

**Before the
Mississippi Public Service Commission**

**Order of the Mississippi Public Service Commission Establishing a Generic
Docket to Consider Competition in the Provision of Retail Electric Service**

Docket No. 96-UA-389

**Testimony and Exhibits of
Bruce Edward Biewald**

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Exhibit BEB-1 Resume of Bruce Edward Biewald

1

1. Qualifications

2 **Q. State your name, occupation and business address.**

3 A. My name is Bruce Edward Biewald. My address is Synapse Energy
4 Economics, Inc., 22 Crescent Street, Cambridge, Massachusetts, 01238.

5 **Q. Please describe your current employment.**

6 A. I am President of Synapse Energy Economics, Inc., a consulting company
7 specializing in economic and policy analysis of electricity restructuring,
8 particularly issues of consumer protection, market power, stranded costs,
9 renewables, efficiency, environmental quality, and nuclear power.

10 **Q. What are your qualifications with regard to energy policy?**

11 A. I graduated from the Massachusetts Institute of Technology in 1981, where I
12 studied energy use in buildings. I was employed for 15 years at the Tellus
13 Institute, where I was Manager of the Electricity Program, responsible for studies
14 on a broad range of electric system regulatory and policy issues. I have testified
15 on energy issues in approximately 50 regulatory proceedings in 20 states, two
16 Canadian provinces, and before the Federal Energy Regulatory Commission. I
17 have co-authored approximately 80 reports, including studies for the Electric
18 Power Research Institute, the U.S. Department of Energy, U.S. Environmental
19 Protection Agency, the Office of Technology Assessment, the New England
20 Governors' Conference, the New England Conference of Public Utility
21 Commissioners, and the National Association of Regulatory Utility
22 Commissioners. My papers have been published in the Electricity Journal, Energy
23 Journal, Energy Policy, Public Utilities Fortnightly and numerous conference
24 proceedings, and I have made presentations on the economic and environmental
25 dimensions of energy throughout the U.S. and internationally. My resume is
26 provided here as Exhibit BEB-1.

27 **Q. What are your qualifications specifically with regard to market power and
28 electric industry restructuring?**

29 A. I have analyzed electricity market power issues in New York, New England,
30 and PJM. I have testified on market power in the New Hampshire restructuring
31 docket on behalf of the Consumer Advocate, and in the Vermont restructuring
32 docket on behalf of the Department of Public Service. I also testified on market
33 power in Consolidated Edison's restructuring case on behalf of the City of New
34 York, and in Pennsylvania on behalf of a coalition of intervenors.

1 I have conducted a simulation analysis of market power in New England on behalf
2 of the New England Conference of Public Utility Commissioners. I was retained
3 by the Maine Department of Attorney General in July of 1997 to work on a study
4 of market power issues raised by the prospect of retail competition in the electric
5 industry. My June 11, 1997 report was filed by NECPUC with its comments to
6 FERC on market power in New England. My testimony on market power in New
7 England was filed on January 23, 1998 in FERC Docket Nos. OA97-237-000 and
8 ER97-1079-000.

9 I have analyzed the market power implications of the proposed merger of
10 Allegheny Power System with Duquesne Light Company on behalf of the
11 Maryland Office of People's Counsel. This analysis was presented in my
12 testimony before the Maryland Public Service Commission (Case No. 8774) and in
13 my Affidavit filed in the corresponding FERC docket (No. EC97-46-000).

14 I have been invited to speak on market power issues by the National Association of
15 Regulatory Utility Commissioners, the New England Conference of Public Utility
16 Commissioners, the National Consumer Law Center, and the National Association
17 of State Utility Consumer Advocates.

18 **Q. Have testified previously before the Mississippi Public Service**
19 **Commission?**

20 A. Yes, I testified on behalf of the Attorney General's Office in MPSC Docket
21 No. 97-UA-496 on Mississippi Power Company's proposed combined cycle
22 generating capacity addition at Plant Daniel.

1 **2. Summary and Recommendations**

2 **Q. What is the purpose of your testimony in this case?**

3 A. I was retained by the Mississippi Attorney General’s Office to review and
4 comment on the filings by Entergy Mississippi, Inc. (EMI) and Mississippi Power
5 Company (MPC) in this proceeding. Most of my comments pertain to the market
6 power analyses presented by Mr. Rodney Frame (for MPC) and Dr. J. Stephen
7 Henderson (for EMI), but I will also touch briefly upon the reliability analyses
8 presented by Mr. George Loehr (for MPC) and Mr. George Bartlett (for EMI), as
9 well as the “Transco” proposal put forward by Mr. Steve Owens (for EMI).

10 **Q. Please summarize your conclusions.**

11 A. I find that the Companies’ analyses of market concentration and market
12 behavior are deficient in several respects. Specifically, the market concentration
13 analysis presented by Mr. Frame for MPC: (1) inappropriately treats MPC retail
14 contract and wholesale load, (2) inappropriately pretends that affiliated companies
15 are separated, (3) inappropriately treats supply delivered over the interties.
16 Nonetheless, Mr. Frame presents results with various combinations of the
17 treatment of these items. His result for the case which has, in my opinion, the most
18 reasonable assumptions shows an HHI of 2400, indicating a highly concentrated
19 market.

20 Dr. Henderson’s market concentration analysis for EMI, like Mr. Frame’s analysis,
21 treats the Mississippi companies as separate from their affiliates in other states.
22 Moreover, Dr. Henderson does not calculate measures of overall market
23 concentration such as the HHI, but rather limits his analysis to the market share of
24 EMI.

25 Neither analysis of market concentration addresses ancillary services markets.
26 This is a critical deficiency.

27 Both Companies also present behavioral analyses. I find these analyses to be
28 incomplete in that they do not analyze an appropriate range of market bidding
29 strategies. Also, the behavioral analyses both make the same implausible
30 assumption that the Mississippi Companies act independently from their affiliates.
31 The results also exhibit some odd characteristics, and it appears that they are
32 sensitive to assumptions for pricing “start up” and “no load” costs, indicating that
33 further exploration is appropriate.

34 In short, I find the market concentration and market behavior analyses to be

1 insufficient to support the conclusions reached by both companies regarding the
2 absence of significant market power.

3 **Q. What do you recommend?**

4 A. I recommend that the Commission: (1) encourage development of a strong and
5 independent regional ISO, (2) encourage divestiture to separate ownership and
6 control of regulated and deregulated assets, and (3) conduct further research into
7 the potential for market power and the appropriate policies for mitigation. These
8 recommendations are detailed in Section 7 at the conclusion of my testimony.

9 **Q. How is the rest of your testimony organized?**

10 A. In Section 3, I present an overview of horizontal and vertical market power
11 issues. In Section 4, I discuss the Companies' analyses of market concentration.
12 In Section 5, I discuss the Companies' analyses of market behavior. Section 6
13 includes a discussion of the role of the ISO in making the market work fairly and
14 efficiently. Finally, Section 7 outlines my recommendations.

1

3. Horizontal and Vertical Market Power

2

Q. What sort of problems can arise in the functioning of a market?

3

A. There are various types of market power problems that can keep a market from functioning competitively. These include problems of horizontal market power and vertical market power.

6

Q. What is horizontal market power?

7

A. Horizontal market power in electricity arises from horizontal concentration in generation. A key mechanism for exploiting horizontal market power is for a large firm to raise market prices by withholding capacity from the market, raising the market price and thereby increasing profits over competitive-market levels. The withholding can be "physical," such as declaring a unit to be out of service, or "economic," such as bidding some capacity at high prices that effectively remove it from the dispatch. Sophisticated strategies can be developed, in which bidding generation into the market is done in order to maximize profits -- with bids differing by hour and tailored to create and exploit transmission constraints. Market power can also take the form of "predatory pricing" and coordinated or collusive practices.

18

Q. How does market concentration influence price and how is it measured?

19

A. An oligopoly is a market structure in which a few firms dominate the supply of a commodity. Its occurrence is quite common. Economic theory tells us that in oligopolistic markets prices can be expected to fall between the extremes of a perfectly competitive market at the low end and an unregulated monopoly market at the high end. It is difficult to say with confidence how a particular market will behave within the two tractable extremes.

25

The two most common measures of market concentration are the Herfindahl index, and the "concentration ratio." The Herfindahl index, or HHI, is the sum of the squares of individual firms' market shares. The higher the index number the greater the level of concentration, and the more likely that market power will be a problem. For example, the Herfindahl index would be 1000 for an industry with 10 equal size firms. "Concentration ratios" are specified for a particular number of firms. For example, the three-firm concentration ratio (CR3) for that same industry would be 30 percent. No single metric can capture the complexities of the cost structures and relationships in a real market, but the Herfindahl and concentration ratio are both useful measures that can serve as starting points in analyses of market power.

1 **Q. How does concentration relate to price?**

2 A. Different oligopoly theories point to different measures of concentration as the
3 most appropriate for explaining how significantly prices might deviate from
4 marginal costs. Similarly, empirical explorations of concentration and price data in
5 various industries are inconclusive in establishing a generally preferred measure of
6 concentration for accurately predicting pricing behavior. At one theoretical
7 extreme, oligopoly firms may act competitively, or "quasi-competitively,"
8 resulting in reasonable market prices. At the other extreme, the firms may collude
9 perfectly, with results much like an unregulated monopoly.

10 Theoretical models may offer some insight as to the behavior of a market in
11 electricity generation. However, even for markets that have existed for years and
12 have been studied in detail, there are likely to be differences of opinion about how
13 the market has behaved. It is simply impossible to say with confidence how a
14 complex market will work before it exists, especially with many aspects of its
15 regulation and structure unresolved. The most we can do is to study the current
16 market structure and cost functions, and to identify areas of concern and potential
17 solutions, and, of course, to apply our experience and judgment.

18 As a general matter, with all other things constant, higher levels of concentration
19 will tend to produce higher market prices.

20 **Q. Are measures of concentration, such as the HHIs used in the market**
21 **power studies submitted by the Companies in this case, useful in analyzing**
22 **market power?**

23 A. Yes, certainly. Measures of concentration can be very useful in market power
24 analysis. They do not, however, measure the extent of market power directly.
25 Behavioral simulations can be useful in that they address the pricing and market
26 strategies directly. The Companies should be commended for preparing both types
27 of analyses of market power. I do, however, find some problems in the Companies
28 analyses, which I will discuss below.

29 **Q. What is vertical market power?**

30 A. Vertical integration provides opportunities for the following types of
31 anti-competitive behavior:

- 32 • favoring affiliates in purchasing decisions;
- 33 • providing affiliates with preferential service;

- 1 • timing and siting transmission upgrades in a way that favors affiliated
2 generators;
- 3 • cross-subsidizing unregulated affiliates; and
- 4 • providing affiliates with proprietary market data.

5 The Federal Energy Regulatory Commission has catalogued in detail the
6 propensity of vertically integrated utilities to abuse their market power (70
7 FERC 61,357 [1995, 65-85]). FERC's observations include the following:

8 In the past, transmission-owning utilities have
9 discriminated against others seeking transmission
10 access. Transmission-owning utilities have denied
11 access by outright refusals to deal... More often,
12 however, discrimination is likely to be manifested
13 more subtly and indirectly. One such way would be
14 [delaying negotiations until]...the window for the
15 customer's trade opportunity has closed. Another way
16 of frustrating access is to substantially change the
17 terms of negotiated agreements through protracted
18 delay including filings with regulatory agencies.
19 Another way...is to allow access but only on
20 noncomparable or unsupportable terms and conditions
21 that are inferior to the conditions [available to]...the
22 transmission owners themselves [such as refusing
23 network services, denying postage stamp rates,
24 denying priority service, insisting on long scheduling
25 lead times, denying flexibility in the use of firm
26 transmission capacity, providing inferior ancillary
27 services, requiring onerous deposits, and requiring
28 double payments in lieu of reciprocity]... Finally, an
29 additional way for transmission-owning utilities to
30 frustrate access and competition is by granting each
31 other superior rights and lower rates, in pools,
32 interconnection agreements and other protocols. (Pages
33 71-78; citations omitted)

34 **Q. Please comment on market power at the retail level.**

35 A. With direct-access competition, market power at retail may also be a problem.
36 Incumbent utilities have a considerable advantage in providing retail service as a

1 result of their current relationships with customers, detailed and valuable
2 information about customers, and in some cases contracts with customers. Barriers
3 to entry in the retail-services market may be particularly severe, given the working
4 relationships that have built up over time between customers and their incumbent
5 utilities.

6 While the studies submitted by the Companies in this case assume full retail access
7 in their service territories, the studies do not examine the issue of market
8 concentration in the provision of retail electricity. If nothing is done to remedy the
9 situation, in moving to competition the incumbent utilities could start off with 100
10 percent market share in their respective areas. It would be far better to start the
11 market off competitively by having the “default” service served under competitive
12 offers. Alternatively, some default customers could be assigned to competing
13 suppliers in order to create a less concentrated retail market.

14 **Q. What is the connection, if any, between horizontal and vertical market**
15 **power?**

16 A. Control of transmission can dictate the size of markets in which horizontal
17 market power can take place. Transmission constraints, even if temporary and
18 limited geographically, can present important opportunities for the exercise of
19 market power. One of the most important aspects of market power to address in
20 electricity restructuring is how to limit the ability of market participants to
21 inappropriately manipulate and exploit transmission constraints.

22 **Q. What do the Companies find with regard to load pockets and must-run**
23 **generation?**

24 A. The Companies’ filings in this case conclude that load pockets and must-run
25 generation are a relatively minor concern.

26 For example, EMI witness Mr. George Bartlett concludes that “Based on our
27 operational experience, we see no evidence of load pockets in the Entergy
28 Mississippi transmission system” (page 9). Similarly, EMI witness Dr. J. Stephen
29 Henderson notes the need for some units in the Jackson area to operate as must run
30 when EMI load exceeds 1800 MW, and concludes that “While such a level of
31 must-run generation is clearly important, it has not posed operating problems for
32 EMI” (page 20).

33 MPC witness Mr. Rodney Frame’s report on market power finds that the “MPC
34 area cannot properly be considered a load pocket” and that “[t]here is no subarea
35 of the MPC service territory that should be considered a load pocket, although the

1 transmission planners did identify limited must run situations involving just Plant
2 Watson” (page 48).

3 **Q. Do you agree with the Companies’ findings with regard to load pockets**
4 **and must-run generation?**

5 A. I have no reason to disagree with the specifics of the Companies’ conclusions
6 about the functioning of their systems. I would, however, point out that care
7 should be taken in extrapolating past experience under a regulated cost-based
8 structure to a market environment. Particularly with regard to the relationship
9 between transmission and generation, things may change in a market environment.
10 The amount of power than can flow over a particular transmission interface can
11 depend upon the specific pattern of loads and operating generators at different
12 locations. Taking a particular generator offline (or putting an additional generator
13 online) can create a transmission limit. The owner of the generator may then
14 benefit from market power deriving from the transmission constraint. This sort of
15 market power is very difficult to model, and nearly impossible to rule out.

16 **Q. Please comment on the use of models in analysis of market power.**

17 A. Simulation models can be useful in directly analyzing horizontal market power,
18 given the specific characteristics of a market such as the number of suppliers and
19 their production facilities and cost structure. While there are limitations to the
20 ability of computer models to predict actual market behavior, it can still be very
21 useful to apply models in understanding the market in particular cases, and to
22 examine the ability of firms in the market to profitably raise prices. If a simulation
23 model shows that it is not profitable for any individual firm to raise its prices
24 significantly above its marginal costs, that offers some comfort that the market will
25 be adequately competitive. If, on the other hand, simulations show that it is
26 profitable for individual large firms to increase prices significantly above marginal
27 costs, then that is cause for concern. In this case, models can be helpful toward
28 understanding the extent of the market power problem and in exploring the
29 effectiveness of various remedies.

30 **Q. Is demand elasticity helpful in reducing the potential for market power to**
31 **increase prices?**

32 A. Generally yes. MPC witness Frame is correct in pointing out that “customer
33 demand reductions in response to rising prices can provide a powerful deterrent to
34 the exercise of market power” (page 7). However, he is also correct that “Except
35 for applications such as space and water heating, it is generally conceded that there
36 are no close substitutes for electricity” (page 5). Moreover, demand elasticity in

1 electricity markets is quite low. That is, customers have little ability to respond to
2 price, particularly in the short run. Smaller customers are particularly helpless in
3 this regard. Residential customers have little information about real time
4 electricity market prices and almost no practical ability to cut back usage in
5 response to price spikes. While the Commission should seek to implement pricing
6 and load profiling policies that empower consumers to respond to electricity
7 prices, such response should not be assumed to be a significant deterrent to the
8 exercise of market power at this point in time.

1 **4. Market Concentration Calculations**

2 **Q. Please comment on the Companies' analyses of market concentration.**

3 A. EMI and MPC have both filed analyses of market concentration in this case. I
4 have not reviewed the assumptions and calculations in detail, and have not had
5 access to the computer model runs. I can, however, comment on several aspects of
6 the market concentration analyses. Specifically, I would like address: (1) the
7 exclusion of retail contract and wholesale load, (2) the treatment of affiliated
8 companies, (3) the identification of suppliers over interconnections, (4) the results,
9 and (5) the need to analyze other related markets. I will focus here upon Mr.
10 Frame's analysis for MPC, since he calculated HHIs. Some of my points are
11 pertinent to Dr. Henderson's analysis for EMI of market shares. Since Dr.
12 Henderson calculates only market shares, and not HHIs, his concentration results
13 do not speak to the overall competitiveness of the market – only to the EMI share
14 of the market (which is, in general and not surprisingly, quite small).

15 **Q. Please explain the issue with regard to the treatment of retail contract and**
16 **wholesale load.**

17 A. As I understand Mr. Frame's analysis, he has treated MPC's retail contract and
18 wholesale load in two different ways (page 58). In the first case, he assumes that
19 these are "in the market," and so included in the denominator of the market share
20 calculation, but that they are "competitively supplied," and so removed from the
21 numerator of the market share calculation. In effect, this treatment counts the
22 transactions in determining the overall size of the market, but does not count them
23 as supplied by any firm in the market. Mr. Frame's second treatment of these
24 transactions is to remove them from the market, excluding them from both the
25 numerator and the denominator of the HHI calculation. The second approach
26 yields a higher HHI than the first. In my view, the first approach is inconsistent
27 and inappropriate, as it keeps these sales as part of the market analyzed but
28 inaccurately treats them as if they are not supplied by MPC when in fact they are.

29 **Q. Please explain the issue of treatment of affiliated companies in the analysis**
30 **of market concentration?**

31 A. In analyzing market concentration in general, and in calculating HHIs in
32 particular, it is appropriate to combine affiliated companies. While the
33 Commission instructed the Companies to do market power studies that assume
34 retail competition in Mississippi only, this should not, in my view, have been
35 interpreted to mean that the Mississippi operating companies function as if they

1 have no corporate relationship with their affiliates. Indeed, both EMI and MPC
2 are tightly related to their sister companies. The systems are dispatched jointly,
3 planning is coordinated, and (most importantly for market power purposes) they
4 are financially related.

5 Mr. Frame's analysis includes both ways of treating affiliates. That is, he
6 calculates HHIs first with MPC and EMI separate from their affiliates and then
7 again with the affiliates combined.

8 **Q. Please explain the issue with regard to identification of suppliers over the**
9 **interconnections.**

10 A. Mr. Frame treats interconnections in two ways (page 59). First, he assumes
11 that this power is provided "in a competitive market" and so in computing market
12 shares he removes them from the numerator but not the denominator. This is
13 similar to the approach for treatment of MPC's retail contract and wholesale load,
14 noted above. Secondly, he makes the alternative assumption that the supplying
15 companies can be identified by a "high/low match" procedure. The first approach
16 is, in my view, inconsistent and inappropriate. If the power is a part of the supply
17 to Mississippi to be counted in the size of the market (the denominator) than it
18 should have specific suppliers identified and included in the reckoning of market
19 concentration. At the same time, Mr. Frame's "high/low match" procedure
20 appears somewhat arbitrary. Other analyses of market power have identified the
21 particular out-of-region suppliers specifically – by using the simulation model.
22 This can be done by raising the market price in the destination market and seeing
23 which generators outside of the region increase their production. It is not clear to
24 me why Mr. Frame did not follow that approach. In any event, at least according
25 to Mr. Frame's results, it appears that the different approaches to treating suppliers
26 of imports will not have a large effect upon the results.

27 **Q. Please explain the significance of Mr. Frame's HHI results.**

28 A. Mr. Frame's market concentration results show some very high levels of
29 concentration. Specifically, for the cases with proper treatment of MPC's retail
30 contract and wholesale load and with MPC and EMI combined with their affiliates,
31 the HHIs are about 2400 (see Mr. Frame's Table 2). This is much higher than the
32 1800 threshold above which the market is considered highly concentrated

33 **Q. On what basis do you conclude that an HHI of 2400 indicates a highly**
34 **concentrated market?**

35 A. I conclude that a market with an HHI of 2400 is highly concentrated on the

1 basis of work that I have done in other areas of the country analyzing market
2 power in electricity markets. Also, it is above the 1800 level that the Department
3 of Justice and the FERC use for evaluating market concentration. Specifically, the
4 Department of Justice's April 2, 1992 "Horizontal Merger Guidelines" are used by
5 FERC in evaluating market power impacts of mergers (see FERC's Policy
6 Statement Order No. 592, Docket No. RM96-6-000, issued December 18, 1996).
7 According to these guidelines, markets with an HHI index above 1800 are "highly
8 concentrated" and adverse effects are "presumed." In such highly concentrated
9 markets, there are significant concerns of market power, although whether and to
10 what extent there is a problem depends upon a variety of other factors, for
11 example, barriers to entry.

12 **Q. Would it be important to analyze other markets?**

13 A. Yes. Certainly before we can have any confidence that market power will not
14 present problems in electricity markets in and around Mississippi it will be
15 important to have analyses done of ancillary service markets. Mr. Frame has some
16 legitimate justification for his argument that there are so many uncertainties as to
17 make an analysis of ancillary services at this time rather speculative (pages 44 and
18 45). Nonetheless, recent experience in California with price jumps in markets for
19 ancillary services indicate that these markets are important and should not be
20 ignored. If the markets are functioning well, then the total cost of ancillary
21 services will be a small fraction of the total cost of electricity. It does not follow
22 from this that these markets are unimportant. They are essential to the reliable
23 operation of the system, and they can offer opportunities to exploit market power.

24 The results of the Companies' behavioral analyses, discussed below, indicate that
25 unit commitment assumptions can play an important role in determining market
26 price. This suggests to me that ancillary service markets such as spinning reserve
27 deserve serious attention in the context of market power analysis, as well as in
28 market monitoring and mitigation.

1 **5. Behavioral Analysis of Market Power**

2 **Q. Please comment on the Companies' behavioral analyses of market power.**

3 A. As with the Companies' analyses of market concentration, I have not had the
4 opportunity to review the detailed assumptions and computer model runs behind
5 the Companies' behavioral analyses. In this case, the unavailability of supporting
6 information presents even more of a problem, since there are thousands of input
7 data items in behavioral analyses, and the results of these particular analyses are
8 somewhat surprising. Nonetheless, I can make some general comments on the
9 Companies' behavioral analyses of market power. Specifically, I will comment
10 on: (1) the results, (2) the treatment of affiliated companies, (3) the restricted
11 nature of the bidding strategies analyzed, (4) the assumption of hypothetical
12 mitigation.

13 **Q. Is it important that a detailed independent review of the assumptions and**
14 **methodology of a behavioral analysis be conducted before relying upon the**
15 **results?**

16 A. Yes. Because the modeling is complex, both large and small errors are quite
17 possible. For example, in recent dockets in Pennsylvania and at the Federal
18 Energy Regulatory Commission (Pennsylvania Public Utilities Commission
19 Docket No. A-110150 F0015 and FERC Docket No. EC97-46 et al) a colleague of
20 Dr. Henderson's, Dr. Howard W. Pifer III (Chairman of Putnam, Hayes & Bartlett,
21 Inc.), submitted a bidding up analysis in support of a proposed merger. I identified
22 a critical error in Dr. Pifer's analysis which, when corrected, completely reversed
23 the results of the PHB bidding up analysis. That is, strategies of bidding up prices
24 by 5, 10, and 15 percent were actually profitable, contrary to the conclusion
25 presented in Dr. Pifer's direct testimony. I believe that the complexity of these
26 simulations is great enough that the models can function like a "black box," and
27 peculiar results can sometimes be accepted and presented as interesting
28 "counterintuitive" findings when actually they are just wrong.

29 **Q. What did the Companies' witnesses find from their behavioral analyses of**
30 **market power in this case?**

31 A. Mr. Frame and Dr. Henderson both present the results of simulation analyses
32 of market power behavior. Mr. Frame concludes that "MPC does not appear to
33 have the ability profitably to raise price in the deregulated supply regime of the
34 Staff's guidelines, i.e., it will not possess market power" (page 67). Similarly, Dr.
35 Henderson finds that "EMI would not be able to exercise market power in any of

1 the four representative periods...” (page 22).

2 **Q. Do you believe that the analyses presented by the Companies in this case**
3 **demonstrate that market power is not a problem for Mississippi electricity**
4 **markets?**

5 A. No. The analyses presented are a start toward understanding the markets, but
6 they suffer from several major deficiencies, and should certainly not be relied upon
7 to conclude that market power is not a problem in these markets.

8 **Q. Please describe the Companies’ simulation results in more detail.**

9 Both Companies present results that are not entirely simple. I will discuss Mr.
10 Frame’s results for MPC first.

11 Mr. Frame analyzes cases in which MPC bids above its marginal costs by 10, 20,
12 and 30 percent. Mr. Frame’s results for cases in which MPC bids above cost show
13 that in some instances the market price actually decreases. This counterintuitive
14 result is explained in a footnote on the computation of spot prices and unit
15 commitment:

16 The peak period spot price for any area is equal to the
17 incremental costs of the last unit required to meet
18 demand plus an allocation of start up and no load costs.
19 The commitment of units is different in the base and
20 increased bid price cases, so the marginal units are
21 likely to be different. If the marginal unit in the
22 increased bid price case has relatively low start up and
23 no load costs, or longer run times over which they
24 should be allocated, the spot price may actually appear
25 to be less when bid prices increase by relatively small
26 amounts. (page 67)

27 This suggests to me that the result is sensitive to assumptions about how market
28 participants will figure start up and no load costs into their pricing strategies. This
29 is quite uncertain, and is dependent in part upon the detailed design of the market
30 rules, including the ancillary services markets. I would think that under these
31 conditions some further exploration of the sensitivity of Mr. Frame’s results to
32 different assumptions would be warranted.

33 Also, I note that in at least one instance the vagaries of the market (or Mr. Frame’s
34 model) cause the market price effect to be greater than the amount by which MPC

1 bids up its own generation. This occurs in the December peak period result
2 presented in Mr. Frame's Table 21. It shows that when MPC increases its bid
3 price by 30 percent the market price increases by 35.9 percent. I find this to be a
4 puzzling and disturbing result that merits some explanation and analysis.

5 **Q. What about the results of Dr. Henderson's behavioral analysis of market**
6 **power?**

7 A. Dr. Henderson analyzes cases in which EMI bids above cost by 20, 40, 60, 80,
8 and 100 percent above marginal cost. He finds that the "withholding strategies"
9 increase EMI's net revenue, but that they do not cause market prices to increase
10 (page 23). He concludes that "improvement to the reported Net Operating
11 Revenue cannot be attributed to any exercise of market power because the price
12 increases are quite modest and cannot provide the additional revenue needed to
13 account for the improvement" (page 24). Dr. Henderson offers no further
14 explanation for this provocative conclusion, leaving it to the reader to speculate
15 about the underlying causes. I would be interested in further analysis in which the
16 model is used to examine the reasons for the reported result and the implications of
17 those reasons for market power. If it is profitable for EMI to bid far in excess of
18 its variable costs, would it be similarly profitable for other companies to do so as
19 well? What would be the combined effect on market prices?

20 **Q. How are the affiliates treated in the Companies' behavioral analyses, and**
21 **what is your view on this?**

22 A. Mr. Frame and Dr. Henderson both assumed in their analyses of bidding
23 strategies that only the Mississippi companies attempt to raise prices by bidding
24 above cost. This is, in my view, an inappropriate assumption. The affiliated
25 Companies can be expected to coordinate on bidding of generation and market
26 strategy. Acting as larger systems, Entergy and Southern will have much greater
27 ability to and incentive to control market prices for electricity. This should
28 certainly be studied before horizontal market power concerns are dismissed.

29 As I noted above, in the discussion of the concentration analyses, it does not make
30 sense to pretend that the Mississippi companies make strategic and pricing
31 decisions separately from their affiliates. Even if the objective is to analyze
32 competition to serve retail load in Mississippi only, the holding companies should
33 be treated as single entities for purposes of assessing market concentration and
34 likely market behavior.

35 **Q. What bidding strategies did the Companies analyze?**

1 A. Mr. Frame and Dr. Henderson both analyzed very simple bidding strategies.
2 They looked at simple bid multipliers in which the prices for the Companies'
3 generation would be raised by a constant percentage for every hour simulated.

4 **Q. Is this an adequate range of bidding strategies for analysis of market**
5 **power?**

6 A. No. The companies supplying generation to the market will be much smarter
7 than this. Sophisticated bidding strategies are possible and likely if they are
8 profitable and not precluded. For example, a supplier in the market could change
9 its bids on an hourly, monthly, or other basis in order to optimize its net revenues.
10 It would not be surprising to find that bids at marginal generating cost make sense
11 in some hours but bids well above generating cost make sense (i.e., maximize
12 profits) in other hours. Generating capacity can be withheld in particular time
13 periods, when it is profitable, and not in others. For example, in the December on
14 peak period in Mr. Frame's analysis where MPC can raise market prices by 35.9
15 percent (Table 21) one would expect this practice to be profitable.

16 There are certainly some creative bidding strategies that cannot now be anticipated
17 and will only become apparent in the workings of an actual market. It does not
18 follow, however, that only the most simplistic bidding strategies can be
19 anticipated. It is reasonable in conducting analysis of market behavior to examine
20 a fairly wide range of strategies that can reasonably be expected. The possibility
21 that a market participant might find it profitable to modify its bid adders in the
22 course of the year is certainly one that deserves serious consideration.

23 **Q. Are there other types of bidding behavior, beyond refinement of the**
24 **timing of bid adders, that should be analyzed?**

25 A. Yes. Mr. Frame suggests coordinated strategies:

26 The above discussion concerns individual sellers acting
27 on a unilateral basis to exercise horizontal market
28 power. However, sellers also may recognize that the
29 profitability of their bidding behavior depends on the
30 bidding behavior of competing suppliers. Even though
31 the sellers do not formally coordinate their bidding
32 strategies, they may still act in a parallel fashion,
33 especially if the relevant market is highly concentrated.
34 That is, whether a price increase by an individual seller
35 will prove profitable will depend in part on how other
36 sellers react to that price increase. If other suppliers

1 take advantage of the price increase to expand their
2 output significantly, that will tend to defeat the benefits
3 of the increase. On the other hand, if other suppliers
4 respond by raising their own bid prices or withholding
5 capacity, the price increase is more likely to stick and
6 be profitable for all. (page 18)

7 While it is difficult to predict how market participants will behave when
8 confronted with the actual costs, risks, and opportunities that the market presents,
9 it is certainly possible to explore some of the considerations suggested in Mr.
10 Frame's paragraph. An obvious scenario to test is one in which all suppliers
11 attempt to maximize their profits. This is, in fact, what one would reasonably
12 expect all market participants to do. The behavioral analyses filed by the
13 Companies *assume* that all market participants except one bid their resources at
14 marginal cost. This avoids the most obvious and interesting question: will it be
15 profitable for market participants to raise prices above cost in a world without
16 price restrictions?

17 **Q. Mr. Frame declines to analyze a market in which more than one supplier**
18 **attempts to maximize its profits, stating that the previous work on this topic**
19 **of which he is aware “is much more simplistic than would be required for a**
20 **proper analysis...” (page 68). Is this reasonable?**

21 A. No. I am not aware of the specific analyses that Mr. Frame is aware of. He
22 does, however, point out in a footnote that “That previous work involves either
23 duopolies or the simplifying assumption that all suppliers are equally sized” (page
24 68). My own work on this topic, looking at simultaneous multi-company
25 optimization in other markets (New England and New York) makes neither
26 objectionable simplification. I am sure that other economic consulting firms,
27 including Mr. Frame's, could develop models at least as sophisticated as Synapse's
28 “Electric Market Optimization Model.” The algorithm for multi-company profit
29 maximization can be implemented using standard mathematical optimization
30 software or, as in Synapse's model, through an iterative approach in which each
31 company adjusts its strategy to be optimal taking the other companies' strategies as
32 given. After several iterations a solution approximating the “Nash Equilibrium”
33 can be identified.

34 **Q. How does mitigation figure into analysis of market power?**

35 A. Normally, one would conduct some analysis of market power in the absence of
36 mitigation, and then examine particular mitigation measures in order to determine
37 whether and to what extent they might be effective. In Dr. Henderson's study, he

1 “assume[s] that any must-run circumstance identified by EMI would be addressed
2 through some form of contractual arrangement approved by regulators that would
3 prevent EMI from unduly increasing net operating revenue by charging a high
4 price during must-run conditions” (page 21). This hypothetical mitigation does not
5 presently exist. In a sense, Dr. Henderson is assuming away the potential problem
6 of interest. The need for this particular mitigation (of EMI’s must-run situations)
7 points to the need for an Independent System Operator with the resources and
8 authority to implement such mitigation.

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6. Independent System Operator

Q. What is the role of an Independent System Operator?

A. An Independent System Operator, or ISO, can play many important roles in making the market work fairly and efficiently. FERC identified 11 responsibilities or principles for ISOs in its Order 888. They cover the operation and control of the transmission system as well as the facilitation of the wholesale power market.

Q. What is your view of EMI’s proposal for a Transco in this case?

A. EMI proposes a “regional transmission company, regulated by the FERC under performance-based regulation” (page 3, Steve Owens’ submission in this case). Entergy would have an ownership interest in the Transco, and another organization would be created to monitor the marketplace (page 4). I see several problems with this proposal. First, I am very skeptical that an organization owned by Entergy could function impartially in this critical role. Even if it were possible that Entergy would “exercise no control over the operation and management decisions of Transco” (page 4) the perception that the market might be controlled by one of its largest participants could deter the enthusiasm of potential market entrants. It could also lead to ongoing questions, accusations, and investigations. Regulators would have to remain actively involved in reviewing detailed decisions, including the transmission system upgrades, measures taken to ensure reliability, and allocations of costs and resources.

Apparently EMI envisions that the Transco would obtain services from Entergy Services, Inc. (page 9). This would, I think, add to concerns about the Transco’s independence.

The “separate organization” to be created to “monitor the market and ensure non-discriminatory access” would, presumably, not be owned by Entergy. Its structure and governance are, in my view, critical issues. The Company’s proposal calls for this organization to “have the authority to report any problems or concerns directly to the FERC” (page 4). Similarly, MPC’s filing in this case recommends that a transitional market monitoring program would attempt to identify any problems, and call them to the attention of regulatory or antitrust authorities (page 14 of the Frame report). This reporting is entirely inadequate. First, antitrust agencies have very limited ability to respond to the sort of market power abuse that is likely, since it is perfectly legal. Indeed, a corporation has an obligation to its shareholders to maximize its profits through legally available means. Second, such reporting would be after the fact, at which point available remedies will be limited and unsatisfying.

1 **Q. Do you agree with Mr. Frame that the market monitoring function should**
2 **be temporary?**

3 A. No. The market monitoring function is essential, and should be a permanent
4 feature of the market. The specific form of monitoring may vary as the market
5 develops, but the basic function is essential.

6 **Q. What do you mean by “market monitoring and mitigation?”**

7 I believe that there should be an ISO, and that the ISO should have a group
8 responsible for market monitoring and mitigation of market power. The
9 monitoring function would include collection of data on generation, bids, costs,
10 and overall performance as well as specific capability to investigate instances in
11 which problems may arise. The mitigation function would include rules and
12 sanctions for addressing anti-competitive bidding practices, capacity withholding,
13 and other potential problems. The ISO should have standard procedures and a set
14 of standard penalties and remedies to impose, as well as latitude to modify
15 procedures as it sees fit. The ISO must be truly independent from the market
16 participants.

17 MPC witness George Loehr states that:

18 To prevent gaming of the system by unscrupulous
19 market participants, the SOs [system operators] must
20 develop detailed, specific rules. To be effective, the
21 SOs must also have the methods and authority to
22 verify, monitor and enforce these rules. (page 34).

23 I agree with Mr. Loehr on this point.

24 **Q. What is the appropriate size for an ISO?**

25 A. Mr. Loehr states that the Southern Company control area is “more than large
26 enough to function effectively” and that “it does not appear necessary or
27 advantageous for the Southern Company control area or either of the others
28 [Entergy and TVA] to become part of a larger Independent System Operator”
29 (page 4). I must point out that Mr. Loehr is addressing the question of ISO size
30 entirely from a reliability perspective. To the extent that this is the case, I have no
31 argument with his testimony on this point. However, from a market perspective, I
32 believe that the ISO should ideally be larger than any one of these three systems.

33 While these systems are comparable to or larger than ISOs such as New England,
34 New York, and PJM, it must be noted that the ownership and control of generating

1 resources within those three ISOs is much less concentrated. The Southern
2 Company and Entergy would enjoy a near monopoly on the ownership and control
3 of generation within their systems. Also, it is far from obvious that the separate
4 NE, NY, and PJM markets are economically desirable, particularly from a market
5 power perspective.

