

1 Q. HAS THE PROPRIETY OF THE CLEC BALANCING APPROACH BEEN
2 ADDRESSED IN ANY OTHER PROCEEDINGS?

3 A. Yes. As I mentioned earlier, KPMG Consulting is conducting statistical tests of
4 performance as part of its independent audit of OSS in Illinois and throughout the region.
5 It has consistently adopted the 5 percent Type I error rate used by Ameritech Illinois here,
6 and it has rejected the CLECs' proposed "balancing" of Type I and Type II errors. In so
7 doing, KPMG has explained that a single δ_j for all measures, as proposed by the CLECs,
8 would be "unjustified"¹¹ because the definition of a material disparity "is likely to differ
9 by product."¹²

10 Q. IN THESE PROCEEDINGS, HAS ANY STATE COMMISSION RULED ON THE
11 CLECS' BALANCING METHODOLOGY?

12 A. Yes. The state commissions of Michigan and Wisconsin (the only ones to have
13 addressed the issue so far) have all upheld the 5 percent Type I error rate, and rejected the
14 CLECs' balancing approach. An ALJ in Indiana and the Staff in Ohio have also chosen
15 the 5 percent Type I error rate over the CLECs' balancing approach.

16 B. Failure To Address Small Sample Sizes

17 Q. HOW DO THE TWO REMEDY PLANS DIFFER WITH RESPECT TO SMALL
18 SAMPLE SIZES?

19 A. Both plans employ a Z-test to assess parity where there are 30 or more wholesale
20 observations. But when the sample size is under 30, Ameritech Illinois' plan uses a well-

¹¹ KPMG Consulting, Assessment of the OH/IN Stats Proposal and WI Appeal March 21, 2001, p. 3. (Attachment D hereto).

¹² . *Id.*

1 known test, called a “permutation” test, which has specific benefits for small sample
2 tests. The CLEC proposal, however, still uses the modified Z-test.

3 **Q. IS THE CLEC PROPOSAL STATISTICALLY VALID?**

4 A. No. As I said earlier, the modified Z-test assumes that the distribution of the sample
5 means are close to normally distributed. This assumption may be valid for large samples
6 of data, but it is very unlikely to hold for the populations we are considering in small
7 sample sizes, such as those under 30.

8 **Q. WHAT IS THE EFFECT OF USING THE Z-TEST ON SMALL SAMPLE SIZES?**

9 A. It’s likely that the statistical tests would become biased and invalid. We would no longer
10 be able to rely on the statistical tests to determine the magnitude of the Type I or Type II
11 errors. The 95 percent confidence level tests would no longer produce results we could
12 be confident in at the 95 percent level, and the Type I –Type II balancing tests proposed
13 by the CLECs would no longer balance the Type I and Type II error rates even if the
14 measures of material difference, δ_j , ϵ_j and ϕ_j , could be agreed upon.

15 **Q. HOW PREVALENT IS THIS ISSUE?**

16 A. Small samples are very common in practice. In fact, it has been our experience that small
17 samples with less than 30 observations comprise two-thirds of the remedy tests currently
18 performed in Illinois. Therefore the bias created by using Z-tests on small samples would
19 be likely to impact most of the tests performed. This lack of statistical tests appropriate
20 for small samples is a significant omission in the CLEC plan.

1 **C. Missing Pieces**

2 **Q. WHAT IS THE NEXT DIFFERENCE BETWEEN THE PARTIES' REMEDY**
3 **PLANS?**

4 A. The next difference is one of practicality. Ameritech Illinois' remedy plan has been
5 implemented hundreds of times across multiple states. The plan description spells out the
6 calculations involved, and many of them have been captured on easy-to-use tables (such
7 as the table for "critical Z" values and "k" values). The CLEC plan has not been
8 implemented, and it contains values that need to be filled into formulas, tables that must
9 be completed, definitions of appropriate statistical tests for small samples that must be
10 specified and averages measured against benchmarks that must be calculated before the
11 plan can be implemented. As presented, implementing the CLEC plan would essentially
12 require guesswork about what those terms, tables and tests should be.

13 **Q. DOES THE CLEC PLAN PROVIDE ALL OF THE VALUES NEEDED TO**
14 **PERFORM THE PARITY TESTS THEY PROPOSE?**

15 A. No, the CLEC plan as written is missing values for critical parameters needed to test for
16 parity. As I described above, the CLEC proposal uses an arbitrary definition of
17 "disparity" or " δ_j " set at .25 standard deviations, for all performance measures that
18 compare a wholesale average to a retail average (such as the average time to install or
19 repair service). There are also measures that compare rates (such as the rate of "trouble
20 reports") and proportions (the percentage of missed due dates). The CLEC plan contains
21 two additional parameters, " ϵ_j " and " ϕ_j ," that are used to determine the material

1 difference for rate and proportion measures, respectively.¹³ But the plan provides no
2 indication of what the values of ϵ_j and ϕ_j should be.

3 **Q. WHAT EFFECT DOES THE LACK OF DEFINITION HAVE ON THE CLEC**
4 **PROPOSAL?**

5 A. As I said earlier, there is no way to estimate Type II error without first having a definition
6 of the disparity you are trying to detect. Thus, there is no way to “balance” Type II error
7 against Type I error. Without some definition of the values of ϵ_j and ϕ_j , the balancing test
8 that the CLECs propose cannot be performed because there is no definition of disparity
9 (also called the “alternative hypothesis”) to test against.

10 **Q. HOW MANY PERFORMANCE MEASURES DOES THIS AFFECT?**

11 A. Rates and proportions comprise approximately two-thirds of all performance measures
12 tested. The CLECs’ omission of ϵ_j and ϕ_j makes their proposal literally inoperable.

13 **Q. ARE THERE ADDITIONAL VALUES THAT NEED TO BE DETERMINED**
14 **BEFORE THE CLEC PLAN CAN BE CALCULATED?**

15 A. The value of parameter λ_j also is never defined. The value of this parameter is necessary
16 to calculate the critical Z value. Attachment 1 to the CLEC proposal just specifies that it
17 must be greater than or equal to 1. The CLEC proposal also never indicates why it should
18 be greater than or equal to 1. In Attachment 2, AT&T has suggested that there is normally
19 little reason to suggest that λ_j should be anything other than 1. But again AT&T does not
20 indicate under what conditions λ_j should be something other than 1 and whether certain
21 performance tests fit conditions where λ_j may be greater than 1.

¹³ CLEC Proposed Remedy Plan for Illinois, Attachment 2, pp. 4-6.

1 **Q. WHAT IS THE OTHER MISSING INFORMATION FROM THE CLEC PLAN?**

2 A. The CLEC proposal is also missing other critical definitions and values needed to
3 implement the statistical tests and determine remedy payments. Some of these critical
4 omissions are discussed in this section.

5 One obvious omission is the lack of a test for benchmarks expressed as averages. The
6 CLEC plan is silent on this issue, creating another hole in their proposal that needs to be
7 filled before it can be fully considered.

8 In addition, there is no indication of which measures are considered to be eligible for
9 remedies. Ameritech/SBC's plan indicates whether a measure is classified as
10 "high/medium/low" or "none." The measures indicated as "none" are considered to be
11 diagnostic and ineligible for remedies.

12 Another problem arises from the incomplete "Benchmark Percentage Adjustments
13 for Small Data Sets."¹⁴ There is no explanation of how the table was created or how it
14 should be expanded to include the many small sample and benchmark combinations that
15 are not listed. The CLEC plan argues that a special table is needed to determine the
16 critical values for benchmark tests on small sample sizes. There is a table included in the
17 plan for adjusting the benchmarks for some sample sizes, but the table is incomplete. The
18 sample sizes included are 5-10, 20, and 30. There is no indication how tests that have 1-4,
19 11-19, or 20-29 observations should be handled. Also, there are only three benchmarks
20 listed: 85, 90, and 95 percent. Many other benchmarks are currently being implemented
21 for the performance measurements that are not included: 92, 94, 96.5, 97, 98, 99, and

¹⁴ CLEC Proposed Remedy Plan for Illinois, p. 15.

1 99.5 percent. There is no indication how tests employing these benchmarks should be
2 performed and what level of performance would result in findings of disparity. Without a
3 complete table of adjustments for small samples for benchmarks, this remedy plan cannot
4 be implemented. This information would be a necessary component of a completed
5 CLEC plan.

6 **Q. ARE THERE ADDITIONAL OMISSIONS IN THE CLEC PLAN THAT MAKE**
7 **INCOMPLETE?**

8 Chronic remedy payments are not adequately defined for Tier II. The plan's
9 "recommended treatment for chronic failures is to assess a chronic failure over-ride in the
10 third consecutive month of non-compliant performance."¹⁵ The plan defines "compliant"
11 for Tier I; however, it never defines "compliant" for Tier II. The plan goes on to describe
12 "indeterminate" test results for Tier II parity and benchmark comparisons which both
13 have \$0 remedies associated with them. It is not clear, however, whether they are
14 considered "compliant." If they are not considered compliant, a definition of the level of
15 performance indicative of compliance for the aggregation of all CLECs must be
16 established. Clarity on this issue is essential since chronic remedies are \$250,000 per
17 disaggregation for Tier II when the lines provided to the CLEC are less than 5 percent of
18 the total lines. Again, the CLECs should complete the proposal before the plan is
19 considered.

¹⁵ CLEC Proposed Remedy Plan for Illinois, p. 17.

1 **IV. ILLUSTRATION OF PLANS USING PERFORMANCE DATA**

2 **Q. IN THE PRECEDING SECTIONS YOU COMPARED THE STATISTICAL**
3 **METHODOLOGIES USED BY AMERITECH ILLINOIS AND CLEC PLANS.**
4 **HAVE YOU ANALYZED THE DIFFERENCES IN REMEDIES PRODUCED BY**
5 **EACH PLAN?**

6 A. Yes. I directed a calculation of remedies under the Ameritech Illinois plan, and reviewed
7 the calculation of remedies prepared by the CLECs. Both parties calculated and
8 exchanged remedies using the same performance data, in order to facilitate comparison.

9 **Q. WHAT IS THE SOURCE OF THE PERFORMANCE DATA?**

10 A. The data were taken from Ameritech Illinois' simulated data based on actual performance
11 data for the months of September – December 2000. Portions of the data were modified
12 to protect confidential and sensitive business information – for example, performance
13 statistics for individual CLECs were shuffled among CLECs to prevent anyone from
14 matching performance to the correct CLEC. The modifications were made pursuant to an
15 agreement between Ameritech Illinois and AT&T, the leading proponent of the CLEC
16 plan.

17 **Q. COULD YOU PLEASE SUMMARIZE THE REMEDY AMOUNTS FOR THAT**
18 **PERIOD UNDER THE AMERITECH ILLINOIS PLAN?**

19 A. In December 2000, Ameritech Illinois was found compliant in 91.4 percent of the
20 performance measurement tests that are subject to Tier 1 remedies (payable to CLECs)
21 under its plan. The score on Tier 2 remedies (payable to the State) is 76.1 percent. With
22 this level of compliance, the remedies for December 2000 under Ameritech's proposal

1 would be over \$6 million - \$6,293,400 to be precise. (\$3,714,800 of this amount would
2 be paid to CLECs under Tier 1 of the Ameritech plan; \$2,578,600 would be paid to the
3 State under Tier 2).

4 **Q. WHAT WOULD THE REMEDIES HAVE BEEN UNDER THE CLEC**
5 **PROPOSAL?**

6 A. Despite the incompleteness and ambiguities of the CLEC plan, AT&T has provided its
7 own estimates of remedies under the CLEC plan using the simulated data. As I will
8 discuss later, the AT&T estimates in many cases do not accurately reflect the CLEC plan
9 documentation, and contain a number of errors, so their numbers should be considered
10 provisional. AT&T estimates a total remedy amount of \$56.1 million dollars for
11 December 2000 (\$26.6 million for Tier 1 and \$29.5 million for Tier 2) – almost ten times
12 as high as the Ameritech Illinois plan. What is more worrisome is that Ameritech
13 Illinois will still have to pay high remedies even after it achieves parity in service under
14 the CLEC plan.

15 **Q. USING THE SIMULATED DATA FOR DECEMBER 2000, WHAT WOULD YOU**
16 **EXPECT THE CLEC PLAN REMEDIES TO BE IF ALL MEASURES WERE**
17 **ACHIEVING PARITY OF SERVICE?**

18 A. We have made a number of assumptions about issues they have left open in their plan to
19 determine the magnitude of remedies implied by the plan.¹⁶ These should be considered

16 Because the CLEC proposal is incomplete, a significant number of assumptions had to be made to perform this estimate. This list is too voluminous to detail here. However, some of the important assumptions include the following: (1) ϵ_j and ϕ_j , the parameters that determine a material difference, were assumed to lead to the same result as using $\delta_j = 0.25$; (2) λ was assumed to be 1; (3) only one month of data was used, reducing the estimated remedies; (4) the small sample size benchmark table was completed using methods we believe are consistent with

1 approximate figures that will change once the CLECs have fully specified their plan.
2 Based on our estimates using the simulated December 2000 data, the CLEC proposal
3 would produce remedy payments of \$18.1 million in Tier 1 remedies and \$9.9 million in
4 Tier 2 remedies. This totals to \$28 million per month *even when Ameritech Illinois in*
5 *providing service that is in parity.* Over the course of a year, this amount will add up to
6 over a one-third of a *billion* dollars. In order to avoid such steep penalties, Ameritech
7 Illinois would have to provide the CLEC customers with better service than its own retail
8 customers.

9 **Q. WHY ARE THE CLEC REMEDIES SO MUCH HIGHER, GIVEN 91.4**
10 **PERCENT COMPLIANCE?**

11 A. Even when Ameritech Illinois is providing parity service, the actual outcome of the
12 service will fluctuate due to random variation. The statistical methods of the CLECs'
13 plan permit large Type I error rates, well above the conventional levels of 5 percent, in
14 the name of balancing.

15 As a result, the CLEC proposal does not give meaningful and significant incentives for
16 compliance with performance measurements. Ameritech Illinois maintains that remedies
17 should not be paid unless the results demonstrate with a reasonable degree of scientific
18 certainty that the process used for CLEC customers differs from the process used for
19 retail customers. In other words, the difference in performance outcomes must come
20 from something other than random variation or factors outside the control of Ameritech

the few entries in the table included in the CLEC plan; (5) no remedies were calculated for benchmark tests performed on averages because the CLEC plan proposes no method for this test; (6) benchmarks measured as rates were treated the same as those measured as proportions; (7) diagnostic measures were not eligible for remedies. Literally dozens of assumptions were needed to make the current CLEC plan functional.

1 Illinois. The Ameritech Illinois remedy plan gives the proper incentives to the ILEC. By
2 requiring Ameritech Illinois to pay remedies when poor service is given and limiting
3 remedies when poor service is due to random chance, the Ameritech Illinois remedy plan
4 gives the proper incentives to the ILEC: to provide parity service to avoid remedies. The
5 CLEC proposal, by contrast will lead to remedies, even "severe failure" remedies, for
6 differences in performance that are not statistically significant.

7 **Q. WHAT IS THE CAUSE OF THIS PROBLEM?**

8 A. As I described above, the CLEC plan has a very small threshold (critical Z) for declaring
9 disparity when there are few CLEC observations. In fact, for some tests this threshold is
10 so small that statistically significant differences would require a Z-score three times
11 larger than the "severe failure" critical values as defined by the CLECs. The CLECs are
12 assigning "failure" and "critical failure" to a large extent by random chance. While the
13 Ameritech Illinois plan is designed to maintain an overall 5 percent Type I error rate, the
14 CLEC plan's Type I error rates exceed 5 percent in the vast majority of the cases.

15 **Q. HOW PERVASIVE ARE HIGH TYPE I ERROR RATES?**

16 A. Table 2, below, shows the proportion of remedy-eligible parity tests within the simulated
17 data given various levels of Type I error rates. Recall, the Type I error rate represents the
18 probability that the statistical test falsely declares disparity when the underlying
19 performance is actually in parity. Ameritech Illinois' plan sets the Type I error rate at the
20 conventional level of 5 percent. The CLECs' balancing plan does not do this. Using the
21 AT&T provided critical Z values for their simulated calculations, we determined that
22 close to seven out of every eight Tier 1 remedy eligible parity tests have Type I error
23 rates that exceed 5 percent. Furthermore, the probability of falsely declaring disparity

1 when the underlying performance is in parity is over 45 percent in more than 23 percent
 2 of the Tier 1 tests. Testing at this level provides little more certainty than the outcome of
 3 a flip of a coin. For this reason, the CLEC plan results in high remedy dollars being paid
 4 even under parity conditions: each month many performance tests and remedies are
 5 assessed in an arbitrary and capricious manner under the CLEC plan, ensuring that
 6 CLECs receive a stream of remedy payments each month even if performance is in
 7 parity.

8 Table 2. CLEC PLAN: Proportion of Tests With A Given Type I Error Rate:
 9 Simulated Data, Tier 1, Remedy Eligible Tests.

Probability of Type I Error α	Proportion of Tier I Tests with Given Type I error Rate	Cumulative percent of Tier I Tests with Type I Error Rate
>45 %	23.4 %	23.4 %
35 %- 45 %	31.6 %	55.0 %
25 % - 35 %	15.8 %	70.8 %
15 %-25 %	8.8 %	79.6 %
5 % - 15 %	7.1 %	86.8 %
0 % - 5%	13.2 %	100 %

10
 11 Table 3 shows the proportion or remedy eligible parity tests under the CLEC plan within
 12 the simulated data given various levels of Type I error rates at the *Tier 2* aggregate level.
 13 Since these tests have larger sample sizes, there will be more scientific certainty than for
 14 Tier 1. However, only a little over one-third of the tests yield a 95 percent confidence
 15 level or higher. Almost the same percentage of Tier 2 remedy eligible tests have Type I
 16 error rates of 35 percent or higher.

1 Table 3. CLEC PLAN: Proportion of Tests With A Given Type I Error Rate:
 2 Simulated Data, Tier 2, Remedy Eligible Tests.

Probability of Type I Error α	Proportion of Tier 2 Tests with Given Type I error Rate	Cumulative percent of Tier 2 Tests with Type I Error Rate
>45 %	0.8 %	0.8 %
35 %-45 %	33.1 %	33.9 %
25 %-35 %	13.0 %	46.9 %
15 %-25 %	9.2 %	56.1 %
5 %-15 %	9.2 %	65.3 %
0 %-5 %	34.7 %	100 %

3
 4 **Q. CAN YOU PROVIDE A COUPLE OF EXAMPLES OF THE RAMIFICATIONS**
 5 **OF THESE HIGH TYPE I ERROR RATES ON TESTS CONDUCTED USING**
 6 **THE SIMULATED DATA?**

7 **A.** The following two examples within the simulated results provided by AT&T illustrates
 8 clearly that under the CLEC plan, remedies would routinely occur without scientific
 9 proof that disparity exists.

10 The first example comes from AT&T's November 2000 simulation results for CLEC
 11 #205, Average Delay Days for Ameritech Caused Missed Due Dates (#32). The
 12 disaggregation is business – field work within the Chicago Suburban metro area.¹⁷ In the
 13 simulated data, CLEC #205 customers had 1 missed due date that caused a delay of 7.66
 14 days for this disaggregation. The Ameritech Illinois retail customers had an average
 15 delay of 6.75 days for 218 missed due dates. The important parameters and results for
 16 this example are listed in Table 4.

17 Table 4. Simulated Data Used For Example 1: Tier 1 - Average Delay Days For AIT Caused
 18 Missed Due Dates – Business – Fieldwork – CLEC 205 – Chicago Suburban – November 2000.

¹⁷ These data can be found in the simulated results provided by AT&T on row 1.654 of 't1 parity int and rates 2 of 3.xls' within the intervals tab.

CLEC	# CLEC Orders	ILEC	# ILEC Orders	Z value
7.66	1	6.75	218	0.128
Critical Z (z*) - CLEC Plan	Type I Error (α) - CLEC Plan	Critical Z - Ameritech Plan	Remedy - CLEC Plan	Remedy - Ameritech Plan
0.125	45 percent	1.75	\$2,503	\$0

1
2 The question to be answered is how likely is it that the CLEC process that
3 resulted in 7.66 days is different from the ILEC process that resulted in 6.75 days? If we
4 looked at one miss from the ILEC process, would we be surprised to see that the order
5 was delayed 7.66 days? What level of proof is necessary? The Ameritech Illinois plan
6 requires us to be 95 percent certain that the underlying processes are indeed different.
7 The CLEC plan requires us to be only 55 percent certain ($Z^* = 0.125$) before declaring
8 disparity.¹⁸ This is little more certainty than the odds of getting heads in a 50-50 coin
9 flip. Indeed, the CLEC determination of disparity is almost virtually arbitrary: the Z-
10 value is 0.128, which is much lower than conventional level of 1.65 or more used to
11 determine disparity. Yet, the CLEC plan would have Ameritech Illinois pay \$2,503 in
12 remedies to this CLEC for this single order.

13 The second example comes from AT&T's October 2000 simulation results for CLEC
14 #245, Mean Installation Interval (#27). The disaggregation is residence – no fieldwork
15 within the Illinois South metro area.¹⁹ In the simulated data, CLEC #245 customers had
16 1 residential – no field work installation which required 1 day to install. The
17 corresponding Ameritech retail installations averaged 0.74 days. Once again, if we
18 looked at one installation from the ILEC process, would we be surprised to see that the

¹⁸ For these examples, I am following Ameritech's convention of a positive Z value denoting worse CLEC performance than ILEC performance.

¹⁹ These data can be found in the simulated results provided by AT&T on row 239 of 't1 parity int and rates2 of 3.xl's within the intervals tab.

1 install took 1 day given the other installations? A summary of this example is provided
 2 in Table 5.

3 Table 5. Simulated Data Used For Example 2: Tier 1 – Mean Installation Interval – Residential
 4 – No fieldwork – CLEC 245 – Illinois South – October 2000.

CLEC	# CLEC installs	ILEC	# ILEC Installs	Z value
1.00	1	0.74	12,120	0.417
Critical Z (z*) – CLEC Plan	Type I Error (α) - CLEC Plan	Critical Z - Ameritech Plan	Remedy - CLEC Plan	Remedy - Ameritech Plan
0.125	45 percent	1.68	\$25,000	\$0

5
 6 As in the first example, the CLEC plan required a confidence level of only 55
 7 percent ($z^* = 0.125$) before declaring disparity. Furthermore, the CLEC plan will assess
 8 “severe failure” penalties over one-third of the time (35.3 percent) even when parity of
 9 service is given ($3z^* = 0.37$). In this example based on the simulated data, the Z value is
 10 0.42, which is much lower than conventional level of 1.65 and higher used to determine
 11 disparity. Yet, the CLEC plan would have Ameritech Illinois pay the maximum remedy
 12 possible to this CLEC: \$25,000 for this single installation. Under the CLEC plan,
 13 CLECs with a single residential – no field visit installation have more than a one out of
 14 three chance of receiving \$25,000 in remedies when Ameritech’s service to CLEC and
 15 ILEC customers is *not* distinguishable with any reasonable degree of scientific certainty.
 16 These two examples illustrate why Ameritech Illinois would be forced to provide
 17 superior service to the CLECs in order to avoid paying massive remedies. Unless
 18 Ameritech provides CLEC customers with service that is significantly better than it
 19 provides to its own retail customers, Ameritech will be forced to pay these types of
 20 remedy payments due simple random variation, even when the underlying service is in
 21 parity.

1 Q. ARE THERE CASES WHERE THE CLEC PLAN WILL RESULT IN SMALLER
2 REMEDIES FOR THE CLECs?

3 A. Yes. Earlier in this document as well as in the above examples, I have shown that the
4 CLEC plan fails because it frequently sanctions service when parity exists. The next two
5 examples illustrate that the CLEC plan also founders (although less frequently) because it
6 fails to sanction service that is actually in disparity. This occurs because when sample
7 sizes are large, the CLEC plan's statistical methodology requires an absurdly *high* level
8 of confidence for parity tests. The next two examples illustrate this point by showing the
9 CLEC plan's comparison of remedy assessments when the level of disparity is
10 statistically significant in the simulated data.

11 The first example comes from AT&T's November 2000 simulation results for Tier 2,
12 Mean Installation Interval (#27). The disaggregation is business – no fieldwork within
13 the Chicago Suburban metro area.²⁰ The aggregate CLEC performance for this measure
14 was 4.28 days for 1,154 installations. The average installation interval for retail
15 customers was 1.21 days for 9,583 installations. Given the large relative difference and
16 the many installations affected, it is not surprising that the computed Z value for the
17 performance difference is 5.56. This Z value indicates that there is less than a 1 in a
18 million chance that the CLEC service and the ILEC service are in parity. Obviously,
19 these results are statistically significant and remedies should be paid. Ameritech's
20 remedy plan takes into account the size of the relative difference in performance and the
21 number of CLEC installations affected (1,154) in order to determine a remedy amount of

²⁰ This data can be found in the simulated results provided by AT&T on row 200 of 't2 parity.xls' within the intervals tab.

1 \$442,500. This remedy amount exceeds anything found in the CLEC plan. The CLEC
 2 plan's remedy amount would be \$0. A summary of this example is provided in Table 5.

3 Table 6. Simulated Data Used For Example 3: Tier 2 – Mean Installation Interval – Business –
 4 No fieldwork – Chicago Suburban – November 2000.

CLEC performance	# CLEC lines	ILEC performance	# ILEC Lines	Z-Value
4.28	1,154	1.21	9,583	5.56
Critical Z (z*) – CLEC Plan	Type I Error (α) – CLEC Plan	Critical Z - Ameritech Plan	Remedy - CLEC Plan	Remedy - Ameritech Plan
4.01	~0 percent	1.70	\$0	\$442,500

5
 6 The CLEC plan requires that the Z-value exceed 6.68 ($5/3z^*=6.68$) for this
 7 particular test before remedies are paid. The Z-value will exceed this critical Z-value less
 8 than one out of every billion times when the performance is actually parity. The stringent
 9 requirements of statistical confidence in the above example is in stark contrast to the
 10 plan's requirement of only a 45 percent Type I error rate when there is only 1 CLEC
 11 installation as noted earlier. Do the first two examples deserve remedies more than the
 12 third example? The CLEC plan thinks so.

13 The second example comes from AT&T's December 2000 simulation results for
 14 CLEC 91, Trouble Report Rate (#37). The disaggregation is residential within the
 15 Chicago Suburban metro area.²¹ The CLEC performance for this measure is 36 troubles
 16 per every 100 lines. This rate is 20 times as high as the trouble report rate for retail
 17 customers 1.7 troubles per every 100 lines. The main features of this example are listed
 18 in Table 7.

²¹ This data can be found in the simulated results provided by AT&T on row 995 of 't1 parity int and rates2 of 3. xls' within the rates tab.

1 Table 7. Simulated data used for example 4: Tier 1 – Trouble Report Rate – Residential – CLEC
 2 91 – Chicago Suburban – December 2000.

CLEC	# CLEC lines	ILEC	# ILEC Lines	Z value
0.36	12,840	0.02	1,455,336	300.20
Critical Z (z*) – CLEC Plan	Type I Error (α) – CLEC Plan	Critical Z - Ameritech Plan	Remedy - CLEC Plan	Remedy - Ameritech Plan
14.10	~0 percent	1.71	\$25,000	\$2,197,500

3 Note: the Z value is CLEC plan's LCUG-Z

4 Coupling this difference in performance with the fact that there are over 12,840
 5 lines (4,637 troubles) affected and this disaggregation has been in disparity for three
 6 consecutive months, one expects a severe remedy. In fact, both the CLEC plan and
 7 Ameritech's remedy plan agree on this. The CLEC plan gives the CLEC the most severe
 8 Tier 1 remedy possible under their plan, \$25,000. The Ameritech plan takes into account
 9 the difference between the performances and the number of months in disparity (3), as
 10 well as the number of lines affected. The resulting remedy under the Ameritech remedy
 11 plan is over two million dollars, \$2,197,500. Contrast this with the \$25,000 under the
 12 CLEC plan. This is the exact same remedy that the CLEC plan would levy for the 1
 13 installation that was in parity by conventional testing standards described in Example 2
 14 above. Clearly, the CLEC plan is inconsistent in the manner that it provides remedies.

15 **Q. YOU HAVE MENTIONED THAT THE CLEC PLAN IS INCOMPLETE AND**
 16 **UNABLE TO BE IMPLEMENTED AS CURRENTLY WRITTEN. WHAT DO**
 17 **YOU MEAN BY THAT?**

18 **A.** There are many unresolved issues within the plan. We were hoping that when we
 19 received the spreadsheet program and the simulated CLEC plan results from AT&T that
 20 we would be able to learn more about the omissions of the written document. However,
 21 the receipt of these items only demonstrated and revealed more inconsistencies in the

1 CLEC plan. It appears that even AT&T does not understand its own plan. We now have
2 many new concerns about the CLEC plan.

3 **Q. WOULD YOU PLEASE COMPARE (1) THE CLEC PLAN DOCUMENTATION**
4 **SUBMITTED ON MARCH 12, 2001, (2) THE SPREADSHEET PROGRAM**
5 **PROVIDED BY AT&T TO CALCULATE REMEDIES FOR THEIR PLAN (01-**
6 **0120PROXYCALCULATIONS(6-18-01)) AND (3) THE SIMULATED CLEC**
7 **PLAN REMEDY RESULTS PROVIDED BY AT&T?**

8 A. There are numerous inconsistencies and issues. For sake of brevity, I have included a
9 table summarizing some of the issue and inconsistencies between the CLECs' three
10 interpretations of their own proposed plan. The first few issues are list instances where
11 the CLEC plan documentation submitted on March 12, 2001 is specific about the
12 methods to be used, but the CLEC plan is being ignored by AT&T in their spreadsheet
13 program or their simulated remedy results. That is, the spreadsheet program and/or the
14 simulated remedy results provided by AT&T are inconsistent with the CLEC plan. I have
15 confined myself to issues that do not appear to be mistakes by AT&T, but rather
16 intentional changes.

17 *Issue #1 – Treatment of Affiliate Data.* AT&T gives us three different answers about how
18 to handle affiliate data. The simulated remedy results ignore the affiliate data, even
19 though we provided the data. Page 5 of the CLEC plan says to compare the CLEC
20 service to the better of the retail customers or SBC/Ameritech's affiliate customers. The
21 spreadsheet program calculates separate remedies for the retail data and affiliate data then
22 adds them together. Which is it? The CLECs' simulation does one calculation, the

1 CLECs' spreadsheet program indicates a different calculation and neither is what the
2 CLEC plan says should be done.

3 *Issue #2 – Chronic Remedies.* On page 17 of the CLEC plan, “chronic” remedies are
4 issued whenever a disaggregation has been in disparity for three consecutive months.
5 These remedies are set at the maximum amount for the applicable tier. The spreadsheet
6 program implemented chronic remedies. However, AT&T reports \$0 in chronic
7 remedies for the simulated data for every disaggregation, even those that were in
8 disparity for three months. AT&T apparently either does not understand its own
9 proposal, or was not able to implement it.

10 *Issue #3 – The Determination of the Critical Z.* The CLEC plan defines the
11 determination of the Critical Z in two different ways. Attachment 1 tells us to use the
12 *balanced Truncated Z* and provides a formula for determining the critical Z on page 27.
13 This formula cannot be implemented because it has many undefined terms. Attachment 2
14 tells us to use the *balanced modified Z* and gives 3 formulas to determine the critical Z:
15 (1) one for intervals using δ_j on pages 3 and 4, (2) one for proportions using ϕ_j on page 5,
16 and (3) one for rates using ϵ_j on page 6. The formulas using ϕ_j and ϵ_j cannot be
17 implemented because values were never assigned to these terms. All three of these
18 formulas are inconsistent with the Truncated Z formula in Attachment 1. Therefore,
19 within the CLEC plan itself, there are two different approaches that can be taken.

20 The CLECs add more inconsistencies on this topic with their spreadsheet
21 program, which follows neither the formulas for the balanced Truncated Z nor the
22 balanced modified Z. The spreadsheet program leaves out ϕ_j and ϵ_j , which were an

1 integral part of the CLECs' proposal for rate and proportion parity calculations. Again,
2 AT&T has proposed two different calculations, but decided to implement a third method
3 not listed in its proposal. Will the CLECs provide values for ϕ_j and ϵ_j ? Will Ameritech
4 have a chance to comment on their proposed values? Will AT&T provide a different
5 value of ϕ_j and ϵ_j for each measure, geography and product as it states would be required
6 for δ_j . Is Ameritech expected to know what AT&T intends without seeing it on paper?

7 *Issue #4 – Treatment of Benchmarks with Averages.* Benchmark tests for averages are
8 ignored within the CLEC plan. The spreadsheet program and the AT&T results both
9 have benchmarks for average results with new formulas that have never been proposed in
10 any other state within the Ameritech five state region to date, including Illinois!²² Should
11 Ameritech follow the documented plan or the plan use in the spreadsheet program?

12 *Issue #5 – Remedies for Diagnostic Measures.* The CLEC plan does not mention the
13 treatment of measures that are labeled as “none” (as opposed to “low”, “medium,” and
14 “high”) within the business rules. The simulated remedy results had remedies for all
15 measures provided to them (with the exception of measures 114.1 (Tier 2) and MI 15, no
16 reason given). Ameritech provided AT&T, within the simulated data, a column called
17 “remedy eligible” indicating the sub-measures eligible under the Ameritech plan, but this
18 field was ignored. Was this a mistake by AT&T or does it mean to have remedies paid
19 on every single measure including the ones labeled “none”? What about 114.1 and MI
20 15? Were they meant to be excluded?

²² There appears to be a mistake with the remedy results provided by AT&T for the average benchmark portion of PM #5 for Tier 2. The simulated remedy results reversed the remedy results. That is, remedies were levied when the CLEC performance was better than the benchmark and were not levied when the CLEC performance was worse than the benchmark.

1 Q. WHAT OTHER ISSUES DID YOU FIND?

2 A. There were several issues involving the remedies for percentage benchmarks. There has
3 always been a question of how to handle small sample sizes. The CLEC plan provides a
4 table on page 15, but this table is incomplete and is missing essential entries. The
5 question is what to do for those benchmarks and small sample size combinations not
6 listed within the table. The spreadsheet program and the simulated remedy results give
7 us two different answers – neither answer is completely consistent with the CLEC plan
8 itself. Again, should Ameritech follow the plan as documented by the CLECs or the one
9 AT&T implemented?

10 *Issue #6 – Percentage Benchmark Small Sample Size Adjustments.* The CLEC plan only
11 adjusts the benchmarks for certain benchmarks – 85 percent, 90 percent, 95 percent. It
12 also only adjusts the benchmark for certain sample sizes: 5-10, 20, 30. The spreadsheet
13 program has a formula to adjust the benchmark regardless of the sample size. This
14 formula is to make the benchmark equal to the quantity of the benchmark times the
15 number of CLEC observations rounded down, divided by the number of CLEC
16 observations ($\text{rounddown}(\text{CLEC obs} * \text{benchmark}) / (\text{CLEC obs})$). This formula is
17 inconsistent with the table on page 15 of the CLEC plan for a sample size of 7
18 observations and a benchmark of 85 percent. The CLEC adjusted benchmark is 85
19 percent, whereas the spreadsheet program result is 71.4 percent. In contrast, the
20 spreadsheet program does not apply small sample size adjustments to the benchmarks.
21 The CLEC plan, the spreadsheet program, and the simulated results give three different
22 methods for adjusting benchmarks. Unless the CLEC plan is rewritten, benchmark
23 measures will not be able to be implemented.

1 *Issue #7 – Percentage Benchmark Remedy Implementation Issue.* The simulated
2 remedies provided by AT&T use formulas that are entirely inconsistent with both the
3 CLEC plan and their spreadsheet program that they provided.²³ The AT&T remedy
4 results indicate that it is unable to calculate percentage benchmarks under its own plan.

5 **Q. WHAT ARE SOME OTHER ISSUES YOU HAVE FOUND?**

6 A. There are a few issues involving Tier 2 remedies for parity tests, one for each type of test.

7 *Issue #8 - Tier 2 - Parity tests for Intervals issue.* The CLEC plan sets remedies equal to
8 \$25,000*n when the remedies qualify as “market constraining.” The spreadsheet
9 program sets these remedies equal to \$81,250 (\$325,000*8). The simulated remedy
10 results seems to set them equal to \$25,000*n where n equals 8.

11 *Issue #9 - Tier 2 - Parity Tests for Percentages Issue.* The spreadsheet program’s
12 affiliate comparison remedy is always \$0. As noted above, the CLEC simulated data
13 ignore the affiliate data.

14 *Issue #10 - Tier 2 - Parity Tests for Rates Issue.* The CLEC plan does not have remedies
15 unless the Z value exceeds the critical Z by a factor of 5/3. The spreadsheet program has
16 remedies whenever the Z value exceeds the critical Z. The simulated results provided by
17 AT&T are consistent with the CLEC plan, but inconsistent with the spreadsheet program.

18 **Q. WHAT ARE THE OTHER ISSUES LISTED WITHIN THE TABLE?**

²³ The CLEC plan and the spreadsheet program appear to be consistent except for the cutoff point where remedies are automatically \$25,000. The spreadsheet program has a “2” that should be removed and the “<” should be “>”. While this is a significant problem within the spreadsheet program, this issue will focus on the remedy results provided by AT&T because these appear to have even larger discrepancies with the plan being proposed by the CLECs.

1 A. *Issue #11 – LCUG Z value for Retail Percentages of 0 percent or 100 percent.* The
2 LCUG-Z results in a missing Z value whenever the retail percentage is 0 percent or 100
3 percent. The Ameritech plan uses the pooled percentage rather than the retail percentage
4 to avoid this issue. There is no description given within the CLEC plan of how to handle
5 this issue. The spreadsheet program does not take measures to avoid this issue resulting
6 in errors for the Z value as well as the remedy results whenever the retail performance is
7 0 percent or 100 percent. The simulated remedies substitutes 50 percent for the retail
8 performance within the denominator of the LCUG Z value formula for all but six tests.
9 These six tests were all assigned missing Z-values and \$0 remedies. The inconsistencies
10 in the treatment of retail percentages with values of 0 percent or 100 percent are almost
11 Byzantine.

12 *Issue #12 – LCUG Z value for Retail Rates of 0 percent.* The LCUG-Z results in a
13 missing Z value when the retail rate is 0 percent. The Ameritech plan uses the pooled
14 rate rather than the retail percentage to avoid this issue. There is no description given
15 within the CLEC plan of how to handle this issue. The spreadsheet program does not
16 take measures to avoid this problem resulting in errors for the Z value as well as the
17 remedy results whenever the retail performance is 0 percent. The simulated remedies
18 substitute a numerator of 1 for the retail records for Tier 1 and sets the Z value equal to 0
19 regardless of the CLEC performance for Tier 2. Neither of the solutions observed in the
20 simulated remedy results is consistent with the CLEC plan or simple intuition.

21 *Issue #13 – Tier 2 multiplier – n.* The CLEC plan defines the Tier 2 multiplier, “n,” for
22 remedies as the percentage of the aggregate CLEC lines relative to the ILEC lines. The
23 multiplier is 10 for 0-5 percent and 8 for 5-10 percent in the CLEC plan. The CLEC plan

1 says that the value of “n” was 10 on the date the plan was filed. The spreadsheet program
2 also uses a multiplier of 10. The simulated results use a multiplier of 8 for most tests, but
3 use 10 for some others. How is it possible for the multiplier to be 8 for some tests and 10
4 for others? The CLEC plan only allows for a single “n” for the whole state.

5 **Q. ARE THERE ANY ISSUES REGARDING THE AT&T SIMULATED REMEDY**
6 **RESULTS NOT LISTED WITHIN THE TABLE?**

7 A. I have listed below some of the data issues within the AT&T simulated remedy results.
8 This list is not intended to be complete.

- 9 • PM 115 calculates “severe failure” remedies for 57 Tier 1 records even though the
10 performance is perfect at 100 percent delays.
- 11 • PM 105 calculates “severe failure” remedies for 6 records even though the
12 performance is perfect at 100 percent on time.
- 13 • PM 96 calculates parity incorrectly. It finds parity regardless of CLEC
14 performance.
- 15 • The AT&T simulation classified PM 54, the failure frequency (trouble report rate)
16 for design products, as a percentage measure, when it should be classified as a
17 rate.
- 18 • Most, but not all, of the metro areas classified as “UNDETERMINED” were not
19 included in the simulated remedy results provided by AT&T.

- 1 • The data for PM 114.1 (Tier 2), PM 98 (Tier 1 October) and MI 15 were not
2 included. In addition, there are 10 Tier 1 and 10 Tier 2 tests not included.
- 3 • One test for metro area "ALL" as well as the individual metro areas was included,
4 leading to double counting.
- 5 • The parity results for one MI 12 record were overwritten by the totals for the
6 column.
- 7 • Interval parity tests where the retail standard deviation is zero are included for
8 Tier 2 (with one exception) and excluded from Tier 1.

9 **Q. HAVING REVIEWED THE PROPOSED CLEC PLAN AND**
10 **IMPLEMENTATION, CAN YOU DRAW ANY GENERERAL CONCLUSIONS**
11 **ABOUT THE PLAN?**

12 A. Yes, I think there are at least two critical features that a parity testing and remedy plan
13 must have. First, the plan must be implementable. This means that the plan is
14 documented accurately, including the necessary methods, calculations, parameter values,
15 and tables to determine parity and remedies. Second, the plan must provide incentives
16 that promote parity of service and competition. The CLEC plan does neither of these.
17 The CLEC plan has many inconsistencies and omissions that make it impossible to
18 implement. The CLEC plan itself delivers some of the most scathing criticism of the
19 methods the CLECs have proposed, noting that critical aspects of the CLEC plan do not
20 make sense. In addition, the CLEC plan provides incentives that promote disparity and
21 discrimination against customers of Ameritech Illinois or that generate enormous

1 remedies even when the service provided to CLEC and Ameritech Illinois customers is in
2 parity.

3 **Q. WHAT IS YOUR GENERAL ASSESMENT OF THE PLAN PROPOSED BY**
4 **AMERITECH ILLINOIS?**

5 A. The Ameritech Illinois plan meets both of the important criteria I mentioned above. The
6 plan is clearly implementable, as is evident from the fact that it has been used hundreds
7 of times across multiple states. Second, the Ameritech Illinois plan uses well-established
8 statistical methods that are widely accepted in the scientific community and by the
9 CLECs' own statistical experts to determine when disparity exists. Based on these
10 statistical tests, Ameritech Illinois has developed a remedy plan that imposes payments
11 when there is a reasonable degree of scientific certainty that disparity exists, and which
12 do not arbitrarily assess remedy payments when Ameritech's service is in parity.

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

14 A. Yes.

Attachment A

DANIEL S. LEVY

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EDUCATION

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Daniel S. Levy specializes in applications of economics and statistics in the study of corporate structures related to industrial organization/antitrust and labor economics. His work includes detailed analyses and valuations of corporate functions, risks, and assets for international corporations in a wide range of industries.

Dr. Levy's work also includes the study of environmental issues, including comment before the EPA on contingent valuations of power plant emissions damages. In the area of labor economics, he has studied the effects of variations in employment incentives on the productivity and retention of employees, and has investigated the social and economic determinants of investments in human capital. He is expert in numerous statistical and modeling applications, and has modeled complex economic and social factors affecting demographic and market behavior.

Prior to joining Arthur Andersen, Dr. Levy held research and consulting positions at Charles River Associates, The RAND Corporation, Needham-Harper Worldwide Advertising, SPSS Inc. and the University of Chicago Computation Center.

EXPERT TESTIMONY AND AFFIDAVITS

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- Before the Wisconsin Public Utilities Commission, 2000, Expert Report and Testimony, *Statistical Methods*.
- Dayton Technologies Inc., et al., v. Aluminum Company of America, et al, United States District Court Southern District of Ohio Western division, 2000, Expert Report and Deposition.

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- Before the Michigan Public Service Commission, 1998, Expert Affidavit, *Statistical Analysis*.
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- Daras v. Texaco Inc, 1993, Affidavit.
- Environmental Protection Agency: Navajo Generating Station, 1991, Public Comment, *Valuation of Environmental Damages*.

PROFESSIONAL EXPERIENCE

1998 – Present	National Leader of Economic Consulting, Andersen Business Consulting
1996 – 1998	Regional Director of Economics, Arthur Andersen: CRCO
1995 - 1996	Economist, Arthur Andersen
1991 - 1995	Senior Associate, Charles River Associates
1988 - 1991	Associate Economist, The RAND Corporation
1985 - 1988	Computer Advisor, University of Chicago Computation Center
1982 - 1985	Research and Teaching Consultant, SPSS Inc.
1981 - 1982	Research Consultant, Needham, Harper Worldwide Advertising

PROFESSIONAL HONORS and ACTIVITIES

- Earhart Fellowship for graduate research in economics, 1981 - 1982
- Hewlett Grant for research in developing countries, 1985 - 1986; renewed, 1986 - 1987
- CBS Bicentennial Scholarship for research on events leading to the American Revolution, 1986 - 1987
- Homer and Alice Jones Fellowship, University of Chicago, 1987 - 1988
- American Economics Association, 1988- Present
- Population Association of America, 1988-1991

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Attachment B

Ameritech Parity Calculation Example

Based on Ameritech Illinois'
Performance Remedy Plan
March, 2001

Calculate monthly Z statistic

*#27 - Mean Installation Interval - POTS - Residence - No Field Visit
CLEC XYZ*

CLEC Mean = 1.21541 days per installation order

ILEC Mean = 0.64313 days per installation order

STEP #1:

$$\text{DIFF} = \text{Mean}_{\text{CLEC}} - \text{Mean}_{\text{ILEC}} = 1.21541 - 0.64313 = 0.57228$$