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June 30, 2006

Hon. Vernon A. Williams
Secretary
Surface Transportation Board
1925 K Street, N.W.
Suite 700
Washington, DC 20423

Re: Major Issues in Rail Rate Cases, Ex Parte No. 657 (Sub-No. 1); Rebuttal
Comments of Arkansas Electric Cooperative Corporation

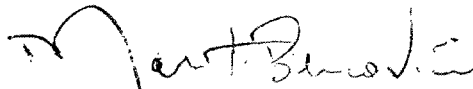
Dear Secretary Williams:

Submitted herewith, on behalf of the Arkansas Electric Cooperative Corporation
("AECC"), please find the Rebuttal Testimony of Michael A. Nelson.

A copy of this Rebuttal is being contemporaneously served on all parties of record in this
proceeding.

Your attention to the foregoing is appreciated.

Sincerely,



Martin W. Bercovici

cc: Parties of Record

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**BEFORE THE
SURFACE TRANSPORTATION BOARD**

STB EX PARTE NO. 657 (Sub-No. 1)

MAJOR ISSUES IN RAIL RATE CASES

**REBUTTAL TESTIMONY OF
MICHAEL A. NELSON**

**ON BEHALF OF
ARKANSAS ELECTRIC COOPERATIVE CORPORATION**

**131 North Street
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June 30, 2006

REBUTTAL TESTIMONY OF MICHAEL A. NELSON

1. Qualifications

My name is Michael A. Nelson. I am an independent transportation systems analyst with over 25 years of experience advising clients on rail transportation issues. My office is in Dalton, Massachusetts. My qualifications were described in detail in the written testimony I submitted on behalf of Arkansas Electric Cooperative Corporation (AECC) in the initial phase of this proceeding.

2. Scope of Testimony

I have been asked by AECC to respond to issues raised in the replies to AECC's opening comments submitted by other parties in this proceeding. Essentially all of the direct criticisms of AECC's opening comments are contained in the Reply Submission of Union Pacific Railroad Company ("UP Reply") and the Reply Comments of BNSF Railway Company ("BNSF Reply"), both dated May 31, 2006. Issues raised in these filings address the AECC proposals to:

- allocate fixed SARR costs on the basis of train-miles in the determination of the maximum rate;
- rely on incremental analysis to allocate the contribution from cross-over traffic;
- permit the SARR to realize productivity improvements based on a case-specific assessment of initial SARR productivity advantages and future productivity-enhancement opportunities; and,
- utilize simulation results to validate or modify URCS variable cost findings.

Specific issues raised by UP and BNSF in each of these areas are addressed below.

3. Train-Mile Allocation of Fixed SARR Costs

The UP and BNSF reply comments both take issue with the AECC proposal to allocate fixed SARR costs on the basis of train-miles in the determination of the maximum rate. Ostensibly relying on Ramsey pricing theory, both railroads object to any methodology (including those proposed by the Board) that would have the effect of constraining disproportionately the rates charged to the shippers with the most inelastic demand.

UP claims the AECC train-mile proposal "...is functionally equivalent to MCM", and "...shares with MCM, MMM and RAM a disregard of demand-based differential pricing." UP cites the opening statement of BNSF witness Willig to dispute the proposition that preservation of differential pricing on lower-rated traffic (i.e., within a constraint that imposes an upper bound on differential pricing) is consistent with Ramsey pricing.¹

BNSF differs somewhat from UP in that it characterizes the train-mile proposal as being equivalent to MMM rather than MCM.² However, BNSF's fundamental criticism is the same as UP's -- i.e., that the method and the "rate compression" it would produce are inconsistent with Ramsey pricing.

I have examined this claim carefully, and have concluded that it is unsound on both conceptual and computational grounds. First, I reviewed the "Verified Statement of Economists Supporting the Principles of Constrained Market Pricing", submitted to the

¹ UP Reply at 7-8.

² BNSF Reply at 13.

ICC in Ex Parte 347 (Sub-No. 1) Coal Rate Guidelines – Nationwide (June 1983).³ In that statement, 16 of the pre-eminent transportation economists of the time subscribed to a consensus description of proper SAC procedures.⁴

The statement discusses how Ramsey pricing is economically efficient, “...because the resulting rates do not bias the demand pattern that would be achieved under marginal cost pricing.” It further discusses how unconstrained rail rates can be expected to embody “the principles of Ramsey pricing”, and how “...pricing and resource allocation will be most efficient when the railroads are permitted to take the ratemaking initiative.”

Even if one accepts the proposition that differential pricing has desirable efficiency properties (at least when marginal cost pricing is infeasible), the issue in the SAC test is how to impose a constraint on rail revenues (i.e., to reflect SARR savings) that minimizes distortions of the demand pattern.⁵ To investigate this, I reviewed the mathematical properties of elasticities. To summarize briefly, an elasticity of demand with respect to price can be expressed as:

$$(1) \quad \text{elasticity}_{(\text{demand, price})} = (\text{percent change in demand})/(\text{percent change in price})$$

Based on this formula, the percent change in demand can be expressed as:

$$(2) \quad (\text{percent change in demand}) = \text{elasticity}_{(\text{demand, price})} \times (\text{percent change in price})$$

³ STB Ex Parte 657, Comments of BNSF Railway (May 1, 2006) (hereafter, “BNSF Opening Comments”), Exhibit RDW-2.

⁴ Among the many distinguished signatories, I would particularly like to note the endorsement provided by Professor Ann Friedlaender of M.I.T. I am honored to have benefitted as a student from the wisdom of her insights in transportation economics.

⁵ It is important to note that Ramsey pricing is not monopoly pricing, and does not justify the generation of any particular amount of contribution. Ramsey pricing principles call for reliance on demand elasticities to minimize efficiency distortions associated with deviations from marginal cost pricing needed to achieve prespecified contribution levels.

I then used (2) to investigate how most effectively to minimize any adverse efficiency impacts (i.e., changes in the demand pattern) caused by price reductions associated with SARR savings. According to the formula, the smallest change in demand will occur when the elasticity and the percent change in price are both minimized. All else equal, the elasticity is presumed (under the railroads' own theory) to be lowest on the traffic with the highest mark-ups. Similarly, the percent change in price associated with a given amount of SARR savings will be smallest when the price is highest. Put another way, if one starts with unconstrained differential pricing, the math indicates that the smallest percent change in demand will occur when any SARR savings are applied to the highest-priced, least-elastic traffic.

Even if one is seeking to preserve the "demand pattern" by equalizing the percentage changes in demand experienced by different traffic types, the properties of elasticities necessitate that the savings be distributed primarily or entirely to the highest-priced, least elastic traffic. For example, consider a SARR that handles 2 types of traffic: captive coal traffic that moves at a rate equal to 240 percent of its variable cost and has a price elasticity of -0.1, and bulk aggregates traffic that moves at a rate equal to 120 percent of its variable cost and has a price elasticity of -1.2. Assume further for simplicity that both types of traffic have equal variable costs and move in equal volumes.

For each type of traffic to experience an equal percentage change in volume, a revenue reduction would have to be allocated such that:

$$(3) \quad \text{elasticity}_{(\text{aggregates})} \times (\text{percent change in price})_{(\text{aggregates})} = \text{elasticity}_{(\text{coal})} \times (\text{percent change in price})_{(\text{coal})}$$

Given that the percent change in price is simply the price reduction divided by the current price, substitution yields:

$$(4) \quad \text{price reduction}_{(\text{aggregates})} / 1.2 \text{ VC} = (\text{elasticity}_{(\text{coal})} / \text{elasticity}_{(\text{aggregates})}) \times (\text{price reduction}_{(\text{coal})} / 2.4 \text{ VC});$$

and finally:

$$(5) \quad \text{price reduction}_{(\text{aggregates})} = (0.1/1.2) \times \text{price reduction}_{(\text{coal})} \times 0.5 \\ = 0.0417 \times \text{price reduction}_{(\text{coal})}$$

Even though the aggregates traffic accounts for one-half of the SARR traffic and one-third of the SARR revenue in this example, it could only receive about 4 percent of any SARR savings (while the coal would get the other 96 percent) if the “demand pattern” is to be preserved.

If the elasticity for the coal traffic were literally zero, an analogous computation would show that none of the savings could be passed to the aggregates traffic without altering the demand pattern. As discussed in my initial testimony in this proceeding, captive baseload coal-fired powerplants typically exhibit inelastic demand in the range between the variable cost floor and market prices.⁶ This is corroborated by information presented in BNSF’s opening comments,⁷ which demonstrates how 6 captive coal-fired plants are sufficiently far down the dispatch curve in the markets they serve that transportation rate decreases (and even some rate increases) would not alter their demand levels at all. In this situation, the math says that SARR savings must be distributed entirely to the inelastic, high-rated traffic to avoid undermining economic efficiency.

⁶ STB Ex Parte 657, Written Testimony of Michael A. Nelson, submitted on behalf of Arkansas Electric Cooperative Corporation (May 1, 2006) (hereafter “AECC Opening Comments”) at 8-9.

⁷ BNSF Opening Comments, Exhibit DWG-2.

Contrary to the railroad rhetoric, “rate compression” is fully consistent with the efficiency objectives underlying the use of Ramsey pricing principles in SAC. Indeed, the property that makes it acceptable from an efficiency perspective to charge high rates to customers with inelastic demand also necessitates that those customers be placed at the head of the line for relief when SARR savings are distributed.

When it is necessary and appropriate to constrain revenue levels, “rate compression” is consistent with minimization of adverse impacts on resource allocation. It is economically efficient and fully preserves the benefits of differential pricing on lower-rated traffic. If unconstrained differential pricing would produce excessive revenue, it is appropriate for the Board to establish upper limits on contribution through the train-mile method or other analogous approaches (including those advanced by the Board in the NPRM).

It should also be noted that in the proposed “train-mile” method - as well as in the Board’s proposals - the practice of truncating the distribution of fixed cost at the market rate for each type of traffic ensures that economic inefficiencies are not introduced by the allocation method itself. Indeed, this practice preserves the market rate structure up to the point where further deviations from marginal cost pricing are not needed in order to generate the required revenues. Contrary to the railroads’ characterizations, these features are fully consistent with Ramsey pricing principles.

BNSF’s Additional Criticisms – Beyond the Ramsey pricing/rate compression issue, BNSF also offers criticisms directed to the substance of the train-mile proposal.

BNSF characterizes the train-mile proposal as arbitrary⁸, and its witness Klick argues that train-miles aren't really homogenous.⁹

The train-mile approach was specifically developed to provide a direct measure of the consumption of SARR capacity by different traffic types. Its advantages over car-miles and ton-miles have been described in detail¹⁰ and are reinforced by the widespread use of train movement data to frame and address rail capacity issues all over the rail network. From Penn Station in New York¹¹ to the Alameda Corridor in California¹² to the PRB Joint Line¹³ (and even to Gotthard Pass in Switzerland¹⁴), rail capacity issues are most commonly addressed on the basis of train movement limitations.

The proposed train-mile measure reflects the fundamental role of train movements in determining capacity limits, and the fact that the different SARR moves may incur different on-line mileages. In comparison with possible measures based on tons, ton-miles, etc., train-miles provide a more precise indicator of SARR capacity consumption and correspond more closely to the way railroads view their own capacity issues. Far from being arbitrary, this measure reflects a causal relationship.

While Mr. Klick may be correct that train-miles are not perfectly homogenous, he does not indicate how this is any different from any of the cost drivers used in URCS or almost any other cost analysis procedure. He certainly has not shown any problems that would systematically bias the results, and has offered no suggestions for refinements to address the concerns he discusses.

⁸ BNSF Reply at 13.

⁹ BNSF Reply, Reply Verified Statement of John C. Klick at 15.

¹⁰ AECC Opening Comments at 5.

¹¹ See <http://www.railwayage.com/B/feature1.html>.

¹² See <http://onlinepubs.trb.org/onlinepubs/security/144/Goodwin.pdf>.

¹³ See http://www.uprr.com/customers/energy/sprb/updates_2005.shtml.

¹⁴ See <http://www.inboundlogistics.com/articles/global/global0106a.shtml>.

As is the case with URCS, the Board can leave open the possibility that meritorious refinements of the train-mile measure may be identified at some point in the future. However, in the meantime, the train-mile measure has a causal relationship with capacity-related costs and is the most appropriate measure currently available to the Board to distribute such costs within a given SARR traffic group. Moreover, no party has credibly contradicted the expectation that the proposed use of train-miles would create incentives that better align the interests of railroads and captive shippers in the productivity area,¹⁵ which is crucial to the long-term financial health of the rail system. The AECC train-mile proposal has thus withstood the scrutiny of the other parties, and may be accepted by the Board as a useful refinement of the SAC process.

4. Cross-Over Traffic

UP and BNSF both appear to take issue with AECC's proposal for allocating revenue on cross-over traffic.¹⁶ However, closer inspection reveals that the railroads' arguments are not supported by the authorities they cite.

BNSF cites Professor Kalt for the proposition that the AECC proposal is "...inconsistent with contestability principles."¹⁷ However, Professor Kalt only mentions the AECC proposal in a footnote of his testimony, wherein he simply reasserts his previous conclusion that the incumbent should keep the contribution.¹⁸ UP acknowledges that the AECC proposal has never before been advanced,¹⁹ so the allocation proposed by AECC was not addressed in the body of work from which Professor Kalt drew his

¹⁵ AECC Opening Comments at 7-8.

¹⁶ Relying on incremental analysis, this proposal would credit the SARR with the full contribution associated with the traffic it serves, subject to safeguards that ensure, among other things, the adequacy of revenues for off-SARR segments

¹⁷ BNSF Reply at 31.

¹⁸ BNSF Reply, Reply Verified Statement of Joseph P. Kalt at 29, footnote 59.

¹⁹ UP Reply at 7.

original conclusion. With the complete absence of any discussion regarding the content of the AECC proposal or the issues it raises, Professor Kalt appears to be saying “my mind is made up – don’t confuse me with facts.” His testimony cannot be relied upon to draw any conclusions regarding the merits of the AECC proposal.

UP characterizes the method as “empirically invalid”, and claims that it relies at least in part on a misplaced analogy to a carrier’s view of the economics associated with potential abandonments.²⁰ However, UP’s alternative analogy (i.e., to a “real-world carrier that is deciding whether to build a line from a plant to an interchange with another railroad”) supports the AECC proposal as fully as did the original analogy. If the line to the plant has not been built, the existing railroad (to which the new line would connect) would earn no contribution from the plant’s traffic. UP’s proposed revenue allocation would not result in the construction of the new line because if the new line is only going to receive its variable cost, it won’t generate the contribution needed to justify the required investment. This would still leave the existing railroad with no contribution from the plant’s traffic. However, the existing railroad would not then sit idle - it would simply make the investment itself and capture the incremental contribution attainable from the plant’s traffic.

In the context of the SAC test, contestability does not mean that the SARR will face cutthroat competition where the existing carrier does not, or that the existing carrier can ignore the causal link between its incremental revenues and the subject investment. It does mean that the SARR is entitled to take the same view as the existing carrier in

²⁰ UP Reply at 23-24.

evaluating investment in the subject facilities. UP's alternative analogy confirms that when the decision that results in the actual construction is made, the investment-worthiness of the project takes into account the full contribution of the traffic that uses the subject facilities (as was the case in the abandonment analogy).

UP cites the reply statement of Dr. Neels to support its "empirical" argument that the AECC proposal would not leave sufficient revenue for the incumbent carrier.²¹

Unlike Professor Kalt, Dr. Neels does actually discuss some of the details of the AECC proposal.²² Indeed, he presents a substantial discussion regarding the possibility that the proposal would deprive the residual incumbent of the revenue it needs to justify its investment in off-SARR segments used by the cross-over traffic. The problem is that Dr. Neels ignores the fact that this concern was anticipated and addressed in the initial presentation of the proposal. As originally described, the AECC proposal can be used by the incumbent carrier to ensure the sufficiency of revenue on off-SARR segments used by cross-over traffic. This process generates the adjustments needed to ensure that the results of a "limited SARR" analysis are equivalent to the results of a "full SARR" analysis.²³ Contrary to UP's characterization, the AECC proposal ensures that the incumbent carrier is fully protected from cross-subsidy.

Ultimately, the railroads do not raise any sustainable objections to the proposed methodology. Moreover, they do not address:

- its foundation in incremental analysis;
- the symmetry of the protection it provides for on-SARR and off-SARR segments;

²¹ UP Reply at 23.

²² UP Reply, Reply Verified Statement of Kevin Neels at 12-14.

²³ AECC Opening Comments at 15.

- the consistency of its results between limited SARR and full SARR analyses; the consistency of its results with the railroad position in the circumstance where the incumbent has viable non-SARR routings; and/or
- its computational simplicity.

In light of these considerations, and the consistency of the AECC proposal with a railroad's view of its own network and the economic value of constructing (or abandoning) portions thereof, the Board should adopt the AECC proposal.

5. SARR Productivity Improvements

BNSF opposes AECC's proposed treatment of SARR productivity improvements, apparently relying on criticism of the statement of Caves et al. presented in the reply testimony of Dr. Baily.²⁴ However, the discussion presented in Dr. Baily's testimony relates to a proposal that is based on RCAF-U and RCAF-A, and does not purport to criticize the AECC proposal. Indeed, a closer reading of Dr. Baily's testimony reveals that it corroborates fully the validity of the type of approach proposed by AECC:

"It is important to look at specific sources of potential productivity improvement and to determine whether they would or would not affect a SARR – there is no other valid approach to addressing the issue. It is true...that these sources of productivity may well be interconnected, but the sources can often be identified and their likelihood and timing evaluated. It is incumbent on those who argue that the SARR would achieve productivity growth in the future to identify the specific sources of productivity improvement, *especially in the early years of a SARR's existence.*"²⁵ (italics in original).

²⁴ BNSF Reply at 34, footnote 34. UP does not appear to take issue with AECC's proposal regarding future productivity improvements. UP's opening comments already left open the possibility that situation-specific analyses could show the need for productivity adjustments, even during the early years of SARR operation.

²⁵ BNSF Reply, Reply Verified Statement of Martin N. Baily at 5.

This testimony explicitly supports the central elements of the proposal advanced by AECC, which provided for "...the parties to submit limited evidence regarding (a) the magnitude of productivity improvements that can reasonably be anticipated during the forecast period for the types of heavy haul operations at issue, and (b) the degree to which the SARR already incorporates such improvements."²⁶ The AECC proposal further provided a suggested method for ensuring an appropriately low level of early-year productivity growth when the SARR has already incorporated productivity enhancements not yet implemented by the incumbent. It would be difficult to imagine a clearer or more concise statement of support for the principal components of the AECC proposal than that provided by Dr. Baily.²⁷

6. Use of Simulations in the Estimation of Variable Costs

UP and BNSF both criticize the proposed use of simulation results to validate or supplement the determination of URCS variable costs. They rely on the undisputed fact that such simulations are conducted in the context of the SARR analysis to summarily dismiss the possibility that they could yield valid, useable information.

There are several reasons why this dismissal is not warranted. First, the theoretical ability of a shipper to construct an "optimally efficient" SARR does not always create dramatic differences between the SARR and the defendant carrier's actual operations. Indeed, for reasons discussed previously,²⁸ the SARR frequently mimics a portion of the defendant railroad's physical plant.

²⁶ AECC Opening Comments at 18.

²⁷ In emphasizing the importance of situation-specific analysis, it should be noted that Dr. Baily's statement implicitly rebuts essentially all of the railroad proposals that would have the Board discount or disregard the productivity issue for a 5- or 10-year period.

²⁸ AECC Opening Comments at 17-18.

To the extent that they exist at all, productivity differences between a SARR and an incumbent carrier may stem from specific, known factors. For example, the SARR may employ locomotives that are known to be a given percent more fuel efficient than the locomotives used by the incumbent. All else equal, a fuel use estimate from a SARR simulation could be converted to a fuel use estimate for the incumbent through application of a simple adjustment. Depending upon the circumstances, the Board could conclude that such an estimate is more reliable than the fuel use implicit in the corresponding URCS computation. In general, reliable conversions between SARR and incumbent cost structures may often be feasible.

Comparisons between simulation results and actual operations may provide important additional insights relevant to variable cost determinations. For example:

- As discussed previously,²⁹ railroads may under some circumstances experience perverse economic incentives that tend to inflate variable costs for specific captive movements. Simulation can provide an important benchmark to which the efficiency of current operations can be compared;
- Cyclical volume conditions and/or the service meltdowns of the type that periodically have afflicted the major railroads could affect variable cost computations for a given period through their impacts on system velocity and cycle times. Simulation could help the Board in assessing “steady-state” conditions;
- Industry trends toward higher volume and congestion levels can reasonably be expected to affect at least some of the determinants of variable costs, such as crew

²⁹ AECC Opening Comments at 3-4.

- and locomotive resources. All else equal, it may become more commonplace for a SARR to be able to pay its own way and achieve cycle times and variable costs that are lower than the incumbent's due solely to congestion caused by the incumbent's traffic that is not incorporated in the SARR traffic group. In such circumstances, simulation may provide insights regarding the impacts of congestion and service levels on variable costs that would be useful to the Board;
- The trend towards higher volume and congestion is being accompanied by questions regarding the adequacy of industry investment in capacity resources. The Board should be particularly alert to the possibility that carrier under-investment in capacity resources over time will lead to deteriorating service, higher cycle times and higher variable costs (as described above). If unchecked, this would increase rates for captive shippers, and undermine incentives for sound investment in capacity resources. Simulation can help the Board assess relevant issues related to the incumbent carrier's capacity resources.

In general, Board acceptance of simulation evidence in the determination of variable costs would not obligate the Board to rule in any particular way, but it would provide a powerful tool for the Board to use in examining these types of issues. Especially if URCS adjustments are to be eliminated, the Board should encourage the development of alternative sources of information and validation.

7. Summary

In response to the NPRM, AECC presented a set of sound proposals for meaningful SAC reforms. While the railroads have criticized these proposals with rhetoric, they have not backed up their criticisms with substance.

As envisioned by the “dream team” of economists in 1983, SAC is supposed to extend the benefits of competition to captive shippers, and to constrain the exercise of railroad market power. Twenty-three years later, the evidence indicates that the implementation of SAC has fallen short of these goals. In addition to whatever factors may have contributed to the Board’s decision to initiate this proceeding, the recently-released GAO study findings show that the situation of captive shippers has materially worsened in comparison with shippers who benefit from competitive rail service. While competitively-served shippers benefit from innovation, productivity improvement and lower prices, captive shippers clearly have not.³⁰ Above and beyond the possible causes for this situation articulated by GAO, it is reasonable to believe that a substantial contributing factor has been shortcomings in the past applications of SAC made by the STB and ICC.

AECC’s proposals provide specific, demonstrable and defensible improvements that the Board can make to restore the SAC test in a manner that fulfills the promise it once held for protecting captive shippers. These proposals are uniformly consistent with economic theory, including the original foundations of the SAC test. They have withstood scrutiny and attempted criticism from the railroads, and offer numerous beneficial features. The hollow mantras of the railroads should not be permitted to take the place of sound theory and practice, or to obstruct meaningful SAC reforms.

³⁰ “Preliminary GAO Observations on Freight Rail Rates, Competition and Capacity Issues”, presented to United States Senate, Committee on Commerce, Science, and Transportation, Subcommittee on Surface Transportation and Merchant Marine (June 21, 2006).