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OFFICE OF THE
EXECUTIVE SECRETARY

July 12, 2002

The Honorable Sara Kyle, Chairman
Tennessee Regulatory Authority
460 James Robertson Parkway
Nashville, TN 37243-0505

In Re: BellSouth Telecommunications, Inc.'s Entry Into Long Distance (InterLATA) Service in Tennessee Pursuant to section 271 of the Telecommunications Act of 1996

Docket No. 97-00309

Dear Chairman Kyle:

Please accept for filing the original and fourteen copies of the testimony of Colette Davis and Terry L. Murray on behalf of Covad Communications Company in the above-captioned proceeding.

Very truly yours,

BOULT, CUMMINGS, CONNERS & BERRY, PLC

By: Henry Walker

Henry Walker

HW/nl
Attachment

FILED 7/16/02

CERTIFICATE OF SERVICE

I hereby certify that on the 12th day of July, 2002, a copy of the foregoing document was served on the parties of record, via hand-delivery, overnight delivery or U.S. Mail, postage prepaid, addressed as follows:

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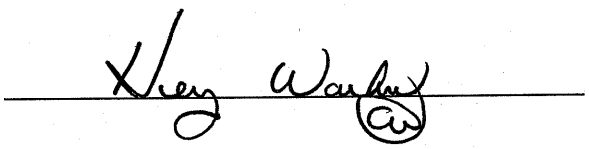

BEFORE THE
TENNESSEE REGULATORY AUTHORITY
Nashville, Tennessee

In Re: BellSouth Telecommunications, Inc.'s Entry into Long Distance (interLATA) Service in Tennessee Pursuant to Section 271 of the Telecommunications Act of 1996	))))	Docket No. 97-00309

DIRECT TESTIMONY

OF

COLETTE DAVIS

OF

COVAD COMMUNICATIONS COMPANY

July 12, 2002

Q. Please state your name and business address.

A. My name is Colette Davis. I am the Director of ILEC Relations for Covad Communications for the BellSouth region. My address is 1230 Peachtree St., N.E., 19th Floor, Atlanta GA 30309.

Q. What is the purpose of your testimony.

A. My testimony offers Covad Communication Company's perspective on whether BellSouth has fully opened its local markets in Tennessee to competition, as required by the Telecommunications Act. Specifically, I will comment on whether BellSouth has met Checklist Item 2 (non-discriminatory access to Unbundled Network Elements, like OSS) and Checklist Item 4 (non-discriminatory access to loops).

Q. Please describe your responsibilities at Covad.

A. I am the Director of ILEC Relations for Covad for the BellSouth region. In that capacity, I am involved in the day to day operations of Covad's relationship with BellSouth, its sole supplier of unbundled network elements. I function as the liaison between BellSouth's and Covad's operations groups in the resolution of operational issues arising from Covad's use of BellSouth OSS systems, as well as pre-ordering, ordering and provisioning systems. I participate in ensuring that Covad's operational issues are appropriately escalated and addressed by the various BellSouth work groups that affect Covad's ability to be successful in this region, including the CRSG, the CWINS group, the LCSC and Covad's account team.

Q. Please describe your career prior to joining Covad.

A. Prior to joining Covad in July 2000, I worked at Project Management Services, Inc. ("PMSI") as an Assistant Vice President of Professional Services Division. In that role, I

directed strategic network infrastructure projects for our clients. During my tenure at PMSI, I provided project management services to the BellSouth ADSL network process improvement project. Earlier in my career, I worked for BellSouth for 15 years in the Consumer Operations department. In that capacity, I held responsibilities including business office line management, staff support for force management, customer service and carrier services as well as managing consumer projects.

Because of my project management and Operation Support Systems (OSS) background, my work at Covad focuses on managing our OSS needs and ensuring that BellSouth develops the functionalities necessary to enable Covad to successfully compete in this region. Because of my work with other ILECs while at Covad, I gather the best practices from around the country and implement them in the BellSouth region, when appropriate.

Q. How is your testimony organized?

A. It is organized by Checklist Item. As mentioned above, Covad will focus on Checklist Item 2 (non-discriminatory access to Unbundled Network Elements, like OSS) and Checklist Item 4 (non-discriminatory access to loops).

I. CHECKLIST ITEM 2: OPERATIONAL SUPPORT SYSTEM

Q. What must BellSouth do to comply with Checklist Item 2?

A. Although I am not a lawyer, my general understanding is that BellSouth has the burden of proving at least two things: (1) that it has deployed the necessary OSS systems and personnel to support those systems for use by competitors; and (2) that its systems are operationally ready, as shown either by testing or by

commercial usage. As my testimony will show, BellSouth cannot prove either of these requirements.

A. BELLSOUTH HAS NOT DEPLOYED THE OSS SYSTEMS NECESSARY TO COMPLY WITH CHECKLIST ITEM 2

(1) BellSouth Has Failed to Mechanize the Ordering of Critical DSL Loops

Q. When you talk about mechanization of the ordering process, what are you referring to?

A. Covad orders a loop by submitting a Local Service Request (LSR) to BellSouth. There are many ways to do this: the order can be faxed, or input through on an interface on the internet, or placed electronically in some other fashion. "Mechanization" of ordering refers to the process whereby manual steps in ordering procedures—like using a fax machine—are eliminated and more efficient ways of ordering are implemented. The ideal process is one in which human intervention is done away with entirely for the middle portions of the ordering process. When this sort of efficiency is obtained, the process is said to be a "flow-through" process, and it works like this:

(1) Covad gets a call for service from a new customer;

(2) Covad inputs the customer's information into a computer interface designed by Covad to match specific parameters provided by BellSouth;

(3) the customer information automatically populates a BellSouth electronic LSR form;

(4) the LSR is transmitted to BellSouth;

(5) a BellSouth computer receives the LSR and processes it automatically;

(6) tasks necessary to fill the order are automatically generated and sent electronically to BellSouth personnel responsible for completing the order;

(7) the BellSouth computers also transmit a Firm Order Commitment (FOC) to Covad;

(8) Covad's internal OSS extracts necessary information from the FOC, updates internal databases, and routes necessary information for completing the order to appropriate Covad personnel;

(9) BellSouth personnel take the steps necessary to complete the order;

(10) An order completion notification is sent to Covad;

(11) Covad personnel take the final steps necessary to activate service for Covad's customer; and

(12) The order is closed.

Q. Why is mechanization important to Covad and other CLECs?

A. A mechanized ordering process provides (1) a better customer experience because it operates faster; (2) increased efficiency; and (3) lower costs.

Q. In what areas does BellSouth have its biggest problems in providing the efficiencies of mechanization?

A. BellSouth does not provide mechanization for either UCL-ND Loops or Conditioned Loops.

Q. What is the Unbundled Copper Loop — Non Designed (UCL-ND)?

A. It is a plain copper loop over which Covad can provide its customers with various DSL services. BellSouth began offering this loop in response to the concerns of Covad and various state commissions regarding BellSouth's expensive and unnecessary "design services" that it performs on what it calls DSL capable loops.

The UCL-ND loop is less expensive than the BellSouth xDSL loops because it does not go through the BellSouth "design process." Unfortunately, the early promise of this loop has been squandered by BellSouth's refusal to mechanize it and its apparent inability to provision it properly (discussed in more detail below).

Q. When will the UCL-ND be mechanized?

A. This is unknown. *Partial* mechanization of this loop was supposed to occur on July 13, 2002, but this has already been delayed until August 24-25, 2002. BellSouth also claims that full mechanization of this loop will occur in its December 2002 software releases. Based on its past experience, it is unknown whether it will adhere to this schedule.

Q. What is loop conditioning?

A. This is the process by which electronics in a circuit that could interfere with the transmission of DSL signals are removed.

Q. Why is mechanization of loop conditioning order important?

A. Without a mechanized process, for any loop that requires conditioning, Covad is forced once again to revert to a manual ordering process, not because Covad lacks the tools to place the order electronically, but, rather, because BellSouth has not made that functionality available. Thus, for a loop that requires conditioning, any advantage obtained from mechanization of the loop ordering process is lost.

Q. How should the process work to order conditioned loops?

A. The process should be integrated into the mechanized loop ordering process. In other words, Covad should be able to place an order for a loop that directs BellSouth to condition the loop if, and only if required. This avoids the costly and

time-consuming process of being forced to manually submit a separate order for conditioning. At a minimum, however, Covad should be able to order loop conditioning in a flow-though process that requires as little human intervention as technologically possible.

(2) Serious Problems Remain With the Mechanization of the Line Shared Loop

Q. What is a Line Shared Loop?

A. This is a loop that is "shared" with BellSouth. Covad uses the high-frequency portion of the loop to provide its customers with data services via DSL technology while BellSouth uses the low-frequency portion of the loop to provide plain old telephone service (POTS) to the same customer.

Q. Why are Line Shared Loops important?

A. Line Shared Loops are the principle means by which Covad delivers DSL services to residential customers in Tennessee. Without this UNE, it would be virtually impossible from an economic standpoint for Covad or any other CLEC to provide DSL access at an affordable price for residential use.

Q. Does BellSouth use line sharing technology to provide DSL services to its own customers?

A. Yes, and using line sharing technology has enabled BellSouth to rapidly deploy DSL throughout the region. By using the high frequency portion of the local voice loop, BellSouth has been able to add more than 620,000 DSL customers to

its network, and it projects that this number will climb to 1.1 million by the end of the year.[1]

Q. Why should the TRA compare BellSouth's systems for placing line sharing orders for itself to those that BellSouth provides for Covad's orders?

A. Quite simply because these systems ought to be nearly identical given that BellSouth and Covad are providing virtually identical services over the high-frequency portion of the voice loop. Under these circumstances, it should be easy for the TRA to evaluate whether BellSouth's ordering systems for CLECs are as good as the ordering systems that it uses for its own retail DSL services.

Q. Is the ordering system that BellSouth uses for its own retail DSL services the same as the system it provides for CLEC ordering?

A. No. Although BellSouth has a fully mechanized ordering process for itself, it has proven unable or unwilling to provide flow-through mechanization for the ordering of Line Shared Loops by CLECs. There are two specific and ongoing defects with its system.

Q. Please describe the first major defect with BellSouth's Line Shared Loop ordering process.

A. Covad places orders for Line Shared Loops by submitting a Local Service Request (LSR) to BellSouth. BellSouth responds to the LSR with a Firm Order Commitment (FOC) that contains a variety of information that Covad uses to enter the order into its database, track the order, and—eventually—reconcile the bills that BellSouth sends to us. One critical piece of information that should be contained in the FOC but is not is the pseudo circuit number. When BellSouth

[1] BellSouth press release dated January 3, 2002 (available at http://bellsouthcorp.com/proactive/newsroom/release.vtml?id=38723)

sends Covad a bill that contains—among its thousands and thousands of entries—the charges for a single line shared loop serving one of Covad's customers, those charges will be identified only by the pseudo circuit number. If Covad does not have that number it is impossible to determine if we are being billed properly. To solve this defect in BellSouth's OSS, Covad is forced to stop the flow-through process of the order, manually access the FOC, use information contained on the FOC to manually access BellSouth's CSOTS database, extract the pseudo circuit number from that database, manually input the pseudo circuit number on the Covad order, then manually complete and close the order.

Q. Why is the fact that BellSouth's OSS defect forces Covad to handle a Line Shared Loop order manually so harmful to Covad's business?

A. Because manual handling is very expensive. In order to provide Tennessee consumers and small businesses with innovative, cost-effective DSL service offerings, Covad has automated its processes to the greatest extent possible, thereby minimizing human intervention and maximizing the savings and the quality of service that we can pass on to our customers. By forcing us to incur manual handling fees that it does not incur itself, BellSouth is treating Covad differently than itself. But this is by no means where the problem stops.

Q. Does BellSouth incur these added costs that it imposes on CLECs because of this defect in its OSS?

A. No. BellSouth has complete flow-through mechanization for its retail line sharing orders, yet it has thus far refused to even commit to a date on which it will solve this costly defect for Covad and other CLECs

Q. Has Covad attempted to use the Change Control process to have BellSouth begin giving it the information that it needs to be able to check BellSouth's billing practices?

A. Yes. As will be discussed in detail below, on January 18, 2002, Covad submitted Change Request 621-FTTF36 (attached hereto as Exhibit 1) to BellSouth specifically requesting that this serious defect be corrected. Today, six months later, BellSouth has yet to even scheduled a date on which this defect will be fixed.

Q. In addition to BellSouth's refusal to provide the information that Covad and other CLECs need to validate BellSouth's bills, what is the second major defect with BellSouth's Line Shared Loop ordering process?

A. The second defect arises from the fact that when a Line Shared Loop order is placed, BellSouth creates two separate orders internally, one that goes to its billing department and one that goes to the Central Office where the Line Shared Loop is actually provisioned. Unfortunately, BellSouth does not relate these two orders internally. In our experience, the billing order is generally completed within 24 hours, and once this has happened BellSouth deems the order complete and begins to bill for the circuit. The order, however, ***is not*** complete, and many negative consequences flow from this (in BellSouth's latest data, it generally completes the order in about 4 days meaning that even if the order is completed promptly, Covad is often being billed improperly for the circuit for three days).

First, and most obviously, Covad should not have to pay for a circuit that BellSouth has not provisioned. BellSouth must fix this process so that the billing cycle does not begin until the work in the Central Office has been completed and the loop has actually been delivered to Covad.

Second, BellSouth's premature showing of a "completed" order in its billing system can prove quite expensive to Covad in other ways. For example, take a typical situation where a Covad customer places a Line Sharing Order. Even before the order is complete, Covad checks BellSouth's databases to ensure that the technical parameters for the requested Line Shared Loop will support the service. Assuming that the answer to this question is positive, Covad then places the order electronically with BellSouth which generates—as noted above—a billing order and a work order. The billing order completes in about 24 hours and BellSouth improperly begins to bill Covad for the loop. When BellSouth personnel in the Central Office attempt to complete the order, however, they discover that BellSouth's database contained inaccurate information and the loop actually requires conditioning before it will be able to support DSL service.

Under these circumstances, if BellSouth had not "completed" the billing portion of the loop order, Covad would be able to modify the order and request that the loop be conditioned. Instead, Covad is forced to place a Disconnect Order on the loop even though it was never connected in the first place. This is a much more expensive and time-consuming process than a simple order modification, and this is an added expense that BellSouth itself would never incur under similar circumstances. But this is not where the trouble ends.

Based on the information in BellSouth's databases and the Firm Order Commitment that it returns to Covad after an order has been placed, Covad has given its customer an indication as to when he or she can expect service to begin. Suddenly, however, this window has been lengthened dramatically because now,

in addition to needing to condition the loop, Covad has to first wait for BellSouth to process the unneeded disconnect order, and only then can the order be placed for loop conditioning. This cumbersome process leads to dissatisfied customers, and, again, this is not a hardship that BellSouth's own customers would be subjected to. In short, BellSouth's inability to take the simple step of delivering the loop before "completing" the billing portion of the order, costs Covad money and the good will of its customers. Both of these problems are caused solely by a BellSouth OSS defect.

Q. Has Covad attempted to get BellSouth to correct its OSS so that Covad does not get billed for work that has not been done?

A. Yes. Covad submitted Change Request 0779 ("CR 0779" attached hereto as Exhibit 2) on May 9, 2002. BellSouth has yet to provide us with a date as to when this serious defect is going to be repaired.

(3) <u>BellSouth Plans to Close the TAG Gateway Is Discriminatory</u>

Q. What is the TAG Pre-Order Gateway and why is it important?

A. The TAG Pre-Order Gateway is an Application Program Interface (API) interface that provides address validation information for customers and obtains various, necessary information about the loops that may be serving that customer's premises. It allows Covad to determine at the "pre-ordering" stage of the process based on information contained in various BellSouth databases whether or not Covad can provide the customer with the DSL service that he or she wants. Getting this information as early as possible prevents customer dissatisfaction and also prevents Covad from attempting to provision a loop that will not support

DSL service (i.e. a loop that extends more than 18,000 feet from the Central Office).

Q. Isn't BellSouth planning to replace the TAG Pre-Order Gateway with an Electronic Data Interface (EDI) that will perform the same function?

A. Yes, but not fast enough. The current way in which the TAG Pre-Order Gateway works is not ideal because CLECs are not actually able to place orders with this interface, an action that is taken in BellSouth's EDI system. To attempt to solve this problem and streamline the overall billing process, the CLEC community has prioritized the creation of a pre-ordering function in EDI as their highest priority in an effort to gain the ability to carry out, for the first time, both pre-ordering and ordering functions through a single interface. BellSouth has begun the process necessary to implement this change, but its current timetable calls for it to retire the existing TAG Gateway ***before*** the new EDI pre-order functionality is ready. This is unacceptable because it forces Covad to incur significant costs in migrating to a new pre-ordering platform after the TAG Gateway shutdown only to have those costs recur yet again at a later time later the EDI pre-order process is finally implemented. These migration costs are not borne by BellSouth because its ordering processes are not changing. BellSouth should be required to keep the existing TAG pre-ordering function available until the EDI pre-order process is complete so that CLECs are only forced to go through one migration rather than two.

B. BELLSOUTH'S OSS SYSTEMS ARE NOT OPERATIONALLY READY TO SUPPORT COMPETITION

Q. Has BellSouth performed tests to show that its OSS systems are operationally ready to support their utilization by competitors?

A. No. It is my understanding that BellSouth has not tested its Tennessee systems, but instead attempts to rely in part on tests performed in Georgia. It is also my understanding that the Authority rejected this approach when it found that BellSouth's OSS systems are not regional.

Q. If BellSouth has done no testing, how is it attempting to prove that its OSS systems are operationally ready to support their utilization by competitors?

A. As set forth more fully below, BellSouth attempts to rely on commercial usage to supports its OSS arguments even though it measured commercial usage using a plan devised by another state.

Q. What specific concerns does Covad have about the Operational Support System put in place by BellSouth for xDSL pre-ordering and ordering.

A. We have several, including:

(1) The commercial usage data produced by BellSouth shows that it treats its own orders far differently than the orders of CLECs;

(2) BellSouth has not yet produced any commercial usage data under the Tennessee Performance Plan;

(3) BellSouth has produced no evidence at all of testing of BellSouth's Tennessee OSS systems for xDSL loops and line sharing;

(4) BellSouth uses the change management process to quickly implement changes that effect its business, but drags its feet in implementing changes that effect Covad.

I will discuss each of these problems below.

(1) <u>Commercial Usage Data Produced by BellSouth Shows that BellSouth Does Not Provide Parity Treatement to CLECs</u>

Q. What does the commercial usage data produced by BellSouth show?

A. BellSouth treats Covad's orders and customers differently than its own in almost every phase of the ordering and provisioning of Covad's most important DSL products. I will discuss this in more detail below because this problem dooms BellSouth's application as to *both* Checklist Item 2 and Checklist Item 4, but several critical examples follow, all taken from March or April BellSouth performance data:

- In April, it took BellSouth almost a day longer to provisions Covad's Line Shared Loops requiring dispatch than it did to provision its own, and it took ***six days longer*** just one month earlier in March.
- Also in April, Covad's Line Shared Loops requiring dispatch provisioned by BellSouth experienced problems at ***more than seven times the rate*** of the loops that BellSouth provisioned for itself.

I discuss many other examples of such behavior below, but even this sample serves to show that BellSouth treats its own customers far differently that CLEC customers. For this reason alone, the Authority should deny its 271 Application.

(2) <u>BellSouth has not yet produced any commercial usage data under the Tennessee Performance Plan</u>

Q. How did BellSouth report the data that it produced to illustrate its performance of various OSS functions?

A. It is my understanding that BellSouth did not report data under the plan set out in the Tennessee Performance Measures Docket, but, instead, calculated its performance data based on a plan designed by the *Georgia* Public Service Commission. This plan is significantly different and far less comprehensive than the plan adopted by Tennessee. Thus, it would appear that BellSouth's application under Section 271 is premature. BellSouth has the burden under Checklist Item 2 to prove to the Authority that it is meeting the performance

criteria set out by the Authority, yet it has produced not a scintilla of evidence generated under the performance plan designed by this Authority. This is unacceptable, and the Authority should reject BellSouth's application until such time as it can produce evidence that its performance is adequate under the plan devised by the Tennessee Regulatory Authority for the people of Tennessee rather than by some other commission in some other state for some other group of people.

Q. What other problems are caused by BellSouth's reliance on a performance measurement plan that was not designed by the Tennessee Regulatory Authority?

A. In addition to the mere fact that the TRA has before it no evidence regarding BellSouth's performance under the standard that the TRA itself set, the standards that BellSouth decided to use are often far different than those ordered by the TRA. The import of this is simple: there is not necessarily a correlation between the performance that BellSouth has reported in Georgia and the performance that BellSouth will report in Tennessee in the future because Georgia was measuring different things than Tennessee will be measuring.

Although I am not completely conversant in all of the differences in the Tennessee and the Georgia order, I am aware that the Georgia standard for measuring the time it takes for BellSouth to complete an order begins when BellSouth transmits a Firm Order Commitment to a CLEC. In Tennessee, however, this interval is measured from the time the CLEC submits a Local Service Request. The Tennessee measurement thus measures the time that it takes to complete an order from the *time that the order is placed* rather than from the

time that BellSouth decides to respond to the order as is the case with the Georgia measurement. Despite the fact that this Tennessee interval is a better measurement than that adopted in Georgia of the response times that matter most to Tennessee CLECs and, ultimately, Tennessee consumers, the Authority currently has no access to BellSouth performance data under the Tennessee plan. For this reason alone, the Authority should deny BellSouth's 271 application until such time as BellSouth can provide at least three months of data under the Tennessee Performance Measurements Order.

(3) <u>BellSouth Has Not Tested Its Tennessee OSS Systems</u>

Q. In Georgia and Florida, BellSouth conducted extensive third-party testing in an effort to validate the functionality of its OSS systems. Did it do such testing in Tennessee?

A. No. BellSouth did no third-party testing of its Tennessee OSS systems.

Q. Even if the Authority did consider the Georgia third-party testing, does Covad have concerns about the scope of that testing, particularly with regard to areas that are critical to the development of DSL competition in Tennessee?

A. Yes. Any reliance on the Georgia Third Party Test to determine compliance with Checklist Item 2, particularly with respect to OSS for xDSL loops and Line Shared Loops, would be misplaced. The Georgia Third Party Test utterly failed to test or evaluate significant aspects of DSL provisioning and thus cannot support BellSouth's assertion that it has complied with Checklist Item 2.[2]

[2] The Georgia Third Party test did not test the following: (1) electronic ordering of stand alone xDSL loops (ADSL, HDSL, UCL) by any of the three electronic order gateways BellSouth has purported to make available to CLECs in the region for electronic xDSL orders; (2) BellSouth's ability to handle high volumes of manual orders for stand alone xDSL (ADSL, HDSL, UCL) loops; (3) missed appointment and jeopardy notifications or processes for stand alone xDSL loops; (4) electronic ordering of Line Shared Loops through any of the three electronic ordering gateways BellSouth has purported to make available to CLECs in the BellSouth region; (5) provisioning processes and systems for Line Sharing; (6) missed appointment and jeopardy notifications or processes for Line Sharing; (7)

Q. What is the purpose of third party testing?

A. The purpose of third party testing is to mirror as closely as possible the actual experience of CLECs.

Q. What does BellSouth need to do to be able to use third-party testing to support its Section 271 application with regard to OSS issues?

A. Before BellSouth can use testing to support its assertion that it has met the requirements of Checklist Item 2 with regard to OSS, such testing would have to be done in Tennessee, not in some other state. Given that BellSouth has not performed such testing in Tennessee and cannot produce sufficient evidence of commercial usage to support a passing grade on Checklist Item 2, it its request to enter into long distance service pursuant to Section 271 is premature.

(4) <u>BellSouth's Implementation of Change Management Procedures is Harmful to CLECs</u>

Q. What is Change Management?

A. Change Management is the process by which BellSouth corrects errors in its OSS systems, and BellSouth is required by the 1996 Act to provide CLECs with nondiscriminatory access to such systems. In practice, this means that CLECs must be able to order UNEs electronically to the same extent that BellSouth is able to place orders electronically. When such a system is implemented, there are often errors that prevent the system from working properly. Change Management is the process by which such defects are corrected so that the system is *actually* nondiscriminatory rather than merely appearing to be nondiscriminatory.

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pre-Ordering, Ordering or Provisioning of IDSL loops; (8) obtaining loop makeup information via electronic means; or (9) the LENS graphical user interface, which Covad uses for both loop makeup inquiries and for placing loop orders. Thus, the KPMG test simply failed to evaluate many of the critical processes, interfaces, and situations which DSL providers in Tennessee face daily.

Q. How is BellSouth's Change Management process different for itself than for Covad and other CLECs?

A. As will be apparent from the example set forth below, BellSouth's behavior in correcting OSS problems is dramatically different for itself than for CLECs: it fixes problems that affect its own business, but refuses to fix the same problems in the systems that affect CLECs. In other words, BellSouth quickly resolves problems that impact its own bottom-line, but is quite content to sit back and watch CLECs loose money by being forced to expend time and money creating work-arounds for the same problem.

Q. Do you have a concrete example of BellSouth's uneven implementation of the Change Management process?

A. Yes, as detailed above, BellSouth's Line Shared Loop OSS has a defect that prevents it from returning critical information to Covad that enables Covad to verify the bills that BellSouth sends to it. As a result, Covad is forced to resort to an expensive and time-consuming manual process to gather this necessary information.

Q. I know that you have answered this question before, but has Covad attempted to use the BellSouth Change Management process to correct this problem?

A. Yes. On January 18, 2002, Covad submitted Change Request 621-FTTF36 (Exhibit 1) to BellSouth specifically requesting that this serious defect be corrected.

Q. Has that attempt been successful?

A. No. BellSouth has done absolutely nothing to fix this problem for CLECs, but it has already corrected a similar defect in its systems based on a Change Request that BellSouth itself generated.

Q. Please describe what Covad has done to get this problem solved.

A. According to BellSouth procedures, after Covad submitted the change request, the request then had to be identified as either a "Defect"—meaning a problem with BellSouth's OSS that needed to be repaired—or a "Feature Enhancement" which is a functionality that a CLEC wants but is not actually required. Despite the fact that BellSouth's failure to provide the pseudo circuit number amounts to denying Covad the information needed to check if BellSouth bills it fairly (imagine a business that told you to "take it on faith" that it would properly bill your credit card and refused to give you a receipt), it took BellSouth ***four months*** just to decide how to ***classify*** the problem: on May 17, 2002, it finally declared that its failure to provide the pseudo circuit number was a Defect in its OSS.

Q. Now that BellSouth has declared the problem to be a defect in its OSS, has it corrected the problem?

A. No. In fact, not only has BellSouth not fixed the defect, but it has thus far refused to even provide a date in the future as to when it may get around to fixing it.

Q. Has BellSouth's behavior toward a similar Change Request that it, rather than Covad, opened been any different?

A. Yes. Markedly so. On May 3, 2002, BellSouth itself opened Change Request 0766 ("CR 0766" attached hereto as Exhibit 3) to deal with a precisely analogous defect in its Local Number Portability (LNP) interface, a defect that prevented circuit numbers from being provided in responses to orders for certain non-

designed services. ***Within a week, BellSouth classified the defect and set a schedule for the defect to be fixed. For the defect identified by Covad, however, nearly six months have passed, and BellSouth has yet to even schedule its repair.*** In short: BellSouth fixes problems that concern BellSouth and ignores problems that effect the CLECs.

I. CHECKLIST ITEM 4: NONDISCRIMINATORY ACCESS TO LOOPS

Q. In your opinion, what does BellSouth need to do to provide nondiscriminatory access to loops?

A. Basically, BellSouth needs to treat Covad and other CLECs like customers. That is, BellSouth needs to work cooperatively with Covad to develop processes that improve performance by both parties. We need to work collaboratively to get Covad's orders through BellSouth's systems and provisioned in a timely and efficient manner.

Q. How does BellSouth's provisioning of loops affect Covad?

A. Covad's business plan depends upon loop delivery performance by BellSouth as well as on high quality pre-ordering, ordering, repair and maintenance services. As part of my daily work for Covad, I am actively involved in monitoring operational issues and in driving improvement by both Covad and BellSouth.

A. LOOP PERFORMANCE ISSUES

(1) BellSouth Does Not Deliver Line Shared Loops in the Standard Interval

Q. Please describe BellSouth's performance in provisioning the Line Shared Loop.

A. BellSouth's Interconnection Agreement with Covad requires it to deliver Line Shared Loops in three days (see Interconnection Agreement extract attached

hereto as Exhibit 4). The latest available data, however, indicates that BellSouth is delivering this loop in an average of 4.03 days in Tennessee, an ongoing provisioning problem that has a serious impact on Covad's ability to provided timely service to its customers.

Q. Why is the fact that BellSouth provisions Covad's Line Shared Loops one day slower than it is contractually required to do significant?

A. BellSouth's one day delay is significant for two primary reasons. First, Covad is competing for customers will BellSouth, and customers want faster service. When BellSouth slows our ability to deliver DSL service quickly, it is harming our business in a very real way. Second, BellSouth's delay actually costs Covad money. We do not begin billing our customers until their service is up-and-running, and, to the extent that BellSouth's inability to meet its contractual obligations slows our ability to reach this point, it is costing us revenue.

Q. What other provisioning problems does BellSouth have with this loop?

A. Its other provisioning problems include:

- The information contained in BellSouth's database is often inaccurate, particularly with regard to identifying loops that need conditioning. The result of these inaccuracies is that Covad customers are informed of a delivery date based on the information in BellSouth's database, only to have that date pushed back by a minimum of 10 or 11 days when the need for conditioning is discovered.
- Despite the fact that BellSouth central office technicians are required to check each Line Shared Loop for the ability to support DSL services, they often

complete the provisioning process even when the loop in question needs conditioning to be able to support those services. The result of this is that the loop fails when Covad attempts to activate its customer's service. When a loop needs conditioning, the loop should be placed in a jeopardy status with Covad. BellSouth's failure to follow its own simple procedures in this regard results in delays over and above the delays inherent in the loop conditioning process.

Q. Does BellSouth also have provisioning problems with the UCL-ND loop?

A. Yes. If anything, in fact, its UCL-ND provisioning problems are even worse. Unfortunately, BellSouth has proven incapable of properly provisioning this loop in accordance with its own processes and its Interconnection Agreement (IA) with Covad. As a result, the UCL-ND loop has cost Covad far more in trouble ticket charges, man-hours and personnel frustration than any purported cost savings.

Q. Has Covad taken steps to attempt to get BellSouth to fix the problems with the UCL-ND loop?

A. Yes, but despite Covad's best efforts to make this loop work, BellSouth has failed to take responsibility for its successful provisioning. We have written numerous letters requesting investigation and improvement in these processes, but more than a year after the UCL-ND was introduced, Covad still cannot consistently order and receive a timely, functional loop.

Q. Please describe specific problems that Covad has with this loop.

A. Quite simply, BellSouth cannot provision the loop correctly. Of 50 UCL-ND orders in January 2002, Covad data showed that BellSouth failed to properly provision 38 of those orders. After investigating, BellSouth admitted that of the

30 orders it believed were timely delivered, BellSouth had failed to follow process and notify Covad that the order was closed on 7 orders. BellSouth further admitted that 10 of the 50 orders were nonfunctional at turn-up. Thus, BellSouth's own data showed that more than 17 out of 50 orders were improperly provisioned. Irrespective of which set of data is used, serious process and provisioning problems clearly exist with this loop.

Further, when BellSouth does manage to provision the loop, it cannot fix subsequent problems with it at anywhere near an acceptable level. An analysis of January-March, 2002, data reveals that 43% of Covad's orders that require trouble tickets, require more than one trouble ticket to resolve whatever problem there is with the loop. Moreover, even excluding BellSouth's failure to provide demarcation point information, 9% of Covad UCL-ND orders cannot be turned up on dispatch because of BellSouth loop issues.

Q. What about demarcation information? Does BellSouth provide Covad with this critical information?

A. No. In addition to its provisioning problems and despite Covad's continuous efforts to resolve this issue, BellSouth is still refusing to provide demarcation point information in accordance with it Interconnection Agreement with Covad. Since Covad orders UCL-ND loops for business customers, the loops are often to office buildings that may have multiple phone closets and thousands of lines. Demarcation point information enables Covad's technicians to learn where BellSouth has dropped the loop, so that Covad can perform the remaining work to get a customer into service. Without demarcation point information, Covad

technicians are forced to play blind man's bluff, searching basements, multiple phone closets and attempting to find the proverbial needle in a haystack.

Covad and BellSouth clearly understood the importance of transferring this information from BellSouth to Covad, and that's why the following language was put in the Interconnection Agreement.

> Where a technician is dispatched to provision a loop, the BellSouth technician shall tag a circuit for identification purposes. Where a technician is not dispatched by BellSouth, BellSouth will provide sufficient information to Covad to enable Covad to locate the circuit being provisioned.

(Interconnection Agreement, Attachment 2, § 2.1.17.9.3). Thus, irrespective of whether BellSouth dispatches a technician, BellSouth is obligated to provide information to Covad sufficient to allow Covad to locate the circuit being provisioned.

This proves that BellSouth has failed to provide loops to Covad in the same manner that it provides those loops to itself. BellSouth refuses to comply with its contractual obligation to provide demarcation information, and this makes the UCL-ND an unacceptable alternative for Covad to order. This forces us into the untenable position of having to order the more expensive "designed" loops just to ensure that we get a loop that works together with demarcation information.

Q. Has Covad attempted to work with BellSouth to solve this demarcation information problem?

A. Extensively, but these efforts have proved useless in the face of BellSouth's stubborn commitment to unequal treatment of CLECs. When this problem first arose, BellSouth suggested that Covad order joint acceptance testing on these

loops for the purpose of obtaining demarcation point information. As an interim measure designed to get our customers into service, Covad was willing to do this while BellSouth devised a permanent solution. However, this adds another $50-$100 to the Covad loop price, and Covad cannot continue to pay an extra free to get BellSouth to meet its pre-existing contractual obligations.

Then, in April, Covad wrote to BellSouth informing BellSouth that we would be opening trouble tickets in advance of the Covad truck to obtain demarcation point information where BellSouth did not provide it, and we spoke with BellSouth personnel to inform BellSouth of this process and to ask for help working toward a better solution for both companies. BellSouth has refused to respond to both of these requests, but it is now refusing to open a trouble ticket to obtain demarcation point information. Again, this unilateral action on BellSouth part directly violates its contractual obligations and is yet another illustration of its refusal to even attempt to develop a workable solution to this operational problem.

Q. What solutions do you recommend to deal with these problems?

A. First, BellSouth must identify a high-ranking operations officer to be responsible for resolution of these problems. Second, BellSouth should be required to perform joint testing before it closes a trouble ticket to ensure that multiple tickets are not required to solve a single problem. As I mentioned, Covad data shows that 45% of our UCL-ND orders had trouble tickets and of those orders requiring trouble tickets, 43% had multiple tickets. This clearly indicates BellSouth's failure to properly address troubles on these loops in the first instance. As a result of this egregious track record, Covad has already asked BellSouth to participate in

Joint Acceptance Testing before closing trouble tickets, but BellSouth has refused. BellSouth's performance illustrates why such testing is essential.

Third, BellSouth must develop some process to provide Covad with demarcation point information on every UCL-ND loop ordered. This is required by the IA, and BellSouth's failure to provide such information is a clear violation of that contract.

(2) BellSouth's Reports Poor Performance for Loop Delivery in Tennessee

Q. How can BellSouth's performance in these areas be measured?

A. In this docket, BellSouth has filed data measuring its performance for its own customers in various provisioning and repair processes as compared to its performance for CLECs in these same areas. The data that it filed covered November and December 2001, and January 2002, and, as noted before, it is my understanding that this data measured BellSouth's performance based on the Performance Measurements Order of Georgia rather than the more recent Order of this Authority.

In preparing this testimony, Covad attempted to use the May data, but BellSouth failed to post the Tennessee Monthly State Summary for May in time for this filing despite the fact that its own procedures called for it to be posted by June 30, 2002. Thus, April 2002 data is the most recent BellSouth data available, and I have relied on this data and data from March in preparing this testimony. As set forth below, the data clearly establishes a pattern of poor performance insufficient to support its application for long distance authority.

A. <u>Order Completion Interval (P-4)</u>

Q. What does Order Completion Interval (metric P-4) measure?

A. It measures the interval from BellSouth's issuance of a Firm Order Confirmation to Covad until BellSouth completes the service order. As noted earlier in my testimony, this is a very different measure than the one ordered by the TRA. The TRA's measure begins when a CLEC places an order, rather than the measure discussed below which only measures from the time BellSouth chooses to *respond* to the CLEC's order. Thus, the TRA's performance plan actually captures and measures the customer's experience from submission of an order until that order is completed.

Q. What results did BellSouth report for Line Shared Loops?

A. For Line Shared Loops, BellSouth uses "ADSL provided to Retail" as the retail analog. The reported data shows that BellSouth performed much better in provisioning its retail ADSL service than it did in provisioning line sharing to Covad in Tennessee. While BellSouth completed its own retail ADSL orders in 4.12 days for orders requiring dispatch, it took 4.9 days to complete those orders for Covad's Line Shared Loops in April. BellSouth's performance was even poorer in March: its provisioned this loop for itself in 3.99 days on average, but took ***10 days*** to provision it for Covad.

B. <u>Percent Provisioning Troubles Within 30 days (P-9)</u>

Q. Please describe why this is an important measurement of BellSouth performance.

A. Percent Provisioning Troubles Within 30 Days measures the percent of trouble reports filed for loops within 30 days of installation. Generally, this metric assesses the quality of the installation of an xDSL loop, since loop quality is an

essential aspect of non-discriminatory loop provisioning. In the Southwestern Bell Texas 271 Order, the FCC found two important reasons why measurement of trouble tickets within 30 days is important for determining checklist compliance. First, trouble reports within 30 days are "indicative of the quality of network components supplied by the incumbent LEC."[3] Second, the FCC concluded that advanced services customers that experience substantial troubles in the period following installation of an xDSL-capable loop are unlikely to remain with a competing carrier.[4]

Q. How did BellSouth perform under this measurement?

A. BellSouth reported in April that an astounding 20.00% of Covad's Line Shared Loops had troubles within 30 days of installation. At the same time, BellSouth reported that its own performance for these loops showed repeat troubles at a rate of only 2.74% within 30 days. In short, ***BellSouth is nearly eight times more likely to install a loop that needs to be fixed within thirty days for one of Covad's customers than for one of its own.***

C. Maintenance Average Duration (M&R-3)

Q. What does this metric measure?

A. The purpose of this metric is to measure the time that it takes (in hours) for BellSouth to complete work once a trouble ticket has been issued. This measurement is, again, critical to the customer experience because it provides a direct measure of down-time.

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[3] *SWBT Texas 271 Order*, ¶ 299.
[4] *Id.*

Q. Is BellSouth providing Covad with parity treatment for this important measure.

A. Absolutely not. In April, BellSouth took an average of 12.75 hours to repair problems on loops running to Covad customers, but repaired its own customers loops in an average of only 3.55 hours.

D. Customer Trouble Report Rate (M&R 2)

Q. What is Customer Trouble Report Rate?

A. This metric measures the percentage of orders experiencing trouble with BellSouth-controlled portions of a loop during the reporting month. This metric signifies overall performance offered to CLECs by BellSouth in Tennessee. For Covad's two most important loops for reaching Tennessee small businesses, our ISDN and T-1 loops, BellSouth's April data for Tennessee demonstrates significant poor performance for Covad: for ISDN loops, BellSouth's customers had trouble with their loops approximately half as often as Covad's customers, and ***BellSouth gave its own T-1 customers service that was 156 times better than the service that it gave to Covad's customers*** with 50% of Covad's customers experiencing problems during the month as compared to only 0.32% of BellSouth's customers.

E. Percent Repeat Troubles Within 30 Days (M&R-4)

Q. What is Percent Repeat Troubles within 30 Days?

A. This measures the percentage of lines/circuits that have more than one trouble report in a thirty day period. As with all of the other measures, poor performance by BellSouth on this measure can translate directly to a lost customer because

repeat troubles can destroy customer confidence. Once again, BellSouth's performance on this metric has been miserable

Q. What are the results of this metric?

A. Again, BellSouth provides better service to its retail customers than it does to Covad. For ISDN loops in March where the repair required dispatch, 21.11% of BellSouth's end users experienced repeat troubles whereas this happened for 33% of Covad's end-users. The numbers were worse for ISDN loop where the repair did not require dispatch: only 15.63% of BellSouth's end users experienced repeat troubles whereas this happened for 33% of Covad's end-users.

The numbers are similar for Line Shared Loops in April: only 24.82% of BellSouth's end users experienced repeat troubles whereas this happened for a full ***50.00%*** of Covad's end-users.

Q. What conclusion should the Commission draw from the BellSouth reported data you have just summarized?

A. As I understand it, this proceeding provides the Commission with an opportunity to review the state of competition in Tennessee and to determine whether BellSouth has provided CLECs with a meaningful opportunity to compete here. My testimony only discusses a few performance metrics that give a glimpse of the type of performance Covad and other CLECs receive from BellSouth, and the simple fact that these numbers reveal is this: BellSouth performs far better for its retail operations than for CLECs, and this unequal treatment should preclude BellSouth from having its 271 Application granted. As CLECs in Tennessee struggle to find a foothold in the marketplace, BellSouth's performance in delivering loops continues to pose a significant obstacle to successful competition.

Before BellSouth is permitted to win 271 approval, the Authority must first ensure that the BellSouth-sponsored obstacles to competition have been eliminated. As is apparent from the statistics, this day has not yet arrived.

B. FACILITIES ISSUES

Q. Does Covad have any concerns about BellSouth's maintenance of its LFACS database?

A. Yes, and this impacts Covad in several ways. BellSouth's LFACS database is the primary source of information about the physical makeup of BellSouth's loops, including such information as loop length and whether or not the loop is loaded (meaning that it would need to be "conditioned" before it could be used to provided DSL services). This database, however, is rife with inaccuracies, and BellSouth's current processes work against rather than with CLECs in resolving the loop problems that arise from these database inaccuracies.

Q. Is there a way to resolve this problem?

A. Yes. BellSouth should implement a plan to complete and update its loop records for all residential accounts. Without such a program, CLECs in Tennessee will continue to experience significant discrimination because the problems that arise from BellSouth's database inaccuracies fall disproportionately on CLECs.

Q. Why does the burden of database inaccuracies fall disproportionately on CLECs?

A. Because a significant portion of the cost of any loop is what CLECs pay to BellSouth for processing orders and other administrative tasks. Database inaccuracies force CLECs to place additional orders and open multiple trouble-tickets, a process that is far more expensive for the CLEC than for BellSouth.

BellSouth's perpetuation of its poorly maintained LFACS database thus acts like a hidden tax on CLECs, a tax which prevents us from competing fully with BellSouth and prevents Tennessee consumers and small businesses from enjoying the full benefits of such competition.

Q. Does this conclude your testimony.

A. Yes.

BELLSOUTH

RFI873
4/00

Change Request Form

To be completed by BCCM only: Date Sent: 01/18/02 / Reclassified – 05/17/02

(1) CHANGE REQUEST LOG #	CR621
(2) STATUS	V

To be completed by CCM or BellSouth:

(3) REQUEST TYPE	☐ TYPE 2 (REGULATORY)	☐ TYPE 3 (INDUSTRY)	☐ TYPE 4 (BST)	TYPE 5 (CLEC)
	☒ TYPE 6 (DEFECT) NOTE: COMPLETE SECTION 2	☐ EXPEDITED FEATURE	☐ FLOW-THRU	

SECTION 1

(4) COMPANY NAME	Covad Communications
(5) OCN	
(6) CCM NAME	Colette Davis
(7) TELEPHONE NUMBER	404.942.3493
(8) CCM EMAIL ADDRESS	
(9) CCM FAX NUMBER	
(10) ALTERNATE CCM NAME	
(11) ALTERNATE PHONE NUMBER	
(12) ORIGINATOR'S NAME	Colette Davis
(13) ORIGINATOR'S PHONE NUMBER	404.942.3493
(14) TITLE OF CHANGE REQUEST	ECCKT Not Returned on Mechanized or Manual Loop Orders for Line share Orders

(15) CATEGORY	ADD NEW FUNCTIONALITY	X CHANGE EXISTING
(16) DESIRED DUE DATE		

Attachment A-1A

Jointly Developed by the Change Control Sub-team comprised of BellSouth and CLEC Representatives.

EXHIBIT 1

Jul. 8. 2002 8:06PM No. 2052 P. 2

BELLSOUTH

RFS#1
6/0

Change Request Form

(17) ORIGINATING CCM ASSESSMENT OF IMPACT	X HIGH	☐ MEDIUM	☐ LOW	
(18) ORIGINATING CCM ASSESSMENT OF PRIORITY	URGENT	X HIGH	☐ MEDIUM	☐ LOW

(19) INTERFACES IMPACTED				
PRE-ORDERING	LENS	☐ TAG	☐ CSOTS	
ORDERING	X EDI	X LENS	☐ TAG	☐ LNP
MAINTENANCE	☐ TAFI	☐ EC-TA Local		
MANUAL	X Manual			

(20) TYPE OF CHANGE (Check one or more, as applicable)				
X Software	X Product & Services	X Documentation	☐ Hardware	☐ New or Revised Edits
☐ Regulatory	☐ Industry Standards	Process	☐ Other	☒ Defect
☐ Expedited Feature	Flow Through			

(21) DESCRIPTION OF REQUESTED CHANGE (Including purpose and benefit received from this change. Include attachments if available)	Revised 03/11/02 The ECCKT is not being returned on mechanized or manual loop orders for Lineshare orders. BellSouth needs to provide the circuit information back through EDI as well as in the manual environment with the FOC and Completion Notice. . BellSouth requires Covad to secure this information via CSOTS. The circuit information should be passed back to the ILEC via EDI. BellSouth is the only ILEC that does not return this data via EDI back to Covad.
(22) REQ TYP(s) IMPACTED:	Lineshare Orders
(23) ACT TYP(s) IMPACTED:	
(24) PROVIDE EXAMPLE OF REQUESTED CHANGE:	
(25) Identify the LSOG versions that are affected by this change	

This section to be completed by BellSouth only:

(26) Does this request require clarification?	☒ YES ☐ NO

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Jul. 8. 2002 8:07PM No. 2052 P. 3

BELLSOUTH

BF1871
4/02

Change Request Form

(27) Clarification Request Sent	01/21/02 03/25/02
(28) Clarification Response Due	04/03/02

(29) Change Request Review Date	04/09/02 – 04/10/02
(30) Target Implementation Date	
(31) Change Review Meeting Results	01/21/02 Request placed in Clarification Status. 03/11/02 CLEC sent response to Clarification. 03/12/02 CMT verified with CLEC (Colette) PC response. 03/12/02 Being reviewed by BellSouth. 03/25/02 Request placed in Clarification Status. 03/28/02 Colette (CLEC) provided clarification response to this request. 04/01/02 BellSouth (FTTF) request additional time to investigate the response to this request. 04/03/02 BellSouth response sent to CLEC. This request has been reclassified as a "Defect" and will be corrected in a future Release TBD. 04/10/02 BellSouth determined that this request is not a "Defect" as previously stated and on the FTTF conference call 04/09/02, it was agreed the feature would be prioritized by the CLECs as a feature. 04/18/02 Prioritized at the 04/09/02 CCP/FTTF meeting. Ballots were due on 04/10/02. Status changed to "Candidate Request". 05/16/02 – Re-classified as a defect and will be corrected in a future release TBD.

(32) CANCELED CHANGE REQUEST	☐ DUPLICATE	☐ TRAINING	☐ CLARIFICATION NOT RECEIVED
(33) CANCELLATION ACKNOWLEDGMENT	☐ CLEC	☐ BST	DATE:

(34) APPEAL	☐ YES	☐ NO
(35) APPEAL CONSIDERATIONS		

SECTION 2

This section to be completed by CLEC/BellSouth- External Explanation of Type 6 Defect Change Request

(36) PON #	
(37) ERROR MESSAGE:	
(38) RELEASE OR API VERSION (if applicable)	

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BELLSOUTH

RF1871
[illegible]

Change Request Form

[39] DESCRIPTION OF DEFECT SCENARIO:	

SECTION 3
This section to be completed by BellSouth – Internal Validation of Defect Change Request

[40] DEFECT VALIDATION RESULTS:	05/16/02 – BellSouth has determined that this is a defect and will be corrected in a future release TBD.
[41] CLARIFICATION NEEDED:	☐ YES ☐ NO
[42] VALIDATED DEFECT IMPACT LEVEL:	☐ HIGH ☒ MEDIUM ☐ LOW
[43] VALIDATION TYPE:	☐ DEFECT ☐ FEATURE ☐ TRAINING ISSUE ☐ DUPLICATE
[44] DEFECT IMPACTS OTHER CLECS?	☒ YES ☐ NO
[45] INTERFACES IMPACTED BY DEFECT:	☒ EDI ☒ TAG ☐ LNP ☒ LENS ☐ TCIF 7 ☒ TCIF 9
[46] TARGET IMPLEMENTATION DATE:	TBD

BELLSOUTH

Change Request Form

To be completed by BCCM only: Date Sent: 05/09/02

(1) CHANGE REQUEST LOG #	CR 0779
(2) STATUS	V

To be completed by CCM or BellSouth:

(3) REQUEST TYPE	☐ TYPE 2 (REGULATORY)	☐ TYPE 3 (INDUSTRY)	☐ TYPE 4 (BST)	TYPE 5 (CLEC)
	☒ TYPE 6 (DEFECT) NOTE: COMPLETE SECTION 2	☐ EXPEDITED FEATURE	☐ FLOW-THRU	

SECTION 1

(4) COMPANY NAME	Covad Communications
(5) OCN	
(6) CCM NAME	Colette Davis
(7) TELEPHONE NUMBER	404.942.3493
(8) CCM EMAIL ADDRESS	Codavis@covad.com
(9) CCM FAX NUMBER	
(10) ALTERNATE CCM NAME	
(11) ALTERNATE PHONE NUMBER	
(12) ORIGINATOR'S NAME	Colette Davis
(13) ORIGINATOR'S PHONE NUMBER	404.942.3493
(14) TITLE OF CHANGE REQUEST	LineSharing Order Completion Sequencing error on R &C order

(15) CATEGORY	ADD NEW FUNCTIONLITY	X CHANGE EXISTING
(16) DESIRED DUE DATE		

[illegible]	X HIGH	☐ MEDIUM	☐ LOW

Attachment A-1

Jointly Developed by the Change Control Sub-team comprised of BellSouth and CLEC Representatives.

EXHIBIT 2

Jul. 8. 2002 8:08PM No.2052 P. 6

BELLSOUTH

Change Request Form

ASSESSMENT OF IMPACT				
(18) ORIGINATING CCM ASSESSMENT OF PRIORITY	X URGENT	HIGH	☐ MEDIUM	☐ LOW

(19) INTERFACES IMPACTED				
PRE-ORDERING	LENS	☐ TAG	☐ CSOTS	
ORDERING	X EDI	X LENS	☐ TAG	☐ LNP
MAINTENANCE	☐ TAFI	☐ EC-TA Locat -		
MANUAL	X Manual			

(20) TYPE OF CHANGE (Check one or more, as applicable)				
X Software	Product & Services	Documentation	☐ Hardware	New or Revised Edits
☒ Regulatory	☐ Industry Standards	X Process	☐ Other	☐ Defect
☐ Expedited Feature	X Flow Through			

(21) DESCRIPTION OF REQUESTED CHANGE (Including purpose and benefit received from this change. Include attachments if available)	BellSouth generates two orders for Line Sharing orders. A 'C" order on the CRIS account for the physical work to be completed in the Central Office and a "R" order to CABS to generate the billing. BellSouth fails to sequence the orders so that the billing order is completed AFTER the actual physical work is completed in the Central Office. The result of this failure to sequence or relate the orders is 1) BellSouth is billing Covad for work they have not done 2) when Covad has to supplement the C order and, the R order has completed, Covad receives a rejection on the supplemental order request not allowing the order to process. This causes the Line Sharing ordering process to fail flow through and requires some manual intervention on the side of both BellSouth and Covad. A work around is in place by the LCSC but is not a satisfactory situation as Covad must proactive contact the LCSC on each order that falls into this scenario. The ENCORE Requirements dated 9/14/2000 were referenced and the BBRLO as well. Also a letter has been sent to the Line Share Collaborative and added to their action list.
(22) REQ TYP(s) IMPACTED:	A Line Sharing Loops
(23) ACT TYP(s) IMPACTED:	C, D

Attachment A-1

Jointly Developed by the Change Control Sub-team comprised of BellSouth and CLEC Representatives.

RF-1809
4/23

BELLSOUTH

Change Request Form

(24) PROVIDE EXAMPLE OF REQUESTED CHANGE:	
(25) Identify the LSOG versions that are affected by this change	

This section to be completed by BellSouth only:

(26) Does this request require clarification?	☐ YES ☐ NO
(27) Clarification Request Sent	
(28) Clarification Response Due	

(29) Change Request Review Date	
(30) Target Implementation Date	
(31) Change Review Meeting Results	05/15/02 Being reviewed by BellSouth.

(32) CANCELED CHANGE REQUEST	☐ DUPLICATE	☐ TRAINING	☐ CLARIFICATION NOT RECEIVED
(33) CANCELLATION ACKNOWLEDGMENT	☐ CLEC	☐ BST	DATE:

(34) APPEAL	☐ YES	☐ NO
(35) APPEAL CONSIDERATIONS		

SECTION 2

This section to be completed by CLEC/BellSouth- External Explanation of Type 6 Defect Change Request

(36) PON #	
(37) ERROR MESSAGE:	
(38) RELEASE OR API VERSION (If applicable)	
(39) DESCRIPTION OF DEFECT SCENARIO:	

SECTION 3

This section to be completed by BellSouth – Internal Validation of Defect Change Request

(40) DEFECT VALIDATION RESULTS:	05/21/02 – Re-classified as a defect and will be corrected in a future release TBD.
(41) CLARIFICATION NEEDED:	☐ YES ☐ NO
(42) VALIDATED DEFECT IMPACT LEVEL:	☐ HIGH ☐ MEDIUM ☐ LOW
(43) VALIDATION TYPE:	☐ DEFECT ☐ FEATURE ☐ TRAINING ISSUE ☐ DUPLICATE

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BELLSOUTH

Change Request Form

(44) DEFECT IMPACTS OTHER CLECS?	☐ YES ☐ NO
(45) INTERFACES IMPACTED BY DEFECT:	☐ EDI ☐ TAG ☐ LNP ☐ LENS ☐ TCIF 7 ☐ TCIF 9
(46) TARGET IMPLEMENTATION DATE:	TBD

To be completed by BCCM only: Date Sent: 05/03/02

(1) CHANGE REQUEST NO:	CR 0766
(2) STATUS:	S

To be completed by CCM or BellSouth:

(3) REQUEST TYPE:	☐ TYPE 2 (REGULATORY)	☐ TYPE 3 (INDUSTRY)	☐ TYPE 4 (BST)	☐ TYPE 5 (CLEC)
	☒ TYPE 6 (DEFECT) NOTE: COMPLETE SECTION 2	☐ EXPEDITED FEATURE	☐ FLOW-THRU	

SECTION 1

(4) COMPANY NAME:	BellSouth
(5) DCN:	
(6) CCM NAME:	
(7) TELEPHONE NUMBER:	
(8) CCM EMAIL ADDRESS:	
(9) CCM FAX NUMBER:	
(10) ALTERNATE CCM NAME:	
(11) ALTERNATE PHONE NUMBER:	
(12) ORIGINATOR'S NAME:	Steve Hancock
(13) ORIGINATOR'S PHONE NUMBER:	205-321-2111
(14) TYPE OF CHANGE REQUEST:	ECXT information is not being returned to the CLEC on the FOC for non-designed loop orders

(15) CATEGORY:	☐ ADD NEW FUNCTIONALITY	☒ CHANGE EXISTING
(16) DESIRED DUE DATE:		

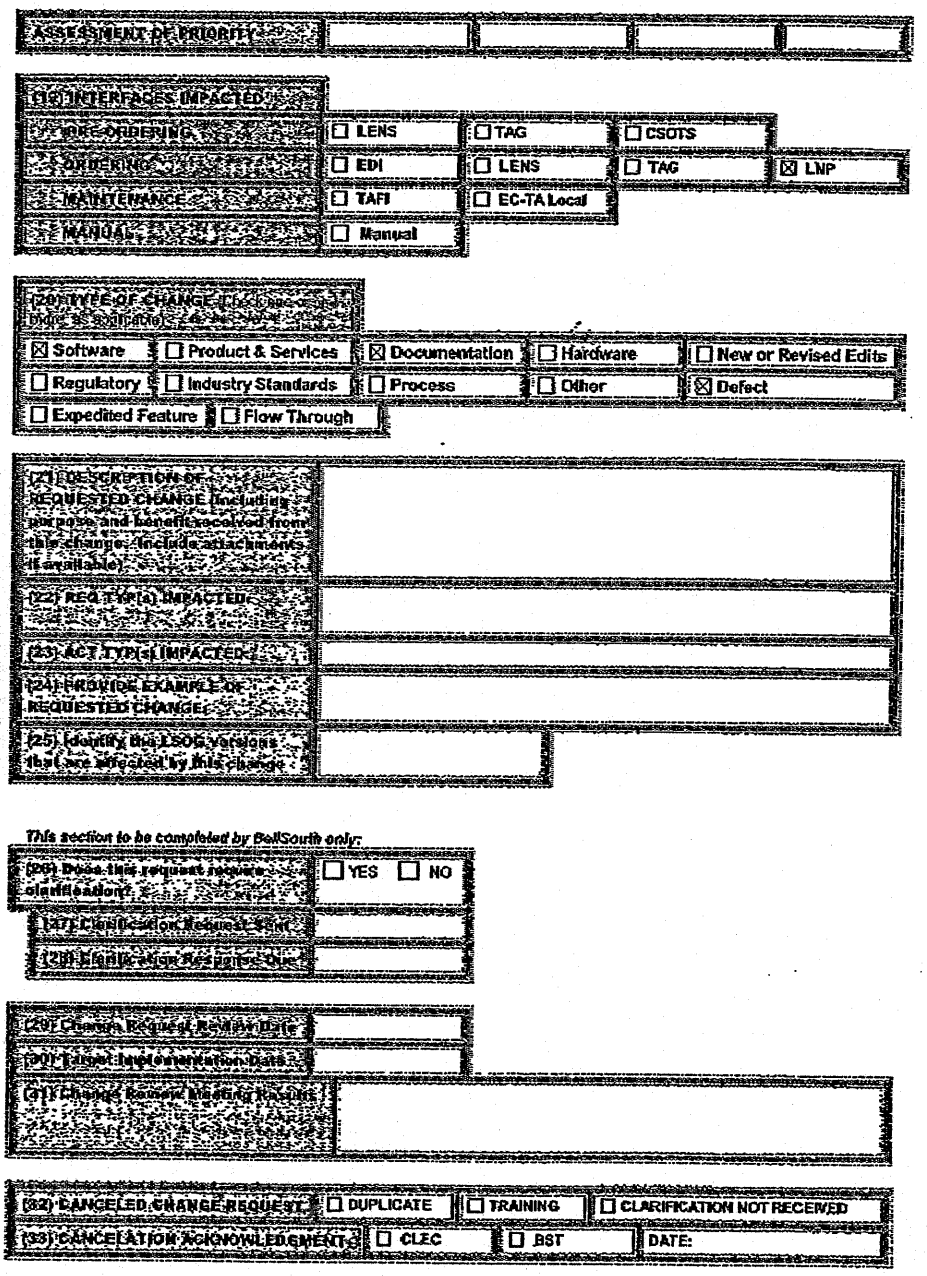
(17) ORIGINATING CCM ASSESSMENT OF IMPACT:	☐ HIGH	☐ MEDIUM	☐ LOW	
	☐ URGENT	☐ HIGH	☐ MEDIUM	☐ LOW

Attachment A-4A

Jointly Developed by the Change Control Sub-team comprised of BellSouth and CLEC Representatives.

EXHIBIT 3

Jul. 8. 2002 8:10PM No. 2052 P. 10



(19) ASSESSMENT OF PRIORITY				

(19) INTERFACES IMPACTED				
PRE-ORDERING	☐ LENS	☐ TAG	☐ CSOTS	
ORDERING	☐ EDI	☐ LENS	☐ TAG	☒ LNP
MAINTENANCE	☐ TAFI	☐ EC-TA Local		
MANUAL	☐ Manual			

(20) TYPE OF CHANGE (Check all that apply)				
☒ Software	☐ Product & Services	☒ Documentation	☐ Hardware	☐ New or Revised Edits
☐ Regulatory	☐ Industry Standards	☐ Process	☐ Other	☒ Defect
☐ Expedited Feature	☐ Flow Through			

(21) DESCRIPTION OF REQUESTED CHANGE (Including purpose and benefit received from this change. Include attachments if available)	
(22) REL TYP(s) IMPACTED	
(23) ACT TYP(s) IMPACTED	
(24) PROVIDE EXAMPLE OF REQUESTED CHANGE	
(25) Identify the LSOG versions that are affected by this change	

This section to be completed by BellSouth only:

(26) Does this request require clarification?	☐ YES ☐ NO
(27) Clarification Request Sent	
(28) Clarification Response Due	

(29) Change Request Review Date	
(30) Target Implementation Date	
(31) Change Control Meeting Results	

(32) CANCELED CHANGE REQUEST	☐ DUPLICATE	☐ TRAINING	☐ CLARIFICATION NOT RECEIVED
(33) CANCELATION ACKNOWLEDGEMENT	☐ CLEC	☐ BST	DATE:

Attachment A-4A

Jointly Developed by the Change Control Sub-team comprised of BellSouth and CLEC Representatives.

Jul. 8. 2002 8:10PM No.2052 P. 11

(34) APPEAL?	☐ YES ☐ NO
(35) APPEAL CONSIDERATIONS	

SECTION 2

This section to be completed by CLEC/BellSouth- External Explanation of Type 6 Defect Change Request

(36) PON:	
(37) ERROR MESSAGE:	
(38) RELEASE OR ATP VERSION (If applicable):	
(39) DESCRIPTION OF DEFECT SCENARIO:	LNP Defect – ECCKT info is not being returned to the CLEC on the FOC for non-designed loop orders.

SECTION 3

This section to be completed by BellSouth – Internal Validation of Defect Change Request

(40) DEFECT VALIDATION RESULTS:	05/03/02 – BellSouth has determined that this is an LNP defect and will be corrected in a future release TBD. Workaround: The Fleming Island and Birmingham LCSCs will answer calls from CLECs questioning circuit information only when the CLEC does not receive on the FOC. 05/10/02 – Scheduled for correction in Release 10.6. 06/03/02 – Release 10.6 implementation date changed to 08/25/02.
(41) CLARIFICATION NEEDED:	☐ YES ☒ NO
(42) VALIDATED DEFECT IMPACT LEVEL:	☐ HIGH ☒ MEDIUM ☐ LOW
(43) VALIDATION TYPE:	☒ DEFECT ☐ FEATURE ☐ TRAINING ISSUE ☐ DUPLICATE
(44) DEFECT IMPACTS OTHER CLECS?	☒ YES ☐ NO
(45) INTERFACES IMPACTED BY DEFECT:	☐ EDI ☐ TAG ☒ LNP ☐ LENS ☐ TCIF 7 ☐ TCIF 9
(46) TARGET IMPLEMENTATION DATE:	08/25/02
(47) ACTUAL IMPLEMENTATION DATE:	

By and Between

BellSouth Telecommunications, Inc.

And

DIECA Communications, Inc. d/b/a

Covad Communications Company

EXHIBIT 4

Jul. 8. 2002 8:12PM

2.1.17.8.6 Covad shall exclusively order the UDC for its IDSL service.

2.1.17.9 Acceptance Testing and Cooperative Testing

2.1.17.9.1 Cooperative Acceptance Testing is acknowledged by both BellSouth and Covad to assist in the timely and efficient provisioning of functioning loops. If both parties agree in writing that this testing is no longer necessary, it can be suspended at any time.

2.1.17.9.2 BellSouth will dispatch a technician to provide normal acceptance testing where BellSouth determines a dispatch is required to provision the loop. Normal acceptance testing includes: Placing a short on the tip and ring conductors, listening for tone, and placing a ground on tip and ring. BellSouth will call Covad with the technician on the line to perform the above mentioned tests and Covad will within 15 minutes begin testing with the technician. The BellSouth technician will test with Covad for a period not to exceed 15 minutes. Testing not considered to be normal acceptance testing as outlined above may be performed by BellSouth, if requested by Covad. BellSouth will charge and Covad will pay for additional acceptance testing, by paying additional acceptance charges as outlined in FCC No. 1 Tariff. BellSouth shall deliver loops which perform according to the characteristics of TR73600 for the particular loop ordered.

2.1.17.9.3 Where a technician is dispatched to provision a loop, the BellSouth technician shall tag a circuit for identification purposes. Where a technician is not dispatched by BellSouth, BellSouth will provide sufficient information to Covad to enable Covad to locate the circuit being provisioned. Upon delivery of the loop BellSouth will contact CLEC via a toll free number to provide notification of the completion of the loop and where required, provide acceptance testing as provided for in this agreement.

2.1.17.9.4 If Covad is not available to perform acceptance testing within 15 minutes of the time of loop turn up by BellSouth then CLEC may request and BellSouth, if mutually agreed to, will require the BellSouth technician to standby. CLEC would then be required to pay standby charges as provided for in FCC No. 1 Tariff.

2.1.17.9.5 If BellSouth is unable to contact a Covad employee to perform acceptance testing at the time of loop turn up (placed on hold for more than 15 minutes, reaches voice mail or other recording, no answer or repeated busy conditions), BellSouth will test the loop to ensure the loop is provisioned according to requirements of TR73600 for the type of loop requested by CLEC. BellSouth will complete the local service request without obtaining acceptance from Covad and will have no further obligation to perform normal acceptance testing of the provisioned loop. On any such orders where

No. 2052 P. 14

BEFORE THE
TENNESSEE REGULATORY AUTHORITY
Nashville, Tennessee

In Re: BellSouth Telecommunications, Inc.'s Entry into Long Distance (interLATA) Service in Tennessee Pursuant to Section 271 of the Telecommunications Act of 1996	))))	Docket No. 97-00309

DIRECT TESTIMONY

OF

TERRY L. MURRRAY

OF

COVAD COMMUNICATIONS COMPANY

July 12, 2002

TESTIMONY OF
TERRY L. MURRAY
ON BEHALF OF
COVAD COMMUNICATIONS COMPANY

I. INTRODUCTION

Q. Please state your name, title and business address.

A. My name is Terry L. Murray. I am President of the consulting firm Murray & Cratty, LLC. My business address is 227 Palm Drive, Piedmont, CA 94610.

Q. Please describe your qualifications and experience as they pertain to this proceeding.

A. I am an economist specializing in analysis of regulated industries. I received an M.A. and M.Phil. in Economics from Yale University and an A.B. in Economics from Oberlin College. At Yale, I was admitted to doctoral candidacy and completed all requirements for the Ph.D. except the dissertation. My fields of concentration at Yale were industrial organization (including an emphasis on regulatory and antitrust economics) and energy and environmental economics.

My professional background includes employment and consulting experiences in the fields of telecommunications, energy, and insurance regulation. As a consultant, I have testified or served as an expert on telecommunications issues in proceedings before state regulatory commissions in California, Connecticut, Delaware, the District of Columbia, Florida, Georgia, Hawaii, Illinois, Kansas, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nevada, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania,

South Carolina, Texas, Virginia, Washington, and Wisconsin, and before the Federal Communications Commission ("FCC").

Before I became a consultant in 1990, I was employed for approximately six years at the California Public Utilities Commission in a variety of positions, culminating in my service as Director of the Division of Ratepayer Advocates. In virtually all of these positions, I had significant responsibility for telecommunications matters. I have also taught economics and regulatory policy at both the undergraduate and graduate levels. My curriculum vitae, included as Exhibit TLM-1 to this testimony, provides more detail concerning my qualifications and experience.

Q. What is the purpose of your testimony?

A. Dieca Communications Company d/b/a Covad Communications Company ("Covad") has asked me to address issues related to the deployment of Digital Subscriber Line ("DSL") services over fiber-fed loops in Tennessee. BellSouth, in replacing copper wires with fiber-optic technology, has taken steps that effectively place the customers served by nearly half of the Remote Terminals ("RTs") in Tennessee off-limits to DSL competition.[1] This effective "remonopolization" of the bottleneck facility of the local loop is the very essence of discrimination in providing access to loops, and, as such, BellSouth's actions should prevent it from gaining approval for its 271 application in accordance with Checklist Item 4.

[1] BellSouth Response to Consolidated CLEC Data Request 80 ("Data Request"), which indicates that nearly 50% of all remote terminals are not served by alternative copper feeder cable facilities.

Q. Why is the issue of providing DSL services over fiber-fed loops significant?

A. The issue of providing DSL services over fiber-fed loops is significant because, as I will explain below, competitors are often unable to supply Tennessee customers with competitive DSL services when those customers are served over fiber feeder and Digital Loop Carrier ("DLC") instead of copper feeder cable. BellSouth is aggressively deploying fiber/DLC technology throughout Tennessee; thus, over time, fewer and fewer Tennessee consumers and small businesses will be able to reap the benefits of DSL competition as BellSouth regains complete monopoly control over the bottleneck facility of the local loop.

II. DESCRIPTION OF DSL TECHNOLOGY

Q. Must DSL-based services be provided over all-copper loops?

A. No. The predominant method for provisioning DSL-based services today is to use a "clean copper loop"—*i.e.*, an all-copper loop without load coils or excessive bridged tap. Nevertheless, some currently available DLC equipment allows carriers to provide DSL-based services over fiber/DLC loops.

Q. When you speak of "DLC equipment," what do you mean?

A. Most basic telephone service today is provided over loops that are either all-copper or loops that combine an initial (feeder) segment that is fiber optic cable with a copper (distribution) cable that completes the loop connection to individual homes and businesses. When fiber optic cable is deployed as part of the loop, electronics systems, commonly referred to as DLC, are deployed at both ends of the fiber cable. This DLC equipment is placed in an RT at the interface between

the fiber and copper cable. Certain modern DLC equipment allows the provisioning of DSL services to customers served by that RT.

Q. How does Covad provide DSL over an all-copper loop?

A. Like other competitors, Covad provides DSL services over all-copper loops in one of two basic ways: (1) Covad can use a loop that is dedicated to providing DSL (a "stand-alone loop"), or (2) Covad can provide DSL over a loop over the high-frequency portion of a loop that also provides basic voice services ("line sharing"). In both configurations, Covad provides DSL over a copper pair that runs all the way from the customer premises back to the BellSouth central office where it is connected to Covad's collocated Digital Subscriber Line Access Multiplexer ("DSLAM"), a piece of equipment that collects various end-user DSL connections and allows these signals to be routed to a single, high-speed packet switch. In this way, all of the information coming from all of Covad's customers served from a single central office is collected and connected to Covad's high-speed network.

In the stand-alone loop configuration, the available bandwidth of the all-copper loop is used exclusively for DSL services. In the line-sharing configuration, the loop passes through a "splitter" in the central office before being connected to Covad's DSLAM. The splitter "splits" the signal in the loop, with the high frequency portion being sent to Covad and the low-frequency, voice portion being sent to BellSouth or (in what is called "line splitting") to another voice provider.

Q. Can Covad use the same process to provide DSL when BellSouth provides the loop in part over fiber feeder, instead of over entirely copper cable?

A. No. When loops have fiber feeder, Covad (or any other carrier) must place the DSLAM functionality out in the field, so that it can interface directly with the copper cable. The remotely located DSLAM functionality collects all of DSL signals from the end users served by that RT and sends this information back to the central office over fiber. I am aware of two technically feasible ways that this is being done (at least to some degree) today.

Q. What is the first option for providing DSL when the loop includes fiber feeder?

A. The competitor can install a DSLAM at the RT to perform precisely the same function as the DSLAM that previously would have been located in the central office. This option effectively requires each competitor to create a collocation-type arrangement at each RT (*i.e.,* in the middle of each separate loop facility route) and to obtain transport facilities from its remote DSLAM to the Central Office. BellSouth has 6318 such RT structures in Tennessee alone.[2] I will explain in detail below why this option is unlikely to be feasible for competitors other than BellSouth in most, if not all, situations.

Q. What is the second approach for providing DSL over a loop with fiber/DLC?

A. Certain modern DLC systems can support the provision of DSL service if they are equipped with suitable line cards, which are different from the line cards that are used for basic voice-only service. With a suitable array of line cards, it is my

understanding that these currently available DLC systems can accommodate voice, ISDN, and a wide variety of DSL-based services such as ADSL, HDSL and SDSL.[3]

Q. Is this second arrangement widely deployed today?

A. Yes. DSL services are currently being deployed over such DLC systems across the country. At least one major incumbent, SBC, has determined that it can actually reduce its costs by substantially accelerating the deployment of forward-looking DLCs that can support DSL-based services. SBC has announced that its "Project Pronto" initiative, which is designed to extend the reach of DSL-based services and other broadband services to the substantial majority of SBC end users using currently available DLC technology, will produce that benefit by delivering "profound impacts on its cost structure" with "efficiencies ... conservatively targeted to yield annual savings of about $1.5 billion by 2004" such that the savings "will pay for the cost of deployment on an NPV [Net Present Value] basis."[4]

Q. Does BellSouth provide its own broadband services over fiber/DLC systems in Tennessee?

A. Yes. BellSouth admits that it is currently providing such services to 15,438 customers in Tennessee through remote DSLAMs collocated at the RT, a number representing approximately 30% of BellSouth's total DSL customer base in

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[2] BellSouth Response to Data Request 83.

[3] The DSL and voice signals may, or may not, travel on physically separate fiber strands in this arrangement.

[4] SBC Investor Briefing No. 211, October 18, 1999, at 7.

Tennessee.[5] Further, BellSouth also admits that it is at least testing the option of providing DSL using "dual purpose line cards" to provide broadband services through its Tennessee RTs using modern DSL-capable DLC technology.[6]

III. COMPETITIVE ISSUES RELATED TO PROVISIONING DSL VIA "REMOTE DSLAMS"

Q. BellSouth has claimed in the past that physical collocation of DSLAMs at the RT can solve the problem of competitive access to the DSL market for fiber-fed loops. Is this collocation option adequate to enable DSL providers other than BellSouth or its affiliates to offer Tennessee consumers competitive alternatives for advanced services throughout the state?

A. No. Physical collocation of DSLAMs at the RT may be a viable option for some competitors at some locations, but the physical collocation option will not enable DSL providers to offer ubiquitous alternatives to BellSouth's own DSL services. The cost of collocation alone may prohibit competitors other than BellSouth from employing this option.

In testimony filed before the FCC, Covad has provided a sample business case for RT collocation based on realistic (but conservative) parameters derived from Covad's experience nationwide and the testimony of incumbent local exchange carriers concerning collocation costs and customer take rates for broadband services. This sample business case shows that it would take Covad an average of 14.2 years just to break even on the cost of RT collocation, even under optimistic assumptions about the penetration that Covad could achieve at each RT

[5] BellSouth Response to Data Request 86 and 87.

and the cost to Covad of such collocation. That estimate entirely ignores all of the other costs Covad would incur to provide DSL service to the customers served by those RTs, such as the cost of the DSLAMs, the cost of the loops, the cost of customer premises equipment (the DSL modems) and so on. Based on this estimate, Covad concluded that "[n]o CLEC could make a profit faced with these economics."[7]

A recent decision of the Wisconsin Public Service Commission ("PSC") supports this conclusion. The Wisconsin PSC found that "[c]ollocation by competitors at remote terminals ('RTs') is costly and time consuming and may present difficulties with space considerations, availability of dark fiber, and completing an engineering controlled splice."[8] As evidence of the prohibitive cost of RT collocation, the Wisconsin PSC cited a study by Sprint indicating that it would cost more than $22 million dollars to collocate only at the Wisconsin RTs that were already equipped with NGDLC terminals, not to mention those that would be upgraded in the future.[9]

These findings are not surprising. Collocation at central offices is already an expensive and complex process for competitors. Collocation of DSLAMs at Tennessee's 6318 RTs would require thousands of additional collocations, on a

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[6] Affidavit of William J. McNamara, III attached to BellSouth's Petition for Stay (April 10, 2002) in TRA Docket No. 00-00544.

[7] Joint Declaration of Anjali Joshi, Eric Moyer, Mark Richman, and Michael Zulevic on Behalf of Covad Communications Company in CC Docket Nos. 01-338, 96-98, and 98-147, April 5, 2002, at ¶ 40. A copy of this Declaration, containing the sample business case for RT collocation, is attached hereto as Exhibit TLM-2. Section VII of the Joint Declaration filed at the FCC provides additional detail concerning the competitive issues I address in this testimony.

[8] Final Decision of the Wisconsin Public Service Commission in Docket No. 6720-TI-161, Investigation Into Ameritech Wisconsin's Unbundled Network Elements, March 21, 2002, (hereafter, "Wisconsin Order") at 11-12, ¶ 67.

route-by-route basis, in each central office area merely to achieve or maintain the ability to provide broadband service at parity with BellSouth. Excluding the costs of construction, equipment, loops, etc., the total application fees alone for these new collocations would amount to millions of dollars.[10]

Further, unlike at a central office, the level of concentration present at a remote terminal is often as low as a hundred or a few hundred lines in total. Therefore, the cost of establishing an entire collocation arrangement at each remote terminal may be so prohibitive as to never make economic sense given the few customers that any given competitor might serve from an individual RT location. Indeed, a requirement to collocate a stand-alone DSLAM at the remote terminal might be sufficient to eliminate competition in most locations served by DLC.

The cost of RT collocation also places BellSouth's competitors at a substantial financial disadvantage in those instances in which BellSouth or its affiliates are able to offer DSL-based services using line cards placed in BellSouth's DLC.

Without a requirement to unbundle a full array of options for providing DSL over fiber-fed loops, BellSouth could severely disadvantage competitive providers of DSL-based services. As the FCC has observed:

> When an incumbent has deployed DLC systems, requesting carriers must install DSLAMs at the remote terminal instead of

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[9] *Id.* at 12, ¶ 68.

[10] *See* Covad's Interconnection Agreement with BellSouth, Attachment 4, Exhibit D. The application fee alone that Covad would have to pay to BellSouth for each remote terminal collocation site would be $872.95, *bringing the total cost to Covad of doing nothing more than applying for remote terminal collocation at all locations to $5,515,298.10.*

> at the central office in order to provide advanced services. We agree that, if a requesting carrier is unable to install its DSLAM at the remote terminal or obtain spare copper loops necessary to offer the same level of quality for advanced services, the incumbent LEC can effectively deny competitors entry into the packet switching market.[11]

Absent a regulatory constraint, it is simply rational for incumbents such as BellSouth to evolve their local exchange networks in a manner that supports advanced services options that they or their affiliates plan to implement, while creating technical or pricing disadvantages for competing providers. Moreover, the incumbents also have an incentive to delay competitors' access to options that are built into the incumbents' networks. Unless regulators give clear direction to incumbents to take the needs of competition into account as part of the network modernization process, the incumbents will continue to follow their self-interest, "slow rolling" competitors' access to network options. Such a process has the inefficient effect of forcing competitors to begin lengthy regulatory procedures to win access to network options one-at-a-time.

Thus, while the Commission should certainly ensure that BellSouth offers physical collocation at the RT at prices, terms and conditions that comply with the FCC's *UNE Remand Order*, this action alone will not suffice to provide competitive choices to the many Tennessee consumers served by fiber/DLC systems.

Q. Are there other problems with RT collocation?

A. Yes. Even if it were economically possible for Covad and other competitors to collocate at RTs, BellSouth still has a tremendous competitive advantage in

[11] *UNE Remand Order* at ¶ 313.

choosing where to spend money on RT DSLAM and NGDLC deployment. This advantage arises from the decades of data that BellSouth possesses (strictly as a result of its former outright monopoly) concerning the customers served by each of its RTs—information such as what services they order for their local phones and their payment history. This information allows BellSouth to upgrade its RTs only in those neighborhoods where its experience proves that it will be able to recoup its investment. Neither Covad nor any other competitor has access to such data derived during an era of monopoly power. Thus, in deciding to collocate at a BellSouth RT, Covad would be taking a higher risk than BellSouth ever has to take in making the same decision.

Given all of these considerations, BellSouth's proposed RT collocation solution is no solution at all. Essentially, BellSouth is proposing that competitors spend substantial sums of money (which will be difficult, if not impossible, to obtain in today's investment climate) to expand collocation RT-by-RT. Doing so requires not only buying collocation space and installing new equipment (if space is available), but also obtaining spare fiber capacity (if it is available), thereby creating excess capacity because of the low concentration of customers served by any single RT. Meanwhile, BellSouth can use its superior customer knowledge developed over decades of monopoly power to invest in placing remote DSLAMs only in those RTs where it is assured of a profit and to selectively and exclusively roll out line-card-based DSL service in other areas.

Q. Can competitors rely on alternative, all-copper facilities to provision DSL services to Tennessee consumers and small businesses where BellSouth serves the end-user via fiber/DLC facilities?

A. No. As BellSouth indicated in its response to Data Request 80, 48.9% of the RTs in Tennessee do not have alternate copper facilities available. Hence, unless competitors have access to a DLC-based option to provide service to customers served from those RTs, BellSouth can effectively remonopolize a substantial portion of the Tennessee marketplace for DSL services and for combined voice and DSL service.

IV. SOLUTIONS TO THE PROBLEM OF DSL OVER FIBER-FED LOOPS

Q. Has the Authority already taken steps to help solve this problem?

A. Yes. The Authority has already recognized the competitive disadvantage to which competitors are subjected when BellSouth moves central office functionality out to RTs. To address this problem, the Authority has ordered BellSouth "to install, for the CLECs' use, dual-purpose line cards in the fiber-fed Next Generation DLC equipment in the remote terminal."[12] This is an extraordinarily important first step to bring the benefits of DSL competition to all Tennessee consumers. I recommend that the Commission take another step to address the problem of DSL over fiber-fed loops and further extend the benefits of DSL competition.

[12] April 3, 2002 Order in Docket No. 00-0054 ("Generic Docket to Establish UNE Prices for Line Sharing," etc.) (hereafter, "TRA Line Sharing Order") at 43.

Q. What other solution to this problem do you recommend?

A. An additional solution to the problem of BellSouth's discrimination would be to mandate the creation of an end-to-end Broadband UNE. This is the approach that the Wisconsin PSC adopted in its recent Order.[13] The Wisconsin PSC ordered Ameritech to provide competitors with a "Broadband end-to-end UNE" in part because, without it, "CLECs will incur higher costs, experience lower or less consistent levels of quality, have less ubiquitous access to similar facilities, and encounter more troublesome operational issues."[14]

Failing the immediate adoption of the Broadband UNE, the Authority should, at least, open a docket to investigate the competitive effects of BellSouth's ongoing remonopolization of the bottleneck local loop facility and to set prices for an end-to-end Broadband UNE.

Q. What do you mean by an end-to-end Broadband UNE?

A. By an end-to-end Broadband UNE, I mean the creation of a loop UNE from the customer's premises to BellSouth's central office that allows competitors to provide DSL services to any customer regardless of the technology that BellSouth deploys at a given RT. In other words, this UNE would be provisioned over whatever technology existed to serve Covad's target customer.

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[13] Wisconsin Order at 12, ¶ 69.

[14] *Id.* at 11, ¶ 66.

Q. What should the TRA do in the interim before the Broadband UNE can be implemented?

A. I recommend that this Authority take a position similar to that taken by several other state commissions[15] by prohibiting BellSouth, or any of its affiliates, from providing DSL-based services over fiber facilities in Tennessee until BellSouth has set forth terms, conditions and prices that would allow unaffiliated competitors access to that capability for both stand-alone and line-shared loops and parties have had an opportunity to litigate the propriety of the BellSouth proposals. In other words, until BellSouth ceases its discriminatory practices and until rates are set for whatever solution the Authority deems most appropriate, BellSouth should not be allowed to add DSL customers in those areas where it has already remonopolized the bottleneck loop facilities.

V. SUMMARY

Q. Please summarize your conclusions and recommendations.

A. BellSouth serves a large and growing proportion of Tennessee consumers over fiber-fed loops. For nearly half of these consumers, there are no alternative all-copper facilities available. As the Wisconsin PSC has observed, physical collocation at the RT is often so expensive that it amounts to a barrier to

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[15] *See* Order, *Investigation by the Department on its own motion as to the propriety of the rates and charges set for in M.D.T.E. No. 17*, D.T.E. 98-57-Phase III at 80 (Sept. 29, 2000) at 94-96; Public Service Commission of Maryland, Case No. 8842, Phase I, Order No. 76488, Oct. 6, 2000, at 15-16; and New York Public Service Commission, Case 00-C-0127, Opinion No. 00-12, issued and effective, Oct. 31, 2000, at 25-27. *See also*, Illinois Commerce Commission Arbitration Decision, Dockets 00-0312 and 00-0313, Aug. 17, 2000, at 31.

competitive entry and, even where its cost might be justified, would prove unworkable in many instances.

Therefore, the Commission should open a new docket to consider pricing for an end-to-end Broadband UNE like the one adopted by the Wisconsin PSC to be provisioned over whatever technology BellSouth chooses to use in its Tennessee RTs.

Otherwise, BellSouth will slowly choke off all DSL competition in Tennessee to the detriment of Tennessee consumers and small businesses. This outcome is antithetical to the Telecommunications Act of 1996.[16] In short, the Authority has the power and the mandate to act to prevent the remonopolization of the local loop in Tennessee, and it should take the appropriate steps to ensure that this occurs before granting BellSouth's 271 application.

Q. Does that conclude your testimony at this time?

A. Yes, it does.

[16] I am also informed by counsel that T.C.A. § 65-4-124 gives this Authority the power to order the creation of a Broadband UNE wholly apart from the power granted to it by the 1996 Act.

EXHIBIT TLM-1

CURRICULUM VITAE OF TERRY L. MURRAY

Terry L. Murray

President, Murray & Cratty, LLC
January 1998 - present
Economic consulting and expert witness testimony specializing in regulatory and antitrust matters.

Principal, Murray and Associates
April 1992 - December 1997
Economic consulting and expert witness testimony, primarily in the fields of telecommunications, energy and insurance regulation and antitrust.

Director, Regulatory Economics, Morse, Richard, Weisenmiller & Associates, Inc.
April 1990 - April 1992
Economic consulting and expert witness testimony, primarily in the fields of telecommunications and energy regulation.

California Public Utilities Commission
June 1984 - March 1990

Director, Division of Ratepayer Advocates (DRA)
March 1989 - March 1990
Headed a staff of over 200 analysts who provided expert witness testimony on behalf of California ratepayers in contested proceedings involving telecommunications, electric, gas, water and transportation utilities. Major proceedings included evaluation of proposed merger between Southern California Edison and San Diego Gas and Electric Companies.

Program Manager, Energy Rate Design and Economics Branch, DRA
October 1987 - March 1989
Managed a staff of over 30 analysts who testified on electric and gas rate design and costing issues, sales forecasts and productivity analyses. Testified as lead policy witness in electric utility incentive ratemaking and transportation policy proceedings.

Senior Policy Analyst, Policy and Planning Division
March 1987 - October 1987
Organized *en banc* hearing and drafted notice of investigation for major telecommunications incentive regulation proceeding. Headed Commission task force on open network architecture.

Commissioner's Advisor
July 1985 - March 1987
Lead advisor on independent power industry and cost of capital issues. Analyzed proposed decisions on energy, telecommunications, water and transportation issues and made recommendations for Commission action. Co-authored Commission order establishing conditions for approval of San Diego Gas and Electric Company application to form a holding company.

Staff Economist, Public Staff Division
June 1984 - July 1985
Testified on cost of capital and telecommunications bypass issues. Served on telecommunications strategy task force charged with developing recommendations for post-divestiture regulatory policies.

Instructor, Golden Gate University
1986 - 1987
Taught courses on telecommunications regulation to students in the Masters in Telecommunications Management program and students in a special program for federal government telecommunications managers.

Acting Assistant Professor of Economics, Wesleyan University
July 1981 - June 1982
Taught undergraduate courses in microeconomics, macroeconomics, econometrics, and economics and policy of regulation.

TESTIMONY

California Department of Insurance

- File Nos. PA-94-0012-00 & PA-94-0012-0A, In re 20th Century Insurance Company and 21st Century Casualty Company.
- File Nos. PA-93-0014-00 *et al.*, In the Matter of the Rates and Rating Practices, and Rate Applications of: State Farm Mutual Automobile Insurance Company, State Farm Fire and Casualty Company, State Farm General Insurance Company, Applicants and Respondents, 3/1/94, 3/29/94.
- File Nos. PA-93-0009-00 *et al.*, In the Matter of the Rate Applications of Nationwide Mutual Insurance Company, Nationwide Mutual Fire Insurance Company, Nationwide Property and Casualty Insurance Company, Applicants, 9/11/93.

California Public Utilities Commission

- R.93-04-003/I.93-04-002, Rulemaking and Investigation on the Commission's Own Motion to Govern Open Access to Bottleneck Services and Establish and Framework for Network Architecture Development of Dominant Carrier Networks, and R. 95-04-043/I.95-04-044, Rulemaking and Investigation on the Commission's Own Motion into Competition for Local Exchange Service (consolidated for purposes of evaluating Pacific Bell's Section 271 application), 8/23/01.
- A.01-02-024, Joint Application of AT&T Communications of California, Inc. (U 5002 C) and WorldCom, Inc. for the Commission to Reexamine the Recurring Costs and Prices of Unbundled Switching in Its First Annual Review of Unbundled Network Element Costs Pursuant to Ordering Paragraph 11 of D.99-11-050, and A.01-02-035, Application of AT&T Communications of California, Inc. (U 5002 C) and WorldCom, Inc. for the Commission to Reexamine the Recurring Costs and Prices of Unbundled Loops in Its First Annual Review of Unbundled Network Element Costs Pursuant to Ordering Paragraph 11 of D.99 11-050, 8/20/01.
- A.01-01-010, Application by Pacific Bell Telephone Company (U 1001 C) for Arbitration of an Interconnection Agreement with MCImetro Access Transmission Services, L.L.C. (U 5253 C) Pursuant to Section 252(b) of the Telecommunications Act of 1996,. 2/2/01.

- A.00-01-022, Application of AT&T Communications of California, Inc., *et al.*, for Arbitration of an Interconnection Agreement with Pacific Bell Pursuant to Section 252(b) of the Telecommunications Act of 1996, 1/24/00, 3/5/00.
- A.00-01-012, In the Matter of Covad Communications Company's (U 5752 C) Petition for Arbitration of Interconnection Agreement with Roseville Telephone Company (U 1015 C), 1/7/00.
- A.98-12-005, In the Matter of the Joint Application of GTE Corporation ("GTE") and Bell Atlantic Corporation ("Bell Atlantic") to Transfer Control of GTE's California Utility Subsidiaries to Bell Atlantic Which Will Occur Indirectly as a Result of GTE's Merger with Bell Atlantic, 6/7/99.
- A.99-03-047, In the Matter of the Petition by Pacific Bell (U 1001 C) for Arbitration of an Interconnection Agreement with Metropolitan Fiber Systems/ Worldcom Technologies, Inc. (MFS/Worldcom) Pursuant to Section 252(b) of the Telecommunications Act of 1996, 4/16/99, 5/24/99.
- A.98-05-038, In the Matter of the Application of Pacific Bell for Authority for Pricing Flexibility and to Increase Certain Operator Services, to Reduce the Number of Monthly Directory Assistance Call Allowances, and Adjust Prices for Four Centrex Optional Features, 11/17/98.
- A.98-06-052, In the Matter of the Petition of PDO Communications, Inc. for Arbitration Pursuant to Section 252 of the Federal Telecommunications Act of 1996 to Establish an Interconnection Agreement with Pacific Bell, 8/14/98.
- In the Matter of the Petition of MCImetro Access Transmission Services, Inc. for Arbitration of Interconnection Rates, Terms, and Conditions Pursuant to 47 U.S.C. § 252(b) of the Telecommunications Act of 1996 (re: GTE California, Inc.), 9/96.
- A.96-04-038, In the Matter of the Joint Application of Pacific Telesis Group and SBC Communications, Inc. for SBC to Control Pacific Bell, 9/30/96.
- A.93-03-054, Application to Modify Diablo Canyon Pricing and Adopt a Customer Electric Rate Freeze in Compliance with Decision 95-12-063, 9/9/96.
- R.93-04-003/I.93-04-002, Rulemaking and Investigation on the Commission's Own Motion to Govern Open Access to Bottleneck Services and Establish and Framework for Network Architecture Development of Dominant Carrier Networks, 6/14/96, 7/10/96, 3/18/97, 12/19/97, 2/11/98, 4/8/98, 4/27/98, 5/1/98, 6/5/98, 12/18/98, 1/11/99, 2/8/99, 3/15/00, 3/27/00, 4/5/00, 5/2/00, 6/11/01, 6/25/01, 7/24/01.
- I.95-04-044, Order Instituting Investigation on the Commission's Own Motion into Competition for Local Exchange Service, 10/2/95, 10/9/95, 12/95.
- I.94-04-032, Order Instituting Investigation on the Commission's Proposed Policies Governing Restructuring California's Electric Services Industry and Reforming Regulation, 12/8/94.
- Application Nos. 93-05-008 *et al.*, In the Matter of the Application of Sierra Pacific Power Company to Authorize a Return on Equity for Calendar Year 1994 Pursuant to Attrition Rate Adjustment Mechanism, 8/93.
- Application Nos. 92-05-002 and 92-05-004, Application of GTE California Incorporated for Review of the Operations of the Incentive-Based Regulatory Framework Adopted in Decision 89-10-031, 5/93, 7/93.
- Case No. 91-12-028, The City of Long Beach, in its Proprietary Capacity and as Trustee for the State of California, Complainant, vs. Unocal California Pipeline Company, a Unocal Company, Defendant, 5/15/93.
- I.87-11-033 *et al.*, In the Matter of Alternative Regulatory Frameworks for Local Exchange Carriers (Phase III, Implementation and Rate Design), 9/23/91, 12/16/91, 1/17/92.
- General freight deregulation proceeding, 10/88.

- I.86-10-001, Risk, Return and Ratemaking, 3/88.
- Southwest Gas General Rate Case, 8/85.
- Application No. 85-01-034, Pacific Bell Test Year 1986 General Rate Case, 4/22/85.
- CP National South Lake Tahoe Gas General Rate Case, 12/84.

Colorado Public Service Commission

- Docket No. 91A-480EG, In the Matter of the Joint Application of the Parties to Revised Settlement Agreement II in Docket Nos. 91S-091EG and 90F-226E for Commission Consideration of Decoupling Revenues from Sales and Establishment of Regulatory Incentives to Encourage the Implementation of DSM Programs, 11/8/91, 4/30/92, 9/8/92, 9/14/92.

Connecticut Department of Public Utility Control

- In the Matter of the Petition of MCImetro Access Transmission Services, Inc. for Arbitration of Interconnection Rates, Terms, and Conditions Pursuant to 47 U.S.C. § 252(b) of the Telecommunications Act of 1996 (with The Southern New England Telephone Company), 12/96.
- Docket Nos. 95-06-17 *et al.*, Application of The Southern New England Telephone Company for Approval to Offer Unbundled Loops, Ports and Associated Interconnection Arrangements, 9/8/95.

Delaware Public Service Commission

- Docket No. 96-324, Bell Atlantic - Delaware Statement of Terms and Conditions Under Section 252(F) of the Telecommunications Act of 1996, 2/4/97.
- Docket No. 45, In the Matter of the Development of Regulations for the Facilitation of Competitive Entry into the Telecommunications Local Exchange Service Market, 7/3/96.

District of Columbia Public Service Commission

- Formal Case No. 962, In the Matter of the Implementation of the District of Columbia Telecommunications Act of 1996 and Implementation of the Telecommunications Act of 1996, 3/24/97, 5/2/97, 5/9/97, 1/11/02.

Federal Communications Commission

- CC Docket Nos. 00-218, 00-249 and 00-251, In the Matter of the Petition of WorldCom, Inc., Pursuant to Section 252(e)(5) of the Communications Act for Expedited Preemption of the Jurisdiction of the Virginia State Corporation Commission Regarding Interconnection Disputes with Verizon Virginia, Inc., and for Expedited Arbitration, *et al.*, 7/31/01, 8/27/01, 9/21/01.
- File No. E-98-12, MCI Telecommunications Corp. and MCImetro Access Transmission Services, Inc., Complainants, v. Bell Atlantic Corp., Defendant, 12/19/97, 3/25/98.
- CC Docket No. 94-1, In the Matter of Price Cap Performance Review for Local Exchange Carriers, 6/29/94.
- W-P-C 6913 *et al.*, In re the Matter of the Application of Pacific Bell for Authority Pursuant to Section 214 of the Communications Act of 1934, and Section 63.01 of the Commission's Rules and Regulations to Construct and Maintain Advanced Telecommunications Facilities to Provide Video Dialtone Services to Selected Communities.

Florida Public Service Commission

- Docket No. 990649-TP, In re: Investigation into the Pricing of Unbundled Network Elements, 8/11/99, 9/10/99, 10/15/99, 6/8/00, 7/31/00, 8/28/00.
- Docket No. 930424-EI, In re: Request for Approval of Proposal for Incentive Return on Demand-Side Management Investments by Florida Power Corporation, 11/22/93.
- Docket No. 93-444-EI, In re: Request for Approval of Proposal for Revenue Decoupling by Florida Power Corporation, 11/22/93.

Georgia Public Service Commission

- Docket No. 11900-U, In re: Investigation of BellSouth Telecommunications, Inc.'s Provision of Unbundled Network Elements for xDSL Service Providers, 11/13/00, 12/20/00.

Hawaii Public Service Commission

- Docket No. 7702, In the Matter of Public Utilities Commission Instituting a Proceeding on Communications, Including an Investigation of the Communications Infrastructure of the State of Hawaii, 7/3/97, 8/29/97, 6/2/00.

Illinois Commerce Commission

- Docket No. 00-0393, Illinois Bell Telephone Company Proposed Implementation of High Frequency Portion of Loop (HFPL) / Line Sharing Service, 9/1/00, 9/20/00, 10/4/00.
- Docket Nos. 00-0312 and 00-0313, Petitions of Covad Communications Company and Rhythms Links Inc. for Arbitration Pursuant to Section 252(b) of the Telecommunications Act of 1996 to Establish an Amendment for Line Sharing to the Interconnection Agreement with Illinois Bell Telephone Company d/b/a Ameritech Illinois, and for an Expedited Arbitration Award on Certain Core Issues, 5/15/00, 6/22/00, 11/21/00, 12/12/00, 12/21/00, 7/13/00.
- Docket No. 98-0396, Investigation into the Compliance of Illinois Bell Telephone Company with the Order in Docket 96-0486/0569 Consolidated Regarding the Filing of Tariffs and the Accompanying Cost Studies for Interconnection, Unbundled Network Elements and Local Transport and Termination and Regarding End to End Bundling Issues, 3/29/00, 5/5/00, 7/12/00.
- Docket No. 99-0593. Investigation of Construction Charges, 2/17/00, 3/8/00, 3/22/00.
- In the Matter of the Petition of MCImetro Access Transmission Services, Inc. for Arbitration of Interconnection Rates, Terms, and Conditions Pursuant to 47 U.S.C. § 252(b) of the Telecommunications Act of 1996 (Ameritech – Illinois), 12/96.

Kansas Corporation Commission

- Docket No. 00-DCIT-997-ARB, In the Matter of the Petition of Covad Communications Company for Arbitration of Interconnection Rates, Terms, Conditions and Related Arrangements for Line Sharing with Southwestern Bell Telephone Company, 6/12/00.
- Docket No. 00-DCIT-389-ARB, In the Matter of the Petition of DIECA Communications, Inc. d/b/a Covad Communications Company for Arbitration of Interconnection Rates, Terms, Conditions and Related Arrangements with Southwestern Bell Telephone Company, 1/7/00, 1/25/00, 2/21/00.
- Docket Nos. 190, 192-U, In the Matter of a General Investigation into Competition within the Telecommunications Industry in the State of Kansas, 11/14/94.

Maryland Public Service Commission

- Case No. 8879 – In the Matter of the Investigation into Rates for Unbundled Network Elements Pursuant to the Telecommunications Act of 1996, 5/25/01, 9/5/01, 10/15/01.
- Case No. 8745 – In the Matter of the Provision of Universal Service to Telecommunications Consumers, 5/21/01, 6/11/01.
- Case No. 8842 – In the Matter of Rhythms Links Inc. and Covad Communications Company vs. Bell Atlantic-Maryland, Inc., pursuant to Section 252(B) of the Telecommunications Act of 1996, 5/5/00, 7/14/00, 10/27/00.
- Case No. 8820, In the Matter of the Investigation into Affiliated Activities, Promotional Practices and Codes of Conduct of Regulated Gas and Electric Companies, 10/1/99, 10/26/99, 12/10/99.
- Docket No. 8797, In the Matter of The Potomac Edison Company's Proposed: (a) Stranded Cost Quantification Mechanism; (b) Price Protection Mechanism; (c) and Unbundled Rates, 1/26/99.
- Docket No. 8795, In the Matter of Delmarva Power and Light Company's Proposed Stranded Cost Quantification Mechanism, Price Protection Mechanism, and Unbundled Rates, 12/28/98.
- Docket No. 8794, In the Matter of Baltimore Gas and Electric (BGE)'s Proposed Stranded Cost Quantification Mechanism, Price Protection Mechanism, and Unbundled Rates, 12/22/98, 7/23/99, 8/3/99.
- Docket No. 8786, In the Matter of the Investigation of Non-Recurring Charges for Telecommunications Interconnection Service, 5/27/98, 11/16/98, 12/18/98.
- Docket No. 8731, Phase II, In the Matter of the Petitions for Approval of Agreements and Arbitration of Unresolved Issues Arising Under §252 of the Telecommunications Act of 1996, 3/7/97.
- Case No. 8731, In the Matter of the Petitions for Approval of Agreements and Arbitration of Unresolved Issues Arising under Section 252 of the Telecommunications Act of 1996, 10/96.
- Case No. 8715, In the Matter of the Inquiry into Alternative Forms of Regulating Telephone Companies, 11/95, 4/1/96.

Massachusetts Department of Telecommunications and Energy

- Docket No. DTE 98-57, Investigation by the Department on its own motion as to the propriety of the rates and charges set forth in the following tariffs: M.D.T.E. Nos. 14 and 17, filed with the Department on April 2, 1999, to become effective May 2, 1999, by New England Telephone and Telegraph Company d/b/a Bell Atlantic – Massachusetts, 7/26/99, 11/9/99.

Michigan Public Service Commission

- Case No. U-12540, In the Matter of the Application of Ameritech Michigan for Approval of Cost Studies and Resolution of Disputed Issues Related to Certain New UNE Offerings, 9/15/00, 10/13/00.
- Case No. U-10755, In the Matter of the Application of Consumers Power Company for Authority to Increase Its Rates for the Sale of Natural Gas and for Other Relief, 6/9/95.
- Case No. U-10685, In the Matter of the Application of Consumers Power Company for Authority to Increase Its Rates for the Sale of Electricity, 3/29/95, 5/5/95.
- Case No. U-10647, In the Matter of the Application of City Signal, Inc., for an Order Establishing and Approving Interconnection Arrangements with Michigan Bell Telephone Company, 8/5/94, 11/7/94, 11/30/94.

Minnesota Public Utilities Commission

- PUC Docket No. P-421/CI-01-1370, In the Matter of a Commission Investigation into Qwest's Compliance with Section 272(c)(2)(B) of the Telecommunications Act of 1996; Checklist Items 3, 7, 8, 9, 10 and 12, 1/28/02, 2/22/02.

Missouri Public Service Commission

- Case No. TO-2001-439, In the Matter of the Determination of Prices, Terms, and Conditions of Conditioning for xDSL-Capable Loops, 6/22/01, 7/13/01.
- Case No. TO-2000-322, In the Matter of the Petition of DIECA Communications, Inc. d/b/a Covad Communications Company for Arbitration of Interconnection Rates, Terms, Conditions and Related Arrangements with Southwestern Bell Telephone Company, 1/7/00, 1/27/00, 2/10/00.

Nevada Public Service Commission

- In re a Petition of the Staff of the Public Utilities Commission to Open a Docket to Investigate Costing and Pricing Issues Related to Industry-Wide Collocation Costs Pursuant to the Telecommunications Act of 1996 and the Commission's Regulations, 11/3/00.
- Docket No. 96-9035, In re a Petition by the Regulatory Operations Staff to Open an Investigation into the Procedures and Methodologies that Should Be Used to Develop Costs for Bundled or Unbundled Telephone Services or Service Elements in the State of Nevada, 5/8/97, 5/23/97.

New Jersey Board of Public Utilities

- Docket No. TO00060356, In the Matter of the Board's Review of Unbundled Network Elements Rates, Terms and Conditions of Bell Atlantic – New Jersey, 10/12/00.
- Docket No. TX95120631, Notice of Investigation into Local Exchange Competition for Telecommunications Services, 8/30/96, 12/20/96.

New York Public Service Commission

- Case No. 98-C-1357, Proceeding on Motion of the Commission to Examine New York Telephone Company's Rates for Unbundled Network Elements, 9/23/99, 10/18/99, 10/22/99, 2/7/00, 2/22/00, 3/31/00, 4/17/00, 6/26/00, 10/19/00, 11/13/00.
- Case Nos. 94-E-0098 and 94-E-0099, Niagara Mohawk Fuel Adjustment Clause Target and S.C. 6 Update Filing, 11/17/95.
- Case Nos. 93-E-0912 and 93-E-1075, Proceeding on Motion of the Commission to Review Long-Run Avoided Cost Estimation Policies and Methods, 5/10/95, 5/31/95.
- Case Nos. 92-E-1055 and 92-G-1056, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations for Central Hudson Gas & Electric Company for Electric Service and Gas Service, respectively, 3/93.
- Case Nos. 92-E-0108 *et al.*, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation for Electric Service, 1992.
- Case Nos. 91-E-0863 *et al.*, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of New York State Electric & Gas Corporation for Electric Service, 1/92.
- Case Nos. 91-E-0765 *et al.*, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Rochester Gas & Electric Corporation for Electric Service, 11/91.

- Case No. 91-E-0506, Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations for Central Hudson Gas & Electric Company for Electric Service, 9/91, 10/91.
- Case Nos. 29327 *et al.*, Niagara Mohawk Power Corporation Financial Recovery Agreement proceeding, 3/91.
- Docket No. 89-E-176, In the Matter of the Proceeding on Motion of the Commission to Examine Ratemaking Practices and Incentive Mechanisms Promoting Least-Cost Planning and Demand-Side Management by Electric Utilities, 4/19/90, 5/4/90, 4/18/91, 6/20/91.

North Carolina Utilities Commission

- Docket Nos. P-7, Sub 825, and P-10, Sub 479, In the Matter of Petition of Carolina Telephone and Telegraph and Central Telephone Company for Approval of a Price Regulation Plan Pursuant to G. S. 62-133.5, 1/31/96.
- Docket No. P-55, Sub 1013, In the Matter of Application of BellSouth Telecommunications, Inc., for, and Election of, Price Regulation and Motion for a Hearing, 1/28/96, 2/1/96.

Ohio Public Utilities Commission

- Case No. 96-922-TP-UNC, In the Matter of the Review of Ameritech Ohio's Economic Costs for Interconnection, Unbundled Network Elements, and Reciprocal Compensation for Transport and Termination of Local Telecommunications Traffic, 10/6/00.

Oklahoma Corporation Commission

- Cause No. PUD 200000192, Applicant: Southwestern Bell Telephone Company; Relief Sought: Approval of Nonrecurring Rates for Conditioning Unbundled Digital Subscriber Line ("DSL") Capable Loops, 7/12/00, 8/1/00.

Oregon Public Utility Commission

- Case No. UM-731, Phase IV, In the Matter of the Investigation of Universal Service in the State of Oregon, 1/17/00.

Pennsylvania Public Utility Commission

- Docket No. R-00016683, Generic Investigation of Verizon Pennsylvania, Inc.'s Unbundled Network Element Rates, 12/7/01, 1/11/02, 2/8/02.
- Docket No. M-00001353, Re Structural Separation of Verizon-Pennsylvania Inc. Wholesale and Retail Operations, 10/10/00.
- Docket No. R-00005261, In re: Further Pricing of Bell Atlantic Pennsylvania, Inc.'s Unbundled Network Elements, 10/4/00.
- Docket Nos. R-00994697 and R-994697C0001, Pennsylvania Public Utility Commission v. Bell Atlantic – Pennsylvania, Inc./ Rhythms Links Inc., Complainant v. Bell Atlantic – Pennsylvania, Inc., Respondent, 12/21/99, 1/14/00.
- Docket Nos. P-00991648, Joint Application of NEXTLINK Pennsylvania, Inc., *et al.* and P-00991649, Joint Application of Bell Atlantic – Pennsylvania, Inc., *et al.*, 4/22/99, 6/11/99.
- Docket Nos. A-310200F0002 *et al.*, In re the Joint Application of Bell Atlantic Corporation and GTE Corporation for Approval of Agreement and Plan of Merger, 3/23/99, 5/19/99.
- Docket No. I-00960066, Generic Investigation of Intrastate Access Charge Reform, 6/30/97, 7/29/97, 8/27/97.
- Docket No. A-31023670002, In the Matter of the Application of MCI Metro Access

Transmission Services, Inc. for a Certificate of Public Convenience and Necessity to Provide and Resell Local Exchange Telecommunications Services in Pennsylvania, 9//96.

- Petition for Arbitration by AT&T-PA for an Interconnection Agreement with GTE-PA, 9/96.
- Petition for Arbitration by Eastern TeleLogic for an Interconnection Agreement with Bell Atlantic - Pennsylvania, 9/96.
- Petition for Arbitration by AT&T-PA for an Interconnection Agreement with Bell Atlantic - Pennsylvania, 9/96.
- Docket No. I-940035, Formal Investigation to Examine and Establish Updated Universal Service Principles and Policies for Telecommunications Services, 1/11/96, 2/14/96, 2/27/96.
- Docket No. A-310203F002, Application of MFS Intelenet of Pennsylvania, Inc., for Approval to Operate as a Local Exchange Telecommunications Company, 1/30/95, 2/22/96, 3/22/96, 1/13/97, 2/97.

South Carolina Public Service Commission

- Docket No. 95-720-C, Application of BellSouth Telecommunications, Inc. d/b/a Southern Bell Telephone and Telegraph Company for Alternative Regulation, 8/21/95, 9/11/95.
- Docket No. 95-862-C, Re: BellSouth Telecommunications, Inc. d/b/a Southern Bell Telephone and Telegraph Company Investigation of Level of Earnings, 8/21/95, 9/11/95.

Texas Public Utility Commission

- Docket Nos. 22168, Petition of IP Communications Corporation to Establish Public Utility Commission of Texas Oversight Concerning Line Sharing Issues and 22469, Complaint of Covad Communications Company and Rhythms Links, Inc. against Southwestern Bell Telephone Company and GTE Southwest Inc. for Post-Interconnection and Arbitration under the Telecommunications Act of 1996 Regarding Rates, Terms, Conditions and Related Arrangements for Line-Sharing, 5/17/00, 9/5/00 (rev. 10/6/00), 10/20/00.
- Docket Nos. 20226, Petition of Accelerated Connections, Inc. d/b/a ACI Corp. for Arbitration to Establish an Interconnection Agreement with Southwestern Bell Telephone Company, and 20272, Petition of DIECA Communications, Inc., d/b/a Covad Communications Company for Arbitration of Interconnection Rates, Terms and Conditions and Related Arrangements with Southwestern Bell Telephone Company, 2/19/99, 4/8/99.

Vermont Public Service Board

- Docket No. 5780, Green Mountain Power Company General Rate Case, 1/13/95.
- Docket No. 5695, Tariff Filing of Green Mountain Power Company Requesting an 8.60% Rate Increase to Take Effect 11/15/93, 1/94.

Virginia State Corporation Commission

- Petitions for Arbitration of AT&T-VA and MCI Communications Corporation for an Interconnection Agreement with Bell Atlantic - Virginia, 9/20/96.
- Petition for Arbitration of AT&T-VA for an Interconnection Agreement with GTE-VA, 8/96, 10/29/96.

Washington Utilities and Transportation Commission

- Docket No. UT-960639 *et al.*, Phase II, In the Matter of the Pricing Proceeding for Interconnection, Unbundled Elements, Transport and Termination, and Resale, 8/20/98, 9/11/98.
- Docket No. UT-950200, Washington Utilities and Transportation Commission vs. U S WEST Communications, Inc., 8/28/95, 12/15/95.
- Docket No. UT-941464 *et al.*, Washington Utilities and Transportation Commission vs. U S WEST Communications, Inc., 4/17/95, 5/31/95.
- Docket No. UT-911488 *et al.*, Washington Utilities and Transportation Commission vs. U S WEST Communications, Inc.

Wisconsin Public Service Commission

- In the Matter of the Petition of MCImetro Access Transmission Services, Inc. for Arbitration of Interconnection Rates, Terms, and Conditions Pursuant to 47 U.S.C. § 252(b) of the Telecommunications Act of 1996 (Ameritech – Wisconsin), 12/96.

EDUCATION

A.B., Oberlin College, Oberlin, Ohio. Major: Economics. National Merit Scholar, recipient of Hanson Prize in Economics, elected to Phi Beta Kappa.

M.A., M.Phil., Yale University, New Haven, Connecticut. Economics. Admitted to Ph.D. candidacy and completed all Ph.D. requirements except dissertation. Fields of specialization included industrial organization and energy and environmental economics. Honorable mention, National Science Foundation Fellowship; recipient of University Fellowship and Sloan Foundation dissertation research fellowship.

EXHIBIT TLM-2

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers	)	CC Docket No. 01-338
Implementation of the Local Competition Provisions of the Telecommunications Act of 1996	)	CC Docket No. 96-98
Deployment of Wireline Services Offering Advanced Telecommunications Capability	)	CC Docket No. 98-147

JOINT DECLARATION OF ANJALI JOSHI, ERIC MOYER, MARK RICHMAN, AND MICHAEL ZULEVIC ON BEHALF OF COVAD COMMUNICATIONS COMPANY

I. Witness Qualifications

1. My name is Anjali Joshi. I am the Executive Vice President for Engineering for Covad Communications Company ("Covad"). My business address is 3420 Central Expressway, Santa Clara, CA 95051. I am responsible for network infrastructure planning and implementation. I have extensive experience in designing and building carrier class networks for voice and data. Prior to joining Covad, I worked for AT&T, where I developed AT&T's InterSpan ATM service. I have Masters degrees in Engineering and Computer Engineering and a BS degree in Electrical Engineering.

2. My name is Eric Moyer. I am the Director of Marketing Operations at Covad and am responsible for strategic business projects at Covad. My business address is 3420 Central Expressway, Santa Clara, CA 95051 . Previously, I was the Director of Product Management for Consumer Services (also Consumer/Business Access Services) for three

and a half years at Covad. Prior to coming to Covad, I worked at Hewlett Packard for 8 years in a variety of positions, including Industry Marketing Manager for US Wireless segment; Industry Marketing Manager for Fiber Optic Test; various other marketing, technical, and sales positions at HP, all in the telecommunications industry. I hold an MBA from Harvard Business School (1998) and a BS degree in electrical engineering and computer science from Johns Hopkins University (1988).

3. My name is Mark Richman. I am Chief Financial Officer for Covad. My business address is 3420 Central Expressway, Santa Clara, CA 95051. I have over 18 years of financial management experience. Prior to joining Covad, I was vice president and CFO for MainStreet Networks. Before MainStreet, I held senior management positions at Adecco S.A. where I was vice president of finance and administration for Adecco U.S., a $3 billion operating division. I was also vice president and corporate treasurer at the parent company. I also have worked for Merisel, Inc., ING Capital, Manufacturers Hanover Trust Company and Wells Fargo Bank. I hold a B.S. degree in managerial economics from the University of California at Davis and a MBA from the Anderson School at UCLA.

4. My name is Michael Zulevic. I am a Director of External Affairs for Covad Communications Company. My business address is 13769 North Slazenger Drive, Oro Valley, Arizona 85737. I am responsible for providing technical and witness support to Covad's Government and External Affairs Department in connection with regulatory proceedings. Prior to joining Covad, I was employed by U S WEST (now Qwest) for 30 years, most recently as Manager, Depreciation and Analysis for the last year I was employed by US WEST. Prior to that, I worked in Network and Technology Services

("NTS") for several years, providing technical support to U S WEST Interconnection Negotiation and Implementation Teams. While working in these two capacities, I provided testimony on technical issues in support of arbitration cases and/or cost dockets in Minnesota, Iowa, Montana, Washington, Oregon, Arizona, New Mexico, Nebraska, Utah, Wyoming, and Idaho.

II. Background on Covad

5. Covad is the nations' largest competitive digital subscriber line ("DSL") service provider. DSL is a broadband data service that offers consumers high speed connectivity over copper and fiber loops with data speeds that are more than twenty times faster than conventional dial-up modems. To offer service to its customers, Covad raised more than two billion dollars in debt and equity financing and constructed a nationwide facilities-based broadband network[1]. In addition to purchasing and deploying its own broadband equipment, Covad leases unbundled loops, the high frequency portion of the loop, dedicated interoffice transport and collocation space from ILECs around the country. With over 350,000 customers, Covad is likely the nation's largest user of standalone unbundled loops and line sharing network elements. Indeed, Covad's services are currently available in the top 94 metropolitan statistical areas, and its network covers more than 40 million homes and businesses.

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[1] Covad raised $1.4 billion in debt and $0.7 billion in equity.

III. Covad's Network Architecture

6. Covad specifically relied upon the Commission's UNE rules in designing its network architecture. By way of background, Covad's network is structured as follows:

(A) Covad has collocated a digital subscriber line access multiplexer ("DSLAM") at each ILEC central office at which the loops of its target end users terminate;

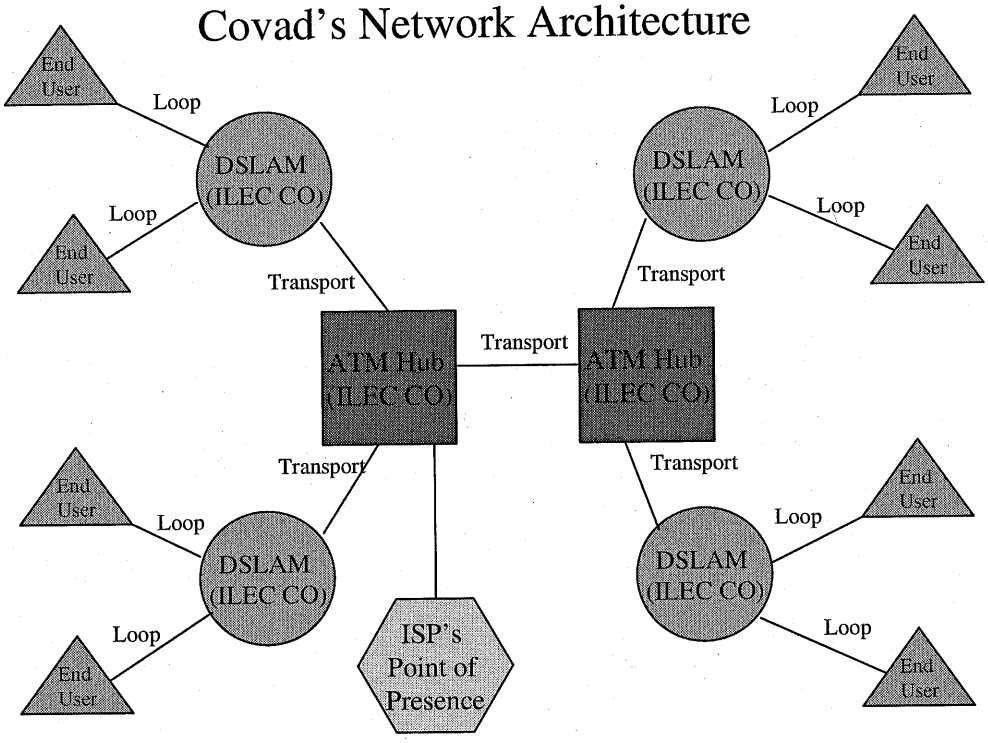
(B) Covad creates hub locations by collocating ATM equipment at an ILEC central office that collects traffic from a group of central offices with a DSLAM;[2]

(C) Covad connects each of its DSLAMs to a hub central office with dedicated interoffice transport ("transport");

(D) Covad interconnects its ATM equipment both within each region and between regions with transport; and

(E) Covad and its Internet service provider ("ISP") partners connect their IP Points of Presence ("POPs") to ATM equipment in one or more regions.

[2] Covad determines the ratio of hubs (ATM equipment) to spokes (DSLAMs) through the use of a cost optimization algorithm, which weighs the transport and DSLAM costs against the cost of the ATM equipment. The actual number of DSLAMs per piece of ATM equipment varies throughout Covad's footprint.



7. For purely illustrative purposes, Covad's network looks like the diagram above.

8. As the diagram makes plain, Covad's network is designed to aggregate traffic from a large number of central offices at hub locations. In determining what level of aggregation to use, Covad relied upon the availability of UNE transport. As the price of transport increases, so too does the value of aggregating traffic and thereby creating economies of scale. If the Commission were to take unbundled transport off the list of UNEs, Covad's network would no longer be efficient or viable. Covad would need to deploy additional hubs in order to aggregate more traffic and reduce its costs to transport each unit of traffic. An architecture with a large number of hubs would justify placing different (and smaller) ATM equipment because the traffic would be more distributed. Alternatively, if Covad did not add hubs, it would have to de-activate DSLAMs whose

transport costs are too high (e.g., those serving residential customers), which means serving fewer customers in general and contracting Covad's business.

9. It would be undesirable and costly for Covad to reduce the size of its central office footprint. Covad has an obvious incentive to make its services available to as large an addressable market as is financially and technically feasible. Moreover, Covad does not relish the prospect of forcing end users to leave its network. At the same time, it would be even more costly and time-consuming for Covad to convert to a more aggregated network architecture because: (a) it would have to buy and collocate smaller ATM equipment; and (b) it would have to re-configure its existing transport network to create smaller aggregation zones.

IV. Covad's Financial Model

10. To assist the Commission in understanding the impact of removing certain network elements from the UNE list, we provide below a breakdown of Covad's monthly cost of providing service (total costs, excluding SG&A[3] expenses and capital investments[4]):

- ILEC loop costs are approximately 22% of monthly costs;
- ILEC dedicated transport costs are approximately 25% of monthly costs;
- ILEC collocation costs (including rent and power) are approximately 15% of monthly costs;
- Covad's operations costs (e.g., salaries and related costs) are approximately 25% of monthly costs; and
- Other miscellaneous costs of service are approximately 13% of monthly costs.

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[3] Sales, General & Administrative ("SG&A") expenses.

[4] Capital expenses include the investment that Covad made in DSL equipment that it collocated in ILEC central offices.

11. In addition, Covad's use of self-installation kits for line sharing customers has improved these numbers dramatically. When Covad had to install ADSL service for consumers over stand-alone loops, it cost approximately $150 for each dispatch (and often times more than one dispatch was necessary for individual consumers). Because margins are so low on residential lines, the cost of dispatching to install residential orders prevented Covad from offering these services profitably, and the lack of line sharing would have forced Covad eventually to exit the residential broadband market entirely. As with ILECs, Covad can only deploy DSL profitably to residential customers if line sharing is available.

V. Copper DSL Loops and Line Sharing

12. For Covad, there are no alternatives to the ILEC's loop plant.[5] Contrary to the ILECs' arguments, cable, competitive fiber, wireless and satellite facilities are not viable alternatives to DSL (for both residential and business customers).

13. Starting with cable,[6] it is hardly trivial to an independent broadband provider like Covad that cable providers do not lease their plant to other carriers, and thus is not available as an alternative to ILEC loop plant. The costs to Covad of placing new cable plant would be phenomenal (and not much different than replicating the ILEC's loop plant, which would cost hundreds of billions of dollars). Even if cable providers were willing to unbundle their equipment, cable is a fundamentally different service than DSL, as the next five paragraphs demonstrate. This also helps explain why retail DSL services

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[5] We should also note that it is often not possible to provide DSL service to residential consumers over a stand-alone loop (in lieu of line sharing) because many consumers have only one line coming to their home.

[6] *See* NPRM, ¶ 28.

offered by Covad are an important choice for consumers to have as an alternative to cable modem services.

14. First, because of the shared nature of cable modem networks, all data sent to or from a given subscriber is transmitted to all subscribers in the neighborhood. While measures can be taken to secure this data, security remains a primary concern, especially for business or home office users. By contrast, DSL networks operate on a point-to-point basis between the subscriber and the service provider and therefore do not present the opportunity for a one subscriber to attempt to view another's traffic. Because of the shared nature of the cable system, Covad would have little control over the kinds of broadband services offered over cable. All of the users on a cable system get basically the same broadband service. DSL service, by contrast, runs over loops that are dedicated to each end user and thereby allow the DSL provider to offer dramatically different network access services (including, but not limited to, access to the Internet and virtual private networks) to different customers. DSL providers differentiate their products through the available bandwidth (both upstream and downstream), the quality of service, and the manner in which traffic is prioritized, which would be difficult on a shared platform.

15. Second, cable modem service is generally not available to businesses. When cable providers originally wired cities, they went after residential customers. For the most part, they did not wire commercial centers. On the other hand, Covad can provide a

variety of business-class broadband services[7] to small business customers using DSL because they all have telephone lines.

16. Third, in any event, cable plant generally does not provide the kind of upstream bandwidth that small business demands. Cable modem services are biased toward downloading, which meets the typical usage pattern of residential customers using the service for recreation purposes. Cable services are also inadequate for telecommuters, who are residential customers that often require high upload speeds.

17. Fourth, cable plant does not provide a dedicated circuit in the manner that DSL does. The bandwidth provided to each cable customer depends on the number of other users currently on the network in that neighborhood. DSL, by contrast, gives the customer dedicated bandwidth all the way to the central office. As a result, cable provides such a distinctly lower quality of service than DSL that the two truly are not technically comparable substitutes for one another.

18. Fifth, cable modem service in the past has been much less suitable than DSL for transmitting voice services. As the shared cable network becomes more congested, services that are sensitive to delay such as voice will become increasingly unreliable to the point where it may no longer be possible to provide toll quality voice services at all.[8]

19. Competitive fiber, over which competitors offer voice, data and T-1 services, is no alternative to DSL for two primary reasons. First, the costs of deploying competitive fiber make it economical only if the target market consists of large business

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[7] Business class competitive broadband service is an always-on Internet connection providing a minimum guaranteed bandwidth of 384 kbps both up- and downstream and priced at approximately $350/month (as opposed to roughly $1000/month for a T-1 service).

[8] By contrast, a single SDSL line could carry up to 16 voice lines reliably and with a high quality of service.

customers in commercial centers, not the residential and small business customers that Covad targets over individual loops.

20. Second, competitive fiber is by no means ubiquitous. For instance, the Joint Petition of BellSouth, SBC, and Verizon effectively admitted that 75% of the commercial buildings in the country were without access to competitive fiber.[9] And that study dealt with large buildings; competitive fiber is not nearly so prevalent in areas that predominantly contain residential and small business customers.

21. Offering broadband services over wireless networks is not an alternative to DSL for three reasons.[10] First, Covad is not aware of any wireless carriers that have made their broadband services or underlying network facilities available for resale. Similarly, Covad could not be expected to construct a wireless network itself. Setting aside the vast capital outlay that would be required (but most likely unavailable in today's market), there is also the problem of obtaining spectrum. It is far from clear what spectrum Covad could obtain and use to provide broadband services.

22. Second, the maximum bandwidth of most wireless networks is nowhere near that of DSL. Certain carriers, such as Winstar and Teligent, created much more powerful wireless networks, but those were targeted at large business customers. And even then, both of those companies drove themselves into bankruptcy pursuing a customer base that is far more lucrative than the residential and small business customers that Covad serves.

23. Third, the cost of adding subscribers to a wireless network is very high compared to DSL. For the most part, this cost difference is attributable to (1) the need to

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[9] *See Implementation of the Local Competition Provisions in the Telecommunications Act of 1996; Joint Petition of BellSouth, SBC, and Verizon for Elimination of Mandatory Unbundling of High-Capacity Loops and Dedicated Transport*, Joint Petition, CC Docket No. 96-98, at 11 (stating that only 25% of the nation's commercial buildings are served by a competitive fiber provider).

use relatively expensive customer premises equipment for wireless customers; (2) the more intense labor costs associated with installing wireless customers; and (3) the greater amount of engineering work tailored to each customer to ensure acceptable signal strength.

24. Satellite broadband services are not an alternative to DSL for four reasons. First, most such services are not two-way. While satellite dishes to receive programming are small enough (18" in diameter) to be ubiquitous, they are too small to send data back to the satellite. Most satellite services must use telephone lines to provide two-way communications, which severely limits upstream bandwidth. The few services that do offer two-way communications through the dish itself have very low upstream speeds. Consequently, satellite broadband service is either purely a residential product (because it provides significant bandwidth only for downloading) or a small business product only when coupled with a high capacity telephone line for uploading (which essentially would be DSL).

25. Second, the performance of satellite-based communications suffers from the delay caused by the distance that the signal must travel. These services typically use geostationary satellites that orbit over 22,000 miles above the equator. The time that it takes signals to cover that distance, even in one direction, prevents many applications from working properly. In addition, since the satellites orbit above the equator, subscribers in North America must be able to place their dish in position to have a clear view of the southern sky.

26. Third, satellite broadband platforms cannot offer both broadband *and* voice services to end users. There is simply too much delay in having the voice signal travel to

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10 *See* NPRM, ¶ 28.

and from a satellite for such carriers to provide high quality voice services. Although there are satellite telephones available to end users, they use lower orbiting satellites that then lack the capability to offer broadband service.

27. Fourth, even if the technical problems with satellite broadband service did not exist, it would be unlikely that Covad could raise the capital in today's market to enter what would be a new line of business.

VI. DS-1 Loops

28. DS-1 loops can be either ordinary copper loops with DS-1 electronics installed along the loop or fiber loops with electronics installed at the customer's premise and the central office. DS-1 loops provide a reliable symmetric connection operating at 1.544 mbps.

29. There are no alternatives to DS-1 loops that could eliminate the need for an unbundling obligation. The various technologies discussed above (cable, fiber, wireless, and satellite) are even less appropriate substitutes for DS-1 loops, which are highly reliable, high-capacity facilities.

30. It is worth explaining why standard DSL loops are not an alternative for DS-1 loops.[11] First, DSL can deliver similar bandwidth to DS1 loops only over relatively short distances (approximately 8,000 feet from the central office).[12] DS-1 loops are designed to overcome the distance limitations of DSL by making use of technologies such as repeaters and fiber optics. DS-1 loop designers deploy the most appropriate technology

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[11] In fact, Verizon Communications has previously admitted that SDSL and T-1 services are very different. *See* letter of Michael E. Glover & Karen Zacharia (of Verizon) and Michael Olsen & William J. Bailey, III (of NorthPoint) to Jake Jennings, Deputy Division Chief, at 2 (filed in CC Docket No. 00-157, August 31, 2000).

based upon the distance of the end user from the central office as well as knowledge of the make-up and design details of the loop plant that serves the end user.

31. Second, because DS-1 loops are specially designed to be suitable for carrying DS-1 signals, they tend to be more reliable[13] and come with tighter time-to-restore targets. While DSL is generally a reliable technology, it typically runs on copper loops that are not specifically engineered to the specifications of the technology that they will carry. Therefore, it is less certain that a given DSL loop will be suitable for the service that will ultimately run over it.

32. Interestingly, end users who buy DS-1 service from Covad generally seek in the first instance to purchase DSL service (because it is much cheaper), but are unable to do so because of technical limitations on DSL that DS-1 service overcomes.

VII. Hybrid Copper/Fiber DSL Loops

33. More and more, ILEC loop networks are constructed using both copper wire and fiber optic cable.[14] In this configuration, a fiber loop feeder travels from the central office to a remote terminal ("RT") in the field, where digital loop carrier ("DLC") electronics convert the optical signal into an electrical one traveling over a copper loop (known as "distribution") to the customer's premises.

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12 *See id.* ("whereas a T-1 line runs at a constant bandwidth of 1.544 Mbps, and SDSL line can run at that speed only at short distances from the central office").

13 *See id.* (T-1 lines are "technically more robust" than SDSL lines, "are not limited by loop length from the central office and can be ordered for a long haul circuit of hundreds of miles").

14 According to the Commission's 2000 ARMIS reports, of the 196 million local loop channels in service across the country, approximately 42 million, or 21% of those loops, were served at least partially over fiber facilities. *See FCC 2000 Trends in Telephone Service*, at 18-7, available at http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/trend801.pdf.
We expect that number to rise in the future, given that most ILECs have ceased deploying new all-copper loops.

34. Although DSL is primarily a technology for transmitting broadband services over copper loops, carriers can offer it over hybrid copper/fiber loops through two methods. First, they can use DLC at the RT that is DSL-compatible,[15] such as Alcatel's Lightspan 2000 product,[16] which employs fiber loops typically designed as follows:

(F) the feeder of the loop, carrying both digitized voice and data, is made of fiber optic cable that terminates at a remote terminal in the field (within several thousand feet of the customer);

(G) at the remote terminal, there are DLC electronics at the end of the fiber portion of the loop;

(H) these DLC electronics transform both the voice and data signals on the loop from optical to electrical form;

(I) as the loop signal exits the DLC electronics in electrical form, it travels over a copper cross-connect to the copper distribution cable; and

(J) that copper distribution cable travels to the customer's location.

35. Loops in this configuration (hereinafter the "Fiber DSL Loop") terminate in the central office on an optical concentration device ("OCD"), unlike traditional fiber loops carrying voice services that terminate on either DLC equipment or the ILEC's switch. An OCD acts essentially as an ATM demultiplexer and a termination point that is the equivalent of a main distribution frame. In other words, the OCD is the first point in the central office at which the signal from the loop terminates (by converting from optical to electrical form). The OCD also demultiplexes and distributes the signal to its next

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15 DLC that is DSL-compatible is commonly known as next generation DLC ("NGDLC").

16 ILECs can upgrade the Lightspan 2000 to handle DSL signals simply by adding to it certain line cards and other electronics. Both SBC and Verizon use the Lightspan 2000 DLC to a significant degree and have undertaken the upgrades discussed here. SBC has done so as part of Project Pronto. Verizon announced on February 20, 2002 that it plans to offer retail services based upon this configuration in Massachusetts beginning in July of this year. Verizon also has pre-positioned Lightspan 2000 equipment at certain RTs that is DSL-capable, albeit it still requires ADLU cards and ABCU cards to be added.

destination (which, although ILECs may intend to keep the traffic within their networks, can be to a group of CLECs collocated in the central office).

36. With Fiber DSL Loops, ILECs can offer customers voice services alone, voice and DSL services over the same line, or DSL service alone, all of which can be provisioned remotely once the appropriate line cards have been placed in the NGDLC.

37. Second, carriers can collocate a traditional DSLAM at the RT that will perform the functions of DSL-compatible DLC. In this configuration:

(A) The fiber feeder of the loop, carrying both digitized voice and data signals, terminates on DLC and/or fiber optic multiplexing electronics in an RT in the field;

(B) The digitized voice signal (if present) is fed into the DLC, which converts the voice into an analog signal on a copper pair;

(C) The data signal is fed into a traditional DSLAM, which may be collocated there or at a feeder-distribution interface ("FDI")[17] located even closer to the end users;[18]

(D) The DSLAM converts the data into a DSL signal on a copper pair;

(E) If the voice and data are to share a single copper pair, the two pairs (from B and D, above) connect to a splitter that combines the low frequency voice signal with the high frequency DSL signal on a single pair; and

(F) the DSL signal, or combined voice and DSL signals, are transmitted over the copper distribution cable which then travels to the end user's location.[19]

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[17] An FDI is a cross-connection point where copper feeder cable from a fiber-served RT connects to copper distribution cable. Normally, several FDIs serve each RT.

[18] In the case of a line shared service, a splitter would handle the separate data and voice connections that pass through the RT. The splitter would be located within or adjacent to the DSLAM.

[19] Some ILECs have stated that they would not allow CLECs to receive data signals over the same fiber cable that serves the DLC electronics there. Instead, CLECs would have to purchase dark fiber from the RT to the central office in order to transmit the data signal to the RT. It is not likely that such dark fiber would be ubiquitously available at all RTs.

38. The difference between the two methods is that (1) with the first, the DLC performs all of the functions of the DSLAM in an integrated fashion; and (2) with the second, there are considerable inefficiencies associated with placing a stand-alone DSLAM in a RT (or FDI) and connecting it to the copper and fiber loop plant. These inefficiencies include:

(A) Placing a stand-alone DSLAM in an RT/FDI requires space that may not be available, depending on the RT;

(B) Stand-alone DSLAMs require an independent source of power that often is unavailable at RTs;

(C) Having to make new and separate connections between the stand-alone DSLAM and the fiber and copper appearances in the RT, that are otherwise unnecessary with a Fiber DSL Loop, is costly and may require a technician to be dispatched for each new line;[20] and

(D) There likely will be greater maintenance costs associated with maintaining equipment collocated at RTs, because there will be more points of failure.

We also estimate that, assuming Covad had the necessary capital, it would take as many as 10 years to collocate at RTs ubiquitously.[21]

39. Despite all of these inefficiencies, ILECs contend that the Commission should force CLECs to collocate stand-alone DSLAMs at RTs, rather than unbundle Fiber DSL Loops. The following sample business case explains why it would be financial suicide for CLECs to do so. The business case is based upon a typical Covad market, with 50

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[20] The process would be further complicated because, as we understand the situation, ILECs are not proposing to give CLECs direct access to equipment collocated at RTs.

[21] It took Covad 3 years to collocate at approximately 1700 central offices. There are many more RTs than there are central offices, and it is much more difficult to collocate at RTs than at central offices. For that reason, we assume that the time to collocate at RTs ubiquitously would be more than triple Covad's time to collocate in ILEC central offices.

central offices, each serving an average of 15 RTs.[22] The case assumes that the average cost of collocating at an RT is $90,000, which is based upon Qwest testimony given in Minnesota.[23] The case also assumes that each RT serves 300 customers and that Covad is able to win the business of 5% of them (which is conservative estimate, given that broadband penetration for all platforms, including cable modem service, is 11% nationwide).[24]

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[22] Although in some cases, this business plan would require Covad to collocate at some FDIs that are associated with a given RT, Covad has not included that configuration in this business case for the sake of simplicity.

[23] Attached hereto as Exhibit A is the testimony of Georganne Weidenbach on behalf of Qwest Corporation, presented to the Minnesota Public Utilities Commission, Docket No. P-421/CI-01-1375, OAH Docket No. 12-2500-14490-2 (dated February 2, 2002). Ms. Weidenbach testified (at 8) that "Qwest estimates that it will cost approximately $90,000 per remote DSLAM." This fee will buy CLECs a slot in a collocation hotel that Qwest will build at each RT. For that reason, the estimate probably understates the cost to collocate at the RTs of ILECs that are not constructing such collocation hotels on a standard basis for CLECs. Indeed, we are aware that Sprint spent more than $130,000 to collocate next to an RT in Kansas. Sprint did not collocate in the RT because there was no room for its equipment. See *ex parte* letter of Richard Juhnke (Sprint) to Magalie Roman Salas, CC Docket Nos. 96-98 & 98-147 (dated July 18, 2001). We believe that the majority of RTs in the country will have such space constraints (perhaps even those in Qwest's territory because it cannot guarantee that there will be space in the collocation hotels for every CLEC). Thus, relying upon the Qwest cost estimate was conservative.

[24] In an Illinois proceeding on Ameritech's deployment of Project Pronto, Ameritech forecasted that CLECs would capture between 3 and 5 customers per RT. Covad conservatively assumes in the sample business case that at least three times that amount of customers will select its RT-based DSL service.

Sample Business Case for RT Collocation

Model Input	Model Assumptions/Conclusions
Central Offices	50
Remote Terminals Per CO	15
Total Remote Terminals	750
Cost to Collocate at RT	$90,000 per RT
Total RT Collo Costs	$67,500,000
Avg. # Customers Per RT	300
Total Number of RT Customers	225,000
Take Rate	5%
Total Customers Captured	11,250
Average monthly revenue per customer for Covad	$35
Total Annual Revenue to Covad for Captured Customers	$4,725,000
Years to Recover Investment in RT Collocation	14.2 years, assuming no churn in customer base

40. The business case demonstrates that it would take 14.2 years to recover *just* the cost of collocating at RTs from customers (assuming there is no churn).[25] The business case does not consider such other real and significant costs as: (A) the capital and collocation costs of placing DSL equipment in the central office; (B) the transport costs of sending DSL traffic from the end user's serving central office to the Internet; (C) the customer premises equipment costs (e.g., the DSL modem); (D) any of the recurring costs to use any of the associated network elements; (E) any of the recurring costs to collocate in RTs in the first place; or (F) any of the costs to provision DSL loops served by such RTs. No CLEC could make a profit faced with these economics.

41. ILECs, on the other hand, that upgrade their DLC to create Fiber DSL Loops enjoy a much rosier set of numbers. In announcing the roll-out of Project Pronto, SBC

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[25] Interestingly, the Commission's depreciation lives for digital circuit equipment, such as the DSLAMs to be placed in RT collocations, are generally less than 14 years. The DSLAMs of CLECs

told the investment community that: "The network efficiency improvements alone will pay for this initiative, leaving SBC with a data network that will be second to none in its ability to satisfy the exploding demand for broadband services."[26] SBC further bragged that its

> new network investments will have a profound impact on its cost structure; in fact, the efficiencies SBC expects to gain will pay for the cost of the deployment on an NPV basis. These efficiencies are conservatively targeted to yield annual savings of about $1.5 billion by 2004 ($850 million in cash operating expense and $600 million in capital expenditures).[27]

Plainly, deploying Fiber DSL loops will be a infinitely more financially rewarding opportunity for ILECs than the prospect of collocating stand-alone DSLAMs at RTs would be for CLECs.

42. If the Commission decides to permit CLECs to unbundle Fiber DSL Loops, it should also allow them to modify the associated quality of service ("QoS") settings on the NGDLC. QoS determines the priority that the NGDLC assigns to particular types of traffic. Some end users may require a connection that provides a more stringent guarantee of what bandwidth will be available when the network is congested than other end users' traffic receives. For example, with voice or video conferencing services offered over the network, which are "real-time" services that are extremely sensitive to delay, the network must ensure that the traffic is delivered at a very consistent rate. When data and voice/video packets arrive at a congestion point, the data can wait,

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required to collocate at the RT would not have any remaining economic life before they ever produced a dime in profit.

[26] *See SBC Announces Sweeping Broadband Initiative*, SBC Investor Briefing, at 2 (October 18, 1999). It is our understanding that SBC has deployed a substantial portion of the Project Pronto facilities.

[27] *Id.*, at 7.

but the voice and video traffic generally cannot do so (without distorting the customer's service).

VIII. Dedicated Interoffice Transport

43. Covad provided the Declaration of Mark Shipley and Marie Chang last year in response to the petition of BellSouth, Verizon, and SBC to remove dedicated interoffice transport ("transport") from the list of unbundled network elements.[28]

44. Although competitive transport is not ubiquitously available, where it is available, it is expensive. CLECs providing competitive transport are competing with the ILEC's special access services (where both ILECs and CLECs seek to serve end users on a retail basis, not telecommunications carriers on a wholesale basis). For that reason, competitive transport providers price their services typically at a 20% discount from the ILEC's special access services, which is generally more than twice the UNE rate. Covad could not afford to use competitive transport, even if it was ubiquitously available.

45. Covad could not build its own transport facilities because it lacks both the expertise and the capital. Covad does not have the employees necessary to dig up the streets and lay fiber. Even if it did, Covad does not have the capital necessary for such operations, nor could it obtain that kind of money in today's market.

46. Today, most all transport and digital loop carrier runs over fiber facilities and uses Synchronous Optical Network ("SONET") electronics. SONET is merely "an

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28 *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996; Joint Petition of BellSouth, SBC, and Verizon for Elimination of Mandatory Unbundling of High-Capacity Loops and Dedicated Transport*, Declaration of Mark Shipley and Marie Chang, CC Docket No. 96-98 (June 11, 2001).

optical interface standard" by which manufacturers build all kinds of equipment – everything from digital loop carrier to common and dedicated interoffice transport.[29]

47. There is nothing special about SONET technology to warrant an exception from the Commission's unbundling rules. Indeed, such an exception would eviscerate any rules unbundling transport and fiber loops (carrying both voice and data traffic) because almost all of it is SONET-based.

48. Similarly, the fact that a piece of transport may be channelized on a larger facility is no reason not to unbundle it. It is generally efficient to channelize as much of the transport network as possible. For that reason, DS-1 transport is usually channelized on a DS-3 or OC-3 facility. But that does not mean that Covad or another CLEC could have either built the larger facility or leased it from another provider. When Covad needs a DS-1, it cannot build the facility, nor can it buy a much larger facility, such as DS-3, because the cost difference between the two can be huge. In addition, if Covad cannot find any alternative transport in general, it does not matter that CLECs theoretically also sell channelized DS-1 service.

49. This concludes our declaration.

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29 *See* Newton's Telecom Dictionary, at 663-64 (14th Ed. 1998).

I declare under penalty of perjury that the foregoing is true and correct. Executed on April __, 2002.

Anjali Joshi

I declare under penalty of perjury that the foregoing is true and correct. Executed on April __, 2002.

_____

Eric Moyer

I declare under penalty of perjury that the foregoing is true and correct. Executed on April __, 2002.

_____

Mark Richman

I declare under penalty of perjury that the foregoing is true and correct. Executed on April __, 2002.

_____

Mark Shipley

I declare under penalty of perjury that the foregoing is true and correct. Executed on April __, 2002.

Michael Zulevic

Q: PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A: My name is Mary Conquest. I am employee of ITC^DeltaCom Communications, Inc., ("ITC^DeltaCom"), and my business address is 600 Boulevard South, Huntsville, Alabama 35802.

Q: PLEASE PROVIDE A BRIEF DESCRIPTION OF YOUR EDUCATION AND WORK HISTORY.

A: My education and relevant work experience are as follows:

I received a masters certificate from George Washington University for project management. I have been employed in the telecommunications industry for over thirty-five years. I began my career with Southern Bell in 1966. I held various positions within BellSouth over that time period as an employee and as a consultant. My last position with BellSouth was as a Certified Project Manager in IT. I also acted as a consultant to BellSouth in the area of billing. As part of the billing assignment, I supported their development of J Billing ("UNE-P"). I retired from BellSouth in December of 1996. My consultant assignment for BellSouth occurred between 1997-1999. As a manager of BellSouth's regional service order support staff, I am very familiar with BellSouth's legacy systems. I am employed by ITC^DeltaCom and specialize in the areas of OSS – ordering and gateway support to ILECs including but not limited to BellSouth.

Q: HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A: NO.