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April 27, 1990

HAND DELIVERED

Mr. Steve Tribble, Director
Division of Records and Reporting
Florida Public Service Commission
101 East Gaines Street
Tallahassee, Florida 32399

Re: Docket No. 891345-EI, Petition of Gulf Power Company for an increase in its rates and charges.

Dear Mr. Tribble:

Enclosed for filing and distribution are the original and fifteen copies of the Direct Testimony and Exhibit of Tom Kisla, on behalf of Stone Container Corporation. An extra copy is enclosed for acknowledgment of receipt; please return it to me.

If you have any questions, please call.

Yours truly,

Joe A. McGlothlin

Joseph A. McGlothlin

JAM/jfg

Enclosures

ACK ✓
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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition of Gulf Power Company for an Increase in its Rates and Charges.	))))	DOCKET NO. 891345-EI

DIRECT TESTIMONY AND EXHIBIT

OF

TOM KISLA

ON BEHALF OF STONE CONTAINER CORPORATION

April 27, 1990

DIRECT TESTIMONY

OF

TOM KISLA

ON BEHALF OF STONE CONTAINER CORPORATION

DOCKET NO. 891345-EI

PETITION OF GULF POWER COMPANY

FOR AN INCREASE IN ITS RATES AND CHARGES

Q. PLEASE STATE YOUR NAME, OCCUPATION, EMPLOYER AND BUSINESS ADDRESS.

A. I am Tom Kisla, Senior Engineer, Stone Container Corporation, Atlanta Technology and Engineering Group, 2150 Parklake Drive, Atlanta, Georgia, 30345.

Q. ON WHOSE BEHALF ARE YOU APPEARING IN THIS DOCKET?

A. I appear on behalf of Stone Container, Panama City, but I believe my testimony could apply to other process industries which cogenerate a part of their electrical requirements.

Q. WHAT IS THE SUBJECT OF YOUR TESTIMONY?

A. I will address practical problems in the implementation of the existing standby rate design and how they affect my company and the utility. I will identify certain disincentives built into the rate, and suggest modifications which I think would provide benefits to the utility as well as to the customer. Our consultant, Jeffry Pollock of Drazen-Brubaker and Associates, will also be addressing these and related points in his testimony.

Q. ARE YOU SPONSORING ANY EXHIBITS IN CONNECTION WITH YOUR TESTIMONY?

A. I have prepared an exhibit consisting of three tables which are designed to provide a basic introduction to the interrelationship between the papermaking process and its associated purchased electricity requirements. A basic familiarity with our process is essential to an understanding of the impact of the present SS rate design on our operations.

Q. PLEASE DESCRIBE THE TABLES AND THEIR PURPOSE.

A. Table I is a brief overview of some aspects of the pulp and papermaking process. It is designed to show some of the unit operations, their gross electric needs, the amount of steam they require and the electric generation which that process steam can provide. Essentially, it shows that while each step in the process consumes electricity, the steam which some steps require can be used to produce sufficient electricity to provide much of the overall electrical requirement.

In our operation, the raw material (wood chips) moves in sequence from the woodyard, to the pulp mill, to the paper machines and through the driers. In a separate power house, we burn bark, process wastes, and, when necessary, fossil fuels to make steam. The steam passes through one of three turbine generators en route to the separate parts of the process where it is needed.

The first entry on Table I is designated "woodyard." Here the long logs are received, stored, debarked, chipped, and then inventoried until they are needed in the pulpmill. The process uses approximately six megawatts of electricity on average and uses no appreciable steam. This situation is typical of most noncogenerating process industries. Its maximum purchased electric requirement is fixed by the equipment installed and its load factor is a function of the time that equipment is run and the percentage load.

The next area shown on Table I is the pulpmill. Here the chips are placed into digesters and chemicals are added. The mixture is heated with steam so that the chemical reactions which occur during pulping will proceed at a faster rate. As shown, there are a number of digesters which in this example use about 190,000 pounds of steam per hour. The steam used by the digesters is produced in our boilers at temperatures and pressures much higher than required by the digesters. Before the steam enters the digesters it passes through one of our three steam turbogenerators. In the process of passing through the turbine, some of the energy in the steam is transferred to rotational energy to the turbine's shaft. Simultaneous with the energy transfer, the temperature and pressure of the steam drops to a level closer to that needed for use in the digester.

The energy that the steam places into the turbine shaft helps to turn the rotor in a generator. This produces electricity.

As shown, the steam sent to the digester produces about six megawatts of electricity. Since the digesters do not require much electricity, most of it is available for distribution to other parts of the mill.

After the digesters convert the chips into pulp, the pulp is washed while still in the pulpmill. This process separates the pulp from the chemicals, which form a new stream containing the used chemicals and degraded wood material. The washers use about seven megawatts of electricity and almost no steam. Thus, the net electric use in the pulpmill might average one megawatt.

The next operation shown is the evaporators. These use steam to evaporate water and concentrate the recovered chemical stream. The evaporators use about the same number of pounds of steam per hour as the digesters, but since they require a lower final temperature and pressure than the digesters on average, the turbine shaft receives more energy per pound and is able to generate more electricity; in this example, about eight megawatts per hour, or a net of seven megawatts for distribution to the rest of the mill.

The paper machines take the washed pulp and form it into a "wet sheet." The process requires a lot of electricity and very little steam. The average electric need in the example shown here is 20 megawatts (or 10 megawatts per paper machine). The wet sheet is pressed and then most of the water is evaporated using steam filled driers. The steam used in these driers is also made in the power house, and can also go through the turbogenerators to make about nine megawatts of electricity.

The last entry is meant to include all the other processes not specifically addressed.

The bottom line in this example shows a gross electric requirement of 42 megawatts. Typically the mill would generate about 30 megawatts of this, and thus it would have to buy an average of 12 megawatts, or about 30 percent of its average electric requirement. We produce about 1,100,000 pounds of steam per hour under average conditions.

Q. **WHY DO YOU EMPHASIZE "AVERAGE CONDITIONS"?**

A. There are a number of factors which will change the situation, and indeed a pulp and paper mill steam system is almost always in flux.

For instance, Table II shows just the effects of outside ambient temperature on our in-house generation. If the outside air is colder, the chips placed in the digesters are colder, and we have to supply more steam for heating to achieve the chemical reaction of the same efficiency. When we do so, more steam can pass through the turbine and more electricity is generated. As shown, there is a four megawatt difference in generation between the coldest and the hottest weather. This may seem like a lot, but it is less than a 1,000 pound increase in lower pressure steam requirements per ton of production or a six percent change overall. This translates to a range of 3 percent above and 3 percent below the average steam flow.

Q. **IS THE DIFFERENCE IN GENERATION BETWEEN THE HOT AND COLD MONTHS PERTINENT TO THE QUESTION OF STANDBY SERVICE?**

A. Very much so. The current standby contract states that the daily standby service is calculated by taking the maximum customer generation output in any interval since the last outage minus the generation during the on peak portion of the new outage minus the load reduction which is a direct result of the current generation outage.

Thus there could be a significant difference in the calculated standby charge just based on the effect weather has on our amount of self-generation. Clearly the rate structure appears to be highly punitive to cogenerators with systems like Stone's.

Q. **CAN YOU ILLUSTRATE WHY THIS PROVISION OF THE STANDBY RATE IS PUNITIVE?**

A. Yes. The lower part of Table II shows hypothetical large turbine outages. In the lower left we show winter operation. If the large turbine went out, the mill would transfer some load to the condensing turbine, giving us net in-plant generation of 14.5 megawatts. In that event, we would increase our supplementary purchase to 15 megawatts and take 7.5 megawatts of standby. But, to achieve balance, we must either reduce load or buy more power.

In winter scenario A we opt to reduce load by five megawatts to achieve balance. Winter scenario B supposes that we opt to purchase the additional five megawatts rather than reduce load.

The summer scenarios (C and D) are similar, except that because of the warmer weather we start with a generation of 28 megawatts and can only achieve an in-plant generation of 14 megawatts. We increase supplementary service to 15 megawatts and we take the contracted 7.5 megawatts of standby. In scenario C we reduce load by 5.5 megawatts, whereas in Scenario D we would increase purchases by 5.5 megawatts.

The lowest block of data shows the calculation of the standby KW and the monetary penalty related to each scenario. Note that following the methodology in the tariff, we calculate standby billings of 12.5 and 17.5 megawatts in the winter, and 12.5 and 18 megawatts in the summer.

Subtracting the standby actually used, we see that there is in each case a five megawatt discrepancy. This translates into an unwarranted penalty of $112,700.

Q. **COULD YOU SUGGEST A RATE STRUCTURE WHICH WOULD BE MORE EQUITABLE?**

A. Yes. The calculation of the daily standby service charge should not be based on the weather-sensitive nature of our operation. I should not be charged for service never received. The daily standby service demand charge should be based on the difference between the highest on peak readings in each day of an outage and the highest on-peak reading during a non-outage period of the same billing period. That is, the customer should pay the reservation charge that he would have experienced without the outage, or the daily demand charge for the additional standby service actually taken during the billing period, whichever is greater.

Q. YOU MENTIONED THAT YOU HAD PREPARED THREE TABLES. IS THE THIRD PERTINENT TO THIS DISCUSSION?

A. I believe it is.

Table III contains a brief overview of some of the situations which impact the electrical balance with some regularity. As shown, most of the changes are in the three to five megawatt range. Generally, when the generation is lost the mill has almost no real decrease in its electric load. Thus, if nothing were to change, the mill would have to buy the additional power required. This incremental demand would come at $7.55 per kWh under the PXT rate. The cost of paying $7,550 per MWH for infrequently required electricity has to be balanced against the mill's options to reduce purchased electricity during that time period. For instance, we can alter our operation to produce more electricity, even if the paper process doesn't require more steam. The trick is to supply more steam to the turbine, then remove the excess from the system before it proceeds to the other parts of the mill. This can be done in two ways.

First, one of our turbines has a condensing apparatus that immediately converts some of the steam to water. Typically, the condenser is not fully loaded, so more steam can be driven through the turbine to generate more electricity and then diverted to the condenser, without affecting the amount of steam delivered to the papermaking process. This is the preferred option, because it can be accomplished by simply burning more low-cost bark in the boiler. Still, this energy costs two times as much to produce as the PXT energy rate.

If the condenser is working to capacity, the other option is to produce more steam to pass through the turbine, then vent the excess to the air before delivering it to the process mill. This is a much more expensive option for two reasons. First, unlike the steam which is condensed, vented steam is lost and we must make it up with additional expensive demineralized water. Secondly, to achieve the immediate, incremental generation with vented steam, it has been our experience that we must burn expensive fossil fuel instead of cheap bark. For these reasons, power produced by venting steam costs three times as much as the PXT energy rate.

The other option available to the company--which we sometimes employ--is to reduce load by shutting down the woodyard or by shutting down selected washer lines. These courses of action are effective in keeping our demand down, but they disrupt operations and can cause changes in quality.

Q. **HOW COULD THIS SITUATION BE IMPROVED?**

A. We propose two modifications to govern two sets of circumstances. First, if we could purchase as-available energy on the SE rider to displace our more expensive alternatives (operating more costly generation through condensing and venting, or curtailing production), we could purchase more electricity from Gulf Power and simultaneously reduce our production cost and have more consistent product quality. We could curtail our use of SE in as little as 30 minutes' notification. The second circumstance concerns our ability to plan and coordinate with Gulf Power the scheduled maintenance of our largest generator.

Q. **WHAT HAPPENS WHEN THE LARGEST GENERATOR IS REMOVED FROM SERVICE FOR SCHEDULED MAINTENANCE?**

A. As shown in Table III the removal of our large turbine causes the biggest swing in our generation. This occurs about once every four years. In practice, a portion of the 18 MW of load normally supplied by this unit can be recouped by loading other turbines; perhaps as much as an additional four megawatts.

Panama City currently has a contract standby of 7,500 KW and the mill would probably use all of that, thus increasing purchases to about, in this case, 22.5 megawatts. As before, this would be 5.5 megawatts below the use we would normally have. We have seen these situations before in Table II. This time, however, we are dealing with the economics of proceeding with scenarios B or D of Table II; that is, the feasibility of purchasing additional standby service.

Q. IS THERE AN INCENTIVE TO PURCHASE THE EXTRA 5.5 MW OF STANDBY SERVICE ONCE EVERY FOUR YEARS DURING A MAINTENANCE OUTAGE?

A. No. This would cause our standby service capacity to be ratcheted upwards for the next 23 months, resulting in an additional cost of:

5500	0.98	23	=	$123,970
kWh	$ Reservation	Months		

Since we would not expect to need that level of service for another four years, then the mill almost certainly will choose to schedule the turbine outage during a normal maintenance period and then restrict electric use and production if necessary until the job could be completed.

Q. DO YOU BELIEVE THE PROBLEM COULD BE EQUITABLY RESOLVED?

A. Certainly. Remember, this is not a forced outage. We can take it when we want, and we could notify Gulf Power ahead of time. In that way Stone Container and Gulf Power could time the outage to occur when Gulf Power could accommodate it without affecting its system adversely. If we offer to fully coordinate the outage with Gulf Power beforehand, there would be no reason to impose the ratchet feature of the rate to the extra maintenance power required every four years. Thus, we could purchase more electricity, make more product, and make better use of our manpower during this large mill-wide outage.

Q. DO YOU FEEL TRAPPED IN A NEVER ENDING SPIRAL OF RISING ELECTRICITY COST?

A. No. We can take measures to limit our costs. Our mills in Hopewell, Virginia and Florence, South Carolina already are self sufficient. We were considering an increase to our cogeneration capacity when we were offered the SE rate to maintain or increase our purchases of electricity from Gulf Power. If electric rates rise it will be that much easier to install equipment that would allow us to reduce our purchased electricity requirement. We could become electrically self sufficient. The possibility is carefully evaluated and reevaluated with changing times.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

TABLE I: A brief overview of the pulp and papermaking process with attention to steam and electric use and generation.

AREA AND FUNCTION	MAJOR UNITS	MKHW/HR USED	STEAM REQUIRED LBS/TON	LBS/HR	ELECTRIC MWH/HR GENERATED BY STEAM USE SHOWN
Woodyard: Receives wood, debarks and chips if needed, delivers chips to pulpmill and bark to power house	1	6	0	0	0
Pulpmill: Receives chips, adds steam and chemicals to produce pulp, washes pulp to recover chemicals, sends washed pulp to paper mill, sends wash water to evaporator cycle	22 6	7	2,800	190,000	6
Evaporators: Use steam to evaporate water and concentrate recovered chemicals. The stream containing the chemicals is sent to the power house to be used as fuel	2	1	3,000	200,000	8
Power House: Burns spent chemicals, bark and fossil to make steam and recovery chemical. Turbines and generators used	2 3	7	2,000	100,000	4
Paper Machines: Take washed pulp, form wet sheets, press and dry using steam	2	20	8,000	500,000	9
Other Support Facilities: All other necessary tasks	NA	7	1,000	70,000	3
TOTAL		42	16,800	1,060,000	30

TABLE II: Generator ratings and the effects of ambient temperature on generator output

	GENERATOR NOMINAL	AVERAGE OUTPUT	WARMEST	COLDEST
	20	18	17	19
	10	8	7	9
	4	4	4	4
OUTPUT	34	30	28	32
AVERAGE NEEDED		42	42	42
AVERAGE PURCHASE		13	14	10

CALCULATION OF POSSIBLE STANDBY SERVICE CHARGES IN WINTER AND SUMMER

	WINTER COLD	WINTER OUTAGE A	WINTER OUTAGE B	SUMMER HOT	SUMMER OUTAGE C	SUMMER OUTAGE D
TURBINE OUTPUT	19.0	0.0	0.0	17.0	0.0	0.0
TURBINE OUTPUT	9.0	10.5	10.5	7.0	10.0	10.0
TURBINE OUTPUT	4.0	4.0	4.0	4.0	4.0	4.0
SELF GEN	32.0	14.5	14.5	28.0	14.0	14.0
SUPPLEMENTARY	10.0	15.0	15.0	14.0	15.0	15.0
STANDBY	0.0	7.5	12.5	0.0	7.5	13.0
REDUCE LOAD	0.0	5.0	0.0	0.0	5.5	0.0
SUM OF FACTOR	42.0	42.0	42.0	42.0	42.0	42.0

ACCORDING TO EXISTING TARIFF MEGAWATTS ARE

SCENARIO	MAX	DAILY	REDUCTION	CALCULATED	ACTUALLY USED	ERROR	RESER-VATION		MS
A	32	14.5	5.0	12.5	7.5	5	0.98	23	$112.70
B	32	14.5	0.0	17.5	12.5	5	0.98	23	$112.70
C	32	14.0	5.5	12.5	7.5	5	0.98	23	$112.70
D	32	14.0	0.0	18.0	13.0	5	0.98	23	$112.70

TABLE III: A brief overview of how some process disruptions could affect steam and electric use and generation at pulp and paper mills

AREA AND DESCRIPTION	MAJOR UNITS	MKHW/HR USED	STEAM REQUIRED LBS/TON	STEAM REQUIRED LBS/HR		ELECTRIC MWH/HR GENERATED BY STEAM USE SHOWN PRIOR	ELECTRIC MWH/HR GENERATED BY STEAM USE SHOWN CHANGE
Woodyard: Speed up or slow down in response to inventory	1	3 to 9	0	0	0	0	+/-3
Pulpmill: High pulp or low chips, erratic steam use, erratic washing	22 6	7	2,800	100,000	3	6	-3
Evaporators: Low feed inventory, reduced evaporation	2	1	3,000	100,000	4	6	-4
Power House: Maintenance outage, low steam demand and recovery chemical, turbines and generators used	2	7	2,000	100,000	4	4	0
Turbine down for routine maintenance every four to five years, loss of 20 MEGS of generation						-18	-18
Paper Machines: Sheet break, temporary loss OS condensing load	2	20	8,000	225,000	4	9	-5
Other Support Facilities: All other necessary tasks	NA	7	1,000	70,000	3	3	0

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the Direct Testimony of Tom Kisla, on behalf of Stone Container Corporation, has been furnished by U.S. Mail to the following parties of record, this 27th day of April, 1990:

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