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May 21, 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 Rebuttal Testimony and Exhibit of Jeffry Pollock, on behalf of the Industrial Intervenors. An extra copy is enclosed for acknowledgment of receipt; please return it to me.

If you have any questions, please call.

Yours truly,

Joe McGlothlin

Joseph A. McGlothlin

JAM/jfg

Enclosures

ACK ✓
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Exh
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Testimony
DOCUMENT NUMBER-DATE
04435 MAY 21 1990
FPSC-RECORDS/REPORTING

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 Dated: May 21, 1990

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that true and correct copies of the Testimony and Exhibit of Jeffry Pollock, on behalf of Air Products & Chemicals, Inc., American Cyanamid Company, Monsanto Company, Stone Container Corporation, Champion International Corporation and Exxon Company, USA, ("Industrial Intervenors") have been furnished by U.S. Mail to the following parties of record, this 21st day of May, 1990:

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Attorneys for the Industrial Intervenors

Before the

Florida Public Service Commission

Docket No. 891345-EI

GULF POWER COMPANY

Rebuttal Testimony of

JEFFRY POLLOCK

On behalf of:

AIR PRODUCTS AND CHEMICALS, INC.
AMERICAN CYANAMID COMPANY
CHAMPION INTERNATIONAL CORPORATION
EXXON COMPANY, U.S.A.
MONSANTO COMPANY
STONE CONTAINER CORPORATION

Project 5095
May 1990

Drazen-Brubaker & Associates, Inc.
St. Louis, Missouri 63141-0110

GULF POWER COMPANY

before the

Florida Public Service Commission

Docket No. 891345-EI

Rebuttal Testimony of Jeffry Pollock

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Jeffry Pollock, 12312 Olive Boulevard, St. Louis, Missouri.

Q ARE YOU THE SAME JEFFRY POLLOCK WHO HAS PREVIOUSLY FILED TESTIMONY ADDRESSING COST ALLOCATION/RATE DESIGN ISSUES ON BEHALF OF THE INDUSTRIAL INTERVENORS IN THIS DOCKET?

A Yes.

Q WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A I shall respond to the recommendations sponsored by Robert Scheffel Wright and James A. Rothschild on behalf of the Office of Public Counsel (OPC).

Mr. Wright testifies in support of the Equivalent Peaker (EP) method of classifying and allocating production capital costs. Although it is not clear from his testimony, I am assuming that he is implicitly supporting the 12CP method to allocate the "equivalent peaking" capital costs. The various problems with the EP and 12CP methods are discussed on Pages 7 through 22 and Pages 31 through 33 of my direct testimony and in Appendix C. At this time, I shall address:

- How the EP concept is not an accurate reflection of the utility system planning process;
- Various inconsistencies in Mr. Wright's allocation of capital and operating costs and in the arguments he poses which are unrelated to the capital substitution (CAPSUB) postulate underlying his EP method;
- Mr. Wright's criticisms of the REP method;
- The proposed modifications to the REP cost-of-service study; and
- The minimum demand charge for Rates PX/PXT.

Mr. Rothschild alleges that the cost of equity for industrial customers is 40 basis points higher than the corresponding cost of equity for residential and commercial customers. Although he did not quantify the rates of return for any specific rate class, the impact of his recommendation would be to require industrial customers to pay higher rates of return on rate base than either residential or commercial customers. In other words, cost-based rate-making would not be achieved by equalizing the class rates of return at parity--contrary to this Commission's long-standing policy.

Q **MR. WRIGHT TESTIFIES THAT HE INTENDS TO OFFER ENHANCED REVISED VERSIONS OF TWO COST-OF-SERVICE STUDIES CONTAINED IN HIS DIRECT TESTIMONY, EXHIBITS ____ (RSW-1) AND ____ (RSW-2). HAVE THESE ENHANCED STUDIES BEEN PROVIDED AT THIS TIME?**

A No. Mr. Wright should be required to file all of his evidence in direct testimony, as is the case for other intervenor witnesses.

Q **DO YOU HAVE ANY EXHIBITS TO SUBMIT IN CONNECTION WITH YOUR REBUTTAL TESTIMONY?**

A Yes. I am sponsoring Exhibit JP-2 (   ), consisting of three schedules. These schedules were prepared by me or under my supervision and direction.

REBUTTAL TO ROBERT SCHEFFEL WRIGHT

EQUIVALENT PEAKER METHOD

Q **MR. WRIGHT CONTENDS THAT THE EQUIVALENT PEAKER (EP) METHOD IS BASED ON, AND CONSISTENT WITH, UTILITY GENERATION PLANNING PRACTICES. DO YOU AGREE?**

A No. As I stated in my direct testimony, the EP method is at best an oversimplification of the utility generation planning process. However, its failure to accurately replicate planning considerations severely distorts the cost-of-service relationships.

Q **IN WHAT WAY IS THE EQUIVALENT PEAKER AN OVERSIMPLIFICATION OF THE PLANNING PROCESS?**

A Wright's Equivalent Peaker concept focuses on only one of many planning considerations--the trade-off between capital and operating costs. As I shall demonstrate, however, he fails to carry the production (capital and operating) cost trade-off to its full and logical conclusion. In fact, his defense for failing to be logically consistent has nothing to do with the theory underlying the EP method; namely, that a utility incurs the high capital costs of a base load unit only to achieve fuel savings.

Q **IS THERE ANY EVIDENCE TO DEMONSTRATE THAT A UTILITY SYSTEM DOES NOT BEHAVE THE WAY MR. WRIGHT'S THEORY SAYS IT MUST?**

A Yes. In the case of Gulf Power and the Southern Company system, Plant Scherer Unit No. 3 is such an example. Scherer 3 is a relatively expensive base load unit. Mr. Wright's EP theory says that the utility must have incurred that investment to save fuel costs. Because of its high fuel costs, Georgia Power classifies Scherer 3 as "peaking" capacity for purposes of allocating investment among the Georgia territorial utilities. The facts do not support the assumption of the EP method that fuel savings were either the sole, or even the primary, cause for constructing the unit. Nor do the facts support Mr. Wright's claim that his Equivalent Peaker concept accurately tracks the utility's planning process.

Q **HOW DOES MR. WRIGHT'S EQUIVALENT PEAKER CONCEPT FAIL TO ACCURATELY EMULATE THE SYSTEM PLANNING PROCESS?**

A Above all else, the job of a system planner is to provide a system that will meet peak demands reliably. In quantifying the cost of a hypothetical minimum system designed solely to meet peak demand, Wright would substitute peaking capacity for base load capacity on a MW-for-MW basis. However, the forced outage rate of peaking units is about 50% whereas the corresponding forced outage rate of coal-fired base load units is closer to 7%. Therefore, if one begins with a system having 2,135 MW of base load capacity and substitutes 2,135 MW of peaking capacity, the latter system would be only 53.76% (50% ÷ 93%) as reliable as the former at the time of the system peak. One would have to increase the amount of peaking capacity from 2,135 MW to 3,971 MW (2,135 MW ÷ 53.76%) to provide the same degree of reliability. By failing to recognize these fundamental relationships, he has substantially understated (by almost half) the percent of production investment which should be classified to demand even under the EP concept. This is but one of several examples of how Mr. Wright's cost-of-service methodology is a seriously flawed image of the planning process.

Q **HOW ELSE DOES MR. WRIGHT'S EQUIVALENT PEAKER CONCEPT FAIL TO ACCURATELY EMULATE THE PLANNING PROCESS?**

A Underlying Wright's Equivalent Peaker concept is the idea that all kWh loads contribute to the selection of the type of unit to be built. While it is certainly true that a utility projects both peak demand and energy sales, it is incorrect to say that all kWh loads influence the decision of what type of unit is to be built. Instead, once projections indicate the need for additional capacity, the planners perform a "least cost" analysis which typically identifies the most economical unit. Such an analysis of the various options reveals that the total life cycle net present value revenue requirement will "break-even" on the basis of far fewer than 8,760 hours. Studies which I have made comparing the life cycle cost of base load and peaking capacity indicate a break-even threshold of between 1,000 and 2,000 hours per year.

Q **CAN YOU ILLUSTRATE THE CONCEPT OF A BREAK-EVEN THRESHOLD?**

A Yes. Let's assume the life cycle capital and operating costs of base load and peaking capacity were as follows:

Option	Capital Costs ($/kW)	Operating Costs ($/MWh)
Base Load	$250($C_B$)	$ 25(O_B)
Peaking	$ 70(C_P)	$145($O_P$)

The break-even threshold would be as follows:

$$C_B + O_B \times BET = C_P + O_P \times BET$$

$$BET = \frac{C_B - C_P}{O_P - O_B}$$

$$= 1{,}500 \text{ Hours}$$

Given this relationship, it would be unreasonable to allocate the "above-the-cost-of-peaker" costs on the basis of loads in all hours, because the decision of the planner--which the EP theory says should govern the allocation--was based on the loads of only 1,500 hours.

Q ARE YOU AWARE OF ANY EFFORTS TO CONFORM TO THE "EP THEORY" TO THIS PLANNING REALITY?

A Yes. During the course of the most recent Florida Power Corporation base rate proceeding, FPC witness William Slusser prepared a modification of the EP method which allocated the capital costs deemed by the study to be energy-related on the basis of demands in the highest 1,500 hours, to reflect the break-even type of analysis performed by planners. That effort was the origin of the "Refined Equivalent Peaker," or REP, which has appeared in this case as a Company response to Staff Interrogatory No. 2.

Mr. Wright's insistence on clinging to total annual energy consumption in the face of this reality indicates that he is trying to conjure a planning process conform to his notion of how to allocate costs rather than trying to build a methodology that accurately parallels the planning process.

Q DOES MR. WRIGHT'S EP CONCEPT "FOLLOW THROUGH" WITH THE PRODUCTION COST TRADE-OFFS IT CLAIMS TO RECOGNIZE?

A No. The EP concept recognizes only half of the relationship between capital costs and operating costs on which it is purportedly based. According to Mr. Wright, more capital-intensive base load investment is made to secure low operating (fuel) costs, and his method of classifying production plant costs between demand and energy components purportedly reflects this capital side of the trade-off, as illustrated below:

Load Factor Versus the Per Unit Production Plant Cost Under the EP Method

Rate Class	12CP Average Load Factor (1)	Net Production Plant ($/CPkW) (2)	Relative Unit Cost (3)
RS	59%	$277	90
GS	63	287	94
GSD	79	324	106
LP/LPT	89	349	114
PXT	108	395	128
OS & SS	131	451	147
Total Retail	71%	$307	100

Source: Derived from Exhibit ____ (RSW-2).

As can be seen, the higher the load factor, the higher the allocated per unit production plant cost. Because base load units are typically more expensive on a per kW basis, the above differences mean that the higher load factor rate classes are receiving a larger portion of base load capacity under the EP method relative to a "slice-of-the system" approach, like the Near Peak Method. Wright's EP concept, thus, allocates different mixes of technologies to each rate class.

But Mr. Wright's version continues to use a "slice-of-the system" approach to allocate operating costs. A "slice-of-the system" means that each class is served from the same mix of base load and peaking energy. As illustrated in Exhibit JP-1 (   ), Schedule 2, this means that the same per unit operating cost is allocated to each class.

Thus, while Mr. Wright would levy a higher daily charge on a high mileage driver who prefers to rent more capital-intensive/fuel efficient cars, he refuses to acknowledge that the high mileage driver is also entitled to receive the correspondingly lower mileage charges: even though he would argue that the fuel benefits are the only reason to rent the more expensive car.

Q **HOW DOES MR. WRIGHT EXPLAIN HIS POSITION THAT NO ADJUSTMENT TO REFLECT THE FUEL TRADE-OFF IS NEEDED?**

A He explains it--not by defending the EP theory--but by actually <u>abandoning</u> the EP in favor of a completely different rationale for an energy-based allocation of capital costs.

Q **PLEASE EXPLAIN.**

A Mr. Wright's "defense" of the EP is the contention that the allocation of base load plant costs ideally should parallel the classes' respective ratios of the base energy they receive to the total energy they consume. In other words, Mr. Wright says, in effect, never mind if the EP study is logically inconsistent; my real belief is that a fair apportionment of base load plant costs would be one by which each class' share of base load plant costs would approximate the share of inexpensive base load energy. Starting with the premise that average-cost pricing of fuel implies that each class' share of base load energy is equivalent to its share of total energy consumption, Mr. Wright concludes that, but for the need to recognize that all classes to contribute to the need to build capacity necessary to serve peak demands, simple economic equity means allocating the full cost of base load units on energy.

Q **IS THE RELATIONSHIP BETWEEN A CLASS' RATIO OF BASE ENERGY AND TOTAL ENERGY RELATED TO THE EQUIVALENT PEAKER'S CAPSUB RATIONALE?**

A No. It is wholly independent of and unrelated to the CAPSUB theory underlying the EP method. Mr. Wright's defense is truly an apples-and-oranges mixture of ideas, and it is no defense to the failure of Wright's EP study to be internally consistent.

Q **DOES AVERAGE-COST PRICING OF FUEL IMPLY THAT EACH CLASS SHOULD GET A SHARE OF BASE LOAD ENERGY PROPORTIONAL TO ITS SHARE OF TOTAL ENERGY CONSUMPTION?**

A Yes.

Q **DOES THAT OBSERVATION SUPPORT HIS CHOICE OF A PRODUCTION COSTING METHODOLOGY?**

A No. Mr. Wright mistakenly believes that cost allocation must follow the pricing assumptions used to recover fuel costs from each class. That would defeat the purpose of a cost-of-service study which is to determine a cost basis for setting rates. It is the costs that determine the prices, and not vice-versa.

Q **IS THERE ANYTHING WRONG WITH THE COMMISSION'S PRACTICE OF RECOVERING AVERAGE FUEL COSTS FROM ALL CLASSES?**

A No. Average-cost pricing may be a practical necessity when fuel and purchased power costs are recovered through a separate adjustment clause mechanism, as is the case in Florida and in other states. It would be misleading to assert that the average-cost pricing of fuel should in any way constrain the derivation of the base rate revenue requirement using a methodology that purportedly recognizes production cost trade-offs.

Q **HOW IS THE BASE RATE REVENUE REQUIREMENT DERIVED IN A CLASS COST-OF-SERVICE STUDY?**

A The procedure for using a cost-of-service study to derive the base revenue requirement of each rate class can be illustrated as follows:

Example to Illustrate the Derivation of Base Revenue Requirement for a Rate Class

Description	Total (1)	Fuel (2)	Nonfuel (3)
Total Revenue Requirement (from Cost-of-Service Study)	$ 1,000	$ 400	$ 600
Less: Fuel Clause Revenues	(390)	(390)	--
Franchise Taxes @ 2.5%	(25)	(10)	(15)
Other Revenues	(10)	--	(10)
Base Revenue Requirement	$ 575	$ --	$ 575

Q **WHAT WOULD HAPPEN IF, TO APPROPRIATELY RECOGNIZE THE PRODUCTION COST TRADE-OFFS, FUEL <u>COSTS</u> WERE ALLOCATED DIFFERENTLY THAN FUEL IS ACTUALLY BEING RECOVERED UNDER AVERAGE-COST PRICING?**

A The base rate revenue requirement would automatically compensate for the more symmetrical fuel cost allocation, as illustrated thus:

Example to Illustrate the Effect on Base Rates of a Symmetrical Fuel Cost Allocation

Description	Total (1)	Fuel (2)	Nonfuel (3)
Total Revenue Requirement (from Cost-of-Service Study)	$ 950	$ 350	$ 600
Less: Fuel Clause Revenues	(390)	(390)	--
Franchise Taxes @ 2.5%	(24)	(9)	(15)
Other Revenues	(10)	--	(10)
Base Revenue Requirement	$ 526	$(49)	$ 575

Q **WHAT IS THE SIGNIFICANCE OF THE NEGATIVE BASE REVENUE REQUIREMENT SHOWN ABOVE UNDER THE FUEL COLUMN?**

A The $(49) amount is in effect a "fuel symmetry" adjustment like the one employed in the Corrected REP method [Exhibit JP-1 (   ), Schedules 12 and 13)]. Thus, even if fuel is completely removed from the study, a fuel symmetry adjustment can be used to appropriately recognize the capital/operating cost trade-offs without disturbing the Commission's practice of recovering fuel costs based on average-cost pricing.

Q **IS MR. WRIGHT CORRECT IN ASSERTING THAT EQUITY CAN BE ACHIEVED BY THAT MATCHING THE BASE LOAD PLANT COST RESPONSIBILITY AND THE BASE LOAD FUEL RECEIVED?**

A No. To do so would be tantamount to allocating all base load capital costs relative to total kWh loads. This implicitly assumes that base load plants are built <u>solely</u> to provide fuel savings in each and every hour of the year throughout their 30 to 40-year useful lives, rather than to maintain system reliability. Such a proposition is indeed far-fetched especially considering the very speculative nature inherent in any projection of fuel costs. It even conflicts with the assumptions of the Wright EP, which holds that a quantifiable portion of investment is made for the purpose of meeting peak demand.

Further, this proposition completely ignores differences in class load factors. In other words, a class having an above-average load factor, by definition, should be assigned a larger share of the variable operating costs relative to its share of plant responsibility, because it is making more efficient use of capacity. A lower load factor class, by contrast, is making less efficient use of the capacity, and therefore, it should be assigned a lower share of the variable operating costs relative to its share of plant cost responsibility. This is nothing new, and it is not even a function of Capital Substitution or any other cost allocation theory. It simply reflects the reality that higher load factor customers use more energy per unit of capacity than lower load factor customers. This relationship holds irrespective of the mix of generating capacity that may be allocated to them. To match the allocation of plant to the fuel cost responsibility, as Mr. Wright suggests, would ignore differences in load factor between the classes and would, therefore, be inequitable.

Thus, in the course of backstopping the deficiencies of the EP study, Mr. Wright is at odds not only with his own principles of cost-causation, but also with reality, equity and common sense. Further, by supporting the proposition that average-cost pricing of fuel should dictate the allocation of base load plant costs, he has turned those principles topsy-turvy.

Q **IS IT MR. WRIGHT'S CONTENTION THAT NO ADJUSTMENT TO THE ALLOCATION OF FUEL COSTS IS NECESSARY BECAUSE GULF POWER GENERATES 99.6% OF ITS ENERGY FROM COAL?**

A His observation that Gulf Power is primarily a coal-fired utility is certainly correct. If anything, this should reinforce the notion that there is no capital substitution because the opportunities for significant fuel cost savings are minimal. Further, his contention has absolutely nothing to do with the production cost trade-offs that may have caused this utility to opt for primarily coal-fired capacity rather than combustion turbines. If a combustion turbine is to be the yardstick to determine how to classify and allocate production capital costs, then consistency demands that this same (arbitrary) yardstick also be used to determine how production operating costs should be allocated.

Q IF A COMBUSTION TURBINE WERE USED AS THE YARDSTICK TO CLASSIFY AND ALLOCATE PRODUCTION CAPITAL COSTS, SHOULD ALL CLASSES CONTINUE TO BE ALLOCATED A "SLICE-OF-THE SYSTEM" AVERAGE OPERATING COST?

A No. As I demonstrated in Appendix C to my direct testimony, a full and consistent application of the Capital Substitution theory (which uses a combustion turbine unit as the yardstick) inevitably results in allocating below-average operating costs to the higher load factor rate classes.

REFINED EQUIVALENT PEAKER METHOD

Q BEGINNING ON PAGE 27 OF HIS TESTIMONY, MR. WRIGHT OFFERS FIVE CRITICISMS OF THE REFINED EQUIVALENT PEAKER (REP) METHOD. HIS FIRST CRITICISM IS THAT THE REP METHOD DOES NOT TRACK UTILITIES' ACTUAL GENERATION EXPANSION PLANNING PROCESSES. IS THIS A VALID CRITICISM?

A No. Mr. Wright apparently believes that inputting a utility's total energy loads into the economic analysis is tantamount to considering all (year-round) kWh in the generation expansion planning process. This step is a far cry from determining which energy loads, if any, actually cause the utility to make capital investment decisions.

Further, Mr. Wright's understanding of the utility generation planning process does not comport with the practices of other utilities, including at least one utility in the State of Florida--Florida Power Corporation. Mr. Wright has not presented any evidence to support his understanding of the utility generation expansion planning process.

Q **MR. WRIGHT ALSO CRITICIZES THE REP METHOD FOR NOT RECOGNIZING POTENTIAL LONG-RUN MARGINAL OR INCREMENTAL PLANT COSTS OF OFF-PEAK ENERGY USE. WHAT IS HE GETTING AT HERE?**

A He apparently believes that additional off-peak energy use could cause the utility to install additional capacity. However, he has not provided any proof that this potential exists either for Gulf Power Company or for any other utility.

It is also curious that Mr. Wright has chosen to introduce marginal costing concepts to backstop the EP method while arguing, at the same time, that average-cost pricing of fuel should dictate how base load plant costs are allocated. Mr. Wright, thus, is mixing bananas along with the apples and oranges.

Q **MR. WRIGHT'S THIRD CRITICISM IS THAT THE REP METHOD RESULTS IN A LESSER DEGREE OF "FUEL COST MATCHING" OR LESS FUEL EQUITY THAN THE BASIC EP METHOD. IS THERE ANYTHING WRONG WITH HIS OBSERVATION THAT THE LP/LPT AND PXT CLASSES WOULD PAY FOR ONLY 23.64% OF GULF'S BASE LOAD COAL PLANTS WHILE RECEIVING 29.87% OF COAL-FIRED GENERATION?**

A No. To the contrary, the differences in percentage allocators reflect the fact that Rates LP/LPT and PXT are high load factor classes.

Q **WHAT DO THESE ALLOCATORS REPRESENT?**

A The first allocator, 23.64%, represents the percent of production plant allocated to the LP/LPT and PXT classes under the REP method, as presented in Gulf's response to Staff Interrogatory No. 2 [attached to Mr. Wright's Exhibit ____ (RSW-2)]. These classes, by comparison, comprise 22.40% of the total retail 12CP demands.

The second allocator, 29.87%, is the percent of total retail energy required by the LP/LPT and PXT classes.

Because the LP/LPT and PXT classes have above-average load factors (as shown in the table on Page 8), it follows that the energy allocator (29.87%) should be bigger than the plant allocator (23.64%) if the study is to accurately reflect differences in class load factor.

Q **MR. WRIGHT ALSO CRITICIZES THE REP BECAUSE OF ITS RELIANCE ON THE HIGHEST DEMAND HOURS UNDER THE LOAD DURATION CURVE. IS THERE ANY MERIT TO THIS ARGUMENT?**

A No. Notwithstanding his observation that base load plants operate in the hours beyond the break-even point, his arguments have nothing to do whatsoever with cost-causation. (Base load units typically do not operate all 8,760 hours per year.) However, the capacity required to meet peak demand--the first step in the planning process--is determined by the highest demand hours. If it weren't for the high demand hours, a utility would have little reason to install anything other than a base load unit.

Q **PLEASE EXPLAIN.**

A Appendix C, Schedule C-2 shows the load duration curves of the various rate classes and the proportion of base load and peaking capacity required to serve each class on a stand-alone basis at the lowest overall cost. With the notable exception of the outdoor service class, the load duration curves of each rate class are demonstrably flatter beyond the break-even threshold (the area to the right of the shaded area). The flatter the load curve, the higher the load factor. The Rate PXT class, for example, has the flattest load duration curve and also the highest load factor of any class (Appendix B, Schedule B-1). It is no coincidence that because of its flatter load curve (i.e., higher load factor), the PXT class would require the least amount of peaking capacity.

In other words, as the load curve becomes flatter--as is the case beyond the break-even threshold--then there are fewer trade-offs to consider and, therefore, less capital substitution. Without capital substitution, there is no basis for the EP method.

Q **MR. WRIGHT CLAIMS THAT THE REP METHOD PLACE THE COMMISSION IN A CLEARLY AND UNCOMFORTABLY INCONSISTENT POSITION WITH RESPECT TO PRODUCTION PLANT COST ALLOCATION AND THE PRICING OF COGENERATION POWER PURCHASED BY UTILITIES. IS HE RIGHT?**

A No. Mr. Wright is, once again, putting the cart before the horse by using pricing assumptions to judge the appropriateness of a costing methodology.

If anything, Mr. Wright's QF analogy shows how the Commission follows through the logic of using the same type of unit (e.g., a base load coal-fired unit) to determine both avoided capacity and operating costs. The EP method, by contrast, uses one theory to allocate capital costs (i.e., CAPSUB) and yet another unrelated theory to allocate operating costs (i.e., average-cost pricing of fuel).

Further, if a QF were to operate at a high capacity factor, then the percentage of avoided capacity payments (i.e., base load plant responsibility) would not match the corresponding percentage of avoided energy payments (i.e., base load fuel). In other words, there would be no matching between avoided base load plant costs and avoided base load energy costs, as Mr. Wright claims would be equitable under his EP concept.

MODIFICATIONS TO THE REP METHOD

Q **ALTHOUGH MR. WRIGHT IS UNWILLING TO GIVE HIS FULL SUPPORT TO THE REP METHOD, DOES HE, NEVERTHELESS, RECOMMEND SEVERAL MODIFICATIONS TO THE REP COST-OF-SERVICE STUDY PROVIDED IN RESPONSE TO STAFF'S INTERROGATORY NO. 2?**

A Yes. In the event that the Commission adopts the REP method, Mr. Wright recommends that:

(1) The extra capital costs associated with base and intermediate units should be allocated to the on-peak hours as defined in Gulf Power's tariff;

(2) Additional investment in conductors should be allocated to those primary and high voltage customers served from dedicated distribution substations; and

(3) Fuel inventory should be classified and allocated relative to energy.

Only the first modification has anything to do with the REP method.

Q **IS IT APPROPRIATE TO ALLOCATE THE EXTRA BASE AND INTERMEDIATE CAPITAL COSTS TO THE ON-PEAK HOURS AS DEFINED IN GULF POWER'S TIME-OF-USE RATES?**

A No. This is yet a third example of Mr. Wright's insistence that pricing assumptions should dictate how a costing methodology is to be implemented. I have previously demonstrated that the hours beyond the break-even threshold, although inputted into the economic analysis phase of the generation expansion planning process, do not cause a utility to incur the extra capital costs associated with base load capacity. Mr. Wright's first modification should be rejected.

Q **IS THERE ANY BASIS FOR MR. WRIGHT'S RECOMMENDATION THAT GULF ESTIMATE THE RATE BASE VALUE OF PRIMARY AND HIGHER VOLTAGE-LEVEL CONDUCTOR THAT FUNCTIONS AS DEDICATED DISTRIBUTION FACILITIES, OR AS HIGHER VOLTAGE SERVICE DROPS, AND ASSIGN THESE ESTIMATED AMOUNTS TO THOSE CLASSES TO WHICH DEDICATED SUBSTATION FACILITIES WERE DIRECTLY ASSIGNED?**

A It is difficult to assess Mr. Wright's position because he fails to provide any specific examples to demonstrate that customers served from dedicated distribution substations cause Gulf to make additional distribution plant investment in Accounts 364 through 369.

In principle, it would be preferable to directly assign plant to specific customer classes provided that it is practicable to do so and that appropriate adjustments are made to prevent overallocating distribution costs to the same class. This may not be an easy task.

For example, let's assume that Gulf could identify a 46 kV feeder that serves only one specific Rate PXT customer. It would be easy to directly assign the cost of this radial feeder to the class. The hard part is that there may be many other instances where a similar radial feeder could be directly assigned. Although Gulf may be readily able to identify the cost of one radial feeder serving a particular customer, it may be impossible or at best very time consuming to identify a multitude of radial feeders serving specific customers or customer classes.

Even assuming that all 46 kV radial feeders can be identified and directly assigned, there remains the problem of allocating the remaining 46 kV investment. By definition, the customers who are directly assigned the cost of 46 kV radial feeder should not bear any of the cost associated with the remaining 46 kV system. Therefore, it becomes necessary to remove the loads associated with the direct assigned investment in determining the allocation factors that would apply to the remaining investment.

Although the above-described process would increase the complexity of the study, it is not clear whether it would measurably increase the accuracy of the results.

Q **ON PAGE 33, MR. WRIGHT RECOMMENDS THAT FUEL INVENTORY BE CLASSIFIED AS ENERGY-RELATED "SIMPLY BECAUSE FUEL IS ENERGY-RELATED AND ALLOWABLE FUEL INVENTORY IS A FUNCTION OF PROJECTED GENERATION." DO YOU CONCUR WITH MR. WRIGHT'S RECOMMENDATION?**

A No, not entirely. While I agree with his statement that fuel inventory is a function of projected generation, that does not justify classifying this fixed rate base component to energy and then allocating it entirely on the basis of total kWh loads. To do so would ignore the purpose of having a fuel inventory--which is to enable the utility the operate the plant to meet the loads as they materialize. Absent a fuel inventory, the plant could not be relied upon to provide dependable capacity to the system. I would argue, therefore, that fuel inventory is vital to maintaining system reliability, and it, thus, should be allocated accordingly. Allocating fuel inventory entirely on total kWh loads fails to give any recognition to system reliability and is, therefore, improper.

Q **DO YOU HAVE ANY RESPONSE TO MR. WRIGHT'S GENERIC CRITICISMS OF COSTING METHODS THAT CLASSIFY ALL PRODUCTION PLANT COSTS TO DEMAND?**

A I have previously addressed the appropriateness of this approach in my direct testimony. Mr. Wright's criticisms of all-demand costing methodology aside, I have demonstrated in my direct testimony that the Near Peak method, with all production plant costs classified to demand, yields similar results to the corrected REP method, in which some production plant costs are classified as energy-related and allocated to classes in a manner which I believe more closely reflects utility system planning practices than either the EP method which Mr. Wright champions or the REP method which Gulf provided in response to Staff Interrogatory No. 2. The Commission, thus, can comfortably rely on either study as a primary guide for determining the distribution of any base revenue increase that Gulf may be awarded in this Docket.

DESIGN OF RATE PXT

Q MR. WRIGHT RECOMMENDS THAT GULF IMPLEMENT A LOCAL FACILITIES OR DISTRIBUTION DEMAND CHARGE BASED ON EACH CLASS' DISTRIBUTION UNIT COST, CALCULATED USING 100% RATCHETED BILLING DEMAND AND APPLIED TO THE CUSTOMER'S HIGHEST MEASURED DEMAND DURING THE CURRENT MONTH OR IN A SPECIFIED PERIOD PRECEDING THE CURRENT BILLING MONTH. DO YOU AGREE WITH MR. WRIGHT'S RECOMMENDATION?

A No, not entirely. Although I agree with the concept of a minimum demand charge, I object to a 100% ratchet based on the customer's highest measured demand during a two-year period. A 100% demand ratchet is extremely harsh, it fails to balance the interest between ratepayers and shareholders and it is not consistent with industry practice. The same thing may also be said about establishing a ratchet period beyond 11 months following the establishment of a higher maximum demand.

If Mr. Wright's recommendation is adopted, then, to balance the interests of Gulf and its ratepayers and to be consistent with industry practice, the local facility demand ratchet should not exceed 90%, and the ratchet period should not exceed 11 months.

REBUTTAL TO JAMES A. ROTHSCHILD

COST OF EQUITY BY CUSTOMER CLASS

Q HAVE YOU REVIEWED THE TESTIMONY OF JAMES A. ROTHSCHILD WHEREIN HE ALLEGES THAT THERE ARE DIFFERENCES IN THE COST OF EQUITY OF SERVING VARIOUS CUSTOMER CLASSES?

A Yes, I have. His recommendation is based on three erroneous premises. First, he claims that "it is well recognized that serving industrial customers entails a higher degree of risk than serving residential or commercial customers." (Testimony at Page 52, Lines 6-8.) I shall demonstrate, however, that this proposition is far from being "accepted," as he claims. In fact, several analysts have demonstrated that the opposite may be true; namely that residential customers may be more risky to serve than industrial customers.

A second false premise is the assumption that the variability in the percent of sales growth is a reasonable "proxy" for measuring the variability of each class's contribution to the utility's earnings, or income (Testimony at Pages 52-54 and Schedule 11, Page 2). This assumption is not supported by any empirical analysis presented in his testimony. Other analysts, who have addressed this subject in much more depth, have refuted this assumption. I shall demonstrate that, for Gulf Power Company, variability in class kilowatthour sales is not a proxy which can be used to measure the variability in class contributions to income.

His third erroneous premise is the assumption that differences in stock market price volatility, as measured by Value Line's Beta statistic, can be explained solely by the differences in the industrial sales mix (as measured by the percent of industrial kWh sales to total sales)--Testimony at Pages 55-59; Schedule 11, Pages 1, 3 and 4.

Finally, setting industrial class rates of return higher than the other classes on the theory that industrials are more risky may only exacerbate the utility's risk, thereby increasing the cost of capital to the detriment of all ratepayers.

Q **TURNING TO MR. ROTHSCHILD'S FIRST PREMISE, IS THERE AGREEMENT AMONG FINANCIAL ANALYSTS THAT INDUSTRIAL CUSTOMERS ARE MORE RISKY TO SERVE THAN RESIDENTIAL OR COMMERCIAL CUSTOMERS?**

A Certainly not. Mr. Rothschild has overlooked several in-depth studies which have been presented on the subject of class risk differentials, in both the literature and various regulatory proceedings.

Some of these studies refute the notion that there is any quantifiable risk differential, while other studies have concluded that the risk to serve residential customers may be greater than the corresponding risk to serve industrial customers.

Q CAN YOU CITE SOME SPECIFIC EXAMPLES?

A Yes. I am aware of several studies which attempt to determine empirically whether there is any relationship between electric utilities' customer mix and investors' perception about the riskiness of those utilities' securities. For example:

> In an article in "Public Utilities Fortnightly" for July 30, 1980, Mr. Nick Poulius concluded from his analysis that electric utility bond ratings appear to be positively influenced by industrial sales, i.e., the greater the ratio of industrial sales to residential sales, the higher the bond rating.

> In a 1981 Arkansas Power & Light rate case before the Arkansas Public Service Commission (Docket U-3108), Dr. Paul Garfield presented studies from which he concluded that electric utilities with heavy reliance upon industrial sales do not test out to be more risky than those with only minor dependence upon industrial sales.

> In their April, 1981 'Report to the Delaware Public Service Commission on Class Rate of Return Differentials by Customer Class for Electric Utility Services rendered by Delmarva Power and Light Company,' Mr. Harris and his associate, Mr. Joseph Brennan, concluded on the basis of various studies that customer mix has no impact on the traditionally accepted risk indicators, bond rating and beta.

In the same Report to the Delaware Commission, and in subsequent testimony in a Delmarva rate case (Docket No. 81-12), Harris and Brennan claimed to establish a relationship between 'cost of capital' and customer mix such that investors require a higher common equity component for firms with a greater concentration of industrial sales.

In the above Delmarva case (Docket No. 81-12), Drazen-Brubaker & Associates replicated the Harris-Brennan 'cost of capital' study using consistent (Standard Industrial Code) definitions of classes rather than the unstandardized definitions used by Harris and Brennan; in the revised study the purported relationship vanished.

In a report prepared for the Electricity Consumers Resource Council, FINCAP, Inc. conducted numerous empirical tests relating customer mix and both traditional investment risk indicators <u>and</u> capital costs. ('An Examination of the Concept of Using Relative Customer Class Risk to Set Target Rates of Return in Electric Cost of Service Studies,' October, 1981.) Once again, the conclusion drawn was that the empirical analysis failed to develop sufficient evidence to support the hypothesis that customer mix impacts utilities' investment risk and capital.

In their October 27, 1988, Article in "Public Utilities Fortnightly," Messrs. James A. Waddell and William M. Takis presented an analysis which directly measured the inherent riskiness of earnings from each class. They concluded that there is no significant difference in the financial risks associated with Connecticut Light and Power (CL&P) Company's full requirements Residential, Small (SGS) and Large General Service (LGS) classes and recommended that equalized rates of return should be used in the class cost-of-service study. Their analysis revealed that despite the greater sales volatility, the overall financial risk of the LGS class was lower than the corresponding risks of serving the Residential and SGS classes.

Therefore, I disagree with Mr. Rothschild's assertion that it is a "well accepted fact" that industrial sales are more risky. If anything, the literature gives more weight to the contrary proposition; in any event, he has not proven it is true in the case of Gulf Power Company.

Q MR. ROTHSCHILD CITES STATEMENTS MADE BY MOODY'S AND STANDARD & POOR'S AS SUPPORT FOR HIS ASSERTION THAT THE GREATER RISKINESS OF SERVING INDUSTRIAL CUSTOMERS IS WELL RECOGNIZED. HAVE YOU REVIEWED THE SPECIFIC PASSAGES QUOTED IN MR. ROTHSCHILD'S TESTIMONY?

A Yes, I have. Mr. Rothschild overstates his case when he claims that the cited passages support his assertion. Although I do not have the 1979 "Standard & Poor's Rating Guide," I could not find a similar passage or other material which asserted that industrial sales were more risky than residential or commercial sales in a more recent version of S&P's "Credit Overview." The only passage that I was able to find on the subject concerned "the size in growth rate of the market, diversity of the customer base and its economic strength (as measured by trends in population, unemployment, and per capita incomes)." This was but one of the many non-financial rating criteria cited by S&P. S&P's rating methodology profile involves the analyses of twelve criteria including:

Non-Financial Criteria

- Market of service territory
- Fuel/power supply
- Operating efficiency
- Regulatory treatment
- Management
- Competition/monopoly balance

Financial Criteria

- Construction/asset concentration risks
- Earnings protection
- Debt leverage
- Cash flow adequacy
- Financial flexibility/capital attraction
- Accounting quality

(Source: S&P's "Credit Overview", Page 34.)

If industrial sales versus residential and commercial sales have any influence on S&P's determination of a utility's rating, then it is, at best, a second-order effect. This was precisely the conclusion of the FINCAP Report which was based on in-depth interviews with eighteen leading investment analysts, including those with the major investment banking firms and bond rating agencies. Specifically, the authors found a clear consensus among the analysts that risk perceptions were more a function of the effects of "inflation, high interest rates, and capital market uncertainty," "earnings erosion (attrition), regulatory lag and heavy financing requirements," "uncertainties associated with nuclear projects and large magnitudes of construction work in progress (CWIP)," "the unknown future of federal energy and environmental regulation," and "difficulties in forecasting load growth and energy sales." FINCAP also found that only when a utility's customer mix is dominated by one customer class and that class is vulnerable to major economic shocks did the security analysts believe that customer mix "might have some material effect (although less than the other risk factors identified above). . . ."

Q DO INDUSTRIAL SALES REPRESENT A DOMINANT SHARE OF GULF POWER'S SALES MIX?

A Certainly not. According to its "1989 Annual Report to Stockholders," Gulf Power's territorial sales mix is as follows:

Gulf Power Territorial Sales Mix

Class	1989 (1)	1988 (2)	1987 (3)	1986 (4)
Residential	42%	42%	42%	43%
Commercial	28	28	28	27
Industrial	27	26	26	25
Other	3	4	4	5

If anything, Gulf Power's territorial sales are dominated by residential and commercial customers.

Q **THE QUOTE FROM THE 1989 <u>MOODY'S PUBLIC UTILITY MANUAL</u> REFERS TO UNIFORMITY OF RESIDENTIAL SALES GROWTH AND THE SENSITIVITY OF INDUSTRIAL SALES TO FLUCTUATIONS IN THE ECONOMY. DOES THIS SUPPORT MR. ROTHSCHILD'S ASSERTION THAT SERVING INDUSTRIAL CUSTOMERS IS MORE RISKY THAN SERVING EITHER RESIDENTIAL OR COMMERCIAL CUSTOMERS?**

A No. Virtually all financial analysts, even Mr. Rothschild, would agree that risk is a function of the variability in <u>earnings</u>. Neither Moody's nor S&P make any reference to the volatility of earnings of the various customer classes served by a utility. Although the passage from Moody's supports Mr. Rothschild's empirical analysis that growth in industrial sales is less uniform than the percent growth in either residential or commercial sales, he has failed to prove that this lack of uniformity matches the variability in the income contributed by industrial customers.

Q **IN YOUR OPINION, IS THE VARIATION IN CLASS ENERGY SALES AN APPROPRIATE PROXY FOR THE VARIATION IN CLASS INCOME?**

A Absolutely not. Mr. Rothschild has ignored the fundamental differences in the design of industrial rates, as compared to residential rates. For example, Gulf Power's industrial rates consist of separately stated demand and energy charges. Also, Gulf Power is proposing to reimplement a demand ratchet based upon each customer's contract demand. This would ensure that industrial customers will pay a reasonable share of the costs of local facilities which they impose on Gulf, irrespective of their actual operating levels.

Residential rates, on the other hand, consist basically of customer and energy charges. The latter must recover both fixed and variable costs. Mr. Rothschild also ignores the fact that weather conditions are perhaps the largest factor influencing year-to-year kilowatthour sales to residential customers. Since the residential rate depends upon kilowatthour sales volumes to recover both fixed costs and variable costs, it is obvious that variations in kilowatthour sales will have a more pronounced effect upon the earnings from the residential class than they will on earnings from the industrial class.

Q **WOULD A CHANGE IN KILOWATTHOUR SALES PRODUCE A CORRESPONDING CHANGE IN NET INCOME FOR THE RESIDENTIAL AND INDUSTRIAL RATE CLASSES SERVED BY GULF POWER?**

A No. Exhibit JP-2 ( ), Schedule 1, demonstrates that a 10% decrease in kilowatthour sales would translate into a 17% decrease in the net operating income derived from the residential class, but only decreases of 2.3% and 0.7% in the income derived from the LP & LPT and PXT classes. Although the analysis was based on Gulf Power's revised cost-of-service study at proposed rates, the application of the other cost allocation methods would not materially change the relationships.

Q WOULD CHANGES IN KILOWATTHOUR SALES NECESSARILY RESULT IN CORRESPONDING CHANGES IN BILLING DEMAND FOR INDUSTRIAL CUSTOMERS?

A No. Although industrial sales may fluctuate in accordance with economic conditions, it is usually the case that kilowatthour sales exhibit more variation than do either actual kilowatt demands or billing demands. If an industrial rate is properly designed (such that the demand charges recover fixed costs, while the energy charges basically recover variable costs), increases or decreases in the level of kilowatthour sales will produce increases or decreases in revenues that are in line with the increases or decreases in variable costs. Under these conditions, the operating income or earnings to the utility from its industrial sales will remain relatively unaffected, as demonstrated in Schedule 1.

Q IS THERE ANY OTHER EXPLANATION, BESIDES THE DIFFERENT RATE STRUCTURES, THAT LEAD YOU TO BELIEVE THAT THERE IS NOT A 1-1 RELATIONSHIP BETWEEN SALES VOLATILITY AND EARNINGS VOLATILITY?

A Waddell and Takis concluded that it was unrealistic to assume that variations in earnings (the relevant consideration for determining investor risk) exactly mirrors variations in sales. The basis for their conclusion was the observation that there are differences in the proportion of fixed costs relative to total costs to serve the various customer classes. If a class has a relatively higher ratio of fixed costs (those which do not vary with sales volume) to total costs, then variations in net earnings will be more volatile relative to a given change in sales. Quoting Waddell and Takis:

> Intuitively, if most of the costs of production are fixed costs, a reduction in sales will reduce revenues but will not change costs significantly. Net revenues (operating income) will necessarily fall. If most costs are variable, however, the loss of sales in revenues will be largely offset by a reduction in costs. Operating income in this case should be more stable. (IBID, Page 29)

Their conclusion, thus, was that variations in sales will have a more pronounced effect on operating income from a customer class with a high percentage of fixed costs relative to total costs (i.e., is more capital-intensive).

Q **HAVE YOU COMPARED THE RELATIVE CAPITAL-INTENSITY OF THE RATE CLASSES SERVED BY GULF POWER?**

A Yes. Exhibit JP-2 ( ), Schedule 2, demonstrates that the RS, GS and OS classes are more capital-intensive than the LP & LPT and PXT classes. In fact, serving PXT customers is about 35% less capital-intensive than serving residential customers.

Looking at this proposition from a somewhat different perspective, Schedule 3 compares the ratio of customer and demand-related costs to total revenue requirement, including fuel and conservation cost recoveries, by rate class, based on Gulf Power's cost-of-service study at proposed rates. The ratio of fixed costs-to-total revenue requirement varies widely from 62% for the residential class to only 44% and 34% for the LP/LPT and PXT classes, respectively.

Simply stated, even if it were true that PXT kilowatthour sales were more volatile, it does not follow that the PXT class's earnings volatility would be any greater than the corresponding earnings variability of the residential class. This is consistent with the analysis conducted by Waddell and Takis which demonstrated that the lower financial risk associated with serving industrial customers offset the greater sales volatility. In other words, greater sales volatility--assuming it exists for Gulf's LPT and PXT classes--is not a sufficient condition to justify setting the LPT and PXT class rates of return above parity.

Q **MR. ROTHSCHILD'S SCHEDULE 11 SEEMS TO IMPLY A RELATIONSHIP BETWEEN THE BETA, OR RISK OF A UTILITY, WITH THE PERCENTAGE OF INDUSTRIAL SALES TO TOTAL RETAIL SALES. ARE MR. ROTHSCHILD'S FINDINGS VALID IN YOUR OPINION?**

A No. Mr. Rothschild has not provided any statistical analysis to confirm that investors perceive utilities with a higher industrial sales mix to be more risky than utilities having a high residential or commercial sales mix. To prove this hypothesis, Mr. Rothschild should have first analyzed all of the factors that could have an impact on a utility's beta factor. Once a valid statistical relationship has been demonstrated, it would then be possible to incorporate industrial sales mix into the analysis. Only under these circumstances is it possible to test the hypothesis that industrial sales mix effects the stock market price volatility of a utility.

Mr. Rothschild's comparison proves nothing. The different betas could be explained by any number of factors. His study is analogous to one which takes the average income for people of above-average height and the average income for people of below-average height and compares the difference in average income to the difference in average height, thereby "proving" that each inch of additional height results in so many dollars of additional annual income.

Q ARE THERE OTHER CONSIDERATIONS WHICH DEMONSTRATE THAT INDUSTRIAL CUSTOMERS ARE NOT MORE RISKY TO SERVE THAN OTHER CUSTOMER?

A Yes. Not only are there fundamental differences in the design of industrial rates--including separately stated demand and energy charges and a demand ratchet--industrial customers are typically required to execute multi-year contracts. The term of contract under Rate PXT, for example, is for an initial period of five or more years and thereafter from year to year until terminated by twelve months' written notice. Residential customers, by contrast, are usually not required to sign multi-year contracts for the supply of electric service, so that the "assurance" of collecting revenues to cover the cost of installed plant is less in the case of a residential customer.

Q **LET'S ASSUME, CONTRARY TO THE FACTS YOU HAVE SET OUT, THAT INDUSTRIAL CUSTOMERS ARE MORE RISKY TO SERVE THAN OTHER CLASSES. IF THE COMMISSION WERE TO SET INDUSTRIAL RATES OF RETURN ABOVE PARITY, HOW MIGHT GULF POWER BE AFFECTED BY SUCH A POLICY?**

A The simple answer is that Gulf Power would probably become a more risky utility. By setting industrial rates above parity, Gulf Power would become more dependent on the revenues derived from the assumed riskier rate classes than if the rates were set to parity for all customer classes. To the extent that the greater risk would cause Gulf Power's cost of capital to increase, the result would be higher rates for all customers.

Mr. Rothschild overlooks the facts that Gulf's industrial customers must compete with firms located elsewhere and that electricity can be a significant operating cost. Arbitrarily setting industrial rates above parity could place these customers at a competitive disadvantage. This could lead to a temporary or even a permanent drop in Gulf's revenues as the affected customers either shift production to lower cost sites or curtail operations. The resulting drop in income would have to be absorbed by shareholders or recovered from the other ratepayers.

Q **IN YOUR OPINION, SHOULD THE COMMISSION CONTINUE ITS LONG-STANDING OBJECTIVE OF MOVING CLASS RELATIVE RATES OF RETURN TO PARITY?**

A Yes. Based on the more in-depth studies presented on the subject of class risk differentials and on the analysis presented in Schedules

1 through 3, it is my opinion that there is no basis for ascribing a higher risk, and a higher rate of return, to industrial sales than to the sales made to other customer classes. The proper definition of cost of service comprehends that each rate class produce the same rate of return.

Q **DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

A Yes, it does.