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October 4, 2000

Ms. Blanca S. Bayo, Director Division of Records & Reporting Florida Public Service Commission 2540 Shumard Oak Boulevard Tallahassee, FL 32399-0850

Re: Docket No. 000121-TP Investigation into the Establishment of Operations Support Systems Permanent Performance Measures for Incumbent Local Exchange Telecommunications Companies

Dear Ms. Bayo:

Please find enclosed an original and 15 copies of Verizon Florida Inc.'s Rebuttal Comments for filing in the above matter. These comments were e-mailed to Commission Staff on September 29, 2000. Service has been made as indicated on the Certificate of Service. If there are any questions regarding this matter, please contact me at 813-483-2617.

Sincerely,

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FPSC-RECORDS/REPORTING

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 Filed: September 29, 2000

VERIZON FLORIDA INC.'S REBUTTAL COMMENTS

In these Rebuttal Comments, Verizon Florida Inc. (Verizon) responds to the comments and operations support system (OSS) performance plans submitted by the other parties in this proceeding. Among the parties, AT&T, BellSouth, Z-Tel and Verizon submitted plans. (Sprint filed an outline of its plan.) Verizon will devote much of its discussion here to AT&T's and Z-Tel's plans because they are so severely lacking in any statistical, economic, or logical foundation. They use seriously flawed methodologies, would result in payments that are grossly excessive, and would create perverse incentives whereby competitive local exchange carriers (CLECs) benefit more from sub-standard service than from service meeting Commission standards.

The CLEC plans contrast sharply with Verizon's performance incentive plan, which provides a strong financial incentive to provide quality wholesale service. Verizon's proposed, self-executing payments are high enough to induce the Company to provide the appropriate level of service quality, without jeopardizing the interests of the public or creating perverse incentives on the CLECs' part. Moreover, unlike the CLECs' plans, Verizon's plan is based upon a methodology that is statistically sound and reasonable.

Before turning to Verizon's specific responses to the plans, a few general observations about procedural matters are in order.

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First, Verizon agrees with Sprint that the Commission's focus on performance penalties is premature. (Sprint Comments at 1.) Verizon, like Sprint, does not believe the Commission can logically and reasonably develop performance incentives without first establishing the performance measures that are to be the basis for any incentives. It will be impossible to adopt any particular plan for any particular company without at least implicitly approving the underlying performance measures. In this regard, Verizon emphasizes that the measures reflected in its incentive plan are an integral part of that plan. The incentives Verizon proposes are not intended to be "mixed and matched" with measures other than those in the Company's plan.

Second, although Verizon disagrees with most of the substance of AT&T's comments and its plan, it shares AT&T's understanding that the Commission intends to consider performance measures and enforcement mechanisms separately for each incumbent local exchange carrier (ILEC). Each carrier's systems are different, so Verizon continues to believe that a "one-size-fits-all" approach to measures and incentives is inappropriate. For this reason, while Verizon may disagree with some aspects of Sprint's and BellSouth's proposals, it will not comment in detail on them because they should not be viewed as relevant to Verizon's operations. In any event, because there may be some confusion as to the ultimate objective of these proceedings, Verizon asks Staff to clarify that, to the extent the Commission intends to adopt OSS measures and incentives, such measures and incentives may be different for each ILEC.

Third, Verizon agrees with BellSouth that the Commission should resolve the fundamental legal issues governing this proceeding before it devotes any more

resources to the consideration of enforcement mechanisms. (BellSouth Comments at 10.) Staff understands the central role of these issues in this proceeding. Before, during and after the workshop, it asked the parties to comment on the Commission's authority to award damages and to even establish a generic OSS enforcement mechanism. As Verizon and BellSouth explained in their Comments, the Commission does not have the authority to award damages or to implement a generic enforcement mechanism. As such, there is a substantial risk that the Commission will waste considerable resources on developing and ordering an incentive plan that it ultimately has no authority to implement. The only way to avoid this potential outcome is to resolve the legal issues first, so the Commission will know what procedures it can use to lawfully address the issue of incentive mechanisms. In this regard, Verizon has recommended that the parties use a collaborative process to develop measures and incentives that can be voluntarily adopted. This approach will circumvent the difficult legal issues concerning the Commission's authority.

I. LEGAL ISSUES

The Staff identified two legal issues for comment:

- Does the Commission have the authority to establish, in advance, a generic enforcement mechanism provision which would be inserted in interconnection agreements in the event negotiations on this provision fail?; and
- 2. Does the adoption of an enforcement mechanism provision by the Commission constitute the awarding of damages?

As Verizon pointed out in its initial, post-workshop Comments, the Commission recognizes that it has no authority to award damages. Since the Commission cannot award damages, it obviously must avoid ordering any enforcement mechanism that amounts to awarding damages. Verizon agrees with BellSouth that, from a legal perspective, it is difficult to view the payments contemplated in this proceeding as anything other than damages. They are clearly unlike any penalties the Commission has assessed in the past under section 364.285 of the Florida Statutes, which defines the Commission's authority to impose penalties on regulated companies. Even Z-Tel admits that the adoption of an enforcement mechanism "constitutes an award for liquidated damages." (Z-Tel Comments at 4.) While AT&T avoids directly answering the damages question in its Comments (*see* AT&T Comments at 3), its plan nonetheless admits that the penalties it proposes "act as a form of liquidated damages." (AT&T Att. 2 at 23 n. 27.) Time Warner also skirts the damages inquiry, but its reference to a performance "remedy" plan is telling. (Time Warner Comments at 1, 2.)

Even if the Commission could make a conceptual distinction between an incentive plan and a mechanism for awarding damages, the CLECs' plans would clearly fall into the latter, impermissible category. As discussed in detail in the following sections, one of the fundamental flaws in the CLECs' "enforcement" or "remedy" proposals is that the payments far exceed any reasonable measure of the amounts needed to ensure that Verizon will provide a proper quality of service. The amounts proposed are so large as to be punitive in nature and thus beyond the scope of any legitimate incentive plan. Thus, even if the Commission could adopt a generic

enforcement mechanism (see discussion below), the CLECs' plans would be unacceptable under the damages analysis.

In any event, the Commission has no authority to order a generic enforcement mechanism, whether or not it is construed as awarding damages. Under the Telecommunications Act of 1996, the Commission can intervene in UNE-related issues and disputes only by means of the arbitration provisions in section 252 of the Act. Establishment of generic terms to be inserted into interconnection agreement would impermissibly circumvent the negotiation and arbitration process Congress established in the Act.

The case the CLECs use to support their advocacy of a generic mechanism, in fact, only confirms Verizon's own legal conclusions about the scope of the Commission's authority. In *MCI Telecommunications Corporation, et al. v. BellSouth Telecommunications, Inc., et al.*, Case No. 4:97cv141-RH (June 6, 2000), the U.S. District Court for the Northern District of Florida held that the Commission could arbitrate the open issue of whether the parties' interconnection agreement should include a compensation mechanism. Contrary to the implications of some CLECs in this case, the case sheds no light on the question of whether the Commission can establish a generic enforcement mechanism in this proceeding. The Court spoke only to the Commission's authority to intervene in disputes within the context of an *arbitration.* Indeed, as BellSouth explains, using a generic, predetermined enforcement mechanism in future arbitrations would seem to contradict the logic of the Court's ruling. If the Commission is expected to arbitrate open issues in a particular case between particular parties, then this process would preclude simply plugging in a predetermined

enforcement mechanism into an interconnection contract. (BellSouth Comments at 6-7.)

In light of the constraints on the Commission's authority to establish a generic enforcement mechanism, Verizon once again suggests that the best and most legally sound approach is a collaborative process through which parties can agree on measures and incentives to be implemented on a voluntary basis. In this way, the Commission can address the OSS issues that Staff has designated, without fear that its efforts will be rendered futile by legal challenges later.

II. TECHNICAL ISSUES

A. <u>General Principles</u>

1. Measures

Verizon believes that an incentive plan should address the set of measures that best reflects the CLEC's ability to compete in the marketplace. AT&T, for example, asks for an exhaustive list of measures to be included in the incentive plan, many of which do not affect the end user and which may exhibit a high degree of correlation. Such measures are not only redundant and uninformative, but irrelevant to this OSS proceeding. AT&T's proposal demonstrates the common regulatory fallacy that a larger number of measures will better facilitate the move towards parity.

2. Testing for Parity

An OSS incentive plan requires testing that accurately reflects the service provided to the CLEC by the ILEC. To execute testing reliability, Verizon proposes the following three principles:

1. Verizon maintains that the *modified-z test* is the preferred statistical test to detect instances of discriminatory behavior without unduly penalizing the

ILEC for false detection of "out-of-parity" service. However, Verizon recognizes the importance of employing the statistical test that yields the *highest power* under various degrees of non-compliance. That is, the test that consistently maintains the best chance of detecting non-compliant behavior should be used, thereby minimizing Type II error.

- 2. Meaningful statistical testing requires that relevant measures be evaluated on like-to-like basis further enhancing the ability of the test to detect instances of both nondiscriminatory and discriminatory behavior.
- 3. Bell South, AT&T and Sprint propose high levels of disaggregation for statistical testing. While Verizon has a vested interest in preserving the integrity of the statistical test, it has not determined that increased complexity is warranted. However, Verizon recognizes that different levels of disaggregation may be appropriate for each provider.

3. Significance Level

AT&T proposes to select the significance level for statistical testing that balances Type I and Type II error with the rationale that the financial risk incurred by the ILEC will equal that of the CLEC. This approach is fundamentally flawed in that it departs from the basic goal of an OSS performance plan. If the point of an OSS incentive plan is to prompt the ILECs to provide parity service, then the focus should be on Type I error. With the appropriate incentive amount in place, the ILECs will provide parity service, making Type II error immaterial. If the ILECs are providing parity service, then by definition there will be no occasion for them to provide non-parity service that will not be detected.

Indeed, one of AT&T's experts, Dr. Colin Mallows, has said that a 5% alpha value correctly accounts for Type 1 and Type II errors. In 1998, in an affidavit filed in a proceeding before the FCC, Dr. Mallows stated:

"If we choose to make the Type I error small, then the Type II error will be large; and conversely. AT&T proposes to set the Type I error at no more than the conventional level of 5%. This controls the

frequency of false alarms to be at most 5% while making the probability of Type II errors small for violations that are of substantial size. Using a one-tailed test for Type I error at about the 5% level thus strikes a reasonable balance (emphasis added)."¹

4. Minimum Sample Size

Minimum sample size is an issue for both the CLECs and the ILECs. The CLECs are concerned that they may receive discriminatory service that may not be penalized when there are a small number of orders. In contrast, the ILECs are concerned that statistical tests based on small samples may be unreliable and too heavily influenced by a single anomalous observation. Small CLECs' concerns should be at least partially alleviated by the fact that the OSS ordering systems are national in scope. Therefore, discriminatory service is not likely to go undetected. However, Verizon also proposes to statistically mitigate the small sample problem by:

- 1. Aggregating the small sample data while ensuring that like-to-like comparison is preserved.
- 2. Establishing lower bounds on permutation testing.
- 3. Trimming outliers from the data.

5. Mitigation for Random Variation

AT&T's Dr. Mallows concurs in Verizon's view as to the need for random variation mitigation in an incentive plan:

If we apply a large number, several hundred, perhaps, of tests of individual performance measurement comparison, each test having a Type I error rate of 5%, then we would expect, on average, about 5% of these tests to indicate non-compliance even when the ILEC is actually fully in compliance. Thus the fact that this many tests indicate non-compliance does not give conclusive evidence that the ILEC is not in compliance with its Section 251 nondiscrimination

¹ "Affidavit of Dr. Colin Mallows" before the Federal Communications Commission in CC Docket No. 98-56, RM 9101.

obligations. The number of tests that erroneously indicate non-parity will vary randomly about this average number. We need to derive some threshold number of failed parity tests such that if more than this number are observed to fail, then non-compliance can be deduced. This threshold number of tests must be determined in such a way as to control the probability of an overall, or aggregate, Type I error.²

6. Benchmarks

There are three main issues associated with benchmarks:

- 1. Standards must be established to reflect the underlying process. Both historical and trial period data must be examined to appropriately determine the benchmark values.
- 2. It is necessary to apply an adjustment for calculating benchmark failure with small sample sizes. Although AT&T, BellSouth and Verizon concur in this principle, there are minor differences among them in the calculations and the upper limits needed for application.
- 3. Correlated or redundant benchmark measures are not meaningful indicators of non-compliant service.

7. Incentives

It is critical to understand that incentive payments are *NOT* damages. Rather, legitimate incentives must be based on the ILEC's financial gain for non-compliant behavior. If the ILEC's profit-maximizing behavior is targeted, then the dollar amount required to induce compliant behavior can be assessed such that efficient market entry is preserved. Excessive incentive payments violate the prime tenets of the Telecommunications Act of 1996.

In addition, both Verizon and Bell South oppose AT&T's notion that incentive payments should be made on a per measure basis. The amount of harm (and potential

² Ibid.

gain from non-compliance) is directly related to the number of affected end-user customers.

8. Trial Period

A trial period for the OSS performance plan is essential to evaluate and recalibrate the model to accommodate unforeseen challenges associated with implementation, measures or testing.

B. Specific Comments

1. Measures

a) <u>Types of Measures Subject to Incentives</u>:

The chief dispute with regard to the OSS measures to be incented is the level to which ILEC activities should be measured for purposes of assessing incentive payments.

AT&T, for example, argues that: "It is beyond dispute that any system of self-enforcing consequences must be based on an underlying set of performance measurements that cover the full panoply of ILEC activities upon which CLECs must rely to deliver their own retail service offerings. The Act requires that these activities, which touch upon every aspect of the business relationship between incumbents and CLECs, must be provided in a non-discriminatory manner." (AT&T Att. A, p.2.).

Contrary to AT&T's view, nothing in the Act requires the kind of measurement approach AT&T suggests, which has little or nothing to do with service provided to the CLEC's end user. AT&T espouses the common myth that, in the words of Professor Sappington, "the more performance measures

included an incentive regulation plan, the better it will perform."³ AT&T's view is at odds with the academic literature on incentive mechanisms, which holds that such mechanisms, to be most effective, must be clearly targeted and limited to the system's objectives. In other words, it is better to limit the number of measures to the important few rather than trying to cover the "full panoply" as advocated by AT&T. Moreover, the full panoply concept seems to open the door to anything that is measurable, whether or not it is important. Essentially, the analogy is that we have one bullet (incentive payments) to hit multiple targets – an impossible task.

BellSouth aptly notes that the correct focus is not the "full panoply of ILEC activities upon which the CLECs must rely," but is instead those measures that directly affect the final residential or business customer. "[E]valuations resulting in penalties should be based only on outcome-oriented metrics that impact the customer's experience. For example, while an end-user would be negatively impacted by a missed installation appointment, the customer does not experience all the subprocesses that may have led to that missed appointment, such as jeopardy notices, held order interval and firm order confirmation interval. Again, the customer only experiences the missed installation appointment. To pay penalties on each of these subprocesses would duplicate the penalty associated with the missed due date." (BellSouth Comments at 12).

b) <u>Problems with Correlated Measures</u>

³ Sappington, D.E.M. 1996. Designing Incentive Regulation for the Telecommunications Industry (p. 122). MIT Press, Cambridge, Mass.

BellSouth succinctly points out the problem with correlated measures. That is, payment of penalties for each of these measures results in multiple payments for the same failure. For instance, if the CLEC has longer held order intervals or firm confirmation intervals than the ILEC, it is also likely to have more missed installation dates. Missed installation dates is the factor that will influence the customer's choice of local service provider and ultimately affect the CLEC's ability to compete (which is the objective). If incentive levels are properly set at the "retained profit" level, then payment for each of these measures represents multiple payments for the same "problem." These overpayments will lead to overinvestment (and economically inefficient investment) in OSS systems, and the overinvestment is likely to be irreversible. That is, we can't "lay off" or reduce prior capital expenditures incurred by too-high incentives.

2. Testing for Parity – Parity Measures

a) Like-to-Like Comparisons

There appears to be consensus on the need for like-to-like comparison among the proposals submitted. In particular, AT&T (and BellSouth) have proposed that the proper basis for statistical testing is "like-to-like" comparisons between the CLEC and ILEC data. In general, Verizon agrees with this principle. In other jurisdictions, the CLECs and Verizon have made progress toward this goal by disaggregating the performance measures into sub-categories, *e.g.*, UNE/ resale, manual/electronic interface. BellSouth has proposed further disaggregation, perhaps down to the wire center level. Verizon, at this time, does not believe that additional computations (such as wire center calculations or

aggregation using the truncated Z statistic) are warranted, at least during any trial period. However, Verizon remains interested in tracking results during the trial period to determine whether further disaggregation would be warranted.

Sprint proposes testing with geographic, as well as product, disaggregation. Verizon believes geographic disaggregation is not advisable during the trial period and that it might undermine the integrity of the test. The parties might better re-evaluate the need for geographic disaggregation after the trial period.

b) <u>Test Statistic</u>

AT&T and Sprint have proposed using the modified Z test statistic for testing whether or not parity performance measures have met the statistical standard for "parity." AT&T has also proposed separate formulae for computing the statistic for average, proportion, rate and ratio performance measures. BellSouth proposes using the same test statistic as AT&T.

Verizon conditionally supports using the mod Z test statistic. That is, the Company is willing to use the test statistic for parity determination during a trial period, and for a more extended period if the statistic "proves out." However, during the trial period, other test statistics, such as the classic and pooled "t" should be monitored.⁴ There appears to be no single "best" test statistic for these types of data and Verizon believes it is best to monitor the performance of other candidates and select the final set after the pilot period.

⁴ The "classic" and "pooled" t-tests are the more widely used test statistics for evaluating hypotheses of this type (*i.e.*, equality of distributions). However, the CLECs have raised concerns that the traditional tests may not be sensitive enough to differences in variances, or spread, between the distributions. Consequently, they have proposed using the "modified Z" statistic, which was designed to test for increased variance in the "treated" (*e.g.*, CLEC) group. Formulas for the classic and pooled Z-statistics can be found in standard statistics texts.

Z-Tel has taken a slightly different approach to testing for parity; however, this approach certainly can't be called non-statistical, as Z-Tel contends. This approach is known in the literature as non-parametric. Z-Tel proposes to compare the distributions of the 2 data sets (CLEC and ILEC) by first determining where the value (*e.g.*, repair time) of the upper 30% and 5% of the ILEC's data occurs (*e.g.*, 5 hours and 10 hours). Then, using these two points, one would then compute the fraction of the CLEC's data that was within these bounds (*e.g.*, 35% and 8%). In this case, there would be an out-of-parity condition, as 5% more of the CLEC data are in the first Zone and 3% more in the last zone. This may appear to be non-statistical, but it simply replaces a comparison of two percentiles (30% and 5%).

There are some additional complications in Z-Tel's approach. First, there are credits for doing better. Suppose the ILEC had 35% in the 30th percentile, but only 3% in the 5th percentile. The 2% "better" performance could be used to offset some of the penalties for the lower 30th percentile. While this concept, in itself, is not necessarily objectionable, it does add complexity to Z-Tel's assertedly "simple" plan.

Next, Z-Tel proposes to make some allowance for historical variation of the data and seasonality (performance is always random and may also vary systematically month-by-month). It initially proposes allowing some slack for both of these events, with the slack factor to be negotiated.

Z-Tel then proposes to establish the ILEC values based on historical analysis. No time period is specified. However, most econometricians would require a minimum of 3 years of data to establish the seasonality adjustments, and one year of data to establish the 30th and 5th percentile values plus the slack needed for random variation. In the absence of historical data, Z-Tel invites the Commission and other parties to establish a benchmark standard for parity measures.

Finally, Z-Tel has proposed revisiting the standard on a periodic basis, perhaps as frequently as monthly, in order to update the standard as service quality for all customers generally increases. If anomalous events such as weather related degradation occur, Z-Tel's remedy is arbitration.

Contrary to Z-Tel's contentions, it has proposed a statistical approach, and an unduly complicated one, at that. This approach compares percentiles rather than the mean and it allows for statistical variation through the use of ad hoc ("fudge") factors rather than accepted statistical calculations (*e.g.*, variance). Although it does not explicitly address Type I/II error, it does so implicitly by the choices of "slack" factors. In general, the literature recognizes that nonparametric test are less powerful (less accurate in assessing whether the null hypothesis, here, "parity," has been accepted/rejected) than parametric tests (*e.g.*, Z-tests).) That is why the non-parametric approaches were abandoned fairly early on in the OSS California workshops.

In addition, the determination of magnitudes of Z-Tel's proposed series of adjustments, which are essential to its plan, is guaranteed to be contentious.

These adjustments are an offsetting credit scheme, a slack factor for "small variations in service provisioning" (*i.e.*, random variation), and "seasonality" (systematic variation). So even if the application of these factors may be straightforward, their determination will be anything but.

In contrast to Z-Tel's non-parametric approach, one of the advantages of a statistical methodology (as proposed by Verizon) is that if a "phenomenon" such as weather affects OSS performance equally for the ILEC and CLEC, then the statistical comparison of averages within the same month will "automatically" compensate for this. In contrast, in Z-Tel's plan, such a phenomenon would appear as below "parity" for the CLEC for that month when compared to the ILEC's historical performance. Verizon would then have to invoke the exception clause and probably provide supporting data before being relieved of incentive payments under the Z-Tel plan.

3. Significance Level / Critical Value

Verizon and Sprint have proposed using the standard accepted 5% significance level that is commonly found in introductory texts.⁵ In contrast, AT&T and Bell South propose to select the significance level of the test (of parity) by balancing Type I and Type II error. The asserted rationale for this approach is that the probability of making a false detection of "out-of-parity" (Type I error) against the probability of making a false detection of "in parity" (Type II error) balances the financial risk faced by the ILEC and CLEC. This is, however, a fairly

⁵ For example, in Bradley Efron and Robert J. Tibshirani, *An Introduction to the Bootstrap*, Chapman & Hall, International Thomson Publishing, 1993 p.204, the following statement on significance levels can be found:

Sigma < .10 borderline evidence against H

Sigma < .05 reasonably strong evidence against H

Sigma < .01 very strong evidence against H.

naïve assertion. If the ILEC is falsely detected "out-of-parity" when it is providing parity service, then the ILEC is harmed by the amount of the incentive payments it has to make to the CLEC. But if the CLEC receives out-of-parity service that is not detected by the statistical test, then it *may or may not* be harmed. That is, whether or not the CLEC loses the customer depends on how poor the service was. For small differences for *key* measures, the customer's choice may not be affected at all, while with larger differences, the customer may be adversely affected. If the incentive payment equals the profit the "at risk" customers represent, then the financial risk to the ILEC equals the probability of a Type I error times the probability of making an incentive payment (given a type I error has occurred) times the incentive amount. The probability of making a Type I error is equal to the significance level of the test. The probability of making an incentive payment when there is a Type I error equals 1. That is, the ILEC always pays when there is a false rejection of parity.

If we compute the CLEC's financial risk, then it equals the probability of Type II error times the probability that the customer leaves (given that there is a difference in service) times the net profit lost. By definition, the first and third terms in both the ILEC's and CLEC's financial risk calculation are equal. Because the probability of a customer leaving (or not choosing) the CLEC is less than 1, then it is obvious that balancing Type I and Type II error does not equate financial risk – as claimed by AT&T. This inequality is exacerbated by AT&T's proposed incentive payments for a "full panoply" of measures (many of which may have no effect on the final customer's experience).

AT&T would require Tier I payments ranging from \$2500 to \$25,000 per CLEC and submeasure missed. As explained more fully below, these dollar amounts greatly overestimate the profit that could be retained by poor service. Under AT&T's error balancing proposal and incentive levels, the financial risk to the ILEC is many times greater than that of the CLECs.

4. Minimum Sample Size

Verizon was unable to find any clear reference to what AT&T proposes to use as a minimum sample size for payment of incentives when the statistical test or parity fails. In its Comments (p.5) and plan (p. 9), AT&T refers to using permutation tests for sample sizes of 30 or less – but with no lower bound noted. In the past (for instance, in California), AT&T has advocated sample sizes as small as 1.

If that is also AT&T's proposal here, it is unrealistic to think results from statistical tests are reliable with as few as 1 observation per CLEC. Verizon proposes paying incentives for failures when there are at least 10 observations in the smallest data set. Verizon also proposes to use permutation tests from 10 to 50 observations and normal approximations for larger data sets. However, Verizon's proposal of testing down to 10 is contingent on a suitable methodology for mitigating the incentive payments that are due solely to random variation.

AT&T proposes that permutation tests could be applied, by mutual agreement, to larger data sets. Verizon would be agreeable to extending permutation tests to all count, rates and ratio performance measures.

Sprint does not propose an explicit minimum sample size. However, Sprint does propose to perform permutation testing on sample sizes less than 6. Verizon believes that using permutation testing below 30 down to 10 is more appropriate, as testing below 10 is typically unreliable. For instance, small sample statistics can be overly influenced by one or two anomalous observations. Given the limited experience with any historical data, statistical testing with very small samples is unwise, especially with the lower statistical threshold for rejection and the huge incentive payment levels.

5. Mitigation for Random Variation – Multiple Tests

AT&T opposes mitigating incentive payments due only to random variation--*i.e.*, payments made by the ILEC for false rejections of parity. This position is based on AT&T's flawed premise that its mechanism for balancing Type I and II error also balances the financial risk for both parties. As explained above, AT&T mistakenly states "[i]f these two probabilities are balanced, then, the consequences for 'false' failures conceptually offset the consequences for undetected failures." Otherwise stated, the small remedy payment by the ILEC under falsely declared non-compliance is conceptually balanced with the market losses experienced by the CLECs due to falsely detected compliance." (AT&T Att. 2, pp. 50-51). The flaws in this approach were discussed briefly above, but they are threefold:

First, balancing Type I and II errors balances only the errors – not the financial risk. The fact that a false determination of parity (Type II error) occurs does not mean that CLEC experiences a market share loss. This will depend on

whether the measure is important to the final residential or business customer and how much poorer (that is, different from the ILEC's own service level) the level of service actually was. However, if a Type I error occurs (false rejection of parity), then the ILEC will have to make an incentive payment – so the ILEC is always harmed by a Type I error.

Second, AT&T's proposed enforcement payments, which begin at \$2500 and increase to up to \$25,000 per measure, can hardly be termed "small," especially since any CLEC, regardless of the number of orders (recall that AT&T's proposal may incent down to 1 transaction) receives the same payment for numerous sub-measures. AT&T's proposal to choose a significance level based on balancing errors is likely to result in a higher number of Type I errors than is typically accepted in standard hypothesis testing. Coupled with the "large" incentive payments, regardless of the scale of the CLEC, and the numerous sub-measures subject to incentives, then it shouldn't be surprising that the resulting financial risk is mostly on the ILEC.

Verizon proposes using a statistical approach to mitigate unwarranted incentive payments due to random variation. The approach is similar to that used to construct the "benchmark adjustment table" for small sample size proposed by AT&T, Verizon and Bell South. The methodology computes the expected number of "missed" performance measures (per CLEC), which depends on the number of sub-measures subject to incentives and the significance level. This approach is similar to that proposed by Dr. Mallows for AT&T in the California workshops.

Sprint proposes a credit plan to mitigate for random variation. Under the plan, the ILEC receives 2 credits for failures per year per measure. That is, given the clauses included in the Sprint plan which limit the use of the credits, an ILEC is allowed to miss on 2 measures annually. Sprint specifically restricts the misses to ordinary level misses, excluding chronic and more severe misses. While Verizon prefers its statistical approach for its own plan, Sprint's proposal confirms the need for a mitigation mechanism.

6. Benchmarks

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a) Establishing and Interpreting the Benchmark Standard

The purpose of the benchmark, as stated correctly by AT&T, is "to define the level of performance that is judged essential to permit competition on a going-forward basis" (Att. 2, p.13). However, AT&T makes a tremendous leap of logic in concluding that "the benchmark level is at the lower range of what a viable competitive support process should be capable of delivering on a routine basis." (Att. 2, p.13) It makes yet another great leap in stating that "the limiting performance is expressed as 'B% meet or exceed the benchmark' where 'B%' is a proportion figure set less than 100% in order to account for random variation considerations." (AT&T Att. 2, p.13).

This is an astonishing set of assertions, given that benchmarks have generally been established with little or no historical performance data and the associated decisions did not embody any statistical considerations. It strains credulity to accept that these wholly subjective benchmarks represent the 'lower range" of what is viable, let alone that they account for random variation. More

honestly, they represented "informed" guesses, arrived at by negotiation, as to what might be necessary to ensure a meaningful opportunity to compete; the "B%" reflects uncertainty about what the standard should be (absent data) rather than any explicit accounting of mitigation for random variation.

b) <u>Small Sample Problems/Granularity</u>

AT&T proposes to apply an adjustment for calculating the B% standard for benchmarks with small sample sizes (AT&T Att. 2, Table 2, p. 14). In general, BellSouth and Verizon endorse this approach, but there are minor differences in how the calculation is made and what the upper limit for application is (AT&T limits it to 30 or less observations; Verizon would extend the calculation to 100).

7. Incentives

Below, Verizon addresses chief points of contention in context of the respective AT&T and Z-Tel plans.

a. <u>AT&T Incentive Payment Mechanism</u>

i) Per Occurrence or Per Measure?

AT&T proposes establishing payments on a per measure basis, where payments range from \$2500 to \$25,000 (Tier I) per "failed" metric, regardless of the "scale" of the CLECs. Both BellSouth and Verizon propose payments based on the "number of failures" per CLEC, which takes into account the number of orders received from the CLEC. The latter approach explicitly recognizes that the amount of harm (and potential gain from non-compliance) is directly related to the number of

final customers affected and that a "one size fits all" payment is incompatible with a properly designed incentive system.

ii) Tier I Incentives

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1) Parity – Severity, Payments

As noted, AT&T proposes amount ranging from \$2500 to \$25,000 per sub-measure missed (per CLEC) for Tier I payments accrued by the CLEC. It provides no real support for how it arrived at these amounts, summarily stating that "[t]otal consequences, in the aggregate, must have sufficient impact to motivate compliant performance without the need to apply a remedy repeatedly" (AT&T Att. 2, p.4); and "the consequences must provide the ILEC with incentives that exceed the benefits it may derive by inhibiting competition" (AT&T Att. 2, p.1).

AT&T's views contrast sharply with the approach developed by Nobel laureate Professor Gary S. Becker⁶ (and cited by Z-Tel) where the optimal remedy for noncompliance depends on the ratio of increased profits (from noncompliance) to the probability of detection. Clearly, Professor Becker's rigorously derived prescription finds no need to ensure that the incentives exceed the retained profits (or benefits). In addition, AT&T has provided no support for how it determined that the amounts it proposes achieve the goal it has set forth.

⁶ Becker, Gary S., "Crime and Punishment: An Economic Approach," in G. Becker & W.L. Laudes (ed.), <u>Essays in Economics of Crime and Punishment</u>, Columbia University Press, NY, 1974, pp.1-54.

AT&T rationalizes that incentives should be increased "as the confidence in a "Non-Parity" conclusion increases. (AT&T Att. 2, p. 10). Although AT&T notes that the mod Z statistic "does not quantify 'how far out of parity' the process is when parity is not indicated" (AT&T Att. 2, p.7), the proposal presents a convoluted scale for severity based on the actual (computed) Z-score and the balancing Z-score. The Z-score is an imperfect measure of the severity of the miss, as it is affected not only by the difference between the ILEC and CLEC means, but also by the sample sizes. The Z-score, for a given difference in means, will increase over time if the number of orders (sample size) increases - not simply because the miss is becoming more severe. Additionally, AT&T has provided no rationale for the breakpoints between "basic," "intermediate," and "severe" failure, which contrasts unfavorably with Verizon's simpler and sounder method of scaling the severity of the miss on the actual percentage difference between the two means.

In short, AT&T's plan—with its unduly large number of incentives, unnecessarily high incentive payments, and lack of scaling payments by size of the CLEC—will undermine the public interest without significantly advancing the legitimate goals of an incentive plan. Above all, it is critical to set an appropriate limit on the amount of dollars at risk. Setting the level of incentive payment

too high will result in "over-deterrence." That is, a level set too high will force Verizon to make huge investments in wholesale systems and personnel in an effort to avoid incentive payments, without commensurate benefit to CLECs, the public, or competition. If Verizon is required to pay more than the amount reasonably necessary to induce it to provide the CLECs with the appropriate level of service quality, the Company will be compelled to provide wholesale service that is better than its retail service in order to avoid those payments. Verizon will be forced to under-invest in retail service and over-invest in wholesale service, shift its personnel away from efforts to serve retail customers, and delay the introduction of new technologies or systems for both retail and wholesale service.

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These anti-consumer effects will be exacerbated if CLECs are permitted to receive large payments for performance standard "misses" that are of small magnitude and minor competitive impact. In such circumstances, the CLECs have no incentive to work with Verizon to prevent operational problems or to report problems quickly. CLECs also will be discouraged from investing in their own systems and facilities. Instead of facilitating competition, the payments the CLECs propose will create incentives for companies to go into business simply to receive payments or to engage in conduct designed to cause Verizon to fail to meet performance

standards, rather than to provide end users with a competitive alternative for local service. This result would directly undermine this Commission's mission to encourage local competition.

2) <u>Functional Form</u>

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In addition to proposing an indirect and convoluted method for computing severity, AT&T has also introduced a complex formula for computing the actual dollar amount for Tier I payments. (See Table 1, p.11 of AT&T Att. 2.) The primary justification for the equation appears to be that it fits a smooth curve between the starting value of \$2500 and the ending value of \$25,000. For no apparent reason, AT&T states "the calculated remedy should be a continuous function of the severity of the failure as measured by the z-statistic. In this way, small changes in severity lead to small changes in consequences thus assuring that mathematically chaotic behavior is avoided at step thresholds." (AT&T Att. 2, p.10.) In truth, incentive systems function much better when the incented party is better able to predict the consequences of its behavior. Under these circumstances, the affected party can more reliably trust its benefit/cost calculations to guide its behavior. The "continuous function" approach would appear to only introduce greater uncertainty into the process (you'd need to predict Z, Z* and then compute the dollar amount from the equation) and therefore only blunt the incentive instrument. In addition, this approach

departs from simplicity as a guiding design principle. Severity is the difference in performance that would appear to best measured directly (as Verizon has proposed) rather than by an indirect method.

3) Chronic misses

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AT&T and Verizon agree that 3 consecutive months constitute a "chronic" miss and that incentives should be increased, although, once again, Verizon disagrees with AT&T as to what the appropriate dollar amount should be.

4) Benchmarks – Severity

AT&T proposes a three-level severity scale for incentive payments (Table 3, Comments at 8) and an arbitrary formula for categorizing misses into basic, intermediate and severe failures. Again, like the parity measures, no justification is provided for the break points – and again the formula purportedly saving us from "mathematical chaos" is applied to calculate the actual incentive amounts.

5) "Incorporation of Randomness"

AT&T proposes to include B% allowances in the benchmarks to account for random variation. As explained above, the B% approach is nothing more than an expression of uncertainty as to what the standard needs to be in order to provide CLECs the capability to compete. AT&T's B% approach has no basis in

historical performance data or statistical analysis. As such, it should be rejected.

iii) Tier II Incentives

In addition to the Tier I incentives that AT&T has assertedly designed to "exceed the benefits [the ILEC] may derive by inhibiting competition," AT&T has proposed an additional set of incentive payments, Tier II, that are payable to the state. AT&T states that the purpose of the Tier II incentives is "to enhance the ILEC's incentives to provide performance that complies with its statutory obligations....Tier II incentives are designed to counterbalance the ILEC's incentive to damage not just individual firms but the competitive marketplace itself." (AT&T Att. 2, p17). In AT&T's view, mitigation of incentive payments for random variation is not necessary because "properly calibrated" incentive payments "eliminate the need for additional forms of protection" for CLECs with respect to intentional discrimination. (AT&T Att 2, p17)

As explained above, AT&T has set incentive payments too high, and its Tier II system is part of this fundamental problem with AT&T's plan. Again, if incentive payments are set too high (*i.e.*, above the benefits of non-compliance), then the ILEC will inefficiently expend resources to increase OSS performance well above "parity" (see W. Kip Viscusi, "Frameworks for Analyzing the Effects of Risk and Environmental Regulations on Productivity," American Economic Review, September, 1983, pp. 793-801). If incentives are "excessive," then the ILEC will

attempt to minimize incentive payments by investing in (capital) service improvements that are well above the "parity" level. As Professor Viscusi has noted, these expenditures do not come without a societal cost. He notes that in the environmental arena, "A series of studies has linked these regulations to productivity slowdown. inflation and unemployment....The existence of a negative relationship between the regulatory burden and capital investments, and consequently productivity is not controversial.... If however, these regulations change over time and firm's investment decisions are irreversible, there will be additional distortions." (Viscusi, p. 793)

AT&T has admitted that its Tier I incentives are designed to exceed the benefits of noncompliance; with Tier II incentives, it attempts to impose an additional, undue financial burden on the ILECs. First, it is not obvious how the ILECs would escape Tier I payments if they are discriminating against individual CLECs. If the Tier I incentives were "properly calibrated," there should be no need for an additional layer of incentives. As Professor Viscusi has noted, these excessive incentives will only lead to non-optimal investment in capital and quality and, in turn, decreased productivity and under-capitalization for non-OSS assets.

The lack of sound rationale and economic grounding for AT&T's plan is further evident in its proposal to adjust incentive payments by a market share adjustment ('n'), based on the notion that one instance of non-parity service would have a greater impact on a small CLEC's ability

to compete than it would have on a large CLEC. The obvious flaw in this reasoning is that a competitive environment does not automatically confer market share. It simply implies that price has been driven down to marginal cost. AT&T's proposal ignores the plain fact that CLEC market share is primarily affected by numerous factors exclusively within the control of the CLEC itself. AT&T's additional mechanism to ratchet up incentive payments only magnifies the folly of the entire Tier II proposal.

iv) Plan Exclusions

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AT&T acknowledges that the ILEC should not be denied protection from making incentive payments for events beyond its control. (AT&T Att. 2 at 24-35.) However, the complex, expensive and time-consuming process it proposes for determination is of excludable events is plainly unworkable. In short, AT&T outlines a kind of paper hearing process, under which there is no predetermined list of excludable events. Instead, each extraordinary occurrence will need to be, in effect, litigated, with a decision from the Commission as to whether the ILEC should be excused from payment for the event. AT&T even includes a provision for award of attorneys' fees to the CLEC if it should win the dispute (but none if the ILEC should win)—yet another avenue to obtain unwarranted payments from the ILEC.

Under AT&T's approach, CLECs will have nothing to lose in contesting every exclusion. Verizon does not believe the Commission wishes to waste its limited resources in becoming involved in this kind of

contentious process, which will require a decision in every case for each assertedly affected CLEC. There is no need to diverge from the simple, customary and longstanding approach used in both telecommunications tariffs and commercial contracts—that is, a listing of "force majeure"-type events. These usually include, for instance, natural catastrophes, labor disputes, civil disturbances, and other such events beyond the contracting party's control. The specific list can be negotiated among the parties and included in the plan.

v) Additional Enforcement Mechanisms

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In addition to Tier I and Tier II payments, AT&T proposes yet more layers of incentives, purportedly to enforce the operation of the plan. (AT&T Att. 2 at 27.) For instance, AT&T recommends substantial financial penalties for late, incomplete, or revised performance reports. These kinds of penalties are unnecessary and counterproductive. There is no basis for an assumption that Verizon will hide bad reports. Moreover, although Verizon does not anticipate technical problems in generating reports, the Company should not be subject to penalties if it occasionally experiences such problems. Finally, it would create perverse incentives to impose penalties on Verizon for correcting performance reports to ensure their accuracy. This Commission should reject such counterproductive and unnecessary penalties, as has the Pennsylvania Public Utilities Commission.

vi) Incentive Caps

AT&T properly distinguishes between absolute and procedural caps. Absolute caps are the dollar amount that incentive payments can never exceed, while procedural caps trigger an administrative review to determine whether additional payments are warranted or the incentive mechanism is flawed.

AT&T opposes absolute caps because "First, such caps provide an ILEC with the means to evaluate the cost of market share retention through delivery of non-compliant performance. Second, absolute caps send the signal that once the ILEC's performance deteriorates to a particular level (*i.e.*, reaching the absolute cap) then further deterioration is irrelevant." (Att. 2, p. 22) This line of reasoning is seriously flawed.

First, as Professor Becker has noted, proper design of incentives is based on the ILEC's trade-off of benefits of non-compliance against the penalty. This is exactly what the Commission should seek to accomplish in its incentive mechanism. With regard to the second point, if the absolute cap is "properly calibrated," then there is no incentive for the ILEC to expend resources in search of further deterioration. That is, the absolute cap should be set at the value of the market to the CLECs. For example, most secondary market research sources estimate that the CLECs should eventually be able to obtain 30% market share. Therefore, the market value to the CLECs equals the average net margin per customer times the number of access lines. If OSS performance was so

poor as to reach this cap, there would be no additional incentive for the ILEC to engage in further discrimination as (1) it would have already retained all of the potentially lost customers and (2) such action would be costly. This also establishes the proper rationale for setting an absolute cap. Total incentive payments should never exceed the value of the market to competitors.

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As to procedural caps, AT&T notes that they may be useful if properly implemented. Verizon agrees with this principle, but disagrees with AT&T's implementation conditions. First, AT&T proposes that procedural caps should apply not to Tier I consequences for the CLECs but only to Tier II consequences. AT&T's limited justification is that "Tier I consequences principally act as a form of liquidated damages. Thus, there is no justification for capping such consequences whether for an individual CLEC or the industry as a whole." (AT&T Att. 2, footnote 27, p. 23.) As Verizon has already established, there is a theoretically justifiable limit on the absolute cap – the value of the market to the CLECs – regardless of the type of payment. The procedural cap obviously should be set at something less than this if it is to function as an "early warning device." Since there has been no state-ordered OSS performance plan and only limited historical data exists, there is no guarantee that any plan is going to work as advertised. Therefore, once a plan is in place here, it will be necessary to test whether all facets are working as envisioned. This includes the measures incented, the test statistic, significance level,

minimum sample size criteria, benchmark levels, and incentive amounts. It would be premature to exclude any form of incentive payment from the procedural cap any payments to the CLEC.

b) <u>Z-Tel's Incentive Payment Mechanism</u>

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Z-Tel claims to take a flexible incentive approach that can be adapted to either a per measure or per occurrence incentive scheme. It cites Professor Becker's article, referenced above in Verizon's critique of AT&T's incentive plan, as the theoretical underpinning of its incentive approach. However, it appears that academic theory is conveniently ignored at critical points in Z-Tel's proposal. For instance, Z-Tel cites Professor Becker's equation that shows the optimal remedy for non-compliance is equal to the ratio of the increased profits to the probability of detection (p.17, A). The underlying intuition is that a profitmaximizing firm will trade off the benefits of non-compliance (retained profits) against the expected value of the incentive payments. As the probability of being detected gets close to certainty (=1), then the optimal remedy is just equal to the retained profits. However, when the probability of being detected is less than 1, then the expected value of the penalty (equal to the probability of detection times the incentive amount) falls if the remedy amount remained constant. Therefore, in order to get "optimal" behavior the remedy increases with lowering of the probability of detection in order to keep the expected value of the remedy constant.

Z-Tel frequently ignores that the numerator, increased profits, is an incremental, rather than total, quantity throughout their exposition. The

numerator varies with the magnitude of the difference between ILEC and CLEC performance. And the magnitude of the difference will vary systematically with the probability of detection (*ceteris paribus*). That is, the probability of detection will be low for small differences in service (because with two means are not very far apart and without a large number of observations its difficult to distinguish between random variation and actual discrimination). But the incremental retained profits will also be small, because most customers won't notice or be affected by small differences in the service, and therefore their choice will not be affected by the difference. However, higher probabilities of detection will be associated with larger differences in service, which are likely to result in a customer's not choosing a CLEC, and therefore higher incremental retained profits. Z-Tel instead assumes that a failure of one measure at any difference in one month leads to an irretrievable loss of the customer and therefore calculates the optimal remedy based on an annuity formula (to deal with the stream of lost revenues).

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This approach was aptly criticized by the New York Commission as being too extreme when Dr. Ford presented it there on behalf of MCI WorldCom. In response to the petition filed by Bell Atlantic-New York for approval of a performance assurance plan, the State of New York Public Service Commission (in its Order in Case 99-C-0949) concluded that "...their [MCI WorldCom's and AT&T's] methodology is flawed. First, both assume that poor performance in year one will result in ongoing benefits for at least ten years. It has not been demonstrated that poor service in year one that is corrected would cause

irreversible and cumulative damage in the following years" (NYPUC Order at 16). This approach also ignores that we are proposing to "incent" 149 submeasures, of which one customer can "touch" many. Therefore, the optimal remedy should either be spread across the number of measures "touched" by one customer or only applied to a limited number of key measures (or applied on a weighted basis in accordance with the importance of the measure to the customer's experience).

Z-Tel also attempts to "pile on" the incentive dollars by extending the incentive payment beyond the financial gain of non-compliance, thereby confusing damages and proper incentive payments. It states that there are three potential sources of economic gain for Verizon: (1) retained profits from a customer not switching carriers; (2) systematic deterrence of competitive entry because of either "brand name" damage or scaling back of the CLEC's entry plans and (3) increased market share from long distance and xDSL revenues. For a number of reasons, these speculative assertions must be disregarded as an attempt to justify asking for more money.

First, Verizon's earlier-discussed criticism applies here, as well. That is, Z-Tel simply assumes that a one-time violation results in irretrievable revenue loss from these sources, whatever the magnitude of the difference. This conclusion is plainly too extreme.

Second, systematic deterrence and loss of brand name equity (if such a concept exists at all) are properly matters for the judicial system (rather than an incentive plan), with the burden of proof on the CLEC. Z-Tel illustrates how

much of a stretch one has to make to quantify this in stating that "the relevant question is how many customers are indirectly affected by a single act of discrimination" (p. 27, A), as distinguished from those directly affected.

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Third, Verizon's gaining long distance and xDSL revenues is wholly speculative. Z-Tel's plan asks us to assume that if a customer chose Verizon for local service, then the rest of the bundle follows. This conclusion is certainly at odds with Verizon's experience in the intraLATA toll market, where it lost most of its market share after equal access implementation.

Z-Tel further proposes that per-occurrence penalties should be based on a percentage of ILEC annual retail revenues. Again, the flaw in this proposal is the assumption that a customer has been irretrievably lost because of the lower level of service for that measure. Interestingly enough, Z-Tel argues that the per-occurrence penalties should not be the same across all measures as the financial gain (through discrimination) would be different (p. 26). Verizon would agree with this concept, which suggests that either a "weighting" approach or varying incentive structure should be adopted.

Verizon would also agree with Z-Tel that incentives with increased duration of non-compliant service are appropriate, as continued poor service is likely to lead to Verizon retaining more customers. However, it isn't clear what the monthly criteria for severity is in Z-Tel's proposal. Verizon believes a 3month period is reasonable given that it will take about 1.5 months to recognize a problem, and optimistically, another month and one-half to figure out what to do

and to develop the training/corrections necessary and to implement the corrective measures.

Finally, Z-Tel proposes to keep the severity payments in play until the ILEC has provided parity service for several (unspecified) consecutive months. It defends this approach on the grounds that the "repetitious failure indicates that the penalty level is too low" (p.23, A). As discussed earlier, this is not necessarily so. Rather, it just takes time to turn the ship around. In addition, Z-Tel misses the other side of its argument – that penalties should be reduced with consecutive months of "parity" service.

8. Trial Period

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Verizon continues to maintain that there is strong justification for a trial period for any OSS incentive mechanism. Among the commenters, only WorldCom seems to explicitly oppose this concept.

The purpose of the test period is chiefly to examine a proposed model in actual operation, allow reasonable variations from the "model" to test different parameters, and then evaluate the data and results to determine whether the trial has shown the model to be workable and reasonable. Especially when the process of designing incentive mechanisms is embryonic throughout the country, it defies logic and reason to presume that the model devised here will work perfectly in all respects. There is an overwhelming requirement to test, under actual working conditions, any incentive plan to determine whether it detects a lack of parity and invokes reasonable incentives when that condition arises, but does not arbitrarily penalize the incumbents when they are offering parity service.

In addition, the trial period would allow for "learning-by-doing," system enhancements and improved training. These conditions are accounted for with statistical methods.

Verizon proposes that incentives paid during the test period be placed in escrow until the six-month period ends. Following this period, the plan will be evaluated and recalibrated to accommodate unforeseen challenges. The final payment to the CLEC will be adjusted and will reflect any new changes in the plan.

Respectfully submitted on September 29, 2000.

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that copies of Verizon Florida Inc.'s Rebuttal Comments in Docket No. 000121-TP were sent via U.S. mail on October 4, 2000 to the parties on the attached list.

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