BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

IN RE: INVESTIGATION INTO THE ESTABLISHMENT) **OF OPERATIONS SUPPORT SYSTEMS PERMANENT)** **PERFORMANCE MEASURES FOR INCUMBENT LOCAL)** **EXCHANGE TELECOMMUNICATIONS COMPANIES)**	**DOCKET NO. 000121-TP**

REBUTTAL TESTIMONY

OF

WILLIAM E. TAYLOR, Ph.D.

ON BEHALF OF

BELLSOUTH TELECOMMUNICATIONS, INC.

MARCH 21, 2001

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TABLE OF CONTENTS

Page

I. INTRODUCTION AND SUMMARY 1

II. ECONOMIC PERSPECTIVE ON DESIGN OF PERFORMANCE ASSESSMENT PLAN: GENERAL PRINCIPLES 7

III. OVERALL COMPARISON OF THE COMPETING PERFORMANCE PLANS 9

IV. EVALUATION OF SPECIFIC PROPOSALS BY THE ALEC COALITION 11

1. *There is no economic justification for measuring performance at the sub-measure level. 11*
2. *There is no economic justification for applying a statistical decision rule used to detect performance disparities to the purpose of setting remedies as well. 12*
3. *There is no economic justification for setting remedies and penalty payments in the manner proposed by the ALEC Coalition. 18*
4. *The cap on BellSouth's financial liability should not be procedural, but a percent of its net revenue from services sold in Florida 33*
5. *There should be no adjustments for market penetration or competitive entry volume ... 35*
6. *BellSouth's performance assessment plan should become effective no earlier than the date it receives authorization to offer interLATA services 39*

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1 ## I. INTRODUCTION AND SUMMARY

2 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND CURRENT**
3 **POSITION.**

4 A. My name is William E. Taylor. I am Senior Vice President of National Economic
5 Research Associates, Inc. ("NERA"), head of its Communications Practice, and head of its
6 Cambridge office located at One Main Street, Cambridge, Massachusetts 02142.

7 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL, PROFESSIONAL, AND BUSINESS**
8 **EXPERIENCE.**

9 A. I have been an economist for over twenty-five years. I earned a Bachelor of Arts degree
10 from Harvard College in 1968, a Master of Arts degree in Statistics from the University of
11 California at Berkeley in 1970, and a Ph.D. from Berkeley in 1974, specializing in
12 Industrial Organization and Econometrics. For the past twenty-five years, I have taught
13 and published research in the areas of microeconomics, theoretical and applied
14 econometrics, which is the study of statistical methods applied to economic data, and
15 telecommunications policy at academic and research institutions. Specifically, I have
16 taught at the Economics Departments of Cornell University, the Catholic University of

1 Louvain in Belgium, and the Massachusetts Institute of Technology. I have also conducted
2 research at Bell Laboratories and Bell Communications Research, Inc.

3 I have participated in telecommunications regulatory proceedings before several state
4 public service commissions, including the Florida Public Service Commission
5 ("Commission") in Docket Nos. 900633-TL, 920260-TL, 920385-TL, 980000-SP, 980696-
6 TP, 990750-TP, and 000075-TP. In addition, I have filed testimony before the Federal
7 Communications Commission ("FCC") and the Canadian Radio-television
8 Telecommunications Commission on matters concerning incentive regulation, price cap
9 regulation, productivity, access charges, local competition, interLATA competition,
10 interconnection and pricing for economic efficiency. Recently, I was chosen by the
11 Mexican Federal Telecommunications Commission and Telefonos de Mexico ("Telmex")
12 to arbitrate the renewal of the Telmex price cap plan in Mexico.

13 I have also testified on market power and antitrust issues in federal court. In recent
14 work years, I have studied—and testified on—the competitive effects of mergers among
15 major telecommunications firms and of vertical integration and interconnection of
16 telecommunications networks.

17 Finally, I have appeared as a telecommunications commentator on PBS Radio and on
18 The News Hour with Jim Lehrer. My curriculum vita is attached as Exhibit WET-1.

19 **Q. PLEASE DESCRIBE NERA, YOUR PLACE OF EMPLOYMENT.**

20 A. Founded in 1961, National Economic Research Associates or NERA is an internationally
21 known economic consulting firm. It specializes in devising economic solutions to

1 problems involving competition, regulation, finance, and public policy. Currently, NERA
2 has more than 275 professionals (mostly highly experienced and credentialed economists)
3 with 10 offices in the U.S. and overseas offices in Europe (London and Madrid) and
4 Sydney, Australia. In addition, NERA has on staff several internationally renowned
5 academic economists as Special Consultants who provide their professional expertise and
6 testimony when called upon.

7 The Communications Practice, of which I am the head, is a major part of NERA. For
8 over 30 years, it has advised a large number of communications firms both within and
9 outside the U.S. Those include several of the regional Bell companies and their
10 subsidiaries, independent telephone companies, cable companies, and telephone operations
11 abroad (e.g., Canada, Mexico, Europe, Japan and East Asia, Australia, and South
12 America). In addition, this practice has supported a large number of legal firms and the
13 clients they represent, and routinely provided testimony or other input to governmental
14 entities like the FCC, the Department of Justice, the U.S. Congress, several state regulatory
15 commissions, foreign regulatory commissions, and courts of law. Other clients include
16 industry forums like the Unites States Telephone Association.

17 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

18 A. I have been asked by BellSouth Telecommunications, Inc. ("BellSouth")—an incumbent
19 local exchange carrier ("ILEC")—to address economic issues raised in this proceeding to
20 determine a performance assessment plan ("PAP") for BellSouth. Testimony has been
21 filed thus far by BellSouth in support of its Self-Effectuating Enforcement Mechanisms

1 ("SEEM") plan, by a coalition of alternative local exchange carriers ("ALEC Coalition") in
2 support of its Performance Incentive Plan ("PIP") Version 2.0, and Paul W. Stallcup, a
3 witness for the Florida Public Service Commission Staff ("Staff") who has provided a
4 "strawman" proposal for a PAP. Specifically, I respond to testimony from witnesses
5 Cheryl Bursh and Robert M. Bell (on behalf of the ALEC Coalition) and George S. Ford
6 (on behalf of Z-Tel Communications, Inc.).

7 **Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

8 A. The Commission has an important opportunity to determine the course of future
9 competition for *all* (not just local exchange) services in Florida. By selecting a PAP for
10 BellSouth, it can set into motion the process by which BellSouth is eventually able to
11 compete as a provider of all local and long distance services, just as its present competitors
12 currently have the freedom to do.

13 The design of a PAP requires clear identification of the central goal: to provide a
14 balanced set of incentives that would (1) enable BellSouth to provide wholesale services to
15 ALECs on par with the services it provides to its own retail operations and (2) provide
16 appropriate remedies to ALECs who have been denied wholesale services at parity, not
17 windfall payments. The PAP that is most likely to achieve this goal is one based on
18 deterrence and automatic compliance, rather than contentious processes intended to lead to
19 payment of damages.

20 In addition to the Staff's strawman proposal intended to frame the debate in this
21 proceeding, BellSouth and the ALEC Coalition (with additional input from Z-Tel) have

1 submitted two competing PAP proposals for the Commission's consideration. Although
2 the proposed PAPs agree on some matters, they also differ in some significant respects.
3 First, the ALEC Coalition proposes to measure and remedy performance disparities at
4 the level of sub-measures (the most elemental performance metrics), while BellSouth
5 proposes to do so at the more aggregated transaction level.
6 Second, the ALEC Coalition proposes to apply the same statistical methodology that
7 is used to detect performance disparities to setting remedies as well. In contrast, while it
8 proposes an analogous statistical methodology for detecting disparities, BellSouth intends
9 to determine appropriate penalties for specific disparities based on business judgment
10 (subject to periodic review) rather than on arbitrary and mechanical mathematical formulas
11 unrelated to likely gains or losses.
12 Third, the ALEC Coalition proposes to set a much lower threshold within its
13 statistical methodology for detecting performance disparities that are also material in an
14 economic (not just statistical) sense. BellSouth's counter-proposal, which is more
15 appropriate for a transaction-level view of things, is to set that threshold of materiality
16 initially at a relatively higher level but make it subject to periodic review.
17 Fourth, in contrast to BellSouth's proposal to set a cap on its annual financial liability
18 as a percentage of its net revenue from services sold in Florida, the ALEC Coalition
19 supports a procedural cap which, in effect, amounts to no cap at all.
20 Finally, in line with the Staff's proposal, the ALEC Coalition proposes specific
21 adjustments to remedies when the volume of retail service provided by ALECs (relative) to
22 BellSouth is "small" or when the market share of ALECs is collectively "low" (between

1 zero and 50 percent). BellSouth disagrees that either adjustment is necessary or prudent.

2 My testimony addresses at length these five specific areas of disagreement,

3 particularly from an economic perspective. Specifically, it

4 1. Argues that performance measurement and payment of remedies at the transaction level
5 is more meaningful and less likely to create a source of windfall payments to either
6 individual ALECs or the state.

7 2. Explains the dangers of accepting a PAP in which a single statistical methodology (and
8 simple-minded and arbitrary mathematical functions of test statistics) is relied upon for
9 both detecting performance disparities and paying remedies. I argue further that any
10 system of remedies that is totally divorced from the likely economic gains or losses
11 from performance disparities can generate perverse incentives for ALECs and force
12 BellSouth to compromise its ability to utilize its resources efficiently in the service of
13 both retail and wholesale customers.

14 3. Explains the relevance of the materiality threshold, and how selection of different such
15 thresholds can change incentives for BellSouth and its competitors.

16 4. Argues for the need to reduce business risks by setting a cap on BellSouth's annual
17 financial liability, rather than leave that risk open and subject to manipulation by
18 ALECs.

19 5. Explains why proposed competitive entry volume and market penetration adjustments
20 are economically unjustified and could lead to undesirable strategic behavior by
21 ALECs.

22 6. Explains why any PAP ultimately approved by the Commission must go into effect only
23 when BellSouth receives interLATA long distance authorization in Florida, so that all
24 competitors are able to operate on an even footing.

25

1 **Q. HOW IS YOUR TESTIMONY ORGANIZED?**

2 A. My testimony begins with the economic perspective on the design of a PAP for BellSouth
3 in Florida and, against this backdrop, evaluates the two competing PAP proposals (one
4 each from BellSouth and the ALEC Coalition). Subsequently, my testimony explores in
5 greater depth some specific proposals made by the ALEC Coalition in this regard.

6 II. ECONOMIC PERSPECTIVE ON DESIGN OF PERFORMANCE ASSESSMENT 7 PLAN: GENERAL PRINCIPLES

8 **Q. AS A GENERAL MATTER, WHAT FUNDAMENTAL ECONOMIC PRINCIPLE**
9 **SHOULD GUIDE THE DESIGN OF A PERFORMANCE ASSESSMENT PLAN?**

10 A. The purpose of a PAP should be to induce BellSouth to deliver wholesale service of the
11 desired quality to its competitors, the ALECs. For this, it should provide remedies to
12 ALECs denied wholesale service of the desired quality by BellSouth. However, such a
13 system of remedies should neither compensate ALECs excessively and become a means of
14 their enrichment, nor fail to penalize BellSouth suitably for any economic benefit it derives
15 by failing to deliver service of the desired quality. The fundamental economic principle
16 described below is the basis for striking that balance in the design of a PAP.

17 Before stating that economic principle, it is important to understand what would
18 constitute a failure on BellSouth's part. A performance or service quality disparity would
19 occur in the following two circumstances:

20 1. The quality of a wholesale service provided to an ALEC falls short of that provided by
21 BellSouth to its own retail operations.

22

1 2. Where BellSouth does not use a wholesale service in its own retail operations, the
2 quality of the service provided to an ALEC falls short of a predetermined benchmark
3 level.

4 Whether BellSouth's non-compliance with service quality or performance standards is
5 inadvertent (e.g., due to system malfunctions, breakdowns within the sequence of tasks and
6 operations associated with wholesale services, or pure random variation) or a deliberate act
7 of discrimination (intended to diminish an ALEC's ability to compete in retail service
8 markets) should not be the central issue. Regardless of whether the disparity is a planned
9 or unplanned outcome, the net financial consequences are likely to be the same.[1] Rather,
10 instead of attempting to assign a motive to BellSouth for an observed performance
11 disparity, a well-designed PAP should focus squarely on distinguishing among
12 performance disparities that are of some economic consequence to ALECs and those that
13 are innocuous.

14 Accordingly, the fundamental economic principle for designing a PAP is that it should
15 prevent BellSouth from securing any undue economic value or competitive advantage by
16 violating wholesale service quality standards, either inadvertently or otherwise. The
17 optimal PAP would provide the right incentives to BellSouth and protect its competitors
18 without providing them a source of windfall payments. That is, the PAP's penalties would
19 provide the right amount of *deterrence* for acts of discrimination, favoritism, or other
20 unfair strategic acts. A PAP based on deterrence, rather than the payment of punitive
21 damages, would leave BellSouth no better off economically—and the aggrieved ALEC no

[1] In my testimony, I use the terms *discrimination*, *disparities*, and *non-compliance* interchangeably to refer to any proven failure to meet performance standards and benchmarks.

1 worse off—than before the performance disparity. Any departure from this principle, such
2 as by setting penalties unrelated to the economic value of the disparity, could encourage
3 either BellSouth or the ALEC, or both, to act in ways that compromise the PAP itself and
4 reduce economic efficiency and social welfare.

5 III. OVERALL COMPARISON OF THE COMPETING PERFORMANCE PLANS

6 **Q. BASED ON THE TESTIMONIES OF WITNESSES REPRESENTING**
7 **BELLSOUTH AND THE ALEC COALITION, WHAT DO THE TWO**
8 **PERFORMANCE ASSESSMENT PLANS PROPOSED BY THEM HAVE IN**
9 **COMMON?**

10 A. Both parties agree on the broad design issues for any such plan. In accordance with
11 precedents set by FCC rulings and opinions and similar proceedings in other states (most
12 notably, New York), both parties agree on a two-tiered structure of remedies for
13 BellSouth's failure to meet pre-specified service quality standards (parity and benchmarks)
14 when providing wholesale services to ALECs with which it competes at the retail level.
15 Similarly, both parties agree on the essentials of the statistical methodology to use for
16 detecting compliance with, or violation of, pre-specified performance standards.[2] Third,
17 both parties agree on several operational and implementation details, including (1)
18 identifying a set of performance metrics, (2) determining to whom penalty payments

[2] They do differ on the level of measurement at which to apply the methodology. BellSouth has proposed transaction-level measurement, while the ALEC Coalition prefers greater disaggregation and measurement at the level of sub-measures.

1 should be made, (3) and adopting self-effectuating remedies.

2 **Q. ARE THERE ISSUES OF DISAGREEMENT BETWEEN THE TWO PARTIES**
3 **THAT YOU ADDRESS IN YOUR TESTIMONY?**

4 A. Yes. While there are a number of issues on which the parties differ, my purpose in this
5 testimony is to address only the issues of economic significance. These include the
6 following proposals by the ALEC Coalition:

7 1. Select a comprehensive set of performance measurements based on sub-measures, rather
8 than transactions. Thus, the ALEC Coalition supports measurement at a more
9 disaggregated level than BellSouth. [Bursh, at 9; Ford, at 29-30]

10 2. Use a *statistical* decision rule to determine both whether a performance disparity has
11 occurred *and* the size of the penalty if disparity is proved. While the test of
12 performance disparity requires comparing a z-statistic with a critical value, the penalty
13 is computed as a function of the ratio of that z-statistic and the critical value. An
14 escalating scale of penalty payments is based solely on that ratio. [Bursh, at 16-17 and
15 23-24]

16 3. Measure the severity of a performance disparity (and set the appropriate penalty) by
17 choosing a value of 0.25 for the *delta* parameter.[3] [Bursh, Exhibit CLB-1 at 10; Ford, at
18 30-31]

19 4. Impose a procedural cap on BellSouth's annual financial liability for proven
20 performance disparities in Florida. [Bursh, at 27-28; Ford, at 34-35]

21 5. Employ various adjustments, particularly if a transaction-based PAP is chosen, for
22 competitive entry volume and market penetration by ALECs. [Bursh, at 19-20 and 21-
23 25]

24 The rest of my testimony addresses each of these proposals.

[3] The role of the delta parameter is explained later in my testimony. Direct testimonies submitted by all parties in this proceeding have devoted some discussion to this parameter and how it should be chosen.

1 ## IV. EVALUATION OF SPECIFIC PROPOSALS BY THE ALEC COALITION

2 **1. There is no economic justification for measuring performance at the**
3 **sub-measure level.**

4 **Q. WHY IS IT APPROPRIATE, AS BELLSOUTH BELIEVES, TO TEST FOR AND**
5 **REMEDY PERFORMANCE DISPARITIES AT THE MORE AGGREGATED**
6 **TRANSACTION LEVEL, RATHER THAN AT THE MORE DISAGGREGATED**
7 **SUB-MEASURE LEVEL?**

8 A. Ultimately, the answer to this question depends on what a PAP is designed to achieve. If a
9 PAP's purpose is to hold BellSouth accountable for every little "failure" to provide a sub-
10 measure at the desired quality level, regardless of the larger consequences of that failure,
11 then the more disaggregated approach of the ALEC Coalition would appear to have merit.
12 Indeed, the manner in which the ALEC Coalition has structured its proposed remedies,
13 there is the potential for BellSouth to have to make very large remedy payments even with
14 relatively few ALEC transactions.[4] Instead, if—as I believe it should be—the PAP's
15 purpose is to ensure that BellSouth provides wholesale *services*, not just individual
16 *functionalities*, at parity so that ALECs can compete for customers and provide matching
17 services, then BellSouth's proposed more aggregated approach makes more economic
18 sense. Whether BellSouth falls short or exceeds the quality standard for each and every
19 sub-measure or functionality is less important than whether the wholesale services—which

[4] The ALEC Coalition proposes a maximum penalty of $25,000 for every "severe failure." [Bursh, at 16] Hypothetically, if BellSouth were to register "severe failure" on several sub-measures, then it could find its remedy payments balloon quickly even when those sub-measures make up only a handful of actual ALEC transactions. If enrichment of the ALECs at BellSouth's expense is not the goal of a PAP—as it should surely

(continued...)

1 those sub-measures and functionalities collectively make up—meet quality standards set
2 for them. Only if a performance failure for a single sub-measure were likely to cause a
3 performance failure for the ALEC transaction as a whole, would it make sense to conduct
4 tests and pay remedies at the sub-measure level.

5 **2. There is no economic justification for applying a statistical decision rule**
6 **used to detect performance disparities to the purpose of setting remedies**
7 **as well.**

8 **Q. DO YOU ACCEPT THE STATISTICAL METHODOLOGY (BASED ON THE Z-**
9 **SCORE) PROPOSED BY BOTH PARTIES FOR DETECTING PERFORMANCE**
10 **DISPARITIES OR ACTS OF DISCRIMINATION?**

11 A. Yes. Both BellSouth and the ALEC Coalition agree that, because of inherent randomness,
12 it is preferable to identify violations of standards for performance measures with retail
13 analogs using a statistical decision rule. To this end, the ALEC Coalition has proposed a
14 version of the z-statistic called the "modified z-score" [Bursh, Exhibit CLB-1; Bell, at 4
15 and Exhibit RMB-1, Ford, at 10], while BellSouth's proposed version of that statistic is the
16 "truncated z-score" [Direct testimony of Edward Mulrow]. These statistics are fairly
17 similar and the differences between them are explained in the testimonies of Dr. Bell and
18 Dr. Mulrow.
19

(...continued)

not be—then the more measured approach to remedies proposed by BellSouth is appropriate.

1 **Q. IS THIS METHODOLOGY THE SAME AS USED IN CONVENTIONAL TESTS**
2 **OF STATISTICAL SIGNIFICANCE?**

3 A. No, this methodology differs from conventional tests in several important ways. The most
4 important difference is that, unlike a conventional test that fixes the probability of Type I
5 error but not that of Type II error, the proposed methodology first selects a critical value
6 for the test that equalizes or "balances" the two probabilities of error.[5] In a conventional
7 test, it is customary to first "fix" the probability of Type I error at an "acceptable" level,
8 e.g., 5 percent, and then conduct the test without making any attempt to control for the
9 probability of Type II error. The most useful technique available at that point to minimize
10 the probability of Type II error is to make the sample size as large as possible. A less
11 useful technique is to exploit the trade-off between the probabilities of the two types of
12 error and to tolerate a higher probability of Type I error in return for a lower probability of
13 Type II error. As far as I know, the proposed truncated z-statistic makes the first attempt to
14 conduct a test of statistical significance in a manner that equalizes (balances) the
15 probabilities of the two types of error. The motivation for this comes from the desire to
16 hold the risk of Type I error (which would favor the ALEC at BellSouth's expense) at
17 exactly the same level as the risk of Type II error (which would favor BellSouth at the
18 ALEC's expense).

[5] The probability of Type I error is the probability of rejecting a null hypothesis that is true (roughly, the return of a "guilty" verdict when, in fact, the accused is innocent), and the probability of Type II error is the probability of failing to reject a false null hypothesis (roughly, the return of a "not guilty" verdict when, in fact, the accused is not innocent). In this context, Type I error favors an ALEC but punishes BellSouth in error, while Type II error favors BellSouth and denies an ALEC just compensation in error.

1 The second difference is that the proposed test of statistical significance also builds in
2 the added element of materiality. It does so by requiring that the disparity not only be
3 statistically significant but also exceed a certain predetermined level to be considered
4 material.[6] In effect, this makes the statistical test a joint test of statistical significance and
5 materiality. For example, suppose the average response time for a certain function
6 provided to an ALEC is x minutes while it is y minutes when BellSouth provides that
7 function to its own retail operations. Now, suppose that y is less than x, i.e., there is at
8 least *prima facie* evidence of a performance disparity favoring BellSouth's retail operations
9 at the ALEC's expense. The purpose of the statistical test using the truncated z-statistic
10 would then be two-fold:

11 1. Determine whether the difference $y - x$ is *statistically* significant, i.e., whether that
12 difference is genuine in the sense that it may be expected to happen overwhelmingly
13 often in repeated trials (say, 95 times out of 100) or is simply a random and infrequent
14 event.
15 2. Determine whether the difference $y - x$ is *material*, i.e., whether that difference is large
16 enough to have real or significant financial consequences for both BellSouth (which
17 gains) and the ALEC (which loses).

18 To accomplish the latter, BellSouth proposes that y and x be separated by a pre-set
19 amount before that difference is considered material. The separation amount in question is
20 a parameter *delta* multiplied by the standard deviation of response times when BellSouth

[6] This introduction of materiality necessarily comes about because Type I and Type II error rates must be balanced for a *particular* deviation from the null hypothesis of non-discrimination (i.e., no performance disparity). If the alternative hypothesis is far from the null (corresponding to a high degree of disparity or discrimination), the corresponding balanced Type I and II error rates will be small. If the alternative hypothesis is close to the null (corresponding to a small amount of disparity or discrimination), the associated balanced Type I and II error rates will be large. Materiality must be used to determine the degree of discrimination or performance disparity at which it is appropriate to balance Type I and II error probabilities.

1 serves its own retail operations.[7]

2 Finally, a statistical test based on the truncated z-statistic differs by having a built-in
3 asymmetry that is not present in a test based on the conventional z-statistic. To understand
4 this point, refer again to the example above of response times on a specified function when
5 BellSouth serves an ALEC as opposed to when it serves its own retail operations. There
6 are likely to be occasions when the quality of service BellSouth provides the ALEC
7 exceeds the quality it provides its own retail operations. Conversely, there are likely to be
8 other occasions when just the opposite is true. The *average* performance by BellSouth in
9 this regard would ordinarily account for both better-than-expected performance as well as
10 worse-than-expected performance. However, BellSouth's proposed truncated z-statistic is
11 asymmetric in that it only considers worse-than-expected performance; all instances of
12 better-than-expected performance are, in essence, set to zero. The final outcome is a
13 measure of performance disparity whose severity depends on the size of each individual
14 worse-than-expected performance. In effect, this type of truncated accounting of
15 BellSouth's performance gives it no credit for delivering better-than-expected performance
16 but holds it accountable for all instances of worse-than-expected performance. In contrast,
17 a statistical test using the conventional z-statistic—which neither party has proposed to use

[7] In conventional tests of statistical significance, materiality is not a factor. Therefore, a parameter like delta is not needed in such tests. But, in tests employing the truncated z-score and a balancing critical value, delta becomes an important choice, one (as I explain later) to be made with a judicious blend of economic, business, and statistical judgment. The testimonies (and attachments thereto) of Dr. Mulrow, Dr. Bell, Dr. Ford, and Ms. Bursh all explain how the choice of delta affects the statistical tests, thus making it unnecessary for me to dwell any further on that matter.

1 here—would account for both types of performance.[8]

2 **Q. SHOULD A STATISTICAL DECISION RULE BE EMPLOYED FOR BOTH**
3 **DETECTING PERFORMANCE VIOLATIONS *AND* DETERMINING THE**
4 **SEVERITY OF THOSE VIOLATIONS FOR THE PURPOSES OF SETTING**
5 **REMEDIES?**

6 A. No. A statistical decision rule may only be used for the first purpose, i.e., to *detect*
7 performance disparities that are material in some sense. It may not be used for determining
8 the severity of those violations because the z-score and similar test statistics are designed
9 only to indicate whether a particular statistical hypothesis is true or false, not how true or
10 how false or what the economic significance of a given deviation from the null hypothesis
11 might be. In other words, a statistical decision rule like the z-score can only provide an
12 absolute diagnosis, not a relative one and, therefore, may not be used for setting remedies.
13 As I explain below, the setting of remedies should depend on both the type and the severity
14 of the performance disparity.

15 **Q. CAN YOU EXPLAIN WITH AN EXAMPLE THE LIMITATION OF THE Z-**

[8] The ALEC Coalition's modified z-statistic also considers only instances of worse-than-expected performance. The ALEC Coalition believes that giving BellSouth credit for better-than-expected performance would enable BellSouth to "game the system." [Bursh, Exhibit CLB-1, at 39-40] Apparently, BellSouth would do this by balancing worse-than-expected performance for some functions against better-than-expected performance for other functions and thus escaping penalties for performance disparities or discriminatory acts, regardless of the harm caused to the ALEC's ability to compete. In instances in which BellSouth provides better-than-expected service, the benefit to the ALEC may not be ephemeral as the ALEC Coalition seems to suggest. If such service helps an ALEC to win over a customer from BellSouth, then it may take several mis-steps by the ALEC for that customer to consider switching back to BellSouth or some other ALEC. It is important to remember the central underlying economic issue in this proceeding: the more meaningful service quality-based competition is for the customer, rather than for any individual service.

1 **SCORE FOR DETERMINING SEVERITY AND SETTING REMEDIES?**

2 A. Yes. Suppose a z-score is computed for the same performance metric in two successive
3 months, and in both months the outcome (an observed departure from parity) is found to be
4 statistically significant. Next, suppose the z-score in the second month is twice as distant
5 from a pre-specified critical value than that in the first month. Can it be inferred that the
6 economic significance of the observed departure from parity is twice as great in the second
7 month as in the first month, or that the penalty should be twice as large in the second
8 month? The answer, in general, is "no." The reason for that is that the z-score has several
9 ingredients (e.g., the mean performance when BellSouth serves itself, the mean
10 performance when BellSouth serves the ALEC, the standard deviations for both, and the
11 number of measurements made in each case). Changes in any of these ingredients can
12 influence the realized value of the z-score. Therefore, a z-score that is twice as distant
13 from a critical value than another could easily be so for reasons other than simply that one
14 of the performance means is twice as large as the other. For these reasons, it is improper to
15 use the same statistical decision rule that determines whether or not an outcome is
16 statistically significant to also compare the economic significance of different outcomes or
17 set remedies.

18 **Q. DOESN'T THE DELTA PARAMETER ALREADY FACTOR MATERIALITY OR**
19 **ECONOMIC SIGNIFICANCE INTO THE Z-SCORE? IF YES, SHOULDN'T THIS**
20 **THEN PERMIT SETTING REMEDIES BASED ON THAT Z-SCORE (OR SOME**
21 **FUNCTION OF IT)?**

1 A. Yes, the chosen value of delta reflects what level of observed disparity would be
2 considered material or economically significant. However, that is *not* sufficient, in and of
3 itself, to determine what penalty should be paid in any given instance. In other words, the
4 use of delta draws a dividing line between observed disparities that are material and those
5 that are not. That says nothing, however, about how severe a particular material
6 performance disparity is, or what level of penalty ought to apply to it. Once that
7 materiality threshold is crossed, the disparity can be thought of as generating economic
8 value for BellSouth that it would not otherwise receive.[9] However, whether that economic
9 value would be considered relatively small, moderate, or large depends entirely on the
10 function performed by BellSouth for the ALEC. Not all functions or performance metrics
11 have the same economic value; nor does that economic value change with time for all
12 functions or performance metrics. Therefore, the severity of a disparity is not simply a
13 matter of how long that disparity lasts. Moreover, the level of severity associated with
14 disparities for different performance metrics may itself vary. That is why BellSouth has
15 proposed a fee schedule for different performance metrics, for both Tier 1 and Tier 2
16 penalties. [Direct testimony of David A. Coon, Exhibit DAC-6]

17 **3. There is no economic justification for setting remedies and penalty**
18 **payments in the manner proposed by the ALEC Coalition.**

19 **Q. DO YOU AGREE WITH THE ALEC COALITION'S PROPOSAL [BURSH,**
20 **EXHIBIT CLB-1; FORD, AT 32] TO CALIBRATE THE SEVERITY OF**

[9] Correspondingly, there is an economic opportunity cost to the ALEC that receives disparate service from
(continued...)

1 **PERFORMANCE DISPARITIES BY USE OF THE Z-SCORE?**

2 A. No, for the reasons explained above, a statistical decision rule based on the z-score may not
3 be applied to the tasks of determining the severity of performance disparities and setting
4 remedies.[10] Besides representing an improper use of statistics, this proposed methodology
5 also attempts to equate the degree to which a z-score differs from a critical value—whether
6 as a mathematical difference (as in the ALEC Coalition's proposal) or as a ratio (as
7 proposed by Dr. Ford)—with the economic importance of an observed performance
8 disparity. By using labels such as "Basic Failure," "Intermediate Failure," and "Severe
9 Failure," the ALEC Coalition obviously wishes to convey a sense of how economically or
10 financially important an observed "failure" is. The best that the statistical decision rule
11 proposed in this proceeding can do, however, is only indicate whether an outcome is—
12 from a statistical standpoint only— a "success" (i.e., compliance) or a "material failure."
13 Such a rule may indicate that a particular failure crosses some pre-specified level of
14 materiality, but it *cannot per se* determine the relative severity of that failure, i.e., just how
15 material it really is. Ultimately, the question that must be answered is: what economic

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(...continued)

BellSouth.

[10] This fact has been recognized elsewhere as well. For example, Administrative Law Judges in Pennsylvania evaluating competing PAP proposals from Bell Atlantic-Pennsylvania and other parties including AT&T and MCI WorldCom, rejected the idea of using the z-score for both purposes. Before the Pennsylvania Public Utility Commission, *Joint Petition of Nextlink Pennsylvania, Inc., RCN Telecommunications Services of Pennsylvania, Inc., Hyperion Telecommunications, Inc., ATX Telecommunications, Focal Communications Corporation of Pennsylvania, Inc., CSTI, Inc., MCI Worldcom, E. Spire Communications, and AT&T Communications of Pennsylvania, Inc. for an Order Establishing a Formal Investigation of Performance Standards, Remedies and Operations Support Systems Testing for Bell Atlantic-Pennsylvania, Inc.*, Docket No. P-009991643, *Recommended Decision*, August 6, 1999, at 206.

1 value does BellSouth stand to gain from a specific performance disparity or act of
2 discrimination on a specific performance metric? The statistics-based rule proposed by the
3 ALEC Coalition and Dr. Ford does not answer this question.

4 **Q. DO YOU ACCEPT THE ALEC COALITION'S PROPOSAL OF AN ESCALTING**
5 **SCALE OF PENALTY PAYMENTS TO MATCH ITS CHOICE OF AN**
6 **ESCALATING SCALE OF PERFORMANCE DISPARITIES?**

7 A. No. The remedies or penalty payments proposed by the ALEC Coalition are arbitrary and
8 capricious. First, they are suggested without regard to specific characteristics of the
9 underlying performance metrics or transactions. That is, they are "one size fits all,"
10 suggested without any regard to what functions the different performance metrics perform
11 or whether they contribute equally to an ALEC's ability to provide service or compete.
12 For example, suppose that the "parity gap" (expressed either as a difference between the z-
13 score and the balancing critical value, or with the former as a percentage of the latter) is the
14 *same* for two different performance metrics. Should we then conclude that the economic
15 value to BellSouth of the two performance disparities is *identical*? While the rules
16 proposed by the ALEC Coalition and Dr. Ford would imply that to be the case, such an
17 implication is clearly absurd. The parity gap simply cannot be compared in any
18 meaningful way across different performance metrics.

19 Second, the proposed penalty rules (e.g., the ALEC Coalition's quadratic penalty
20 function that even Dr. Ford gives only qualified approval) are clearly designed to produce
21 penalties that themselves escalate to match an escalating scale of performance disparities.

1 In its eagerness to generate that match, however, the ALEC Coalition has neglected to
2 explain why such a system of remedies makes economic sense. Does the economic value
3 to BellSouth of a performance disparity in its favor change in the manner implied by the
4 mathematical rules proposed by the ALEC Coalition? If the purpose of a well-designed,
5 deterrence-focused PAP is to provide incentives to BellSouth to meet pre-set performance
6 standards, then why is the proposed set of penalty rules the right way to go about
7 dissuading BellSouth from providing service of lower quality to ALECs? Will the
8 penalties, as calculated according to the ALEC Coalition-proposed rules, exactly offset any
9 economic gain from discrimination or could they provide unwarranted revenues to the
10 ALECs themselves? The ALEC Coalition has not given us reasons to believe that its
11 proposed penalty rules can answer these questions. Ms. Bursh states [at 5] that
12 "[r]emedies must be set at a level high enough to incent BellSouth to meet its obligations
13 under the [1996 Telecommunications] Act to provide nondiscriminatory access to services
14 and facilities." Besides emphasizing that penalties ought to be "high enough," Ms. Bursh
15 provides no insight into how the remedies proposed by the ALEC Coalition would provide
16 BellSouth the incentives to which she refers.

17 **Q. IDEALLY, HOW SHOULD VARIOUS LEVELS OF PENALTY PAYMENTS BE**
18 **SET?**

19 A. Assuming that the public policy goal is to provide BellSouth a greater economic incentive
20 to comply with performance standards than not to comply, the size of the penalty payments
21 should vary directly and proportionally with the economic severity of the performance

1 disparity. Equating more serious performance disparities with more severe economic
2 consequences (i.e., greater economic value or competitive advantage for BellSouth and the
3 opposite for ALECs), the ideal system of penalties should be calibrated to the economic
4 seriousness of the performance disparities. However, just as a statistical decision rule is
5 not appropriate for creating such a system, it is also not always possible to determine
6 accurately the economic importance of every performance disparity. This is a problem
7 arising from the lack of the necessary information and experience, not from any infirmity
8 in the use of economic principles for setting penalties. Therefore, the estimates of the
9 economic value in question are initially based mostly on business judgment; subsequently,
10 those estimates are revised as warranted by experience with the effectiveness of penalties
11 in deterring performance disparities.

12 For this reason, BellSouth's multi-pronged approach is, in my opinion, both practical
13 and reasonable for the current environment. In this approach, the first step is to design the
14 statistical test for detecting performance disparities to catch only the disparities that meet at
15 least a minimum materiality threshold. On this point, there is general agreement among all
16 parties, except that the delta parameter—needed to implement the materiality threshold—is
17 still a matter of contention among those parties.

18 The second step is to determine what proportion of transactions (in serving ALECs) is
19 likely to have suffered from statistically significant and material performance disparities
20 and is, therefore, eligible for compensatory penalty payments. Among all the parties, only
21 BellSouth makes an attempt to determine that. The procedure for this is explained and

1 demonstrated in the direct testimonies of Dr. Mulrow and Mr. Coon.[11]

2 The final step is to multiply the number of affected transactions by a per-transaction
3 penalty or "fee" from a fee schedule. [Coon Direct Testimony, Exhibit DAC-6] Thus, the
4 remedy that applies in any given instance depends in part on an estimate of the affected
5 volume of transactions and in part on a penalty level chosen to reflect the likely economic
6 value to BellSouth of the performance disparity on a particular performance metric.

7 **Q. HOW IS BELLSOUTH'S PROPOSED PENALTY SYSTEM SUPERIOR TO THAT**
8 **PROPOSED BY THE ALEC COALITION?**

9 A. Unlike the ALEC Coalition, BellSouth does not—correctly, in my opinion—propose a set
10 of penalty payments that escalate according to a pre-specified mathematical function of the
11 statistical decision rule used to detect performance disparities. This avoids the false
12 correspondence between the statistical decision rule statistic and the economic significance
13 of—and penalties for—observed performance disparities. Moreover, BellSouth proposes
14 penalties that are specific to each performance metric and transaction. In contrast, the
15 ALEC Coalition's proposal is arbitrary, unrelated to performance metrics or transactions,
16 and unrelated to the economic importance of observed performance disparities.

17 **Q. ARE YOU SUGGESTING THAT BELLSOUTH'S OWN PROPOSED PENALTIES**
18 **ARE NOT ARBITRARY?**

19 A. On balance, yes. While BellSouth's plan may not be perfect, it falls much lower on any

[11] This procedure was accepted conditionally for a trial period of six months by the Staff of the Louisiana Public
(continued...)

1 scale of arbitrariness than does the ALEC Coalition's plan. Performance measurement and
2 PAPs are very new to the telecommunications industry. The need for such PAPs—at the
3 current comprehensive level of detail—only surfaced after the passage of the
4 Telecommunications Act of 1996. In particular, valuable experience and insight into the
5 design of such plans are being gained as the Regional Bell Operating Companies pursue
6 the process of securing Section 271 (interLATA long distance) authority. With few tried
7 and tested blueprints or grand designs to work from, and significant variations among the
8 plans that have been adopted in the handful of states to have received Section 271 authority
9 so far, carriers and regulators alike have explored the structure and purpose of PAPs from
10 various angles. While there is still no major or reliable empirical record on how effective
11 those PAPs are, it is possible to bring reasoned judgment to any assessment of the
12 proposed plans based on what *is* known so far.
13 The BellSouth plan proposes penalty payments based on (1) the type of underlying
14 transaction, (2) the estimated economic seriousness of the violation, and (3) the duration of
15 the violation. While there may be room for revision of the specific levels of the proposed
16 penalties—by transaction—over time as carriers and regulators gain more experience in
17 this regard, there is no denying that the ALEC Coalition's plan makes no attempt to match
18 the comprehensive detail that is in BellSouth's proposed plan. In contrast, the ALEC
19 Coalition's plan is arbitrary in two essential respects: (1) it relies on statistical, rather than

(...continued)

Service Commission during a similar proceeding in Louisiana.

1 on economic, criteria for determining the severity of a performance disparity, and (2) it
2 treats all transactions or performance metrics alike by failing to link the size of the penalty
3 to the likely economic harm resulting from a disparity.

4 **Q. PLEASE INDICATE WHERE OPPORTUNITIES WOULD ARISE FOR**
5 **REVISION WITH MORE EXPERIENCE.**

6 A. Two important areas in which revision may be needed—and would be possible—as the
7 chosen PAP is reviewed in the future include (1) the choice of delta and (2) the schedule of
8 fees or penalty payments. Because of a lack of historical precedents or analogs from other
9 areas of BellSouth's operations or regulatory obligations, current choices made with
10 respect to both must necessarily be tentative and subject to review. To this end, BellSouth
11 has already proposed to conditionally use a delta of 1.0 for Tier 1 remedies and 0.5 for Tier
12 2 remedies for a period of six months from the point a PAP is adopted in Florida. [Coon
13 Direct Testimony, at 33 and 41] Similarly, BellSouth has proposed two tables of penalty
14 payments (corresponding to Tier 1 and Tier 2 remedies) to be used to calculate actual
15 compensation for ALECs that receive disparate service. The proposed payments reflect
16 BellSouth's best business judgment at this time of the economic value, for each
17 performance metric, of disparities that last for one month or more. With experience of how
18 each type of performance disparity unduly contributes economic value to BellSouth, the
19 opportunity may arise to fine-tune those proposed penalties as well.
20

1 **Q. IN WHAT SENSE WOULD YOU CONSIDER BELLSOUTH'S CONDITIONAL**
2 **CHOICES OF DELTA FOR TIER 1 AND TIER 2 REMEDIES TO BE**
3 **REASONABLE?**

4 A. There is near-universal agreement that while delta is itself a statistical parameter, the value
5 that is chosen for it should be based on business knowledge and telephony considerations.
6 [Bell, at 11; Mulrow, at 19] Dr. Ford [at 19] believes—and I agree—that, in choosing
7 delta, we must also consider the reasonableness of the statistical implications of that
8 choice. This suggests that whatever delta is chosen for now must necessarily be an
9 educated guess, whose statistical and business implications need to be followed closely.

10 BellSouth's proposal for a delta of 1.0 for Tier 1 remedies and 0.5 for Tier 2 remedies
11 is countered by the ALEC Coalition by a proposal that delta not exceed 0.25. Whether or
12 not these proposed values make sense from a business (or telephony) standpoint is hard to
13 determine currently. Obviously, the lower the value of delta, the quicker the materiality
14 threshold will be reached and a performance disparity that crosses that threshold will
15 become a reason for the payment of penalties. Framing the debate over delta in this light,
16 Dr. Bell argues that BellSouth has a natural interest in asking for a "high" value while
17 ALECs have a natural interest in asking for a lower value.

18 When delta is large, the balancing occurs at a more extreme degree of observed
19 disparity. BellSouth wants a large delta because this means a smaller probability
20 of Type I error and hence, larger probability of Type II errors for any given
21 degree of true disparity. The ALECs want a value of delta that protects them
22 against any degree of disparity that would pose a material obstacle to
23 competition. [Bell, at 11-12]

24

1 Similarly, Dr. Ford offers the following explanation:

2 We must also recognize that BellSouth wants delta to be very large, because
3 large values of delta allow BellSouth to discriminate against the ALECs without
4 much consequence. Alternately, the ALECs will want delta to be small, because
5 the ALECs want non-discriminatory service. [Ford, at 19]

6 The problem with these explanations, as I see it, is threefold. First, they present the
7 issue as a matter of knowing with perfect certainty that BellSouth's sole purpose is to
8 exploit every opportunity to discriminate, including by selecting a "high" delta and,
9 therefore, the Commission's role is essentially one of playing policeman by siding with the
10 ALEC Coalition's demand for a "low" delta. If the Commission must play policeman in
11 this matter, then it must also recognize the opposite economic incentive that exists, i.e.,
12 that of ALECs receiving unwarranted penalty payments from BellSouth as delta is selected
13 low enough to make even small performance disparities appear material.

14 Second, the ALEC witnesses disregard the fact that what happens to the statistical test
15 of performance disparity depends at least as much on the sample size (i.e., the number of
16 ALEC transactions) as it does on the chosen value of delta. True, the balancing critical
17 value is higher as delta gets larger (implying that the materiality threshold becomes more
18 distant), and the implied Type I and Type II error rates get smaller. This is the effect to
19 which Dr. Bell refers as balancing occurring at "a more extreme degree of observed
20 disparity." However, for any *fixed* value of delta, the same phenomenon occurs as sample
21 size increases, i.e., more and more ALEC transactions are included in the test for disparity.
22 ALEC witnesses are concerned about this effect because the approach they advocate for
23 determining remedies—based on sub-measures rather than transactions—will naturally
24 cause sample size (here, the number of sub-measures recorded) to be quite large even for

1 ALECs of small or moderate size. Conversely, since BellSouth proposes to determine
2 remedies at the transaction—rather than the sub-measure—level, the sample size (here, the
3 number of transactions recorded) may naturally be quite small even for ALECs of
4 moderate or large size. Therefore, a "small" delta in these circumstances could cause even
5 fairly small observed disparities to be found material and subject to penalty payments, and
6 for Type I and Type II error rates to be quite high. Under these circumstances, it is
7 perfectly reasonable for BellSouth—within its proposed scheme of things—to opt for a
8 higher delta than would be acceptable to the ALEC Coalition.
9 Third, these explanations appear to ignore the salient characteristic of testing with
10 balancing—that Type I and Type II error probabilities are not only equalized (so neither
11 BellSouth nor the ALEC is better or worse off relative to each other) but they also go up
12 and down together. So, if a large delta, particularly with large samples, seems to lower the
13 Type I error rate almost to zero (which favors BellSouth), then so does it lower the Type II
14 error rate almost to zero (which favors ALECs).
15 In sum, as explained more fully by Dr. Mulrow, the choice of delta is more than
16 simply a matter of preventing BellSouth from discriminating. A number of factors besides
17 delta affects the quality of the statistical test of detection or the calculation of remedies.
18 The Commission should see the full picture in this regard, rather than be distracted by
19 alarmist claims about the damage that BellSouth could do ALECs if granted a "high" value
20 of delta. Instead, as accepted by the Louisiana Public Service Commission, this
21 Commission should accept conditionally the range for delta proposed by BellSouth, and
22 make suitable revisions following a review of results after a suitable period like six

1 months. From that standpoint, BellSouth's proposed course of action looks eminently
2 reasonable.

3 **Q. SHOULD DELTA PLAY A LEADING ROLE IN DETERMINING TIER 1 AND**
4 **TIER 2 REMEDIES?**

5 A. No. In the ALEC Coalition's proposed rules for setting remedies, delta plays a prominent
6 if somewhat hidden-from-view role. The choice of delta determines in part the balancing
7 critical value; in turn, that balancing critical value is an important part of the statistical
8 decision rule that, in either the ALEC Coalition's or Dr. Ford's formulation, determines the
9 level of penalties. For reasons explained above, that approach to setting remedies is
10 flawed. Instead, BellSouth relies more on its proposed fee schedule (which putatively
11 measures the economic value of different performance disparities) to determine the final
12 penalty payments. To the extent, BellSouth uses the parity gap (which, in itself, depends
13 on delta) to determine the number of transactions eligible for penalty payments, there is an
14 unavoidable connection to delta. However, that connection is nowhere nearly as pervasive
15 as it is in the ALEC Coalition's approach to setting remedies.

16 **Q. WHAT ARE THE LIKELY CONSEQUENCES OF SETTING REMEDIES, AS IN**
17 **THE ALEC COALITION'S PLAN, WITHOUT ANY ACCOUNTING OF THE**
18 **LIKELY ECONOMIC SIGNIFICANCE OF PERFORMANCE DISPARITIES?**

19 A. When a performance disparity is proved, the only way to establish the appropriate penalty
20 is to investigate the nature of the disparity itself, specifically the functionality or service
21 that suffered a lapse in performance or quality, and to determine the likely gain to the ILEC

1 (corresponding to the likely loss to the ALEC). As I stated earlier, initial estimates of that
2 gain or loss may need to be based on business judgment, with subsequent revisions being
3 made as experience with the effects of performance disparities accumulates. To use only a
4 blanket statistical decision rule for this purpose, e.g., by "how much" the quality of service
5 provided to the ALEC misses the set standard or benchmark, would jeopardize the
6 objective of measuring accurately the expected gain or loss from the disparity.
7 Furthermore, because a statistical decision rule is often influenced by factors unrelated to
8 either that expected gain or loss, and is beyond the control of one or the other party, it can
9 become subject to abuse when applied to the determination of the appropriate penalty.
10 One example of the kind of gaming that can arise when the penalty set for a
11 performance disparity is unrelated to the financial importance of that disparity is a class of
12 actions that are described in economics as *moral hazard.* Broadly defined, moral hazard is
13 a form of gaming by which one party to a plan or contract may act in ways—within the
14 framework of the existing plan—that allow it to gain an unanticipated competitive or
15 financial advantage at the expense of the other party. The PAP being formulated in this
16 proceeding is by design asymmetric, i.e., all penalties are to be paid *by* BellSouth and *to*
17 the ALECs. Therefore, without protections built into the PAP, there could be a strong
18 incentive for the ALECs to act in ways that raise the risk of default—and loss—to
19 BellSouth.

20 **Q. PLEASE INDICATE THE DIFFERENT WAYS THIS MORAL HAZARD-BASED**
21 **BEHAVIOR COULD MANIFEST ITSELF.**

1 A. The prospect—or promise—of payments in excess of amounts necessary for deterrence
2 could trigger moral hazard-based behavior in at least the following ways:[12]

3 1. *Reward lack of cooperation.* ALECs could have less incentive to report operational
4 problems to BellSouth in a timely manner. The longer a problem goes uncorrected, the
5 greater would be the compensation available.

6 2. *Maximize opportunities for unearned income to ALECs.* Reliance on arbitrary rules to
7 set penalties could result in a PAP setting disproportionately severe penalties for
8 relatively minor disparities. However, not every service failure would cause an ALEC
9 customer to permanently change suppliers. Also, the proposed penalties would take
10 effect regardless of whether the fault was BellSouth's, the ALEC's, the customer's, or
11 of no one in particular.

12 3. *Discourage investment by ALECs.* The opportunities for unearned income could
13 discourage the ALECs from investing in their own facilities, especially if such
14 investment were to cause those carriers to lose a lucrative source of income.

15 4. *Encourage inefficient entry.* Firms that are inefficient relative to BellSouth could
16 nevertheless see an opportunity to enter the market in the expectation of receiving
17 penalty payments from BellSouth. This would be precisely the same effect that
18 providing a subsidy would have in inducing entry by inefficient firms.

19 5. *Entrapment by ALEC.* ALECs could have an incentive to force BellSouth into
20 situations of non-compliance. For example, by choosing to provision hard-to-serve end-
21 users, presenting service requests that are calculated to cause bottlenecks and delays in
22 BellSouth's response, or basing service requests on deliberately underestimated service
23 requirements (with a subsequent upward revision in those requests that BellSouth could
24 not possibly fulfill quickly), those carriers could increase the risk of BellSouth's non-
25 compliance.

26 **Q. COULDN'T PROTECTIONS AGAINST SUCH GAMING BE BUILT INTO A**
27 **PERFORMANCE ASSESSMENT PLAN?**

28 A. Only partially. In fact, the strawman PAP attached as Exhibit PWS-1 to Mr. Stallcup's

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[12] The following are two examples of moral hazard:

1. A homeowner that insures his home against accidental fire damage may actually raise the risk of such damage by failing to take precautions or to maintain the pre-insurance level of vigilance against accidental fires.

2. A customer that purchases an appliance or automobile under a comprehensive warranty may actually raise the risk of needing repairs by failing to accord the level of care that would have been given without

(continued...)

1 testimony contains protections against some of these forms of moral hazard behavior (see
2 Section 4.7 regarding the Limitations of Liability).[13] However, in most instances, those
3 protections would not likely be automatic, i.e., moral hazard behavior would first have to
4 be proved through litigation or some contested proceeding. Also, those protections would
5 not suffice for all forms of moral hazard behavior. While the proposed protections are
6 definitely worthwhile, the best protection would be to remove pre-emptively the very
7 incentives that give rise to moral hazard behavior. Again, this means adopting a
8 deterrence-based PAP which separates the use of statistical decision rules for establishing
9 disparities from the use of economic or financial methodologies to determine the severity
10 of disparities and the penalties appropriate for them. The efficient PAP must minimize the
11 costs of proving alleged disparities and determining their appropriate penalties, and make
12 the detection and remedying of disparities voluntary, self-effectuating, and automatic.

13 The single best protection against gaming is to de-link the size of penalties for specific
14 performance disparities from the statistical methodology used to test for those disparities.
15 If the sole determinant of penalty payments by BellSouth is also the means by which
16 BellSouth is determined to be non-compliant, then the incentive—and, conceivably, the
17 opportunity—would exist for ALECs to engage in moral hazard behavior. Such behavior
18 would simultaneously make it more probable for BellSouth to be found non-compliant *and*

(...continued)

the warranty.

[13] In apparent recognition of the potential for gaming, Ms. Bursh [at 5] states: "Enforcement mechanisms must not produce remedies so large that an ALEC is more desirous of receiving discriminatory performance and collecting large remedies than receiving non-discriminatory performance."

1 liable for penalty payments unrelated to the likely economic significance of that non-
2 compliance.

3 **4. The cap on BellSouth's financial liability should not be procedural, but**
4 **a percent of its net revenue from services sold in Florida**

5 **Q. SHOULD BELLSOUTH'S FINANCIAL LIABILITY BE CAPPED AS A MATTER**
6 **OF ECONOMIC PRINCIPLE?**

7 A. Yes. A cap on BellSouth's financial liability will be an important signal to both BellSouth
8 and ALECs to not employ tactics to secure any undue or extra-market financial advantage
9 for themselves. In other words, a cap would prevent efforts by all parties to game the
10 system. Knowing exactly what its financial liability is would limit the uncertainty under
11 which BellSouth would have to operate. Without a cap on that liability, BellSouth would
12 have to prepare for compensation claims almost without limit. This could affect BellSouth
13 in at least one important way, namely, compromise BellSouth's ability to utilize its
14 resources efficiently in all possible uses, including serving retail customers. BellSouth's
15 resources to meet its various needs are not unlimited. While delivering retail services at
16 the desired level is both an obligation and a competitive necessity, BellSouth also has an
17 obligation to provide wholesale services of the desired ability to its competitors. An
18 excessive and unreasonable financial liability on one flank of its operations could clearly
19 jeopardize BellSouth's ability to meet its goals elsewhere.

20 **Q. SHOULD THE CAP ON ITS FINANCIAL LIABILITY BE PROCEDURAL OR**
21 **RELATED TO ITS MARKET PERFORMANCE?**

1 A. I endorse BellSouth's suggestion [Coon Direct Testimony, at 48] that its financial liability
2 be capped at 36 percent of its net revenue from all Florida operations. This is consistent
3 with the percentage and the type of cap accepted by the FCC in other states that have
4 recently received Section 271 authority.
5 The idea behind such a cap is straightforward. First, it reflects BellSouth's actual
6 scale of operations and its profitability. As BellSouth loses market share over time, and its
7 net revenue from services sold in Florida decreases, the proposed cap would allow a
8 commensurate scaling down of its liability. This would guard against the prospect that, as
9 its net revenue shrinks, any fixed amount of liability would become a larger and more
10 crippling fraction of that net revenue. Also, the ALEC Coalition's procedural cap does not
11 really cap BellSouth's financial liability with any degree of certainty. Thus, BellSouth's
12 liability could escalate without any limit, and the only recourse available to BellSouth
13 would be to persuade the Commission to impose a limit on its own. BellSouth's proposed
14 approach would also guard against that prospect. Absent the protection of BellSouth's
15 proposed cap, and sensing BellSouth's increased financial vulnerability in that
16 circumstance, some ALECs could choose to compete with BellSouth not by attempting to
17 do better in the marketplace but by maximizing their claims for compensation from
18 BellSouth. If the ALEC Coalition's proposed methodology for detecting and
19 compensating performance failures were adopted, ALECs would have a strong incentive to
20 compete in this perverse fashion.
21 Second, the Commission may find it easier to pick a fair percentage of BellSouth's net
22 revenue for setting its financial liability than to implement and periodically modify a

1 procedural cap amount. Once that percentage is picked, BellSouth's annual financial
2 liability would automatically adjust in proportion to its net revenue from services sold in
3 Florida. The Commission would spare itself the onerous—not to mention, contentious—
4 task of determining and revising the liability cap as market circumstances changed. As Mr.
5 Coon notes correctly [Direct Testimony at p. 46], a procedural cap would interfere with the
6 self-effectuating nature of BellSouth's proposed PAP.

7 **5. There should be no adjustments for market penetration or competitive**
8 **entry volume**

9 **Q. WHAT ARE THE MARKET PENETRATION ADJUSTMENT AND THE**
10 **COMPETITIVE ENTRY VOLUME ADJUSTMENT?**

11 A. Mr. Stallcup proposes [Exhibit PWS-1, Sections 5 and 6] two adjustments that would scale
12 up penalties for performance disparities when the ALECs affected by those disparities
13 provide services with generally low monthly volumes. Specifically, the Market
14 Penetration Adjustment, which applies only to Tier 2 remedies, increases penalties for
15 BellSouth when (1) the aggrieved ALECs receive sub-par quality for specified wholesale
16 services that are needed to provide new services to consumers and (2) the number of
17 monthly ALEC transactions for any of five specified performance metrics is 100 or less.
18 Similarly, the Competitive Entry Volume Adjustment, which applies only to Tier 1
19 remedies, increases penalties for BellSouth when (1) an aggrieved ALEC with a relatively
20 small market presence receives sub-par quality for wholesale services and (2) the number
21 of monthly transactions for any performance metric is 50 or fewer. As Mr. Stallcup
22 explains [at 17]:

1 Both of these adjustments deal with special situations where the number of
2 transactions are [sic] small. In a "transaction-based system" like the one
3 contained in my proposal, the normal remedy payment amounts in these cases
4 may not be sufficient to provide an effective incentive for BellSouth to provide
5 compliant service. These adjustments help eliminate this characteristic by
6 increasing the remedy payments in these special situations.

7 For Tier 1 remedies, the ALEC Coalition makes exactly the same argument (about the
8 lack of an incentive for BellSouth to provide non-discriminatory service) to support the
9 Competitive Entry Volume Adjustment. [Bursh, at 20] However, it argues, such an
10 adjustment would not be needed when the PAP operates at the sub-measure level, as
11 opposed to the transaction level in BellSouth's proposed PAP. For Tier 2 remedies, the
12 ALEC Coalition proposes a somewhat different form of a Market Penetration adjustment:
13 one which multiplies all levels of Tier 2 penalties by a factor *n* which takes on different
14 values (from 1 to 10) as ALEC's collective market share of access lines varies from
15 roughly half of the market to between zero and 5 percent. Since, that collective market
16 share is currently at 8.1 percent in Florida [Rebuttal testimony of Cynthia Cox, at 3] an *n* of
17 8 would apply if the PAP were implemented today and the ALEC Coalition's proposed
18 Market Penetration Adjustment were accepted. In other words, under this adjustment, Tier
19 2 penalties today would be several multiples higher than at a time in the future when the
20 market became evenly divided between BellSouth and the ALECs.[14] This approach, unlike

[14] The use of market share in isolation, as a predictor or estimate of the state of competition in a market, can be particularly misleading. The real issue is whether the incumbent firm, here BellSouth, has either the incentive or the ability to exercise market *power* (e.g., restrict competitive entry and/or manipulate market prices), not market share *per se*. If other indicators confirm that BellSouth is unable, in any way, to exercise that market power, then adjusting Tier 2 remedies for BellSouth's current market share is both unnecessary and distortive. Indeed, the whole point of Tier 1 remedies is to prevent BellSouth from exercising market power, such as by raising barriers to entry for potential competitors. If Tier 1 remedies are successful at accomplishing this, then scaling Tier 2 penalties by a market penetration factor would be overkill and economically inefficient. For Tier
(continued...)

1 Mr. Stallcup's, is not qualified in the least by focusing only on the wholesale services
2 needed by an ALEC to provide retail service to new consumers, or on the volume of
3 transactions on five key performance metrics.

4 **Q. ARE THESE ADJUSTMENTS JUSTIFIABLE FROM AN ECONOMIC**
5 **STANDPOINT?**

6 A. On balance, no. As proposed by Mr. Stallcup, the adjustments are not characterized as
7 temporary or specific to any stage of local exchange competition. As such, once
8 implemented, they may continue into the indefinite future as long as the applicable
9 conditions exist but regardless of what the overall market looks like. They should be
10 understood as being essentially "infant industry" protections because they apply in addition
11 to, rather than in place of, the usual Tier 1 and Tier 2 protections that would always apply.
12 Although the ALEC Coalition's proposal *would* tie the Market Penetration Adjustment to
13 the current stage of local exchange competition, the arbitrarily high multiple selected to
14 scale up Tier 2 penalty payments could actually become a lucrative source of income for
15 the state and a monumental drain on BellSouth's resources.

16 Although the motivation behind infant industry protections is usually commendable,

(...continued)

2 remedies, the real question is whether BellSouth's performance disparities are severe enough to cause damage to market competition. If competition is not harmed, i.e., market power is not exercised by BellSouth, then, even in a market in which ALECs have a relatively low combined market share, there can be no justification for scaling remedies according to a market penetration factor. It is important to keep in view that an observed "low" market penetration factor for ALECs could have other reasons as well, e.g., a strategic unwillingness on the part of ALECs (several of whom are large, well-financed inter-exchange carriers that face potential competitive losses from BellSouth's entry into the interLATA long distance market) to take stronger positions in the local exchange market, or to provide residential local exchange service when their rates—particularly in

(continued...)

1 the problem is that, by promoting a one-way stream of compensation (whether justified or
2 not), those protections can also create certain perverse incentives. The one that concerns
3 me the most is the incentive an ALEC may have to maintain a low number of transactions
4 in circumstances where (1) BellSouth would have a relatively high probability of
5 committing a performance disparity and (2) the additional compensation due to the ALEC
6 (over and above what it would receive anyway) becomes a greater payoff than what it
7 could earn in profit from consumer sales were it to receive wholesale services of the
8 desired quality from BellSouth. While no one is in a position to predict actual market
9 outcomes with a bearing on this issue, I am troubled that the possibility of such perverse
10 incentives would exist. Also, even if the market share-scaled Tier 2 penalties are paid to
11 the state and not to the ALECs themselves, there is no question that large payments would
12 greatly reduce BellSouth's profitability and be a considerable drain on its resources.
13 Although ALECs could benefit from BellSouth being financially weakened in this manner,
14 ironically, ALECs would have a greater incentive to "remain small," i.e., not reduce
15 BellSouth's market share too much. The more the *status quo* could be preserved, the more
16 BellSouth would be in danger of making very large penalty payments.
17 Returning to the theme that any PAP should be based on deterrence, the essential
18 point here is that compensation owed to ALECs for BellSouth's failure to comply with set
19 performance standards must be proportional to the financial or economic significance of

(...continued)

rural areas—are below the incremental cost to provide the service.

1 the non-compliance. Any adjustment that creates arbitrary and excessive penalty payments
2 also sows the seed for perverse behavior by the recipients of those payments. Unless it can
3 be conclusively demonstrated that the economic gain to BellSouth (and the economic loss
4 to an ALEC) is two or three times greater when the ALEC in question has low monthly
5 volumes than when it doesn't, the proposed adjustments (particularly the Competitive
6 Entry Volume Adjustment) cannot be consistent with a deterrence-based PAP.

7 **6. BellSouth's performance assessment plan should become effective no**
8 **earlier than the date it receives authorization to offer interLATA**
9 **services**

10 **Q. FROM AN ECONOMIC STANDPOINT, WHEN WOULD BE THE PROPER TIME**
11 **TO IMPLEMENT A PERFORMANCE ASSESSMENT PLAN FOR BELLSOUTH?**

12 A. The introduction of a PAP for BellSouth should be timed to coincide with the creation of
13 *all* the conditions needed for competition among *all* carriers and unfettered access by those
14 carriers to markets for *all* services. According to Section 271 of the Telecommunications
15 Act of 1996, this will happen when BellSouth receives authorization from the FCC to offer
16 interLATA long distance services. The purpose of the PAP should be to ensure that
17 BellSouth's competitors are not placed at an economic disadvantage because of
18 BellSouth's actions. It is appropriate, therefore, to require that any remaining restraints on
19 BellSouth's ability to compete for all services be removed at the same time. Otherwise, the
20 operation of the PAP alone would create an artificial competitive advantage for
21 BellSouth's competitors for at least the period of time that BellSouth is held out of the
22 interLATA long distance market, and that advantage—once created—may well endure

1 even after BellSouth is authorized entry into that market. For example, as penalty
2 payments get triggered, BellSouth could respond by shoring up the quality of wholesale
3 services provided to ALECs, perhaps even exceeding the quality that BellSouth provides to
4 its own retail operations. As a result, ALECs that are beneficiaries of this BellSouth
5 response could develop competitive retail services of a higher quality than BellSouth's and
6 win over customers—perhaps even permanently—on the strength of those superior
7 services.

8 Most customers of telecommunications services prefer stability in their choice of
9 suppliers, particularly when they seek all of their services from a single source. Once
10 customers have elected to receive all their services from its competitors, BellSouth could
11 find it extremely difficult to woo those customers back even after it received interLATA
12 long distance authorization and offered attractive prices and service packages. From an
13 economic standpoint, the preferred outcome would be to put customers in a position to
14 choose among suppliers only when all those suppliers are able to compete for all the
15 services that customers may desire.

16 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

17 A. Yes.

EXHIBIT WET-1

WILLIAM E. TAYLOR: CURRICULUM VITAE

BUSINESS ADDRESS

National Economic Research Associates, Inc.
One Main Street
Cambridge, Massachusetts 02142

(617) 621-2615
(617) 621-0336 (fax)
william.taylor@nera.com

Dr. Taylor received a B.A. magna cum laude in Economics from Harvard College, an M.A. in Statistics and a Ph.D. in Economics from the University of California at Berkeley. He has taught economics, statistics, and econometrics at Cornell and the Massachusetts Institute of Technology and was a post doctoral Research Fellow at the Center for Operations Research and Econometrics at the University of Louvain, Belgium.

At NERA, Dr. Taylor is a Senior Vice President, heads the Cambridge office and is Director of the Telecommunications Practice. He has worked primarily in the field of telecommunications economics on problems of state and federal regulatory reform, competition policy, terms and conditions for competitive parity in local competition, quantitative analysis of state and federal price cap and incentive regulation proposals, and antitrust problems in telecommunications markets. He has testified on telecommunications economics before numerous state regulatory authorities, the Federal Communications Commission, the Canadian Radio-television and Telecommunications Commission, federal and state congressional committees and courts. Recently, he was chosen by the Mexican Federal Telecommunications Commission and Telmex to arbitrate the renewal of the Telmex price cap plan in Mexico. Other recent work includes studies of the competitive effects of major mergers among telecommunications firms and analyses of vertical integration and interconnection of telecommunications networks. He has appeared as a telecommunications commentator on PBS Radio and on The News Hour with Jim Lehrer.

He has published extensively in the areas of telecommunications policy related to access and in theoretical and applied econometrics. His articles have appeared in numerous telecommunications industry publications as well as *Econometrica*, the *American Economic Review*, the International *Economic Review*, the *Journal of Econometrics*, *Econometric Reviews*, the *Antitrust Law Journal*, *The Review of Industrial Organization*, and *The*

Encyclopedia of Statistical Sciences. He has served as a referee for these journals (and others) and the National Science Foundation and has served as an Associate Editor of the *Journal of Econometrics*.

EDUCATION

UNIVERSITY OF CALIFORNIA, BERKELEY
Ph.D., Economics, 1974

UNIVERSITY OF CALIFORNIA, BERKELEY
M.A., Statistics, 1970

HARVARD COLLEGE
B.A., Economics, 1968
(Magna Cum Laude)

EMPLOYMENT

NATIONAL ECONOMIC RESEARCH ASSOCIATES, INC. (NERA)
1988- Senior Vice President, Office Head, Telecommunications Practice Director. Dr. Taylor has directed many studies applying economic and statistical reasoning to regulatory, antitrust and competitive issues in telecommunications markets. In the area of environmental regulation, he has studied statistical problems associated with measuring the level and rate of change of emissions.

BELL COMMUNICATIONS RESEARCH, INC. (Bellcore)
1983-1988 Division Manager, Economic Analysis, formerly Central Services Organization, formerly American Telephone and Telegraph Company. While at Bellcore, Dr. Taylor performed theoretical and quantitative research focusing on problems raised by the implementation of access charges. His work included design and implementation of demand response forecasting for interstate access demand, quantification of potential bypass liability, design of optimal nonlinear price schedules for access charges and theoretical and quantitative analysis of price cap regulation of access charges.

BELL TELEPHONE LABORATORIES
1975-1983 Member, Technical Staff, Economics Research Center. Performed basic research on theoretical and applied econometrics, focusing on small sample theory, panel data and simultaneous equations systems.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Fall 1977 Visiting Associate Professor, Department of Economics. Taught graduate courses in econometrics.

CENTER FOR OPERATIONS RESEARCH AND ECONOMETRICS
Université Catholique de Louvain, Belgium.
1974-1975 Research Associate. Performed post-doctoral research on finite sample econometric theory and on cost function estimation.

CORNELL UNIVERSITY
1972-1975 Assistant Professor, Department of Economics. (On leave 1974-1975.) Taught graduate and undergraduate courses on econometrics, microeconomic theory and principles.

MISCELLANEOUS

1985-1995 Associate Editor, *Journal of Econometrics*, North-Holland Publishing Company.
1990- Board of Directors, National Economic Research Associates, Inc.
1995- Board of Trustees, Treasurer, Episcopal Divinity School, Cambridge, Massachusetts.

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