø9.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø2.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø9.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 111.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 11Ø.% OF MAX LOAD

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:          :            WED, JAN 13 1988  09:40 GENERATION=  37373.6 LOAD=  36117.2 INTERCHANGE=       0.0 LOSSES=   1253.8
:__________: NO. 2251  101 GENERATORS ON    84 BUSES                   INTERVAL      16  HOUR  7 LOAD= 35046.7  SO TEX 5 @ 2500.
                                                                            1 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 101.% OF MAX LOAD/11/
LEON     138 TO LNGLVL M 138 LINE @ 113.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 119.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 103.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 104.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 106.% OF MAX LOAD

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:          :            WED, JAN 13 1988  09:43 GENERATION=  38428.9 LOAD=  37040.2 INTERCHANGE=       0.0 LOSSES=   1385.9
:__________: NO. 2252  107 GENERATORS ON    87 BUSES                   INTERVAL      16  HOUR  8 LOAD= 35999.5  SO TEX 5 @ 2500.
                                                                            2 TRANSFORMER PROBLEM(S)  10 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 103.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 103.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 101.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 116.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 122.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 103.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 105.% OF MAX LOAD/ 1/    MASON4   138 TO GILLSPE8 138 LINE @ 106.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 110.% OF MAX LOAD        UVALDE 4 138 TO ASPHALT4 138 LINE @ 107.% OF MAX LOAD/ 8/
ASPHALT4 138 TO BRACKVL4 138 LINE @ 105.% OF MAX LOAD/ 8/    CNC.W T4 138 TO ASHERTN4 138 LINE @ 100.% OF MAX LOAD/ 8/

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:          :            WED, JAN 13 1988  09:46 GENERATION=  37060.4 LOAD=  35586.7 INTERCHANGE=       0.0 LOSSES=   1471.2
:__________: NO. 2254  100 GENERATORS ON    83 BUSES                   INTERVAL      16  HOUR 10 LOAD= 34499.9  SO TEX 5 @ 2500.
                                                                            2 TRANSFORMER PROBLEM(S)   9 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 110.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 107.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 112.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 115.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 120.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 109.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 106.% OF MAX LOAD/ 1/    MASON4   138 TO GILLSPE8 138 LINE @ 103.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 114.% OF MAX LOAD        UVALDE 4 138 TO ASPHALT4 138 LINE @ 103.% OF MAX LOAD/ 8/
ASPHALT4 138 TO BRACKVL4 138 LINE @ 101.% OF MAX LOAD/ 8/
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:           :              WED, JAN 13 1988  Ø9:5Ø GENERATION=  34992.1 LOAD=  33447.8 INTERCHANGE=        Ø.Ø LOSSES=   1541.4
:___________: NO. 2255   97 GENERATORS ON    82 BUSES                     INTERVAL      16  HOUR 11 LOAD= 32294.7  SO TEX 5 @ 25ØØ.
                                                                               2 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 114.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø7.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 12Ø.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 115.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 12Ø.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1ØØ.% OF MAX LOAD/ 1/    MASON4   138 TO GILLSPE8 138 LINE @ 1Ø4.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 116.% OF MAX LOAD

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:           :              WED, JAN 13 1988  Ø9:53 GENERATION=  31384.6 LOAD=  3Ø265.5 INTERCHANGE=        Ø.Ø LOSSES=   1116.4
:___________: NO. 2256   91 GENERATORS ON    76 BUSES                     INTERVAL      16  HOUR 12 LOAD= 29Ø13.7  SO TEX 5 @ 25ØØ.
                                                                               1 TRANSFORMER PROBLEM(S)   Ø LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø5.% OF MAX LOAD/11/

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:           :              WED, JAN 13 1988  Ø9:56 GENERATION=  3465Ø.3 LOAD=  33249.5 INTERCHANGE=        Ø.Ø LOSSES=   1397.8
:___________: NO. 2262   97 GENERATORS ON    82 BUSES                     INTERVAL      16  HOUR 18 LOAD= 3209Ø.1  SO TEX 5 @ 25ØØ.
                                                                               2 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 11Ø.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø3.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 111.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 113.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 118.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø9.% OF MAX LOAD

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:           :              WED, JAN 13 1988  Ø9:59 GENERATION=  37127.4 LOAD=  35859.3 INTERCHANGE=        Ø.Ø LOSSES=   1265.6
:___________: NO. 2263  1Ø1 GENERATORS ON    84 BUSES                     INTERVAL      16  HOUR 19 LOAD= 3478Ø.9  SO TEX 5 @ 25ØØ.
                                                                               2 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø3.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø1.% OF MAX LOAD/ 1/

LEON     138 TO LNGLVL M 138 LINE @ 113.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 119.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø5.% OF MAX LOAD

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:          :              WED, JAN 13 1988  10:03 GENERATION=  38356.8 LOAD=  37056.2 INTERCHANGE=       0.0 LOSSES=   1297.5
:__________: NO. 2264  107 GENERATORS ON    87 BUSES                      INTERVAL      16  HOUR 20 LOAD= 36015.0  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   8 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 116.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 121.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 102.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 103.% OF MAX LOAD/ 1/
MASON4   138 TO GILLSPE8 138 LINE @ 104.% OF MAX LOAD/ 6/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 106.% OF MAX LOAD
UVALDE 4 138 TO ASPHALT4 138 LINE @ 105.% OF MAX LOAD/ 8/    ASPHALT4 138 TO BRACKVL4 138 LINE @ 103.% OF MAX LOAD/ 8/

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:          :              WED, JAN 13 1988  10:13 GENERATION=  37850.5 LOAD=  36427.7 INTERCHANGE=       0.0 LOSSES=   1420.1
:__________: NO. 2266  104 GENERATORS ON    86 BUSES                      INTERVAL      16  HOUR 22 LOAD= 35366.8  SO TEX 5 @ 2500.
                                                                                2 TRANSFORMER PROBLEM(S)   9 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 107.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 105.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 106.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 116.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 121.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 107.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 106.% OF MAX LOAD/ 1/    MASON4   138 TO GILLSPE8 138 LINE @ 108.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 111.% OF MAX LOAD        UVALDE 4 138 TO ASPHALT4 138 LINE @ 106.% OF MAX LOAD/ 8/
ASPHALT4 138 TO BRACKVL4 138 LINE @ 104.% OF MAX LOAD/ 8/
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:          :              WED, JAN 13 1988  10:24 GENERATION=  36034.3 LOAD=  34652.9 INTERCHANGE=       0.0 LOSSES=   1378.3
:__________: NO. 2267   99 GENERATORS ON    84 BUSES                      INTERVAL      16  HOUR 23 LOAD= 33537.1  SO TEX 5 @ 2500.
                                                                                2 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 109.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 104.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 107.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 113.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 119.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 104.% OF MAX LOAD/ 1/
MASON4   138 TO GILLSPE8 138 LINE @ 101.% OF MAX LOAD/ 6/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 109.% OF MAX LOAD

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:          :              WED, JAN 13 1988  10:35 GENERATION=  31670.9 LOAD=  30529.0 INTERCHANGE=       0.0 LOSSES=   1138.6
:__________: NO. 2268   94 GENERATORS ON    79 BUSES                      INTERVAL      16  HOUR 24 LOAD= 29285.4  SO TEX 5 @ 2500.
                                                                                1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 105.% OF MAX LOAD/11/
LNGLVL M 138 TO STPHVIL  138 LINE @ 104.% OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  10:47 GENERATION=  35231.5 LOAD=  33813.0 INTERCHANGE=       0.0 LOSSES=    1415.8
:__________: NO. 2274   99 GENERATORS ON    84 BUSES                     INTERVAL      16  HOUR 30 LOAD= 32671.3  SO TEX 5 @ 2500.
                                                                               2 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 110.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA    69 XFMR @ 105.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 114.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 114.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 120.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 109.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 103.% OF MAX LOAD/ 1/    MASON4   138 TO GILLSPE8 138 LINE @ 103.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 115.% OF MAX LOAD

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:          :                  WED, JAN 13 1988  10:58 GENERATION=  37450.7 LOAD=  36152.4 INTERCHANGE=       0.0 LOSSES=    1295.2
:__________: NO. 2275  103 GENERATORS ON    85 BUSES                     INTERVAL      16  HOUR 31 LOAD= 35083.0  SO TEX 5 @ 2500.
                                                                               2 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 103.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA    69 XFMR @ 101.% OF MAX LOAD/ 1/

LEON     138 TO LNGLVL M 138 LINE @ 114.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 119.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 104.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 104.% OF MAX LOAD/ 1/
MASON4   138 TO GILLSPE8 138 LINE @ 100.% OF MAX LOAD/ 6/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 108.% OF MAX LOAD

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:          :                  WED, JAN 13 1988  11:07 GENERATION=  39201.3 LOAD=  37955.8 INTERCHANGE=       0.0 LOSSES=    1242.7
:__________: NO. 2276  118 GENERATORS ON    93 BUSES                     INTERVAL      16  HOUR 32 LOAD= 36942.1  SO TEX 5 @ 2500.
                                                                               0 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 115.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 120.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 101.% OF MAX LOAD/ 1/    MASON4   138 TO GILLSPE8 138 LINE @ 101.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 101.% OF MAX LOAD        UVALDE 4 138 TO ASPHALT4 138 LINE @ 104.% OF MAX LOAD/ 8/
ASPHALT4 138 TO BRACKVL4 138 LINE @ 102.% OF MAX LOAD/ 8/

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:          :                WED, JAN 13 1988  11:10 GENERATION=  38520.8 LOAD=  37220.7 INTERCHANGE=       0.0 LOSSES=   1297.1
:__________: NO. 2278  109 GENERATORS ON     89 BUSES                   INTERVAL       16  HOUR 34 LOAD= 36184.5  SO TEX 5 @ 2500.
                                                                              2 TRANSFORMER PROBLEM(S)   8 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 100.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 100.% OF MAX LOAD/ 1/

LEON     138 TO LNGLVL M 138 LINE @ 116.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 121.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 101.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 103.% OF MAX LOAD/ 1/
MASON4   138 TO GILLSPE8 138 LINE @ 105.% OF MAX LOAD/ 6/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 106.% OF MAX LOAD
UVALDE 4 138 TO ASPHALT4 138 LINE @ 106.% OF MAX LOAD/ 8/    ASPHALT4 138 TO BRACKVL4 138 LINE @ 104.% OF MAX LOAD/ 8/

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:          :                WED, JAN 13 1988  11:14 GENERATION=  36670.7 LOAD=  35303.9 INTERCHANGE=       0.0 LOSSES=   1363.9
:__________: NO. 2279  100 GENERATORS ON     84 BUSES                   INTERVAL       16  HOUR 35 LOAD= 34208.2  SO TEX 5 @ 2500.
                                                                              2 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 107.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 104.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 107.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 114.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 119.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 108.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 105.% OF MAX LOAD/ 1/    MASON4   138 TO GILLSPE8 138 LINE @ 104.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 113.% OF MAX LOAD
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:          :                WED, JAN 13 1988  11:17 GENERATION=  32729.2 LOAD=  31596.5 INTERCHANGE=       0.0 LOSSES=   1129.8
:__________: NO. 2280   96 GENERATORS ON     81 BUSES                   INTERVAL       16  HOUR 36 LOAD= 30386.0  SO TEX 5 @ 2500.
                                                                              1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 104.% OF MAX LOAD/11/
LNGLVL M 138 TO STPHVIL  138 LINE @ 100.% OF MAX LOAD/ 1/
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:          :                WED, JAN 13 1988  11:21 GENERATION=  32427.5 LOAD=  31268.9 INTERCHANGE=       0.0 LOSSES=   1155.7
:__________: NO. 2285   96 GENERATORS ON     81 BUSES                   INTERVAL       16  HOUR 41 LOAD= 30040.4  SO TEX 5 @ 2500.
                                                                              1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 105.% OF MAX LOAD/11/
LNGLVL M 138 TO STPHVIL  138 LINE @ 103.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  11:29 GENERATION=  35680.6 LOAD=  34322.5 INTERCHANGE=       0.0 LOSSES=   1355.1
:__________: NO. 2286   99 GENERATORS ON     84 BUSES                          INTERVAL      16  HOUR 42 LOAD= 33196.5  SO TEX 5 @ 2500.
                                                                                    2 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 108.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 103.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 108.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 113.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 119.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 109.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 104.% OF MAX LOAD/ 1/    MASON4   138 TO GILLSPE8 138 LINE @ 103.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 112.% OF MAX LOAD
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:          :                WED, JAN 13 1988  11:33 GENERATION=  38109.7 LOAD=  36782.8 INTERCHANGE=       0.0 LOSSES=   1323.9
:__________: NO. 2287  106 GENERATORS ON     87 BUSES                          INTERVAL      16  HOUR 43 LOAD= 35732.9  SO TEX 5 @ 2500.
                                                                                    2 TRANSFORMER PROBLEM(S)   8 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 101.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 101.% OF MAX LOAD/ 1/

LEON     138 TO LNGLVL M 138 LINE @ 115.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 121.% OF MAX LOAD/ 1/
RNDRK    138 TO RNDRK WH 138 LINE @ 103.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 104.% OF MAX LOAD/ 1/
MASON4   138 TO GILLSPE8 138 LINE @ 106.% OF MAX LOAD/ 6/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 110.% OF MAX LOAD
UVALDE 4 138 TO ASPHALT4 138 LINE @ 104.% OF MAX LOAD/ 8/    ASPHALT4 138 TO BRACKVL4 138 LINE @ 102.% OF MAX LOAD/ 8/

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:          :                WED, JAN 13 1988  11:37 GENERATION=  39540.1 LOAD=  38306.2 INTERCHANGE=       0.0 LOSSES=   1231.5
:__________: NO. 2288  121 GENERATORS ON     94 BUSES                          INTERVAL      16  HOUR 44 LOAD= 37303.9  SO TEX 5 @ 2500.
                                                                                    0 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 113.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 119.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 101.% OF MAX LOAD/ 1/    MASON4   138 TO GILLSPE8 138 LINE @ 103.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 101.% OF MAX LOAD        UVALDE 4 138 TO ASPHALT4 138 LINE @ 105.% OF MAX LOAD/ 8/
ASPHALT4 138 TO BRACKVL4 138 LINE @ 103.% OF MAX LOAD/ 8/
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:          :                 WED, JAN 13 1988  11:46 GENERATION=  37955.6 LOAD=  36586.5 INTERCHANGE=       0.0 LOSSES=   1366.3
:__________: NO. 2290  105 GENERATORS ON    86 BUSES                      INTERVAL      16  HOUR 46 LOAD= 35530.7  SO TEX 5 @ 2500.
                                                                                2 TRANSFORMER PROBLEM(S)   9 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 105.% OF MAX LOAD/11/     MINERVA  138 TO MINERVA   69 XFMR @ 103.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 101.% OF MAX LOAD/11/     LEON     138 TO LNGLVL M 138 LINE @ 116.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 121.% OF MAX LOAD/ 1/     RNDRK    138 TO RNDRK WH 138 LINE @ 105.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 104.% OF MAX LOAD/ 1/     MASON4   138 TO GILLSPE8 138 LINE @ 106.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 108.% OF MAX LOAD         UVALDE 4 138 TO ASPHALT4 138 LINE @ 107.% OF MAX LOAD/ 8/
ASPHALT4 138 TO BRACKVL4 138 LINE @ 105.% OF MAX LOAD/ 8/
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:          :                 WED, JAN 13 1988  11:54 GENERATION=  36233.0 LOAD=  34813.4 INTERCHANGE=       0.0 LOSSES=   1416.5
:__________: NO. 2291   99 GENERATORS ON    84 BUSES                      INTERVAL      16  HOUR 47 LOAD= 33702.6  SO TEX 5 @ 2500.
                                                                                2 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 111.% OF MAX LOAD/11/     MINERVA  138 TO MINERVA   69 XFMR @ 105.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 110.% OF MAX LOAD/11/     LEON     138 TO LNGLVL M 138 LINE @ 114.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 119.% OF MAX LOAD/ 1/     RNDRK    138 TO RNDRK WH 138 LINE @ 105.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 101.% OF MAX LOAD/ 1/     MASON4   138 TO GILLSPE8 138 LINE @ 102.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 109.% OF MAX LOAD
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:          :                 WED, JAN 13 1988  12:02 GENERATION=  36220.9 LOAD=  34856.4 INTERCHANGE=       0.0 LOSSES=   1361.5
:__________: NO. 2298  100 GENERATORS ON    84 BUSES                      INTERVAL      16  HOUR 54 LOAD= 33746.9  SO TEX 5 @ 2500.
                                                                                2 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 108.% OF MAX LOAD/11/     MINERVA  138 TO MINERVA   69 XFMR @ 104.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 100.% OF MAX LOAD/11/     LEON     138 TO LNGLVL M 138 LINE @ 113.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 119.% OF MAX LOAD/ 1/     RNDRK    138 TO RNDRK WH 138 LINE @ 109.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 106.% OF MAX LOAD/ 1/     MASON4   138 TO GILLSPE8 138 LINE @ 103.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 114.% OF MAX LOAD
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:          :                 WED, JAN 13 1988  12:1Ø GENERATION=  3862Ø.5 LOAD=  37368.9 INTERCHANGE=      Ø.Ø LOSSES=   1249.5
:__________: NO. 2299  11Ø GENERATORS ON    89 BUSES                     INTERVAL      16  HOUR 55 LOAD= 36337.2  SO TEX 5 @ 25ØØ.
                                                                             Ø TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 115.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 12Ø.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/    MASON4   138 TO GILLSPE8 138 LINE @ 1Ø3.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø5.% OF MAX LOAD        UVALDE 4 138 TO ASPHALT4 138 LINE @ 1Ø3.% OF MAX LOAD/ 8/
ASPHALT4 138 TO BRACKVL4 138 LINE @ 1Ø1.% OF MAX LOAD/ 8/

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:          :                 WED, JAN 13 1988  12:17 GENERATION=  39781.2 LOAD=  38582.1 INTERCHANGE=      Ø.Ø LOSSES=   1196.4
:__________: NO. 23ØØ  123 GENERATORS ON    96 BUSES                     INTERVAL      16  HOUR 56 LOAD= 37587.9  SO TEX 5 @ 25ØØ.
                                                                             Ø TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 113.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 119.% OF MAX LOAD/ 1/
MASON4   138 TO GILLSPE8 138 LINE @ 1Ø1.% OF MAX LOAD/ 6/    UVALDE 4 138 TO ASPHALT4 138 LINE @ 1Ø3.% OF MAX LOAD/ 8/
ASPHALT4 138 TO BRACKVL4 138 LINE @ 1Ø1.% OF MAX LOAD/ 8/

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:          :                 WED, JAN 13 1988  12:26 GENERATION=  37Ø64.3 LOAD=  35543.1 INTERCHANGE=      Ø.Ø LOSSES=   1518.3
:__________: NO. 23Ø2  1Ø1 GENERATORS ON    84 BUSES                     INTERVAL      16  HOUR 58 LOAD= 34454.9  SO TEX 5 @ 25ØØ.
                                                                             2 TRANSFORMER PROBLEM(S)   9 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 111.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø7.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 115.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 116.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 122.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 11Ø.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø7.% OF MAX LOAD/ 1/    MASON4   138 TO GILLSPE8 138 LINE @ 1Ø9.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 116.% OF MAX LOAD        UVALDE 4 138 TO ASPHALT4 138 LINE @ 1Ø5.% OF MAX LOAD/ 8/
ASPHALT4 138 TO BRACKVL4 138 LINE @ 1Ø3.% OF MAX LOAD/ 8/

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:          :                 WED, JAN 13 1988  12:31 GENERATION=  35357.4 LOAD=  339Ø6.7 INTERCHANGE=      Ø.Ø LOSSES=   1447.7
:__________: NO. 23Ø3   97 GENERATORS ON    83 BUSES                     INTERVAL      16  HOUR 59 LOAD= 32767.8  SO TEX 5 @ 25ØØ.
                                                                             2 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 112.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø4.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 113.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 113.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 119.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø8.% OF MAX LOAD

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:          :              WED, JAN 13 1988  12:35 GENERATION=  32181.Ø LOAD=  3Ø962.5 INTERCHANGE=       Ø.Ø LOSSES=   1215.5
:__________: NO. 23Ø4   93 GENERATORS ON    79 BUSES                      INTERVAL       16  HOUR 6Ø LOAD= 29732.2  SO TEX 5 @ 25ØØ.
                                                                               1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø8.% OF MAX LOAD/11/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :              WED, JAN 13 1988  12:38 GENERATION=  32759.Ø LOAD=  316Ø1.4 INTERCHANGE=       Ø.Ø LOSSES=   1154.6
:__________: NO. 231Ø   94 GENERATORS ON    8Ø BUSES                      INTERVAL       16  HOUR 66 LOAD= 3Ø391.1  SO TEX 5 @ 25ØØ.
                                                                               1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø5.% OF MAX LOAD/11/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø1.% OF MAX LOAD/ 1/

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:          :              WED, JAN 13 1988  12:41 GENERATION=  357Ø6.Ø LOAD=  34371.1 INTERCHANGE=       Ø.Ø LOSSES=   1331.8
:__________: NO. 2311   98 GENERATORS ON    83 BUSES                      INTERVAL       16  HOUR 67 LOAD= 33246.6  SO TEX 5 @ 25ØØ.
                                                                               2 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø8.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø4.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø6.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø6.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø8.% OF MAX LOAD

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:          :              WED, JAN 13 1988  12:44 GENERATION=  362Ø9.4 LOAD=  35Ø21.Ø INTERCHANGE=       Ø.Ø LOSSES=   1185.1
:__________: NO. 2312   99 GENERATORS ON    83 BUSES                      INTERVAL       16  HOUR 68 LOAD= 33916.9  SO TEX 5 @ 25ØØ.
                                                                               1 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø2.% OF MAX LOAD/11/
LEON     138 TO LNGLVL M 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø9.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  12:47 GENERATION=  34249.Ø LOAD=  3312Ø.9 INTERCHANGE=      Ø.Ø LOSSES=   1124.1
:__________: NO. 2313   95 GENERATORS ON    81 BUSES                    INTERVAL       16  HOUR 69 LOAD= 31957.7  SO TEX 5 @ 25ØØ.
                                                                              1 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1ØØ.% OF MAX LOAD/11/
LEON     138 TO LNGLVL M 138 LINE @ 1Ø5.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 111.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  12:5Ø GENERATION=  32863.3 LOAD=  3182Ø.9 INTERCHANGE=      Ø.Ø LOSSES=   1Ø39.7
:__________: NO. 2314   93 GENERATORS ON    79 BUSES                    INTERVAL       16  HOUR 7Ø LOAD= 3Ø617.2  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø1.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  12:52 GENERATION=  33156.1 LOAD=  32Ø68.1 INTERCHANGE=      Ø.Ø LOSSES=   1Ø85.3
:__________: NO. 2322   94 GENERATORS ON    8Ø BUSES                    INTERVAL       16  HOUR 79 LOAD= 3Ø872.2  SO TEX 5 @ 25ØØ.
                                                                              1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø1.% OF MAX LOAD/11/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø1.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  12:56 GENERATION=  34392.9 LOAD=  3311Ø.5 INTERCHANGE=      Ø.Ø LOSSES=   1279.1
:__________: NO. 2323   95 GENERATORS ON    81 BUSES                    INTERVAL       16  HOUR 8Ø LOAD= 31947.1  SO TEX 5 @ 25ØØ.
                                                                              1 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø7.% OF MAX LOAD/11/
LEON     138 TO LNGLVL M 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø8.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  12:59 GENERATION=  35594.6 LOAD=  34116.9 INTERCHANGE=      Ø.Ø LOSSES=   1474.6
:__________: NO. 2324   96 GENERATORS ON    82 BUSES                    INTERVAL       16  HOUR 81 LOAD= 32984.5  SO TEX 5 @ 25ØØ.
                                                                              2 TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 113.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 1Ø6.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 112.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø8.% OF MAX LOAD/ 1/    RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø4.% OF MAX LOAD

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:          :                  WED, JAN 13 1988  13:02 GENERATION=  34523.9 LOAD=  33051.1 INTERCHANGE=       0.0 LOSSES=   1470.0
:__________: NO. 2325   95 GENERATORS ON    81 BUSES                      INTERVAL      16  HOUR 82 LOAD= 31885.6  SO TEX 5 @ 2500.
                                                                                2 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 113.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 104.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 114.% OF MAX LOAD/11/    LEON     138 TO LNGLVL M 138 LINE @ 104.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 110.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 103.% OF MAX LOAD

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:          :                  WED, JAN 13 1988  13:05 GENERATION=  32515.1 LOAD=  31349.5 INTERCHANGE=       0.0 LOSSES=   1162.7
:__________: NO. 2326   93 GENERATORS ON    79 BUSES                      INTERVAL      16  HOUR 83 LOAD= 30131.1  SO TEX 5 @ 2500.
                                                                                1 TRANSFORMER PROBLEM(S)   0 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 105.% OF MAX LOAD/11/

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:          :                  WED, JAN 13 1988  13:08 GENERATION=  31974.3 LOAD=  30908.5 INTERCHANGE=       0.0 LOSSES=   1063.3
:__________: NO. 2332   99 GENERATORS ON    84 BUSES                      INTERVAL      17  HOUR  5 LOAD= 29676.7  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 100.% OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  13:16 GENERATION=  35807.2 LOAD=  34483.8 INTERCHANGE=       0.0 LOSSES=   1318.7
:__________: NO. 2333  101 GENERATORS ON    86 BUSES                      INTERVAL      17  HOUR  6 LOAD= 33369.3  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

LARGEST MISMATCH:     2.28 MW    21.22 MVAR     21.34 MVA-BUS  9187 [DECKER    138]
SYSTEM TOTAL ABSOLUTE MISMATCH:              103.68 MVA
LEON     138 TO LNGLVL M 138 LINE @ 104.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 109.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 105.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 114.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  13:21 GENERATION=  38228.5 LOAD=  37050.2 INTERCHANGE=       0.0 LOSSES=   1174.0
:__________: NO. 2334  111 GENERATORS ON    93 BUSES                          INTERVAL      17  HOUR  7 LOAD= 36235.4  SO TEX 5 @ 2500.
                                                                                   1 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 107.% OF MAX LOAD/ 1/
NORWDDPL 138 TO DEN DR E 138 LINE @ 101.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  W 138 LINE @ 100.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 106.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 111.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  13:27 GENERATION=  41243.2 LOAD=  40203.4 INTERCHANGE=       0.0 LOSSES=   1036.3
:__________: NO. 2335  143 GENERATORS ON   107 BUSES                          INTERVAL      17  HOUR  8 LOAD= 39499.2  SO TEX 5 @ 2500.
                                                                                   1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 103.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 106.% OF MAX LOAD/ 1/
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:          :                WED, JAN 13 1988  13:42 GENERATION=  42280.7 LOAD=  41368.2 INTERCHANGE=       0.0 LOSSES=    908.8
:__________: NO. 2336  149 GENERATORS ON   110 BUSES                          INTERVAL      17  HOUR  9 LOAD= 40705.9  SO TEX 5 @ 2500.
                                                                                   2 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 100.% OF MAX LOAD/ 1/    SANDOW   345 TO SANDOW   138 XFMR @ 100.% OF MAX LOAD/ 1/

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 105.% OF MAX LOAD/ 1/
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:          :                WED, JAN 13 1988  13:47 GENERATION=  39327.9 LOAD=  38225.8 INTERCHANGE=       0.0 LOSSES=   1098.8
:__________: NO. 2337  124 GENERATORS ON    99 BUSES                          INTERVAL      17  HOUR 10 LOAD= 37451.4  SO TEX 5 @ 2500.
                                                                                   1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 105.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 109.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  13:57 GENERATION=  37076.8 LOAD=  35763.5 INTERCHANGE=       0.0 LOSSES=   1310.0
:__________: NO. 2338  105 GENERATORS ON    89 BUSES                      INTERVAL      17  HOUR 11 LOAD= 34901.6  SO TEX 5 @ 2500.
                                                                               0 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 105.% OF MAX LOAD/ 1/    NORWDDPL 138 TO DEN DR E 138 LINE @ 102.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  W 138 LINE @ 106.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  E 138 LINE @ 112.% OF MAX LOAD/ 1/
SANDOW   138 TO ELGIN SS 138 LINE @ 102.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 115.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  14:07 GENERATION=  33349.8 LOAD=  31928.6 INTERCHANGE=       0.0 LOSSES=   1418.6
:__________: NO. 2339   99 GENERATORS ON    84 BUSES                      INTERVAL      17  HOUR 12 LOAD= 30733.0  SO TEX 5 @ 2500.
                                                                               0 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 107.% OF MAX LOAD/11/    E LEVEE  138 TO GRNVL  E 138 LINE @ 105.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 115.% OF MAX LOAD/ 1/
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:          :                WED, JAN 13 1988  14:15 GENERATION=  32991.9 LOAD=  31677.1 INTERCHANGE=       0.0 LOSSES=   1312.0
:__________: NO. 2344   98 GENERATORS ON    83 BUSES                      INTERVAL      17  HOUR 17 LOAD= 30470.6  SO TEX 5 @ 2500.
                                                                               0 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 102.% OF MAX LOAD/11/    E LEVEE  138 TO GRNVL  E 138 LINE @ 102.% OF MAX LOAD/ 1/
SANDOW   138 TO ELGIN SS 138 LINE @ 101.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 114.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  14:25 GENERATION=  36066.6 LOAD=  34864.4 INTERCHANGE=       0.0 LOSSES=   1199.1
:__________: NO. 2345  101 GENERATORS ON    86 BUSES                      INTERVAL      17  HOUR 18 LOAD= 33756.5  SO TEX 5 @ 2500.
                                                                               0 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 102.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 108.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 100.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 109.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  14:32 GENERATION=  39230.2 LOAD=  38164.7 INTERCHANGE=       0.0 LOSSES=   1062.0
:__________: NO. 2346  123 GENERATORS ON    98 BUSES                      INTERVAL      17  HOUR 19 LOAD= 37385.9  SO TEX 5 @ 2500.
                                                                               1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 104.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 108.% OF MAX LOAD/ 1/

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:          :                   WED, JAN 13 1988  14:38 GENERATION=  4Ø978.Ø LOAD=  39987.6 INTERCHANGE=        Ø.Ø LOSSES=    987.7
:__________: NO. 2347  142 GENERATORS ON    1Ø7 BUSES                          INTERVAL       17  HOUR 2Ø LOAD= 39278.5  SO TEX 5 @ 25ØØ.
                                                                                     1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  1ØØ TO TRINIDAD 138 XFMR @ 1Ø3.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/

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:          :                   WED, JAN 13 1988  14:46 GENERATION=  41362.6 LOAD=  4Ø436.Ø INTERCHANGE=        Ø.Ø LOSSES=    923.Ø
:__________: NO. 2348  144 GENERATORS ON    1Ø8 BUSES                          INTERVAL       17  HOUR 21 LOAD= 39734.6  SO TEX 5 @ 25ØØ.
                                                                                     Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø5.% OF MAX LOAD/ 1/

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:          :                   WED, JAN 13 1988  14:56 GENERATION=  3872Ø.8 LOAD=  37572.Ø INTERCHANGE=        Ø.Ø LOSSES=   1145.6
:__________: NO. 2349  118 GENERATORS ON     96 BUSES                          INTERVAL       17  HOUR 22 LOAD= 3677Ø.7  SO TEX 5 @ 25ØØ.
                                                                                     Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/

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:          :                   WED, JAN 13 1988  15:Ø5 GENERATION=  36491.Ø LOAD=  35Ø98.5 INTERCHANGE=        Ø.Ø LOSSES=   1389.6
:__________: NO. 235Ø  1Ø1 GENERATORS ON     86 BUSES                          INTERVAL       17  HOUR 23 LOAD= 34213.1  SO TEX 5 @ 25ØØ.
                                                                                     Ø TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø7.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 113.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  W 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/
SANDOW   138 TO ELGIN SS 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 117.% OF MAX LOAD/ 1/

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:          :                   WED, JAN 13 1988  15:12 GENERATION=  37983.2 LOAD=  36835.8 INTERCHANGE=        Ø.Ø LOSSES=   1144.3
:__________: NO. 2358  11Ø GENERATORS ON     92 BUSES                          INTERVAL       17  HOUR 31 LOAD= 36Ø1Ø.4  SO TEX 5 @ 25ØØ.
                                                                                     Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 111.% OF MAX LOAD/ 1/

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:          :              WED, JAN 13 1988  15:18 GENERATION=  40096.3 LOAD=  39130.1 INTERCHANGE=       0.0 LOSSES=    963.1
:__________: NO. 2359  133 GENERATORS ON    102 BUSES                    INTERVAL      17  HOUR 32 LOAD= 38386.4  SO TEX 5 @ 2500.
                                                                              1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 102.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 106.% OF MAX LOAD/ 1/

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:          :              WED, JAN 13 1988  15:24 GENERATION=  41431.0 LOAD=  40513.6 INTERCHANGE=       0.0 LOSSES=    914.2
:__________: NO. 2360  144 GENERATORS ON    108 BUSES                    INTERVAL      17  HOUR 33 LOAD= 39818.8  SO TEX 5 @ 2500.
                                                                              1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 101.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 105.% OF MAX LOAD/ 1/

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:          :              WED, JAN 13 1988  15:33 GENERATION=  38199.2 LOAD=  37019.4 INTERCHANGE=       0.0 LOSSES=   1175.5
:__________: NO. 2361  111 GENERATORS ON     93 BUSES                    INTERVAL      17  HOUR 34 LOAD= 36203.8  SO TEX 5 @ 2500.
                                                                              1 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 108.% OF MAX LOAD/ 1/
NORWDDPL 138 TO DEN DR E 138 LINE @ 101.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  W 138 LINE @ 100.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 106.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 111.% OF MAX LOAD/ 1/

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:          :              WED, JAN 13 1988  15:39 GENERATION=  32310.8 LOAD=  31073.3 INTERCHANGE=       0.0 LOSSES=   1234.7
:__________: NO. 2363   99 GENERATORS ON     84 BUSES                    INTERVAL      17  HOUR 36 LOAD= 29846.6  SO TEX 5 @ 2500.
                                                                              0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 105.% OF MAX LOAD/ 1/

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:          :              WED, JAN 13 1988  15:46 GENERATION=  38643.9 LOAD=  37564.1 INTERCHANGE=       0.0 LOSSES=   1076.8
:__________: NO. 2370  117 GENERATORS ON     96 BUSES                    INTERVAL      17  HOUR 43 LOAD= 36763.6  SO TEX 5 @ 2500.
                                                                              1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 104.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 108.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  15:50 GENERATION=  40454.5 LOAD=  39512.9 INTERCHANGE=      0.0 LOSSES=    938.9
:__________: NO. 2371  137 GENERATORS ON    104 BUSES                         INTERVAL      17  HOUR 44 LOAD= 38779.5  SO TEX 5 @ 2500.
                                                                                    1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 101.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 105.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  15:54 GENERATION=  41842.3 LOAD=  40940.1 INTERCHANGE=      0.0 LOSSES=    898.9
:__________: NO. 2372  145 GENERATORS ON    108 BUSES                         INTERVAL      17  HOUR 45 LOAD= 40254.7  SO TEX 5 @ 2500.
                                                                                    0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 104.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  15:57 GENERATION=  33890.6 LOAD=  32648.3 INTERCHANGE=      0.0 LOSSES=   1239.3
:__________: NO. 2375  101 GENERATORS ON     86 BUSES                         INTERVAL      17  HOUR 48 LOAD= 31471.6  SO TEX 5 @ 2500.
                                                                                    0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

E LEVEE  138 TO GRNVL  E 138 LINE @ 103.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 113.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  16:00 GENERATION=  33509.4 LOAD=  32189.3 INTERCHANGE=      0.0 LOSSES=   1317.4
:__________: NO. 2380   99 GENERATORS ON     84 BUSES                         INTERVAL      17  HOUR 53 LOAD= 31000.2  SO TEX 5 @ 2500.
                                                                                    0 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 103.% OF MAX LOAD/11/    E LEVEE  138 TO GRNVL  E 138 LINE @ 105.% OF MAX LOAD/ 1/
SANDOW   138 TO ELGIN SS 138 LINE @ 101.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 115.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  16:04 GENERATION=  36750.2 LOAD=  35599.3 INTERCHANGE=      0.0 LOSSES=   1147.2
:__________: NO. 2381  104 GENERATORS ON     88 BUSES                         INTERVAL      17  HOUR 54 LOAD= 34516.3  SO TEX 5 @ 2500.
                                                                                    0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

E LEVEE  138 TO GRNVL  E 138 LINE @ 103.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 109.% OF MAX LOAD/ 1/

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:         :                 WED, JAN 13 1988  16:08 GENERATION=  39276.3 LOAD=  38274.8 INTERCHANGE=      0.0 LOSSES=    998.6
:_________: NO. 2382  124 GENERATORS ON    99 BUSES                       INTERVAL       17  HOUR 55 LOAD= 37497.2  SO TEX 5 @ 2500.
                                                                                1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 103.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 107.% OF MAX LOAD/ 1/
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:         :                 WED, JAN 13 1988  16:13 GENERATION=  41154.3 LOAD=  40170.2 INTERCHANGE=      0.0 LOSSES=    980.3
:_________: NO. 2383  143 GENERATORS ON   107 BUSES                       INTERVAL       17  HOUR 56 LOAD= 39460.9  SO TEX 5 @ 2500.
                                                                                1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 101.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 105.% OF MAX LOAD/ 1/
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:         :                 WED, JAN 13 1988  16:20 GENERATION=  40791.0 LOAD=  39729.4 INTERCHANGE=      0.0 LOSSES=   1057.9
:_________: NO. 2384  140 GENERATORS ON   106 BUSES                       INTERVAL       17  HOUR 57 LOAD= 39009.7  SO TEX 5 @ 2500.
                                                                                1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 104.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 107.% OF MAX LOAD/ 1/
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:         :                 WED, JAN 13 1988  16:23 GENERATION=  38651.7 LOAD=  37415.4 INTERCHANGE=      0.0 LOSSES=   1232.7
:_________: NO. 2385  114 GENERATORS ON    94 BUSES                       INTERVAL       17  HOUR 58 LOAD= 36616.8  SO TEX 5 @ 2500.
                                                                                1 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 108.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 102.% OF MAX LOAD/ 1/   RNDRK  S 138 TO MCNEIL 8 138 LINE @ 111.% OF MAX LOAD/ 1/

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:         :                 WED, JAN 13 1988  16:27 GENERATION=  36633.6 LOAD=  35236.0 INTERCHANGE=      0.0 LOSSES=   1394.1
:_________: NO. 2386  102 GENERATORS ON    86 BUSES                       INTERVAL       17  HOUR 59 LOAD= 34358.2  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   6 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.% OF MAX LOAD/ 1/   NORWDDPL 138 TO DEN DR E 138 LINE @ 101.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  W 138 LINE @ 105.% OF MAX LOAD/ 1/   E LEVEE  138 TO GRNVL  E 138 LINE @ 111.% OF MAX LOAD/ 1/
SANDOW   138 TO ELGIN SS 138 LINE @ 104.% OF MAX LOAD/ 1/   RNDRK  S 138 TO MCNEIL 8 138 LINE @ 117.% OF MAX LOAD/ 1/

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:          :                      WED, JAN 13 1988  16:3Ø GENERATION=  341Ø1.3 LOAD=  32799.9 INTERCHANGE=      Ø.Ø LOSSES=   1298.5
:__________: NO. 2393  1ØØ GENERATORS ON     85 BUSES                         INTERVAL      17  HOUR 66 LOAD= 31629.1  SO TEX 5 @ 25ØØ.
                                                                                     Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 114.% OF MAX LOAD/ 1/

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:          :                      WED, JAN 13 1988  16:35 GENERATION=  38Ø1Ø.Ø LOAD=  36929.Ø INTERCHANGE=      Ø.Ø LOSSES=   1Ø77.3
:__________: NO. 2395  111 GENERATORS ON     93 BUSES                         INTERVAL      17  HOUR 68 LOAD= 361Ø7.6  SO TEX 5 @ 25ØØ.
                                                                                     1 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

TDAD TR  1ØØ TO TRINIDAD 138 XFMR @ 1Ø5.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/

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:          :                      WED, JAN 13 1988  16:44 GENERATION=  39478.1 LOAD=  38471.5 INTERCHANGE=      Ø.Ø LOSSES=   1ØØ3.6
:__________: NO. 2396  126 GENERATORS ON     99 BUSES                         INTERVAL      17  HOUR 69 LOAD= 377Ø4.Ø  SO TEX 5 @ 25ØØ.
                                                                                     1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  1ØØ TO TRINIDAD 138 XFMR @ 1Ø3.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/
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:          :                      WED, JAN 13 1988  16:53 GENERATION=  35915.5 LOAD=  34935.4 INTERCHANGE=      Ø.Ø LOSSES=    977.6
:__________: NO. 24Ø6  1Ø3 GENERATORS ON     87 BUSES                         INTERVAL      17  HOUR 8Ø LOAD= 33828.4  SO TEX 5 @ 25ØØ.
                                                                                     Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1ØØ.% OF MAX LOAD/ 1/

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:          :                      WED, JAN 13 1988  17:Ø2 GENERATION=  38Ø67.6 LOAD=  36826.8 INTERCHANGE=      Ø.Ø LOSSES=   1236.9
:__________: NO. 24Ø7  11Ø GENERATORS ON     92 BUSES                         INTERVAL      17  HOUR 81 LOAD= 36Ø1Ø.8  SO TEX 5 @ 25ØØ.
                                                                                     Ø TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

NORWDDPL 138 TO DEN DR E 138 LINE @ 1Ø5.% OF MAX LOAD/ 1/    E LEVEE  138 TO GRNVL  W 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/
E LEVEE  138 TO GRNVL  E 138 LINE @ 112.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 114.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  17:09 GENERATION=  34910.1 LOAD=  33693.1 INTERCHANGE=       0.0 LOSSES=   1214.1
:__________: NO. 2417  100 GENERATORS ON    84 BUSES                     INTERVAL       18  HOUR  7 LOAD= 32548.1  SO TEX 5 @ 2500.
                                                                               0 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 104.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 110.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 109.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  17:12 GENERATION=  40212.8 LOAD=  39282.2 INTERCHANGE=       0.0 LOSSES=    927.6
:__________: NO. 2418  134 GENERATORS ON   101 BUSES                     INTERVAL       18  HOUR  8 LOAD= 38547.6  SO TEX 5 @ 2500.
                                                                               1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 101.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 106.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  17:15 GENERATION=  38244.7 LOAD=  37183.3 INTERCHANGE=       0.0 LOSSES=   1058.3
:__________: NO. 2420  111 GENERATORS ON    91 BUSES                     INTERVAL       18  HOUR 10 LOAD= 36371.9  SO TEX 5 @ 2500.
                                                                               0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 101.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 109.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  17:19 GENERATION=  31889.7 LOAD=  30892.5 INTERCHANGE=       0.0 LOSSES=    994.2
:__________: NO. 2421   97 GENERATORS ON    81 BUSES                     INTERVAL       18  HOUR 11 LOAD= 29660.0  SO TEX 5 @ 2500.
                                                                               0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 104.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  17:21 GENERATION=  35648.3 LOAD=  34479.8 INTERCHANGE=       0.0 LOSSES=   1165.5
:__________: NO. 2429  101 GENERATORS ON    85 BUSES                     INTERVAL       18  HOUR 19 LOAD= 33359.9  SO TEX 5 @ 2500.
                                                                               0 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 105.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 110.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 109.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  17:25 GENERATION=  4Ø592.1 LOAD=  39659.8 INTERCHANGE=      Ø.Ø LOSSES=    929.5
:__________: NO. 243Ø  138 GENERATORS ON   1Ø3 BUSES                       INTERVAL      18  HOUR 2Ø LOAD= 38938.4  SO TEX 5 @ 25ØØ.
                                                                                 1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  1ØØ TO TRINIDAD 138 XFMR @ 1Ø2.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  17:29 GENERATION=  42285.8 LOAD=  41424.9 INTERCHANGE=      Ø.Ø LOSSES=    858.4
:__________: NO. 2431  158 GENERATORS ON   113 BUSES                       INTERVAL      18  HOUR 21 LOAD= 4Ø764.1  SO TEX 5 @ 25ØØ.
                                                                                 1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

SANDOW   345 TO SANDOW   138 XFMR @ 1Ø2.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø4.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  17:32 GENERATION=  38726.4 LOAD=  37719.Ø INTERCHANGE=      Ø.Ø LOSSES=   1ØØ4.4
:__________: NO. 2432  119 GENERATORS ON    94 BUSES                       INTERVAL      18  HOUR 22 LOAD= 36926.8  SO TEX 5 @ 25ØØ.
                                                                                 Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  17:35 GENERATION=  34258.5 LOAD=  33122.8 INTERCHANGE=      Ø.Ø LOSSES=   1133.Ø
:__________: NO. 2433  1ØØ GENERATORS ON    84 BUSES                       INTERVAL      18  HOUR 23 LOAD= 31959.5  SO TEX 5 @ 25ØØ.
                                                                                 Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  17:38 GENERATION=  33316.7 LOAD=  32232.Ø INTERCHANGE=      Ø.Ø LOSSES=   1Ø82.1
:__________: NO. 244Ø  1ØØ GENERATORS ON    84 BUSES                       INTERVAL      18  HOUR 3Ø LOAD= 31Ø41.3  SO TEX 5 @ 25ØØ.
                                                                                 Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/

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:          :              WED, JAN 13 1988  17:40 GENERATION=  35866.1 LOAD=  34688.4 INTERCHANGE=       0.0 LOSSES=   1174.3
:__________: NO. 2441  100 GENERATORS ON    84 BUSES                   INTERVAL      18  HOUR 31 LOAD= 33578.5  SO TEX 5 @ 2500.
                                                                             0 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 105.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 111.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 110.% OF MAX LOAD/ 1/
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:          :              WED, JAN 13 1988  17:43 GENERATION=  40107.4 LOAD=  39268.4 INTERCHANGE=       0.0 LOSSES=    896.3
:__________: NO. 2442  135 GENERATORS ON   102 BUSES                   INTERVAL      18  HOUR 32 LOAD= 38537.7  SO TEX 5 @ 2500.
                                                                             2 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 102.% OF MAX LOAD/ 1/    SANDOW   345 TO SANDOW   138 XFMR @ 100.% OF MAX LOAD/ 1/

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 106.% OF MAX LOAD/ 1/
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:          :              WED, JAN 13 1988  17:47 GENERATION=  41934.1 LOAD=  41094.6 INTERCHANGE=       0.0 LOSSES=    836.1
:__________: NO. 2443  151 GENERATORS ON   111 BUSES                   INTERVAL      18  HOUR 33 LOAD= 40426.4  SO TEX 5 @ 2500.
                                                                             1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

SANDOW   345 TO SANDOW   138 XFMR @ 102.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 104.% OF MAX LOAD/ 1/
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:          :              WED, JAN 13 1988  17:50 GENERATION=  38849.0 LOAD=  37847.5 INTERCHANGE=       0.0 LOSSES=    998.4
:__________: NO. 2444  118 GENERATORS ON    93 BUSES                   INTERVAL      18  HOUR 34 LOAD= 37060.9  SO TEX 5 @ 2500.
                                                                             1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

TDAD TR  100 TO TRINIDAD 138 XFMR @ 101.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 106.% OF MAX LOAD/ 1/
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:          :              WED, JAN 13 1988  17:53 GENERATION=  34879.0 LOAD=  33695.6 INTERCHANGE=       0.0 LOSSES=   1180.3
:__________: NO. 2445  100 GENERATORS ON    84 BUSES                   INTERVAL      18  HOUR 35 LOAD= 32552.0  SO TEX 5 @ 2500.
                                                                             0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 110.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  17:56 GENERATION=  33486.2 LOAD=  32358.6 INTERCHANGE=      Ø.Ø LOSSES=   1124.8
:__________: NO. 2452   99 GENERATORS ON    83 BUSES                        INTERVAL      18  HOUR 42 LOAD= 31171.9  SO TEX 5 @ 25ØØ.
                                                                                  Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø4.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø6.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  17:59 GENERATION=  35957.Ø LOAD=  34769.1 INTERCHANGE=      Ø.Ø LOSSES=   1184.4
:__________: NO. 2453   99 GENERATORS ON    83 BUSES                        INTERVAL      18  HOUR 43 LOAD= 33661.4  SO TEX 5 @ 25ØØ.
                                                                                  Ø TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 11Ø.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 115.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 11Ø.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  18:Ø4 GENERATION=  39155.1 LOAD=  38166.9 INTERCHANGE=      Ø.Ø LOSSES=    985.Ø
:__________: NO. 2454  121 GENERATORS ON    94 BUSES                        INTERVAL      18  HOUR 44 LOAD= 37387.4  SO TEX 5 @ 25ØØ.
                                                                                  1 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

TDAD TR  1ØØ TO TRINIDAD 138 XFMR @ 1Ø2.% OF MAX LOAD/ 1/
LEON     138 TO LNGLVL M 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø7.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø7.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  18:Ø9 GENERATION=  41313.6 LOAD=  4Ø417.1 INTERCHANGE=      Ø.Ø LOSSES=    893.7
:__________: NO. 2455  144 GENERATORS ON   1Ø6 BUSES                        INTERVAL      18  HOUR 45 LOAD= 39717.7  SO TEX 5 @ 25ØØ.
                                                                                  Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø5.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  18:12 GENERATION=  35227.2 LOAD=  34Ø14.Ø INTERCHANGE=      Ø.Ø LOSSES=   121Ø.3
:__________: NO. 2457   97 GENERATORS ON    81 BUSES                        INTERVAL      18  HOUR 47 LOAD= 3288Ø.7  SO TEX 5 @ 25ØØ.
                                                                                  Ø TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø8.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 114.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 11Ø.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  18:15 GENERATION=  33318.8 LOAD=  32228.Ø INTERCHANGE=       Ø.Ø LOSSES=   1Ø88.1
:__________: NO. 2464   96 GENERATORS ON    8Ø BUSES                      INTERVAL       18  HOUR 54 LOAD= 31Ø37.2  SO TEX 5 @ 25ØØ.
                                                                                Ø TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø7.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  18:18 GENERATION=  36176.5 LOAD=  35Ø5Ø.6 INTERCHANGE=       Ø.Ø LOSSES=   1122.7
:__________: NO. 2465   97 GENERATORS ON    81 BUSES                      INTERVAL       18  HOUR 55 LOAD= 3394Ø.3  SO TEX 5 @ 25ØØ.
                                                                                Ø TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 114.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø7.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  18:21 GENERATION=  39151.2 LOAD=  38ØØ8.5 INTERCHANGE=       Ø.Ø LOSSES=   1139.3
:__________: NO. 2467  117 GENERATORS ON    91 BUSES                      INTERVAL       18  HOUR 57 LOAD= 37231.3  SO TEX 5 @ 25ØØ.
                                                                                1 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

TDAD TR  1ØØ TO TRINIDAD 138 XFMR @ 1Ø7.% OF MAX LOAD/ 1/
LEON     138 TO LNGLVL M 138 LINE @ 11Ø.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 116.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  18:24 GENERATION=  34684.4 LOAD=  33466.7 INTERCHANGE=       Ø.Ø LOSSES=   1214.6
:__________: NO. 2469   96 GENERATORS ON    8Ø BUSES                      INTERVAL       18  HOUR 59 LOAD= 32315.3  SO TEX 5 @ 25ØØ.
                                                                                Ø TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø5.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 111.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 11Ø.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  18:27 GENERATION=  35Ø42.8 LOAD=  34Ø67.6 INTERCHANGE=       Ø.Ø LOSSES=    972.8
:__________: NO. 2477   97 GENERATORS ON    81 BUSES                      INTERVAL       18  HOUR 67 LOAD= 32933.7  SO TEX 5 @ 25ØØ.
                                                                                Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø5.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  18:29 GENERATION=  36104.7 LOAD=  35Ø51.6 INTERCHANGE=      Ø.Ø LOSSES=   1Ø52.2
:__________: NO. 2478   98 GENERATORS ON    81 BUSES                  INTERVAL      18  HOUR 68 LOAD= 33949.4  SO TEX 5 @ 25ØØ.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø6.X OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  18:32 GENERATION=  36221.6 LOAD=  35149.Ø INTERCHANGE=      Ø.Ø LOSSES=   1Ø69.4
:__________: NO. 2479   98 GENERATORS ON    81 BUSES                  INTERVAL      18  HOUR 69 LOAD= 34Ø51.4  SO TEX 5 @ 25ØØ.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø7.X OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  18:35 GENERATION=  35Ø23.9 LOAD=  33882.3 INTERCHANGE=      Ø.Ø LOSSES=   1138.6
:__________: NO. 248Ø   98 GENERATORS ON    81 BUSES                  INTERVAL      18  HOUR 7Ø LOAD= 32744.2  SO TEX 5 @ 25ØØ.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø9.X OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  18:38 GENERATION=  36959.4 LOAD=  35975.5 INTERCHANGE=      Ø.Ø LOSSES=    98Ø.5
:__________: NO. 249Ø   99 GENERATORS ON    82 BUSES                  INTERVAL      18  HOUR 81 LOAD= 349Ø4.3  SO TEX 5 @ 25ØØ.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø6.X OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  18:41 GENERATION=  34995.8 LOAD=  33993.3 INTERCHANGE=      Ø.Ø LOSSES=    998.9
:__________: NO. 2491   98 GENERATORS ON    81 BUSES                  INTERVAL      18  HOUR 82 LOAD= 32857.2  SO TEX 5 @ 25ØØ.
                                                                          Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø6.X OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  19:Ø2 GENERATION=  36Ø78.4 LOAD=  3496Ø.5 INTERCHANGE=       Ø.Ø LOSSES=   1115.1
:__________: NO. 2515  1Ø7 GENERATORS ON    92 BUSES                    INTERVAL       19  HOUR 22 LOAD= 33854.2  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø5.X OF MAX LOAD/11/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1ØØ.X OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  19:Ø5 GENERATION=  32996.1 LOAD=  31914.5 INTERCHANGE=       Ø.Ø LOSSES=   1Ø78.7
:__________: NO. 2516   99 GENERATORS ON    87 BUSES                    INTERVAL       19  HOUR 23 LOAD= 3Ø713.8  SO TEX 5 @ 25ØØ.
                                                                              1 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø1.X OF MAX LOAD/11/
WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø6.X OF MAX LOAD/11/

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:          :                 WED, JAN 13 1988  19:Ø8 GENERATION=  34125.Ø LOAD=  32955.Ø INTERCHANGE=       Ø.Ø LOSSES=   1167.5
:__________: NO. 2524  1ØØ GENERATORS ON    87 BUSES                    INTERVAL       19  HOUR 31 LOAD= 31786.7  SO TEX 5 @ 25ØØ.
                                                                              1 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1ØØ.X OF MAX LOAD/11/
WTSN C 8 1ØØ TO JEWETT   138 LINE @ 11Ø.X OF MAX LOAD/11/    RNDRK     138 TO RNDRK WH 138 LINE @ 1Ø8.X OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø4.X OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø7.X OF MAX LOAD

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:          :                 WED, JAN 13 1988  19:11 GENERATION=  37791.8 LOAD=  3671Ø.Ø INTERCHANGE=       Ø.Ø LOSSES=   1Ø79.Ø
:__________: NO. 2525  126 GENERATORS ON   1Ø2 BUSES                    INTERVAL       19  HOUR 32 LOAD= 35658.Ø  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  19:14 GENERATION=  36Ø12.5 LOAD=  34896.Ø INTERCHANGE=       Ø.Ø LOSSES=   1113.3
:__________: NO. 2527  1Ø7 GENERATORS ON    92 BUSES                    INTERVAL       19  HOUR 34 LOAD= 33787.8  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø6.X OF MAX LOAD/11/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1ØØ.X OF MAX LOAD/ 1/

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:          :              WED, JAN 13 1988  18:44 GENERATION=  33718.3 LOAD=  3252Ø.3 INTERCHANGE=       Ø.Ø LOSSES=   1195.2
:__________: NO. 25ØØ   99 GENERATORS ON     87 BUSES                    INTERVAL       19  HOUR  7 LOAD= 31338.7  SO TEX 5 @ 25ØØ.
                                                                              1 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø2.% OF MAX LOAD/11/
WTSN C 8 1ØØ TO JEWETT   138 LINE @ 113.% OF MAX LOAD/11/    RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø5.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø9.% OF MAX LOAD

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:          :              WED, JAN 13 1988  18:48 GENERATION=  38133.4 LOAD=  37Ø9Ø.2 INTERCHANGE=       Ø.Ø LOSSES=   1Ø41.2
:__________: NO. 25Ø1   13Ø GENERATORS ON    1Ø4 BUSES                   INTERVAL       19  HOUR  8 LOAD= 36Ø49.7  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1ØØ.% OF MAX LOAD/ 1/
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:          :              WED, JAN 13 1988  18:53 GENERATION=  3648Ø.4 LOAD=  35389.Ø INTERCHANGE=       Ø.Ø LOSSES=   1Ø88.6
:__________: NO. 25Ø3   11Ø GENERATORS ON     94 BUSES                   INTERVAL       19  HOUR 1Ø LOAD= 34296.1  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1ØØ.% OF MAX LOAD/11/
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:          :              WED, JAN 13 1988  18:56 GENERATION=  34Ø1Ø.5 LOAD=  32829.Ø INTERCHANGE=       Ø.Ø LOSSES=   1179.2
:__________: NO. 2512   1ØØ GENERATORS ON     87 BUSES                   INTERVAL       19  HOUR 19 LOAD= 31656.9  SO TEX 5 @ 25ØØ.
                                                                              1 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø1.% OF MAX LOAD/11/
WTSN C 8 1ØØ TO JEWETT   138 LINE @ 112.% OF MAX LOAD/11/    RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø8.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø5.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø8.% OF MAX LOAD

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:          :              WED, JAN 13 1988  18:59 GENERATION=  37652.8 LOAD=  3663Ø.2 INTERCHANGE=       Ø.Ø LOSSES=   1Ø19.8
:__________: NO. 2513   123 GENERATORS ON    1Ø1 BUSES                   INTERVAL       19  HOUR 2Ø LOAD= 35575.7  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1ØØ.% OF MAX LOAD/ 1/
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:          :
:__________: NO. 2573   109 GENERATORS ON    93 BUSES
                  WED, JAN 13 1988  19:29 GENERATION=  36416.4 LOAD=  35286.4 INTERCHANGE=       0.0 LOSSES=   1126.
                                                        INTERVAL       19  HOUR 81 LOAD= 34190.3  SO TEX 5 @ 25
                                                            0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)
WTSN C 8 100 TO JEWETT   138 LINE @ 105.% OF MAX LOAD/11/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 102.% OF MAX LOAD/ 1/
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:          :
:__________: NO. 2574   102 GENERATORS ON    89 BUSES
                  WED, JAN 13 1988  19:32 GENERATION=  35229.5 LOAD=  34003.4 INTERCHANGE=       0.0 LOSSES=   1223.
                                                        INTERVAL       19  HOUR 82 LOAD= 32867.6  SO TEX 5 @ 25
                                                            2 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)
HEARNE 8 100 TO HEARNE 9 100 XFMR @ 103.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 102.% OF MAX LOAD/ 1/
WTSN C 8 100 TO JEWETT   138 LINE @ 114.% OF MAX LOAD/11/    RNDRK    138 TO RNDRK WH 138 LINE @ 106.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 105.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 105.% OF MAX LOAD
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:          :
:__________: NO. 2575    96 GENERATORS ON    84 BUSES
                  WED, JAN 13 1988  19:35 GENERATION=  31826.3 LOAD=  30588.0 INTERCHANGE=       0.0 LOSSES=   1235.5
                                                        INTERVAL       19  HOUR 83 LOAD= 29346.3  SO TEX 5 @ 2500
                                                            1 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)
HEARNE 8 100 TO HEARNE 9 100 XFMR @ 107.% OF MAX LOAD/11/
WTSN C 8 100 TO JEWETT   138 LINE @ 119.% OF MAX LOAD/11/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 103.% OF MAX LOAD
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:          :
:__________: NO. 2583    86 GENERATORS ON    74 BUSES
                  WED, JAN 13 1988  19:38 GENERATION=  31164.0 LOAD=  30117.6 INTERCHANGE=       0.0 LOSSES=   1043.6
                                                        INTERVAL       20  HOUR  7 LOAD= 28861.4  SO TEX 5 @ 2500.
                                                            0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)
WTSN C 8 100 TO JEWETT   138 LINE @ 102.% OF MAX LOAD/11/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 107.% OF MAX LOAD
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:          :                WED, JAN 13 1988  19:17 GENERATION=  33005.2 LOAD=  31856.4 INTERCHANGE=      0.0 LOSSES=   1147.1
:__________: NO. 2536   98 GENERATORS ON    86 BUSES                      INTERVAL      19  HOUR 43 LOAD= 30653.9  SO TEX 5 @ 2500.
                                                                                 1 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 102.% OF MAX LOAD/11/
WTSN C 8 100 TO JEWETT   138 LINE @ 112.% OF MAX LOAD/11/    RNDRK    138 TO RNDRK WH 138 LINE @ 102.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 103.% OF MAX LOAD

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:          :                WED, JAN 13 1988  19:20 GENERATION=  36145.3 LOAD=  34847.0 INTERCHANGE=      0.0 LOSSES=   1295.4
:__________: NO. 2539  107 GENERATORS ON    92 BUSES                      INTERVAL      19  HOUR 46 LOAD= 33737.3  SO TEX 5 @ 2500.
                                                                                 2 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 102.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 103.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 118.% OF MAX LOAD/11/    RNDRK    138 TO RNDRK WH 138 LINE @ 105.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 105.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 111.% OF MAX LOAD

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:          :                WED, JAN 13 1988  19:23 GENERATION=  33989.7 LOAD=  32527.9 INTERCHANGE=      0.0 LOSSES=   1459.2
:__________: NO. 2548   98 GENERATORS ON    86 BUSES                      INTERVAL      19  HOUR 55 LOAD= 31346.4  SO TEX 5 @ 2500.
                                                                                 2 TRANSFORMER PROBLEM(S)   4 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 109.% OF MAX LOAD/11/    MINERVA  138 TO MINERVA   69 XFMR @ 107.% OF MAX LOAD/ 1/

WTSN C 8 100 TO JEWETT   138 LINE @ 133.% OF MAX LOAD/11/    RNDRK    138 TO RNDRK WH 138 LINE @ 113.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 110.% OF MAX LOAD/ 1/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 124.% OF MAX LOAD

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:          :                WED, JAN 13 1988  19:26 GENERATION=  33825.9 LOAD=  32704.6 INTERCHANGE=      0.0 LOSSES=   1118.4
:__________: NO. 2551   99 GENERATORS ON    87 BUSES                      INTERVAL      19  HOUR 58 LOAD= 31528.7  SO TEX 5 @ 2500.
                                                                                 0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 102.% OF MAX LOAD/11/

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:          :                    WED, JAN 13 1988  19:53 GENERATION=  31108.1 LOAD=  29968.1 INTERCHANGE=       0.0 LOSSES=   1137.9
:__________: NO. 2632   78 GENERATORS ON    67 BUSES                         INTERVAL      20  HOUR 56 LOAD= 28706.7  SO TEX 5 @ 2500.
                                                                                  0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 101.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 106.% OF MAX LOAD/ 1/

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:          :                    WED, JAN 13 1988  19:56 GENERATION=  30021.9 LOAD=  28925.1 INTERCHANGE=       0.0 LOSSES=   1094.2
:__________: NO. 2633   75 GENERATORS ON    64 BUSES                         INTERVAL      20  HOUR 57 LOAD= 27631.6  SO TEX 5 @ 2500.
                                                                                  0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 102.% OF MAX LOAD/ 1/

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:          :                    WED, JAN 13 1988  19:58 GENERATION=  31986.7 LOAD=  30817.8 INTERCHANGE=       0.0 LOSSES=   1166.1
:__________: NO. 2657   81 GENERATORS ON    69 BUSES                         INTERVAL      20  HOUR 82 LOAD= 29583.3  SO TEX 5 @ 2500.
                                                                                  0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 102.% OF MAX LOAD/11/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 105.% OF MAX LOAD

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:          :                    WED, JAN 13 1988  20:01 GENERATION=  31224.1 LOAD=  29992.0 INTERCHANGE=       0.0 LOSSES=   1229.8
:__________: NO. 2658   78 GENERATORS ON    67 BUSES                         INTERVAL      20  HOUR 83 LOAD= 28731.7  SO TEX 5 @ 2500.
                                                                                  1 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

HEARNE 8 100 TO HEARNE 9 100 XFMR @ 104.% OF MAX LOAD/11/
WTSN C 8 100 TO JEWETT   138 LINE @ 109.% OF MAX LOAD/11/    LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 103.% OF MAX LOAD

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:          :                    WED, JAN 13 1988  20:04 GENERATION=  25434.5 LOAD=  24750.9 INTERCHANGE=       0.0 LOSSES=    683.5
:__________: NO. 2748   62 GENERATORS ON    47 BUSES                         INTERVAL      22  HOUR  6 LOAD= 23328.0  COM PEAK @ 2070.
                                                                                  0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 101.% OF MAX LOAD/ 1/

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:          :                    WED, JAN 13 1988  19:41 GENERATION=  35Ø66.4 LOAD=  33865.9 INTERCHANGE=      Ø.Ø LOSSES=   1197.4
:__________: NO. 2584   93 GENERATORS ON     78 BUSES                          INTERVAL      2Ø  HOUR  8 LOAD= 32725.8  SO TEX 5 @ 25ØØ.
                                                                                     Ø TRANSFORMER PROBLEM(S)   5 LINE PROBLEM(S)

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø4.% OF MAX LOAD/11/    LEON      138 TO LNGLVL M 138 LINE @ 1Ø3.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø8.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 1Ø8.% OF MAX LOAD
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:          :                    WED, JAN 13 1988  19:44 GENERATION=  29Ø16.6 LOAD=  27685.5 INTERCHANGE=      Ø.Ø LOSSES=   1328.8
:__________: NO. 2594   74 GENERATORS ON     63 BUSES                          INTERVAL      2Ø  HOUR 18 LOAD= 26353.4  SO TEX 5 @ 25ØØ.
                                                                                     1 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø7.% OF MAX LOAD/11/
WTSN C 8 1ØØ TO JEWETT   138 LINE @ 122.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø1.% OF MAX LOAD/ 1/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 119.% OF MAX LOAD
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:          :                    WED, JAN 13 1988  19:47 GENERATION=  32945.8 LOAD=  315ØØ.5 INTERCHANGE=      Ø.Ø LOSSES=   1443.5
:__________: NO. 2595   84 GENERATORS ON     71 BUSES                          INTERVAL      2Ø  HOUR 19 LOAD= 3Ø287.Ø  SO TEX 5 @ 25ØØ.
                                                                                     2 TRANSFORMER PROBLEM(S)   7 LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø3.% OF MAX LOAD/11/    MINERVA   138 TO MINERVA   69 XFMR @ 1Ø2.% OF MAX LOAD/ 1/

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 124.% OF MAX LOAD/11/    LEON      138 TO LNGLVL M 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 115.% OF MAX LOAD/ 1/    RNDRK     138 TO RNDRK WH 138 LINE @ 1Ø7.% OF MAX LOAD/ 1/
RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø8.% OF MAX LOAD/ 1/    MASON4    138 TO GILLSPE8 138 LINE @ 11Ø.% OF MAX LOAD/ 6/
LAMPSAS8 138 TO GOLDTWT8 138 LINE @ 136.% OF MAX LOAD
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:          :                    WED, JAN 13 1988  19:5Ø GENERATION=  32538.3 LOAD=  31467.1 INTERCHANGE=      Ø.Ø LOSSES=   1Ø68.4
:__________: NO. 2596   84 GENERATORS ON     71 BUSES                          INTERVAL      2Ø  HOUR 2Ø LOAD= 3Ø252.7  SO TEX 5 @ 25ØØ.
                                                                                     Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø7.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  2Ø:Ø7 GENERATION=  24823.4 LOAD=  24134.8 INTERCHANGE=      Ø.Ø LOSSES=    688.5
:__________: NO. 276Ø   61 GENERATORS ON    47 BUSES                    INTERVAL       22  HOUR 18 LOAD= 22692.8  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø4.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  2Ø:1Ø GENERATION=  28335.3 LOAD=  27627.2 INTERCHANGE=      Ø.Ø LOSSES=    7Ø7.9
:__________: NO. 2762   74 GENERATORS ON    56 BUSES                    INTERVAL       22  HOUR 2Ø LOAD= 26293.4  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø1.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  2Ø:12 GENERATION=  2563Ø.1 LOAD=  249Ø8.Ø INTERCHANGE=      Ø.Ø LOSSES=    722.3
:__________: NO. 2772   63 GENERATORS ON    48 BUSES                    INTERVAL       22  HOUR 3Ø LOAD= 23489.8  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1ØØ.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø6.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  2Ø:15 GENERATION=  28434.2 LOAD=  27688.Ø INTERCHANGE=      Ø.Ø LOSSES=    746.Ø
:__________: NO. 2776   75 GENERATORS ON    57 BUSES                    INTERVAL       22  HOUR 34 LOAD= 26356.1  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  2Ø:18 GENERATION=  25741.Ø LOAD=  25Ø27.1 INTERCHANGE=      Ø.Ø LOSSES=    714.2
:__________: NO. 2783   64 GENERATORS ON    49 BUSES                    INTERVAL       22  HOUR 41 LOAD= 23612.8  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø5.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  2Ø:21 GENERATION=  26412.3 LOAD=  2567Ø.3 INTERCHANGE=      Ø.Ø LOSSES=    742.1
:__________: NO. 2784   69 GENERATORS ON    51 BUSES                    INTERVAL       22  HOUR 42 LOAD= 24275.8  COM PEAK @ 2Ø7Ø.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø6.% OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  2Ø:24 GENERATION=  24264.5 LOAD=  23598.9 INTERCHANGE=       Ø.Ø LOSSES=    665.4
:__________: NO. 28Ø8   58 GENERATORS ON    44 BUSES                     INTERVAL       22  HOUR 66 LOAD= 2214Ø.3  COM PEAK @ 2Ø7Ø.
                                                                               Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø1.X OF MAX LOAD/ 1/
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:          :                  WED, JAN 13 1988  2Ø:27 GENERATION=  25Ø6Ø.5 LOAD=  24114.7 INTERCHANGE=       Ø.Ø LOSSES=    943.8
:__________: NO. 2832   66 GENERATORS ON    6Ø BUSES                     INTERVAL       23  HOUR  7 LOAD= 22673.5  SO TEX 5 @ 25ØØ.
                                                                               Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø6.X OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø4.X OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  2Ø:3Ø GENERATION=  25Ø95.8 LOAD=  242Ø8.8 INTERCHANGE=       Ø.Ø LOSSES=    885.3
:__________: NO. 2833   67 GENERATORS ON    61 BUSES                     INTERVAL       23  HOUR  8 LOAD= 2277Ø.3  SO TEX 5 @ 25ØØ.
                                                                               Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø1.X OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1ØØ.X OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  2Ø:34 GENERATION=  2483Ø.9 LOAD=  23923.8 INTERCHANGE=       Ø.Ø LOSSES=    9Ø5.Ø
:__________: NO. 2834   67 GENERATORS ON    61 BUSES                     INTERVAL       23  HOUR  9 LOAD= 22475.2  SO TEX 5 @ 25ØØ.
                                                                               Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

WTSN C 8 1ØØ TO JEWETT   138 LINE @ 1Ø4.X OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø3.X OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  2Ø:37 GENERATION=  2419Ø.7 LOAD=  23335.5 INTERCHANGE=       Ø.Ø LOSSES=    853.1
:__________: NO. 2836   65 GENERATORS ON    59 BUSES                     INTERVAL       23  HOUR 11 LOAD= 21868.7  SO TEX 5 @ 25ØØ.
                                                                               Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø2.X OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  20:40 GENERATION=  23991.8 LOAD=  23147.4 INTERCHANGE=      0.0 LOSSES=    842.3
:__________: NO. 2848   64 GENERATORS ON    58 BUSES                      INTERVAL      23  HOUR 23 LOAD= 21674.8  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  20:43 GENERATION=  21599.4 LOAD=  20949.0 INTERCHANGE=      0.0 LOSSES=    648.4
:__________: NO. 2849   55 GENERATORS ON    53 BUSES                      INTERVAL      23  HOUR 24 LOAD= 19408.4  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 101.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  20:46 GENERATION=  23300.3 LOAD=  22529.4 INTERCHANGE=      0.0 LOSSES=    777.8
:__________: NO. 2853   62 GENERATORS ON    56 BUSES                      INTERVAL      23  HOUR 28 LOAD= 21037.8  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 102.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  20:49 GENERATION=  21718.8 LOAD=  21083.3 INTERCHANGE=      0.0 LOSSES=    633.6
:__________: NO. 2861   58 GENERATORS ON    55 BUSES                      INTERVAL      23  HOUR 36 LOAD= 19546.9  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 102.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  20:52 GENERATION=  24045.6 LOAD=  23221.4 INTERCHANGE=      0.0 LOSSES=    822.4
:__________: NO. 2865   66 GENERATORS ON    59 BUSES                      INTERVAL      23  HOUR 40 LOAD= 21751.2  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 101.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 107.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  20:56 GENERATION=  26799.1 LOAD=  25933.5 INTERCHANGE=      0.0 LOSSES=    863.8
:__________: NO. 2870   78 GENERATORS ON    70 BUSES                      INTERVAL      23  HOUR 45 LOAD= 24547.2  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 103.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 102.% OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  20:59 GENERATION=  22469.6 LOAD=  21791.5 INTERCHANGE=       0.0 LOSSES=    676.2
:__________: NO. 2873   61 GENERATORS ON    57 BUSES                        INTERVAL       23  HOUR 48 LOAD= 20276.8  SO TEX 5 @ 2500.
                                                                                     0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON      138 TO LNGLVL M 138 LINE @ 101.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 107.% OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  21:02 GENERATION=  23873.5 LOAD=  22982.6 INTERCHANGE=       0.0 LOSSES=    888.8
:__________: NO. 2877   68 GENERATORS ON    61 BUSES                        INTERVAL       23  HOUR 52 LOAD= 21504.8  SO TEX 5 @ 2500.
                                                                                     0 TRANSFORMER PROBLEM(S)   3 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 106.% OF MAX LOAD/11/    LEON      138 TO LNGLVL M 138 LINE @ 102.% OF MAX LOAD/ 1/
LNGLVL M 138 TO STPHVIL  138 LINE @ 107.% OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  21:05 GENERATION=  27424.6 LOAD=  26575.1 INTERCHANGE=       0.0 LOSSES=    847.4
:__________: NO. 2880   76 GENERATORS ON    68 BUSES                        INTERVAL       23  HOUR 55 LOAD= 25208.4  SO TEX 5 @ 2500.
                                                                                     0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

WTSN C 8 100 TO JEWETT   138 LINE @ 103.% OF MAX LOAD/11/    LNGLVL M 138 TO STPHVIL  138 LINE @ 105.% OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  21:08 GENERATION=  24020.2 LOAD=  23226.9 INTERCHANGE=       0.0 LOSSES=    791.3
:__________: NO. 2884   64 GENERATORS ON    58 BUSES                        INTERVAL       23  HOUR 59 LOAD= 21756.7  SO TEX 5 @ 2500.
                                                                                     0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 102.% OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  21:11 GENERATION=  22211.2 LOAD=  21532.9 INTERCHANGE=       0.0 LOSSES=    676.4
:__________: NO. 2885   57 GENERATORS ON    54 BUSES                        INTERVAL       23  HOUR 60 LOAD= 20010.4  SO TEX 5 @ 2500.
                                                                                     0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 104.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  21:14 GENERATION=  23145.3 LOAD=  22298.4 INTERCHANGE=      Ø.Ø LOSSES=    845.1
:__________: NO. 289Ø   6Ø GENERATORS ON    55 BUSES                      INTERVAL       23  HOUR 65 LOAD= 2Ø799.6  SO TEX 5 @ 25ØØ.
                                                                                Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 111.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 116.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  21:17 GENERATION=  23271.2 LOAD=  22453.8 INTERCHANGE=      Ø.Ø LOSSES=    815.4
:__________: NO. 2892   61 GENERATORS ON    55 BUSES                      INTERVAL       23  HOUR 67 LOAD= 2Ø959.7  SO TEX 5 @ 25ØØ.
                                                                                Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø8.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 114.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  21:2Ø GENERATION=  22112.2 LOAD=  21418.8 INTERCHANGE=      Ø.Ø LOSSES=    691.4
:__________: NO. 2893   58 GENERATORS ON    54 BUSES                      INTERVAL       23  HOUR 68 LOAD= 19892.8  SO TEX 5 @ 25ØØ.
                                                                                Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø1.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø6.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  21:23 GENERATION=  23Ø28.9 LOAD=  22212.6 INTERCHANGE=      Ø.Ø LOSSES=    814.2
:__________: NO. 2894   61 GENERATORS ON    55 BUSES                      INTERVAL       23  HOUR 69 LOAD= 2Ø711.Ø  SO TEX 5 @ 25ØØ.
                                                                                Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø8.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 114.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  21:26 GENERATION=  23Ø18.3 LOAD=  22237.Ø INTERCHANGE=      Ø.Ø LOSSES=    779.2
:__________: NO. 2896   61 GENERATORS ON    55 BUSES                      INTERVAL       23  HOUR 71 LOAD= 2Ø736.2  SO TEX 5 @ 25ØØ.
                                                                                Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø9.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 114.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  21:29 GENERATION   21472.3 LOAD=  20802.0 INTERCHANGE=       0.0 LOSSES=    668.4
:__________: NO. 2901   55 GENERATORS ON     53 BUSES                     INTERVAL       23  HOUR 77 LOAD= 19256.7  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.X OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  21:32 GENERATION=  24292.6 LOAD=  23437.2 INTERCHANGE=       0.0 LOSSES=    853.2
:__________: NO. 2906   65 GENERATORS ON     59 BUSES                     INTERVAL       23  HOUR 82 LOAD= 21973.5  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 109.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 115.X OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  21:35 GENERATION=  23026.9 LOAD=  22261.8 INTERCHANGE=       0.0 LOSSES=    763.0
:__________: NO. 2907   61 GENERATORS ON     55 BUSES                     INTERVAL       23  HOUR 83 LOAD= 20761.9  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 105.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 110.X OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  21:38 GENERATION=  20130.6 LOAD=  19631.3 INTERCHANGE=       0.0 LOSSES=    497.9
:__________: NO. 2911   53 GENERATORS ON     48 BUSES                     INTERVAL       24  HOUR  3 LOAD= 18049.8  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.X OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  21:41 GENERATION=  27389.2 LOAD=  26419.8 INTERCHANGE=       0.0 LOSSES=    967.0
:__________: NO. 2917   67 GENERATORS ON     58 BUSES                     INTERVAL       24  HOUR  9 LOAD= 25048.7  SO TEX 5 @ 2500.
                                                                                0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 101.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 106.X OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  21:44 GENERATION=  28416.2 LOAD=  27410.8 INTERCHANGE=      0.0 LOSSES=   1003.0
:__________: NO. 2918   74 GENERATORS ON    63 BUSES                   INTERVAL       24  HOUR 10 LOAD= 26070.3  SO TEX 5 @ 2500.
                                                                             0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 105.% OF MAX LOAD/ 1/
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:          :             WED, JAN 13 1988  21:47 GENERATION=  22932.7 LOAD=  22208.9 INTERCHANGE=      0.0 LOSSES=    721.6
:__________: NO. 2920   57 GENERATORS ON    51 BUSES                   INTERVAL       24  HOUR 12 LOAD= 20707.3  SO TEX 5 @ 2500.
                                                                             0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 106.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 111.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  21:50 GENERATION=  21776.8 LOAD=  21162.2 INTERCHANGE=      0.0 LOSSES=    613.2
:__________: NO. 2923   56 GENERATORS ON    50 BUSES                   INTERVAL       24  HOUR 15 LOAD= 19628.2  SO TEX 5 @ 2500.
                                                                             0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.% OF MAX LOAD/ 1/
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:          :             WED, JAN 13 1988  21:53 GENERATION=  27411.8 LOAD=  26434.8 INTERCHANGE=      0.0 LOSSES=    974.6
:__________: NO. 2925   72 GENERATORS ON    61 BUSES                   INTERVAL       24  HOUR 17 LOAD= 25064.1  SO TEX 5 @ 2500.
                                                                             0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 102.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 108.% OF MAX LOAD/ 1/

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:          :             WED, JAN 13 1988  21:56 GENERATION=  27835.9 LOAD=  26890.9 INTERCHANGE=      0.0 LOSSES=    942.6
:__________: NO. 2926   74 GENERATORS ON    63 BUSES                   INTERVAL       24  HOUR 18 LOAD= 25534.2  SO TEX 5 @ 2500.
                                                                             0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 102.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 107.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  21:58 GENERATION=  28736.Ø LOAD=  27739.5 INTERCHANGE=      Ø.Ø LOSSES=    994.4
:__________: NO. 293Ø   76 GENERATORS ON    64 BUSES                     INTERVAL       24  HOUR 22 LOAD= 264Ø9.2  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø5.X OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  22:Ø2 GENERATION=  27922.7 LOAD=  26956.7 INTERCHANGE=      Ø.Ø LOSSES=    963.6
:__________: NO. 2931   73 GENERATORS ON    63 BUSES                     INTERVAL       24  HOUR 23 LOAD= 256Ø2.1  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø6.X OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  22:Ø5 GENERATION=  28Ø43.1 LOAD=  27Ø55.7 INTERCHANGE=      Ø.Ø LOSSES=    985.Ø
:__________: NO. 2936   71 GENERATORS ON    62 BUSES                     INTERVAL       24  HOUR 28 LOAD= 257Ø4.3  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø2.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø7.X OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  22:Ø8 GENERATION=  27746.5 LOAD=  26768.Ø INTERCHANGE=      Ø.Ø LOSSES=    976.4
:__________: NO. 2937   73 GENERATORS ON    63 BUSES                     INTERVAL       24  HOUR 29 LOAD= 254Ø7.5  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø3.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø9.X OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  22:11 GENERATION=  2735Ø.7 LOAD=  26422.8 INTERCHANGE=      Ø.Ø LOSSES=    925.7
:__________: NO. 2942   69 GENERATORS ON    59 BUSES                     INTERVAL       24  HOUR 34 LOAD= 25Ø51.7  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1ØØ.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø5.X OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  22:14 GENERATION=  21183.7 LOAD=  2Ø636.4 INTERCHANGE=       Ø.Ø LOSSES=    545.5
:__________: NO. 2945    53 GENERATORS ON     48 BUSES                   INTERVAL       24  HOUR 37 LOAD= 19Ø86.2  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø1.X OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  22:16 GENERATION=  2184Ø.Ø LOAD=  21228.2 INTERCHANGE=       Ø.Ø LOSSES=    61Ø.2
:__________: NO. 2947    53 GENERATORS ON     48 BUSES                   INTERVAL       24  HOUR 39 LOAD= 19696.3  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø2.X OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  22:19 GENERATION=  23358.8 LOAD=  226Ø5.Ø INTERCHANGE=       Ø.Ø LOSSES=    751.5
:__________: NO. 2951    54 GENERATORS ON     48 BUSES                   INTERVAL       24  HOUR 43 LOAD= 21115.8  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø6.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 112.X OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  22:22 GENERATION=  2152Ø.Ø LOAD=  2Ø921.Ø INTERCHANGE=       Ø.Ø LOSSES=    597.7
:__________: NO. 2952    5Ø GENERATORS ON     45 BUSES                   INTERVAL       24  HOUR 44 LOAD= 19379.4  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø7.X OF MAX LOAD/ 1/

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:          :                  WED, JAN 13 1988  22:25 GENERATION=  21943.7 LOAD=  213Ø7.1 INTERCHANGE=       Ø.Ø LOSSES=    635.1
:__________: NO. 2953    5Ø GENERATORS ON     45 BUSES                   INTERVAL       24  HOUR 45 LOAD= 19777.5  SO TEX 5 @ 25ØØ.
                                                                              Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø3.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø8.X OF MAX LOAD/ 1/

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:          :            WED, JAN 13 1988  22:27 GENERATION=  20706.6 LOAD=  20145.2 INTERCHANGE=      0.0 LOSSES=    560.0
:__________: NO. 2956   50 GENERATORS ON    45 BUSES                 INTERVAL       24  HOUR 48 LOAD= 18579.7  SO TEX 5 @ 2500.
                                                                          0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 103.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 109.% OF MAX LOAD/ 1/

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:          :            WED, JAN 13 1988  22:30 GENERATION=  23628.1 LOAD=  22894.7 INTERCHANGE=      0.0 LOSSES=    731.2
:__________: NO. 2963   52 GENERATORS ON    46 BUSES                 INTERVAL       24  HOUR 55 LOAD= 21414.2  SO TEX 5 @ 2500.
                                                                          0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.% OF MAX LOAD/ 1/
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:          :            WED, JAN 13 1988  22:33 GENERATION=  23360.6 LOAD=  22591.9 INTERCHANGE=      0.0 LOSSES=    766.4
:__________: NO. 2967   51 GENERATORS ON    46 BUSES                 INTERVAL       24  HOUR 59 LOAD= 21102.2  SO TEX 5 @ 2500.
                                                                          0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.% OF MAX LOAD/ 1/
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:          :            WED, JAN 13 1988  22:36 GENERATION=  21324.2 LOAD=  20754.1 INTERCHANGE=      0.0 LOSSES=    568.5
:__________: NO. 2968   50 GENERATORS ON    45 BUSES                 INTERVAL       24  HOUR 60 LOAD= 19207.5  SO TEX 5 @ 2500.
                                                                          0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 101.% OF MAX LOAD/ 1/
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:          :            WED, JAN 13 1988  22:39 GENERATION=  22348.6 LOAD=  21642.8 INTERCHANGE=      0.0 LOSSES=    703.8
:__________: NO. 2972   50 GENERATORS ON    45 BUSES                 INTERVAL       24  HOUR 64 LOAD= 20123.6  SO TEX 5 @ 2500.
                                                                          0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 102.% OF MAX LOAD/ 1/
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:          :            WED, JAN 13 1988  22:42 GENERATION=  23947.2 LOAD=  23119.8 INTERCHANGE=      0.0 LOSSES=    825.1
:__________: NO. 2974   55 GENERATORS ON    48 BUSES                 INTERVAL       24  HOUR 66 LOAD= 21646.3  SO TEX 5 @ 2500.
                                                                          0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 108.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 113.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  22:44 GENERATION=  22255.6 LOAD=  21596.0 INTERCHANGE=       0.0 LOSSES=    657.8
:__________: NO. 2975   51 GENERATORS ON    46 BUSES                          INTERVAL      24  HOUR 67 LOAD= 20075.5  SO TEX 5 @ 2500.
                                                                                    0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  22:47 GENERATION=  22104.9 LOAD=  21456.8 INTERCHANGE=       0.0 LOSSES=    646.3
:__________: NO. 2977   51 GENERATORS ON    46 BUSES                          INTERVAL      24  HOUR 69 LOAD= 19932.0  SO TEX 5 @ 2500.
                                                                                    0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 103.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  22:50 GENERATION=  23987.6 LOAD=  23143.0 INTERCHANGE=       0.0 LOSSES=    842.4
:__________: NO. 2978   55 GENERATORS ON    48 BUSES                          INTERVAL      24  HOUR 70 LOAD= 21671.2  SO TEX 5 @ 2500.
                                                                                    0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 108.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 113.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  22:53 GENERATION=  22954.0 LOAD=  22214.9 INTERCHANGE=       0.0 LOSSES=    736.9
:__________: NO. 2979   51 GENERATORS ON    46 BUSES                          INTERVAL      24  HOUR 71 LOAD= 20713.6  SO TEX 5 @ 2500.
                                                                                    0 TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 106.% OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 112.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  22:56 GENERATION=  22072.9 LOAD=  21403.7 INTERCHANGE=       0.0 LOSSES=    667.5
:__________: NO. 2986   50 GENERATORS ON    45 BUSES                          INTERVAL      24  HOUR 79 LOAD= 19877.1  SO TEX 5 @ 2500.
                                                                                    0 TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

LNGLVL M 138 TO STPHVIL  138 LINE @ 101.% OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  22:59 GENERATION=  22633.Ø LOAD=  21912.4 INTERCHANGE=       Ø.Ø LOSSES=    718.5
:__________: NO. 2988   5Ø GENERATORS ON    45 BUSES                     INTERVAL      24  HOUR 81 LOAD= 2Ø4Ø1.7  SO TEX 5 @ 25ØØ.
                                                                               Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

LEON     138 TO LNGLVL M 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/    LNGLVL M 138 TO STPHVIL  138 LINE @ 1Ø6.X OF MAX LOAD/ 1/

*****************************************************************************************************
:          :                 WED, JAN 13 1988  23:Ø2 GENERATION=  26Ø81.3 LOAD=  25264.9 INTERCHANGE=       Ø.Ø LOSSES=    815.9
:__________: NO. 2995   77 GENERATORS ON    68 BUSES                     INTERVAL      25  HOUR  4 LOAD= 23857.9  COM PEAK @ 2Ø7Ø.
                                                                               Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø7.X OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø3.X OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  23:Ø5 GENERATION=  27Ø44.7 LOAD=  262Ø9.3 INTERCHANGE=       Ø.Ø LOSSES=    834.9
:__________: NO. 2996   79 GENERATORS ON    7Ø BUSES                     INTERVAL      25  HOUR  5 LOAD= 24831.5  COM PEAK @ 2Ø7Ø.
                                                                               Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø4.X OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.X OF MAX LOAD/ 1/

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:          :                 WED, JAN 13 1988  23:Ø8 GENERATION=  27298.3 LOAD=  26574.7 INTERCHANGE=       Ø.Ø LOSSES=    723.5
:__________: NO. 3ØØ8   82 GENERATORS ON    73 BUSES                     INTERVAL      25  HOUR 17 LOAD= 252Ø8.3  COM PEAK @ 2Ø7Ø.
                                                                               Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø3.X OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.X OF MAX LOAD/ 1/

*****************************************************************************************************
:          :                 WED, JAN 13 1988  23:11 GENERATION=  276Ø5.7 LOAD=  269Ø4.4 INTERCHANGE=       Ø.Ø LOSSES=    7Ø1.1
:__________: NO. 3ØØ9   86 GENERATORS ON    75 BUSES                     INTERVAL      25  HOUR 18 LOAD= 25548.2  COM PEAK @ 2Ø7Ø.
                                                                               Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø1.X OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  23:14 GENERATION=  27564.8 LOAD=  26833.Ø INTERCHANGE=      Ø.Ø LOSSES=     731.6
:__________: NO. 3Ø2Ø    83 GENERATORS ON     73 BUSES                   INTERVAL       25  HOUR 29 LOAD= 25474.6  COM PEAK @ 2Ø7Ø.
                                                                               Ø TRANSFORMER PROBLEM(S)   1 LINE PROBLEM(S)

RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1ØØ.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  23:17 GENERATION=  28152.1 LOAD=  27465.7 INTERCHANGE=      Ø.Ø LOSSES=     685.9
:__________: NO. 3Ø24    92 GENERATORS ON     77 BUSES                   INTERVAL       25  HOUR 33 LOAD= 26126.9  COM PEAK @ 2Ø7Ø.
                                                                               Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1ØØ.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

**************************************************************************************************
:          :                WED, JAN 13 1988  23:2Ø GENERATION=  266Ø8.4 LOAD=  25852.Ø INTERCHANGE=      Ø.Ø LOSSES=     756.Ø
:__________: NO. 3Ø31    77 GENERATORS ON     69 BUSES                   INTERVAL       25  HOUR 4Ø LOAD= 24463.1  COM PEAK @ 2Ø7Ø.
                                                                               Ø TRANSFORMER PROBLEM(S)   2 LINE PROBLEM(S)

RNDRK    138 TO RNDRK WH 138 LINE @ 1Ø5.% OF MAX LOAD/ 1/    RNDRK  S 138 TO MCNEIL 8 138 LINE @ 1Ø2.% OF MAX LOAD/ 1/

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:          :                WED, JAN 13 1988  23:23 GENERATION=  26Ø42.2 LOAD=  25Ø4Ø.2 INTERCHANGE=      Ø.Ø LOSSES=    1ØØØ.3
:__________: NO. 31Ø4    7Ø GENERATORS ON     6Ø BUSES                   INTERVAL       26  HOUR 3Ø LOAD= 23626.2  SO TEX 5 @ 25ØØ.
                                                                               1 TRANSFORMER PROBLEM(S)   Ø LINE PROBLEM(S)

HEARNE 8 1ØØ TO HEARNE 9 1ØØ XFMR @ 1Ø4.% OF MAX LOAD/11/

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                                  (PROGRAM REVISION: Ø52287) RUN ON Ø1/13/88 BY BJB    23:23
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TU ELECTRIC

February 4, 1988

PUBLIC UTILITY COMMISSION RECEIVED FEB 04 1988 BY ELECTRIC

Mr. Bill Moore
Public Utility Commission of Texas
7800 Shoal Creek Blvd., Suite 450N
Austin, Texas 78757

Subject: Final Draft of the PUCT Bulk Power Transmission Study

Dear Mr. Moore:

TU Electric appreciates the opportunity to provide comments on the subject study. As a participant in economy energy transfers throughout ERCOT, we are very interested in potential savings by member utilities that could ultimately benefit our customers. However, as you are well aware, the task to realistically uncover the true savings is not an easy one and there are many differing opinions on the best approach.

TU Electric is of the opinion that perhaps the best way to optimize the operation of ERCOT is through measurable positive changes as experienced by programs such as the "brokerage system", which evolve over time and not through drastic changes in its current operation. These programs not only foster closer cooperation among the utilities (an absolute necessary ingredient for any savings), but also provide a mechanism for utilities within ERCOT to adopt to the marketplace as factors such as fuel costs dictate.

Again, thanks for the opportunity to provide input into your study and please accept our comments attached.

Yours very truly,

Dwight Royall

Dwight F. Royall
Manager, Regulatory Services

DFR:cm

Attachment

TU Electric's Response to the Final Draft of the Bulk Power Transmission Study

In response to the draft of the PUCT staff Bulk Power Transmission Study, TU Electric believes that the results obtained are based on unrealistic assumptions and should not be used as support for implementing costly changes to the ERCOT bulk power system or its present operations. Although the Commission staff made a significant effort during the limited time and with limited resources, the potential savings expressed in the report have been significantly overstated and many expenses were not quantified. Most importantly, if the identified power transfers were implemented, the reliability and stability of the bulk power system would be seriously jeopardized.

When using complex bulk power system models, it is imperative that the input assumptions and corresponding output accurately reflect actual system conditions and constraints of the bulk power system. It is the opinion of TU Electric, with literally hundreds of man-years experience in bulk power planning, that the study has not met this basic requirement. Errors in the study's assumptions and logic are listed below:

1. Average gas fuel costs were used instead of marginal fuel costs. Since fuel costs are the largest single marginal factor affecting the price of electricity, utilities' practice is to load up their most efficient units that burn the cheapest fuels. These generating units are, for the most part, base-loaded and are fired by solid fuels, such as lignite and coal. As a result, most ERCOT utilities depend on natural gas-fired power plants to provide the generation that would be

available for bulk power transfers. However, these gas-fired plants must first use the portion of the gas under committed fuel supply contracts during a given year, and the balance of the gas requirement is purchased from the natural gas spot market. The energy produced from this marginally priced spot market fuel is the only energy that is actually available for bulk power transfers.

The study has incorrectly used average gas fuel costs rather than marginal gas fuel costs for each utility to determine the opportunity for savings. If each utility had the same fuel procurement strategy, this assumption could possibly lead to acceptable results. However, due to the location, size and fuel availability for each utility's power plants, different strategies have been utilized (i.e. some have more take-or-pay contracts than others and long term committments were made in both rising and declining gas markets). This has led to the current differences in average fuel prices for the various utilities, while prices for marginal gas fuel, which is based on spot market gas, are essentially the same for utilities in the State.

Since all utilities in ERCOT are in the same spot market for marginal gas, the utilities are paying about the same competitive price for marginal fuel. The main driving force, therefore, in the GE model used in this study then becomes any efficiency differences between individual generating units.

2. <u>Inconsistent heat rates were used.</u>

Heat rates are generally accepted and used as an efficiency indicator for power plant performance. They are also the key factor used to dispatch generating units in planning models, such as the GE MAPS model. In other words, among units with access to a common fuel supply, units with lower heat rates are started first and are loaded sooner than units with higher heat rates. This is a common practice that is understood and accepted by both the staff and the utilities.

However, since the heat rate of a unit is such a critical factor in economic dispatch, it is imperative that all generating units being centrally dispatched have two things in common: 1) the test data is uniformly treated within the dispatch model, and 2) the test data is obtained in a consistent manner (i.e. annual performance tests, original acceptance test, etc.). Herein lies a severe problem with the analysis contained in the study.

The heat rate information requested from each utility was input data developed for their respective planning models and used for their internal analysis purposes. This heat rate information is consistent within each utility but can be inconsistent from company to company.

For example: Some utilities adjust, in their planning models, unit heat rates by up to 5% to make their actual fuel usage replicate a historical test year for which the actual fuel usage is known -- a practice which is acceptable if all units are treated the same. This implies that when making a dispatch study between utilities, with one utility adjusting all their unit heat rates up by 5%, while others have not, the utility with the higher adjusted heat rates will become the primary purchaser and the model will incorrectly show an economic flow of power from one utility to another. This has, in fact, happened in this study and led to calculated power transfers from HL&P's service area to TU Electric which are incorrect but shown in the report with a calculated savings.

3. <u>ERCOT system reliability was not maintained</u>.

The transfers in the base scenarios as modeled for this study reflect all ERCOT transmission facilities to be in service and operating normally. Even the alternate sensitivity case (which resulted in a 46% reduction in transfers) assumed that no more than one line in the entire ERCOT system would be out of service at any time.

In order to meet the ERCOT planning criteria and, more importantly, to maintain system reliability, the transmission system must be planned to withstand the occurrence of substantially more severe contingencies, including the loss of transmission lines while other lines are out of service on maintenance, as well as an entire generating plant. Reality requires that the system must be operated at less than full capability in order to retain the ability to withstand the occurrence of the next contingency.

It should also be noted that reliance upon the transfer limits in the 1986 ERCOT Transfer Limitation Study is inappropriate, primarily because the limits in that study are non-simultaneous limits which apply only to individual transfers between two systems in the absence of all other power transfers. In addition, the 1986 results cannot be reliably extrapolated to future years due to changes in system configuration and operational dispatch from that which existed in the 1986 ERCOT Transfer Limitation Study.

4. <u>Several future lines may not be built.</u>

The study assumes that all future lines proposed by ERCOT utilities will be built. However, the successful construction of all these lines is highly questionable. For instance, certification of the Salem-Zenith double circuit 345 kV line has been denied twice, and the City of Austin's proposed 345 kV loop was recently deemed unnecessary by their City Council. Failure to add these lines to the ERCOT system will significantly reduce the quantity of economy transfers.

5. <u>All costs were not considered</u>.

The study has not taken into account several important items that have an effect on the achievable savings. Listed below are some of those items that have not already been discussed.

° The cost of establishing and operating a control center necessary to implement a statewide single area dispatch center.

° Increased transmission losses and wheeling costs associated with the proposed power transfers

° Existing economy bulk power transfers between individual companies and through the ERCOT broker

° Costs to construct the additional transmission facilities required to accommodate the level of transfers shown in the report

° System stability

It should be pointed out that ERCOT's present mode of operation employs a sophisticated computer based system which allows economy energy transactions to take place. This system allows energy to be "brokered" between utilities, resulting in savings to the customers of ERCOT utilities throughout the State. In this current mode of operation, many of the goals of the Bulk Power Transmission Study are already being achieved in a realistic manner through existing economy energy transfers within ERCOT.

In summary, the potential savings claimed in the Bulk Power Transmission Study are significantly overstated. If all costs were considered, realistic assumptions were made, and the ERCOT transmission system reliability was maintained, it is questionable whether there would be any additional savings to be gained by changing the current mode of ERCOT's operation.

WTU WEST TEXAS UTILITIES COMPANY
P.O. BOX 841 / ABILENE, TEXAS 79604 / (915) 674-7261

James C. Armke
Manager
System Planning

January 14, 1988

Mr. Bill Moore
Electric Division
Public Utility Commission
of Texas
7800 Shoal Creek Blvd. Suite 400N
Austin, TX 78757

Dear Mr. Moore:

West Texas Utilities' comments on the November 1987 draft of the Bulk Power Transmission Study report are enclosed. WTU commends the Staff for its presentation of the study results given on December 7, 1987. WTU also appreciates the opportunity to comment on the study report.

Sincerely,

JCA/dh
Enclosure

WTU COMMENTS

on the

BULK POWER TRANSMISSION STUDY

WTU understands and appreciates the magnitude of the effort made by the Commission Staff in performing the Bulk Power Study. It is obvious that the limitations of the available analytical tools and the data gathering effort required staff members to put in many long hours to complete the study. While the study results are not reliably conclusive, they do provide a basis for discussion and resolution of the issues. The Staff is to be commended for its contribution.

To place the results in perspective, the study does not, given its flawed methodology, demonstrate a large savings potential beyond that already being achieved through coordinated operations. Subsection 1.5.1 presents the expected reduction in total variable costs at about 6 percent and then Subsection 5.5.4 recognizes that such savings could be as small as one-fifth that amount. A savings of 1-1.5% would certainly be sufficient to warrent further investigation if it were the result of a rigorous and comprehensive study. However, given the methodology used and the factors incorrectly assumed to be negligible, the study cannot be relied on to calculate savings within this level of precision. Thus the results cannot be relied upon. To be used as evidence that a savings potential exists, this type of study would have to demonstrate expected savings that were several times the amount actually shown. Therefore, the study simply does not provide adequate justification for the conclusions reached.

As discussed in more detail later, these assumptions and methods produce results which are unreliable and overly optimistic because they are based on 1) average costs instead of incremental costs, 2) neglected wheeling and losses expenses, and 3) transaction levels which would threaten system security. Other costs, which would further reduce savings, include the necessary operation of inefficient generation during cold weather alerts, must-take fuel requirements, fixed costs associated with transmission lines built to support the transactions, and communications and control equipment costs to implement fully coordinated operations. Errors in load forecasts and fuel price projections could also reduce savings. Conservatively, if proper recognition of these factors were made the savings potential is probably a small percentage of the amount claimed. Thus WTU believes that ERCOT utilities are already capturing at least 94 percent and almost all of the potential savings and efficiencies required to achieve minimum system variable production costs. Therefore the evidence contained in the study report does not provide a sufficient basis for further costly study or major changes in the current operating practices of ERCOT utilities.

System Dispatch

Subsection 4.2.6 states that the marginal cost pricing signals directing the flow of power in the model are calculated on average fuel prices. This undesirable limitation is necessary because the MAPS/MWFLOW program used in the study can model only one fuel for each generating unit. In reality, many gas-fueled generators are supplied with several fuels having different prices. Each fuel supply normally changes in price each month. The incremental cost for these units is usually based on the unit's heat rate and the lowest cost fuel available to it. Thus there can be a significant difference between the average fuel price and the incremental fuel price. For example, the projected incremental fuel price for WTU's San Angelo Power Station during August 1988 is only 58 percent of the average fuel price. Such a difference between incremental and average costs can lead to a significant error in the dispatch and simply renders this study methodology unreliable.

The CSW experience with a centrally dispatched system has been that there is considerable disparity between the average fuel costs of the four CSW Operating companies but fairly close alignment between the incremental costs with the result that there is often a lower level of interchange occurring than one might expect from a dispatch based on average costs. Subsection 5.5.4 demonstrates that if gas prices used in the dispatch are closely aligned the expected savings may be reduced from $283 million in the 1990 base case to only $52 million. This is a reduction in expected savings of almost 80 percent and indicates that the use of average fuel costs may cause a significant error in the study results.

Subsection 5.5.5 discusses a scenario which uses incremental gas costs to dispatch units in 1990. However the report does not reveal the incremental costs used nor does it explain how they were derived. The report concludes that a dispatch based on incremental fuel costs does not significantly change the base case results. It is WTU's recommendation that this conclusion is not well supported and that it not be accepted until the relative incremental costs used can be verified by ERCOT utilities.

Furthermore, the MAPS/MWFLOW program does not check to insure that 'must-take' or 'must-burn' fuel contracts are honored. An important system operating goal at WTU is to insure that the 'must-take' provisions of firm gas and coal contracts are met. For example, in order to meet these provisions in the Oklaunion coal contract the plant must be run at 67.1 percent of its maximum capability or higher during heavy load periods. However, when a loadflow, which modeled fully coordinated conditions per the MAPS/MWFLOW program for the 1990 summer peak hour, was obtained from the Commission staff, it was found to be dispatching Oklaunion at only 59.4 percent of its capability. During off peak hours it was likely dispatched at an even lower capacity. This indicates that 'must-take' fuel contracts may not be honored under fully coordinated operations as modeled in the study's base case.

Savings

Subsection 4.2.1 states that the increase in transmission line losses are not taken into consideration in the savings calculation and that results from loadflow analysis indicate that losses will not significantly reduce savings. This has not been WTU's experience. For example, when purchasing economy power from HLP, WTU has had to pay up to 13 percent in third party losses and believes this to be a significant consideration in determining the benefits of purchasing economy power.

Section 5.2 states that half of the transactions in the base case involve firm power transfers. Such transfers will require facility charge payments similar to those currently associated with 'Economy B' transactions. These charges will further reduce the savings potential. For example, WTU would have to pay about two million dollars in facilities usage charges for the purchase of 100 MW of Economy B power from HLP in 1988.

An added concern is that Subsection 4.2.1 further states that the MAPS/MWFLOW program does not keep track of explicit transactions which makes it impossible to calculate wheeling costs. This means that individual utilities can not perform a comprehensive cost/benefit analysis on the effect of fully coordinated operations.

System Security

Subsection 4.2.5 states that the study assumed cost free solutions for any reactive problem associated with higher line loading. This occurs because the MAPS/MWFLOW program cannot recognize system problems associated with reactive power supply or voltage support problems. This concerns WTU because reactive power supply shortages will normally produce low voltages and can cause generator field windings to overheat which could trip the unit. Solutions to such problems may be expensive, especially if static var compensators are required.

The fully coordinated base case indicates that large power transfers will be required. For example, Subsection 4.2.3 indicates that HLP will be exporting an average of 3150 MW for each hour in July 1990. If TUEC's imports from cogenerators located within the HLP area are added to this it is evident that about 4000 MW of power will flow out of the HLP area around the clock. The ERCOT system was probably not designed to support such a high level of exports. Even if this amount could be exported under normal conditions, the outage of a critical line on the transmission system could threaten system security in the area and trigger cascading outages. For example, a recent ERCOT 1992 Power Transfer study found that the outage of the Limestone to Navarro 345 kv double circuit would overload nearby circuits if HLP were exporting more than 1535 MW to TUEC.

To guard against this problem Subsection 5.1.1 states that some 96 of the more than 2700 lines in the ERCOT system model were monitored by the MAPS/MWFLOW program. Also, line outages taken from a list compiled during the 1986 ERCOT Power Transfer Limitation Study were studied to check for overloads. A weakness in this procedure is that by monitoring less than 5 percent of the lines many overloads may go undetected. Also, the outage list compiled in the ERCOT study was developed for single power transfers between two specific utilities. The fully coordinated base case models multiple transfers to be occurring simultaneously between several utilities. This means that a different set of critical line outages may need to be studied.

As a further example the CSW area was shown to be exporting an average of 782 MW during July 1990 which means that WTU would probably be exporting about 200 MW. The WTU system was not planned or designed to export 200 MW around the clock during heavy load periods. Therefore extensive studies would need to be performed to identify critical transmission lines and any system improvements that may be needed to support the export level. It should be noted that new transmission line construction requirements would be analyzed carefully because a sudden increase in WTU's load or change in fuel prices may remove the power sale opportunity which could render the line superfluous to WTU's operations. WTU would, however, still be left with the associated fixed charges.

Cogeneration

WTU is also concerned about the manner in which heat rate, availability factors, and overall efficiencies were assumed for cogenerators. Section 3.4 states that typical cogeneration projects have an effective heat rate of 7645 BTU/kwh and cites a PUCT working paper as proof. WTU is concerned that many cogenerators meeting the PURPA requirements do not have such low effective heat rates but instead consume fuel with about the same efficiencies as conventional electric utility generators. WTU recommends that this heat rate not be accepted without monitoring the performance of active cogenerators.

Subsection 4.1.6 states that availability factors for cogenerators were adjusted as needed to yield the expected KWH output of the unit. WTU believes that this technique of 'backing into' the desired answer is improper. Availability factors should be obtained from forced outage performance data collected in the field.

The introduction to the report sets forth the assumption that all cogenerators are 20 to 30 percent more efficient than conventional generating units. This leads to the conclusion in Subsection 5.6.5 that cogenerators represent a significant fuel savings for the electric utility industry in Texas. Careful monitoring of active cogenerators may reveal that many consume about the same amount of fuel as would otherwise be consumed by conventional units. Since the study does not contain sufficient information to confirm the assumed efficiencies there should be no specific fuel savings estimates (i.e. 40.5 billion cubic feet) listed in the report unless it can be conclusively demonstrated that those savings do, in fact, exist.

It should also be noted that the electric utilities realize no fuel cost savings from cogeneration because they must pay the cogenerator exactly what it would have cost to produce the energy with their own units. Hence, the electric utility's customers will see no reduction in the fuel component of their monthly fuel bill.

ERCOT Brokerage Comparison

Section 4.2 states that the fully coordinated base case can be used as a comparison of the success of the ERCOT brokerage system. However this is not correct because the fully coordinated base case is overly optimistic in several ways. First, as previously discussed, incremental fuel costs are normally more closely aligned than average costs which could reduce the savings by as much as 80 percent. Second, the savings calculated do not include payments for losses and facilities usage (wheeling). Third, the high power transfer levels threaten system security and should be reduced to honor the transfer limits under outage conditions as reported by ERCOT. Subsection 5.1.2 states that when this is done the transaction levels must be reduced by 50 percent. Fourth, in order to be truly comparable to the ERCOT brokerage system firm power transfers must be excluded. As stated in Section 5.2 this would also reduce transaction levels by 50 percent. The combination of all four of these constraints would better determine the upper boundary that can be expected of the ERCOT brokerage system.

Public Utility Commission of Texas

Memorandum

TO: Chairman Thomas
Commissioner Campbell
Commissioner Greytok
Coyle Kelly
Hershel Meriwether
John Duncan
John Schexnayder

FROM: Bill Moore, Economist
Electric Division

DATE: December 17, 1987

SUBJ: Attendees and summaries of Bulk Power Transmission review meetings

On behalf of the BPT study staff, I am pleased to submit to you the lists of those persons who participated in our review meetings with the ERCOT utilities; cogenerators, independent power producers, and industrial customers; and consumer and environmental groups. Also attached is a summary of significant questions which were raised or issues which were discussed with each of these three groups. These summaries are certainly not exhaustive, but I believe they are representative of the range of the discussions.

In each of these meetings, all participants were encouraged to submit written comments, pro or con, to the study staff by January 15, 1988 so that, if warranted, the report can be modified; or the comments can be incorporated into a new section at the end of Chapter 8. Because the subject area of the report is extremely complex, reasonable minds may differ in both interpretation and emphasis of the results. The staff's analyses are based on nearly two years of intimate work with the study simulation model, but we realize that there are many knowledgeable people who view the results differently and we welcome the opportunity to make their views known along with ours -- or to change our interpretations in the light of new or compelling evidence provided by them.

The staff also stands ready to meet with any individuals or groups who wish to conduct additional reviews, and to the extent possible, we will run additional scenarios if they can be translated into data that is compatible with the model. We would also be amenable to reviewing any other procedures or methodologies which could provide other approaches to answering the fundamental questions posed by the study.

cc: Lee Hunt
Jay Zarnikau
All Meeting Participants (along with our thanks to them)

BULK POWER TRANSMISSION STUDY
FINAL DRAFT REVIEW MEETING
ERCOT REPRESENTATIVES
DECEMBER 7, 1987

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BULK POWER TRANSMISSION STUDY
FINAL DRAFT REVIEW MEETING
COGENERATOR, SMALL POWER PRODUCER, AND INDUSTRIAL REPRESENTATIVES
DECEMBER 9, 1987

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BULK POWER TRANSMISSION STUDY
FINAL DRAFT REVIEW MEETING
ELECTRICITY CONSUMER AND ENVIRONMENTAL REPRESENTATIVES
DECEMBER 15, 1987

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BULK POWER TRANSMISSION STUDY
EXTERNAL REVIEW MEETINGS
DECEMBER 7, 9, & 15, 1987
SUMMARY OF COMMENTS AND DISCUSSIONS

December 7, 1987 -- ERCOT representatives

Following the project staff's presentation of the assumptions, analytics, results, conclusions, and recommendations of the study, the discussion and comments ranged from very specific items such as those listed below as 1-15, to general concerns about the methodology, results, and conclusions which are summarized following item 15.

1. Since the study staff ran load flows only on system peak hours, a more thorough analysis should address reliability and stability questions for each of the 4,380 bi-hourly periods in the annual simulation. If some of the ERCOT utilities wish to perform this analysis using their load flow programs, the staff will work with them to provide input data on tape.

2. The staff is checking to see if the model can also produce savings calculations on a bi-hourly basis.

3. A question was raised about the study's statements about the effects of SB142 on the time limit for transmission facility certification. The language in the report says that after one year, the certificate would be granted by default, but that is not correct. The law provides that if a year has elapsed with no final action, an aggrieved party can seek a writ of mandamus in the district court in Travis County to compel a decision by the Commission for the certificate application. This will be corrected in the final report.

4. A concern was raised that the transfer limits developed by ERCOT are non-simultaneous, but it appears that they were used as if they were simultaneous in the model. Simultaneous transfer limits have not been calculated by ERCOT. The staff's interpretation of the results, which are very consistent with the results from the constrained optimization runs, suggests that either the model is accounting for the non-simultaneity in the solution algorithm, or that the limits are achievable simultaneously.

5. A similar concern was raised about the use of 1986 transfer limits for the study year 1990, and that transfer limits change in a different manner from year-to-year. The staff agrees that if additional transfer limits can be determined, another case will be run using the new information.

6. A request was made for a listing of all contingency conditions used in one of the sensitivity cases. The staff will work with ERCOT to provide these if they are needed after ERCOT has had some additional time to pursue other types of analysis.

7. On page 1-26, a statement indicates that the costs of wheeling and incremental losses are "relatively minor omissions," while ERCOT feels that these may not be minor. A better choice of words will be used in the final report.

8. On page 2-3, a statement says that "transmission lines cause power loss to the system." This language is confusing and will be changed in the final report to clarify the meaning.

9. On page 2-4, a statement says that "transmission networks had practically unlimited capability to deliver electricity." This statement will be modified and specifically qualified in the final report.

10. On page 4-96, the discussion of automatic control systems needs to be clarified since it does not necessarily cut off. The staff will obtain a better description of its operation from ERCOT and revise the discussion accordingly.

11. A concern was raised that if HL&P is to markedly increase its generation with natural gas, that the increased demand for gas could affect the gas market and prices. The general nature of the study did not permit modeling of individual markets, hence this is an area which would require further research and is a limitation of the study to date.

12. A concern was raised about the maintenance scheduling module used in one of the sensitivity cases. The staff agrees that the model is not specifically designed to perform a reliability-based analysis of optimal maintenance scheduling, and that this is also a limitation of the study.

13. Several concerns were raised about the reliability effects of the potential level of energy transactions shown in the results, and whether sufficient attention was paid to the reliability issue. The report indicates in numerous places that the MAPS/MWFLOW model is primarily an economic analysis model and that it is not intended as a transmission system design tool. Further, the report consistently points out that additional detailed study of the transmission system is needed to address the reliability issue, and that no actions should be taken which would jeopardize the excellent reliability of the ERCOT system.

14. With respect to the future study of interconnecting ERCOT to other reliability councils, it was pointed out that DC ties are the only way in which it could be technically accomplished. It was further mentioned that there are, as noted in the study, many complex legal and institutional problems surrounding this entire issue which could take many years to resolve.

15. A few days after the meeting, a concern was raised that some of the utilities involved in the study do not calculate generating unit heat rates in the same manner, and that these different methods may cause the model to calculate exchanges which may not be attainable if the heat rates provided by all of the utilities

are not consistent. To the best of the staff's knowledge, this is the first time the issue has been raised. If there are inconsistencies, they were not reported by the utilities submitting the data for the project, and they were not mentioned in the review comments submitted after the release of the interim report in March, 1987. Any changes in heat rates which would be large enough to materially alter the results of the study would necessarily have to be reviewed by the engineering, fuels, and operations review staff at the Commission.

GENERAL SUMMARY

Among the ERCOT utilities, there remains a fundamental concern that the use of average fuel prices in the model may result in an overstatement of both the potential transactions level and the associated dollar savings calculated by the model and that the publication of these results could cause them some problems in the regulatory or political spheres. Similarly, there are numerous concerns among system designers and operators that the MAPS/MWFLOW model does not address specific engineering and operational details -- particularly system reliability concerns -- that they must deal with on a day-to-day basis. Additional issues revolve around the definition of the base case as an idealized comparison of two theoretical extremes of modes of operation, and that people who read the study at a later date may not afford enough attention to the delineation of the assumptions and qualifications which underly the results.

A brief statement of the ERCOT position seems to be that the model is too weak in its analysis of specifics, the results of the transactions and savings potential calculations are too high, and the conclusions and recommendations are, therefore, too strong.

The study staff shares most of the ERCOT concerns, but believes that the model is a good <u>general</u> representation of an extremely complex problem and that the study represents an excellent first step in establishing reasonable boundary conditions within which much additional study should be conducted. While it would have been possible to do so, the staff has categorically avoided developing scenarios which, though plausible, would greatly inflate the transactions and savings levels reported. Although the staff recognizes that for any individual component (such as production costing, maintenance scheduling, system design, and the like) the simulation model employed is not the best available, it is functionally adequate in each area; plus it allows for the complete integration of all the major parts in one analytical bundle. To conclude that the results obtained therefrom have no positive value until all of the individual details can be researched -- a never-ending process -- is tantamount to creating "paralysis by analysis."

December 9, 1987 -- Cogenerators, industrial users, and small producers

Following the project staff's presentation of the assumptions, analytics, results, conclusions, and recommendations of the study, the discussion and comments ranged from very specific items such as those listed below as 1-6, to general concerns about the methodology, results, and conclusions which are summarized following item 6.

1. Concern was expressed about the low percentage of capacity and energy shown in the "other" category which includes cogeneration as shown in Table 3.3-1. Subsequent review by the staff found that the data, which was extracted from the LONG-TERM ELECTRIC PEAK DEMAND AND CAPACITY RESOURCE FORECAST FOR TEXAS, 1986, was based on information submitted by the utilities; and that many of them treated cogeneration and small power production as purchases rather than part of their capacity and energy mix. As a result, the aggregated numbers understate the quantities, but there is not enough specific information to adjust the numbers. A footnote will be added to address this qualification in the final report.

2. A request was made to obtain detailed load flow data such as that which may appear in the non-public Appendix C of the report. The staff explained that the load flow data is ERCOT's proprietary information and subject to the terms of the confidentiality agreement signed by all staff members who have worked on the project. The staff suggested that anyone interested in the data should contact Tom Sweatman at ERCOT and seek permission to have access to the data. Only if the permission is granted, and the staff is so notified in writing by ERCOT, will a copy of the appendix be provided.

3. A discussion was held about the "must-run" status assigned to cogeneration in the model, and that this might understate the role which cogeneration could play in the future. The staff recognizes this as a limitation of the model and the data which cogenerators were willing to provide concerning their actual costs of production, as opposed to contract prices which are based, at least in part, on the utilities' avoided costs. If cogenerators are willing to provide actual cost data, the staff is willing to sign confidentiality agreements with them and use the data to allow the model to dispatch cogeneration in the same manner that utility-owned capacity is treated.

4. A question was raised as to how PUCT would allocate available transmission capacity among competing interests. The staff explained that neither this study nor the current policies of the Commission were in any manner intended to provide for such an allocation. The transmission system has been primarily developed by individual utilities to serve their own loads and provide a high degree of reliability. Access to the system must be negotiated with the individual utilities whose capital in invested in it, and which are aware of specific operational constraints associated with particular components of the system.

5. A discussion of wheeling regulations and pricing addressed the current PUCT policies which mandate wheeling if sufficient transmission capacity is available and compensation based on an average embedded cost methodology. Several recent reports were cited which conclude that marginal cost pricing may provide better economic signals to all involved parties. The staff pointed out that one of the recommendations of the study is for future extensive research into the wheeling access and pricing issues.

6. A question was raised concerning a new proposal sent to the Commission by TNP. The staff was not familar with this issue, but has subsequently found out that TNP has filed for approval of an Economy Service tariff for its Industrial Power Service rate class. Since the study staff does not participate in regulatory actions, interested parties should address their questions to the rate design staff of the Electric Division with respect to Docket Number 7835 filed December 1, 1987, or to TNP.

GENERAL SUMMARY

Among the interests represented at this meeting, there remains a fundamental concern that the information provided by ERCOT utilities is biased upward in terms of the utilization of the transmission system, and that the inherent bias is used to unduly restrict access to the system on grounds that reliability may be compromised. The consequences for the study would be an understatement of the potential for transactions and savings, particularly those which might be supplied from non-utility sources. Similarly, they are concerned that the fuel prices and efficiencies used in the model are based on very conservative assumptions that may also produce a downward bias in the results, and that other scenarios should be developed which would reflect, at the very least, a larger divergence in fuel prices.

A brief statement of the general position of this group is that the model is very good except in its inability to capture <u>all</u> of the efficiencies of cogenerated power, that the calculated transactions and savings potentials are too low, and that conclusions and recommendations are, therefore, too weak.

The study staff also shares some of the concerns expressed by this group, but does not believe that the data provided by ERCOT utilities is deliberately biased. If the data appears to be "shaded," it is the result of the prudent application of sound engineering principles and many years of experience with the transmission system. The excellent reliability record of ERCOT speaks eloquently for itself. The staff also recognizes that other fuel and cost scenarios could produce "higher" results, and stands ready to run such a scenario if reasonable data is submitted for consideration. The staff agrees that the "must-run" status assigned to cogeneration units is not the best representation of this important supply resource, but in the absence of cost and effective heat rate data, it is the only reasonable way to simulate cogeneration at the <u>general</u> level addressed by the model. The staff recognizes that there are impediments to obtaining transmission access, and the report suggests that with an improvements in competition, some deregulation may become possible.

December 15, 1987 -- Consumer and environmental groups

Following the project staff's presentation of the assumptions, analytics, results, conclusions, and recommendations of the study, the discussion and comments ranged from very specific items such as those listed below as 1-6, to general concerns about the methodology, results, and conclusions which are summarized following item 6.

1. Because this group was less technically oriented than the previous two, many questions concerning definitions of terms and interpretation of results came up during the staff presentation.

2. A question was raised about the extent of the use of lignite as a boiler fuel and the possible environmental consequences as a result. The staff pointed out that all power plant construction and operations must meet the water and air quality standards of the U.S. EPA, and those of state regulatory agencies with appropriate jurisdiction. In addition, some estimates indicate that as much as 15% of initial construction costs are related, directly or indirectly, to pollution control.

3. A question was raised about whether utility or PUCT demand forecasts were used in the study, and answered by pointing out that generally the PUCT forecast was used for base case while the utility forecasts were used for sensitivity analysis, although for 1995 the utilities' forecasts were used to be sure that the load forecasts and capacity expansion plans "matched."

4. A question was raised about the possibility of building high voltage lines underground like distribution lines in some subdivisions in urbanized areas. The staff responded that for the very few miles of transmission lines which, because there were no other alternatives, were built underground, cost 8 to 10 times as much as conventional overhead lines. It was further noted that locating the facilities underground does not provide any shielding from magnetic field effects.

5. A question was raised about the lack of interstate power pooling in Texas, as compared to the New England and New York areas even including some power from Canada. The staff responded with a discussion of both the technical and non-technical problems associated with interconnecting ERCOT with adjacent power pools, and referred the questioner back to the written material in the report for further amplification.

6. Because of the potential volume of transactions, it was suggested that some utilities might find it profitable to build generating units solely for the purpose of selling to other utilities. The staff pointed out that the model does not consider capital and financing costs, so that it would be impossible to directly address this issue. But, it was pointed out that if such a development were economically feasible, it would more likely be addressed through shared ownership arrangements.

7. It was suggested that their might be too much reliance on the use of natural gas as a boiler fuel, since it is expected to become more scarce and more expensive in the future. The staff replied that, in fact, was one attractive feature of the coordinated operations -- that less natural gas would be used because of both inter-fuel substitution and the assurance that the most efficient gas plants in the system would be on line.

8. A general question was asked as to why bulk power transmission was selected for research, instead of many other utility issues. The staff replied that the question was addressed in Chapter 1 of the report, and if, after reading that, questions remained to please call or write to the study staff.

9. Some discussion addressed the role of the PUCT vis-a-vis ERCOT and control of the transmission system and transactions. The staff outlined the existing institutional arrangements under which the individual utilities are subject to certain types of regulation, while ERCOT, per se, is not a utility subject to PUCT jurisdiction. Further discussion centered on the voluntary and cooperative nature of the current relationship between ERCOT and the PUCT, and the data sharing arrangements with individual utilities as well as the group.

10. In response to a question about line losses, the staff explained the difference between transmission and distribution losses, and total as compared to incremental losses.

11. In response to a question about potential health effects, the staff briefly explained the difference between electric and magnetic fields and their relationship to current and voltage. The staff apprised the group of EPRI's research in this area and Dr. Leonard Sagan's opinion that there is an emerging consensus in the scientific community that sufficient research has been completed to indicate that there are no apparent harmful effects associated with electric fields. Further, that the focus of research has shifted to potential magnetic field effects, particularly with respect to childhood leukemia where the Savitz study commissioned by the New York Power Lines Project has indicated a small, but positive association.

GENERAL SUMMARY

This review group, while less technical than the others, has some general concerns that the study did not address the issue of impact on the final consumers of electricity; but were generally supportive of the study and the results. They also expressed some curiosity about "what next" and whether they could provide additional assistance in continuing or expanding the research efforts.

The staff encouraged the member of this group to spend some additional time reviewing the study assumptions that clarify and qualify the results, and to keep a focus on the transactions level, not just the dollar amounts of savings. The staff also agreed that if they wanted another meeting, it could be scheduled between now and January 15, 1988.

Appendix D
Environmental And Health Standard Survey Results

The information presented in this appendix was obtained principally from responses to an informational request sent to state regulatory commissions in March, 1987. Written or telephone replies were received from 34 states. As could be expected, the contents of the responses ranged from simple declarations that the state had no relevant standards to the submission of hundreds of pages of regulatory acts, policies and procedures that encompassed the certification process. In some cases, supplemental information was found in other studies and may be included, especially for those states which have adopted specific criteria for allowable field effects. The sources referred to in the detailed tables which appear in this appendix are:

(1) Survey responses

(2) MOVING POWER -- FLEXIBILITY FOR THE FUTURE
Report of the National Governor's Association Committee on Energy and Environment, Task Force on Electricity Transmission (Table 1, pps. 28-30) 1987

(3) INTERNATIONAL UTILITY SYMPOSIUM -- Health Effects of electric and magnetic fields: Research, Communication, Regulation. Toronto, Canada; September 16-19, 1986 (c.f. Section 3, papers presented by Robert S. Banks, Daniel A. Driscoll, and Van Jamison)

Because of the wide variation in the material available to the project staff, considerable discretion was exercised in the summary and classification of the material received. It is hoped that this presents a reasonably accurate picture of each state's current regulatory practices; however, those who may be interested in more specific details should contact the respective state agencies who have authorities and responsibilities for actual siting standards.

Survey Letter Sent to 49 State Regulatory Commissions

March 19,1987

Dear :

In conjunction with a federally funded research concerning the Bulk Power Transmission system and the potential for expanded transactions among the state's utilities, the staff of the Public Utility Commission of Texas is also investigating the current status of health and environmental regulations as they pertain to the construction, re-construction, or expansion of the transmission system. In particular, we would like to examine the existing laws, regulations, rules, policies, and/or other guidelines in effect in each of the other states. We would greatly appreciate receiving copies of any such information pertaining to the topics outlined below, or others which you may feel are germane, by April 30, 1987 so that our study may proceed in a timely manner.

I. HUMAN HEALTH STANDARDS

A. Applicability by line voltage for both AC and DC.

B. Basis for adoption -- supporting studies or citations.

C. Type of regulation -- mandatory, case-by-case, design standard, retroactive, advisory only, etc.

D. Length of time regulations have been in effect.

E. Issues addressed -- electrical effects, magnetic effects, ozone or other atmospheric gases, induced contact currents, audible noise, occupational health and safety, public health and safety, etc.

II. ENVIRONMENTAL OR SITING STANDARDS

A. Applicability by line voltage for both AC and DC.

B. Basis for adoption -- supporting studies or citations.

C. Type of regulation -- mandatory, case-by-case, design standard, retroactive, advisory only, etc.

D. Length of time regulations have been in effect.

E. Issues addressed -- electrical effects, magnetic effects, ozone or other atmospheric gases, induced contact currents, audible noise, animal or habitat effects, vegetation effects, radio and television interference effects, rural vs. urban standards, right-of-way requirements, cooridor considerations, aesthetic considerations, etc.

III. COSTS, BENEFITS, AND ALLOCATIONS

A. Regulartory -- adminstrative, fee, etc.

B. Utilities -- rate considerations, certification, etc.

C. Public -- electric rates, taxes, etc.

Thank you in advance for your assistance in this project, I'm sure the information will be very helpful as we investigate the "state-of-the-art" for these standards. If you would like to receive a copy of our research results which should be available after September, please advise us and we'll be sure that you receive a copy. If, in the meantime, you should have any questions about this request, please feel free to contact me at (512) 458-0102.

Sincerely,

Bill Moore
Economist
Electric Division

BM:lr

STATE: Alabama

PRINCIPAL AGENCIES:

GENERAL REQUIREMENTS: None

MIMIMUM APPLICABLE VOLTAGE (kV):

<u>ENVIRONMENTAL CONSIDERATIONS</u>

<u>HEALTH CONSIDERATIONS</u>

SOURCE: 2

STATE: Alaska

PRINCIPAL AGENCIES:

GENERAL REQUIREMENTS: None

MIMIMUM APPLICABLE VOLTAGE (kV):

<u>ENVIRONMENTAL CONSIDERATIONS</u>

<u>HEALTH CONSIDERATIONS</u>

SOURCE: 1

STATE: Arizona

PRINCIPAL AGENCIES: Power plant and transmission line siting committee

GENERAL REQUIREMENTS: Certificate of environmental compatibility

MIMIMUM APPLICABLE VOLTAGE (kV): 115

ENVIRONMENTAL CONSIDERATIONS

Existing Plans

Fish, wildlife, and plant life

Noise levels and electrical interference

Recreational purposes

Scenic, historic, and archaeological sites

Technical practicality

Estimated cost

Total environment of area

Requirements of applicable state and federal laws

HEALTH CONSIDERATIONS

None reported

SOURCE: 1

STATE: Arkansas

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS: Certificate of environmental compatibility and public need

MIMIMUM APPLICABLE VOLTAGE (kV): 100

ENVIRONMENTAL CONSIDERATIONS

Location

Reasonable alternate locations

Statement of need

Estimated cost and financing

Alternate financing comparison

Economic and financial impact

Effect on energy cost

Environmental impact statement
- land, air, and water ecology
- parks and recreational areas
- natural, historic, and scenic values and resources

Notification of other State agencies

HEALTH CONSIDERATIONS

None reported

SOURCE: 1

STATE: California

PRINCIPAL AGENCIES: Public utility commission, state energy commission

GENERAL REQUIREMENTS: Certificate of convenience and necessity, environmetal impact report or negative declaration

MIMIMUM APPLICABLE VOLTAGE (kV): 200

ENVIRONMENTAL CONSIDERATIONS

Location and right-of-way map

Line description and design

Comparison to alternative routes

Construction schedule

Notice to governmental authorities

Proponent's environmental assessment
- environmental quality
- fish, wildlife habitat and population
- rare or endangered plants or animals
- cumulative effects
- direct or indirect adverse human effects
- topography, land use, and biological environs
- proposed mitigation measures
- economic and population growth

Land use impacts

Geologic and pedologic conditions

Atmospheric impact

Hydrologic impact

Biological impact

Sonic impact

Visual impact

Socio-economic impact

HEALTH CONSIDERATIONS

Public health and safety impacts

SOURCE: 1

STATE: Colorado -- no information submitted

PRINCIPAL AGENCIES:

GENERAL REQUIREMENTS:

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

HEALTH CONSIDERATIONS

SOURCE:

STATE: Connecticut

PRINCIPAL AGENCIES: State siting council

GENERAL REQUIREMENTS: Certificate of environmental compatibility and public need, certificate of public safety and necessity

MIMIMUM APPLICABLE VOLTAGE (kV): 69

ENVIRONMENTAL CONSIDERATIONS

Right-of-way development and management plan

Key map and topography

Plan drawings
- proposed right-of-way
- public roads and lands
- contours
- structures, foundations, and other structures

Access points

Vegetation clearing

Sensitive areas and conditions
- watercourses
- erosion potential
- critical plant and animal habitats
- rare or endangered species

Public recreation areas

Estimated costs

Comparison to alternative routes

Environmental effects

Notification of governmental agencies

HEALTH CONSIDERATIONS

None reported

SOURCE: 1

STATE: Delaware

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS: No specific regulations

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

HEALTH CONSIDERATIONS

SOURCE: 1

STATE: District of Columbia

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS: No specific regulations

MIMIMUM APPLICABLE VOLTAGE (kV):

<u>ENVIRONMENTAL CONSIDERATIONS</u>

<u>HEALTH CONSIDERATIONS</u>

SOURCE: 1

STATE: Georgia -- no information submitted

PRINCIPAL AGENCIES:

GENERAL REQUIREMENTS:

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

HEALTH CONSIDERATIONS

SOURCE:

STATE: Florida

PRINCIPAL AGENCIES: Public service commission, siting board, environmental regulation department

GENERAL REQUIREMENTS: None reported

MIMIMUM APPLICABLE VOLTAGE (kV): 230

ENVIRONMENTAL CONSIDERATIONS

None reported

HEALTH CONSIDERATIONS

Electric and magnetic fields scientific advisory council

1. unlikely that human exposure to 60 Hz fields can lead to public health problems
2. standards or reductions would have to be based on other than scientific considerations

Environmental department is currently drafting standards

SOURCE: 1,3

STATE: Hawaii -- no information submitted

PRINCIPAL AGENCIES:

GENERAL REQUIREMENTS:

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

HEALTH CONSIDERATIONS

SOURCE:

STATE: Idaho

PRINCIPAL AGENCIES: Public utility commission

GENERAL REQUIREMENTS: None

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

HEALTH CONSIDERATIONS

SOURCE: 1

STATE: Illinois

PRINCIPAL AGENCIES: Commerce commission

GENERAL REQUIREMENTS: Certificate of public convenience and necessity

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

HEALTH CONSIDERATIONS

One case required electric field strength to be held constant at existing levels

SOURCE: 1

STATE: Indiana

PRINCIPAL AGENCIES:

GENERAL REQUIREMENTS: No regulations

MIMIMUM APPLICABLE VOLTAGE (kV):

<u>ENVIRONMENTAL CONSIDERATIONS</u>

<u>HEALTH CONSIDERATIONS</u>

SOURCE: 1

STATE: Iowa -- no information submitted

PRINCIPAL AGENCIES:

GENERAL REQUIREMENTS:

MIMIMUM APPLICABLE VOLTAGE (kV):

<u>ENVIRONMENTAL CONSIDERATIONS</u>

<u>HEALTH CONSIDERATIONS</u>

SOURCE:

STATE: Kansas

PRINCIPAL AGENCIES: Corporation commission

GENERAL REQUIREMENTS: Siting permit

MIMIMUM APPLICABLE VOLTAGE (kV): if less than 230, case is handled administratively.

if greater than 230, a hearing is required.

ENVIRONMENTAL CONSIDERATIONS

No specific standards

Case-by-case analysis usually considers:

- electrostatic and magnetic field effects
- audible noise
- communications interference
- visual impact
- transportation
- land use
- flora and fauna
- archaeological and historical standards

HEALTH CONSIDERATIONS

Safety - NESC compliance

SOURCE: 1

STATE: Kentucky

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS: Certificate of public convenience and necessity

MIMIMUM APPLICABLE VOLTAGE (kV): 400

ENVIRONMENTAL CONSIDERATIONS

Design on facility should reasonably minimize impacts on:
- scenic assets
- environmental assets

Full route description

Maps showing facilities and ownership

Financing details

Estimated operating costs

HEALTH CONSIDERATIONS

None reported

SOURCE: 1

STATE: Louisiana

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS: None reported

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

HEALTH CONSIDERATIONS

SOURCE: 1

STATE: Maine

PRINCIPAL AGENCIES: Public utilities commission

GENERAL REQUIREMENTS: Petition of public convenience and necessity

MIMIMUM APPLICABLE VOLTAGE (kV): 100

ENVIRONMENTAL CONSIDERATIONS

Location map -- 10 mile corridor
- incorporated communities
- topographical features
- public or private recreational areas
- parks
- forests
- hunting or fishing areas
- historical or scenic areas or places
- rivers, lakes, streams, reservoirs, or other water

Technical description of line

Projected 5 and 10 year loading

Cost estimates

Operational changes

Alternative routes considered

Reliability considerations

HEALTH CONSIDERATIONS

None reported

SOURCE: 1

STATE: Maryland

PRINCIPAL AGENCIES: Public service commission, natural resources department

GENERAL REQUIREMENTS: Certificate of public convenience and necessity, environmental report

MIMIMUM APPLICABLE VOLTAGE (kV): 69

ENVIRONMENTAL CONSIDERATIONS

Engineering and construction features

Property or property rights

Access roads

Historical sites

Institutional land

Recreational areas

Aesthetic sites

Archaeological sites

Wildlife management areas

State parks or forests

100 year flood plain

Public airports within one mile

Topographic maps

Estimated costs

Alternative routes

Environmental information
- physical features
- biological features
- cultural features
- socio-economic effects

impacts and mitigation

HEALTH CONSIDERATIONS

None reported

SOURCE: 1

STATE: Massachusetts -- no information submitted

PRINCIPAL AGENCIES:

GENERAL REQUIREMENTS:

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

HEALTH CONSIDERATIONS

SOURCE:

STATE: Michigan

PRINCIPAL AGENCIES: Public service commission, department of health

GENERAL REQUIREMENTS: Certificate of public need

MIMIMUM APPLICABLE VOLTAGE (kV): 300

ENVIRONMENTAL CONSIDERATIONS

None reported

HEALTH CONSIDERATIONS

None reported

Very detailed construction code and specifications for lower voltages specifying conductors, insulators, spacing, ground requirements, flash-over limits, etc. for capacities between 750 V and 230 kV.

SOURCE: 1

STATE: Minnesota

PRINCIPAL AGENCIES: Public utilities commission, natural resources department, environmental quality board

GENERAL REQUIREMENTS: Certificate of need, environmental impact statement

MIMIMUM APPLICABLE VOLTAGE (kV): 69, public land or water

200, 50 miles or more long

300, 25 miles or more long

ENVIRONMENTAL CONSIDERATIONS

Technical description

Strength and distribution of electrical fields

Air ions

Ozone and nitrogen oxide emissions

Radio and television interference

Audible noise

Right-of-way width

Construction and operation & maintenance practices

Estimated work force

Major regional features
- hydrologic
- natural vegetation and wildlife
- physiographic regions
- land uses
  - settled
  - recreational
  - agricultural
  - forestry
  - mineral extraction

Comparison to alternative of no facility

HEALTH CONSIDERATIONS

8.0 kV/m maximum electrical field anywhere on right-of-way, measured one meter above ground level

SOURCE: 1,3

STATE: Mississippi

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS: Joint siting and certification

MIMIMUM APPLICABLE VOLTAGE (kV): None reported

ENVIRONMENTAL CONSIDERATIONS

None reported

HEALTH CONSIDERATIONS

None reported

SOURCE: 1,2

STATE: Missouri

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS: None reported

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

None reported

HEALTH CONSIDERATIONS

None reported

SOURCE: 1,2

STATE: Montana

PRINCIPAL AGENCIES: Board of natural resources and conservation

GENERAL REQUIREMENTS: Certificate of need

MIMIMUM APPLICABLE VOLTAGE (kV): 69

ENVIRONMENTAL CONSIDERATIONS

Public health, safety, and welfare

Land use impacts

Radiation impacts, safeguards, and operating procedures

Noise impact limited to 50 dBA at edge of right-of-way

HEALTH CONSIDERATIONS

Maximum allowable electric fields
1.0 kV/m at edge of right-of-way, 1 m above ground
7.0 kV/m on right-of-way at road crossings, 1 m above ground

SOURCE: 3

STATE: Nebraska

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS: Construction permit

MIMIMUM APPLICABLE VOLTAGE (kV): 15

<u>ENVIRONMENTAL CONSIDERATIONS</u>

None reported

<u>HEALTH CONSIDERATIONS</u>

No specific standards, NESC for enginnering

SOURCE: 1

STATE: Nevada

PRINCIPAL AGENCIES: Public service commission, environmental commission

GENERAL REQUIREMENTS: Construction permit

MIMIMUM APPLICABLE VOLTAGE (kV): 200

ENVIRONMENTAL CONSIDERATIONS

Description of facility

Comparison of alternatives including no action

Cost/benefit analysis

Description of environmental characteristics

Human environment effects

Environmental impacts and studies

Mitigation proposals

Evaluation by other governmental entities

HEALTH CONSIDERATIONS

None reported, but NESC

SOURCE: 1

STATE: New Hampshire

PRINCIPAL AGENCIES: Public utilities commission, site evaluation committee

GENERAL REQUIREMENTS: Certificate of site and facility

MIMIMUM APPLICABLE VOLTAGE (kV): 100

ENVIRONMENTAL CONSIDERATIONS

Land use

Air quality

Water quality

Available alternatives

Environmental impact

HEALTH CONSIDERATIONS

None reported

SOURCE: 1

STATE: New Jersey

PRINCIPAL AGENCIES: Public utility commission, commission on radiation protection, department of environmental protection

GENERAL REQUIREMENTS: Certificate (if condemnation used)

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

HEALTH CONSIDERATIONS

Advisory standard of 3 kV/m at edge of right-of-way

SOURCE: 2,3

STATE: New Mexico -- no information submitted

PRINCIPAL AGENCIES:

GENERAL REQUIREMENTS:

MIMIMUM APPLICABLE VOLTAGE (kV):

<u>ENVIRONMENTAL CONSIDERATIONS</u>

<u>HEALTH CONSIDERATIONS</u>

SOURCE:

STATE: New York

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS: Certificate

MIMIMUM APPLICABLE VOLTAGE (kV): 100, 10 miles or more long

125, 1 mile or more long

ENVIRONMENTAL CONSIDERATIONS

None reported

HEALTH CONSIDERATIONS

Maximum electric field strengths permitted

- 1.6 kV/m at edge of right-of-way (interim standard)
- 7.0 kV/m at ground level at public road crossing
- 11.0 kV/m at ground level at private road crossing
- 11.8 kV/m at ground level for other terrain

Standards imply a minimum right-of-way width of 350 feet for a 765 kV transmission line.

Recently completed study focused on magnetic field effects near high densities of distribution lines and relationship to childhood cancer. Assessment continues with a view toward establishing a magnetic field strength standard in the future.

SOURCE: 3

STATE: North Carolina -- no information submitted

PRINCIPAL AGENCIES:

GENERAL REQUIREMENTS:

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

HEALTH CONSIDERATIONS

SOURCE:

STATE: North Dakota

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS:

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

None reported

HEALTH CONSIDERATIONS

9 kV/m maximum electric field strength on right-of-way

SOURCE: 3

STATE: Ohio

PRINCIPAL AGENCIES: Power siting board

GENERAL REQUIREMENTS: Certificate of environmental compatibility and public need

MIMIMUM APPLICABLE VOLTAGE (kV): 125

ENVIRONMENTAL CONSIDERATIONS

Alternative routes

Geography and topography

Alternative structures and equipment

Financial data

Socio-economic data
- general land use by category
- noise sensitive area
- agricultural districts
- affected local governments and offcials
- affected buildings
- estimated radio and TV interference
- mitigation procedures

Ecological data
- water resources
- woodlands
- proposed areas of herbicide application
- major species -- rare or endangered

Economic factors

Cultural values

Aesthetic quality

HEALTH CONSIDERATIONS

None reported

SOURCE: 1

STATE: Oklahoma -- no information submitted

PRINCIPAL AGENCIES:

GENERAL REQUIREMENTS:

MIMIMUM APPLICABLE VOLTAGE (kV):

<u>ENVIRONMENTAL CONSIDERATIONS</u>

<u>HEALTH CONSIDERATIONS</u>

SOURCE:

STATE: Oregon

PRINCIPAL AGENCIES: Energy facility siting council, department of environmental quality

GENERAL REQUIREMENTS: Site certificate

MIMIMUM APPLICABLE VOLTAGE (kV): 230

ENVIRONMENTAL CONSIDERATIONS

National parks, monuments, and wildlife refuges

State parks, waysides, and wildlife refuges

Natural area preserves

Wilderness areas

Scenic waterways

Wild and scenic rivers

Experimental areas for rangeland resources

Wildlife values

Geologic values

Botanical values

Research values

Recreational values

Land use

Socio-economic impacts

Water rights

Topography

Noise abatement -- maximum 50 dBA at edge of right-of-way

Radio and TV interference

HEALTH CONSIDERATIONS

9.0 kV/m maximum electric field where public has access

NESC

SOURCE: 1,3

STATE: Pennsylvania

PRINCIPAL AGENCIES: Public utility commission

GENERAL REQUIREMENTS: Commission order

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

Land use

Soil and sedimentation

Plant and wildlife habitat

Terrain

Hydrology

Landscape

Archaeologic areas

Geologic areas

Historic areas

Scenic areas

Wilderness areas

Scenic rivers

Alternative routes

Airports within 2 miles

Affected governmental entities

Estimated cost

Topographic maps

Line description and cross-section

Any related litigation

HEALTH CONSIDERATIONS

Safety -- NESC

SOURCE: 1

STATE: Rhode Island

PRINCIPAL AGENCIES: Public utility commission, siting board

GENERAL REQUIREMENTS: None reported

MIMIMUM APPLICABLE VOLTAGE (kV): less than 345, PUC
more than 345, siting

<u>ENVIRONMENTAL CONSIDERATIONS</u>

<u>HEALTH CONSIDERATIONS</u>

SOURCE: 2

STATE: South Carolina

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS: Certificate

MIMIMUM APPLICABLE VOLTAGE (kV): 125

ENVIRONMENTAL CONSIDERATIONS

Description of facilities

Summary of environmental studies

Affected governmental entities

HEALTH CONSIDERATIONS

None reported

SOURCE: 1

STATE: South Dakota

PRINCIPAL AGENCIES: Public utilities commission

GENERAL REQUIREMENTS: Permit

MIMIMUM APPLICABLE VOLTAGE (kV): 250 generally

115 in some special cases

<u>ENVIRONMENTAL CONSIDERATIONS</u>

Housing supplies

Educational facilities

Regional land forms

Topography

Geological features

Mineral deposits

Erosion potential

Seismic risks

Recreation

Government

Energy

Hydrology

Terrestrial ecosystems

Aquatic ecosystems

Land use and local controls

Water and air quality

Community impact

Employment estimates

HEALTH CONSIDERATIONS

8.5 kV/m maximum electric field on right-of-way measured at 1 m above ground level (proposed standard in one case)

SOURCE: 1

STATE: Tennessee -- no information submitted, TVA standards

PRINCIPAL AGENCIES:

GENERAL REQUIREMENTS:

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

HEALTH CONSIDERATIONS

SOURCE: 2

STATE: Texas

PRINCIPAL AGENCIES: Public utilities commission

GENERAL REQUIREMENTS: Certificate of public conveniece and necessity

MIMIMUM APPLICABLE VOLTAGE (kV): 60

ENVIRONMENTAL CONSIDERATIONS

Community values

Recreational and park areas

Historical and aesthetic values

Environmental integrity

Municipalities and counties

Route maps and interconnections

Alternatives considered

Technical description

Right-of-way width

Estimated costs and financing

Habitable structures within 500 feet (200 feet, urban area)

Radio and television transmitters, microwave relay stations

Airstrips within 10,000 feet

Irrigated pasture or cropland

Other governmental entities

Impact studies or assessments, if available

HEALTH CONSIDERATIONS

None reported, currently under study

Safety -- NESC

SOURCE: 1

STATE: Utah

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS:

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

None reported

HEALTH CONSIDERATIONS

None reported

SOURCE: 1

STATE: Vermont

PRINCIPAL AGENCIES: Public service board

GENERAL REQUIREMENTS: Certificate of public good

MIMIMUM APPLICABLE VOLTAGE (kV): None

ENVIRONMENTAL CONSIDERATIONS

Aesthetics

Historic sites

Air purity

Water purity

Natural environment

HEALTH CONSIDERATIONS

Public health

Public safety

SOURCE: 1

STATE: Virginia

PRINCIPAL AGENCIES: Corporation commission, department of health

GENERAL REQUIREMENTS: Certificate of convenience and necessity

MIMIMUM APPLICABLE VOLTAGE (kV): 150

ENVIRONMENTAL CONSIDERATIONS

Minimize adverse impacts

Consider environmental protection reports

Description of route

Scenic assets

Historical sites

HEALTH CONSIDERATIONS

Health and safety -- NESC

Annual monitoring and reporting of ongoing research

SOURCE: 1

STATE: Washington

PRINCIPAL AGENCIES: Utilities and transportation commission

Energy facility site evaluation council

Department of ecology

GENERAL REQUIREMENTS: Environmental impact statement

MIMIMUM APPLICABLE VOLTAGE (kV): 200

ENVIRONMENTAL CONSIDERATIONS

Enviromental information reports

Other governmental entities

Project description and location

Environmental elements

- earth - topography, soils, and erosion
- air - emissions and controls
- water - surface and ground, quality, runoff
- plants - vegetation and endangered species
- animals - endangered species, migration routes
- energy and natural resources
- noise - types and levels
- land and shoreline use
- housing
- aesthetics
- light and glare
- recreation
- historic and cultural preservation
- transportation
- public services and utilities

HEALTH CONSIDERATIONS

Environmental health, hazards, emergency services

SOURCE: 1

STATE: West Virginia

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS: Certificate of public convenience and necessity, environmental impact statement

MIMIMUM APPLICABLE VOLTAGE (kV): 200

ENVIRONMENTAL CONSIDERATIONS

Location map and description, 10 mile corridor
- incorporated communities
- public or private recreational areas
- parks
- forests
- hunting or fishing areas
- historic scenic areas or places
- rivers, lakes, streams, reservoirs, other water bodies
- type of line and technical description
- right-of-way topography and disturbances
- right-of-way vegetation control
- land and aquatic wildlife habitats
- effects on human and domestic animal life
- alternate routes

HEALTH CONSIDERATIONS

None reported, NESC

SOURCE: 1

STATE: Wisconsin -- no information submitted

PRINCIPAL AGENCIES:

GENERAL REQUIREMENTS:

MIMIMUM APPLICABLE VOLTAGE (kV):

<u>ENVIRONMENTAL CONSIDERATIONS</u>

<u>HEALTH CONSIDERATIONS</u>

SOURCE:

STATE: Wyoming

PRINCIPAL AGENCIES: Public service commission

GENERAL REQUIREMENTS:

MIMIMUM APPLICABLE VOLTAGE (kV):

ENVIRONMENTAL CONSIDERATIONS

None reported

HEALTH CONSIDERATIONS

None reported, NESC

SOURCE: 1

Appendix E
Cogeneration and Small Power Producers

Public Utility Commission of Texas

February, 1987

INTRODUCTION

BACKGROUND

This report was originally published in January, 1985. The data was compiled from various sources including the Federal Register, trade journals, and discussions and correspondence from cogenerators and utility representatives.

In August, 1986, each utility was asked to update and verify the data for projects in its service area. Responses were received by December of that year.

MAJOR CHANGES IN 1986

Forty projects are listed as being "CANCELED". These projects totaled approximately 3628 megawatts of power that are no longer considered to be "PROPOSED" by the host utility. The "CANCELED" status may reflect an indefinite postponement of construction, or a lack of contact with the host utility during the year. Among the reasons given for canceling projects are:

Excess generation capacity among major utilities,

Low "avoided cost" payments for non-firm energy,

Depressed economic condition of potential cogenerating industries,

Fewer incentives under the new federal tax laws.

Projects identified as "CANCELED" in this report will not be included in subsequent reports.

Approximately 1092 megawatts of cogeneration capacity were added during 1986, with another 1183 megawatts being constructed as of the end of the year.

COGENERATION AND SMALL POWER PRODUCERS

CONTENTS

KEY

CLASS

COG:	Cogenerator
SELF:	Self Generators
SPP:	Small Power Producer

TYPE

CT:	Combustion Turbine and/or Combined Cycle
DE:	Diesel Engine
HT:	Hydro Turbine
ST:	Steam Turbine
WT:	Wind Turbine

FUEL

BIO:	Biomass
COAL:	Coal
HYDRO:	Hydro
MSW:	Municipal Solid Waste
NG:	Natural Gas
PC:	Petroleum Coke
WG:	Waste Gas
WH:	Waste Heat
WI:	Wind

STATUS

IO:	In Operation
PROP:	Proposed
UC:	Under Construction
CANCELED:	Canceled
RETIRED:	Retired

UTILITY

CITY:	Various Municipal Utilities
COOP:	Various Electric Cooperatives
CPL:	Central Power and Light Company
GSU:	Gulf States Utilities Company
HLP:	Houston Light and Power Company
SPS:	Southwestern Public Service Company
SWEPCO:	Southwestern Electric Power Company
TNP:	Texas-New Mexico Power Company
TUEC:	Texas Utilities Electric Company
WTU:	West Texas Utilities Company

PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
Adams Terminal	AES	Ship Channel
Air Products - Olin Road		Pasadena
American Hoechst		
American Recovery Systems		
American Recovery Systems		LaPorte
American Ref-Fuel	Browning-Ferris Ind. / Air Products	Pasadena
Amoco Chemicals		Chocolate Bayou
Amoco Chemicals		Texas City
Amoco Gasoline Plant	Intergas	Ector County
Amoco Oil		Texas City
Anchor Hocking		
Aquaculture	National Cogeneration	Howard County
Arco Chemical		Portland
Arco Chemical		
Austin State Hospital		Austin
Bay City	Celanese	Bay City
Bayou Cogeneration Plant	Enron Cogen./Big Three Indust./GE	Pasadena
Bishop Cogen Co	Celanese	Bishop
CO2 Extraction Plant	Mitchell Energy Corp.	Bridgeport
Capitol Cogeneration	Celanese / H.B. Zachry / TNP	Pasadena
Celanese CZ-1		Pampa
Celanese CZ-2		Pampa
Central Expressway Site	Enserch Development Corporation	Dallas
CertainTeed	Wichita Falls Energy	Wichita Falls
Champion Int.		Corrigan

COGENERATION AND SMALL POWER PRODUCTION IN TEXAS

NAMEPLATE MW RATING	PROJECT STATUS	DATE OF OPERATION	SERVICE AREA	CLASS	TYPE	FUEL	NOTE
150.000	CANCELED	1988	HLP	COG	ST	PC	
4.100	IO	1985	HLP	COG	CT	NG	
20.000	CANCELED	Unknown	HLP	COG	CT	NG	
10.000	CANCELED	1987	HLP	SPP	ST	BIO	
52.000	CANCELED	Unknown	HLP	COG	CT/ST	NG	
52.500	CANCELED	1989	HLP	SPP	ST	MSW	
37.100	IO	1985	HLP	COG	CT	NG	
40.000	IO	1984	TNP	COG	CT	NG	
120.000	PROP	1988	TUEC	COG	CT	NG	
180.000	IO	1986	TNP	COG	CT	NG	
4.000	CANCELED	Unknown	HLP	COG	CT	NG	
60.000	PROP	1989	TUEC	COG	CT	NG	
1.500	UC	1987	CPL	COG	CT	NG	
75.000	CANCELED	1986	HLP	COG	CT	NG	
1.000	PROP	1988	CITY	COG	CT	NG	
40.000	PROP	Unknown	CPL	COG	CT	NG	
312.000	IO	1985	HLP	COG	CT	NG	
236.000	PROP	1988	CPL	COG	CT	NG	
3.000	IO	1984	TUEC	COG	ST	WG	
375.000	IO	1984	HLP	COG	CT	NG	
10.000	IO	1965	SPS	SPP/COG		WG	
29.000	IO	1979	SPS	COG	ST	COAL	
200.000	PROP	1988	TUEC	COG	CT	NG	Formerly Tx. Instruments
75.000	UC	1987	TUEC	COG	CT	NG	
8.000	PROP	Unknown	GSU	SPP	ST	BIO	Posponed from 1986

PUBLIC UTILITY COMMISSION OF TEXAS

PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
Champion Paper		Deepwater
Champion Paper		Lufkin
Champion Paper	General Electric	Pasadena
Champion Sheldon (St.Regis)		
Champlin Petroleum		Corpus Christi
Chevron Chemical		Beaumont
Chevron Chemical		Baytown
Chevron Refinery		Port Arthur
Chevron U.S.A. Inc.		Port Arthur
City of Cleburne		Cleburne
CoGen Kern Bluff		Houston
Coastal States Petro Co.		Corpus Christi
Cogen Lynchburg	Power System Engr.	La Porte
Cogen Lyondell	Power System Engr.	Channelview
Cogen Power, Inc.		Port Arthur
Corpus Christi Petrochemical Complx		Corpus Christi
Cuero Hydro		Cuero
DFW Sanitary Landfill	Waste Management Inc.	Lewisville
Dean Lumber Company		Gilmer
Deepwater	AES	Pasadena
Dow Chemical		Freeport
Dupont		Corpus Christi
Dupont		Victoria
El Paso Natural Gas	Intergrated Energy Systems	Ector County
El Paso Products	Cobisa, Inc.	Odessa

COGENERATION AND SMALL POWER PRODUCTION IN TEXAS

NAMEPLATE MW RATING	PROJECT STATUS	DATE OF OPERATION	SERVICE AREA	CLASS	TYPE	FUEL	NOTE
190.000	CANCELED	1987	HLP	COG	CT	NG	
75.000	CANCELED	Unknown	TUEC				
34.000	PROP	1988	HLP	COG	CT	NG	
68.000	CANCELED	1986	HLP	COG		NG	
60.000	PROP	Unknown	CPL	COG	CT	NG	
42.000	PROP	1987	GSU	COG	CT	NG	Formerly Gulf - Posponed
20.000	CANCELED	Unknown	HLP				
8.000	PROP	1987	GSU	COG	CT	NG	Formerly Gulf - Posponed
0.087	IO	Unknown	GSU	COG	CT	NG/WH	
0.750	IO	1986	TUEC	SPP	ST	MSW	
45.000	CANCELED	Unknown	HLP	COG	CT	NG	
47.000	IO	1984	CPL	COG	CT	NG	
502.000	PROP	1988	HLP	COG	CT	NG	Posponed from 1988
518.000	IO	1985	HLP	COG	CT	NG	
7.000	IO	1984	GSU	SPP	ST	WH	
40.000	PROP	Unknown	CPL	COG	CT	NG	
1.000	UC	1987	COOP	SPP	HT	HYDRO	DeWitt Co Elec Coop area
3.000	PROP	1988	TNP	SPP	CT	BIO	
0.560	IO	1985	SWEPCO	SPP	ST	BIO	
154.000	IO	1986	HLP	COG	ST	PC	
1300.000	IO	1982	HLP	COG	CT	NG	
150.000	CANCELED	1987	CPL	COG	CT	NG	
82.000	UC	1987	CPL	COG	CT	NG	
0.000	PROP	Unknown	TUEC	COG		NG	
210.000	PROP	1989	TUEC	COG	CT	NG	

PUBLIC UTILITY COMMISSION OF TEXAS

PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
Energy Advancement Inc.		West Columbia
Enhanced Oil Recovery	Dallas Gas and Electric	Slocum
Enterprise Product		Mont Belvieu
Exxon Refinery Pwr Plnt 4&5	Exxon Chemicals	Baytown
Fina	Falcon Seaboard	Big Springs
Fina	Falcon Seaboard	Big Springs
Formosa Plastics		Point Comfort
Gabriel Power		Stanton
General Foods/Maxwell House		Houston
General Tire/Tesoro Petroleum		Waco
Gentex		Bayport
Gentex - ICI		Bayport
Gentex - Tenneco		Houston
Gentex / TSG. Inc.		Bayport
Goodrich		Ship Channel
Goodyear		Beaumont
Goodyear/GE		Deepwater
Huber		Borger
Imperial Sugar		Sugarland
Internorth	Alcoa	Point Comfort
Invironmental Protection Resources		Texas City
J. M. Huber		Orange
Kerr Magee		Corpus Christi
Koch Industries		Corpus Christi
Lake Brazos Hydro-Electric	Young Brothers	Waco

COGENERATION AND SMALL POWER PRODUCTION IN TEXAS

NAMEPLATE MW RATING	PROJECT STATUS	DATE OF OPERATION	SERVICE AREA	CLASS	TYPE	FUEL	NOTE
5.300	CANCELED	1988	TNP	SPP	ST	BIO	
220.000	PROP	1988	COOP	COG	CT	NG	Houston Co Elec Coop area
5.000	IO	1984	HLP	COG	CT	WH	
70.000	PROP	1989	HLP	COG	CT	NG	
133.000	UC	1987	TUEC	COG	CT	NG	
57.000	PROP	1988	TUEC	COG	CT	NG	
37.000	UC	1987	CPL	COG	CT	NG	Down sized from 70 MW
105.000	PROP	1988	TUEC	COG	CT	NG	
9.000	CANCELED	1989	HLP	COG		NG	
180.000	CANCELED	Unknown	TUEC				
240.000	CANCELED	1987	HLP	COG	CT	NG	
60.000	CANCELED	1987	HLP	COG	CT	NG	
60.000	CANCELED	Unknown	HLP	COG	CT	NG	
63.500	PROP	1988	HLP	COG	CT	NG	Formerly Lubrizol/Pwr Sys
19.000	CANCELED	1987	HLP	COG	CT	NG	
18.000	UC	1987	GSU	COG	CT	NG	
350.000	CANCELED	Unknown	HLP	COG	CT	NG	
20.000	IO	1982	SPS	SPP/COG	ST	WG	
4.000	IO	1984	HLP	COG	ST	NG	
200.000	PROP	1988	CPL	COG	CT	NG	
10.000	PROP	1988	TNP	SPP	CT	MSW	
10.000	IO	1985	GSU	SPP	ST	WH	Formerly Phillips Petro.
40.000	PROP	Unknown	CPL	COG	CT	NG	
37.000	UC	1988	CPL	COG	CT	NG	
1.700	PROP	1987	TUEC	SPP	HT	HYDRO	

PUBLIC UTILITY COMMISSION OF TEXAS

PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
Lone Star Steel		Lone Star
Minnesota Mining and Manufacturing	3M	Austin
Misc. Wind < 100 KW		Various
Mobay	General Electric	Baytown
Mobil		Pasadena
Nasa Windfarm		Freeport
North American Ethanol Plant	North American Electric Power	Winkler County
Occidental		Deer Park
Occidental		La Porte
Olin (Mobil)		Ship Channel
Olin Chemical		Beaumont
Osborne Solar		Pampa
Panda Energy Corp.		Masterson
Phillips Petroleum		Sweeny
Phillips Processing Plant	Advanced Energy Systems	Andrews
Plaza Del Oro Hospital		Houston
Power Systems		Port Arthur
Pride Oil		Abilene
Quaker Oats		
Rhone-Poulenc/Decker Energy		Freeport
Rice University		Houston
Rock - Tenn Mill	Panda Energy Corporation	Dallas
SOHIO		Port Lavaca
SW Gt. Plains Research		Amarillo
Sabine	Dupont	Orange

COGENERATION AND SMALL POWER PRODUCTION IN TEXAS

NAMEPLATE MW RATING	PROJECT STATUS	DATE OF OPERATION	SERVICE AREA	CLASS	TYPE	FUEL	NOTE
34.000	IO	1953	SWEPCO	COG	ST	NG/WG	
13.500	UC	1987	CITY	COG	CT	NG	
0.701	IO	Various	SPS	SPP	WT	WIND	
37.000	PROP	1989	HLP	COG	CT	NG	Posponed from 1989
12.000	PROP	Unknown	HLP	COG	CT	NG	
0.230	IO	1984	HLP	SPP	WT	WIND	
30.000	PROP	1987	TUEC	COG	CT	NG	
75.000	IO	1985	HLP	COG	CT	NG	Formerly Diamond Shamrock
225.000	IO	1982	HLP	COG	CT	NG	Formerly Diamond Shamrock
10.000	CANCELED	1988	HLP	COG			
3.000	PROP	Unknown	GSU	COG	CT	NG	
0.125	IO	1981	SPS	SPP	WT	WIND	
40.000	CANCELED	Unknown	SPS	SPP	WT	WIND	
202.000	CANCELED	Unknown	TNP	COG	CT	NG	
120.000	PROP	1988	TUEC	COG	CT	NG	
0.500	IO	1984	HLP	COG	DE	NG	
75.000	PROP	Unknown	GSU	COG	CT	NG	
50.000	CANCELED	1987	WTU	COG	CT	NG	
25.000	CANCELED	Unknown	HLP	COG			
3.400	CANCELED	Unknown	HLP	COG	CT	NG	Posponed from 1986
3.200	IO	1986	HLP	COG	CT	NG	
80.000	PROP	1988	TUEC	COG	CT	NG	
17.000	IO	1981	CPL	SPP	ST	WH	
0.115	RETIRED	1980	SPS	SPP	WT	WIND	
80.000	UC	1987	GSU	COG	CT	NG	

PUBLIC UTILITY COMMISSION OF TEXAS

PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
Seadrift	Union Carbide	Seadrift
Sealy Power Ltd.		Sealy
Self-Generators / Non-QF	Various	Various
Self-Generators / Non-QF	Various	Various
Shell Oil		Deer Park
Sid Richardson Carbon & Gasoline		Borger
Sims Bayou/ARCO Petro.	AES / Arco Petroleum	Ship Channel
Slaughter Field	Amoco Production Company	Hockley Co.
Snider Industries		Marshall
Soltex/Ebasco		Ship Channel
Southwest Texas State University		San Marcos
Standard Meat Company	Panda Energy Corporation	Ft. Worth
Stauffer Chemical		Manchester
Stauffer Chemical		Baytown
Sterling Chemical Company	General Electric	Texas City
TXO/Delhi/La Gloria Ref.		Tyler
Technical Industrial Services		Houston County
Temple-Eastex Inc.		Diboll
Temple-Eastex Inc.		Evadale
Temple-Eastex Inc.		Evadale
Tenneco Building		Houston
Tenneco Polymers		Pasadena
Texaco Chemical Co.		Port Arthur
Texaco Refining & Marketing		Port Arthur
Texas A&M University		College Station

NAMEPLATE MW RATING	PROJECT STATUS	DATE OF OPERATION	SERVICE AREA	CLASS	TYPE	FUEL	NOTE
115.000	UC	1987	CPL	COG	CT	NG	
2.200	PROP	Unknown	HLP	SPP	ST	MSW	Formerly Energy Advancmnt
142.000	IO	Various	CPL	SELF	CT	NG	
134.400	IO	Various	SWEPCO	SELF	ST	BIO/NG	
50.000	CANCELED	Unknown	HLP				
28.000	IO	1985	SPS	SPP	ST	WG	Formerly Phillips Petro.
165.000	CANCELED	1987	HLP	COG	ST	PC	
18.000	IO	1984	SPS	COG	CT	NG	
3.000	IO	1983	SWEPCO	SPP	ST	BIO	
7.000	CANCELED	Unknown	HLP	COG		NG	
6.000	PROP	1989	CITY	COG	DE	NG	
50.000	PROP	1988	TUEC	COG	CT	NG	
6.500	IO	1984	HLP	COG	ST	WH	
1.000	IO	1984	HLP	COG	ST	WH	
450.000	CANCELED	Unknown	TNP	COG	CT	NG	Formerly Monsanto / GE
200.000	CANCELED	1987	TUEC	COG	CT	NG	
0.000	PROP	Unknown	TUEC	SPP		MSW	
214.000	CANCELED	1988	TUEC	COG	CT	NG	
17.000	IO	1986	GSU	SPP	ST	BIO	
9.000	UC	1988	GSU	SPP	ST	BIO	
1.300	PROP	Unknown	HLP	COG	CT	NG	Posponed from 1986
15.000	CANCELED	Unknown	HLP				
35.000	PROP	1987	GSU	COG	CT	NG	Down sized & Posponed
50.000	IO	1986	GSU	COG	CT/ST	NG	Down sized from 164 MW
32.500	IO	1935	CITY	COG	CT/ST	NG	

PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
Texas City Refining	Power System	Texas City
Texas Industries Inc.		Midlothian
Texas Petro-Chem		Deepwater
Texas Petro-Chemical		Houston
Texas Related Energy		
Texas Tech University		Lubbock
Texas Woman's University		Denton
Texasgulf Chemicals Co.		Newgulf
Thermal Energy		Houston
Tretolite, Inc.		Pasadena
U.S. Industrial Chemical		Deer Park
USDA - Potter County		Bushland
Uncle Ben's		Houston
Union Carbide	Enron Cogeneration Company	Texas City
Union Carbide (Old)		Texas City
University of Texas at Austin		Austin
University of Texas at Austin		Austin
Valero Refining		Corpus Christi
Valley View Energy Corp.		Hereford
Valley View Energy Corp.		Gruver
Venture Cogeneration	Airco	Port Lavaca
Warren Petroleum Co.		Mont. Belvieu
Wasson ODC Field	Amoco Production Company	Yoakum Co.
Waste Control Systems		
Wingtex, Inc.	Goodyear/TxPetroChem/Denka	Houston

COGENERATION AND SMALL POWER PRODUCTION IN TEXAS

NAMEPLATE MW RATING	PROJECT STATUS	DATE OF OPERATION	SERVICE AREA	CLASS	TYPE	FUEL	NOTE
37.000	PROP	Unknown	TNP	COG	CT	NG	
100.000	CANCELED	1987	TUEC	COG	ST	COAL	
120.000	CANCELED	Unknown	HLP	COG		NG	Formerly Petro-Tex
35.000	IO	1942	HLP	COG	ST	NG	Formerly Petro-Tex
100.000	CANCELED		HLP	COG	CT	NG	
1.500	PROP	Unknown	CITY	COG	ST	NG	
6.000	PROP	1988	CITY	COG	CT	NG	
78.000	IO	1985	HLP	COG	CT	NG	
7.000	PROP	1988	HLP	COG	DE	NG	
1.000	CANCELED	Unknown	HLP	COG	CT	NG	
35.000	CANCELED	Unknown	HLP				
0.600	PROP	1987	SPS	SPP	WT	WIND	
1.400	IO	1984	HLP	SPP	ST	BIO	
441.000	UC	1987	TNP	COG	CT	NG	Formerly Nrthrn Cogen One
25.000	IO	Unknown	TNP	COG	CT	NG	
60.000	IO	1949	CITY	COG	CT/ST	NG	
36.000	UC	1987	CITY	COG	CT/ST	NG	
64.000	IO	1984	CPL	SPP	ST	WH	Formerly Sabre
52.000	UC	1987	SPS	SPP		BIO	
52.000	UC	1987	SPS	SPP		BIO	
7.500	IO	1984	CPL	SPP	ST	WH	
10.000	PROP	1987	HLP	COG	CT	NG	
18.000	PROP	1987	SPS	COG	CT	NG	
6.000	CANCELED	1988	HLP	SPP	ST	BIO	
185.000	PROP	1987	HLP	COG	CT	NG	

PUBLIC UTILITY COMMISSION OF TEXAS

PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
** PROJECTS IN THE SERVICE AREA OF CITY		
Austin State Hospital		Austin
Minnesota Mining and Manufacturing 3M		Austin
Southwest Texas State University		San Marcos
Texas A&M University		College Station
Texas Tech University		Lubbock
Texas Woman's University		Denton
University of Texas at Austin		Austin
University of Texas at Austin		Austin
** PROJECTS IN THE SERVICE AREA OF COOP		
Cuero Hydro		Cuero
Enhanced Oil Recovery	Dallas Gas and Electric	Slocum
** PROJECTS IN THE SERVICE AREA OF CPL		
Arco Chemical		Portland
Bay City	Celanese	Bay City
Bishop Cogen Co	Celanese	Bishop
Champlin Petroleum		Corpus Christi
Coastal States Petro Co.		Corpus Christi
Corpus Christi Petrochemical Complx		Corpus Christi
Dupont		Corpus Christi
Dupont		Victoria

COGENERATION AND SMALL POWER PRODUCTION IN TEXAS

PROJECT STATUS	DATE OF OPERATION	CLASS	NAMEPLATE MW RATING	FIRM CONTRACT	FIRM MW CAPACITY	NON-FIRM CONTRACT	NON-FIRM MAX. MW
PROP	1988	COG	1.000		0.000		0.000
UC	1987	COG	13.500		0.000		0.000
PROP	1989	COG	6.000		0.000		0.000
IO	1935	COG	32.500		0.000		0.000
PROP	Unknown	COG	1.500		0.000		0.000
PROP	1988	COG	6.000		0.000		0.000
IO	1949	COG	60.000		0.000		0.000
UC	1987	COG	36.000		0.000		0.000
UC	1987	SPP	1.000		0.000		0.000
PROP	1988	COG	220.000		0.000		0.000
UC	1987	COG	1.500		0.000		0.000
PROP	Unknown	COG	40.000		0.000		0.000
PROP	1988	COG	236.000		0.000		0.000
PROP	Unknown	COG	60.000		0.000		0.000
IO	1984	COG	47.000		0.000	CPL	0.000
PROP	Unknown	COG	40.000		0.000		0.000
CANCELED	1987	COG	150.000		0.000		0.000
UC	1987	COG	82.000		0.000		0.000

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PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
** PROJECTS IN THE SERVICE AREA OF CPL (Continued)		
Formosa Plastics		Point Comfort
Internorth	Alcoa	Point Comfort
Kerr Magee		Corpus Christi
Koch Industries		Corpus Christi
SOHIO		Port Lavaca
Seadrift	Union Carbide	Seadrift
Self-Generators / Non-QF	Various	Various
Valero Refining		Corpus Christi
Venture Cogeneration	Airco	Port Lavaca
** PROJECTS IN THE SERVICE AREA OF GSU		
Champion Int.		Corrigan
Chevron Chemical		Beaumont
Chevron Refinery		Port Arthur
Chevron U.S.A. Inc.		Port Arthur
Cogen Power, Inc.		Port Arthur
Goodyear		Beaumont
J. M. Huber		Orange
Olin Chemical		Beaumont
Power Systems		Port Arthur
Sabine	Dupont	Orange
Temple-Eastex Inc.		Evadale

COGENERATION AND SMALL POWER PRODUCTION IN TEXAS

PROJECT STATUS	DATE OF OPERATION	CLASS	NAMEPLATE MW RATING	FIRM CONTRACT	FIRM MW CAPACITY	NON-FIRM CONTRACT	NON-FIRM MAX. MW
UC	1987	COG	37.000		0.000		0.000
PROP	1988	COG	200.000		0.000		0.000
PROP	Unknown	COG	40.000		0.000		0.000
UC	1988	COG	37.000		0.000		0.000
IO	1981	SPP	17.000		0.000	CPL	0.000
UC	1987	COG	115.000		0.000		0.000
IO	Various	SELF	142.000		0.000		0.000
IO	1984	SPP	64.000		0.000	CPL	0.000
IO	1984	SPP	7.500		0.000	CPL	0.000
PROP	Unknown	SPP	8.000		0.000		0.000
PROP	1987	COG	42.000		0.000		0.000
PROP	1987	COG	8.000		0.000		0.000
IO	Unknown	COG	0.087		0.000		0.000
IO	1984	SPP	7.000		0.000	GSU	7.000
UC	1987	COG	18.000		0.000		0.000
IO	1985	SPP	10.000		0.000	GSU	10.000
PROP	Unknown	COG	3.000		0.000		0.000
PROP	Unknown	COG	75.000		0.000		0.000
UC	1987	COG	80.000		0.000		0.000
IO	1986	SPP	17.000		0.000		0.000

PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
** PROJECTS IN THE SERVICE AREA OF GSU	(Continued)	
Temple-Eastex Inc.		Evadale
Texaco Chemical Co.		Port Arthur
Texaco Refining & Marketing		Port Arthur
** PROJECTS IN THE SERVICE AREA OF HLP		
Adams Terminal	AES	Ship Channel
Air Products - Olin Road		Pasadena
American Hoechst		
American Recovery Systems		
American Recovery Systems		LaPorte
American Ref-Fuel	Browning-Ferris Ind. / Air Products	Pasadena
Amoco Chemicals		Chocolate Bayou
Anchor Hocking		
Arco Chemical		
Bayou Cogeneration Plant	Enron Cogen./Big Three Indust./GE	Pasadena
Capitol Cogeneration	Celanese / H.B. Zachry / TNP	Pasadena
Champion Paper		Deepwater
Champion Paper	General Electric	Pasadena
Champion Sheldon (St.Regis)		
Chevron Chemical		Baytown
CoGen Kern Bluff		Houston
Cogen Lynchburg	Power System Engr.	La Porte

COGENERATION AND SMALL POWER PRODUCTION IN TEXAS

PROJECT STATUS	DATE OF OPERATION	CLASS	NAMEPLATE MW RATING	FIRM CONTRACT	FIRM MW CAPACITY	NON-FIRM CONTRACT	NON-FIRM MAX. MW
UC	1988	SPP	9.000		0.000		0.000
PROP	1987	COG	35.000		0.000		0.000
IO	1986	COG	50.000		0.000	GSU	50.000
CANCELED	1988	COG	150.000		0.000		0.000
IO	1985	COG	4.100		0.000	HLP	4.100
CANCELED	Unknown	COG	20.000		0.000		0.000
CANCELED	1987	SPP	10.000		0.000		0.000
CANCELED	Unknown	COG	52.000		0.000		0.000
CANCELED	1989	SPP	52.500		0.000		0.000
IO	1985	COG	37.100		0.000	HLP	37.100
CANCELED	Unknown	COG	4.000		0.000		0.000
CANCELED	1986	COG	75.000		0.000		0.000
IO	1985	COG	312.000	HLP	270.000		0.000
IO	1984	COG	375.000	TNP	300.000	HLP,CITY	375.000
CANCELED	1987	COG	190.000		0.000		0.000
PROP	1988	COG	34.000		0.000		0.000
CANCELED	1986	COG	68.000		0.000		0.000
CANCELED	Unknown		20.000		0.000		0.000
CANCELED	Unknown	COG	45.000		0.000		0.000
PROP	1988	COG	502.000		0.000		0.000

PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
** PROJECTS IN THE SERVICE AREA OF HLP (Continued)		
Cogen Lyondell	Power System Engr.	Channelview
Deepwater	AES	Pasadena
Dow Chemical		Freeport
Enterprise Product		Mont Belvieu
Exxon Refinery Pwr Plnt 4&5	Exxon Chemicals	Baytown
General Foods/Maxwell House		Houston
Gentex		Bayport
Gentex - ICI		Bayport
Gentex - Tenneco		Houston
Gentex / TSG. Inc.		Bayport
Goodrich		Ship Channel
Goodyear/GE		Deepwater
Imperial Sugar		Sugarland
Mobay	General Electric	Baytown
Mobil		Pasadena
Nasa Windfarm		Freeport
Occidental		Deer Park
Occidental		La Porte
Olin (Mobil)		Ship Channel
Plaza Del Oro Hospital		Houston
Quaker Oats		
Rhone-Poulenc/Decker Energy		Freeport
Rice University		Houston

PROJECT STATUS	DATE OF OPERATION	CLASS	NAMEPLATE MW RATING	FIRM CONTRACT	FIRM MW CAPACITY	NON-FIRM CONTRACT	NON-FIRM MAX. MW
IO	1985	COG	518.000	TUEC	400.000	HLP	150.000
IO	1986	COG	154.000	HLP	136.000		0.000
IO	1982	COG	1300.000	HLP	325.000	TUEC	450.000
IO	1984	COG	5.000		0.000		0.000
PROP	1989	COG	70.000		0.000		0.000
CANCELED	1989	COG	9.000		0.000		0.000
CANCELED	1987	COG	240.000		0.000		0.000
CANCELED	1987	COG	60.000		0.000		0.000
CANCELED	Unknown	COG	60.000		0.000		0.000
PROP	1988	COG	63.500	TUEC	0.000		0.000
CANCELED	1987	COG	19.000		0.000		0.000
CANCELED	Unknown	COG	350.000		0.000		0.000
IO	1984	COG	4.000		0.000	HLP	1.000
PROP	1989	COG	37.000		0.000		0.000
PROP	Unknown	COG	12.000		0.000		0.000
IO	1984	SPP	0.230		0.000	HLP	0.600
IO	1985	COG	75.000		0.000	HLP	0.000
IO	1982	COG	225.000	HLP	225.000		0.000
CANCELED	1988	COG	10.000		0.000		0.000
IO	1984	COG	0.500		0.000		0.000
CANCELED	Unknown	COG	25.000		0.000		0.000
CANCELED	Unknown	COG	3.400		0.000		0.000
IO	1986	COG	3.200		0.000		0.000

PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
** PROJECTS IN THE SERVICE AREA OF HLP (Continued)		
Sealy Power Ltd.		Sealy
Shell Oil		Deer Park
Sims Bayou/ARCO Petro.	AES / Arco Petroleum	Ship Channel
Soltex/Ebasco		Ship Channel
Stauffer Chemical		Manchester
Stauffer Chemical		Baytown
Tenneco Building		Houston
Tenneco Polymers		Pasadena
Texas Petro-Chem		Deepwater
Texas Petro-Chemical		Houston
Texas Related Energy		
Texasgulf Chemicals Co.		Newgulf
Thermal Energy		Houston
Tretolite, Inc.		Pasadena
U.S. Industrial Chemical		Deer Park
Uncle Ben's		Houston
Warren Petroleum Co.		Mont. Belvieu
Waste Control Systems		
Wingtex, Inc.	Goodyear/TxPetroChem/Denka	Houston
** PROJECTS IN THE SERVICE AREA OF SPS		
Celanese CZ-1		Pampa

COGENERATION AND SMALL POWER PRODUCTION IN TEXAS

PROJECT STATUS	DATE OF OPERATION	CLASS	NAMEPLATE MW RATING	FIRM CONTRACT	FIRM MW CAPACITY	NON-FIRM CONTRACT	NON-FIRM MAX. MW
PROP	Unknown	SPP	2.200		0.000	HLP	2.200
CANCELED	Unknown		50.000		0.000		0.000
CANCELED	1987	COG	165.000		0.000		0.000
CANCELED	Unknown	COG	7.000		0.000		0.000
IO	1984	COG	6.500		0.000	HLP	5.000
IO	1984	COG	1.000		0.000		0.000
PROP	Unknown	COG	1.300		0.000		0.000
CANCELED	Unknown		15.000		0.000		0.000
CANCELED	Unknown	COG	120.000		0.000		0.000
IO	1942	COG	35.000		0.000	HLP	5.000
CANCELED		COG	100.000		0.000		0.000
IO	1985	COG	78.000	TUEC	70.000		0.000
PROP	1988	COG	7.000		0.000		0.000
CANCELED	Unknown	COG	1.000		0.000		0.000
CANCELED	Unknown		35.000		0.000		0.000
IO	1984	SPP	1.400		0.000		0.000
PROP	1987	COG	10.000		0.000		0.000
CANCELED	1988	SPP	6.000		0.000		0.000
PROP	1987	COG	185.000		0.000		0.000
IO	1965	SPP/COG	10.000	SPS	10.000		0.000

PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
** PROJECTS IN THE SERVICE AREA OF SPS	(Continued)	
Celanese CZ-2		Pampa
Huber		Borger
Misc. Wind < 100 KW		Various
Osborne Solar		Pampa
Panda Energy Corp.		Masterson
SW Gt. Plains Research		Amarillo
Sid Richardson Carbon & Gasoline		Borger
Slaughter Field	Amoco Production Company	Hockley Co.
USDA - Potter County		Bushland
Valley View Energy Corp.		Hereford
Valley View Energy Corp.		Gruver
Wasson ODC Field	Amoco Production Company	Yoakum Co.
** PROJECTS IN THE SERVICE AREA OF SWEPCO		
Dean Lumber Company		Gilmer
Lone Star Steel		Lone Star
Self-Generators / Non-QF	Various	Various
Snider Industries		Marshall
** PROJECTS IN THE SERVICE AREA OF TNP		
Amoco Chemicals		Texas City
Amoco Oil		Texas City

COGENERATION AND SMALL POWER PRODUCTION IN TEXAS

PROJECT STATUS	DATE OF OPERATION	CLASS	NAMEPLATE MW RATING	FIRM CONTRACT	FIRM MW CAPACITY	NON-FIRM CONTRACT	NON-FIRM MAX. MW
IO	1979	COG	29.000	SPS	29.000		0.000
IO	1982	SPP/COG	20.000		0.000	SPS	20.000
IO	Various	SPP	0.701		0.000		0.000
IO	1981	SPP	0.125		0.000	SPS	0.125
CANCELED	Unknown	SPP	40.000		0.000		0.000
RETIRED	1980	SPP	0.115		0.000		0.000
IO	1985	SPP	28.000		0.000	SPS	28.000
IO	1984	COG	18.000		0.000	SPS	18.000
PROP	1987	SPP	0.600		0.000	SPS	0.600
UC	1987	SPP	52.000		0.000		0.000
UC	1987	SPP	52.000		0.000		0.000
PROP	1987	COG	18.000		0.000	SPS	18.000
IO	1985	SPP	0.560		0.000	SWEPCO	0.560
IO	1953	COG	34.000		0.000		0.000
IO	Various	SELF	134.400		0.000		0.000
IO	1983	SPP	3.000		0.000	SWEPCO	3.000
IO	1984	COG	40.000		0.000	HLP	15.000
IO	1986	COG	180.000		0.000	HLP	80.000

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PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
** PROJECTS IN THE SERVICE AREA OF TNP (Continued)		
DFW Sanitary Landfill	Waste Management Inc.	Lewisville
Energy Advancement Inc.		West Columbia
Invironmental Protection Resources		Texas City
Phillips Petroleum		Sweeny
Sterling Chemical Company	General Electric	Texas City
Texas City Refining	Power System	Texas City
Union Carbide	Enron Cogeneration Company	Texas City
Union Carbide (Old)		Texas City
** PROJECTS IN THE SERVICE AREA OF TUEC		
Amoco Gasoline Plant	Intergas	Ector County
Aquaculture	National Cogeneration	Howard County
CO2 Extraction Plant	Mitchell Energy Corp.	Bridgeport
Central Expressway Site	Enserch Development Corporation	Dallas
CertainTeed	Wichita Falls Energy	Wichita Falls
Champion Paper		Lufkin
City of Cleburne		Cleburne
El Paso Natural Gas	Intergrated Energy Systems	Ector County
El Paso Products	Cobisa, Inc.	Odessa
Fina	Falcon Seaboard	Big Springs
Fina	Falcon Seaboard	Big Springs
Gabriel Power		Stanton

COGENERATION AND SMALL POWER PRODUCTION IN TEXAS

PROJECT STATUS	DATE OF OPERATION	CLASS	NAMEPLATE MW RATING	FIRM CONTRACT	FIRM MW CAPACITY	NON-FIRM CONTRACT	NON-FIRM MAX. MW
PROP	1988	SPP	3.000		0.000		0.000
CANCELED	1988	SPP	5.300		0.000		0.000
PROP	1988	SPP	10.000		0.000		0.000
CANCELED	Unknown	COG	202.000		0.000		0.000
CANCELED	Unknown	COG	450.000		0.000		0.000
PROP	Unknown	COG	37.000		0.000		0.000
UC	1987	COG	441.000	TUEC	393.000		0.000
IO	Unknown	COG	25.000		0.000	TNP	0.000
PROP	1988	COG	120.000		0.000		0.000
PROP	1989	COG	60.000		0.000		0.000
IO	1984	COG	3.000		0.000		0.000
PROP	1988	COG	200.000		0.000		0.000
UC	1987	COG	75.000	TUEC	75.000		0.000
CANCELED	Unknown		75.000		0.000		0.000
IO	1986	SPP	0.750		0.000	TUEC	0.750
PROP	Unknown	COG	0.000		0.000		0.000
PROP	1989	COG	210.000		0.000		0.000
UC	1987	COG	133.000	TUEC	106.000		0.000
PROP	1988	COG	57.000		0.000		0.000
PROP	1988	COG	105.000		0.000		0.000

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PROJECT NAME	PROJECT OWNER	PROJECT LOCATION
** PROJECTS IN THE SERVICE AREA OF TUEC (Continued)		
General Tire/Tesoro Petroleum		Waco
Lake Brazos Hydro-Electric	Young Brothers	Waco
North American Ethanol Plant	North American Electric Power	Winkler County
Phillips Processing Plant	Advanced Energy Systems	Andrews
Rock - Tenn Mill	Panda Energy Corporation	Dallas
Standard Meat Company	Panda Energy Corporation	Ft. Worth
TXO/Delhi/La Gloria Ref.		Tyler
Technical Industrial Services		Houston County
Temple-Eastex Inc.		Diboll
Texas Industries Inc.		Midlothian
** PROJECTS IN THE SERVICE AREA OF WTU		
Pride Oil		Abilene

COGENERATION AND SMALL POWER PRODUCTION IN TEXAS

PROJECT STATUS	DATE OF OPERATION	CLASS	NAMEPLATE MW RATING	FIRM CONTRACT	FIRM MW CAPACITY	NON-FIRM CONTRACT	NON-FIRM MAX. MW
CANCELED	Unknown		180.000		0.000		0.000
PROP	1987	SPP	1.700		0.000		0.000
PROP	1987	COG	30.000		0.000		0.000
PROP	1988	COG	120.000		0.000		0.000
PROP	1988	COG	80.000		0.000		0.000
PROP	1988	COG	50.000		0.000		0.000
CANCELED	1987	COG	200.000		0.000		0.000
PROP	Unknown	SPP	0.000		0.000		0.000
CANCELED	1988	COG	214.000		0.000		0.000
CANCELED	1987	COG	100.000		0.000		0.000
CANCELED	1987	COG	50.000		0.000		0.000

PUBLIC UTILITY COMMISSION OF TEXAS
COGENERATION AND SMALL POWER PRODUCERS IN TEXAS

UTILITY SERVICE AREA	NUMBER OF MW IN OPERATION	NUMBER OF MW UNDER CONST.	NUMBER OF MW PROPOSED	NUMBER OF MW CANCELED
CITY	92.500	49.500	14.500	0.000
COOP	0.000	1.000	220.000	0.000
CPL	277.500	272.500	616.000	150.000
GSU	84.087	107.000	171.000	0.000
HLP	3,135.030	0.000	924.000	1,961.900
SPS	105.826	104.000	18.600	40.000
SWEPCO	171.960	0.000	0.000	0.000
TNP	245.000	441.000	50.000	657.300
TUEC	3.750	208.000	1,033.700	769.000
WTU	0.000	0.000	0.000	50.000
TOTAL	4,115.653	1,183.000	3,047.800	3,628.200

Appendix F

Legal Implications of Interconnections Between ERCOT and Other Reliability Councils

Public Utility Commission of Texas

Memorandum

PUBLIC UTILITY COMMISSION OF TEXAS
RECEIVED
FEB 01 1988
BY________
ELECTRIC

To: Bill Moore and Jay Zarnikau

From: Paula Mueller pm

Re: Implications of Additional Interconnections Between ERCOT and Other Reliability Councils

Date: January 19, 1988

I. Question Presented

Whether additional interconnections between the Electric Reliability Council of Texas (ERCOT) and other electric utilities engaged in interstate commerce would result in ERCOT coming within the jurisdiction of the Federal Energy Regulatory Commission.

II. Brief Answer

Interconnection of ERCOT utilities with other utilities engaged in interstate commerce and subject to Federal Energy Regulatory Commission (FERC, or Commission) jurisdiction would result in ERCOT coming within FERC jurisdiction, unless the interconnections were made pursuant to FERC order issued under 16 U.S.C. §§824i, 824j, and 824k (Sections 210, 211, and 212 of the Federal Power Act). 16 U.S.C. §824 (Section 201 of the Federal Power Act) provides for FERC jurisdiction over the transmission of electric energy in interstate commerce and the sale of such energy at wholesale. Case law establishes that voluntary connections between ERCOT and other electric utilities engaged in interstate commerce would result in imposition of FERC regulation upon ERCOT utilities engaged in transmission and wholesale sales of electricity.

FERC has statutory authority to order interconnections between electric utilities not otherwise within its jurisdiction. 16 U.S.C. §§824i, 824j, and 824k. However, §824(b)(2) states that compliance with orders issued under those sections shall not make an electric utility subject to FERC's jurisdiction except for the purposes of carrying out the provisions of the order and for the purposes of enforcement.

III. <u>Statement of Facts</u>

With the exception noted below, ERCOT operates entirely intrastate. ERCOT has no interconnection with any utility operating outside of Texas or having interconnections with any utility operating outside of Texas. Part of the motivation for avoidance of interstate connections is the desire to avoid regulation under the Federal Power Act.

The single exception to ERCOT's intrastate operations results from a 1979 filing by Central Power and Light Company(CPL), Public Service Company of Oklahoma(PSO), Southwestern Electric Power Company(SWEPCO), and West Texas Utilities(WTU) (collectively CSW Operating Companies) with FERC seeking the interconnection of facilities and provision of transmission services pursuant to 16 U.S.C. §§824i, 824j and 824k. CSW sought the interconnnections in order to integrate the operations of CPL and WTU, which operate within ERCOT, with PSO and SWEPCO, which operate within the Southwest Power Pool.

In 1981, in response to CSW Operating Companies' petition, FERC issued an order requiring two DC interconnections and wheeling. FERC ordered Houston Lighting and Power (HL&P), an ERCOT utility, and CSW to interconnect with each other and with any other utility at designated locations in order to permit or facilitate transmission, sale, exchange, wheeling, coordination or commingling of electric power in interstate commerce to, from or over the interconnections or within the State of Texas. The order made similar requirements of Texas Utilities Company (TU), also an ERCOT utility. One of the interconnections ordered has been constructed.

The order specifically provided, in accordance with 16 U.S.C. §824(b)(2),that neither HL&P nor TU would become subject to FERC's jurisdiction by virtue of their compliance with the order. Therefore, in spite of the interconnection which exists as a result of the 1981 FERC order, ERCOT utilities remain outside federal jurisdiction.

IV. <u>Discussion</u>

A. Federal Jurisdiction Over Public Utilities Under 16 U.S.C. §824 (Section 201 of the Federal Power Act)

1. <u>Jurisdiction Under Section 824</u>

The Federal Power Act (the Act), 16 U.S.C. §§791 - 828c, was intended to fill a regulatory gap that existed as a result of the inability of states to regulate the transmission of electric energy in interstate commerce and wholesale sales of such energy because of the constraints of the commerce clause of the United States Constitution.

Since the enactment of the Act in 1935, questions of federal jurisdiction to regulate electric utilities have been largely determined by statutory construction rather than interpretation of the United States Constitution.

The U.S. Supreme Court's decision in Public Utilities Commission of Rhode Island v. Attleboro Steam & Electric Co., 271 U.S. 83, 47 S.Ct. 294 (1927), established that the transmission of electric current from one state to another constituted interstate commerce, and that state regulation of interstate transmission of electric energy places a direct burden on interstate commerce, from which states are restrained by the commerce clause of the United States Constitution. In ruling on the validity of the State of Rhode Island's regulation of rates for interstate wholesale sale of electric energy, the Court stated that the test of the validity of the state regulation is not the character of the general business of a company, but whether the particular business that is regulated is essentially local or national in character. If the regulation in question places a direct burden on interstate commerce, the regulation is beyond the powers of the state.

After Attleboro a large area of utilities operations were unregulated because there was no federal legislation in this area. Therefore, in order to curb abusive practices of public utility companies by bringing them under effective control and to provide effective federal regulation of the expanding business of transmitting and selling electric power in interstate commerce, Congress enacted the Federal Power Act. Gulf States Utilities Co. v. Federal Power Commission, 411 U.S. 747, 93 S.Ct. 1870 (1973), rehearing denied 412 U.S. 944, 93 S.Ct. 2767.

Section 824 of the Act contains the policy declaration and jurisdictional grant relating to electric utilities. Because these subsections include the language that is the subject of most debate, they are set forth in full below.

> Section 824. Declaration of policy; application of subchapter. (a) Federal regulation of transmission and sale of electric energy. It is declared that the business of transmitting and selling electric energy for ultimate distribution to the public is affected with a public interest, and that Federal regulation of matters relating to generation to the extent provided in this subchapter and subchapter III of this chapter and of that part of such business which consists of the transmission of electric energy in interstate commerce and the sale of such energy at wholesale in interstate commerce is necessary to the public interest, such Federal regulation, however, to extend only to those matters which are not subject to regulation by the States.

> (b) Use or sale of electric energy in interstate commerce. (1) The provisions of this subchapter shall apply to the transmission of electric energy in interstate commerce and to the sale of electric energy at wholesale in interstate commerce, but except as provided in paragraph (2) shall not apply to any other sale of electric energy or deprive a State commission of its lawful authority now exercised over the exportation of hydroelectric energy which is transmitted across a State line. The Commission shall have jurisdiction over all facilities for such transmission or sale of electric energy, but shall not have jurisdiction, except as specifically provided in this subchapter and subchapter III of this chapter, over facilities used for the generation of electric energy or over facilities used in local distribution or only for the transmission of electric energy in intrastate commerce, or over facilities for the transmission of electric energy consumed wholly by the transmitter.

The provisions of the Act apply to "public utilities", which are defined as persons who own or operate facilities subject to the jurisdiction of the Commission. The Commission has jurisdiction over facilities used for transmission of electric energy in interstate commerce or for wholesale sales of electric energy that has been transmitted in interstate commerce. The Commission does not have jurisdiction over facilities used for generation of electric energy, over facilities used in local distribution, or used only for the transmission of electric energy in intrastate commerce, or over facilities for the transmission of electric energy consumed wholly by the transmitter.

2. Scope of Jurisdiction

The Act provides that electric energy is held to be transmitted in interstate commerce if transmitted from a State and consumed at any point outside thereof, but only insofar as such transmission takes place within the United States. Energy in interstate commerce does not refer only to energy at the instant it crosses a state line; rather, if a utility transmits electrical energy that has been at some point transmitted in interstate commerce, then that utility is considered to be a public utility under the Act. Part of the rationale for that interpretation is that if intervening purchasers could buy from producers free of federal control, the cost would be fixed prior to the incidence of federal regulation and federal rate control would be substantially impaired if not rendered futile. New Jersey Central Power & Light Co. v. Federal Power Commission, 319 U.S. 61, 63 S.Ct. 953 (1943).

In the New Jersey Central case, the question of the need for Federal Power Commission (FPC) approval of a sale of stock was dependent on whether the seller of the stock, New Jersey Central Power and Light Company, was a public utility. New Jersey Central, all of whose facilities were located in New Jersey, sold and purchased power from Public Service Electric and Gas Company, which transmitted and received power across state lines to and from Staten Island Edison located in New York. The connection between Public Service and Staten Island was maintained primarily to guard against breakdown. It was used for emergencies a few times per year on the average, and surplus energy was occasionally sold. The rest of the time the line was maintained in balance to avoid delay in transmission during an emergency.

The Court determined that New Jersey Central was a public utility subject to FPC jurisdiction because it owned facilities used for the transmission of electric energy in interstate commerce. The Court reasoned that because the purpose of the Federal Power Act was primarily to regulate rates and charges of interstate energy, the fact that the company did not own facilities that actually transmitted across state lines was not determinative. Because the Company's transmission lines carried energy that had at one time been transmitted in interstate commerce, the FPC had plenary jurisdiction over the company.

Another important case in this area is Federal Power Commission v. Southern California Edison Company, 376 U.S. 205, 84 S.Ct. 644 (1964)(the Colton case). The City of Colton purchased its entire power requirement from Southern California Edison Company (Edison), an electric utility operating in central and southern California. Colton used some of the power for municipal use, and resold the bulk to thousands of residential, commercial, and industrial customers. The transactions were regulated by the Public Utilities Commission of California, but Colton filed a petition to have FPC assert jurisdiction. Some of the energy marketed by Edison originated in Nevada and Arizona. Edison admitted that it was a public utility, but asserted that that did not determine the issue of whether FPC may assert jurisdiction over the rates charged in the Edison-Colton sale. The FPC found that out-of-state energy was included in the energy delivered from Edison to Colton, which placed the transactions within the jurisdiction of the FPC.

The Court of Appeals reversed the FPC on the grounds that FPC jurisdiction was restricted to sales constitutionally beyond the reach of State regulation. In this case, the Court of Appeals determined that State regulation of the Edison-Colton sale would not prejudice the interests of any other state. The Supreme Court reversed the Court of Appeals, finding that the FPC has jurisdiction over all sales not expressly exempted by the Act itself. The Court found that Congress intended to draw a bright line as to what constitutes transmission in interstate commerce, rather than have a case-by-case determination.

In the Colton case, the FPC employed tracing studies to prove the existence of interstate power in Colton's lines, relying on a "engineering and scientific" standard for determination of whether energy had been transmitted in interstate commerce, an approach which was enunciated in Connecticut Light & Power Co. v. Federal Power Commission, 324 U.S. 515, 65 S.Ct. 749 (1945). A line of cases explores the issue of the degree of proof required to establish the presence of interstate energy and therefore federal jurisdiction.

Where there is an integrated, interstate pool operation, jurisdiction may be established without resort to tracing studies, Arkansas Power & Light Company v. FPC, 368 F.2d 376 (8th Cir. 1966).The Arkansas Power & Light case was distinguished from the Colton case, supra, because in Colton there was a single customer, with no integrated operation, and the FPC, by necessity, had to resort to scientific studies to show that out-of-state energy reached Colton.

The Colton case does not rule out the use of the "power pool" test, which may be used instead of point to point tracing studies where there is a multi-state integrated electric power system. Public Service Company of Indiana, Inc. v. Federal Power Commission, 375 F.2d 100 (7th Cir. 1967), cert. denied 387 U.S. 931, 87 S.Ct. 2054, Indiana & Michigan Electric Company v. Federal Power Commission, 365 F.2d 180 (7th Cir. 1966), cert. denied.

Commingled intrastate and interstate generated electicity flowing through a utility's system is sufficient to sustain federal jurisdiction. Cincinnati Gas & Electric Company v. Federal Power Commission, 376 F2d 506 (6th Cir. 1967), cert. den. 389 U.S. 842. In that case, the petitioner claimed that the burden of proof was on the FPC to show the actual source of specific units of energy delivered to wholesale customers, and that it was scientifically impossible to do so. The examiner found that at times, each of the company's wholesale customers received out of state electrical energy from a multi-state power network; that the integrated and coordinated Cincinnati systems were interconected with and operating in synchronism with a central system which formed an integrated and operating power pool; that the sales of electricity from Cincinnati to its wholsesale customers were pool sales; and, that by reason of the interstate nature of the pool, the sales were in interstate commerce. The Court sustained the examiner's finding of federal jurisdiction.

Changes in voltage are irrelevant. Commingling of interstate energy with intrastate energy does not destroy the interstate nature of the energy, even if the interstate component is only a small percentage of the total volume. Wisconsin-Michigan Power Co. v. FPC, 197 F.2d 472 (7th Cir. 1952).

A prevailing theme in the above line of cases is the problem of the impossibility of proving beyond doubt whether specific units of electrical energy have been transmitted in interstate commerce. However, as the Court in Indiana & Michigan, supra, noted, people have been convicted of crimes based on circumstantial evidence. The Courts have consistently held that sophisticated tracing techniques are not required to establish the existence of interstate power in a utility's lines. Rather, more "common sense" approaches have been upheld, such as insufficient generation within a given state to provide all of a utility's power needs. Under such facts, it seems obvious that out-of-state power is being transmitted. see Indiana & Michigan Electric Company v. Federal Power Commission, supra.

Sale of electric energy at wholesale is defined in the Act as a sale of electric energy to any person for resale. The term "person", as it is used in this definition, has been held to include municipalities, Wisconsin-Michigan Power Co. et al v. Federal Power Commission, supra, and cooperatives and their members, Public Service Co. of Indiana v. Federal Power Commission, supra.

Where a company is a public utility and subject to federal jurisdiction, all wholesale sales for resale are subject to FERC jurisdiction, even if the transmissions are local in character. Indiana & Michigan Electric Company v. Federal Power Commission, supra.(Court upheld FPC order requiring filing of rate schedules where utility alleged that transmission of interstate power was subject to local distribution exemption).

Federal jurisdiction over wholesale sales may be sufficient to confer authority for regulation of utilities that own generation facilities not subject to federal jurisdiction on the grounds that generating facilities, where used as aids to wholesale sales, are within the FPC's jurisdiction under §824(a). Although the FPC lacked jurisdiction over generating facilities, through its jurisdiction over wholesale sales there is authority over the corporate organization, contracts, accounts, memoranda, papers and other records insofar as they are utilized in such sales. Hartford Electric Light Co. v. Federal Power Commission, 131 F.2d 953 (2d Cir. 1942). The Court considered it immaterial that the sales involved were indirect, or that the quantities sold were variable or part of "surplus" production, or that sales were made at the utility's place of business, or that the utility sold without prior obligation to do so.

In 1983, the United States Supreme Court appeared to modify its "bright line" test in determining whether regulation of wholesale sales of electric energy transmitted in interstate commerce was strictly a matter of federal jurisdiction. In Arkansas Electric Cooperative Corporation v. Arkansas Public Service Commission, 461 U.S. 375, 103

S.Ct. 1905 (1983), the Court ruled that state regulation of wholesale sales of electric energy which may have been transmitted in interstate commerce was within the scope of legitimate local public interest and did not constitute an impermissible burden on interstate commerce. In reaching its decision, the Court followed a "balance-of-interests" test which characterizes commerce clause analysis more recent than Attleboro, noting that following the Attleboro test would have required reaching the opposite result.

In analyzing the importance of the Arkansas Electric Cooperative case in the context of Federal Power Act construction, some important factors must be considered. The Arkansas case does not construe the Federal Power Act; the Federal Power Commission held in 1967 that it had no jurisdiction under the Federal Power Act to regulate wholesale rates charged by rural power cooperatives under the supervision of the Rural Electrification Administration. Dairyland Power Cooperative, 37 F.P.C. 12, 67 P.U.R. 3d 340 (1967). Indeed, the Arkansas Court furthered the purposes of the Act, which was enacted to fill a regulatory gap, by upholding state regulation of an otherwise unregulated area. The Court made it clear that its "balance-of-interests" commerce clause analysis in Arkansas Electric Cooperative does not apply to cases decided under the Act when it said, "Moreover, Southern California Edison Co.[the Colton case] and other cases have made it clear that the Federal Power Act draws a bright line between the respective jurisdictions of federal and state regulatory agencies."

3. Exemptions from Federal Jurisdiction

The Act expressly exempts the following types of facilities from federal jurisdiction: facilities used for the generation of electric energy; facilities used in local distribution only; facilities used only for the transmission of electric energy in intrastate commerce; and, facilities for the transmission of electric energy consumed wholly by the transmitter. The exemption for transmission of electric energy in intrastate commerce is one that ERCOT utilities have historically relied upon.

Although generation facilities are exempt, at least one case, Hartford Electric Light Co. v. Federal Power Commission, supra, upheld federal jurisdiction over a generating facility based on wholesale sales in interstate commerce of energy generated at the subject facility.

The local distribution exemption generally applies to distribution for retail sale directly to the ultimate consumer. It does not refer to transmission activites that are essentially localized in nature. The test is whether the facilities are used for local distribution as opposed to transmission of interstate power. Connecticut Light & Power Co. v. Federal Power Commission, supra.

Some utilities have unsuccessfully relied upon language contained in the Act's policy declaration to attempt to create another "exemption" from federal regulation. Section 824(a) provides that Federal regulation shall "extend only to those matters which are not subject to regulation by the State." In Connecticut Light & Power, supra, the company was incorporated in the State of Connecticut, served only customers located in Connecticut, owned no utility property outside the state and was comprehensively regulated by the Connecticut Public Utilities Commission. The predominant characteristic of the company's business was that of local and intrastate service; there were no lines crossing the state boundary. If local distribution were terminated, there would be no remaining purpose or use for the facilities. The company asserted that federal jurisdiction was an intrusion into an area expressly reserved to state jurisdiction. However, the company purchased power that regularly included power transmitted from Massachusetts. The Court held that the policy declaration that federal regulation is "to extend only to those matters which are not subject to regulation by the states" is of great generality and cannot nullify a clear and specific grant of jurisdiction, even if the particular grant seems inconsistent with the broadly expressed purpose.

In other cases, utilities have relied upon the fact of state regulation of their activities to bolster arguments for exemption from federal jurisdiction based on the express exemption of facilities used for local distribution , Federal Power Commission v. Southern California Edison Company, supra, or to show a lack of federal interest in regulation of stock transactions, New Jersey Central Power & Light Co. v. Federal Power Commission, supra.

B. Federal Jurisdiction Over Electric Utilities
Under 16 U.S.C. §§824i, 824j, & 824k
(Section 210, 211, and 212 of the Federal
Power Act)

Limited federal jurisdiction over electric utilities not otherwise subject to federal regulation may be asserted under 16 U.S.C. §§824i-824k. Section 824i grants authority to FERC to order interconnections among electric utilities; §824j grants authority to order wheeling services; and §824k requires certain findings of FERC prior to issuing orders under §§824i and 824j, and provides procedural requirements. Copies of these sections are attached for reference.

1. Section 824i: Physical Connections

Section 824i provides that upon application of any electric utility, federal power marketing agency, geothermal power producer, qualifying cogenerator, or qualifying small power producer, FERC may issue an order requiring the physical connection of any cogeneration facility, any small power production facility, or the transmission facilities of any electric utilities with the facilities of the applicant. FERC may also order any action as may be necessary to make effective any physical connection ordered, the sale or exchange of electric energy that may be necessary to carry out the purposes of an order entered, and increases in transmission capacity as may be necessary to carry out the purposes of the order.

A state regulatory agency may apply for an order under §824i for any action provided for in the statute as described above, but no order may be issued with respect to a federal power marketing agency based upon the application of a State agency. FERC may also issue an order based on its own motion, but may not do so with respect to a federal power marketing agency.

Upon receipt of an application, FERC must issue notice as required by the statute, afford an opportunity for an evidentiary hearing, and make a determination with respect to certain enumerated factors. No order may be issued by FERC unless the following findings are made:

1) the order is in the public interest;
2) overall conservation of energy or capital would be encouraged;
3) the efficiency of use of facilities or resources would be optimized;
4) the reliability of any electric utility system or federal power marketing agency to which the order applied would be improved; and,
5) the requirements of §824k are met.

2. Section 824j: Wheeling

Under §824j, any electric utility, geothermal power producer (including one which is not an electric utility), or federal power marketing agency may apply for an order requiring any other electric utility to provide transmission services to the applicant, including the enlargement of transmission capability necessary to provide such services. Upon receipt of such an application, provision of appropriate notice, and an opportunity for evidentiary hearing, FERC may issue an order if it finds the following:

1) the order is in the public interest;
2) a significant amount of energy would be conserved;
3) efficient use of facilities and resources would be significantly promoted;
4) reliability of any electric utility system to which the order applies would be improved; and,
5) the requirements of §824k are met. No such order may be issued unless FERC determines that the order would reasonably preserve any existing competitive relationships.

Any electric utility or federal power marketing agency that purchases electric energy for resale from any other electric utility may apply to FERC for an order requiring the other utility to provide transmission services to the applicant. After appropriate notice and opportunity for evidentiary hearing, FERC may issue such an order if it determines the following:

1) the other electric utility has given actual or constructive notice that it is unwilling or unable to provide the electric service to the applicant;
2) the other utility has been requested by the applicant to provide the transmission services; and,
3) the order meets the requirements of §824k.

Section 824j also contains provisions for termination or modification of orders.

3. Section 824k:Orders

Section 824k applies to orders requiring interconnections or wheeling issued pursuant to §824i or §824j. No order may be issued under either section unless FERC determines that the order:

1) is not likely to result in a reasonably ascertainable uncompensated economic loss for any electric utility, qualifying cogenerator, or qualifying small power producer affected by the order;

2) will not place an undue burden on any electric utility, qualifying cogenerator, or qualifying small power producer affected by the order; and,
3) will not impair the ability of any electric utility affected by the order to render adequate service to its customers. FERC has no authority under §824i or §824k to order enlargement of generating facilities.

Section 824k provides for reimbursement for costs incurred by utilities as a result of orders issued under §824i and §824k. Section 824k contains procedural requirements, including a procedure for issuance of orders based on settlements of the parties.

For electric utilities not subject to federal jurisdiction under §824, §§824i-824k confer limited jurisdiction over utilities that are the subject of orders entered under those sections. Compliance with FERC orders requiring involuntary connections or wheeling does not make an electric utility subject to federal jurisdiction for any purposes other than for carrying out the order's provisions and for purposes of enforcement. Entering a settlement or agreeing to an order does not change the jurisdictional aspects.

V. Conclusions

Interconnections between ERCOT utilities and other utilities that operate in other states or are otherwise subject to FERC jurisdiction could cause ERCOT utilities engaged in transmission of electric energy or wholesale sales of electric energy to become subject to federal regulation, unless the connections were made in compliance with an order issued under 16 U.S.C. §824i-824k. Because ERCOT operates as a power pool, interconnections would subject all utilities, except those that do not engage in bulk transmission or wholesale sales of electric energy, to federal regulation, including rate regulation.

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joint hearings with any State commission in connection with any matter with respect to which the Commission is authorized to act. The Commission is authorized in the administration of this chapter to avail itself of such cooperation, services, records, and facilities as may be afforded by any State commission.

(c) Availability of information and reports to State commissions; Commission experts

The Commission shall make available to the several State commissions such information and reports as may be of assistance in State regulation of public utilities. Whenever the Commission can do so without prejudice to the efficient and proper conduct of its affairs, it may upon request from a State make available to such State as witnesses any of its trained rate, valuation, or other experts, subject to reimbursement to the Commission by such State of the compensation and traveling expenses of such witnesses. All sums collected hereunder shall be credited to the appropriation from which the amounts were expended in carrying out the provisions of this subsection.

(June 10, 1920, c. 285, § 209, as added Aug. 26, 1935, c. 687, Title II, § 213, 49 Stat. 853.)

Historical Note

Transfer of Functions. The Federal Power Commission was terminated and its functions with regard to the establishment, review, and enforcement of rates and charges for the transmission or sale of electric energy, including determinations on construction work in progress under this subchapter were transferred to the Federal Energy Regulatory Commission by sections 7172(a)(1)(B) and 7293 of Title 42, The Public Health and Welfare.

All executive and administrative functions of the Federal Power Commission were, with certain reservations, transferred to the Chairman of such Commission, with authority vested in him to authorize their performance by any officer, employee, or administrative unit under his jurisdiction, by Reorg. Plan No. 9 of 1950, §§ 1, 2, eff. May 24, 1950, 15 F.R. 3175, 64 Stat. 1265, set out as a note under section 792 of this title.

Library References

Electricity ⇐2.
C.J.S. Electricity § 10 et seq.

Cross References

State board for review of rates for sale of power to Administrator of Bonneville Power Administration, see section 839f of this title.

§ 824i. Interconnection authority

(a) Powers of Commission; application by State regulatory authority

(1) Upon application of any electric utility, Federal power marketing agency, geothermal power producer (including a producer which is not an electric utility), qualifying cogenerator, or qualifying small power producer, the Commission may issue an order requiring—

(A) the physical connection of any cogeneration facility, any small power production facility, or the transmission facilities of any electric utility, with the facilities of such applicant,

(B) such action as may be necessary to make effective any physical connection described in subparagraph (A), which physical connection is ineffective for any reason, such as inadequate size, poor maintenance, or physical unreliability,

(C) such sale or exchange of electric energy or other coordination, as may be necessary to carry out the purposes of any order under subparagraph (A) or (B), or

(D) such increase in transmission capacity as may be necessary to carry out the purposes of any order under subparagraph (A) or (B).

(2) Any State regulatory authority may apply to the Commission for an order for any action referred to in subparagraph (A), (B), (C), or (D) of paragraph (1). No such order may be issued by the Commission with respect to a Federal power marketing agency upon application of a State regulatory authority.

(b) Notice, hearing and determination by Commission

Upon receipt of an application under subsection (a) of this section, the Commission shall—

(1) issue notice to each affected State regulatory authority, each affected electric utility, each affected Federal power marketing agency, each affected owner or operator of a cogeneration facility or of a small power production facility, and to the public.[1]

(2) afford an opportunity for an evidentiary hearing, and

(3) make a determination with respect to the matters referred to in subsection (c) of this section.

(c) Necessary findings

No order may be issued by the Commission under subsection (a) of this section unless the Commission determines that such order—

(1) is in the public interest,

(2) would—

(A) encourage overall conservation of energy or capital,

(B) optimize the efficiency of use of facilities and resources, or

(C) improve the reliability of any electric utility system or Federal power marketing agency to which the order applies, and

(3) meets the requirements of section 824k of this title.

(d) Motion of Commission

The Commission may, on its own motion, after compliance with the requirements of paragraphs (1) and (2) of subsection (b) of this section, issue an order requiring any action described in subsection (a) (1) of this section if the Commission determines that such order meets the requirements of subsection (c) of this section. No such order may be issued upon the Commission's own motion with respect to a Federal power marketing agency.

(e) Definitions

(1) As used in this section, the term "facilities" means only facilities used for the generation or transmission of electric energy.

(2) With respect to an order issued pursuant to an application of a qualifying cogenerator or qualifying small power producer under subsection (a)(1) of this section, the term "facilities of such applicant" means the qualifying cogeneration facilities or qualifying small power production facilities of the applicant, as specified in the application. With respect to an order issued pursuant to an application under subsection (a)(2) of this section, the term "facilities of such applicant" means the qualifying cogeneration facilities, qualifying small power production facilities, or the transmission facilities of an electric utility, as specified in the application. With respect to an order issued by the Commission on its own motion under subsection (d) of this section, such term means the qualifying cogeneration facilities, qualifying small power production facilities, or the transmission facilities of an electric utility, as specified in the proposed order.

(June 10, 1920, c. 285, § 210, as added Nov. 9, 1978, Pub.L. 95–617, Title II, § 202, 92 Stat. 3135, and amended June 30, 1980, Pub.L. 96–294, Title VI, § 643(a)(2), 94 Stat. 770.)

[1] So in original. Period probably should be a comma.

Historical Note

References in Text. The Commission, referred to in subsecs. (a) to (d) and (e)(2), means the Federal Energy Regulatory Commission. See section 2602(3) of this title.

1980 Amendment. Subsec. (a)(1). Pub.L. 96–294 added applicability to geothermal power producers.

Legislative History. For legislative history and purpose of Pub.L. 95–617, see 1978 U.S. Code Cong. and Adm. News, p. 7659. See, also, Pub.L. 96–294, 1980 U.S. Code Cong. and Adm. News, p. 1743.

§ 824j. Wheeling authority

(a) Transmission service by any electric utility; notice, hearing and findings by Commission

Any electric utility, geothermal power producer (including a producer which is not an electric utility), or Federal power marketing agency may apply to the Commission for an order under this subsection requiring any other electric utility to provide transmission services to the applicant (including any enlargement of transmission capacity necessary to provide such services). Upon receipt of such application, after public notice and notice to each affected State regulatory authority, each affected electric utility, and each affected Federal power marketing agency, and after affording an opportunity for an evidentiary hearing, the Commission may issue such order if it finds that such order—

(1) is in the public interest,

(2) would—

(A) conserve a significant amount of energy,

(B) significantly promote the efficient use of facilities and resources, or

(C) improve the reliability of any electric utility system to which the order applies, and

(3) meets the requirements of section 824k of this title.

(b) Transmission service by sellers of electric energy for resale; notice, hearing and determinations by Commission

Any electric utility, or Federal power marketing agency, which purchases electric energy for resale from any other electric utility may apply to the Commission for an order under this subsection requiring such other electric utility to provide transmission services to the applicant (including any increase in transmission capacity necessary to provide such services). Upon receipt of an application under this subsection, after public notice and notice to each affected State regulatory authority, each affected electric utility, and each affected Federal power marketing agency, and after affording an opportunity for an evidentiary hearing, the Commission may issue such an order if the Commission determines that—

(1) such other electric utility has given actual or constructive notice that it is unwilling or unable to provide electric service to the applicant and has been requested by the applicant to provide the transmission services requested in the application under this subsection, and

(2) such order meets the requirements of section 824k of this title.

(c) Preservation of competitive relationships; replacement of electric energy; inconsistent State laws

(1) No order may be issued under subsection (a) of this section unless the Commission determines that such order would reasonably preserve existing competitive relationships.

(2) No order may be issued under subsection (a) or (b) of this section which requires the electric utility subject to the order to transmit, during any period, an amount of electric energy which replaces any amount of electric energy—

(A) required to be provided to such applicant pursuant to a contract during such period, or

(B) currently provided to the applicant by the utility subject to the order pursuant to a rate schedule on file during such period with the Commission.

(3) No order may be issued under the authority of subsection (a) or (b) of this section which is inconsistent with any State law which governs the retail marketing areas of electric utilities.

(4) No order may be issued under subsection (a) or (b) of this section which provides for the transmission of electric energy directly to an ultimate consumer.

(d) Termination or modification of order; notice, hearing and findings of Commission; contents of order; inclusion in order of terms and conditions agreed upon by parties

(1) Any electric utility ordered under subsection (a) or (b) of this section to provide transmission services may apply to the Commission for an order permitting such electric utility to cease providing all, or any portion of, such services. After public notice, notice to each affected State regulatory authority, each affected Federal power marketing agency, and each affected electric utility, and after an opportunity for an evidentiary hearing, the Commission shall issue an order terminating or modifying the order issued

under subsection (a) or (b) of this section, if the electric utility providing such transmission services has demonstrated, and the Commission has found, that—

(A) due to changed circumstances, the requirements applicable, under this section and section 824k of this title, to the issuance of an order under subsection (a) or (b) of this section are no longer met, or

(B) any transmission capacity of the utility providing transmission services under such order which was, at the time such order was issued, in excess of the capacity necessary to serve its own customers is no longer in excess of the capacity necessary for such purposes.

No order shall be issued under this subsection pursuant to a finding under subparagraph (A) unless the Commission finds that such order is in the public interest.

(2) Any order issued under this subsection terminating or modifying an order issued under subsection (a) or (b) of this section shall—

(A) provide for any appropriate compensation, and

(B) provide the affected electric utilities adequate opportunity and time to—

(i) make suitable alternative arrangements for any transmission services terminated or modified, and

(ii) insure that the interests of ratepayers of such utilities are adequately protected.

(3) No order may be issued under this subsection terminating or modifying any order issued under subsection (a) or (b) of this section if the order under subsection (a) or (b) of this section includes terms and conditions agreed upon by the parties which—

(A) fix a period during which transmission services are to be provided under the order under subsection (a) or (b) of this section, or

(B) otherwise provide procedures or methods for terminating or modifying such order (including, if appropriate, the return of the transmission capacity when necessary to take into account an increase, after the issuance of such order, in the needs of the electric utility subject to such order for transmission capacity).

(e) "Facilities" defined

As used in this section, the term "facilities" means only facilities used for the generation or transmission of electric energy.

(June 10, 1920, c. 285, § 211, as added Nov. 9, 1978, Pub.L. 95–617, Title II, § 203, 92 Stat. 3136, and amended June 30, 1980, Pub.L. 96–294, Title VI, § 643(a)(3), 94 Stat. 770.)

Historical Note

References in Text. The Commission, referred to in subsecs. (a), (b), (c)(1), (2)(B), and (d)(1), means the Federal Energy Regulatory Commission. See section 2602(3) of this title.

1980 Amendment. Subsec. (a). Pub.L. 96–294 added applicability to geothermal power producers.

Legislative History. For legislative history and purpose of Pub.L. 95–617, see 1978 U.S. Code Cong. and Adm. News, p. 7659. See, also, Pub.L. 96–294, 1980 U.S. Code Cong. and Adm. News, p. 1743.

Notes of Decisions

1. Prerequisites to order

Prerequisites of this chapter to order by Commission requiring wheeling applied to order expanding voluntary commitment to wheel. New York State Elec. & Gas Corp. v. Federal Energy Regulatory Commission, C.A.2. 1980, 638 F.2d 388, certiorari denied 102 S.Ct. 105, 454 U.S. 821, 70 L.Ed.2d 93.

2. Power pooling

Given the voluntary nature of power pooling under this chapter and Congress' particular determinations with respect to wheeling, the Commission did not err by failing to order mid-continent area power pool participants to wheel electric power to nongenerating electric systems. Central Iowa Power Co-op v. Federal Energy Regulatory Commission, 1979, 606 F.2d 1156, 196 U.S.App. D.C. 249.

3. Jurisdiction

Regardless of whether one considered exceptions to Bradley rule for applying a change in law to a pending case or this section and section 824i of this title, that authorize Federal Energy Regulatory Commission to order wheeling and power interconnects and that was enacted after institution of action by electric cooperative complaining that failure of defendant utilities to wheel power and to effect power interconnects violated antitrust laws, the suit was to be heard in district court rather than transferred to the agency since the Commission was lacking in primary jurisdiction. Sunflower Elec. Co-op. v. Kansas Power and Light Co., C.A.Kan.1979, 603 F.2d 791.

§ 824k. Orders requiring interconnection or wheeling

(a) Determinations by Commission

No order may be issued by the Commission under section 824i of this title or subsection (a) or (b) of section 824j of this title unless the Commission determines that such order—

(1) is not likely to result in a reasonably ascertainable uncompensated economic loss for any electric utility, qualifying cogenerator, or qualifying small power producer, as the case may be, affected by the order;

(2) will not place an undue burden on an electric utility, qualifying cogenerator, or qualifying small power producer, as the case may be, affected by the order;

(3) will not unreasonably impair the reliability of any electric utility affected by the order; and

(4) will not impair the ability of any electric utility affected by the order to render adequate service to its customers.

The determination under paragraph (1) shall be based upon a showing of the parties. The Commission shall have no authority under section 824i or 824j of this title to compel the enlargement of generating facilities.

(b) Reimbursement of parties subject to orders

No order may be issued under section 824i of this title or subsection (a) or (b) of section 824j of this title unless the applicant for such order demonstrates that he is ready, willing, and able to reimburse the party subject to such order for—

(1) in the case of an order under section 824i of this title, such party's share of the reasonably anticipated costs incurred under such order, and

(2) in the case of an order under subsection (a) or (b) of section 824j of this title—

(A) the reasonable costs of transmission services, including the costs of any enlargement of transmission facilities, and

(B) a reasonable rate of return on such costs, as appropriate, as determined by the Commission.

(c) Issuance of proposed order; agreement by parties to terms and conditions of order; approval by Commission; inclusion in final order; failure to agree

(1) Before issuing an order under section 824i of this title or subsection (a) or (b) of section 824j of this title, the Commission shall issue a proposed order and set a reasonable time for parties to the proposed interconnection or transmission order to agree to terms and conditions under which such order is to be carried out, including the apportionment of costs between them and the compensation or reimbursement reasonably due to any of them. Such proposed order shall not be reviewable or enforceable in any court. The time set for such parties to agree to such terms and conditions may be shortened if the Commission determines that delay would jeopardize the attainment of the purposes of any proposed order. Any terms and conditions agreed to by the parties shall be subject to the approval of the Commission.

(2)(A) If the parties agree as provided in paragraph (1) within the time set by the Commission and the Commission approves such agreement, the terms and conditions shall be included in the final order. In the case of an order under section 824i of this title, if the parties fail to agree within the time set by the Commission or if the Commission does not approve any such agreement, the Commission shall prescribe such terms and conditions and include such terms and conditions in the final order.

(B) In the case of any order applied for under section 824j of this title, if the parties fail to agree within the time set by the Commission, the Commission shall prescribe such terms and conditions in the final order.

(d) Statement of reasons for denial

If the Commission does not issue any order applied for under section 824i or 824j of this title, the Commission shall, by order, deny such application and state the reasons for such denial.

(e) Utilization of interconnection or wheeling authority in lieu of other authority; limitation of Commission authority

No provision of section 824i or 824j of this title shall be treated—

(1) as requiring any person to utilize the authority of such section 824i or 824j of this title in lieu of any other authority of law, or

(2) as limiting, impairing, or otherwise affecting any authority of the Commission under any other provision of law.

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(f) Effective date of order; hearing; notice; review

(1) No order under section 824i or 824j of this title requiring the Tennessee Valley Authority (hereinafter in this subsection referred to as the "TVA") to take any action shall take effect for 60 days following the date of issuance of the order. Within 60 days following the issuance by the Commission of any order under section 824i or of section 824j of this title requiring the TVA to enter into any contract for the sale or delivery of power, the Commission may on its own motion initiate, or upon petition of any aggrieved person shall initiate, an evidentiary hearing to determine whether or not such sale or delivery would result in violation of the third sentence of section 15d(a) of the Tennessee Valley Authority Act of 1933 (16 U.S.C. 831n–4), hereinafter in this subsection referred to as the TVA Act [16 U.S.C.A. § 831 et seq.]

(2) Upon initiation of any evidentiary hearing under paragraph (1), the Commission shall give notice thereof to any applicant who applied for and obtained the order from the Commission, to any electric utility or other entity subject to such order, and to the public, and shall promptly make the determination referred to in paragraph (1). Upon initiation of such hearing, the Commission shall stay the effectiveness of the order under section 824i or 824j of this title until whichever of the following dates is applicable—

(A) the date on which there is a final determination (including any judicial review thereof under paragraph (3)) that no such violation would result from such order, or

(B) the date on which a specific authorization of the Congress (within the meaning of the third sentence of section 15d(a) of the TVA Act [16 U.S.C.A. § 831n–4(a)]) takes effect.

(3) Any determination under paragraph (1) shall be reviewable only in the appropriate court of the United States upon petition filed by any aggrieved person or municipality within 60 days after such determination, and such court shall have jurisdiction to grant appropriate relief. Any applicant who applied for and obtained the order under section 824i or 824j of this title, and any electric utility or other entity subject to such order shall have the right to intervene in any such proceeding in such court. Except for review by such court (and any appeal or other review by an appellate court of the United States), no court shall have jurisdiction to consider any action brought by any person to enjoin the carrying out of any order of the Commission under section 824i or section 824j of this title requiring the TVA to take any action on the grounds that such action requires a specific authorization of the Congress pursuant to the third sentence of section 15d(a) of the TVA Act [16 U.S.C.A. § 831n–4(a)].

(June 10, 1920, c. 285, § 212, as added Nov. 9, 1978, Pub.L. 95–617, Title II, § 204(a), 92 Stat. 3138.)

Historical Note

References in Text. The Commission, referred to in subsecs. (a), (b)(2)(B), (c), (d), (e)(2), and (f), means the Federal Energy Regulatory Commission. See section 2602(3) of this title.

The TVA Act, referred to in subsec. (f)(1), means Act May 18, 1933, c. 32, 48 Stat. 58, as amended, known as the Tennessee Valley Authority Act of 1933, which is classified generally to chapter 12A (section 831 et seq.)

Appendix G

Written Comments on Draft report and Sysnopsis of Review Meetings

Chapter 7
Nontechnical Impediments to Bulk Power Transfers

Impediments to bulk power transfers which are based upon physical limitations of the existing system are often encountered. Additional obstacles may arise due to institutional, legal, regulatory, or economic considerations. The purpose of this chapter is to examine some of these obstacles.

In this chapter, impediments to bulk power transfers which have no technical basis are discussed. It is sometimes difficult, however, to separate technical from non-technical impediments. For example, health and environmental issues associated with transmission lines are technical, but may be used by interveners in certification cases to delay construction through a lengthy appeal process. In such circumstances, the impediment to construction is legal in nature but has a technical basis.

7.1 Other Studies

Three studies were recently conducted which identify nontechnical impediments to bulk power transfers observed or anticipated in the United States. The results of these studies are discussed below.

7.1.1 **Non-Technical Impediment to Power Transfers** by National Regulatory Research Institute (1987)

The National Association of Regulatory Utility Commissioners sponsored a study of non-technical impediments to bulk power transfers in 1987. In this study, four categories of nontechnical impediments were identified: institutional, legal, regulatory, and economic. Each of these categories of impediments is discussed by an analyst, and recommendations for overcoming the impediments are offered.

In order to assess the relative importance of the impediments identified, three case studies involving bulk power transfers are included in the report. The first case involves attempts by investor-owned utilities to construct a new transmission line in Maryland and illustrates how the legal appeals process can be used to delay construction. The second case involves the wheeling of power generated by a municipal utility in Louisiana to a retail customer outside of its territory and provides an illustration of the bypass issue. The third case involves attempts to obtain transmission service by a consortium of municipal utilities.

Although a large number of impediments are identified in the study, a consensus was reached that the three most important nontechnical impediments are:

(1) Utility opposition to mandatory wheeling

(2) Roadblocks to constructing new lines

(3) Incorrect pricing of transmission services

7.1.2 **Moving Power: Flexibility for the Future** by the National Governor's Association (1986)

This report was prepared by the Task Force on Electricity Transmission of the National Governor's Association Committee on Energy and Environment and released in early 1987. It sought to identify areas in which regulatory or institutional "impediments" might lead utilities, regulators, or the public to conclude that a (transmission) project is not feasible or desirable, even though it otherwise would be economically attractive. Information sources included the experiences of task force members; presentations by, and discussions with, industry representatives and observers; written surveys; state and utility siting, certification, and planning documents; interviews with selected utilities; and existing literature.

The task force found that there were a number of impediments to the development of additional transmission capacity at the state level, including a lack of definitive time tables for the regulatory process; differing state or state/federal requirements; a lack of clarity regarding regulatory requirements; lack of coordination among multiple state agencies; and delays caused by local jurisdictional hurdles. It also observed that regulatory goals are not likely to be fully achieved if the approval process is not well coordinated with utility planning and development programs. It further observed that most long-range planning focused on generating capacity needs resulting from a consideration of needs within, rather than between, utility systems; and that this may create economic and regulatory disincentives to the optimal development of the transmission grid.

In order to address these issues, the task force identified several policy options, but stopped short of issuing formal recommendations. The policy options presented can be summarized as:

- streamlining and clarifying state approval procedures
- integrating planning and approval processes
- encouraging multistate siting and certification
- enhancing state planning efforts
- requiring more thorough development of transmission options in utility planning
- promoting multistate planning efforts
- eliminating structural impediments to transmission development
- building on-going informal communication among state and federal regulators, utility representatives, and public interest organizations

7.1.3 Some Economic Principles For Pricing Wheeled Power by the National Regulatory Research Institute (NRRI)

This study by the National Regulatory Research Institute (NRRI) deals with different pricing policies on wheeled power that can encourage good decisions about the use and expansion of electric power transmission networks. The study does not attempt to evaluate whether the current level of transmission capacity within and among the networks in the U.S. is optimal, nor does it evaluate whether the existing transmission system is used efficiently. In contrast, given the current setting of laws, regulations, and other limitations placed on utilities, regulators, and wheeling customers, the study relies on economic theory to establish a benchmark for evaluating different pricing policy options from an economic efficiency standpoint. In addition, the study recommends several pricing policies that could create incentives for the best use and development of the nation's electric bulk power supply sources.

A thorough economic analysis of the cost of generating electric energy and providing transmission services is performed in this study. Two concepts of marginal cost, short-run and long-run, are defined for the electric utility industry and their differences are highlighted as well. In addition, relying on economic theory, it is demonstrated that production efficiency, that is supplying a given level of demand at the least cost, could be achieved by an equalization of marginal costs, including generating and transmission costs, throughout the networks.

Although different pricing policies are analyzed in this study, marginal cost pricing, which is defined as a wheeling charge equal to the marginal cost of providing the transmission services, is recommended. However, the study distinguishes between short-run and long-run marginal costs. As a result, different pricing policies are recommended dealing with different types of wheeled power. For example, to encourage both short-run and long-run cost equalization, it is recommended that all wheeling services be divided into interruptible and firm categories and be priced at short-run and long-run marginal costs, respectively.

In addition, to prevent firm customers from being overcharged in the existence of excess transmission capacity, it is recommended that customers be given the option of selecting the service category. However, the study is well aware of possibilities in which such a pricing policy may not result in economic efficiency. In such circumstances, there is a possibility that wheeling utilities could unduly restrict capacity to sustain a price in the interruptible market at a level above the cost of capacity expansion, and so earn monopoly profits. Therefore, the study recommends strong regulatory oversight of transmission investment programs along with marginal cost pricing.

In summary, to promote the optimal use and expansion of the nation's bulk power supply system, this study recommends that all transactions, including wheeling, be priced so as to promote the equalization of short-run and long-run marginal costs across the grid. Such a total supply cost minimizing policy requires prices that are not distorted by embedded cost revenue requirements, preference power allocations, cogeneration pricing rules, or arrangements that ignore the effect of a given flow through unaffiliated transmission systems. Finally, no attempt is made to propose ways to distribute savings due to marginal cost pricing among participants in a transaction. This suggests that political and regulatory policymakers must ultimately decide who should receive the benefits from new power trading opportunities.

7.2 Experience in Texas

Institutional and regulatory barriers to wheeling in Texas have been greatly reduced since the adoption of wheeling regulations by the Commission. Substantive Rule 23.67

specifies an embedded cost methodology for the calculation of wheeling rates. Although institutional barriers have been eliminated, economic barriers to desirable wheeling transactions may have been created by the use of embedded cost rather than marginal cost methodologies. Embedded cost methods may be sending incorrect pricing signals to market participants.

In the case where transactions involve only ERCOT members, the federal-state conflict is not expected to be a major impediment since ERCOT is entirely within the state of Texas and interstate power flows are not substantially affected by ERCOT operations. However, substantial economic benefits may be realized from bulk power transfers between ERCOT members and adjacent utilities outside ERCOT. In particular, El Paso Electric Company and Gulf States Utilities Company have high reserve margins and may be willing to provide power to ERCOT utilities at attractive rates. Such transactions may have enough impact on interstate power flows to involve the Federal Energy Regulatory Commission (FERC).

Institutional and regulatory barriers to transmission line construction in Texas have also been reduced by recent amendments to the Public Utility Regulatory Act. In the past, Commission review of some transmission line certification applications have caused excessive delays in construction. Senate Bill #142 which amended the PURA in the 1987 legislative session mandates the Commission's decision within one year from the filing date. If such deadline is not met, any party may seek a court order to compel the Commission to make one.

7.3 Summary

Institutional and regulatory barriers to bulk power transfers in Texas have been reduced by recent modifications of the Commission Substantive Rules and the PURA. The governing regulations have helped reduce the legal and administrative burden of bulk power transactions. However, wheeling charges based entirely upon fixed (average embedded) costs may be discouraging economically desirable wheeling transactions. Perhaps a hybrid approach to wheeling rates that involves elements of both embedded and marginal cost principles could be developed. With more accurate price signals, buyers and sellers are more likely to engage in economical bulk power transactions

Chapter 8
Conclusions

8.1 Study Summary

This study is an examination of the potential benefits of a higher level of bulk power transactions in the state of Texas. The primary goal of the study is to estimate the quantity of electricity which would be exchanged by the members of ERCOT under a wide variety of conditions. Estimates are also obtained for the production cost savings which would result from the coordinated operations necessary to achieve the higher levels of bulk power transactions. Because of the need to retain a high level of system reliability, additional high voltage transmission facilities may be required to allow such transactions to occur; thus, a secondary feature of the study is the examination of related health, environmental, institutional, and legal issues.

The primary goal is attained by using a multi-area production simulation program, MAPS/MWFLOW, to model the ERCOT interconnected system and simulate the generation and transmission of electricity under uncoordinated (own-load) and fully coordinated (pool) arrangements. With the fully coordinated operations, it is assumed that the utilities make operational decisions which will yield the minimum system-wide operating costs. This form of pool operations does not necessarily require the implementation of centrally dispatched operations; however with full information available to each of the utilities, the results are essentially the same. The secondary information was obtained from numerous reviews of recent reports about potential health and environmental issues related to high voltage transmission lines, and from a survey of transmission line certification requirements of the regulatory agencies in other states.

All of the results of this study must be viewed only in the context of the assumptions upon which the calculations are based. The projected savings are quite sensitive to various parameter values which must be derived from forecasts or estimates. One result of this sensitivity was the decision to define a more complete set of boundaries in the reference case to reflect the fundamental uncertainty in the natural gas market in Texas. Other important parameters include coordination arrangements, electricity demand forecasts, and cogeneration levels. Alternative scenarios are provided which involve deviations from the reference case values assigned to these parameters.

This study is intended to assist utilities and policymakers in their assessment of alternative systems of planning and operation of the electric utilities in Texas. The project staff anticipates and welcomes questions and criticisms regarding the assumptions in the study and the many issues it raises as well as some issues which were not analyzed. Additional research and analysis is required to refine results and examine other important issues.

8.2 Objectives and Findings

With respect to the formal objectives defined in Section 1.2 of this report, the following sections briefly summarize the study's findings.

8.2.1 Energy Efficiency

- To determine whether greater energy efficiency may be obtained from existing generation and transmission capacity in Texas through enhanced system coordination and increased bulk power transactions.

  The reference case results indicate that, with the assumption of converging natural gas prices, there would be a slight reduction in the total BTU of fuel used by the ERCOT utilities in 1990 and 1995, if ERCOT operated in a fully-coordinated mode. The respective savings would be 14.6 trillion and 8.7 trillion BTU which translate to 0.8% and 0.4%, *respectively, compared to operations in the own-load mode. For natural gas, which is expected to become more scarce in the future, however, the reductions are substantial and amount to 50.0 trillion and 38.7 trillion BTU, or 6.0% and 4.5% of total gas use, respectively.*

With the assumption of diverging fuel prices, total BTU consumption rises very slightly because of the substitution of coal and lignite generation for the relatively more scarce and expensive natural gas. However, the reductions in natural gas consumption are again significant at levels of 56.8 trillion and 27.2 trillion BTU, or 6.6% and 3.2%, respectively.

In 1990, additional savings of natural gas from the higher overall efficiency of cogeneration are estimated to be 41.3 trillion and 45.4 trillion BTU or 4.8% and 5.3%, respectively.

8.2.2 Capacity Requirements

- To determine whether enhanced coordination and increased bulk power transactions can help to reduce the requirements for new capacity additions.

A specific estimate of the amount of capacity which could possibly be deferred or cancelled as a result of increased bulk power transactions could not be obtained from the model used in the study. However, in the Nuclear Uncertainties Scenario where large units currently under construction are assumed not to be available, the ERCOT system seems capable of picking up the load, albeit at a somewhat higher cost of operation under both own-load and fully coordinated operations. Additional research into this area must use a different type of simulation process which allows capital costs and financing mechanisms to be part of the analysis so that total cost comparisons can be made in a long-term setting.

8.2.3 Capacity and Load Growth Differences

- To determine whether a better matching of statewide capacity and load growth can be achieved through changes in the operation or configuration of the bulk power system.

In the reference cases and under a wide spectrum of assumptions in the alternative scenarios, the model consistently shows TUEC to be the largest, and sometimes only, net energy importer. This is a result of two factors: relatively low reserve margins and relatively high natural gas generation costs. The primary sources of energy exports are cogeneration and utility-owned gas-fired generation in the HL&P service area. Lesser quantities are provided by utilities in the Central Texas area, COA and

LCRA, when diverging gas prices are assumed; plus CPSB when converging gas prices are assumed. Overall, when diverging gas prices are assumed, the transmission system would only be adequate to accommodate the higher level of transactions under normal operations with 30% of the transactions fully interruptible. Under the lower level of transactions with converging gas prices, the transmission system appears to be adequate. The strengthening of the transmission system to accomodate higher levels of transactions would permit a better matching of system demands and available capacity.

8.2.4 Production Cost Differentials

- To determine whether utilities in Texas can take greater advantage of their production cost differentials through expanded bulk power transactions.

Under the converging gas price reference case assumptions, comparing the two extremes of own-load and fully coordinated operations, the potential transactions levels are 14.4 billion and 16.0 billion KWH in 1990 and 1995, respectively, and these quantities represent some 7.1% and 6.6% of annual ERCOT system energy requirements. These levels of transactions would produce annual savings of $55.8 million and $108.1 million in the respective study years or 1.3% and 1.6% of system variable production costs.

Under the diverging gas price reference case assumptions, again comparing the two extremes of own-load and fully coordinated operations, the potential transactions levels are 28.0 billion and 24.7 billion KWH in 1990 and 1995, respectively, and these quantities represent some 13.8% and 10.3% of annual ERCOT system energy requirements. These levels of transactions would produce annual savings of $247 million and $355 million in the respective study years or 5.6% and 4.7% of system variable production costs.

The range between these cases indicates that opportunities for transactions are enhanced by fuel cost differentials but may also be based on other production cost components and differing heat rate efficiencies that exist within the system.

8.2.5 Impediments to Interconnections

- To identify legal, technical, and environmental impediments which may be associated with enhanced interconnection of utilities in Texas.

The primary impediments to interconnection of all utilities in Texas are the complex technical, legal, and institutional questions concerning the intra-state nature of ERCOT. Other impediments include organizational *inertia, regulatory lag, isolated utility planning efforts, jurisdictional conflicts, wheeling regulations and pricing, and health and environmental considerations. Certification of transmission lines in Texas is about the same as in the other states who responded to the survey and has similar requirements for the submission of environmental information. Only six states have any kind of regulations relating to health issues, but several have adopted a policy of annual reviews of research about possible effects.*

8.2.6 Impediments to Cogeneration

- To identify operational, financial, and regulatory impediments which may be associated with increased transfers of existing and potential cogenerated power, as well as access to the transmission system.

The primary impediments to increasing transfers of cogenerated power are the reluctance of utilities to rely on resources which are not their own, disagreements about wheeling matters, concerns about cogeneration effects on the allocation of system reserve responsibilities, and questions about short-term and long-term reliability issues. The study results generally indicate that the transmission system may be capable of handling some increased levels of firm power transactions such as those available from cogenerators; but that dispatchability and interruptibility may be required to preserve system reliability.

8.2.7 Wheeling Rule Impacts

- To examine operational, financial, and regulatory impacts of existing wheeling rules on utilities, cogenerators, and potential bulk power transactions.

The version of MAPS/MWFLOW used in the study did not permit the quantitative modeling of wheeling regulations or charges, and their potential impact on the system. However, a recent wheeling study by the National Regulatory Research Institute recommends that wheeling prices be based on short-run and long-run marginal transmission costs for interruptible and firm transactions, respectively. In Texas, an average embedded cost methodology is used and may be sending incorrect price signals to market participants, and thereby impeding otherwise economical power flows.

8.2.8 Effects of Uncertainty

- To estimate the likely impact of fuel price volatility, demand forecast uncertainty, seasonal fuel supply disruption, and power plant construction uncertainty on the state's electric power industry.

For 1990, the converging fuel price reference case assumes that all utilities have the same low uniform natural gas price of $2.46 per MMBTU. This results in transactions of 14.4 billion KWH, and savings of only $55.8 million. Conversely, a sensitivity case with gas prices 10% higher than the diverging gas price reference case produces almost no change in the level of transactions, but increases annual savings to $284.7 million. For 1995, a similar case with a 10% increase in gas prices was developed with nearly identical results. These results indicate that the level of savings is very sensitive to changes in fuel prices, but the level of transactions is much less sensitive.

The results of the alternative demand forecast scenarios for 1990 were as expected. The low demand case causes reserve margins to rise, the level of transactions to fall, and annual savings to decrease correspondingly. The high demand case causes the reverse effects of lower reserve margins, a slightly higher level of transactions and an increase in annual savings. For 1995, the low and high demand case follow the same pattern as in 1990. With low demand, the transactions level falls by 6.1% to 23.2 billion KWH, and annual savings are also reduced by 3.6% as a result. For 1995, with high demand, transactions increase by 7.6% while savings increase by 6.2%

The winter fuel supply disruption scenario examines the likely consequences of a prolonged freeze like the one experienced in December, 1983. Based on information submitted by the utilities about their unit outages at that time and model results for a two-week winter period in 1990, the system reserve margin for normal weather is 48% or almost 13,600 MW. Utilities currently hold fuel oil inventories which are six times as great as their total oil burn during the 1983 freeze and have implemented many other operational changes to insure a reliable supply of electricity under abnormal weather conditions. The availability of such a large amount of excess capacity indicates that the transmission system could play a large role in handling any emergency unit losses on the ERCOT system.

The power plant construction uncertainty question is addressed in two alternative scenarios. The first of these assumes that one unit of the Comanche Peak nuclear plant in unavailable because of delays. Increases in transactions and annual savings provide a degree of cost mitigation which is larger than the savings in the reference cases. In the second scenario, one unit of the South Texas Nuclear Project is assumed to be unavailable. Because the partners in the project tend to have higher available reserve levels, the cost mitigation of the savings is less than the amount of the reference cases.

8.2.9 Other Alternative Scenarios

- To analyze the potential effects on bulk power transactions of transmission system limitations, alternative coordination arrangements, and alternative levels of cogeneration.

A set of transmission limitation cases were run using a different solution algorithm and a set of transfer limits instead of monitored lines. Under normal conditions with no outages, this produces results comparable to the diverging gas price reference case, and serves to reinforce confidence in the model results. When the transfer limits associated with outage conditions are placed on the model, transactions fall by 29% while savings are reduced by 27%. These results indicate that any transactions above the level of 19.9 million KWH would need to be fully interruptible to preserve system reliability under contingency conditions.

Alternative coordination arrangements are modeled for two scenarios. In the first, the utilities are assumed to add coordinated maintenance scheduling which results in an increase in both transactions and annual savings of only 2%. This small change indicates that the ERCOT utilities are currently coordinating their maintenance in a near-optimal manner. In the second, only non-firm transactions are permitted, similar to a broker system. This produces the lowest total transactions level of only 12.0 billion KWH, a 57% decrease. The annual savings fall even more dramatically to $82.4 billion, only 33% of their diverging gas price reference case value. These results indicate the need for some transactions to be under firm contract in order to achieve higher economic gains within the system.

Two alternative cogeneration cases are modeled. The first assumes that there is 15% less cogeneration in 1990 and that loads are served with existing utility generating capacity. As expected, system operating costs, total transactions, and annual savings are nearly constant, while smaller utilities increase their exports to compensate for the lower level of cogeneration. The second assumes that there is 15% more cogeneration in 1990 and that loads are also served with existing utility generating capacity. As expected, system operating costs, total transactions, and annual savings are nearly constant, but smaller utilities decrease their exports while HL&P increases its exports since the higher level of cogeneration is located predominantly within its service area.

By combining the two scenarios, the study estimates that utilities use of natural gas, coal, and lignite would have to increase by 143 trillion, 23.9 trillion, and 7.5 trillion BTU, respectively, in the absence of all cogeneration. While this does not account for heat rate differences, it does provides an indication of part of the higher overall efficiency of cogeneration facilities. Because of the model's inability to utilize capital costs and fixed operating costs for utilities and cogenerators, long term effects cannot be defined or calculated.

8.3 Recommendations

The study results indicate that interconnected utilities in Texas could actively engage in bulk power exchanges which would result in overall cost savings. The establishment of the brokerage system indicates that ERCOT also realizes such potential for savings exists. However, results of this study indicate that if all transactions are made strictly on a non-firm basis, the realized savings would be reduced by approximately 65%. Utilities in Texas should be encouraged to expand the scope of the ERCOT energy broker system in order to coordinate their system planning and operations. Some cogenerators have also expressed interest in participating in the ERCOT broker, but several problems must be addressed to determine whether there are any residual benefits to ratepayers. Some of these problems are reductions in utility savings, control and scheduling, replacement capacity and energy, accounting and billing costs, and reduced transmission reserve capacity. These problems should be examined by ERCOT and any interested cogenerators.

Using the transmission reliability criteria of ERCOT, the level of power exchange will be limited by transmission system constraints. In order to realize all the benefits of power pooling if natural gas prices begin to escalate and diverge, the transmission network will need reinforcement with additional high voltage lines, particularly between TUEC and HL&P.

The transmission line certification process should be streamlined in order to shorten the required lead time for additions to the grid. A shorter planning horizon will give utilities more flexibility in dealing with future uncertainties. One means of streamlining the certification procedure is to increase the minimum size of lines which require certification, thereby allowing rapid administrative disposition of smaller lines. Guidelines should be established with respect to the environment to protect the public as well as to minimize costly delays arising from conflicts with the public. Examples of guidelines adopted by other states are provided.

The high thermal efficiency, high availability and short construction schedule of cogeneration make it a valuable asset to the utilities in Texas. Furthermore, the competitive advantage that cogeneration offers to firms which employ the technology protects jobs in the state of Texas. As the ERCOT system evolves, the transmission system should be strengthened to allow cogenerators greater access to power markets, so that this resource will be optimally used to help supply the State's energy needs. Utilities and cogenerators should form a cooperative study group to consider the institutional and financial implications of designing and developing such a system.

Finally, when generation and transmission planning involves several utilities, it is critical that the data collection process be standardized in order to improve accuracy and consistency. For example, utilities have different methods of measuring the unit heat rate, allocating fixed and variable maintenance expenses, and calculating transmission line ratings. ERCOT should establish guidelines regarding the procedures under which these data are collected.

8.4 Future Research

The following factors may impact the projected cost and energy savings associated with bulk power transactions and should be examined at some future date:

- Short-term costs, including administration, associated with enhanced system coordination.
- Allocation of savings for individual utilities.

- Estimation of long-term costs and benefits associated with capacity deferrals.
- The long-term role of cogeneration as a supply resource.
- Transmission system planning for increased transactions.
- Identification of facilities which should be added or strengthened.
- The costs and impacts of wheeling charges and incremental line losses.
- Interconnection of ERCOT to other power pools.
- Ultimate rate impacts of transactions and savings.
- Reliability and stability analysis of the transmission network.