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November 20, 2000

Mr. David Waddell
Executive Secretary
Tennessee Regulatory Authority
460 James Robertson Parkway
Nashville, TN 37243-0505

In Re: *Generic Docket to Establish UNE Prices for Lines Sharing per FCC 99-355, and Riser Cable and Terminating Wire as Ordered in TRA Docket 98-00123.*
Docket No. 00-00544

Dear David:

Please find enclosed the original and thirteen copies of the Rebuttal Testimony of Dean R. Fassett filed on behalf of the Data Coalition in the above-captioned proceeding. Please bring this to the attention of Director Lynn Greer, the Hearing Officer in this proceeding.

BOULT, CUMMINGS, CONNERS & BERRY, PLC

By:
Henry Walker

HW/nl
Attachment
c: Parties

BEFORE THE TENNESSEE REGULATORY AUTHORITY
NASHVILLE, TENNESSEE

In re:	)	
Generic Docket To Establish UNE Prices for Line Sharing Per FCC 99-355, and Riser Cable and Terminating Wire as Ordered in Authority Docket 98-00123	))))	Docket No. 00-00544

REBUTTAL TESTIMONY
OF
DEAN R. FASSETT
ON BEHALF OF
THE DATA COALITION *

PUBLIC VERSION

NOVEMBER 20, 2000

* DIECA Communications, Inc. d/b/a Covad Communications Company, Broadslate Networks of Tennessee, Inc. and MGC Communications, Inc. d/b/a Mpower Communications are jointly filing this testimony as the Data Coalition.

INDEX

I. <u>INTRODUCTION</u>

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Dean R. Fassett and my business address is 141 Juniper Drive, Ballston Spa, New York, 12020.

Q. BY WHOM AND IN WHAT CAPACITY ARE YOU EMPLOYED?

A. I am the owner of Adirondack Telcom Associates. Currently, I am providing telecommunications consulting services concerning outside plant infrastructure design, construction and engineering issues relating to the provisioning of xDSL in Tennessee to DIECA Communications, Inc. d/b/a Covad Communications Company, Broadslate Networks of Tennessee, Inc. and MGC Communications, Inc. d/b/a Mpower Communication, who I understand are filing testimony jointly in this proceeding as the "Data Coalition."

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am testifying on behalf of the Data Coalition.

Q. PLEASE SUMMARIZE YOUR BACKGROUND IN OUTSIDE PLANT ENGINEERING AND CONSTRUCTION.

A. I have over 30 years of telecommunications experience in outside plant engineering and construction. Prior to my retirement from NYNEX in May 1996, I had outside plant engineering and construction responsibilities for the Adirondack District as the Area Operations Manager. This work included both the actual performance of outside plant engineering work and the supervision of construction personnel performing those tasks. Before that assignment, I was the Engineering Manager for the Capital South District. In this capacity, I was responsible for all engineering operations for the design and construction of the local network within an area that encompassed metropolitan, suburban and rural environments. During these assignments I personally participated in and was responsible for numerous projects that included:

- The planning/design and construction of a $10.7 million 117 mile interoffice SONET project
- Design and deployment of numerous fiber fed DLC systems within 69 central offices
- Design and construction of feeder and distribution facilities to meet the service requirements for a customer base of approximately 400,000 residential customers
- OSP rehabilitation projects to upgrade distribution plant to engineering design standards for the 69 central offices under my responsibility
- Designing and provisioning of numerous digital services to meet the requirements of business customers within city and rural environments including the first HDSL application within region and first PG Flex installation within NYNEX
- Implementation and conversion and utilization of OSP assignment records to mechanized databases
- Preparation and administration of contracts with vendors and labor contractors

Since my retirement from NYNEX, I have continued to work in the outside plant engineering and construction arena working as a contract engineer and operations manager on various projects. In summary, I have had a wide range of hands-on experience that includes urban, suburban and rural network construction. From late 1998 and until recently I was responsible for company operations and engineering at Frontier Communications of AuSable Valley in upstate New York, a small ILEC that until recently was an independent company. In that capacity, I was responsible for the planning, engineering design and construction of all OSP projects, including coordination with other utilities and service providers, preparation and awarding of outside contracts and acquisition of material and test equipment.

Thus, I have experience with both large and small ILECs. My Curriculum Vitae is included as Exhibit DRF-1 to this testimony.

Q. HAVE YOU RECEIVED ANY TRAINING IN OUTSIDE PLANT ENGINEERING AND CONSTRUCTION?

A. Yes. I have attended many outside plant training courses for engineering and construction at the Bell System and Bellcore Training Centers including, among others, Principles of Digital Technology, Applied Transmission, Advanced Distribution Design, Underground Conduit Systems, SONET, FACS, COSMOS-RCMAC/engineering, Engineering Economy, Loop Technology Planning, along with private training available through various vendors including Nortel, NEC, Alcatel, 3M, and Siecor.

Q. HAVE YOU TESTIFIED BEFORE OTHER PUBLIC UTILITY COMMISSIONS?

A. Yes. Since 1996, I have testified before several State Public Service Commissions. Exhibit DRF-1 also identifies the various proceedings in which I have participated.

Q. HOW IS YOUR REBUTTAL TESTIMONY ORGANIZED?

A. Following this introductory section, my testimony is organized in the following fashion:

- Section II summarizes of the purpose of my testimony, including a brief explanation of outside plant engineering, which relates to the provisioning of xDSL loops and responds to issues raised in BellSouth's cost studies and testimony filed in this docket.

- Section III responds to BellSouth's proposal that xDSL loops be priced substantially higher than voice grade loops, by explaining xDSL technologies and deployment and by illustrating that, from an engineering perspective, xDSL services utilize the same loop facilities that ILECs use to provide voice grade services;

- Section IV responds to BellSouth's excessive nonrecurring charge for Line Sharing.

- Section V discusses line conditioning ("Loop Modification" as BellSouth calls it) and explains why the pricing both Bell South and United Telephone-Southeast ("Sprint") propose for loop conditioning is unreasonable;.

- Section V responds to the loop qualification rate proposals sponsored by BellSouth and Sprint.

Q. PLEASE SUMMARIZE THE CONCLUSIONS IN YOUR TESTIMONY?

A: My testimony is based upon proper implementation of sound engineering design guidelines for creating and constructing a network that is forward looking. In contrast, the network shown in BellSouth's cost studies is not forward looking. Moreover, its cost studies are contaminated with flawed assumptions and grossly inflated costs for the provisioning of xDSL services. BellSouth has falsely assumed that provisioning xDSL capable loops is substantially different from provisioning basic loops used to provide POTS or voice grade service and thus require special design. This is simply not the case. BellSouth also inappropriately assumes that extensive manual intervention will be required to provision xDSL capable loops, while existing and forward looking electronic database systems actually eliminate such extensive manual actively. These flawed assumptions and the grossly overstated costs increase costs and discourage meaningful competition. In this testimony I will demonstrate why the work times, costs proposed by BellSouth are unjustified, and I propose reasonable task times and engineering design assumptions upon which this Authority can rely.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The Data Coalition asked that I address the direct testimony and cost studies presented by Bell South Telecommunications, Inc. and United Telephone – Southeast, Inc. ("Sprint") in this proceeding. In addition, I will provide technical support for economic cost witness Michael Starkey and information for the Authority concerning the establishment of UNE prices for line sharing. I will respond to BellSouth's proposals on loop conditioning, loop qualification and other issues pertaining to the provisioning of voice and advance services that will be crucial in the creation of a truly competitive marketplace, which will benefit consumers in Tennessee.

II. XDSL CAPABLE LOOPS

A. ENGINEERING ASSUMPTIONS THAT MUST UNDERLIE FORWARD LOOKING ILEC COSTS

Q. WHAT IS THE DEFINITION OF THE ACRONYMS "DSL" AND "xDSL"?

A. The acronym "DSL" means digital subscriber line and the "x" in "xDSL, is a variable, meant to encompass the various types of digital subscriber line technologies and is used when referring generally to DSL. Digital subscriber line technologies are transmission technologies used on circuits that run between a customer's premises and the central office.

Q. IN HIS DESCRIPTION OF BELLSOUTH'S xDSL CAPABLE LOOP PRODUCTS, DOES BELLSOUTH WITNESS MILNER SEEM TO LIMIT XDSL LOOPS TO "ALL COPPER?"

A. Yes. Although traditionally, DSL technologies have been deployed on loops that are copper end-to-end from the central office to the customer premises ("home run copper"), the current deployment of fiber fed NGDLC systems by ILECs enables some forms of DSL to be provisioned using hybrid loops, consisting of fiber and copper. On those hybrid loops, DSL services are provisioned on copper cable pairs from the customer's premises to a mid-point equipment location, known as a Remote Terminal ("RT"), where signals are combined and transmitted over fiber transmission systems from the RT to the central office ("fiber-fed loops").

Q. WHAT KEY ENGINEERING DESIGN GUIDELINES MUST THE AUTHORITY CONSIDER TO SET COST-BASED RATES FOR XDSL ELEMENTS IN TENNESSEE?

A. I will provide a brief background of fundamental engineering principles, which should underlie the ILEC's, proposals in this case. My criticisms of BellSouth's engineering assumptions are grounded in these engineering guidelines.

Q. PLEASE BRIEFLY DESCRIBE THE ENGINEERING DESIGN GUIDELINES THAT OUTSIDE PLANT ENGINEERS HAVE

FOLLOWED TO DESIGN LOCAL NETWORKS AND HOW HAVE THESE GUIDELINES EVOLVED?

A. During the early 1960's until approximately 1972, outside plant design guidelines mandated the use of a Feeder Distribution Interface ("FDI"). The FDI provided a manual cross-connection and demarcation point between feeder and distribution plant. Compared to "multiplied plant" (designed for party-line service via multiplied bridged taps) which had a single cable pair appear for assignment in several locations, interfaced plant provides greater flexibility in the network. In the early 1970's, the Serving Area Concept ("SAC") design was introduced as a prescription simplified engineering planning and design method, and was the first major attempt to modernize the network for providing ubiquitous and expanded service to an ever shifting customer base.

Under SAC design, the distribution cable network is connected to the feeder network at a single interconnection point, the serving area interface (or Feeder Distribution Interface, "FDI") with no multiplied copper feeder cable facilities (i.e., Zero bridged tap). In 1980, the SAC design concept was incorporated into the Carrier Serving Area concept ("CSA").

Q. DID THE INTRODUCTION OF THE CARRIER SERVING AREA ("CSA") DESIGN GUIDELINES AND USE OF DIGITAL LOOP CARRIER SYSTEMS IN THE FEEDER SEGMENT OF THE LOCAL NETWORK CHANGE THE ENGINEERING PLANNING PROCESS?

A. Yes. Introduction of the Carrier Serving Area ("CSA") design guidelines and utilization of DLC in the feeder portion of the local network changed the engineering planning process. This design change was implemented in 1980. A "CSA" is a planning entity consisting of a distinct geographic area that can be served by a single Digital Loop Carrier ("DLC") Remote Terminal ("RT") site. The geographic area could encompass a single Distribution Area ("DA") or multiple DA's. The maximum allowable bridge-tap rule was relaxed from no bridged tap under SAC guidelines to 2.5 kft, with no single bridged-tap longer than 2.0 kft. Also, all CSA loops must be unloaded and should not consist of more than two gauges of cable. As BellSouth Witness Milner acknowledges at page 4, the CSA design rules provided economic benefits to the ILECs as well as requiring that the ILECs outside plant be developed to support both broadband (i.e. DSL) and narrowband (i.e., voice) technologies.

Q. HAS THE EXTENSIVE DEPLOYMENT OF FIBER IN THE FEEDER SEGMENT OF THE NETWORK AND DEPLOYMENT OF NGDLC SYSTEMS IMPACTED THE LOCAL NETWORK?

A. Yes, as fiber fed digital loop carrier systems have become the preferred method of providing feeder facilities and fiber has been deployed more extensively into the network, the utilization of copper feeder facilities is diminishing. This has enabled ILEC's, including BellSouth, to construct a network that is capable of providing voice and advanced services much more efficiently for customers distant for a central office than older copper feeder networks, while greatly reducing expenses and improving service quality. This has also enabled consumers that previously were unable to enjoy the benefits of xDSL services and other advanced services to be able to receive the same advanced services as customers located near the central office.

Q. WERE ENGINEERING GUIDELINES MODIFIED OR REVISED AS THE DEPLOYMENT OF FIBER FED DLC SYSTEMS BECAME MORE ECONOMICAL?

A. Yes, as the economical benefits of deploying fiber fed digital loop carrier were being realized and costs continued to decease, many engineering guidelines and network planning strategies were revised or changed. In 1983, the recommendation to implement Revised Resistance Design (RRD) was distributed to all Bell Operating Companies. These revised resistance design rules stated that in essence,loops 18 kft. or less (total length including bridged tap) must be designed to 1300 Ohms or less and <u>must</u> be non-loaded; that loops greater than 24 kft. should be designed using DLC, that bridged tap was limited to 6 kft. maximum, and that no loaded bridge tap, and no bridge tap between loads, was permitted. *See Exchange Area Transmission-Revised Resistance Design, BellSouth's Response to Covad's First Request for Production.*

As BellSouth Witness Milner admits on page 5, the economic break point for deploying fiber fed DLC has continued to gravitate closer to the central office and most ILECs have established guidelines that indicate fiber fed digital loop carrier should be utilized for loops greater than 9 to 12 kft. from the central office. Some ILECs have even established closer break points. In his testimony BellSouth witness Milner indicates an economic crossover point for using fiber fed NGDLC of 12,000 feet. These changes eliminated the requirement for load coils in the local network and any existing load coils should be removed as digital loop carrier replaces physical copper facilities.

B. THE AUTHORITY SHOULD REJECT BELLSOUTH'S REVISED DISPATCH RATE ASSUMPTION FOR VOICE-GRADE LOOPS

Q. IN ITS REVISED NONRECURRING COST FILING, BELLSOUTH HAS INCREASED ITS DISPATCH RATE ASSUMPTION FOR SL-1 VOICE-GRADE LOOPS FROM 20% to 38%. IS THIS INCREASE APPROPRIATE?

A. No. As Mr. Starkey explains in his testimony, it is not appropriate to include any level of fieldwork costs in the non-recurring charge for a SL-1 loop. However, even if the Authority were to accept that some fieldwork costs should be included in the non-recurring change, it should reject BST's assumed dispatch rate increase.

Q. WHY SHOULD THE AUTHORITY REJECT BST'S DISPATCH RATE ASSUMPTION?

A. A dispatch rate of 38% is simply too high. It has been long understood that dispatching of technicians is very costly and ILECs should avoid doing so if possible. Outside plant facilities have been designed under "Cut-Through" design to avoid the need for field dispatches to lay in a simple cross connection at the Serving Area Interface ("SAI"), and have pre-connected more than one pair of drop wire conductors at the Drop Terminal and the Network Interface Device ("NID"). Internally, local exchange carriers typically measure their success in avoiding field dispatches via a performance measure referred to as the "NPV" rate (*i.e.*, "No Premises Visit"). To operate efficiently successful operations normally operate at an NPV rate between 85% and 90% (which corresponds to a dispatch rate of 10% to 15%.). Improvements in outside plant engineering design and operating practices have been steadily lowering the need for the actual dispatch of a technician. BellSouth's original rate of 20% was too high. Therefore, instead of increasing that rate, BST's forward-looking analysis should show decreasing dispatch rates.

BellSouth has filed no evidence or supporting material that would allow me to analyze how it arrived at its higher 38% conclusion. Indeed, BST has not even supported its original dispatch rate assumption of 20%. Mr. James R. McCracken, one of BST's subject matter experts for the Installation & Maintenance ("I&M") and Special Services Installation & Maintenance ("SSI&M") work groups, admitted that he doesn't know the source of the dispatch percentages and further that he doesn't have any experience with SL-1 loop installation. [*See* Deposition of James R. McCracken, July 28, 2000, Tr. at 81-83.]

For all of these reasons, if the Authority decides to allow any nonrecurring dispatch charge, BST's original estimate of a 20% dispatch rate is a much more reasonable, and even a generous, proxy for field visits than its revised, unsupported estimate of 38%.

Q. DO THESE DESIGN GUIDELINES HAVE AN impact ON THE COSTS AND RATES BELLSOUTH PROPOSES FOR VARIOUS XDSL UNEs AND RELATED SERVICES.

A. Yes. I will explain their impact on BellSouth's cost proposals in the xDSL loop section, the line sharing section, the conditioning section, and loop makeup section.

C. FACILITIES USED FOR XDSL CAPABLE LOOPS ARE IDENTICAL OR NEARLY IDENTICAL TO THOSE USED FOR VOICE GRADE LOOPS

Q. DO BELLSOUTH'S COST STUDIES GIVE THE IMPRESSION THAT XDSL CAPABLE LOOPS ARE COMPLICATED TO PROVISION?

A. Yes. BellSouth's cost studies, with the myriad of xDSL capable loops and the enormous nonrecurring charges for those loops, create the impression that DSL providers are asking BellSouth to perform extraordinary tasks when they order an xDSL capable loop. This is reflected in the special "design process" BellSouth requires for xDSL capable loops and in the task times, work groups, and assumptions upon which BellSouth's cost studies rest.

Q. HOW DO XDSL-CAPABLE LOOPS DIFFER FROM VOICE-GRADE LOOPS?

A. The facilities used to provide xDSL services are identical or nearly identical to those used to provide voice-grade services in forward looking local networks. In fact, for loops that would be provisioned entirely on copper facilities given current engineering practices, xDSL-capable loops are identical to loops used to provide voice-grade service. BST witness Milner acknowledged as much at page 13 of his direct testimony:

> Significantly, the same copper loops that are used to provide DSL services are also utilized to provide voice service to BellSouth's customers, as well as to other CLECs' customers.

Q. IF VOICE SERVICE IS BEING PROVIDED OVER FIBER FED DLC FACILITIES, CAN XDSL SERVICE STILL BE PROVISIONED OVER THE SAME LOOP LIKE THOSE LOOPS ON ALL COPPER FACILITIES?

A. Yes. If the incumbents have built their existing loop plant to comply with decades-old design standards, all-copper loops under 18,000 feet in length should be xDSL-capable today. The maximum copper loop length included in an analysis based on forward-looking, efficient engineering practices would be 18,000 feet. As I discussed earlier in my testimony and BST witness Milner confirms, the economic crossover point between the use of copper feeder versus fiber feeder and Digital Loop Carrier ("DLC") systems is generally a loop length substantially below 18,000 feet. Thus, copper loops shorter than this length will support xDSL technology without any adjustments whatsoever, provided they are free of interferors like load coils and excessive bridged tap.

With this network architecture, as with all-copper loops, the copper distribution portion of the loop is identical whether the service provided is basic voice-grade analog service or an xDSL-based service. Likewise, incumbents can provision both basic exchange voice grade services and xDSL-based services using the same NGDLC systems and the same fiber feeder facilities. Forward-looking DLC equipment incorporates the DSLAM/splitter function into line cards that are placed in the remote terminal (RT). In this forward-looking configuration with DSL-compatible DLCs, the copper sub-feeder pair will terminate on a line card with integrated DSLAM/splitter functionality that plugs into one of the channel banks in the DLC equipment located in the ILEC's RT. Simply stated in this DLC configuration the line sharing functionality has been shifted from the central office to the remote terminal location. From the remote terminal fiber feeder facilities transmit both the voice and data components of the loop back to the incumbent's serving central office where the data traffic is then routed to the CLECs collocation facilities. Depending upon the type NGDLC system deployed, this transmission can occur over the same fiber or on separate fibers. Basically the only difference between provisioning xDSL service over copper based facilities and fiber fed NGDLC is that some of the functionality performed at the central office is now performed at the remote terminal. As a result, customers on long loops who were once restricted from DSL service can enjoy the benefits of DSL service.

Q. CAN INCUMBENTS PHYSICALLY PROVISION XDSL-CAPABLE LOOPS OVER THE SAME EXISTING FACILITIES THAT THEY USE TO PROVISION VOICE-GRADE LOOPS TODAY?

A. Yes. If the ILECs in Tennessee have been building and maintaining their networks in a manner that meets engineering standards that have been in place for decades as discussed earlier in my testimony, they can provision xDSL-capable loops over the same facilities used to provision voice-grade loops, in most cases. In fact, in his testimony BST witness Milner describes BellSouth's developing network as one that would be enable BellSouth to provide xDSL capable loop over the same facilities as voice service is being provided. For all-copper loops up to 18,000 feet in length, competitors providing xDSL services need nothing more than a basic loop free of impediments such as load coils, excessive bridged tap, repeaters, Digital Added Main Lines ("DAMLs"), noise, or any other condition that has a deleterious effect on xDSL-based services.

Q. HOW DO WE KNOW THAT XDSL LOOPS ARE THE SAME AS VOICE GRADE LOOPS?

A. We know this for several reasons. First, DSL was initially developed to expand the economic usefulness of then existing, ubiquitous telephony infrastructure. Delivering high-speed data on that existing telephone network saved the ILECs the time and expense of deploying a new and duplicative network for delivering such services. Therefore, DSL, from the very beginning, was designed to ride on the existing telephone outside plant network. Second, the use of Line Sharing by ILECs and by competitors proves that all competitors need for DSL is a simple voice grade loop. Line Sharing proves that a single facility may one day support only voice service, then the next day can be used for voice and data, and then the day after that can be used for data only. The actual facility never changes and, thus, the pricing of DSL loops should reflect this fact.

Q. YOU HAVE JUST SHOWN THAT XDSL SERVICES ARE (BY DESIGN) INTENDED TO BE PROVISIONED OVER THE SAME BASIC LOOPS AND NETWORK ARCHITECTURE THAT THE ILECS HAVE DEPLOYED FOR YEARS (AND CONTINUE TO DEPLOY). ARE THE ILEC COST STUDIES SUBMITTED IN THIS PROCEEDING CONSISTENT WITH THAT FACT?

A. No, not at all. BellSouth's cost studies submitted in this docket grossly distort the nature and requirements of xDSL service providers.

Q. HOW HAS BELLSOUTH DONE THIS?

A. Several ways. BST begins by artificially defining and limiting its xDSL capable offerings, through proposing a series of f loop types and loop transmission standards that it would impose on xDSL loops. (Milner at p. 10-12). Then, BellSouth requires all xDSL capable loops to be provisioned through a cumbersome "design process," which imposes numerous special processing steps on delivery of these loops. In turn, all of these unnecessary steps, work groups, and assumptions increase the cost of provisioning a simple xDSL capable loop. None of these steps are useful or desirable for xDSL providers such as the Data Coalition. For example, BellSouth has an engineer design in a test point on every DSL circuit. That process breaks the normal, inexpensive, flow-through provisioning of the loops and, in turn, leads to additional recurring and nonrecurring costs to wire in that testing facility. These and other related costs are entirely unnecessary and do nothing but harm to the competitive market for xDSL services in Tennessee.

D. <u>NECESSARY STEPS FOR PROVISIONING XDSL LOOPS</u>

Q. IF THE AUTHORITY REJECTS BST'S INAPPROPRIATE "DESIGNED LOOP" ASSUMPTIONS FOR XDSL, WHAT ACTIVITIES AND TASK TIMES SHOULD BE INCLUDED IN A NONRECURRING COST STUDY?

A. Costs for access to loop makeup information and/or "conditioning," that may or may not be necessary for any specific loop, if determined to be appropriate at all by this Authority, should be recovered as part of a charge specific to those activities. Therefore, the only activities relevant to processing an order to connect an individual loop are: 1) processing and reviewing a CLEC service order; 2) placing the required jumper to connect the loop appearance in the central office to the (prewired) collocation cross-connection; and 3) completing or closing out the work in OSS. Because these are the same steps required for a basic unbundled loop, there is no reason why the nonrecurring work times or costs for all-copper xDSL loops should be different than for a basic, non-designed loop. However, because of the overstatement of appropriate work times used in BST's cost studies in docket 97-01262, the Authority should make the adjustments I have indicated to determine the cost of xDSL unbundled loops.

Q. IN YOUR OPINION WHAT IS A REASONABLE TIME ESTIMATE TO PROCESS AND REVIEW A CLEC SERVICE ORDER REQUEST?

A. I would estimate on average that it would take no more than 2 to 2 1/2 minutes to pull and analyze a work order to connect an xDSL-capable loop. Typically technicians retrieve a printout of all assigned orders that are generated automatically and perform the necessary cross connect or "jumper" work during specific times of the day. Furthermore, orders are accessed from mechanized systems where a technician pulls up more than one order at a time. Generally, the technician will then organize the orders so that they can be efficiently performed. Once the technician gets the orders, most orders would only require negligible review and are a routine work task for experienced technicians. An order that requires running a jumper is a routine task for a central office frame technician.

Technicians are very familiar with the locations of the "to" and "from" points on the frame within their assigned central offices and can efficiently place the required cross connections without delay.

Q. WHAT IS A REASONABLE TIME TO PLACE A CROSS CONNECTION?

A. The placement of a cross connection to connect the loop to collocation should only take a few minutes, even considering walking time. Since experienced technicians know the frame very well and the process of attaching a cross connection to the frame is very routine and almost automatic. In some locations with non-staffed central offices, the technician would need to travel to an office location to perform the specific cross connection work. Therefore, some travel time may also be required in order to complete this task. However this travel time should be minimal on a per-line basis if the ILEC is efficiently utilizing their workforce. First, most lines will be located in staffed offices. Second, when work in a non-staffed office is required, it can typically be coordinated with other work to complete the necessary tasks efficiently. Travel time would only be assigned to each loop with a 5% occurrence based on the assumption that 80% of loops are in staffed locations and four loops are grouped into a batch (on average) before a technician is dispatched. Based on the further assumption that a non-staffed office is typically 20 minutes from a dispatch location, then each loop would only be assigned one minute of travel time. In my opinion and based upon my personal experiences, I believe these are reasonable assumptions.

Q. WHAT IS INVOLVED IN CLOSING AN ORDER AND HOW LONG SHOULD THAT TASK TAKE ORDER?

A. In closing an order the technician is simply noting into a automated system that the requested work has been completed. This task should take less time than it took to originally "pull" and analyze because no analysis whatsoever is required. Typically an efficient technician will perform this work task in a batch mode once numerous assigned cross connections have been placed. On average, I would estimate that it should take about 1.5 minutes to report work complete for each line on an order.

Q. IS THERE ANY ADDITIONAL COST IN PROCESSING AN ORDER ITSELF?

A. Any additional cost in processing an order would only applied in very limited cases. The OSS used by ILECs' are fully capable of managing the flow of a basic order, which should include the cross connection of a loop regardless of the intended use for that loop, in a fully automated mode. Manual task time required to process an order for an unbundled loop would only be required in a very small percentage of cases in which the mechanized OSS cannot identify facilities and assign the work correctly. Since an ILEC should have adequate up-front edits in place and have maintained accurate database records, the percentage of such fallout should be very low. In my opinion, I would estimate that this percent fallout should be around 2% in an analysis of efficient, forward-looking costs. On average this it might take about 15 minutes to review, analyze and resolve such problems. Given this assumption the correction of errors in the ordering process would legitimately take an additional 0.3 minutes on a per-line basis.

Q. IN DISCONNECTING AN XDSL-CAPABLE LOOP IS THE WORK ACTIVITY REQUIRED APPROXIMATELY THE SAME AS THE TIME YOU JUST REVIEWED FOR CONNECTING THE LOOP?

A. Yes. However the actual cross connection work associated with removing or disconnecting would take less time simply because it is quicker to pull a jumper off of a frame connection than to make a new connection.

Q. PLEASE SUMMARIZE THE STEPS AND TIMES THAT SHOULD BE INCLUDED IN THE NONRECURRING COST TO CONNECT AN ORDERED BASIC OR XDSL-CAPABLE LOOP.

A. The following tables provide a reasonable estimate of the tasks and work times required to provision a basic copper loop (for use to provide basic exchange analog service or an xDSL service).

Tasks, Times and Costs Required to Efficiently Connect an Unbundled Loop			
Task	Minutes	Occurrence	Minutes per Line
Obtain and Review Order	2.5	100%	2.5
Travel to Remote Office	20	5%	1
Place Jumper	3	100%	3
Report Work Complete	1.5	100%	1.5
Total Minutes Per Line			8
Estimated (Proxy) Labor Rate			$ 40.00
Total Cost			$ 5.33

As the preceding table indicates, if one assumes for the sake of illustration that this Authority adopts a forward-looking average labor rate of about $40 for the related work groups for any given ILEC, then the total cost to connect an unbundled xDSL loop should be about $5.33. The price should be about $5.33 plus any adopted common cost markup. As shown in the following table, the costs and rates for disconnect would be very similar.

Tasks, Times and Costs Required to Efficiently Disconnect an Unbundled Loop			
Task	Minutes	Occurrence	Minutes per Line
Obtain and Review Order	2.5	100%	2.5
Travel to Remote Office	20	5%	1
Remove Jumper	2	100%	2
Report Work Complete	1.5	100%	1.5
Total Minutes Per Line			7
Estimated (Proxy) Labor Rate			$ 40.00
Total Cost			$ 4.67

Since the process of placing and removing cross connections in central offices is very consistent with most ILECs and with only minor variations due to labor rates, I would anticipate that the results in the preceding tables would not vary across ILECs.

E. BELLSOUTH DRAMATICALLY INCREASES THE COST OF PROVISIONING XDSL LOOPS BY INCLUDING UNREASONABLE TASK TIMES, UNNECESSARY WORK GROUPS, AND INVALID ASSUMPTIONS IN ITS COST STUDIES

Q. Should the Authority rely upon the BST analysis of the nonrecurring cost to provision various types of unbundled loops for use to provide xDSL services?

A. No. I have reviewed the BellSouth cost studies of October 2, 2000, October 20, 2000 and November 13, 2000, with respect to their support of the BellSouth proposed rates for UCL, ADSL, and HDSL loops in Tennessee. (See BellSouth Ruscilli Testimony, Ex. JAR-1). Since the revised cost studies filed on November 13, 2000 altered several aspects of xDSL loop provisioning, I am continuing to review those studies and to contrast them to the October 2, 2000 BellSouth study.

Even though I've only had a short time to review the new BST study, it is clear that BST's analysis is simply irrelevant to the work effort that would reasonably be required to provision the xDSL-capable unbundled loops that the Data Coalition needs. After having reviewed the numerous BST cost studies and supporting materials that have been presented in this proceeding, I am still unclear about what BST perceives it was analyzing. xDSL loops, particularly those provided over all-copper facilities, are exactly like basic, voice grade loops. Therefore, as I will explain below, the connection of a xDSL loop should involve only a few basic tasks that are required in order to connect a copper loop to a collocation facility in the central office. In its cost studies, BST has included numerous irrelevant tasks. Moreover, even if these tasks were somehow relevant, BST's study includes activities that even a moderately efficient ILEC would have mechanized and task times that are entirely overstated.

Q. WHAT ACTIVITIES DOES BST INCLUDE THAT ARE ENTIRELY IRRELEVANT TO THE PROVISION OF XDSL-CAPABLE LOOPS?

A. BellSouth has created an elaborate "designed loop" process and it requires that all xDSL loops it provisions go through this process. From an engineering perspective, this entire design process is unnecessary. Significantly, the designed loop process triggers involvement of unnecessary work groups, the inclusion of an unnecessary "test point" on the DSL loops, and generates a Design Layout Record and Order Coordination functions that were not requested and are not required by DSL providers. In the following section of my testimony, I will identify some of the extreme examples of grossly inflated task times or unnecessary activities found in BellSouth's cost studies for xDSL capable loops.

Q. If the Authority inappropriately agrees with BST's approach of designing each individual xDSL loop, based on its definitions of those loops, could the Authority rely on the BST reported costs without substantial adjustment?

A. No. As I have noted above, even if this Authority agrees with BST that it must hand design and test each xDSL unbundled loop (using unnecessary manual processes at each step), BST has grossly overstated the cost of each step. Until BST identifies the basis for many of its cost study assumptions, I cannot identify each and every instance of where BST's nonrecurring cost study shows unnecessary, unsupported or inflated task times. The examples based on BST's xDSL Loop studies set forth below clearly illustrate that BST's nonrecurring cost analysis is substantially flawed and should not be relied upon in this proceeding.

Q. HOW HAVE YOU REVIEWED AND ANALYZED BELLSOUTH'S TASK TIMES AND WORK GROUPS FROM THE XDSL STUDIES?

A. In its various cost studies on xDSL loops, BellSouth places various work groups and task times into three general categories: Service Inquiry, Engineering and Connect & Test. As I discuss below, none of these groups are necessary to provision a DSL loop. Nonetheless, I will describe the work activities or assumptions made in BellSouth's cost study and explain why those activities and assumptions are unnecessary and invalid. Where the task is necessary to provision xDSL capable loops, I have suggested reasonable task times based on efficient practices. I will address them in the general categories used in the BellSouth studies for simplicity sake.

TASK GROUP 1: SERVICE INQUIRY

Although BellSouth seems to have eliminated some of these unnecessary Service Inquiry function when the CLEC performs its own loop qualification (and thus orders a loop without loop makeup), many unnecessary, manual processes remain when a CLEC orders loop with loop makeup. It is critical that the Authority adjust rates for both loops with and loops without loop makeup for two reasons. First, at the time of this filing, no CLECs in Tennessee can obtain loop makeup electronically in advance of ordering a loop. Although BellSouth is beta testing this electronic process, the reality is that CLECs today must order a loop with loop makeup or else obtain a separate manual loop makeup in advance of ordering the loop. One of the Data Coalition Members, Mpower, is currently forced to endure this process that adds 5-7 business days to the front end of the ordering process at a cost of $233 per inquiry. Thus, although BellSouth purports to have both loops with and loops without loop makeup available, the only real choice for CLECs is to obtain manual loop makeup from BellSouth. As a result, the task times BellSouth assigns to these processes must be carefully analyzed.

BST assumes that, on 33% of orders, two different groups (the Complex Resale Services Group ("CRSG") and the Local Carrier Services Center ("LCSC")) will require 1.58 hours, (95 minutes) hours of "Service Inquiry" work to manually determine if an xDSL-qualified loop is available. A forward-looking analysis should instead assume that the CLEC has access to the ILECs OSS that includes the necessary data to qualify its own loops. Therefore, all of the tasks elaborated in BellSouth's cost study for Service Inquiry functions are unnecessary. This is true regardless of whether a CLEC orders an xDSL loop with or without loop makeup. The order should submitted electronically to the ILEC, and should flow through to provisioning without manual intervention. For these reasons these costs should be entirely removed from any analysis that is premised on considering forward looking costs.

If the Authority does not simply eliminate these costs, the Authority will need to adjust these costs substantially. BST provides no explanation of the functions of the Complex Resale Group (CRSG) and the Local Carrier Serving Center ("LCSC") (the two work groups performing Service Inquiry functions, according to the BellSouth cost studies) in its direct testimony or cost studies. Nonetheless, the Data Coalition has been able to piece together some explanation of what these groups do from discovery, testimony and hearing transcripts in Florida and North Carolina pricing proceedings.

BST assigns to the CRSG nearly an hour of labor (50 minutes) for tasks like receiving a firm order SI from a CLEC and screens documents; CRSG prepares/sends transmittals to OSPE for verification of facility availability. Upon completion of job, CRSG informs CLEC facilities are available. This effort appears to consist entirely of reviewing the CLEC request and translating it into a different format that another work group uses and, ultimately, sending notice back to the CLEC when the Service Inquiry is done. Those are functions that a mechanized OSS does automatically and should not be portrayed as an necessary component in forward looking cost studies.

The next process step is that the LCSC "receives SI from CRSG, validates for accuracy and sends a firm order commitment BST reports that this manual process requires another 45 minutes. I have been unable to find any work papers supplied by BST that even basically identifies specifically how the 45-minute estimate was developed. However, a document produced by BellSouth in Florida states, "Manual work times for the LCSC ... 1st install ... 30 (15 min to screen &

15 min to process order)."[1] Based on that discovery, it appears that BST began by overstating its input by 50%. More importantly, this step appears to be entirely busy-work created by BST's own manual transcription of a CLEC's request. In other words, the CRSG does nothing more than checking the work of the first group, all before the work gets to the actual group that performs the provisioning. Having a single work group that manually checks orders for errors seems inefficient, but having two separate groups checking for errors is ludicrous. More importantly, this work should all be done electronically with little or no manual intervention.

The work tasks for the two remaining work groups that perform Service Inquiry functions, Outside Plant Engineering ("OSPE") and Service Advocacy Center ("SAC") are equally mysterious. BellSouth proposes a total of 113 minutes of engineering time on each loop. In the Florida proceeding, BellSouth proposed 180 minutes for the same tasks. During that proceeding, the Outside Plant Engineering subject matter expert, Michael K. Zitzmann, who supplied the task times for the OSPE and SAC group portions of the Service Inquiry was deposed. In that deposition, Mr. Zitzmann revealed that his 180-minute estimated task time for those groups consists of 30 minutes for clerical processing and updating of BST's plant records, plus 150 minutes for a BST engineer to look up the facility records for the requested loop route. (Exhibit DRF-2, Zitzmann Depo., p. 44) Given the unexplained changes to the BellSouth cost studies, it is impossible to say which of these task times decreased. Nonetheless, these

[1] See BellSouth's Response to Rhythms' Request for Production of Documents No. 3.

enormous task times means that Mr. Zitzmann has assumed that a BST engineer, working with plant records for a central office with which he is familiar, with full access to all of BST's mechanized plant records for that office and with the paper records for that office at hand, can trace only three or four loops per day. This assumption is totally unrealistic based on my experience as an OSP engineer with extensive experience. Because he was not able to provide a detailed breakdown of how he arrived at his estimates, it is not possible to analyze exactly how Mr. Zitzmann went wrong. His deposition does, however, provide some clues. For example, Mr. Zitzmann is only marginally familiar with BST's mechanized plant databases such as LFACS because he acknowledges that 13 years ago "... when I was an engineer, LFACS was brand new." (Exhibit DRF-2, Zitzmann Depo., p. 100) In fact, Mr. Zitzmann seems to have exaggerated the time required for even the most basic uses of mechanized systems. For example, Mr. Zitzmann first asserted that "[i]t takes longer than five minutes ..." just to log into LFACS. (Exhibit DRF-2, Zitzmann Depo., p. 47) He later seemed to admit that the log-in process involves only two screens and a few key strokes. (Exhibit DRF-2, Zitzmann Depo., pp. 101-104)

Contrary to Mr. Zitzmann's exaggerated estimate, when BST has complete records, a qualified engineer or even an experienced clerical assistant would never need to leave his terminal to qualify loop facilities and might complete the job in the matter of a few minutes. Furthermore, BellSouth Witness Pate testified that some basic information exists electronically in the BellSouth Loop Facilities Assignment and Control System ("LFACS") on all loops. (Pate

Direct, p. 7) That information includes loop length, whether the loop is fiber or copper, the presence of Digital Loop Carrier ("DLC"), and whether it is loaded. Furthermore, Mr. Pate stated that extensive and detailed information was available in LFACS on 80% of loops in metropolitan areas, where most orders for DSL are placed. (Pate Direct, p. 7) Thus, although BellSouth estimates that manual loop makeup will be necessary 33 % of the time, it seems that the necessary information will be available electronically much more often than that. BST's assumption that manual loop makeup will be required 33% of the time is a gross overstatement. Such an effort should only be required when mechanized qualification fails, which should be less than 10 percent of the time.

In those cases in which the BST engineer find the information somewhere other than LFACS, the process should still take less than an hour in a worst case scenario. This has been confirmed by BellSouth witness Greer during the North Carolina hearing. Greer admitted that he could produce a loop make-up pull from BellSouth systems in 5-10 minutes. He also admitted that an experienced engineer could probably do it much more quickly. As an overall average, I believe an efficient BST operation could look up the required information and forward it to a CLEC within 10 minutes, on average. When I was an outside plant engineer and when I managed other engineers, I would certainly not have found it acceptable for them to complete no more than 3 loop orders in a day.

TASK GROUP 2: ENGINEERING

The second cluster of tasks in the BST analysis is for "engineering." The first engineering task is for the Circuit Provisioning Group ("CPG") work group, which apparently processes requests, designs circuit, and generates DLR & WORD document for CLEC and Field. This task appears to consist of two distinct time estimates for correcting fallout in the automated engineering process at two different points, which take 15 and 18 minutes respectively. BST assumes that each type of fallout will occur on 15% of all orders. (BST's response to Rhythms' Request for Production of Documents 3 in Florida) BST's work papers provide no clue as to how the fallout percentages in its study were developed. Hence, because BST failed to provide the source documents for either portion of its cost calculation formula, no detailed analysis is possible.

In addition to the "CPG" work, but also without support, BST assumes that the Assignment Facilities Information Group ("AFIG") work group will spend 8 minutes to "assign loop facilities" as needed to correct fallout in the assignment process for an additional 30% of xDSL loops. Overall, BST is assuming that its automated processes will fail an amazing 55 % of the time on a cumulative basis in this engineering process.

As mentioned above, this entire engineering process is unnecessary. If this Authority should wish to include it, the assumed breakdown rate of 55 % (in this single, minor portion of the order process) is totally out of line with any reasonable forward-looking OSS process. I would recommend that this Authority only allow a very small percentage fallout occurrence across the entire "engineering" activity (e.g., 1 percent each for the BST's three types of fallout would be conservative). This adjustment to the occurrence factor for "engineering" tasks would help to compensate for any overstatement in task times that BST advocates.

TASK GROUP 3: CONNECT & TURN-UP TEST

Under the label "Connect & Turn-up Test" in its cost study BST includes work by a number of distinct groups, each of which I will address separately below.

<u>UNE Center Group</u>

BST reports 255.11 minutes for work by the "UNE Center." BST describes this function as "UNEC pulls info, assigns to work forces; verifies & ensures accuracy of design; creates cut sheets to verify reuse of facilities; ensures dispatch, performs frame continuity and due date coordination and testing; performs manual order coordination (RCF, disconnect and UL order) when service is converted on existing facilities, task times, which BST failed to explain or support.) and contacts customer and completes order." Based on the July 20, 2000 deposition of Mr. James Franklin Ennis, the BST expert who provided the UNE Center inputs, it appears that the basic role of the UNE Center is to coordinate and perform remote testing on design loops such as BST "ADSL Loop." (Exhibit DRF-3, Ennis Depo., pp. 11-14) As noted above, I do not believe that it is necessary or appropriate for an xDSL-capable loop to be designed and specially wired to allow the ILEC remote test access. Without such design steps and extra wiring, no remote testing would even be possible, and the UNE Center work would be eliminated.

Even if this Authority were to improperly adopt a designed xDSL Loop assumption, the UNE Center cost for testing those loops is greatly overstated. For example, the UNE Center time includes functions such as "ensures dispatch" meaning that a UNE Center employee literally checks to make sure that BST's automated systems did not fail to schedule the dispatch of a field technician to coordinate the testing process with the UNE Center. (Exhibit DRF-3, Ennis Depo., p. 21) This is obviously unnecessary and should be removed from a forward-looking cost study.

The most extreme is that BST's study appears to assume that this workgroup will spend a total of 54 minutes to test continuity. A continuity test is one of the most routine, simple and rapid activities in central office operations. If required at all, it is typically done at the same time a connection is made and involves little more than clipping standard test apparatus onto the newly completed connection. This task should take substantially less than one minute and should only be done once at most. BST's reported task time is more than 50 times too high. In my opinion, conservatively an additional five minutes would be adequate for the work activity for an efficient equivalent of the UNE Center testing process.

There are numerous other task which account for the excessive time attributed to the UNE Center, which further exacerbate the lack of efficiency in that process. For example, BST includes manual work time to "pull" the order, to "assign to work force," to "ensure accuracy of design," to "ensure dispatch." Forward looking Operation Support Systems (OSS) used by efficient ILECs have automated all of these activities and should not require any standard manual intervention. BST apparently has mechanized at least some of these tasks but, ironically, has built in a 100% manual backup to make sure, for example, that the automated dispatch that should have been scheduled automatically was actually scheduled. One can only assume that BST is intentionally causing fallout (*i.e.*, a need for manual intervention and additional labor costs) for those activities simply because a competitor for xDSL service will use the ordered loop. Also, BST includes both time to manually contact customer and to manually "complete order," two tasks that should accomplish the same objective. BST's analysis is saturated with such duplicative and unnecessary manual activities, which even a moderately efficient ILEC would have fully mechanized or automated for their retail operations. BellSouth certainly has done so and has those systems available and these manual task are totally unnecessary in most instances.

It is not surprising that BST's estimates are so far off. Although Mr. Ennis was the subject matter expert on which BST relied to support the UNE Center cost estimates, he did not actually develop those estimates. Instead, he merely agreed to accept the cost estimates provided to him by the cost group. He had no idea from where the estimates used actually came or how they were developed. (DRF-3, Ennis Depo., pp. 50-52)

"WMC" Work Group

BST reports 15 minutes for the "WMC" group to "coordinate dispatched technicians." BST failed to provide a word of explanation regarding how this time was developed or what exactly is supposed to take place for the reported 15 minutes. BST's alleged need for yet another layer of manual coordination is contrary to efficient engineering practices using forward-looking OSS. The Authority should not allow any recovery for this group and activity until BST provides compelling justification concerning why it is necessary.

CO I&M

BST includes 20 minutes for 85% of loops for the Central Office Installation & Maintenance ("CO I&M") group to "wire circuit at collocation site." Based on the July 20, 2000 deposition of Mr. Daniel Eric Stinson (the BellSouth subject matter expert on CO I&M), it appears that this is based on an assumed ten minutes to review the order and walk to the frame location, and five minutes to run each of two frame jumpers one on the main distribution frame and another to connect a BST remote test head (thereby making the loop "designed"). (Exhibit DRF-4, Stinson Depo., pp. 29-30) Other than the assumption that a second jumper is required to include a designed test point, I agree that the basic functions for this work group are required. However, I do not agree with the BST time estimates and have presented my own recommended alternative times for those functions earlier in this section of my testimony. If and only if the Authority approves BST's recommendation to design in a test point, I recommend that this task should take a total of 11 minutes.

For example, BST reports that the "pull info" task requires 8 minutes. This task should not require any manual time at all, as information required for work on an assigned order is typically either printed or loaded into a queue in a work terminal automatically in a mechanized OSS environment. Even if, for some odd reason, a manual lookup were required, it should not take anything near 8 minutes merely to retrieve the information needed to process an order.

The 85% assumption appears to be based on a BST note that the study "... assume[s] 15% of total are carried in other transport elements." This is not explained and does not make any obvious sense. Indeed, Mr. Stinson seemed unclear as to where or how the remaining 15% of the CO I&M costs might be captured. (Exhibit DRF-4, Stinson Depo., p. 24) Therefore, I recommend increasing the occurrence of this work from 85% to 100% when applying the occurrence to my more reasonable time estimates.

Outside Plant or Field Work

Finally, BST assumes 194 minutes of outside plant or fieldwork plus 20 minutes of travel time for *every* xDSL loop order. This work should not be included in a forward-looking analysis of nonrecurring costs because it is already captured in the recurring cost analysis.

Not only is this cost entirely double counted, BST's analysis again overstates task times. xDSL loops will not require a dispatch in 100% of cases under any reasonable set of assumptions. As a forward-looking assumption, the Commission should not assume that an xDSL loop will require a dispatch of outside plant technicians any more often than is required for a basic loop, which BST assumes will be required for only 20% of basic unbundled loops.

BST's 194 minute total task time estimates include:

1) 16 minutes for "Actual placement and/or removal of cross connection jumpers, performance of line and station transfer work, or bearing of connect through."
2) 15 minutes to "Check loop pair(s) for continuity, and/or dial tone before leaving cross connect box, LST, PXJ, RXJ, BCT location."
3) 20 minutes for "Time spent 'hooking up' test equipment and performing operational test from the network interface."
4) 19 minutes for "Technician closes out service order on CAT and/or on phone with the ICM."
5) 45 minutes for an "Attempt to resolve problems with continuity of the loop or lack of dial tone" on 30% of all lines.
6) 56 minutes of "Time spent in trouble resolution following failure test performed at the network interface" on 21% of all loops.

All of the preceding detail comes from Exhibit DDC-1 Caldwell Direct Testimony 11-13-00 in this proceeding.

Each of these estimates greatly exaggerates the time required, on average, for a qualified technician to perform the required task. Some of the individual tasks, in the sequence from items 1 through 4 above, such as item 1, can be accomplished in a minute or less. Considering the entire series of tasks in sequence (including setup time), I estimate that it might take an average of 25 minutes in total.

Likewise, the cumulative *** **BST PROPRIETARY** [redacted] **END PROPRIETARY** *** presumed error rate reflected in items 5 and 6 is totally inconsistent with the performance level one would expect from an efficient service provider with a forward looking designed network. BST has provided no support whatsoever for its assumptions and therefore has failed to prove that they form the reasonable basis for a forward looking rate. I recommend allowing BST to include only a maximum of a 5% occurrence for each type of error.

Q. PLEASE SUMMARIZE THE FINDINGS YOU HAVE JUST PRESENTED.

A. The following table compares the BST reported times by function with the times I consider to be more appropriate for either a forward-looking cost study of a basic loop, including an xDSL loop, or a realistic study of a designed loop process.

Group or Function	BST Assumed Time	Realistic Time Assumption W/O Design Process	Realistic Time W/ Engineered/Design Process
Group 1: Service Inquiry	95 Minutes on 80% of orders	"0" Minutes (Should be mechanized and is part of another element)	10 Minutes on 10% of orders
Group 2: Engineering	8 Minutes on 30% of orders 15 Minutes on 15% of orders 18 Minutes on 15% of orders 87 Minutes of 10% of orders	"0" Minutes (xDSL loops should not be designed)	8 Minutes on 1% of Orders 15 Minutes on 1% of Orders 18 Minutes on 1% of Orders
Group 3: CONNECT & TEST (UNEC)	255 Minutes for multiple tasks at various occurrences	"0" Minutes (Remote testing is not required on non-designed loop)	5 Minutes additional time for test at the MDF at time of installation
Group 3: CONNECT & TEST (WMC)	15 Minutes per loop	"0" Minutes - Not required	"0" Minutes - Not required - No explanation provided by BST
Group 3: CONNECT & TEST (CO I & M)	20 Minutes on 85% of loops	8 Minutes on 100% of loops	11 Minutes on 100% of loops
Group 3: CONNECT & TEST (SSI&M)	194 Minutes for multiple tasks at various occurrences	"0" (recurring cost in a forward looking study)	50 Minutes total for 20% of loops (includes 5% additional error correction time)
Approximate Cost	$ $ 186.23	$5.33	$ 18.27

III: LINE SHARING

Q. CAN "DSL" SERVICE BE PROVIDED OVER A CUSTOMERS EXISTING POTS SERVICE FACILITY?

A. Yes, DSL services can be provided over existing telephone lines with a technology known as line sharing or line splitting. As BellSouth Witness

Milner's testimony illustrates, CLECs are now entitled to purchase only the high frequency spectrum of the local loop for DSL services, if they wish.

Q. WAS BELLSOUTH WITNESS MILNER'S DESCRIPTION OF HOW LINE SHARING WORKS FAIRLY ACCURATE?

A. Yes, basically. In the telecommunications industry, the use of a single loop that is capable of providing both POTS and certain high-bandwidth xDSL digital transmission capabilities between a customer's premises and the central office is possible. This is because voice traffic occupies a narrow bandwidth in the lower end of the spectrum available on a loop, traditionally accepted in the industry to be between 300 and 3400 Hz. For those types of xDSL services that permit line sharing, xDSL traffic occupies the high end of the spectrum available on a loop (i.e., Above 4000 Hz). Therefore, both low-bandwidth POTS and high-bandwidth xDSL can coexist on a single physical loop.

Q. WHAT TYPES OF xDSL CAN BE PROVIDED IN A LINE SHARING OR LINE SPLITTING ARRANGEMENT?

A. Since POTS over a copper loop normally occupies the frequencies between 300 and 3400 Hz, an Asymmetric Digital Subscriber Line, (ADSL) can be provisioned on the same loop. This is because both the downstream and upstream data signals, which are transmitted on different frequencies, use frequencies above the range of frequencies used to transmit voice signals. ADSL uses the bandwidth above the 4-kHz POTS frequency to transmit duplex data using digital modulation techniques. It was originally developed to support the delivery of entertainment video, or "video dial tone," services over existing copper loops. Such video services require much higher bandwidth in the "downstream" direction (towards the customer premises) than they do in the "upstream" direction (towards the central office). This is because the video signals being transmitted to the customer's premises require a large amount of bandwidth, and the upstream signal is assumed to be a non-video data signal requiring much less bandwidth. Thus, the need for bandwidth was deemed to be asymmetrical; that is, a high-bandwidth signal exists in the downstream direction and a lower bandwidth signal exists in the upstream direction. ADSL is also useful for consumer Internet access, because such traffic tends to display an asymmetrical pattern similar to video dial tone services. Most Internet traffic flows toward the end user, as graphics-intensive web pages and data files are downloaded. The upstream traffic normally consists of a few keystrokes and occasional uploads of email and small data files.

RADSL, (Rate Adaptive Digital Subscriber Line) a type of ADSL, can also be used in a line sharing arrangement. Just like ADSL, the downstream and upstream data signals arc transmitted using separate frequencies and both data streams use frequencies above the frequencies used to transmit voice signals. Therefore, RADSL can be used on the same loop as POTS service in a line sharing arrangement. As is the case with other types of ADSL, the downstream and upstream data transmission rates are asymmetrical (as an alternative, it is also possible to configure RADSL for symmetrical data transmission rates). RADSL is more flexible than other types of ADSL because it is rate adaptive; that is, the DSL equipment automatically and dynamically adjusts the transmission speed of the circuit to the optimal level achievable on each loop. RADSL can therefore transmit data at a wide range of transmission speeds, depending on the length and condition of the loop in question.

G.Lite is a throughput limited version of ADSL, used on loops with simple filters, rather than splitters, at the subscriber end. G.Lite eliminates the requirement for a splitter installation at the customer premise. It uses the same part of the frequency spectrum as ADSL, and thus can be used in a line sharing arrangement. Additional enhancements and modifications to xDSL will surely continue in this technology aggressive industry.

Q. BELLSOUTH WITNESS MILNER'S TESTIMONY SEEMS TO LIMIT THE USE OF LINE SHARING TO PROVISIONING ADSL. IS THAT ACCURATE?

A. Not entirely. In addition to ADSL, some other variations of DSL service include SDSL, HDSL, VDSL and IDSL. These are all symmetrical configurations of xDSL where the downstream and upstream data signals are transmitted using a full range of frequencies, including those used to transmit voice signals. While most symmetrical DSL services currently can not provide voice and data service over the same facility, some technological advances will surely change that limitation in the very near future. In fact in the September 2000 issue of TELECONNECT, there is an article discussing North Pittsburgh Telephone

Company's deployment of Xpres-DSL service, which uses a symmetric form of DSL, called MVL (Multiple Virtual Line) that unlike standard SDSL, shares the line with voice.

Q. DOES EITHER BELLSOUTH OR SPRINT ATTRIBUTE ANY COST TO THE HIGH FREQUENCY SPECTRUM OF THE LOOP?

A. No. Both ILECs agree that there is no cost associated with providing just the high frequency spectrum. At page 6 of his direct testimony, Sprint witness Gordon states:

Sprint believes if an ILEC customer currently subscribers to voice, then the ILEC recovers its loop cost through the retail rate of the service, access charges and any subsidies that the ILEC might receive. Also in it's cost study documentation filed in this docket Sprint states:

No incremental loop costs are created in the use of the high frequency portion of the loop via a line sharing arrangement. Accordingly, Sprint's Interstate xDSL retail offering cost study included no local loop cost allocation

BellSouth likewise agreed that the cost of the high frequency spectrum of the loop is zero.

Q. HAS BELLSOUTH PROPOSED REASONABLE NONRECURRING CHARGES FOR INSTALLING A SPLITTER.

A. No. BellSouth seeks to impose a charge $371.63 on CLECs when they order either 24 or 96 ports on a splitter. This cost appears to be related to work inventorying circuit assignments. First, it makes no sense that a CLEC would have to pay the same amount irrespective of whether it orders 24 or 96 ports. Second, the work times for these activities are grossly exaggerated. BellSouth proposes that it should take 4.0 hours for its network group and 4.41 hours for the engineering group to do this routine work. The network aspect of this function is merely a matter of building the pertinent information into a standard database that, if programmed correctly, should take no more than 30 minutes for 96 ports and even less for a 24 port splitter. The engineering associated with this work task as well is considerably overstated and should only require 30 minutes at most and essentially is not required at all. BellSouth has not provided any supportable documentation for these proposed charges.

However, as Mr. Starkey states in his testimony, any cost associated should have been capitalized and non-recurring costs are unwarranted.

Q. HAS BELLSOUTH PROVIDED ANY JUSTIFICATION FOR THESE CHARGES?

A. No. As I previously stated, BellSouth has not provided any justification for their proposed non-recurring charges for installing a splitter.

Q. ARE BELLSOUTH'S PROPOSED WORK ACTIVITIES AND TASK TIMES FOR PROVISIONING A LINE SHARED LINE REASONABLE?

A. No. The BellSouth line sharing proposal suffers from many of the same problems the xDSL loop nonrecurring studies suffer from. Namely, manual intervention where a forward looking OSS should be in place, manual review of existing electronic processes, and excessive time for work tasks. With line sharing, the only work that need to be done whatsoever to provision a loop, is removing one jumper and running two other jumpers. The Data Coalition's witness Zulevic explains this process in more detail. The Data Coalition's witness Starkey explains how BellSouth has calculated the costs for line sharing inappropriately and suggests the reasonable way to price this UNE.

Q. WHAT AMOUNT OF TIME DOES BELLSOUTH ESTIMATE IT WILL TAKE TO PROVISION A LINE SHARED LOOP?

A. In response to Covad's First Interrogatories No. 28, BellSouth stated that depending upon the frame configuration, the time required to place jumpers to provision a line shared loop would vary between 21 and 36 minutes, depending on the network architecture in place in a BellSouth office. Of course, BellSouth provides no information about how often a certain network configuration exists. Nonetheless, as I have said earlier in my testimony, running jumpers is the only task necessary for provisioning a line shared loop. The placement of these cross connections or jumpers should not take a qualified, experienced, technician very long and certainly not the excessive times that BellSouth is proposing. In my opinion, conservatively this work operation may take a technician on average 11 minutes.

IV. LOOP CONDITIONING

Q. FOR THE PURPOSE OF THESE PROCEEDINGS, PLEASE DEFINE THE TERM XDSL LOOP CONDITIONING.

A. Loop Conditioning refers to the removal of impediments on the copper loop to permit the functionality of xDSL transmission. This includes the removal of all load coils, excessive bridged tap, repeaters, range extenders, and low pass filters.

Q. DO BELLSOUTH PROPOSED LOOP CONDITIONING CHARGES REFLECT THE EVOLUTION OF OUTSIDE PLANT DESIGN GUIDELINES USED THROUGHOUT THE INDUSTRY FOR THE PAST SEVERAL DECADES?

A. No. As discussed earlier in my testimony, under established industry Outside Plant engineering planning and design guidelines all copper loops since 1980 should have been designed in concert with CSA concepts, which support digital services. All loops since 1972 should have been, at a minimum, designed to Serving Area Concept criteria, in which all distribution cables within the entire Distribution Area have the same transmission characteristics (i.e., all loaded or all non-loaded), the same copper cable gauge, and no excessive bridged taps.

In short, correctly designed Outside Plant for the past two decades should <u>not</u> present any impediment to xDSL service loops requested by CLECs. Loops older than 20 years are far beyond their useful service and depreciation lives. Moreover, as work was done in the outside plant over the past 20 years, outside plant engineers should have insured that BellSouth's plant was brought up to these guidelines.

Q. WHY IS LOOP CONDITIONING NECESSARY FOR XDSL LOOPS AT ALL?

A. CLECs must have access to a loop in which any copper segment is free of impediments such as load coils, excessive bridged tap, repeaters, Digital Added Main Line ("DAML"), noise, or any other condition that harms xDSL service. The use of impairing devices in the network such as load coils and the allowance of bridged taps longer than 2500 feet have been obsolete for the past 20 to 30 years, and should have been eliminated throughout the course of the outside plant's life. Repeaters and other old local loop devices either render local loops unusable for even POTS service, or are so obsolete that they should have been removed by ILECs when their use was no longer necessary. DAMLs are placed as a temporary expedient on loops to mitigate a lack of outside plant facilities, and should be removed by ILECs when they are no longer required due to the provision of adequate facilities inventories. Impairing devices and technologies would not exist on a loop designed to current standards, and they preclude or degrade xDSL signals. However, such devices or conditions may exist in the legacy-embedded plant, especially on older outside plant that has exceeded its useful service life or has been rearranged for other uses than it was originally designed to serve. Where older facilities of this kind remain in service, the ILEC should remove them, to bring loops up to current ISDN/xDSL-capable transmission standards.

Q. DOES BELLSOUTH WITNESS MILNER ADEQUATELY EXPLAIN WHAT LOAD COILS ARE?

A. Basically. However, he fails to mention that load coils severely attenuate frequencies above 3000 Hz, which is detrimental to both DSL loops and analog data modems. Load coils are completely unnecessary on any loop less than 18,000 feet in length.

Q. DO SUCH DEVICES INTERFERE WITH ANY EXISTING SERVICES TODAY?

A. Yes, and this harm is quite distinct from the fact that such devices interfere with xDSL service. As the Authority is aware, the most common complaint of an Internet user using a modem over a traditional POTS line is that although the modem is capable of 56Kbps, that speed is almost never reached while surfing the Internet and downloading files. Many of these complaints result from the presence of this obsolete equipment (such as load coils) that should have been removed by now, and is causing analog modem users to experience slower modem speeds..

Load coils significantly deteriorate the performance of analog modems on POTS loops to as low as 21.6 kbps for a 56 kbps modem[2]. Load coils also add

[2] Poor analog modem performance was the primary reason the FCC determined that any forward looking model used to determine loop costs for the purposes of its Universal Service Fund

unnecessary resistance to the loop[3] thereby reducing the sound volume on the circuit. Severe degradation of modem performance is more important, in that analog modems designed for 56 kbps service use complex combinations of audio tones that require the full use of voice spectrum up to 3400 Hertz. Load coils block higher frequencies, thereby causing 56 kbps analog modems to self adjust themselves to much lower speeds, such as 21.6 kbps, based on the load coil reduced frequency spectrum available.

Q. WHAT ARE SOME OTHER REASONS WHY THE PRESENCE OF LOAD COILS ON LOOPS LESS THAN 18,000 FEET CAN ADVERSELY AFFECT VOICE-GRADE SERVICES?

A. The presence of load coils on loops less than 18,000 feet greatly increases the possibility of loading rules being violated and adversely impacting customer service. Loading rules include:

- Minimum sum of customer end section and bridge tap – 3,000 feet
- Loaded bridge tap – none permitted
- Bridge tap between loads – none permitted
- Stations (customers) between load points – none permitted

Q. SHOULD LOAD COILS EXIST ON COPPER LOOPS THAT ARE LESS THAN 18,000 FEET IN LENGTH?

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proceedings should be based on loops free of load coils (See FCC May 7, 1997 Report and Order CC Docket No. 95-45 §250). The result was to increase the deployment of Digital Loop Carrier to avoid any analog copper loop being longer than 18,000 feet. The FCC did not address the preclusion of load coils on loops of less than 18,000 feet, because they recognize that load coils do not belong on such loops.

A. No. As I have previously stated, load coils on POTS loops were appropriate, under old design guidelines, when copper loop lengths exceeded 18,000 feet. On such long copper lengths, load coils serve to mitigate the build-up of capacitance. However, according to engineering design rules that have been in place for 20 years or more, long loops, such as those over 18,000 feet, should be fed via Digital Loop Carrier systems, so that load coils are never required. Any working POTS loop less than 18,000 feet should have load coils removed to provide good quality service. The presence of these devices on loops less than 18,000 feet are detrimental to both POTS and advanced services.

Q. DID BELLSOUTH WITNESS MILNER ADEQUATELY DESCRIBE WHAT BRIDGED TAP IS?

A. Yes, generally. Bridged tap is any section of a cable pair not on the direct electrical path between the central office and end user. This condition increases the electrical loss on the pair. It occurs when a cable pair has a three-way splice (from the central office to location #1 to location #2), such that dial tone can appear in two or more different cable pair locations. Visually, you can think of a river with a stream entering it while the main branch of the river continues either upstream or downstream. One fork continues necessarily to the customer premise to complete the circuit. The second fork extends some distance into the field, but never terminates at a end user.

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[3] At 8.5 ohms per load coil.

This approach to outside plant design became obsolete when party-line service became largely obsolete. [*See Bellcore Notes on the Networks*, December 1997, p. 12-3: "Multiple plant design [use of bridged tapped pairs] was largely replaced by dedicated plant design because of the labor intensity of adding to or changing existing plant and customer demands to convert from multiple-party line to single-party line service.") Common in the days of party line service, bridged taps should have been engineered out of the network since 1972. The high frequency, digital nature of DSL services (like ISDN services) prevent them from operating with more than 2,500 feet of bridged tap.

Q. SHOULD BRIDGED TAP EVER APPEAR IN COPPER FEEDER PLANT?

A. No. Bridged tap should not appear in copper feeder plant. Bridged tap in copper feeder plant would exist if the same cable pair appeared as a feeder resource in two different Serving Area Interfaces. However, such use of bridged tap is inconsistent with Serving Area Concept ("SAC") guidelines, which have been in use since 1972.

Q. SHOULD BRIDGED TAP BE USED IN DISTRIBUTION PLANT?

A. Although a backbone distribution cable may contain many cable pairs, once distribution spans out into side legs, the same cable pair should never appear in two different side legs. Distribution cable should always be engineered in 25-pair binder groups, such that no pairs in a particular 25-pair binder group should ever appear in more than one side leg. This ensures no bridged tap conditions between separate distribution side legs.

Q. SHOULD A LOOP MODIFICATION CHARGE BE IMPOSED BY ILECS TO REMOVE INTERFERORS ON A COPPER LOOP?

A. No. BellSouth should not be allowed to impose a Loop Modification charge, as it is called, for loops less than 18,000 feet in length from either the central office or remote DLC terminal. Those items that are classified as "Interferes" or impediments should not occur on any copper loops properly designed over the past 20 to 30 years. Moreover, as explained earlier, such impediments often impair the quality of voice services.

Q. WITNESS CALDWELL STATES THAT BELLSOUTH'S COST STUDY USES COSTS THAT ARE FORWARD LOOKING AND REFLECT AN EFFICIENT NETWORK DESIGN. PLEASE COMMENT.

A. Contrary to Ms. Caldwell's statement the assumptions and costs used in BellSouth's cost studies does not represent a "forward looking" efficient network design. Even though Mr. Milner, describes what would be a forward looking efficient network design in his testimony, BellSouth's cost study nevertheless grossly differs from that methodology.

Q. WOULD YOU PLEASE EXPLAIN?

A. Yes. As I have discussed earlier in my testimony and BST witness Milner also supports in his direct testimony, a forward looking network would be in compliance with the engineering guidelines that have evolved over the decades. In a forward looking efficiently designed network, loops greater than 18,000 feet would be provisioned over fiber fed digital loop carrier and all loops would be capable of provisioning advanced services. Therefore, the requirement to place load coils or repeaters on long loops is eliminated and excessive bridge taps would not exist if BellSouth had adhered to those guidelines.

For example, BST's cost studies have inappropriately assumed a network that includes:

- load coils on an excessive number of loops, even those loops that are less than 18,000 feet from the central office
- loops less than 18,000 feet contain 2.1 load coils
- loops greater than 18,000 feet contain 3.5 load coils
- excessive bridge tap exists at 3 point on a loop and that even one of those bridge taps is in the underground feeder facilities

Q. IS THERE ANY EVIDENCE THAT THE CHARACTERISTICS OF LOOPS WITHIN THE NETWORK CHANGED AS THE SERVING AREA CONCEPT (SAC) AND CARRIER SERVING AREA CONCEPT (CSA) WERE IMPLEMENTED?

A. Yes. In Bellcore's "BOC Notes on the LEC Networks-1994", Issue 2, April 1994, the results of a survey indicate the implementation of SAC and CSA have impacted the characteristics of the local residential loop as follows:

Results of BOC Loop Surveys			
Year of Survey	1964	1973	1983
Average Working Length	10,613 ft	11,413 ft	11,723 ft
Average Total Bridge Tap	2478 ft	1,821 ft	1,490 ft

Q. PLEASE DESCRIBE HOW COPPER CABLES ARE CONSTRUCTED AND METHODS USED BY TECHNICIANS TO SPLICE CABLES.

A. Since the late 1960's, copper cables installed in the modern loop network primarily have been plastic insulated copper conductor cable or "PIC" cable. Plastic insulated conductor cable is designed for ease in cable pair identification. It is made up of 25 pair, color-coded binder groups and is available in cable sizes up to 4200 pair. Approximately 30 years ago, modular copper cable splicing was introduced into the industry and remains the standard method of connecting or splicing the network. With modular splicing, technicians can splice and rearrange cable facilities very efficiently by the use of 25 pair splicing modules. These splicing operations would also be applicable when load coils, bridge taps and repeaters would need to be removed for loop conditioning. If permitted, I can provide a brief demonstration of this splicing activity during the summary of my testimony.

Q. BST'S COST STUDIES ASSUME THAT ONLY 10 LOAD COILS WILL BE REMOVED WHEN LOAD COILS ARE REMOVED FOR LOOP CONDITIONING. IS THAT A REASONABLE ASSUMPTION?

A. Not at all. First as I mentioned above BST should not be entitled to charge for the removal of load coils on loops less than 18,000 feet, so BST's costs for loop conditioning – short should be dismissed by this Authority. BST's assumption that only 10 pairs would be unloaded at a time is totally unrealistic and contradictory to industry accepted splicing techniques. If unloading was necessary and if the Authority determined that BellSouth should recover costs for this work, that work most efficiently would be performed in increments of at least 25 pairs.

At least 50 pairs or more would be unloaded at a time.[4] ***BST PROPRIETARY [redacted] END BST PROPRIETARY*** Any experienced technician or OSP engineer understands and will stress the importance of maintaining binder group integrity and acknowledges that 25 pair binder groups are the very foundation of the copper network.

Q. ARE THERE OTHER ADVANTAGES TO CONDITIONING 50 PAIRS PER TECHNICIAN VISIT?

A. Yes, there are. Each time a technician opens a splice case in the outside plant network for purposes of loading or deloading cable pairs (regardless of the number of pairs loaded or deloaded), the process of opening, manipulating and closing the splice case can result in significant wear and tear not only on the apparatus itself, but on the contents as well. Splice cases are waterproof housings that generally accommodate a significant number of spliced cables. The fewer times a technician is required to open/close a splice case for purposes of loading or deloading cable pairs, the less the network is degraded as a result. This is especially true with pulp cable, which is insulated with paper. Deloading 50 pairs per technician visit would significantly reduce the number of times a technician would need to open/close any particular splice case within the network thereby minimizing the negative impacts of this type of work on the network.

[4] Because of the difficulty of singling out individual pairs, it would on average actually require less worktime to condition 50 loops at once than it would to condition 10 loops at once. For loops longer than 18,000 feet, BellSouth assumes that 2 loops will be conditioned at a time. Based upon my experience, it would take about the same length of time to condition 50 loops at once as to

Q. BELLSOUTH'S COST STUDIES ASSUME THAT LARGE PERCENTAGES OF LOOP CONDITIONING JOBS WILL BE PERFORMED IN AN UNDERGROUND (MANHHOLE) ENVIRONMENT. IS THAT A REASONABLE ASSUMPTION.

A. No. In response to Covad's First Data Request Item #1, BellSouth has indicated that 47% of their load coils exist in the underground environment. However, that assumption is very misleading. First, underground structures generally exist near the central office and house the largest number of cable facilities in terms of cable pairs. These underground environments are located in the dense metropolitan areas where loop length is short. Thus, the loops are less likely to have required loading. Secondly, in a typical network, the largest percentage of customers will reside within 18,000 feet (3.4 miles) of the central offices and loading is not required on those loops. Third, since the cable pair sizes are typically much larger in the underground segment of the local network, larger capacity load coil cases were placed prior to the implementation of digital loop carrier as the preferred choice for feeder facilities. While some of these load coil cases may still be in underground plant the vast majority of the load coils within the cases will not be attached to cable pairs. For example, assume a 900 pair load coil case, (LCC) was placed in a manhole and spliced into a 2700 pair cable. When initially installed maybe all 900 load coils were spliced to cable pairs. At that point the LCC count may have been;

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condition 2 loops at once.

824 LCC w/900 662 coils
Cable 1, 1-900

This count indicates that all load coils within the LCC are connected or spliced to cable pairs.

However as the network was modernized and fiber fed digital loop carrier systems replaced the copper feeder facilities and majority of the copper feeder facilities would be re-engineered to serve distribution areas close to the central office. Such re-engineering would trigger load coils removal. At that point the LCC count may have changed to:

824 LCC w/900 662 coils
Cable 1, 1 – 50
850 coils dead

This count indicates that 850 load coils within the LCC are not connected or spliced to cable pairs. Therefore, while a 900 pair load coil exists in the ILECs records, only 5.6 % of the load coils are actually connected to cable pairs in this example.

Q. DOES BST REPORT THE AMOUNT OF CABLE PLANT FOR EACH STRUCTURE TYPE BY DISTANCE?

A. Yes. BST and other ILECs report the amount of cable plant by structure type and length yearly to the FCC.

Q. WHAT PERCENTAGE OF UNDERGROUND COPPER CABLE PLANT WAS REPORTED BY BST?

A. The following table shows the length of copper cable facilities reported to the FCC by BST and United for the State of Tennessee. This indicates that only 5.3 % (by distance) of BST copper cable facilities are placed within underground structure and that the percentage of underground copper cable for BST is trending downward as fiber fed digital loop carrier is deployed to provide feeder facilities. This shows the flaw in BellSouth's assumptions about how many load points will be found in underground environments. Because the underground environment is the most time consuming (and costly) to work in, BellSouth's erroneous assumption unnecessarily increases costs.

Outside Plant Statistics-Cable and Wire Facilities -Armis Data Table 43-08										
Source - www.fcc.gov/ccb/armis/welcome.html										
Year	Company	State	Aer Sheath Km Metallic	Aer % of Total	UG Sheath Km Metallic	UG % of Total	Bur Sheath Km Metallic	Bur % of Total	Total Aer, Bur & UG Cable Km Metallic	Total Conduit Sys Trench Km
1995	Bell South	Tennessee	50344	43.8	6535	5.7	58160	50.6	115039	2998
1996	Bell South	Tennessee	50995	43.9	6518	5.6	58669	50.5	116182	3077
1997	Bell South	Tennessee	51613	44.0	6482	5.5	59332	50.5	117427	3135
1998	Bell South	Tennessee	52537	44.1	6463	5.4	60175	50.5	119175	3174
1999	Bell South	Tennessee	53427	44.2	6457	5.3	60955	50.4	120879	3363
1995	United	Tennessee	10663	85.9	517	4.2	1239	10.0	12419	230
1996	United	Tennessee	10789	85.8	523	4.2	1268	10.1	12580	235
1997	United	Tennessee	11023	85.3	528	4.1	1365	10.6	12916	245
1998	United	Tennessee	11145	84.9	532	4.1	1443	11.0	13120	246
1999	United	Tennessee	12041	84.1	611	4.3	1666	11.6	14318	251

Q. WHEN BST OR ANY OTHER ILEC DEPLOYS FIBER FED DLC SYSTEMS TO REPLACE COPPER FEEDER FACILITIES SHOULD LOAD COILS BE REMOVED IF THE "OLD" COPPER FACILITIES

ARE TO BE RE-USED WITHIN 18,000 FEET OF THE CENTRAL OFFICE OR REMOTE TERMINAL?

A. Yes. As I mentioned earlier in my testimony, any load coils on loops within 18,000 feet of the central office or remote terminals should be removed to ensure that loading rules are not violated and engineering guidelines are followed.

Q. HAS BST PROVIDED ANY EVIDENCE THAT THEY DO INDEED REMOVE EXISTING LOAD COILS WHEN THE EXISTING COPPER FACILITIES HAVE BEEN UPDATED WITH FIBER FED NGDLC SYSTEMS?

A. Yes. In response to Broadslate Network's Revised First Request for Production, BST has produced engineering work prints that clearly demonstrate the fact that BST does remove load coils as fiber fed digital loop carrier is deployed in the network. ***BST PROPRIETARY [redacted] END PROPRIETARY ***

Q. WHAT OTHER "CONDITIONING" ISSUES WERE NOTED IN REVIEWING THIS JOB?

A. Some other observations noted in reviewing this job were: ***BST PROPRIETARY

[redacted]

END BST PROPRIETARY***

Q. SHOULD THE AUTHORITY ACCEPT BST'S ASSUMPTION THAT LOOPS LESS THAN 18,000 FEET WILL HAVE 2.1 LOAD COILS?

A. No. This assumption and associated costs within BST's cost studies is totally ridiculous. ILECs should not be entitled to charge CLECs to correct the designs errors in their networks. Several other ILECs and Commissions have recognized that it would be improper to require CLECs to pay for the removal of load coils since these coils should have been removed over the past 20 – 30 years.

Q. HAVE OTHER ILECS AND COMMISSIONS DETERMINED THAT IT WOULD BE INAPPROPRIATE TO CHARGE FOR THE REMOVAL OF LOAD COILS ON LOOPS LESS THAN 18,000 FEET?

A. Yes. For example Bell Atlantic (Verizon) in Massachusetts has taken the position that since copper loops of less than 18,000 feet should not have load coils, it would remove them at its own expense. This is appropriate treatment for such loops.

Q. BST'S COST STUDIES ALSO ASSUME THOSE LOOPS GREATER THAN 18,000 FEET WILL HAVE 3.5 LOADS PER LOOP. IS THIS ASSUMPTION FLAWED AS WELL, ESPECIALLY IN A FORWARD LOOKING NETWORK?

A. Yes most definitely. Under BST's cost study assumption these loops would range between 21,000 feet to 30,000 feet on average if the minimum (3000 feet) and maximum (12,000 feet) end section loading rules are applied. Much different than the network infrastructure design that BST witness Milner describes in his testimony and I have also discussed earlier. Consequently, forward-looking network design calls for the use of fiber-fed DLC systems before loops can become long enough to require load coils.

Q. WHAT BRIDGED TAP AND LOAD COIL GUIDELINES ARE DICTATED UNDER THE CSA GUIDELINE, AS IT SHOULD HAVE BEEN IMPLEMENTED FOR THE PAST 20 YEARS BY BST IN THE STATE OF TENNESSEE?

A. CSA guidelines clearly state:

> "The maximum allowable bridged-tap is 2.5 kft, with no single bridged-tap longer than 2.0 kft. All CSA loops must be unloaded."[5]

Q. GIVEN THE LENGTH OF TIME THAT SAC AND CSA DESIGN GUIDELINES HAVE BEEN IN EFFECT, HOW OFTEN SHOULD IT BE NECESSARY TO IMPOSE LOAD COIL REMOVAL AND EXCESSIVE BRIDGED TAP REMOVAL?

A. Since SAC and CSA design guidelines would have made load coil and excessive bridged tap conditions obsolete over the past 20 to 30 years, almost all outside plant designed prior to that is near or well past its plant life and should have been replaced by now. Any instances of excessive bridge tap should be very limited or non-existent. As illustrated earlier in my testimony regarding Bellcore's "BOC Notes on the LEC Networks-1994", Issue 2, April 1994, the bridge tap on the

[5] Bellcore, Bellcore Notes on the Networks, December 1997, p. 12-5.

average loop had already been reduced to 1,490 feet in 1983 and 98 % of the loop were ISDN DSL capable.

Q. PLEASE SUMMARIZE WHY A $0.00 NON-RECURRING CHARGE FOR LOOP CONDITIONING IS THE APPROPRIATE FORWARD-LOOKING PRICE?

A. Loop conditioning generally involves removing devices that were put in place in accordance with embedded plant design guidelines that are long outdated. The network engineering guidelines in place for the past two decades call for a loop architecture that does not deploy load coils, excessive bridged taps or repeaters that inhibit the provision of advanced services such as ISDN and DSL-based services. The types of activities that BST has assumed for conditioning DSL-capable loops only exist if one assumes a network design incorporating excessive bridged taps and load coils that BST must remove to make certain loops DSL-capable. That network design is fundamentally incompatible with the least-cost, most efficient technology assumptions of a forward-looking economic cost study.[6]

Costs must be based on a forward-looking network and not on a spectrum of possible networks from which BST chooses the option that produces the highest cost for each specific occasion. More specifically, this Authority should not allow BST to assume, for example, that its network will both have load coils and not

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6 The TELRIC methodology assumes "the most efficient telecommunications technology currently available and the lowest cost network configuration." Also, to comply with the FCC TELRIC methodology, a cost study may not consider costs "incurred in the past and that are recorded in the incumbent LEC's books of accounts." 47 C.F.R. §§ 51.505(b)(1) and (d).

have load coils when developing charges to impose on competitors. If BST's recurring costs are based on a network without load coils because load coils are not an efficient, forward-looking technology choice, then BST cannot reintroduce load coils to develop additional nonrecurring charges and claim that those charges are still part of TELRIC-based prices.

Q. WHAT NON-RECURRING CHARGES HAS BST PROPOSED FOR REMOVAL OF BRIDGED TAPS AND LOAD COILS IN TENNESSEE?

A. That depends upon which version of their cost study you look at. Per BST response to TRA's First Discovery Request Item #1 dated 9/8/2000 the following non recurring costs were indicated:

ULM	Load Coil/Equipment Removal – short	$ 65.40
ULM	Load Coil/Equipment Removal – long additional $23.77	$710.71
ULM –	Bridge Tap Removal	$ 65.44
U sub-loop M	2w/4w Dist Load Coil Rm additional $ 8.15	$357.81
U sub-loop M	2w/4w Dist Bridge Tap Removal additional $ 10.19	$562.71

The most recent cost study dated 11/09/2000 indicates the following non recurring costs:

ULM	Load Coil/Equipment Removal – long	$321.99
ULM	Additive	$ 12.36

additional $ 12.36

I assume that the latest version is the most current and version proposed in this proceeding.

Q. IF THE AUTHORITY DECIDES TO PERMIT BST TO CHARGE FOR LOAD COIL REMOVALS ON LOOPS LONGER THAN 18,000 FEET, WHAT CHARGES WOULD BE APPROPRIATE?

A. First as I have previously stated no charges should apply. However, if this Authority nevertheless decides to permit BST to impose such charges then those charges should be based on efficient, least-cost practices generally employed in the telecommunications industry, which will be described below.

While a forward-looking network design results in zero conditioning charges least-cost practices to determine proper loop conditioning charges which should be applied in the sole event that this Authority insists on ordering conditioning charges are being submitted. The tasks and work-times are based on my personal experience and the experience of others familiar with performing such operations, and in supervising others who performed such operations. In addition, I will be prepared to perform the splicing operations before this Authority to demonstrate the reasonableness of these time estimates. These times are readily achievable, and the resulting rates are reasonable.

Q. IF LOAD COILS MUST BE REMOVED, HOW MANY LOCATIONS ARE NORMALLY INVOLVED?

A. Once load coils are deployed, starting only when a copper loop reaches 18,000 feet in length, loads are immediately deployed in 6,000 foot increments, starting with two or three locations (at 3,000 feet, 9,000 feet, and at 15,000 feet) with a minimum of two load points. In addition, since feeder cable is normally placed in conduit when close to the central office, I have conservatively assumed that the first two load coil locations involve underground cable at manhole locations. However it has been my experience that in a large number of locations feeder cables are either on pole line structure or buried within a mile and half of the office. The third location will most likely be in aerial or buried locations. Therefore I have assumed that 50 percent of the time deloading of the third load coil location will be at an aerial location, and 50 percent of the time at a buried location. It is my opinion that the following work steps and conservative time estimates can be used by this Authority to estimate the costs involved in removing load coils from these three locations:

Underground Cable Load Coil Removal in a Manhole		
Step	Description	Task (min.)
1	Travel time to underground splice location.	20
2	Set up work area protection and underground work site.	5
3	Pump and ventilate manhole.	15
4	Buffer cable / Rerack cable / set up splice.	5
5	Open splice case.	5
6	Identify pairs to be deloaded for 1st 25-pair binder group.	5
7	Bridge 25-pair binder group for service continuity (if necessary).	5
8	Remove / sever connection from main cable to load 'in' & 'out taps.	3
9	Rejoin / splice 25-pair binder group through main cable.	5
10	Remove bridging modules from Step 7.	2
11	Identify pairs to be deloaded for 2nd 25-pair binder group.	5
12	Bridge 25-pair binder group for service continuity (if necessary).	5
13	Remove / sever connection from main cable to load 'in' & 'out' taps.	3
14	Rejoin / splice 25-pair binder group through main cable.	5
15	Remove bridging modules from Step 12.	2
16	Clean, reseal, and close splice case.	10
17	Rack cables, pressure test cables in manhole.	10
18	Close down manhole, stow tools, break down work area protection.	10
	Total Minutes	120
	Total Hours	2.00
	No. Technicians	2
	Total Timesheet Hours	4.00
	No. Locations	2
	Total Hours	8
	Pairs deloaded	50
	Minutes per pair	9.6 min.

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Aerial Cable Load Coil Removal at a Pole (50% occurrence)		
Step	Description	Task (min.)
1	Travel time to aerial splice location from underground splice location.	10
2	Set up work area protection.	5
3	Set up ladder or bucket truck.	10
4	Open splice case.	5
5	Identify PIC pairs to be deloaded for 1st 25-pair binder group.	2
6	Bridge 25-pair binder group for service continuity (if necessary).	5
7	Remove / sever connection from main cable to load 'in' & 'out taps.	3
8	Rejoin / splice 25-pair binder group through main cable.	5
9	Remove bridging modules from Step 6.	2
10	Identify pairs to be deloaded for 2nd 25-pair binder group.	2
11	Bridge 25-pair binder group for service continuity (if necessary).	5
12	Remove / sever connection from main cable to load 'in' & 'out taps.	3

13	Rejoin / splice 25-pair binder group through main cable.	5
14	Remove bridging modules from Step 11.	2
15	Clean, reseal, and close splice case.	10
16	Secure splice case to strand and clean up work area.	10
17	Close down aerial site, stow tools, break down work area protection.	10
	Total Minutes	94
	Total Hours	1.57
	No. Technicians	1
	Total Timesheet Hours	1.57
	No. Locations	0.5
	Total Hours	0.78
	Pairs deloaded	50
	Minutes per pair	0.94 min.

Buried Cable Load Coil Removal at a Pedestal (50% occurrence)		
Step	Description	Task (min.)
1	Travel time to buried splice location from underground splice location.	10
2	Set up traffic cone at rear bumper of truck.	1
3	Walk to site & open splice pedestal.	2
5	Identify PIC pairs to be deloaded for 1st 25-pair binder group.	2
6	Bridge 25-pair binder group for service continuity (if necessary).	5
7	Remove / sever connection from main cable to load 'in' & 'out taps.	3
8	Rejoin / splice 25-pair binder group through main cable.	5
9	Remove bridging modules from Step 6.	2
10	Identify pairs to be deloaded for 2nd 25-pair binder group.	2
11	Bridge 25-pair binder group for service continuity (if necessary).	5
12	Remove / sever connection from main cable to load 'in' & 'out taps.	3
13	Rejoin / splice 25-pair binder group through main cable.	5
14	Remove bridging modules from Step 11.	2
16	Secure splice within buried pedestal and clean up work area.	3
17	Close down buried site, stow tools and traffic cone.	5
	Total Minutes	55
	Total Hours	0.92
	No. Technicians	1
	Total Timesheet Hours	0.92
	No. Locations	0.5
	Total Hours	0.46
	Pairs deloaded	50
	Minutes per pair	0.55 min.

Q. IF THIS AUTHORITY DECIDES TO PERMIT BST TO CHARGE FOR BRIDGED TAP REMOVAL, WHAT CHARGES WOULD BE APPROPRIATE?

A. If this Authority elects to allow BST to impose such charges even though it should not, then those costs should be based upon efficient, least-cost practices generally used in the telecommunications industry. Presented below are what should be considered to be reasonable costs for removing a bridged tap. The tasks and work-times are based on my personal experience and others who are experienced in performing such operations and in supervising others who performed such operations. The task times I am proposing are readily achievable and the resulting rates are reasonable.

Q. IF BRIDGED TAPS MUST BE REMOVED, WHERE IN THE NETWORK ARE THEY MOST LIKELY TO BE REMOVED, AND HOW MANY LOCATIONS ARE NORMALLY INVOLVED?

A. As explained previously, bridged taps should have been eliminated almost 30 years ago, except for limited end section bridged taps, which could be removed in the service terminal at time of an installation visit. In addition, bridged tap should not exist in underground feeder cable close to the central office. Therefore, I have assumed that a single case of bridged tap, if it occurs, would occur 50 percent of the time at an aerial location, and 50 percent of the time at a buried location. Accordingly, it is my opinion that the following work steps and conservative time estimates can be used by this Authority to estimate the costs involved:

Aerial Cable Bridged Tap Removal from Distribution at a Pole (50% occurrence)		
Step	Description	Task (min.)
1	Travel time to aerial splice location	20
2	Set up work area protection	5
3	Set up ladder or bucket truck	10
4	Open splice case	5
5	Identify PIC pairs for bridged tap removal	2
6	Remove bridging modules or cut & clear pairs	2
7	Clean, reseal, and close splice case	10
8	Secure splice case to strand and clean up work area	10
9	Close down aerial site, stow tools, break down work area protection	10
	Total Minutes	74
	Total Hours	1.23
	No. Technicians	1
	Total Timesheet Hours	1.23
	No. Locations	0.5
	Total Hours	0.62
	Pairs Unbridged	25
	Weighted Average Minutes per pair	1.48 min

Buried Cable Bridged Tap Removal from Distribution at a Pedestal (50% occurrence)		
Step	Description	Task (min.)
1	Travel time to buried splice location	20
2	Set up traffic cone at rear bumper of truck	1
3	Walk to site & open splice pedestal	2
4	Identify PIC pairs for bridged tap removal	2
5	Remove bridging modules or cut & clear pairs	2
6	Secure splice within buried pedestal and clean up work area	3
7	Close down buried site, stow tools and traffic cone	5
	Total Minutes	35
	Total Hours	0.58
	No. Technicians	1
	Total Timesheet Hours	0.58
	No. Locations	0.5
	Total Hours	0.29
	Pairs Unbridged	25
	Weighted Average Minutes per pair	0.70 min.

V. LOOP QUALIFICATION

Q. WHAT IS LOOP QUALIFICATION?

A. Loop qualification is the process of identifying the characteristics of a given loop (such as loop length and the presence and location of potential DSL-inhibiting network components such as load coils, excessive bridged taps and repeaters) and determining the suitability of that loop for provisioning DSL-based services. The characteristics of an individual loop determine whether the loop is usable for providing any type of DSL-based service, any modifications (if any) necessary to "condition" the loop to provide DSL-based service and the type/speed of DSL-based service that may be offered over that loop, with or without "conditioning." These determinations are specific to the DSL technology and equipment that a particular carrier deploys; thus, a specific CLEC may be able to offer its DSL-based services over a loop that would not meet the incumbent's technical specifications for DSL-based services.

The carrier-specific nature of loop qualification has significant implications for the definition of the loop qualification activity for which competitors will pay an ILEC. The ILEC can only meaningfully perform the first step of the loop qualification activity, providing access to the relevant information on loop characteristics. The CLEC's own personnel must then use this loop characteristic information to determine the suitability of a given loop for provisioning their variants of DSL-based services.

Q. HAS THE FCC AGREED THAT INCUMBENTS SHOULD PROVIDE DIRECT ACCESS TO THE DATA THAT COMPETITORS NEED TO DO THEIR OWN LOOP QUALIFICATION?

A. Yes. The clear purpose of this FCC requirement is to require ILECs to provide the information that will allow CLECs to make their own determinations about whether loops are suitable to provision the technologies that the CLECs propose to deploy. This purpose is implicit in the FCC's finding that "under its existing rules, the relevant inquiry is not whether the retail arm of the incumbent has access to the underlying loop qualification information, but rather whether such information exists anywhere within the incumbent's back office and can be accessed by any of the incumbent LEC's personnel."[7] If the FCC intended for BST or other ILECs to make the determination on behalf of CLECs there would be no reason to require the incumbents to provide competitors with the information that "back office" personnel use to perform a loop qualification analysis.

Q. WHERE IS THIS LOOP INFORMATION MAINTAINED BY ILECS?

A. This loop makeup information is maintained in mechanized database systems by ILECs. Several of the former Bell Operating Companies like BST maintain a database of this loop information in the Loop Facilities Assignment and Control System ("LFACS"). Cable pair information is also maintained in mechanized cable plats systems that have replaced the older paper plant records or charts. BST

[7] *UNE Remand Order* at ¶ 430.

utilizes a system known as Map Viewer, however there numerous other mechanized CAD or similar systems are available.

Q. HOW SHOULD ILECS PROVIDE THIS NECESSARY LOOP MAKEUP INFORMATION TO CLECS?

A. CLECs should receive this information through limited direct electronic access to those systems and databases.

Q. SHOULD THE INFORMATION THAT COMPETITORS REQUIRE BE UBIQUITOUSLY AVAILABLE IN THE ILECS' MECHANIZED SYSTEMS?

A. Yes. Even BellSouth witness Pate admits that LFACS houses basic information on 100% of loops, including length, loading, and type of facility. Pate also stated that extensive detailed information was in LFACS on 80% of loops. Thus, it should be possible to access data regarding the majority of loops from existing legacy systems such as LFACS. It should not be necessary to develop new databases or update existing databases.

Since these databases are used by the ILECs for loop assignment purposes, they contain some loop makeup information on each and every loop. Many ILECs have proactively updated their databases with current and complete cable loop makeup information. This included requiring engineering work orders to provide any pertinent information about changes or additions to the network so that these databases would be readily updated when work was completed. In fact a few years ago Bell Atlantic in the northeast area dedicated personnel specifically to ensure that all loop qualification information was entered into their databases. The loop makeup of all existing plant was to be entered into the database any time the plant was altered. ILECs need to adhere to their own guidelines that require these databases to be updated with each plant addition, change, rearrangement or removal.

Q. IF LOOP MAKEUP INFORMATION IS MISSING FROM THESE MECHANIZED DATABASES AND SYSTEMS WHERE WOULD THAT INFORMATION RESIDE?

A. If the information required for loop qualification is missing from these mechanized systems it would reside in the outside plant location records and work prints. BST has inappropriately proposed to charge competitors for manual loop qualification whenever they must resort to these outside plant location records and work prints to obtain the loop makeup information because BST mechanized database systems have not been properly updated and maintained. If procedures and guidelines were correctly adhered to, that loop qualification information would be available through databases such as LFACS.

Q. WHAT WOULD YOU RECOMMEND TO THIS AUTHORITY CONCERNING ACCESS TO LOOP MAKEUP INFORMATION?

A. I would recommend that this Authority require ILECs to provide CLECs with electronic access to the relevant databases for the purpose of qualifying loops for xDSL-based services at the price ILECs provide such information to themselves. This would be consistent with the FCC requirements that CLECs have access to back office operation support systems ("OSS") that the incumbents have access to. Direct access to the databases is the efficient means to allow CLECs the opportunity to qualify loops and it is also ensures that competitors and incumbents have parity in terms of their ability to assess which advanced services they can offer to end user customers. Information not found in these mechanized databases, but available through research of an ILECs outside plant location records should be made available without additional cost to a CLEC. In those cases where the cable plant found in the OSP location records was installed/rearranged after the inception of LFACS or other relevant databases, the ILECs should provide the loop makeup information to the CLEC at the same price as that provided via the mechanized system. Otherwise CLECs would be penalized and ILECS wound be rewarded for failing to follow their own established record-keeping guidelines.

Q. IS IT PRACTICAL FOR THE ILECS TO PROVIDE ACCESS TO THEIR DATABASES WITH LOOP MAKEUP INFORMATION?

A. Yes. It is entirely feasible for the ILECs to provide a direct read-only access to LFACS and similar databases. ILEC field operations personnel have been able to obtain such access for years. A forward-looking cost study for CLEC access to loop makeup information should assume that the competitor has such nondiscriminatory access to databases providing information relevant to loop makeup. Given that access, there is no activity associated with loop qualification that a competitor's own personnel could not perform on its own behalf to qualify loops for xDSL services. An analysis that assumes BST will impose additional costs on competitors to "qualify" loops on the competitors' behalf therefore assumes that the ILEC will not comply with FCC requirements and will not provide nondiscriminatory access to its OSS and related databases. If ILEC's interfaces to databases interpret, exclude or restrict access to available data, they will not constitute acceptable access to the appropriate access to loop qualification data.

Q. IF IT IS NECESSARY TO MANUALLY OBTAIN MISSING INFORMATION THAT IS NOT AVAILABLE IN AN ILEC'S ELECTRONIC DATABASE, HOW SHOULD A FORWARD-LOOKING COST ANALYSIS DETERMINE THE APPROPRIATE COST TO PROVIDE THAT INFORMATION?

A. Even if a manual lookup is needed, the cost should be based on a forward-looking charge for an electronic "dip" into the ILEC's database. An incumbent's failure to keep its databases up-to-date or automate other records is not the fault of a CLEC ordering a DSL-capable loop. The CLEC should also not be held responsible for an incumbent's cost to update its databases.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes, thank you.

DEAN R. FASSETT
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OUTSIDE PLANT ENGINEERING/CONSTRUCTION CONSULTANT

Expert witness / consultant specializing in the engineering, construction and operation of outside plant telecommunications networks. Solid experience in the overseeing and coordinating the design and outside plant (OSP) engineering and construction responsibilities as an Operations Manager. Also, extensively experienced in OSP engineering design. An effective supervisor of technical personnel and able to manage capital programs and expense budgets within company objective levels. Skilled in coordinating / communicating with departments, major customers and government authorities.

ADIRONDACK TELCOM ASSOCIATES
Owner **1996 – Present**

Expert outside plant engineering and construction consultant/witness

- Provided outside plant local loop expert advice to AT&T and MCI for the HAI Model, a key economic model referenced by the FCC and various state jurisdictions to determine compliance with the Telecommunications Act of 1996 to set Unbundled Network Element prices and to determine the level of the Universal Service Fund.

- Appeared before 11 state jurisdictions on behalf of AT&T and MCI as an expert OSP engineering and construction witness. Testified before Public Service agencies in the states of Colorado, Idaho Iowa, Montana, Minnesota, North Dakota, South Dakota, New Mexico, Utah, Washington and Wyoming. Assisted other expert witnesses with testimony in other jurisdictions.

- Provided field reviews of OSP facilities at selective locations in Massachusetts for USN Communications Inc.

- Engineered and designed fiber optic transmission network for a private organization in Schroon Lake, New York

FRONTIER COMMUNICATIONS OF AUSABLE VALLEY **1998 – 2000**

Operations Manager/Engineer

- Responsible for all aspects of company operations within service area
- Supervised 7 field technicians, 3 central office technicians and an office sales representative
- Responsible for the engineering, design and construction of all OSP projects, including coordination with other utilities and service providers, preparation and awarding of contractor contracts and securing of material and test equipment.
- Designed and constructed a fiber optic transmission network between central offices.
- Designed and constructed a telecommunications network to meet service requirements for Whiteface Mountain Ski Center and the first Winter Goodwill Games held in February, 2000. This network included the installation of two fiber-fed digital loop carrier systems and also fiber optic digital facilities for live TV broadcasting during the Goodwill Games. This network was designed and constructed in some very challenging terrain and has positioned the Olympic Regional Development Agency at Whiteface Mountain with one of the most advanced communications networks of any ski area in the country. This fiber optic network also extends to the very summit of Whiteface Mountain to meet the special telecommunications requirements of numerous government agencies.
- Frontier Communications of AuSable Valley received a commendation from the New York State Public Service Commission in recognition of improved customer service levels for 1999.

FRONTIER COMMUNICATIONS OF AUSABLE VALLEY 1996

Contract Outside Plant Engineer and Construction Coordinator

- Designed OSP facilities to meet customer requirements for residential and business customers in the company service area.
- Coordinated and managed the construction of OSP projects, including the ordering of materials, coordination with other utilities and government agencies and administration of construction contracts.

NYNEX (NEW YORK TELEPHONE) 1970-1996

Area Construction / Engineering Operations Manager (1994-1996)

Oversaw OSP construction and engineering operations for the Adirondack District, covering 43 wire centers and a customer base of approximately 188,000 access lines. Supervised 14 first level management and 71 craft personnel responsible for designing and building Outside Plant facilities to meet customer requirements and corporate financial commitments.

- By making sure designs, constructions schedules, purchase orders for equipment and outside plant facilities, and permits were acquired when required, put into service the SONET fiber interoffice ring system on schedule. This upgrade assures that services will not be interrupted, even with downed lines, in the Albany - Glens Falls area. Through the same oversight approach, also assured the successful design/construction of dual fiber interoffice trunk routes between nine Central Offices.

- Improved service standards throughout a large portion of the Adirondacks by overseeing timely completion of the Glens Falls Central Office switch cutover to the new #5ESS technology and a $1.2 million municipal relocation project between Malone and Brainardsville.

- Saw the advantage of deploying fiber optic digital technology when informed by NYS of its plan to move and rebuild one of its Interstate I-87 bridges. Negotiated the change with the Department of Transportation which saved the state, federal government and the company $500,000.

Engineering Manager - Adirondack/Capital South Districts (1990-1994)

Initially supervised the OSP Engineering Design group for the Capital South district, covering 26 wire centers with approximately 200,000 access lines with Albany and several major customers located within the district. In 1992 took over the Adirondack district's 43 wire centers and approximately 185,000 access lines serving the northern 518 area. Supervised up to ten Engineers and 12 Engineering Support (Craft) personnel in satisfying residential and business customer service requirements. Managed the Capital program and related expense budgets within established company objective levels that ranged between $13-$20 million to provide residential, business and interoffice trunk facilities.

- Managed a $10.7 million project for the design and construction of a 117 mile interoffice fiber optic facility between Saranac Lake, Plattsburgh and Glens Falls which now provides SONET Ring capability to all offices North of Glens Falls in the 518 LATA. This required negotiating with New York State Departments of Environmental Conservation and Transportation, and the Adirondack Park Agency to place facilities through some of the most environmentally sensitive geography within the eastern United States. This project won the NYSDEC award for environmental excellence.

- Assigned to manage a problem Engineering Group and, by building confidence in their expertise, established a close, effective team relationship between engineering and other departments, which significantly improved work performance and service results.

- Established solid relationships between the company and such major customers as Blue Cross Blue Shield by making sure that fiber optic upgrades were designed and built to meet customer requirements.

Outside Plant Engineer - Albany/Oneonta *(1979-1990)*

Other than size, responsibilities the same for both districts. Designed OSP facilities that met customer requirements for residential and business service, including design of digital loop carrier systems and interoffice trunk facilities. Prepared / administered authorizations within the Capital Program. Turf assignments ranged from six to fifteen wire centers.

Construction Control Center Foreman - Oneonta *(1976-1979)*

Scheduled and supervised field construction operations with the Engineering department and other departments to ensure that commitments were met. Also, coordinated construction operations with other utility companies and municipalities. Maintained accurate labor time reports and material disbursement accounting.

Prior NYNEX Experience (1970-1976)

Started as a Construction Splicing Technician. Promoted to Construction Splicing Foreman, supervising up to 12 Construction Splicing Technicians in 1976.

OTHER WORK EXPERIENCE

Self Employed - Dairy Farmer (1967-1970)
Park Ranger - Central NYS Park Commission (summer 1966)
Crew Foreman - Central NYS Park Commission (1964-1965)

EDUCATION

State University of New York at Cobleskill (1965-1967)
- AAS Degree - Dairy and Food Science, 1967
- Graduated with honors

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Investigation into Pricing of Unbundled Network Elements.	) Docket No. 990649-TP) Order No.) PSC-00-1284-PHO-TP) Issued: July 14, 2000

DEPOSITION OF

MICHAEL K. ZITZMANN

July 20, 2000

9:51 a.m.

Suite 4300
675 W. Peachtree Street
Atlanta, Georgia

Colleen B. Seidl, CCR-B-1113, RPR, CRR

BROWN REPORTING, INC.
1740 PEACHTREE STREET, N.W.
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Q. Yes.
A. Yes.
Q. Are there any other documents which relate to your input that you've ever seen?
A. In relations to this particular item, two-wire ADSL compatible loop?
Q. Yes.
A. No.
Q. And that estimate there is 180 minutes, right?
A. Yes.
Q. Where did that estimate come from?
A. I provided that estimate.
Q. What activities are involved in the 180 minutes?
A. That's handling the Service Inquiry, looking up the facilities, checking the loop makeup, pulling the loop makeup, inputting the loop makeup, filling out the SI form, sending it back to the originator.
Q. So that's all manual activity?
A. It is all manual activity.
Q. I'm sorry if I asked you this before. Have you ever used LFACS to go find a loop?
A. Yes.

clarify it. Have you ever gone to look for an unbundled copper loop in LFACS?

A. I have not.

Q. When you provided this estimate, who did you talk to about looking for those in LFACS?

A. I think I just mentioned that you can't really find them in LFACS. What you find in LFACS is spare facilities. Then you've got to verify that they are compatible with that particular loop type.

Q. Did you ever talk to anybody who worked in a SAC Center and looked for unbundled copper loops about how long it takes to find them?

A. No, because when we developed these costs, they weren't yet doing them.

Q. On 2/2/2000 you weren't yet looking for unbundled copper loops?

A. No, I take that back. I did not talk to anyone about it.

Q. If LFACS has enough data in it, isn't it possible that it would take five minutes to find an unbundled copper loop?

A. No. It takes longer than five minutes to log in.

Q. Are you presuming there's a separate log-in for each inquiry in this estimate?

A. It was a general assumption that sometimes that would have to be done.

Q. How many times? You don't know?

A. I don't know.

Q. So how could you include that as an assumption?

A. It is just general in the time expectancy, in the times that I provided.

Q. So it's just a general assumption in the 2.5 hours. So the 2.5 hours includes theoretical research that an engineer may have to do?

A. Yes.

Q. But you don't know how often he has to do that?

A. No.

Q. You don't know how much of that time that 2.5 hours includes that?

A. No.

Q. You've used LFACS, right?

A. Yes. I don't have extensive use of LFACS experience, but yes. You see, when I was an engineer, LFACS was brand new, and I had for a couple years before I left the engineering district. So I have been in it and I have been in it since, but I'm not a LFACS SME, so I can't do everything that a

LFACS SME can do.

Q. But you know how long things take in LFACS?

A. As the screen pop-ups, yes.

Q. I think you testified earlier that it may only take five minutes to pull up a loop?

A. When you say pull up a loop, what you're looking for is cable facilities; and yes, it could take as little as five minutes.

Q. Could it take less than that?

A. I can't see how it could take less than that, no.

Q. We talked a little bit about you logging in for each entry?

A. Yes.

Q. How does that work?

A. You log into LFACS by wire center.

Q. Okay.

A. So you first either have to know what wire center you want to go into and you put the wire center code in there and then you can log into the system.

Q. And the code is just one line entry, you type it in, right? The wire center code?

A. Yeah, it is a three-digit identifier.

Q. Three-digit identifier, and your engineers, they know which wire centers they are responsible for, right?

A. Yes.

Q. So they know those pretty much off hand, probably by memory?

A. Right.

Q. So they just type that in, three digits?

A. Yes.

Q. That's logging in?

A. Yeah, after you get into IMS security. You have to do that first.

Q. Is there any reason why they wouldn't go in, like I do, at the beginning of the day and log in?

A. They probably do.

Q. So we don't have to consider that IMS security log-in. We just are going to consider the individual wire center log-in, right?

A. Well, what do you mean by right? I don't know, maybe they don't do that. You said they could and I said, yes, they could; but I don't know if they specifically leave it on all day.

There are security issues where you're not supposed to leave your terminal up and running during the day if you're not at the terminal. You're supposed to log off.

Q. Is that a BellSouth procedure?

A. It's supposed to be.

Q. So you're not supposed to leave your terminal unattended even in the SAC Center?

A. You are supposed to lock it up. There are ways to lock them up.

Q. Lock it up?

A. On a PC you can lock it.

Q. You can lock your screen?

A. Yes.

Q. But that wouldn't require logging out?

A. Right.

Q. Now, you are responsible for gathering the inputs that tell us how long it takes to do these tasks for a ADSL and UCL loop, right?

A. Yes.

Q. So when you're gathering these inputs, did you or did you not consider that the engineer was logging in each time for each different ADSL loop?

A. I didn't go down to that detail.

Q. You did not?

A. I did not.

Q. Did you consider the possibility that he may be logging in for each time?

A. It was an overall general assumption that that was the amount of time it would take no matter what it was on average. If that included logging in, it would be in there; but there's no specific item for logging in, other than changing wires.

Q. How much time did you allocate for changing wires?

A. There was no specific amount of time for that particular subset. It's lumped into the two and a half hours to get in and out of databases and do the necessary terminal transactions in order to preserve and find out the spare pairs that are available.

Q. Do you know if logging out was included?

A. I think I just told you that I didn't go down to specific details on that.

Q. You said making the necessary reservations in LFACS is also a part of the 30-minute clerical work; right?

A. Yes.

Q. How is that information conveyed back to the clerical folks?

A. I'm not sure exactly how each district does it. There are many ways. I anticipated when I

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Investigation into Pricing of Unbundled Network Elements.	) Docket No. 990649-TP) Order No.) PSC-00-1284-PHO-TP) Issued: July 14, 2000

DEPOSITION OF

JAMES FRANKLIN ENNIS

July 20, 2000

1:30 p.m.

Suite 4300
675 W. Peachtree Street
Atlanta, Georgia

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Then a person, a technician, is responsible for accomplishing the tasks that we do.

Q. Now, are you aware of something called an ADSL compatible loop?

A. Yes.

Q. If the technician receives one of those and I assume that the WAFA will show you that it is an ADSL compatible loop or order number something or other?

A. Not on the work list, but there is another screen in WAFA that you can determine what type of loop it is.

Q. Now, if a technician has one of those on his or her work list, what do they do with it?

MR. TWOMEY: Let me object to the form of the question. You mean an order for an unbundled ADSL loop?

MR. CUTLER: Yes.

THE WITNESS: Yes, there are certain functions that are the same regardless of type of service. They would do those functions.

An ADSL capable loop has some unique testing requirements, so the technician would recognize the type of loop, do the

things that they do for all loops and then
also do the specialized testing required
for ADSL loops.

Q. (By Mr. Cutler) First let's talk about what they do for all loops?

A. Okay.

Q. What is the next step?

A. I'll try to remember all of the steps. The first thing that they would do is look at a work list. They would assign -- there are different positions in the center, so one person would do what we call screening, which is a verification of the design, and handle any escalations that need to be done.

Then they would pass it over to a technician that would be turning up the circuit. That technician is responsible for escalations for dispatch and wiring.

They are also responsible for testing the circuit. Once the circuit has been successfully installed and tested, they are responsible for contacting the customer and providing that customer the circuit.

Q. Let's start with escalations. Why would there have to be an escalation when you immediately got the work order?

A. There are not necessarily immediately when you get it. All designed orders have critical dates and based on the critical dates, the UNE Center escalates for work to be done by that date. If the work is not done by that date, the UNE Center is responsible for escalating to get the work done.

Q. When you say all designed orders, does the UNE Center also hand SL1?

A. Yes, they do.

Q. On those, those aren't designed?

A. They are not.

Q. On those, do they just -- what do they do differently on SL1?

A. Well, there would be no verification of the design, of course. There are no test points in the circuit, so there would be no preinstallation testing.

Q. What's involved in verifying the design?

A. In our systems a service order flows through our systems and picks up assignments, which is the cable and pair that the service will be supplied on. That circuit then travels through the design process where the CPG engineers the circuit, and verification of the design entails matching up those two separate things to ensure that they are the same; and if there are any discrepancies, we would escalate to get them to match.

MR. TWOMEY: Did somebody join the call?

THE WITNESS: Yes, this is John Fons. I'm sorry to come in late.

MR. CUTLER: I think a lot of other people are emulating your example, but thank you.

Q. (By Mr. Cutler) How can you tell just sitting there whether the cable impaired match-up?

A. It's a stare and compare, which means you have to have both screens in front of you to be able to tell the difference.

Q. Do they each have identifying numbers or something like that?

A. They would be, yes. Technicians are trained to recognize the information.

Q. Is there some reason why that can't be done automatically?

A. I couldn't tell you, I don't know.

Q. Now on the test points, does that involve doing a remote test?

A. Yes.

A. No.
Q. How does that happen then?
A. I don't know.
Q. So the UNE --
A. Well, I hate to say that. The UNE Center is responsible for verifying that a dispatch occurs, okay. We don't actually do the dispatch, but we do verify that a dispatch has occurred.
Q. I think you were talking about some kind of testing being done by the UNE Center?
A. That's true.
Q. So when they do the test, though, there has to be somebody at the other end of it. Weren't you telling me that?
A. That is a product specific thing.
Q. And I'm intending -- and that was a bad question. I'm trying -- generally speaking I'll be talking about ADSL compatible loops and UCLs?
A. Yes.
Q. Let's just make it clear here. For a UCL for instance, the UNE Center has to test it prior to handing it over; correct?
A. That's correct.
Q. Now, presumably they have to -- either somebody else dispatch somebody to be at the other

A. No. That would still be manual in the ACAC.

Q. Let's turn to line 6, is that automated in the ACAC?

A. No.

Q. Line 8 can obviously not be automated. Where do those numbers come from?

A. The numbers in parenthesis?

Q. Yes.

A. Those numbers came from a sheet that the cost person supplied me.

Q. I guess without a time and motion study 10.8 and 3.57 seem to be terribly precise numbers to me. How did you determine whether those were accurate as opposed to 11 minutes?

A. Those numbers were supplied to me from the cost people as based on numbers that were derived in the ACACs. I do not know if that was done with a time and motion study or not.

Q. What was your response when they supplied you with the numbers?

A. I looked at the numbers that they supplied, thought back to my experience with the center, and agreed that those numbers were good.

Q. How did you do decide that it should be

10.8 as opposed to 11 minutes?

A. Well, in other words, I just agreed with the numbers that they gave me. They indicated that these were the numbers that were supplied by the ACACs or in some way and asked me if those numbers were good, and I said yes.

Q. Let's turn down to line or sort of number 16.

A. Okay.

Q. Do you agree with the 10 percent number for reuse for ISDN and ADSL?

A. Do I agree with it?

Q. Yeah.

MR. TWOMEY: Line 12 or 15?

MR. CUTLER: 16.

MR. TWOMEY: I'm sorry, okay, 16.

THE WITNESS: Yes, I do agree.

Q. (By Mr. Cutler) Why is 10 percent the right number?

A. The 10 percent number was based on some data gathered by the cost people and supplied to me. After listening to their explanation of the numbers, I agreed with them that it was valid.

Q. Do you see that data anywhere in this POD?

A. No, I do not.

I did not supply any of the percentages. I strictly gave work times and the cost people came up with the percentages.

Q. Based on your experience working in the UNE Center, does 10 percent seem like the right amount of time that circuits are reused?

A. No.

Q. What seems like the right number?

A. Zero percent.

Q. Nobody orders ADSL compatible loops to be put -- to be a substitute for a voice line?

A. No, they do not. Not currently.

Q. How about ISDN?

A. I have not seen any ISDN conversion orders. Conversion orders would mean reuse of facilities.

Q. Let's turn to the one which says, which is titled Unbundled Loop ACAC Cost. Have you ever seen this document before?

A. Yes.

Q. Is this a document you were referring to with the ACAC data?

A. Yes.

Q. Do you have any idea where this data came from?

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Investigation into Pricing of Unbundled Network Elements.	) Docket No. 990649-TP) Order No.) PSC-00-1284-PHO-TP) Issued: July 14, 2000

DEPOSITION OF

DANIEL ERIC STINSON

July 20, 2000

3:55 p.m.

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MR. CUTLER: 64.

MR. TWOMEY: We may be on the wrong sheet. There appear to be two note 5's.

MR. CUTLER: There are, but the one on line 64 is the one I'm interested in.

MR. TWOMEY: Which says -- read what it says before you answer the question so there's no confusion.

THE WITNESS: Me, COI&M field, connect to test, assumes 15 percent of total COI&M filled time carried in other transport elements.

The question one more time.

Q. (By Mr. Cutler) What is your understanding of the meaning of that note?

A. The meaning of that note is that 15 percent of the total time given would be charged through another element.

Q. Such as?

A. Co-location cross connect element.

Q. Which is another nonrecurring charge?

A. I do not know that.

MR. CUTLER: Let's run through quickly some of these other areas.

MR. TWOMEY: Are you finished with

you rephrase it for me?

Q. Yes. Excuse me. I got the wrong numbers. Of the 20-minute estimate for the first install, the division of time between looking things up and walking around and actually wiring is 8 minutes to do the actual wiring and 12 minutes to look up the work order and walk from the TIRKS machine, presumably I guess the WAFA, to where you're going to do it?

A. I still don't follow you. I don't find the 8 minutes.

Q. Let's go back through that one more time. I'll try to be less obtuse in my questioning.

What I'm trying to figure out is, how much time is involved in each one of the activities to run these jumpers? In other words, how much time is spent looking it up in WAFA? How much time is spent walking from the computer terminal to the frame? That kind of stuff.

My question is, based on the fact that the first install is 20 minutes and the second one is 8 --

MR. TWOMEY: I think that's where the witness is having troubles.

MR. CUTLER: Maybe that's our problem.

Q. (By Mr. Cutler) Then I'm looking at

the wrong document. It is ten minutes. I apologize.

A. Okay, correct.

Q. Amending that question to say, is it fair to say ten minutes is the time involved in looking things up and walking around?

MR. TWOMEY: Just to be precise, that question is 10 minutes of the 20 under first, looking things up and walking around.

MR. CUTLER: Yes.

MR. TWOMEY: Do you understand the question?

THE WITNESS: Yes, I do. And the answer is yes, sir.

MR. CUTLER: All right. Since we have five minutes left, I'm going to page a few interrogatories, but if someone else would like to ask a question on the phone feel free.

MR. TWOMEY: Just to give you the appropriate incentives, as it stands now I have no questions.

MR. CUTLER: You can ask one now.

FEMALE VOICE: Could I confirm this is the same court reporter as the previous

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing has been forwarded via U.S. Mail, postage prepaid, and/or hand delivered to the following on this the 20th day of November, 2000.

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