BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE PETITION	)	
OF DIECA COMMUNICATIONS, INC.	)	
D/B/A COVAD COMMUNICATIONS	)	
COMPANY FOR ARBITRATION OF	)	
INTERCONNECTION RATES,	)	**CASE NO. TO-2000-322**
TERMS, CONDITIONS AND	)	
RELATED ARRANGEMENTS WITH	)	
SOUTHWESTERN BELL	)	
TELEPHONE COMPANY	)	

DIRECT TESTIMONY OF TERRY L. MURRAY ON BEHALF OF DIECA COMMUNICATIONS, INC. D/B/A COVAD COMMUNICATIONS COMPANY, FOR ARBITRATION OF INTERCONNECTION RATES, TERMS, CONDITIONS, AND RELATED ARRANGEMENTS WITH SOUTHWESTERN BELL TELEPHONE COMPANY

ALLEGED SWBT HIGHLY SENSITIVE CONFIDENTIAL MATERIAL HAS BEEN REDACTED

DATED: January 7, 2000

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I. INTRODUCTION AND SUMMARY

Q. PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.

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

Q. PLEASE DESCRIBE YOUR QUALIFICATIONS AND EXPERIENCE AS THEY PERTAIN TO THIS PROCEEDING.

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

My professional background includes employment and consulting experiences in the fields of telecommunications, energy, and insurance regulation. As a consultant, I have testified or served as an expert on telecommunications issues in proceedings before state regulatory commissions in California, Connecticut, Delaware, the District of Columbia, Florida, Hawaii, Illinois, Kansas, Maryland, Massachusetts, Michigan, Nevada, New Jersey, New York, North Carolina, Pennsylvania, South Carolina, Texas, Virginia, Washington and Wisconsin, and before the Federal Communications Commission ("FCC"). I have extensive experience reviewing the cost studies that incumbent local exchange

carriers have presented to state regulatory commissions in support of their proposed prices for unbundled network elements and collocation.

Before I became a consultant in 1990, I was employed for approximately six years in a variety of positions (including Director of the Division of Ratepayer Advocates) at the California Public Utilities Commission and had significant responsibility for telecommunications matters. I have also taught economics and regulatory policy at both the undergraduate and graduate levels.

Q. HAVE YOU INCLUDED A COPY OF YOUR CURRICULUM VITA WITH THIS TESTIMONY?

A. Yes. My curriculum vita, included as Attachment TLM-1 to this testimony, provides more detail concerning my qualifications and experience.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. Covad Communications Company ("Covad") has asked me to address economic and policy issues raised by Southwestern Bell Telephone Company, Inc. ("SWBT") in its response to Covad's Petition for Arbitration. I understand that the unresolved issues in this arbitration are primarily those relating to the costing and pricing of the parts of SWBT's network to which Covad seeks to obtain access. My testimony will establish the proper economic and public policy context for the consideration of these costs and prices, evaluate whether SWBT's proposed costs and prices are appropriate in that context and finally identify more appropriate prices where SWBT's proposals are inconsistent with sound economic and public policy principles.

Q. PLEASE SUMMARIZE YOUR TESTIMONY AND RECOMMENDATIONS.

A. In the remainder of my testimony, I reach the following conclusions:

- The Missouri Public Service Commission ("Commission") should adopt prices, terms and conditions in this arbitration that will encourage the proliferation of cost-effective data communications services such as Digital Subscriber Line ("DSL") services. SWBT's proposals would inhibit competition in this emerging market, whereas Covad's proposals would facilitate such competition.
- The Commission should set prices in this arbitration that reflect forward-looking economic costs, without regard to the actual provisioning practices or technologies that SWBT deploys in its network today. The forward-looking economic costs that serve as the basis for nonrecurring charges should reflect the same network design as was assumed to calculate the forward-looking economic costs on which the recurring charges are based.
- The Commission should reject SWBT's proposed nonrecurring charge for "partially mechanized" loop qualification because that charge reflects the costs for an interim, short-run process and improperly includes costs for SWBT's engineers to perform an unnecessary and duplicative analysis of the loop makeup data that SWBT and Covad have already agreed should not be performed. Instead, the Commission should require SWBT to

provide Covad with mechanized access to loop makeup data for no charge (which reflects the long-run cost of an efficient, fully mechanized system).

- The Commission should reject SWBT's proposed explicit nonrecurring charges for line "conditioning"[1] because those charges recover costs for functions already built into, and recovered through, SWBT's proposed recurring charges for DSL-capable loops.
- If the Commission permits any explicit nonrecurring charge for line "conditioning," it should adjust SWBT's cost studies to reflect efficient processes. The necessary adjustments include recognition of the efficiency of "conditioning" multiple loops at one time, reduction of task times to conform to the more efficient times described in Mr. Donovan's testimony and removal of costs for restoration of bridged taps.
- The Commission should reject SWBT's proposed recurring charge for ISDN-type loops because the underlying cost does not reflect efficient, forward-looking prices and technology for related electronic equipment. Instead, the Commission should use the multiplier that I identify (based on the relative prices for basic analog and ISDN-type loops in other states) to derive a reasonable proxy for a TELRIC-based price for ISDN-type loops.

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[1] The notion that lines must be "conditioned" for DSL-based services is potentially misleading. The term "conditioning" has traditionally been used in telecommunications to refer to situations in which equipment must be *added* to a circuit to enable that circuit to perform to tighter engineering parameters. One example of this is what is known as an "assured" PBX trunk. In contrast, DSL-capable loops require that unnecessary equipment be *removed* from the circuit. Thus, some loops must be *deconditioned* or have equipment that was required in older plant designs to support analog/voice services eliminated to make them DSL-capable.

- The Commission should reject SWBT's proposed nonrecurring charges for collocation cross-connections because those charges appear excessive on their face given the functionality being provided. Instead, the Commission should adopt a proxy price based on the nonrecurring charges adopted in Texas and California for similar cross-connections.

For all of these reasons, the Commission should conclude that SWBT's proposed prices for unbundled network elements are generally improper, unsupported and excessive. Therefore, the Commission should reject SWBT's competition-inhibiting proposals and instead adopt alternative prices for each element based on the adjustments to SWBT's costs and prices that I describe in the following sections.

II. ECONOMIC AND PUBLIC POLICY FRAMEWORK FOR ANALYSIS

Q. WHY IS AN ARBITRATION CONCERNING PRICES, TERMS AND CONDITIONS FOR DSL-RELATED ELEMENTS AND FUNCTIONS IMPORTANT?

A. This arbitration offers the Commission one of its first opportunities to secure an important benefit of the Telecommunications Act of 1996 ("Act") for all Missouri consumers — the delivery of innovative services. Implementing the Act would have made little sense if Congress did not envision that a competitive local exchange market would deliver innovative, improved services, at better prices, to consumers than did the previous single provider market. Yet much of the activity to date has focused on the steps necessary to enable competition for the types of

services that SWBT already offers ubiquitously to its retail customers. In contrast, this arbitration focuses exclusively on the actions needed to facilitate competition for advanced telecommunications services that many Missouri consumers cannot yet obtain. The Commission's decisions in this arbitration proceeding will determine the degree to which competitive market forces will drive the spread of such services to all Missourians as quickly as possible.

DSL is an emerging technology with great promise for meeting the need for advanced telecommunications services. There is a compelling public interest mandate to encourage the spread of such technologies. Pursuant to this goal, the FCC has determined that the network design used to estimate the costs of unbundled network elements and universal service should not impede access to advanced telecommunications services for any customer.[2] For all of these reasons, it is important for the Commission to insure that the prices, terms and conditions under which SWBT offers unbundled DSL-capable loops do not discourage competitive entry into this market.

The market for DSL services is unusual in that SWBT does not already dominate it, and aggressive new competitors such as Covad are offering a wide range of alternative services and options. As in other portions of the local exchange market, however, the potential for new entrants to accelerate the delivery of competitive benefits to DSL customers depends on the new entrants' ability to obtain access to customers on terms and conditions that place them on

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[2] In the Matter of Federal-State Joint Board on Universal Service, CC Docket 96-45, Report and Order, (May 8, 1997), ("FCC Universal Service Order"), at ¶ 250(1).

an even competitive footing with SWBT. SWBT, in contrast, has an incentive to leverage its control of access to end users as a means of expanding its dominance of the local exchange network into dominance of emerging markets for new telecommunications services such as DSL. SWBT can leverage its incumbency advantage by, for example, slowing new entrants' efforts to offer services that SWBT itself is not prepared to offer, requiring entrants to purchase unnecessary elements and charging excessive prices for network elements. In its positions in this arbitration, SWBT appears to be employing such tactics. How the Commission resolves these issues will in large measure determine when or whether the promise of the Act becomes a reality in Missouri.

For all of these reasons, it is important for the Commission to insure that the prices, terms and conditions under which SWBT offers unbundled DSL-capable loops do not discourage competitive entry into this market.

Q. WHAT STANDARD CAN COMMISSION APPLY TO INSURE THAT THE PRICES IT AWARDS IN THIS ARBITRATION WILL BE FAIR TO ALL PARTIES BUT WILL NOT BE SO EXCESSIVE AS TO DISCOURAGE COMPETITION IN MISSOURI?

A. As this Commission has previously decided[3] and as the FCC requires, prices for network elements that entrants require to compete with SWBT should be set equal to SWBT's forward-looking economic cost. By forward-looking economic cost, I mean the Total Element Long Run Incremental Cost ("TELRIC") of providing the

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[3] *See, for example*, Broadspan Arbitration, Case No. TO-99-370, order of June 15, 1999.

element(s) plus a reasonable proportion of the efficient, forward-looking "shared and common" costs that SWBT would incur to provide all of the products and services that it provides.[4]

By insuring that prices for the DSL-related elements and functions recover their forward-looking economic costs, but no more, the Commission can best promote the widespread provision of advanced telecommunications services in Missouri.

Q. WHAT ASPECTS OF THE TELRIC METHODOLOGY ARE MOST RELEVANT TO THE ISSUES IN THIS ARBITRATION?

A. Two aspects of the TELRIC methodology are especially relevant to the issues in this arbitration. First, the TELRIC methodology is a forward-looking cost methodology that is almost totally divorced from the existing network configuration that SWBT (or any other carrier) deploys. Second, the TELRIC methodology requires the minimization of *total* forward-looking costs, both recurring and nonrecurring, which implies that the network configuration used to calculate both types of costs must be consistent.

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[4] My definition corresponds precisely with the rules developed in the FCC's First Report and Order, In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996 (CC Docket No. 96-98), adopted August 1, 1996 ("FCC First Report and Order"). Forward-looking economic cost is defined in § 51.505 of that order as the sum of "(1) the total element long-run incremental cost of the element ..." and "(2) a reasonable allocation of forward-looking common costs ...."

Q. WHAT IS THE SIGNIFICANCE OF THE FIRST ASPECT OF THE TELRIC METHODOLOGY THAT YOU IDENTIFIED IN YOUR PREVIOUS ANSWER?

A. TELRIC is "based on the use of the most efficient telecommunications technology currently available and *the lowest cost network configuration*, given the existing location of the incumbent LEC's wire centers."[5] The FCC has found that prices for interconnection and unbundled network elements should be based on the cost of a "reconstructed local network" deploying "the most efficient technology for reasonably foreseeable capacity requirements."[6] In other words, the network design and technology assumptions in a TELRIC study should reflect the least-cost, most-efficient options currently available, not the attributes of SWBT's embedded plant. The FCC's TELRIC methodology explicitly precludes the consideration of embedded costs (*i.e.*, costs "incurred in the past and that are recorded in the incumbent LEC's books of accounts").[7]

The TELRIC approach to network design is what is known as a "scorched node" methodology. The methodology assumes that customers remain in place at their existing locations and are connected to the existing central office locations. However, all existing, in-place local exchange carrier facilities are assumed

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5 47 C.F.R. § 51.505(b)(1), emphasis added.

6 FCC First Report and Order at ¶ 685.

7 47 C.F.R. § 51.505(d).

away.[8] This "assuming away" of existing facilities is basic to the concept of "long-run" cost analysis, which treats all costs as potentially variable and avoidable.[9]

Q. SWBT IS ONLY REQUIRED TO PROVISION ITS ACTUAL, EXISTING NETWORK. HOW DO YOU SQUARE THIS REQUIREMENT WITH YOUR INTERPRETATION OF THE TELRIC METHODOLOGY?

A. The TELRIC methodology relates only to the costing and pricing of unbundled network elements, not to the physical provisioning of those elements. There is no inherent contradiction in setting prices for access to the existing physical network based on forward-looking economic costs. To the contrary, TELRIC-based pricing of unbundled network elements mimics the outcome that would occur if incumbents such as SWBT faced effective competition in the provision of unbundled network elements.

The market-clearing prices for goods and services sold in a competitive, unregulated market reflect forward-looking economic costs, even though the firms producing those goods and services employ processes and equipment of varying vintages. A steel mill using out-of-date production methods must meet or beat the

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[8] The TELRIC methodology differs from a "scorched earth" or greenfield approach to forward-looking costing in that the forward-looking network design is constrained to place central offices or "nodes" at the existing locations.

[9] I understand that the Commission is quite familiar with this approach. For example, the TELRIC studies for unbundled loops that SWBT previously submitted to this Commission reflected a forward-looking network design with fiber feeder in many places where copper facilities exist today. SWBT's unbundled loop cost analysis did not include the cost of removing the existing copper feeder facilities; instead, it assumed away the existing facilities and studied only the cost of placing new, forward-looking facilities.

prices of competing firms employing the most modern production technologies and equipment, even if such pricing falls below the older mill's "actual" cost (based on its existing equipment). Like all firms in competitive markets, this steel mill must either lower its long-run costs to match more efficient rivals (*i.e.*, achieve "actual" costs that equate to efficient, forward-looking costs) or exit the market. Competitive markets offer no leeway for recovering "actual" costs that exceed efficient, forward-looking costs. Thus, the prices established for unbundled network elements in this arbitration can only mimic the prices that would prevail in a competitive market if the Commission treats the costing and pricing process as distinct from SWBT's provisioning process.

Q. WHAT IS THE SIGNIFICANCE OF THE SECOND ASPECT OF THE TELRIC METHODOLOGY THAT YOU IDENTIFIED PREVIOUSLY (*I.E.*, TOTAL COST MINIMIZATION)?

A. The FCC has defined TELRIC as "the forward-looking cost over the long run of *the total quantity of the facilities and functions* that are directly attributable to, or reasonably identifiable as incremental to, such element, calculated taking as a given the incumbent LEC's provision of other elements."[10] To comply with this total cost minimization requirement, a TELRIC cost study must compute both recurring and nonrecurring costs based on the same network configuration. Failure to compute recurring and nonrecurring costs based on a consistent network design can lead to a systematic bias, upward or downward, in the

[10] 47 C.F.R. § 51.505(b), emphasis added.

estimation of total forward-looking costs. This bias occurs because alternative network designs reflect different tradeoffs between the kinds of costs usually classified as recurring (capital costs and costs for ongoing operations and maintenance) and those classified as nonrecurring (one-time, customer-specific costs caused by a particular service order).

Q. CAN YOU PROVIDE AN EXAMPLE TO ILLUSTRATE THIS POINT?

A. Yes. Under certain conditions, the monthly recurring cost of loop plant with copper feeder is less than the monthly recurring cost of loop plant with fiber feeder and Digital Loop Carrier ("DLC"). Long loops with copper feeder require load coils to achieve acceptable transmission standards for voice-grade services.[11] Those load coils impede the transmission of services such as ISDN and DSL and therefore must be removed from copper-based loops that are used to provide such advanced services. Removal of load coils causes a nonrecurring cost that the carrier would not incur if it had a network with fiber feeder for all loops in excess of 18,000 feet in length. A carrier using copper feeder and load coils to serve long loops might achieve a lower recurring cost given that network design, but would incur a higher nonrecurring cost to provide advanced services over such a network. A carrier with a fiber-based network for long loops would avoid the cost of removing load coils to provide advanced services, but at the expense of potentially higher recurring costs.

[11] As Covad witness Mr. Donovan explains in his direct testimony, the need for load coils applies to loops with copper transmission facilities in excess of 18,000 feet in length.

Thus, computing recurring costs based on a fiber/DLC network for long loops and nonrecurring costs based on an all-copper network would lead to an overstatement of total forward-looking costs. The flip side — computing recurring costs based on an all-copper network and nonrecurring costs based on a fiber/DLC network for long loops — would lead to an understatement of total costs. The correct total cost calculation is the one that results from calculating recurring and nonrecurring costs based on the same network design. This calculation provides the information necessary to determine, *e.g.*, the crossover point at which it becomes more efficient to use fiber feeder and DLC, rather than an all-copper loop design, and thereby facilitates cost minimization. A proper TELRIC analysis embodies the network design that produces the lowest total cost, considering both the recurring and nonrecurring costs for the total quantity of all network elements that the incumbent will supply using that network.

Q. HAVE OTHER STATES RECOGNIZED THE IMPORTANCE OF USING A CONSISTENT NETWORK DESIGN TO CALCULATE RECURRING AND NONRECURRING COSTS FOR UNBUNDLED NETWORK ELEMENTS?

A. Yes. Decisions in Texas, California and New York all endorse this fundamental principle. For example, the SWBT-Covad Texas Arbitration Award states:

> [t]he Arbitrators find that the network design inconsistencies in the recurring and non-recurring cost studies do not result in correct

> xDSL costs and rates and consequently render the proposed charges invalid.[12]

Consistent with this finding, the Arbitrators have ordered SWBT to file new recurring and nonrecurring cost studies for DSL-capable loops and line "conditioning" that are "based on the same network."[13]

This ruling is consistent with an earlier California decision on the nonrecurring costs for unbundled network elements, in which the California Public Utilities Commission found that:

> it makes little sense to model one type of network for unbundled elements and then assume a different network exists for ordering and provisioning the same unbundled elements. We will evaluate Pacific's [nonrecurring cost] model and parties' proposals using the forward looking network we have previously assumed.[14]

The California decision also provided a specific example of the type of double-recovery that could occur if the networks assumed for recurring and nonrecurring costs were not the same.

> In D.96-08-021 and D.98-02-106, we adopted Pacific's loop and access line costs based on a mix of copper and fiber. In the recurring phase of this proceeding, Pacific assumed a 52%/48% copper/fiber ratio. We think it would be both unfair and unreasonable to allow Pacific recurring cost recovery based on this ratio and then allow a different network mix in developing its nonrecurring costs. It would amount to allowing double recovery of NGDLC costs by overstating Pacific's nonrecurring cost studies.[15]

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12 Public Utility Commission of Texas, Arbitration Award, Dockets Nos. 20226 and 20272, November 30, 1999, at 96.

13 *Id.* at 97.

14 California Public Utilities Commission Decision 98-12-097, issued December 17, 1998, in Dockets R.97-04-003/I.93-04-002, at 34.

15 *Id.* at 70.

The California Commission's concern regarding double-recovery of Next Generation Digital Loop Carrier ("NGDLC") costs exactly parallels my concern regarding SWBT's proposal in this arbitration to recover forward-looking loop recurring costs and embedded or actual nonrecurring costs for DSL line "conditioning."

Finally, the New York Public Service Commission has stated that "non-recurring charges for unbundled network elements should be based on the same forward-looking network used to set the network element rates."[16]

The decisions of these three commissions emphasize the importance of using a consistent network design for calculating both recurring and nonrecurring costs as an essential safeguard against double-recovery of costs.

Q. HAS SWBT CORRECTLY APPLIED BOTH OF THESE ASPECTS OF THE TELRIC METHODOLOGY IN THE COST STUDIES THAT SUPPORT ITS PROPOSED PRICES IN THIS ARBITRATION?

A. No. SWBT's proposed prices in this arbitration generally reflect costs that exceed TELRIC-based prices. For example, virtually all of SWBT's proposed nonrecurring charges (for "partially mechanized" loop qualification, line "conditioning" and cross-connections) reflect inefficient, unduly costly methods of operation. SWBT's proposed nonrecurring charges for line "conditioning" also reflect double-recovery of the cost of providing "conditioned" DSL-capable loops because they reflect a different network design from the design assumed in its

recurring cost study for basic 8 dB loops. Finally, SWBT's proposed recurring charge for ISDN-type loops reflects outmoded and excessively costly assumptions about DLC technology and prices. I will explain each of these criticisms in more detail in the sections that follow.

III. ISSUE A(3) – LOOP QUALIFICATION: SWBT'S PROPOSED NONRECURRING CHARGE FOR PARTIALLY MECHANIZED LOOP QUALIFICATION IS UNREASONABLY HIGH.

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 a given loop determine whether the loop is usable at all for providing any type of DSL-based service, the modifications (if any) needed 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, Covad may be able to offer its ADSL service over a loop that would not meet SWBT's technical specifications for SWBT's ADSL service and *vice versa*.

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[16] New York Public Service Commission, Case Nos. 95-C-0657 *et al.*, Opinion No. 99-8 at 24. *See also* New York Public Service Commission, Case Nos. 95-C-0657, 94-C-0095 and 91-C-1174, Opinion No. 97-19 at 46-48.

The carrier-specific nature of loop qualification has significant implications for the definition of the loop qualification activity for which Covad will pay SWBT. SWBT can only meaningfully perform the first step of the loop qualification activity (gathering the relevant information on loop characteristics) on behalf of Covad. Covad's own engineers must then use this loop characteristic information to determine the suitability of a given loop for provisioning Covad's variants of DSL-based services.

Q. IS SWBT'S PROPOSED CHARGE FOR PARTIALLY MECHANIZED LOOP QUALIFICATION BASED ON THE CORRECT DEFINITION OF THIS ACTIVITY?

A. No. SWBT has improperly defined the activity to be studied in at least two respects. First, SWBT has studied an interim "partially mechanized" process, not a long-run process as required under the TELRIC methodology. Second, SWBT has studied the cost of a broader scope of activities than should properly be included in a study of loop qualification in a wholesale environment.

Q. PLEASE ELABORATE ON YOUR FIRST POINT, THAT SWBT HAS STUDIED AN INTERIM, RATHER THAN A LONG-RUN, LOOP QUALIFICATION PROCESS.

A. SWBT's response to Covad's arbitration petition makes clear that its proposed prices for "partially mechanized" loop qualification reflect interim processes. In its pricing appendix to that response, SWBT states:

> Effective August 1, 1999, the rates for Loop Qualification reflect SWBT's planned implementation of partial

> mechanization. SWBT agrees to notify CLEC of any additional changes in the Loop Qualification process and any associated rate modifications. Upon CLEC's receipt of such notification by SWBT, the Parties will meet for the sole purpose (unless otherwise agreed to by both Parties) of negotiating rates, terms and conditions for CLEC's use of the modified Loop Qualification process.[17]

By its own admission, SWBT's proposed manual qualification price reflects the cost of an interim process, not the efficient, fully mechanized process that SWBT expects to deploy in the long run. Therefore, by definition, SWBT's proposed price is inconsistent with TELRIC (which is a long-run cost measure). SWBT studied only the short-run costs of an interim process for loop qualification, not the long-run, forward-looking or efficient cost of that process.

Q. JUST HOW SHORT IS THE "SHORT-RUN" INTERIM PROCESS THAT SWBT HAS STUDIED?

A. To answer this question, I must first explain how SWBT's loop qualification cost studies have evolved from its May 11, 1999, study of a fully manual process to its December 1999 cost study for "partially mechanized" loop qualification. The single most significant difference between the two studies — and the way in which SWBT has represented "partial mechanization" — is the addition of a "task occurrence factor" to the latter study for the percentage of time that a new entrant's request for loop qualification information will "fall out" of the mechanized process and require manual handling on SWBT's part. SWBT's new "partially mechanized" loop qualification study assumes that new entrants will

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[17] Southwestern Bell Telephone Company's Answer to the Petition of Covad Communications Company for Arbitration of Rates, Terms and Conditions and Related

submit loop qualification requests via an electronic interface and that a substantial percentage of those requests will "flow through" directly to SWBT's Operations Support Systems ("OSS"), which will return the requested information electronically, without the intervention of SWBT personnel. The "fallout" percentage is simply 100% minus the percentage of orders expected to "flow through." For orders that "fall out," SWBT's "partially mechanized" loop qualification cost study reflects the cost of manual loop qualification.

The sole support that SWBT has provided for its projected "fallout" ratio is a February 2, 1999, e-mail from a SWBT subject matter expert (who apparently consulted with another SWBT employee before rendering his opinion).[18] Neither the e-mail message itself nor any other material submitted with SWBT's December 1999 cost study contains sufficient detail to determine what process SWBT's subject matter expert had in mind when he estimated the percentage of time that SWBT would have to resort to manual loop qualification. Both the timing of the e-mail message (almost one year ago) and SWBT's recent characterization of its proposed loop qualification charge as representing processes in place as of August 1, 1999, however, suggest that SWBT's cost study does not reflect any increase in mechanization anticipated to occur after August 1999.

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xDSL Loops, Exhibit A at 4.

[18] February 2, 1999, e-mail from Larry Wren included as supporting documentation in SWBT's December 1999 Mechanized Loop Qualification NRC Study.

Q. IS THERE ANY INFORMATION TO SUGGEST THAT THE LOOP QUALIFICATION PROCESS WILL BECOME SIGNIFICANTLY MORE MECHANIZED, AND LESS DEPENDENT ON MANUAL EFFORT BY SWBT ENGINEERS, IN THE LONG RUN?

A. Yes. An internal planning document that SWBT provided in discovery suggests that *** **HIGHLY SENSITIVE CONFIDENTIAL**

.[19] **END CONFIDENTIAL** *** Thus, even before the prices that the Commission adopts in this arbitration go into effect, SWBT may very well have implemented a more highly mechanized process than the one assumed in its most recent "partially mechanized" loop qualification cost study. The short run in SWBT's cost study is so short that it may even be backward-looking.

[19] Attachment to October 27, 1999, e-mail from Erin K. Blain to George R. Phillips, Jr., provided in response to Covad Data Request No. 1-65.

Q. HOW WOULD A TRULY LONG-RUN COST STUDY DIFFER FROM THE STUDY THAT SWBT HAS PERFORMED FOR "PARTIALLY MECHANIZED" LOOP QUALIFICATION?

A. In the long run, SWBT should make loop makeup information available directly to new entrants in an electronic format. Indeed, SWBT is required to do so by FCC Order.[20] It my understanding, based upon witness Bernard Chao's testimony, that the Texas Commission has also ordered SWBT to develop and deploy enhancements that will allow new entrants, including Covad, to have real-time electronic access to loop qualification information and that SWBT has agreed to develop and deploy the same enhancements in Missouri. In such a fully mechanized environment, the forward-looking cost of providing loop makeup information electronically should equal to the cost for supplying a few additional fields of data via SWBT's OSS, *i.e.*, the additional processor capacity time required for a few additional bits of data, the power required to process those bits, *etc.* Given the current power and price for processors, it is unlikely that the additional capacity required to process loop characteristic data would even be measurable on a per-order basis. SWBT implicitly admits this fact by including no cost in its "partially mechanized" loop qualification cost study for the *** **HIGHLY SENSITIVE CONFIDENTIAL END CONFIDENTIAL** ***

[20] 47 C.F.R. § 51.313(c) directs that "[a]n incumbent LEC must provide a carrier purchasing access to unbundled network elements with the pre-ordering, ordering, provisioning, maintenance and repair, and billing functions of the incumbent LEC's operations support systems."

of orders that "flow-through" electronically.[21] Therefore, the best estimate of the efficient, long-run cost for the electronic provision of loop makeup information, which new entrants can in turn use to perform their own loop qualification assessment, is $0.

Q. PLEASE ELABORATE ON YOUR SECOND POINT, THAT SWBT HAS STUDIED A BROADER SCOPE OF ACTIVITIES THAN IS APPROPRIATE IN A STUDY OF LOOP QUALIFICATION IN A WHOLESALE ENVIRONMENT.

A. SWBT's proposed charge for partially mechanized loop qualification reflects the costs for both steps of the loop qualification process that I described above: information gathering and information processing. The "Overview/Methodology" section of SWBT's cost study for loop qualification states that "[t]he purpose of this study is to determine the nonrecurring costs associated [with] Loop Qualification/Spectrum Management." The service description provided in that same section defines loop qualification and spectrum management as follows:

> Loop Qualification ... [is] a tactical measure to identify specific loops that can support ADSL based services. Spectrum Management is the use of assignment data, knowledge of interference relationships, Planning Guidelines, current demand statistics and marketing strategies to analyze and control the ability to provisioning, maintain and grow broadband services in common plant.[22]

This scope of activity is appropriate for a study of loop qualification for SWBT's own DSL-based services, but inappropriate for a study of loop

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[21] *See* SWBT's Mechanized Loop Qualification Study, 12/99.

qualification for unbundled DSL-capable loops. Covad must make its own determination of whether the characteristics of a given loop meet the technical specifications for *Covad's* DSL-based services. Covad should not have to pay SWBT's engineers to perform an analysis that Covad's own engineers are better positioned to perform.

Furthermore, I understand, based upon witness Bernard Chao's testimony, that spectrum management is no longer an issue in this arbitration as SWBT has agreed to abandon its spectrum management practices in the wake of the FCC's Line Sharing Order and the Texas Commission's Arbitration Award prohibiting SWBT from employing those practices. Consequently, any spectrum management analysis on SWBT's part should be eliminated from its cost studies. The activities reflected in SWBT's nonrecurring cost study for Loop Qualification/Spectrum Management include costs for SWBT's engineers to perform such a spectrum management analysis. Thus, it is clear that SWBT's nonrecurring cost study measures the cost of more than the scope of activities to which Covad and SWBT have agreed in their interconnection negotiations.

Q. DOES SWBT'S COST STUDY FOR LOOP QUALIFICATION COMPORT WITH YOUR UNDERSTANDING OF THE FCC'S REQUIREMENTS FOR THE PROVISION OF LOOP QUALIFICATION INFORMATION?

A. No. In its *UNE Remand Order*, the FCC states that incumbents must provide requesting carriers access to all available information relating to loop qualification for DSL-based services. The pertinent information includes, but is not limited to:

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[22] Mechanized Loop Qualification NRC Study, 12/99.

"fiber optics or copper; the existence, location and type of any electronic or other equipment on the loop, including but not limited to, digital loop carrier or other remote concentration devices, feeder/distribution interfaces, bridge taps, load coils, pair-gain devices, disturbers in the same or adjacent binder groups; the loop length, including the length and location of each type of transmission media; the wire gauge(s) of the loop; and the electrical parameters of the loop, which may determine the suitability of the loop for various technologies."[23]

The clear purpose of this FCC requirement is to compel incumbents to produce the information that will allow competitors to make their own determinations about the suitability of loops for the technologies that the competitors intend to deploy. This purpose is implicit in the FCC's finding that "under our 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."[24] If the FCC intended for SWBT or other incumbents to make the determination on behalf of entrants such as Covad, there would be no reason to require the incumbents to provide competitors with the information that "back office" personnel such as SWBT's engineers use to perform a loop qualification analysis. Thus, the Commission should reject SWBT's attempt to make Covad pay for SWBT's engineers to perform loop qualification/spectrum management analysis because

[23] 47 C.F.R. § 51.5; *Third Report and Order and Fourth Further Notice of Proposed Rulemaking* in CC Docket 96-98 ("*UNE Remand Order*"), ¶¶ 427-8.

that attempt is inconsistent with the intent of the FCC's most recent findings concerning access to loop qualification information.

Q. IS THERE ANY OTHER REASON THAT THE COMMISSION SHOULD DISALLOW THE PORTION OF LOOP QUALIFICATION COSTS RELATED TO SWBT'S ANALYSIS OF THE LOOP MAKEUP DATA?

A. Yes. SWBT's own internal documents suggest that the guidelines the company's engineers use to determine loop qualification may not produce useful or accurate results. One internal technical analysis of SWBT's loop qualification guidelines explains that *** **HIGHLY SENSITIVE CONFIDENTIAL**

.[25] **END CONFIDENTIAL** ***

Another recent internal SWBT analysis concluded that *** **HIGHLY SENSITIVE CONFIDENTIAL**

.[26] **END CONFIDENTIAL** *** Covad should not have to pay SWBT (1) to perform analysis that is not only duplicative of efforts Covad will

[24] *UNE Remand Order*, ¶ 430.

need to make internally, but potentially inaccurate and misleading as well and (2) for spectrum management functions that SWBT admittedly will no longer perform.

Q. IS IT POSSIBLE TO DISTINGUISH BETWEEN THE COSTS OF GATHERING LOOP INFORMATION AND THE COSTS OF ANALYZING THAT INFORMATION BASED ON SWBT'S STUDY OF PARTIALLY MECHANIZED LOOP QUALIFICATION COSTS?

A. Not directly. SWBT's December 1999 study for loop qualification consists of a single, aggregated time estimate for all the tasks that the study assumes SWBT will perform, including the time for SWBT's engineer to *** **HIGHLY SENSITIVE CONFIDENTIAL**

.[27] **END CONFIDENTIAL** *** A May 11, 1999, SWBT study of a purely manual loop qualification process, however, provides a separate statement of the time required to gather the relevant information for loop qualification versus the time needed to

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[25] "ADSL Loop Qualification Data Companion Document" by Mark Russell and Dick McDonald, Revision 0, Dated January 2, 1998, provided in response to Covad Data Request No. 82.

[26] October 13, 1999, e-mail from Lee A. Culver to Ronald C. Owens *et al.*, provided in response to Covad Data Request No. 65.

[27] February 2, 1999, e-mail from Larry Wren included as supporting documentation in SWBT's December 1999 Mechanized Loop Qualification NRC Study.

analyze that information.[28] In this earlier study, SWBT divided the manual loop qualification activities between a drafting clerk, who was responsible for what I have described as the first step (gathering information), and an engineer, who was responsible for the second step (analyzing the information). Thus, the task time for the drafting clerk's efforts from the May study provides a stand-alone estimate of the manual effort required to gather the relevant loop makeup information when Covad's request for loop makeup information does not automatically "flow-through" SWBT's electronic interface and return the required data directly from SWBT's OSS.

Q. HOW CAN THE COMMISSION USE THE DATA FROM THE EARLIER SWBT LOOP QUALIFICATION STUDY TO ARRIVE AT A REASONABLE ESTIMATE OF THE COST FOR SWBT'S "PARTIALLY MECHANIZED" LOOP QUALIFICATION PROCESS?

A. The Commission can multiply the May 11, 1999, cost for a drafting clerk to gather loop makeup information manually by the December 1999 task occurrence factor for this manual activity. The resulting calculation is *** **HIGHLY SENSITIVE CONFIDENTIAL**

[29] [30] **. END CONFIDENTIAL *****

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[28] May 11, 1999, ADSL UNE X-Connect and NRC Study provided in response to Covad's Data Request No. 1-6.

[29] May 11, 1999, ADSL UNE X-Connect and NRC Study, provided in response to Covad Data Request No. 1-6.

[30] Mechanized Loop Qualification NRC Study 12/99 (task occurrence factor is the same as the fallout rate, or 1 – the probability of "flow-through").

I note that this calculation implicitly makes two adjustments to the "partially mechanized" loop qualification study. First, it eliminates the task time for analyzing the loop makeup data. Second, it assumes that a drafting clerk (with a correspondingly lower labor rate), rather than an engineer, gathers the loop makeup data. For some reason that SWBT does not explain, its December 1999 study assumes that an engineer both gathers the data and performs the analysis, whereas its earlier study assumed that a drafting clerk gathers the loop makeup data. Covad witness Mr. Donovan confirms that use of an engineer, as opposed to a drafting clerk, is a needless expense; thus, I have used SWBT's earlier assumption in restating the costs for partially mechanized loop qualification.

Q. DOES THE RESTATED COST THAT YOU CALCULATED IN YOUR PREVIOUS ANSWER PROVIDE A REASONABLE ESTIMATE OF THE FORWARD-LOOKING COST OF PROVIDING ACCESS TO LOOP MAKEUP INFORMATION?

A. No. The TELRIC methodology requires long-run cost estimates, and the best estimate of the forward-looking cost of providing loop makeup information in the long run is $0. My previous answer describes a different calculation, namely, the "efficient" cost of providing interim, partially mechanized access to loop makeup data. The point of this calculation is to demonstrate that SWBT's proposed price for "partially mechanized" loop qualification is excessive (over three times greater), even if one accepts the incorrect premise that the cost study should reflect only the level of mechanization that SWBT has currently achieved.

IV. ISSUE A(6) – "CONDITIONING" CHARGES: SWBT'S PROPOSED NONRECURRING CHARGES FOR LINE "CONDITIONING" ARE UNREASONABLY HIGH.

Q. WHAT TYPES OF "CONDITIONING" CHARGES DOES SWBT PROPOSE TO ASSESS COVAD?

A. SWBT proposes nonrecurring line "conditioning" charges for removal of load coils, removal (and subsequent restoral) of bridged taps and removal of repeaters. The proposed prices have a two-part structure in which a relatively high charge applies to the "initial" loop on a "conditioning" order and a considerably lower charge applies to each "additional" loop ordered at the same time, assuming that the "additional" loop requires the same kind of "conditioning" at the same locations (*e.g.*, removal of load coils from the same cable in the same manholes as the initial loop).

A. To Avoid Double-Recovery of the Cost of Providing "Conditioned" DSL-Capable Loops, the Commission Should Not Permit SWBT to Levy Any Separate Line "Conditioning" Charges.

Q. DO SWBT'S PROPOSED LINE "CONDITIONING" CHARGES COMPORT WITH THE PRINCIPLES OF TELRIC ANALYSIS THAT YOU DESCRIBED IN SECTION II ABOVE?

A. No. SWBT's line "conditioning" nonrecurring cost studies are fundamentally inconsistent with TELRIC principles because they do not reflect an efficient, forward-looking network architecture. The testimony of Covad witness John Donovan explains that 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. As Mr. Donovan demonstrates, SWBT generally admits that these network engineering guidelines should guide SWBT's outside plant deployment. Thus, the premise that SWBT must remove load coils, excessive bridged taps or repeaters to render a loop suitable for the provision of DSL-based services has no place in a forward-looking cost study.

The backward-looking network design assumptions in SWBT's "conditioning" cost studies are especially egregious because SWBT assumed a completely different forward-looking network design in its recurring cost study for basic analog loops (8 dB loops). This is the cost study on which SWBT proposes to base the recurring charges for unbundled DSL-capable loops in this arbitration. SWBT's recurring cost study for basic two-wire loops reflects the full forward-looking economic cost of a network design that does not include components such as load coils that interfere with DSL-based services.

As I explained in Section II above, the assumption of different network architectures in the recurring and nonrecurring cost studies for the same network element violates the TELRIC requirement for total cost minimization and creates a significant risk of double-counting. Such double-counting does indeed prevail under the cost studies that SWBT has submitted in this arbitration.

The Commission-adopted recurring charges for basic two-wire unbundled loops explicitly take into account the loop cost for a forward-looking network configuration that does not, for example, use load coils. Specifically, the monthly recurring charge for basic 8 dB unbundled loops reflects the cost of a network that

deploys fiber feeder and DLC for long loops[31] (which I would expect to be higher than the recurring cost of an all-copper network). SWBT would incur the incrementally higher recurring cost for fiber feeder and DLC in its network design in part to avoid the deployment of load coils and other devices that inhibit the provision of advanced services such as ISDN and DSL. The existing monthly recurring charges therefore recover *all* costs for building a network without such DSL inhibitors. Every penny of cost included in SWBT's nonrecurring "conditioning" cost studies thus duplicates a function (the provision of a "conditioned" loop) already fully incorporated in SWBT's recurring cost.

An analogy illustrates the improper effect of SWBT's mix-and-match approach to costing DSL-capable loops. Consider two alternatives to obtaining a race car capable of achieving speeds up to 200 miles per hour: a custom-built car designed only for off-street racing or a stock car modified to attain higher speeds. The custom-built race car has a higher capital cost than the unmodified stock car, but requires no modifications to be capable of speeds up to 200 miles per hour. The minimum cost to obtain a race car that can go 200 miles per hour is the lower of the capital cost of the custom-built race car versus the capital cost of the unmodified stock car *plus* the capital and labor cost of the necessary modifications.

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[31] According to SWBT Response to Covad Data Request No. 1-22, *** **HIGHLY SENSITIVE CONFIDENTIAL** "

." **END CONFIDENTIAL** ***
As a result of this forward-looking network architecture assumption, SWBT's June 1997 Missouri 8 dB loop study includes a range of *** **HIGHLY SENSITIVE CONFIDENTIAL END CONFIDENTIAL** *** fiber feeder/DLC facilities, varying according to loop zone. *See* SWBT Response to Covad Data Request No. 1-43.

SWBT's approach to costing and pricing unbundled DSL-capable loops is the equivalent of charging a customer for a custom-built race car, delivering a stock-model Chevy and then demanding that the customer pay for modifications to make the Chevy competitive with an Indy car on the race track. A firm selling race cars would soon lose its customers to alternative suppliers if it routinely attempted such bait-and-switch tactics.

Q. HOW SHOULD THE COMMISSION ADDRESS THIS DOUBLE-RECOVERY ISSUE?

A. The Commission should reject SWBT's proposed nonrecurring charges for line "conditioning" on new entrants that purchase unbundled DSL-capable loops at TELRIC-based prices. Given that the recurring charge for unbundled DSL-capable loops already includes the cost of providing loops that are free of load coils and other DSL inhibitors, permitting an additional nonrecurring charge for line "conditioning" would be inconsistent with the TELRIC model that the Commission has adopted as the basis for pricing unbundled network elements.[32]

Q. HAS THE FCC PROVIDED ANY ADDITIONAL GUIDANCE CONCERNING THE MANNER IN WHICH THE INCUMBENTS

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[32] In addition, it is my understanding that, because modern network designs do not employ load coils or excessive bridged taps, incumbents such as SWBT typically reengineer older plant to eliminate those DSL inhibitors when growth requires an upgrade to the existing plant in any specific area. The incumbents' booked maintenance expenses capture the cost of such network upgrades; therefore, the adopted recurring TELRIC for the loop includes those costs to the extent that the Commission allowed SWBT to use embedded maintenance expenses to forecast its TELRIC costs.

SHOULD STUDY THE COST OF "CONDITIONED" DSL-CAPABLE LOOPS?

A. Yes, it does. Paragraphs 193 and 194 of the FCC's recent *UNE Remand Order* indicate generally that incumbents may recover the cost of line "conditioning." The FCC's modified pricing rules provide additional guidance as to the methodology the incumbents must follow in establishing the cost basis for any charges for "conditioning."

Specifically, §§ 51.319(a)(3)(B) and (C) of the modified pricing rules state that recovery of "conditioning" costs must be "in accordance with the Commission's forward-looking pricing principles promulgated pursuant to section 252(d)(1) of the Act" and "in compliance with rules governing nonrecurring costs in § 51.507(e)." Section 51.507(e) reads that "[s]tate commissions may, where reasonable, require incumbent LECs to recover nonrecurring costs through recurring charges over a reasonable period of time. Nonrecurring charges shall be allocated efficiently among requesting telecommunications carriers, and *shall not permit an incumbent LEC to recover more than the total forward-looking economic cost of providing the applicable element.*" (Emphasis added.)

Q. AS AN ECONOMIST, HOW DO YOU INTERPRET THESE GUIDELINES?

A. I understand these guidelines to mean that the FCC's TELRIC methodology applies to the study of DSL-capable loops in general, and "conditioning" costs in particular. The TELRIC methodology is the essence of the "forward-looking

pricing principles [that the FCC has] promulgated pursuant to section 252(d)(1) of the Act."[33]

Second, I understand these rules, read in combination, to mean that the incumbent must base both the recurring and nonrecurring costs for DSL-capable loops, including implicit or explicit costs for "conditioning," on the same forward-looking network design. As I noted above, it is literally impossible to determine whether the incumbent is recovering more than the total forward-looking economic cost of an element if the recurring and nonrecurring costs are not calculated for the same network design.

Q. DOES EITHER THE LANGUAGE IN ¶¶ 193 AND 194 OF THE *UNE REMAND ORDER* OR THE MODIFIED PRICING RULES REQUIRE THAT THE COMMISSION ESTABLISH A NONRECURRING CHARGE FOR "CONDITIONING"?

A. No, for at least two reasons. First, the FCC's pricing rules do not require a nonrecurring charge for "conditioning" even if this Commission finds that there are nonrecurring costs associated with such "conditioning." Instead, § 51.507(e) explicitly provides that a state commission may require an incumbent to recover any nonrecurring costs through recurring charges.

Second, the FCC's language does not explicitly consider the possibility that the incumbent's *recurring* costs and charges for unbundled loops will completely capture the forward-looking costs for providing loops free of load

[33] 47 C.F.R. § 51.319(a)(3)(B) (insert added for clarity).

coils, excessive bridged taps and other devices that would impede the provision of DSL-based services. As I have already noted, however, the modified pricing rules do stipulate that the incumbent may not recover more than the total forward-looking cost of providing the applicable element (in this case, a DSL-capable loop that is free of load coils and other DSL-impeding devices). Therefore, if the recurring cost study reflects all of the forward-looking cost of providing such a loop, the pricing rules that the FCC adopted for line "conditioning" in the *UNE Remand Order* would prohibit any additional nonrecurring charge for such "conditioning."

Q. HOW DO YOU RECONCILE YOUR OPINION THAT THERE MAY BE NO LINE "CONDITIONING" COSTS IN A FORWARD-LOOKING ENVIRONMENT WITH THE FCC'S STATEMENT AT ¶ 193 OF THE *UNE REMAND ORDER* THAT THE INCUMBENTS MAY INDEED INCUR LINE "CONDITIONING" COSTS AND SHOULD THEREFORE BE PERMITTED TO LEVY LINE "CONDITIONING" CHARGES?

A. Paragraph 193 of the *UNE Remand Order* states that:

> We agree that networks built today normally should not require voice-transmission enhancing devices on loops of 18,000 feet or shorter. Nevertheless, *the devices are sometimes present on such loops, and the incumbent LEC may incur costs in removing them.* Thus, under our rules, the incumbent should be able to charge for conditioning such loops.

(Footnotes deleted; emphasis added.) As an endorsement of separately stated "conditioning" charges, this statement is, to say the least, highly equivocal. The paragraph opens with a statement that voice-transmission enhancing devices are

not the norm in modern networks — which would be the basis for calculating forward-looking costs. The italicized language merely acknowledges the *possibility* that the incumbent will incur costs for removing voice-transmission enhancing devices on shorter loops.

The plain language of 47 C.F.R. § 51.319(a)(3)(B), which unambiguously requires that any line "conditioning" charges be based on forward-looking costs, and the FCC's previously adopted definition of the "efficient network configuration" to be assumed in a forward-looking cost study, are inconsistent with any reading of ¶ 193 as an endorsement of line "conditioning" charges based on the characteristics of the incumbent's *embedded* network. The FCC's previously adopted — and still applicable — pricing rules, which I cited in Section II above, contain the following language concerning the network design to assume in a forward-looking cost study:

> [t]he total element long-run incremental cost of an element should be measured based on the use of the most efficient telecommunications technology currently available and the lowest cost network configuration, given the existing location of the incumbent LEC's wire centers."[34]

The opening sentence of ¶ 193 of the *UNE Remand Order* acknowledges that the most efficient telecommunications technology currently available does not require "voice-enhancing transmission devices" for loops of 18,000 feet or shorter. Thus, the imposition of line "conditioning" charges for removal of such devices from loops of 18,000 feet or shorter would be inconsistent with the FCC's adopted TELRIC methodology.

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[34] 47 C.F.R. § 51.505(c)(1).

For all of these reasons, I find it implausible that the FCC intends for line "conditioning" costs to be based on the characteristics of the incumbent's existing network design, as the wording of ¶ 193 of the *UNE Remand Order* might seem to imply. I am informed by counsel that Covad intends to seek clarification from the FCC concerning the correct interpretation of ¶ 193 and the apparent conflict between that paragraph and the FCC's pricing rules.

Q. IS IT YOUR POSITION THAT SWBT SHOULD PROVIDE LINE "CONDITIONING" TO COVAD FOR FREE?

A. No. It is my position that SWBT's proposed recurring charge for DSL-capable loops also includes the full cost of providing "conditioned" loops. Thus, in recommending a $0 nonrecurring charge for loop "conditioning," I am merely proposing to eliminate the double compensation that SWBT seeks in this arbitration.

Q. HAS ANY OTHER INCUMBENT LOCAL EXCHANGE CARRIER CONCEDED THE NEED TO APPROPRIATENESS OF RECOVERING THE COSTS FOR LINE "CONDITIONING" SOLELY THROUGH THE RECURRING CHARGE FOR UNBUNDLED DSL-CAPABLE LOOPS?

A. Yes, in part. In August 1999, Bell Atlantic – New York ("BA-NY") filed a tariff proposal for various line "conditioning" charges. BA-NY's filing acknowledges that its own network design standards do not call for load coils on loops under 18,000 feet long; therefore, BA-NY's tariff proposal indicated that the company

would remove load coils at no charge (*i.e.*, no separate nonrecurring "conditioning" charge) from such loops.[35]

B. Even If One Assumes *Arguendo* That SWBT Should Impose Separate Nonrecurring Charges for Line "Conditioning" Based on Its Existing Network Architecture, the Charges that SWBT Has Proposed in this Arbitration Exceed the Efficient Cost of Performing Such Activities.

Q. HOW DID SWBT DEVELOP PROPOSED COSTS AND RATES FOR DSL LINE "CONDITIONING"?

A. SWBT's estimated costs for all types of line "conditioning" consist of time estimates times a labor rate for work in three different categories. *** **HIGHLY SENSITIVE CONFIDENTIAL**

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[35] *See* the amendments to its Tariff P.S.C. No. 916 that New York Telephone Company, d/b/a Bell Atlantic – New York, filed with the New York Public Service Commission on August 30, 1999.

Q. ASSUME FOR THE SAKE OF ARGUMENT THAT THE COMMISSION PERMITS SWBT TO CHARGE FOR LOOP "CONDITIONING," EVEN THOUGH SUCH "CONDITIONING" WOULD BE UNNECESSARY GIVEN THE FORWARD-LOOKING LOOP NETWORK DESIGN. GIVEN THIS ASSUMPTION, WOULD SWBT'S COST CALCULATIONS REFLECT REASONABLE AND EFFICIENT COSTS FOR "CONDITIONING"?

A. No, for several reasons.

- SWBT's reported costs are incorrect because they are not unit costs "divided by a reasonable projection of the sum of the total number of units of the element that the incumbent LEC is likely to provide to requesting telecommunications carriers and the total number of units of the element that the incumbent LEC is likely to use in offering its own services, during a reasonable measuring period." SWBT's proposed costs inappropriately assign the entire cost of upgrading multiple loops in its network to be DSL-capable to the first request by a new entrant for a DSL-capable loop.
- The costs that SWBT proposed for new entrants appear to be based on a provisioning scheme that is discriminatory and anti-competitive by design.
- Even if one were to calculate costs based on SWBT's embedded network design but assume efficient practices, SWBT's proposed "conditioning"

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[36] These inputs appear consistently throughout SWBT's various "conditioning" cost studies. The only documentation of their apparent source is a spreadsheet prepared on August 13, 1999, by Larry Wren, Area Manager, Engineering, that is inserted in the December 1999 Loop Conditioning Study that I reviewed in Kansas City.

prices would result in substantial over-recovery of costs for travel time and setup of the work site.

- SWBT's prices are structured in a manner that will result in double recovery if multiple forms of "conditioning" are required for the same loop.
- SWBT inappropriately bundled costs for "conditioning" and "deconditioning" loops into its proposed price for removing bridged taps. Moreover, SWBT's reported cost for restoring bridged taps is actually a cost for restoring the network to a non-forward-looking design.

Q. WHY DO SWBT'S PROPOSED COSTS AND PRICES FOR DSL LINE "CONDITIONING" INAPPROPRIATELY ASSIGN THE ENTIRE COST OF UPGRADING MULTIPLE LOOPS IN ITS NETWORK TO BE DSL-CAPABLE TO THE FIRST REQUEST BY A NEW ENTRANT?

A. SWBT's proposed charge includes all, or nearly all, of the costs that are necessary to convert multiple loops from an embedded design that does not support DSL-based services to a more forward-looking design. As Covad witness Mr. Donovan explains, once SWBT dispatches a technician to a manhole to condition loops by removing load coils, it is a standard and efficient practice to remove the load coil from at least an entire 25-pair bundle within a binder group[37] — regardless of the number of DSL-capable loops that Covad orders from that

[37] SWBT has acknowledged that the load coils it typically deploys "can load from 100 to 1500 pairs" and that, even in rural areas, the smaller load coils it deploys "can load from 2 to 25 pairs." SWBT Response to ACI Third Request for Information, Request No. 20, in Consolidated Texas ACI/Covad Arbitration.

binder group. If one assumes that SWBT uses an efficient practice, SWBT's proposed costs and cost recovery scheme, based on "conditioning" lines one at a time, would have the effect of making the first new entrant to order service using a particular binder group bear the total costs for providing SWBT with additional DSL-capable loops for its own retail DSL services or to supply an unbundled DSL loops to other new entrants.

This pricing methodology is unreasonable and is inconsistent with the FCC's TELRIC methodology, which requires that unit costs must be "divided by a reasonable projection of the sum of the total number of units of the element that the incumbent LEC is likely to provide to requesting telecommunications carriers and the total number of units of the element that the incumbent LEC is likely to use in offering its own services." SWBT's methodology inflates the cost for early market entrants by completely ignoring its own future demand for DSL-capable loops (and that of other new entrants).

Q. WHY ARE SWBT'S PROPOSED COSTS AND PRICES FOR DSL LINE "CONDITIONING" DISCRIMINATORY AND ANTI-COMPETITIVE?

A. SWBT states that when new entrants order service in a wire center that SWBT has not designed for its own ADSL deployment "the OSP Engineer will condition only the pair designated by the CLEC (UNE) and will not condition any other pairs, unless directed by the CLEC. If this is the case, the CLEC will be charged for each pair conditioned."[38] The inefficient methodology is an accurate

[38] SWBT Response to ACI Third Request for Information, Request No. 24, in Consolidated ACI/Covad Texas Arbitration.

description of the assumptions that SWBT used as the basis of its nonrecurring cost study for line "conditioning." In contrast, SWBT's description of the practice it will actually use when it "conditions" lines in areas where it plans to offer its own ADSL service follows a more efficient practice.

> In wire centers that SWBT had identified to deploy retail ADSL service, SWBT is currently identifying 50 pair binder groups (minimum) for ADSL deployment. SWBT will groom (if needed) those 50 pair binder groups by removing Bridge Tap or loads if necessary. These binder groups will carry not only SWBT's ADSL service, but also CLEC ADSL service.[39]

In sum, SWBT's actual practice when its own financial interests predominate is consistent with efficient practice, *i.e.*, "conditioning" at least 50 lines at a time when it is necessary to dispatch a technician. In contrast, SWBT would make new entrants pay the same cost or nearly the same cost for each line. This variation in practice for itself and for new entrants is discriminatory and anti-competitive.

Q. SWBT HAS CLAIMED THAT IT WILL NOT PROVIDE "CONDITIONING" (AT LEAST IN SOME CASES) FOR ITS OWN RETAIL ADSL SERVICES. HOW DOES THIS CLAIM AFFECT YOUR ANALYSIS OF THE POTENTIALLY DISCRIMINATORY EFFECTS OF LEVYING "CONDITIONING" CHARGES ON NEW ENTRANTS?

[39] SWBT Response to ACI Third Request for Information, Request No. 22, in Consolidated ACI/Covad Texas Arbitration.

A. I am aware that SWBT has sometimes claimed that it will not, for example, incur costs to remove load coils for its planned retail ADSL service.[40] Given that current policy, it is unlikely that SWBT will be the first DSL competitor to offer service using loops that require "conditioning" in a given binder group. SWBT's decision to delay providing its retail DSL service to customers with longer loops does not reduce the likelihood that SWBT will eventually benefit from the increase in DSL-capable loops for those customers.[41] Therefore, although Covad may force SWBT to "condition" loops in certain areas sooner that it would otherwise have done so, it is highly unlikely that SWBT will not also utilize those loops to meet demand for its own retail services (or those of its retail affiliate) in the long run, particularly in light of SBC's Project Pronto, which is a "$6 Billion Initiative To Transform It [SBC] Into America's Largest Single Broadband Provider."[42]

Q. WHY DO YOU SUGGEST THAT, IF ONE ASSUMES EFFICIENT PRACTICES, SWBT'S PROPOSED PRICES FOR NEW ENTRANTS WOULD SUBSTANTIALLY OVER-RECOVER THE COSTS IT WOULD

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40 In its response to ACI's Second Information Request, Request No. 25, in the Texas Consolidated ACI/Covad Arbitration, SWBT states "SWBT does not offer its ADSL based services in areas that require loading (loading starts with plant that is 18,000 feet or more in length). Therefore SWBT does not remove load coils for a retail service."

41 Indeed, as the local exchange market becomes more competitive, the lag between the time when competitors such as Covad are prepared to offer services and the time that SWBT begins to market similar options to the same customers should decrease.

42 SBC Communications Inc. News Release, October 18, 1999. *See also* www.sbc.com.

INCUR FOR "CONDITIONING" LOOPS EVEN GIVEN ITS EMBEDDED NETWORK DESIGN?

A. As I discussed above, the efficient practice that SWBT employs where it plans to provide ADSL requires dispatching a technician once to "condition" 50 or more lines. In contrast, the cost study on which SWBT would base new entrant prices assumes that "conditioning" will always be done one line at a time. For each location at which SWBT must perform a "conditioning" activity, SWBT's price for "conditioning" an "initial" loop includes costs to *** **HIGHLY SENSITIVE CONFIDENTIAL**

END CONFIDENTIAL *** in addition to performing the actual removal of the load coil, bridged tap or repeater for a particular line.[43] Only when a new entrant orders one or more additional lines on the same cable at the same time does SWBT offer any price break for the reduction in per-unit costs associated with "conditioning" multiple lines. In contrast, given the efficient practice that SWBT actually uses where it provides ADSL, all of those setup costs would occur only

[43] The task descriptions in all of SWBT's "conditioning" cost studies are largely identical. This summary relies primarily on SWBT's August 1999 cost study, provided in response to Covad Data Request No. 1-6, which contains a somewhat more detailed description of the tasks than other study versions.

once and would be shared across the total ADSL lines that are eventually installed among the 50 or more preconditioned lines.

Furthermore, as Covad witness Mr. Donovan explains further in his testimony, SWBT's time estimates for all "conditioning" activities other than the actual removal of the load coil, bridged tap or repeater are mutually inconsistent and overstated. SWBT's August 1999 "conditioning" cost studies confirm that all three types of "conditioning" involve *identical* activities, except for the actual removal of one load coil, bridged tap or repeater at one location. SWBT's cost support for its proposed price for "conditioning" an "additional" loop (same location, cable and due date) should reflect only the time necessary for the actual removal of the load coil, bridged tap or repeater. Thus, if one "backs out" SWBT's task time for "conditioning" an "additional" loop, the remaining total Cable Splicer time shown in SWBT's cost study for removing load coils, bridged taps and repeaters should be identical. That is far from being the case. Instead, SWBT's times for the "residual" tasks when removing bridged taps are only about half of the times for the identical tasks when removing load coils and repeaters.[44] Mr. Donovan's review confirms that the error in SWBT's cost study is the inclusion of excessive setup times for the removal of load coils and repeaters, and not insufficient setup times for removal of bridged taps. Thus, SWBT's "conditioning" cost studies for removal of load coils and repeaters do not reflect efficient work times for fieldwork activities.

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[44] The "residual" task times for the travel and setup activities per location are *** **HIGHLY SENSITIVE CONFIDENTIAL . END CONFIDENTIAL** ***

A similar analysis reveals significant inconsistencies and overstatements of task times in the engineering work order portion of the "conditioning" cost studies. SWBT assumes only *** **HIGHLY SENSITIVE CONFIDENTIAL**

END CONFIDENTIAL *** to develop similar work orders to remove or restore one bridged tap or to remove one repeater. Similarly, SWBT assumes less drafting clerk time to post the results of the work orders for load coils than to perform the same task for bridged taps and repeaters. Again, Mr. Donovan's review confirms that the error is excessive task times for the engineering work order portion of the bridged tap and repeater removal studies, rather than insufficient task times for the comparable portion of the load coil removal study.

Q. WHY WOULD SWBT'S PROPOSED PRICE STRUCTURE RESULT IN DOUBLE RECOVERY OF COSTS WHEN MULTIPLE FORMS OF "CONDITIONING" ARE REQUESTED AT THE SAME TIME?

A. The SWBT study is too "bundled" to accurately reflect even its embedded costs, particularly in situations in which more than one form of line "conditioning" might be required. For example, it is unlikely that the time to develop a work order would double (if it increased at all) in a situation in which both load coils and bridged taps must be removed from the same binder group. Therefore, adding the two costs together would overstate costs. Indeed, although SWBT lists the prices for multiple forms of "conditioning" as "TBD" in its Response to Covad's Arbitration Petition, the cost studies that I reviewed in Kansas City

reveal that SWBT has already prepared estimates of the costs of performing two forms of "conditioning" on the same line, and that SWBT acknowledges at least some time saving associated with the work order portion of the process.

Q. IS SWBT'S PROPOSAL TO BUNDLE TOGETHER THE COST FOR REMOVING AND RESTORING BRIDGED TAPS REASONABLE?

A. No. An initial problem is that SWBT's assumption that it must restore bridged taps is not only inconsistent with SWBT's forward-looking network design, it is backward-looking. SWBT's Missouri "conditioning" cost study reflects the same methodology as its Texas cost study. In Texas, SWBT admitted that its presumption that 34% of all bridged taps removed will be reinstalled later is based on SWBT's contention that 34% percent of its embedded loop plant is "not interfaced."[45] SWBT then attempted to justify its re-installation cost for bridged taps by explaining:

> An interface (*i.e.*, Feeder Distribution Interface, or FDI) allows the feeder facility, which is the portion from the central office to the FDI, to be cross connected to the distribution facility, which is the portion from the FDI to the customer's premises. If a facility is not interfaced, then bridgtaps [*sic.*] are required to extend the feeder to the customer's premises.[46]

As opposed to the design that SWBT describes, loop plant with an FDI in place is the standard assumption in every forward-looking cost study that I have seen a local exchange company produce, including the Missouri 8 dB loop cost study. Therefore, it appears that SWBT is suggesting that its competitors should

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[45] SWBT Response to ACI Third Request for Information, Request No. 28, in the Consolidated ACI/Covad Texas Arbitration.

not only pay nonrecurring charges that are not based on forward-looking costs, but that competitors should also pay to restore an embedded design that cannot be used to provide advanced services.

In addition, the Commission should also reject SWBT's proposal to bundle disconnection and reconnection costs for bridged taps. Such bundling is incompatible with the goal of establishing costs and prices that accurately reflect cost causation. At the time a new entrant requests that SWBT remove bridged taps from a particular line to make that line DSL-capable, the new entrant does not cause SWBT to incur any costs for replacing the bridged tap. In fact, there are several scenarios in which SWBT may never incur such costs: the new entrant may continue using that DSL-capable loop for its entire economic life; SWBT or another DSL provider may use that same loop to provide DSL services after the original entrant ceases to do so; SWBT may cease to use that loop to provide POTS services, replacing it with a loop using fiber feeder.

Even if SWBT did restore the line to its original condition when the new entrant ceased to use SWBT's facilities to provide DSL service, there is still substantial uncertainty about the length of time that will elapse between the order for DSL capability on that loop and the disconnection of the new entrant's DSL service. There is no good way to determine the average period over which the new entrant will want the DSL capability, and therefore no accurate method for determining the net present value of the blend of disconnection and reconnection costs. Yet, such a net present value calculation (which SWBT did not perform) is

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[46] *Id.*

an essential step in calculating an accurate upfront nonrecurring cost for a blended nonrecurring cost and charge. SWBT's failure to calculate the net present value of reconnect costs makes its nonrecurring cost estimates too high, even if they were correct in all other respects.

Q. IF, CONTRARY TO YOUR RECOMMENDATION, THE COMMISSION ALLOWS SWBT TO CHARGE FOR "CONDITIONING," CAN IT ALLEVIATE THE ERRORS AND ANTI-COMPETITIVE EFFECTS OF SWBT'S PROPOSALS TO BRING THOSE COSTS AND PRICES CLOSER TO COMPLIANCE WITH TELRIC?

A. In part. As I discussed above, allowing SWBT to levy any additional nonrecurring charge for "conditioning" loops to provide DSL service is fundamentally inconsistent with TELRIC. In addition, as I discussed above, the data that SWBT presented in this proceeding are not sufficient to allow correction of several problems. Indeed, the basis for SWBT's costs is so uncertain that the Commission would be fully justified to reject them on that basis alone. If, however, the Commission does allow SWBT to charge for "conditioning," then it should, at a minimum, require the following corrections to the SWBT calculations.

First, the Commission should modify SWBT's underlying costs to reflect the unit cost per "conditioned" loop across a reasonable estimate of long-run demand. To do so, the Commission needs to decide the total number of loops that would typically be "conditioned" at one time given an efficient approach. Given

that SWBT's practice for its own services is typically to condition a minimum of 50 pairs at one time, 50 is a reasonable, nondiscriminatory assumption.

Second, the Commission should adjust SWBT's task times to reflect efficient work processes. The testimony of Covad witness Mr. Donovan describes the kind of task time adjustments needed to accomplish this objective.

Third, the Commission should eliminate SWBT's costs for restoral of bridged taps.

Q. HAVE ANY REGULATORS ADOPTED SIMILAR ADJUSTMENTS TO SWBT'S "CONDITIONING" COST STUDIES?

A. Yes, the Texas Arbitrators adopted similar adjustments for efficient "conditioning" of multiple loops at a time. The Texas Award describes their reasoning as follows:

> The Arbitrators also modify the cost studies to reflect the costs of efficient conditioning. SWBT states that it does not intend to condition more loops than the CLEC requests. For example, if a CLEC requests conditioning on one loop in a binder group of 50 pairs, SWBT would dispatch a technician to condition only the single loop. However, SWBT's more efficient internal practice is to condition at least 50 loops at a time when it is necessary to dispatch a technician. Therefore, the Arbitrators modify SWBT's xDSL conditioning cost study to reflect the more efficient practice of conditioning several loops, or entire binder groups, when a technician is dispatched and the cable splice is entered. Because of the smaller sized binder groups used in longer cabling, the Arbitrators find an appropriate unit size for the purpose of calculating conditioning charges for loops at or in excess of 18,000 feet in length to be 25. The Arbitrators use a unit size of 50 when calculating the charges for removing load coils, bridged taps, and/or repeaters on xDSL loops greater than 12,000 feet in length but less than 18,000 feet in length.[47]

[47] Award at 98 (footnotes omitted).

The Texas Arbitrators also rejected SWBT's attempt to charge competitors for reinstallation of bridged taps, stating that "based upon the evidence in the record, that the CLEC should not be considered the appropriate 'cost causer' for re-installing bridged taps."[48]

V. ISSUE A(7) - DSL LOOP CHARGES: SWBT'S PROPOSED RECURRING CHARGE FOR A TWO-WIRE "ISDN" TYPE UNBUNDLED LOOP IS UNREASONABLY HIGH.

Q. IS SWBT'S PROPOSED RECURRING CHARGE FOR A TWO-WIRE ISDN-TYPE LOOP REASONABLE?

A. No. SWBT's proposed cost and its "cost-based" price for a two-wire digital loop are *substantially* higher, both in an absolute sense and relative to the adopted costs for basic analog loops, than other cost-based prices for comparable elements of which I am aware. Currently, SWBT is proposing basic loop prices of $12.71, $20.71, $33.29 and $18.23 for Zones 1 through 4, respectively. SWBT's proposed rates for the corresponding digital, ISDN-type loop prices are $25.79, $42.10, $58.44 and $41.44 for Zones 1 through 4, respectively.[49] SWBT's ISDN-type loop thereby reflects an increment ranging from 76% to 127% over its basic loop price. Those results contrast sharply with results from other jurisdictions with final costing or pricing decisions with which I am familiar:

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[48] *Id.* at 97 (footnote omitted).

[49] All representations regarding SWBT's proposed prices are based on Exhibit A to SWBT's December 3, 1999, Answer to the Petition of Covad for Arbitration of Rates, Terms, Conditions and Related xDSL Loops.

- The recently adopted TELRIC data for SWBT's sister company, Pacific Bell, indicates the price of an ISDN-type unbundled loop is only $4.44 or 38% higher than the $11.70 cost of basic loops.[50] Likewise, in its prior arbitration agreements, Pacific provided basic loops for $12.92 and ISDN-BRI loops for $17.25, a 33.5% increment over the basic loop price.
- SWBT's newer affiliate, Ameritech Illinois, provides basic loops at prices that range from $2.59 to $7.07 to $11.40, with corresponding digital loop prices of $2.71, $8.88 and $13.68.[51] Ameritech Illinois' ISDN-type loop price thereby reflects an increment ranging from 5% to 26% over its basic loop price.
- Pennsylvania adopted basic loop prices for Bell Atlantic that range from $11.52 to $23.11 in four density-related groups. The corresponding ISDN-BRI prices adopted for the same density groups range from $13.16 to $24.74. The difference between the adopted prices for basic and ISDN-BRI loops in Pennsylvania ranges from a maximum of 14% down to 7%, across all density zones.[52]
- New Jersey adopted basic loop prices for Bell Atlantic that range from $11.95 to $20.98 in three density-related groups. The corresponding

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50 California Public Utilities Commission, Decision 99-11-050, dated November 18, 1999, Docket Nos. R.94-04-003/I.93-04-002, at Appendix A.

51 Interconnection Agreement under Sections 251 and 252 of the Telecommunications Act of 1996, Dated as of August 18, 1998, by and between, Ameritech Information Industry Services and Accelerated Connections, Inc., Pricing Schedule.

52 Bell Atlantic filing in compliance with Pennsylvania Public Utility Commission Order and Opinion in Docket A-310203F0002, *et al.*, entered August 7, 1997.

ISDN-BRI prices adopted for the same density groups range from $15.02 to $25.12. The difference between the adopted prices for basic and ISDN-BRI loops for Bell Atlantic in New Jersey ranges from a maximum of 26% down to 20%, across all density zones.[53]

- Delaware adopted basic loop prices for Bell Atlantic that range from $9.87 to $17.13 in three density-related groups. The corresponding ISDN-BRI prices adopted for the same density groups range from $11.45 to $18.71. The difference between the adopted prices for basic and ISDN-BRI loops for Bell Atlantic in Delaware ranges from a maximum of 16% down to 9%, across all density zones.[54]
- It is also my understanding that other state commissions in the US West and Ameritech regions have found that digital or BRI loops should be priced *identically* to basic analog loops.

Although I would not expect costs or prices to be identical between Missouri and any other state, I also see no credible explanation for such large discrepancies when all of these incumbent prices are based on the cost of providing ISDN loops based using an efficient, forward-looking network design and efficient, forward-looking operating practices. In addition, even if the *absolute* cost of loops in Missouri were higher than in other states because of differences in terrain, population density or other state-specific factors, I would

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[53] State of New Jersey Board of Public Utilities, Telecommunications Decision and Order in Docket No. TX95120631, December 2, 1997, Attachment 1 at 1.

expect those state-specific factors to have comparable effects on the cost for both analog and digital loops and would therefore expect the *relative* costs of such loops to be similar between states.

Q, WHY IS SWBT'S PRICE FOR THE ISDN-TYPE UNBUNDLED LOOP SO SUBSTANTIALLY OUT OF LINE WITH PRICES IN OTHER JURISDICTIONS?

A. According to SWBT, most of the substantial difference between SWBT's reported basic and ISDN-type unbundled loop costs is attributable to *** **HIGHLY SENSITIVE CONFIDENTIAL**

.[55] **END CONFIDENTIAL** *** The testimony of Covad witness Mr. Donovan demonstrates that this investment is excessively high and that, more generally, SWBT's cost analysis does not reflect the prices and capabilities of the most efficient, forward-looking ISDN-related electronics equipment currently available.

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[54] State of Delaware Public Service Commission, Findings and Recommendations of the Hearing Examiners on Remand from the Commission, Docket No. 96-324, May 9, 1997, Attachment A.

[55] SWBT Response to Covad Data Request No. 1-51.

Q. WHY IS IT IMPORTANT FOR ADVANCED SERVICE COMPETITION THAT THE COMMISSION NOT ALLOW SWBT TO CHARGE ABOVE-COST PRICES FOR ISDN-TYPE LOOPS?

A. SWBT's proposed price for unbundled ISDN-type loops raises a pressing concern relative to competition with its retail ISDN-BRI service. According to SWBT's Internet site, SWBT charges a total of $53.64 for its DigiLine(SM) ISDN service (its retail BRI service) in a package that includes 600 minutes of usage, loop electronics, the switch port, marketing cost, *etc.* Removing SWBT's price for an unbundled BRI line port, which is $4.97 (based on the Attachment A-2 of the December 11, 1996, Arbitration Order in Case Nos. TO-97-40 and TO-97-67), leaves a total of $48.67, or an amount less that the cost of the loop alone in SWBT's proposed zone 3. Therefore, it would be impossible to provide service at all on that zone without losing money. Even in Zone 2, to offer a price-comparable service without losing money, competitors would then need to cover their retail costs, usage costs, cross-connection costs, collocation costs, transport costs, *etc.*, within the remaining $6.57 or 12% margin.

Given SWBT's own description of this service as turning one's existing "lumbering turtle" of a phone line into "a cheetah-fast digital line," SWBT's retail BRI service will be a competitive alternative for customers for whom SWBT (or its affiliates) will not provide ADSL. Therefore, it appears likely that SWBT's extremely high cost for digital loops will cause a price squeeze in that market that will harm competition in Missouri.

Q. HOW CAN THE COMMISSION RESOLVE THIS ISSUE?

A. On an interim basis, the Commission should adopt a proxy cost for the two-wire digital loop. Based on the comparative data that I provided above, it appears that SWBT's affiliate, Pacific Bell, has a relatively high cost ratio for ISDN versus analog loops. Therefore, a conservative approach would be to apply Pacific's 38% increment to the adopted cost for a basic two-wire digital loop in Missouri. Using that approach, the interim price for unbundled digital loops would be $17.54 in Zone 1, $28.58 in Zone 2, $45.94 in Zone 3 and $25.16 in Zone 4. This proxy cost should remain in effect until SWBT provides a properly documented cost study for two-wire digital loops and all affected parties have an opportunity to review and comment on those costs.

Q. SWBT CONTENDS THAT THE ISDN-TYPE UNBUNDLED LOOP PRICE IS EFFECTIVELY A NON-ISSUE BECAUSE THE COMMISSION DETERMINED A RATE FOR THAT ELEMENT IN THE AT&T ARBITRATION, CASE NO. TO-97-40. WOULD A FINDING IN THIS ARBITRATION BASED ON THAT ARGUMENT BE REASONABLE OR COMPLY WITH THE ACT?

A. No. For consumers to benefit from advanced services competition, it is imperative that the Commission insure that reasonable, cost-based prices are available for the related network elements and services. Moreover, the Act requires cost-based prices. Therefore, to the extent that parties such as Covad present the Commission with new evidence establishing that a previously adopted cost is inaccurate, the Commission must act on that information to maintain

compliance with the Act — as well as to bring the greatest potential economic benefit from competition to Missouri.

I have reviewed the loop-related portions of the Commission's Arbitration Order in Case No. TO-97-40 and note that the Commission does not even appear to have addressed SWBT's investments for BRI-related electronics as an issue in that Order. That ISDN-specific investments were overlooked as a topic for scrutiny is not surprising given the hundreds of critical issues that parties and the Commission did address in that proceeding. Given the importance of *digital* loop rates for the provisioning of advanced telecommunications services, the Commission should not, however, continue to allow SWBT to base its price on unexamined investment data. This is particularly true given that SWBT's proposed cost for digital loops, on its face, appears to be unreasonably high.

Q. HAS ANY OTHER COMMISSION REEXAMINED SWBT'S ISDN-TYPE UNBUNDLED LOOP COST BASED ON EVIDENCE PRESENTED BY COVAD?

A. Yes. The Texas Arbitration Award rejected the similar SWBT position that the Texas Commission could not reexamine SWBT's reported cost for the ISDN-type unbundled loop because the Commission had previously adopted an ISDN loop cost in a larger, all-element proceeding. In that proceeding, the Arbitrators found "that reliance on the Mega-Arbitration UNE loop rates is not appropriate, particularly for digital xDSL loops." The Texas Arbitration Award went on to

adopt, on an interim basis, Covad's proposed price for ISDN-type unbundled loops based on the same methodology that I have proposed in this arbitration.[56]

VI. ISSUE A(8) - CROSS CONNECT CHARGES: SWBT'S PROPOSED CHARGES FOR A COLLOCATION CROSS CONNECTION (PARTICULARLY ITS PROPOSED NONRECURRING CHARGES) ARE UNREASONABLY HIGH.

Q. WHAT IS THE BASIS FOR SWBT'S PROPOSED PRICES FOR THE CROSS-CONNECT ELEMENT?

A. According to SWBT's December 3, 1999, Answer to Covad's Petition, SWBT's proposed shielded cross-connect prices "are the same as those rates agreed upon with BroadSpan and Sprint."[57] SWBT does not indicate the basis for the prices agreed on in those negotiations. Moreover, SWBT's proposed prices for the shielded cross connect do not seem to correspond in any way to the cost study that SWBT provided for my review in Kansas City. In addition, it is not yet entirely clear what tasks SWBT intends to include in its cross-connection element as opposed to its unbundled loop nonrecurring cost.

In a disputed arbitration, the mere assertion that SWBT's proposal was agreed to by other carriers, without providing access to the underlying facts or other basis supporting that agreement, is not sufficient. Given what SWBT has furnished, I can only respond on Covad's behalf based on the appearance of SWBT's proposals.

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[56] *See* Public Utility Commission of Texas, Arbitration Award, Dockets Nos. 20226 and 20272, November 30, 1999, at 86-88.

Q. DO SWBT'S PRICES APPEAR REASONABLE?

A. No. SWBT's proposed recurring charge is within the "ballpark" of the cross-connection prices I have observed elsewhere. Presuming, however, that SWBT's nonrecurring costs and its recurring costs are supposed to be for the same service — a cable connecting SWBT's main distribution frame and a collocation cage — its proposed nonrecurring charge per cross-connection does not appear reasonable.

Q. WHY DO SWBT'S PROPOSED NONRECURRING CHARGES FOR CROSS-CONNECTIONS APPEAR HIGH?

A. The cross-connection provided in conjunction with collocation consists of the connection of large cables that run from the SWBT main distribution frame to a collocator's cage. Cross-connection is typically provided by pulling, connecting and testing several cables with substantial capacity at one time. That scenario is precisely what SWBT assumed in the *recurring* cost study that I reviewed in Kansas City. SWBT's relatively high proposed nonrecurring charge on a per cross-connection basis therefore makes no sense as that charge should reflect the cost of installing larger "pipes" or multi-pair cable from the distribution frame to a collocation area. SWBT will not actually need to install anything between the distribution frame and collocation cage on a nonrecurring, per circuit basis. Alternatively, if SWBT's intention is to reflect the cost of the jumper wire and line testing that are done, at a completely separate point in time when individual

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[57] SWBT's other proposed cross-connection prices come from the arbitration decision in Case Nos. TO-97-40 and TO-98-115.

circuits are tested, then it would appear that the combined nonrecurring charge for the unbundled loop ($26.07) plus the cross-connection ($19.96) is too high.

Q. WHAT DATA DO YOU RECOMMEND THAT THE COMMISSION USE AS THE BASIS FOR SETTING COST-BASED PRICES FOR THE CROSS-CONNECTION ELEMENT?

A. The Commission cannot place any reliance on SWBT's unsupported nonrecurring pricing proposal. Therefore, I recommend that the Commission develop a cross-connection nonrecurring charge by averaging prices recently adopted in relevant jurisdictions. Specifically, as a conservative high end, I recommend that the Commission start with the nonrecurring charge that the Texas arbitrators adopted in the SWBT-Covad Texas arbitration ($17.29) for a shielded cross-connection and average that number with the nonrecurring charge that the California Public Utilities Commission recently adopted for SWBT's affiliate, Pacific Bell, for a basic voice-grade cross-connection ($0.16). This approach would give the Commission a reasonable proxy estimate for a forward-looking nonrecurring charge for the cross-connections of $8.73.

In the long run, the Commission should take a fresh look at SWBT's costs based on a consideration of the effort that might be required to efficiently install a cable distributed over the multiple pair capacity of that facility. Based on that reassessment, the Commission should establish a nonrecurring cross-connection charge that more reasonably reflect the nature of the functions that SWBT performs on Covad's behalf.

Q. DOES THAT CONCLUDE YOUR TESTIMONY AT THIS TIME?

A. Yes, it does. I may, however, submit rebuttal testimony.

VERIFICATION

STATE OF CALIFORNIA)
) SS:
COUNTY OF ALAMEDA)

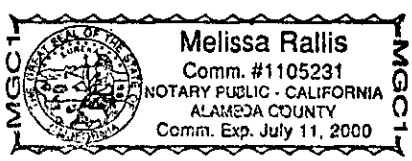
Comes now Terry L. Murray, being of lawful age and duly sworn, who states that she is the witness who has provided the foregoing testimony, that she has prepared and read the foregoing testimony, and that the information contained therein is true and accurate to the best of her knowledge and belief.

Terry L. Murray

Subscribed and sworn to before me on this 6th day of January, 2000.

Melissa Rallis
Notary Public

My commission expires: July 11 2000.



Terry L. Murray

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

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

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

California Public Utilities Commission
June 1984 - March 1990

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

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

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

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

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

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

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

TESTIMONY

California Department of Insurance

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

California Public Utilities Commission

- A.98-12-005, In the Matter of the Joint Application of GTE Corporation ("GTE") and Bell Atlantic Corporation ("Bell Atlantic") to Transfer Control of GTE's California Utility Subsidiaries to Bell Atlantic Which Will Occur Indirectly as a Result of GTE's Merger with Bell Atlantic, 6/7/99.
- A.99-03-047, In the Matter of the Petition by Pacific Bell (U 1001 C) for Arbitration of an Interconnection Agreement with Metropolitan Fiber Systems/ Worldcom Technologies, Inc. (MFS/Worldcom) Pursuant to Section 252(b) of the Telecommunications Act of 1996, 4/16/99, 5/24/99.
- A.98-05-038, In the Matter of the Application of Pacific Bell for Authority for Pricing Flexibility and to Increase Certain Operator Services, to Reduce the Number of Monthly Directory Assistance Call Allowances, and Adjust Prices for Four Centrex Optional Features, 11/17/98.
- A.98-06-052, In the Matter of the Petition of PDO Communications, Inc. for Arbitration Pursuant to Section 252 of the Federal Telecommunications Act of 1996 to Establish an Interconnection Agreement with Pacific Bell, 8/14/98.
- Petition for Arbitration of MCI Telecommunications Corporation for an Interconnection Agreement with GTE California, Inc., 9/96.
- A.96-04-038, In the Matter of the Joint Application of Pacific Telesis Group and SBC Communications, Inc. for SBC to Control Pacific Bell, 9/30/96.

- A.93-03-054, Application to Modify Diablo Canyon Pricing and Adopt a Customer Electric Rate Freeze in Compliance with Decision 95-12-063, 9/9/96.
- R.93-04-003/I.93-04-002, Rulemaking and Investigation on the Commission's Own Motion to Govern Open Access to Bottleneck Services and Establish and Framework for Network Architecture Development of Dominant Carrier Networks, 6/14/96, 7/10/96, 3/18/97, 12/19/97, 2/11/98, 4/8/98, 4/27/98, 5/1/98, 6/5/98, 12/18/98, 1/11/99, 2/8/99.
- I.95-04-044, Order Instituting Investigation on the Commission's Own Motion into Competition for Local Exchange Service, 10/2/95, 10/9/95, 12/95.
- I.94-04-032, Order Instituting Investigation on the Commission's Proposed Policies Governing Restructuring California's Electric Services Industry and Reforming Regulation, 12/8/94.
- Application Nos. 93-05-008 *et al.*, In the Matter of the Application of Sierra Pacific Power Company to Authorize a Return on Equity for Calendar Year 1994 Pursuant to Attrition Rate Adjustment Mechanism, 8/93.
- Application Nos. 92-05-002 and 92-05-004, Application of GTE California Incorporated for Review of the Operations of the Incentive-Based Regulatory Framework Adopted in Decision 89-10-031, 5/93, 7/93.
- Case No. 91-12-028, The City of Long Beach, in its Proprietary Capacity and as Trustee for the State of California, Complainant, vs. Unocal California Pipeline Company, a Unocal Company, Defendant, 5/15/93.
- I.87-11-033 *et al.*, In the Matter of Alternative Regulatory Frameworks for Local Exchange Carriers (Phase III, Implementation and Rate Design), 9/23/91, 12/16/91, 1/17/92.
- General freight deregulation proceeding, 10/88.
- I.86-10-001, Risk, Return and Ratemaking, 3/88.
- Southwest Gas General Rate Case, 8/85.
- Application No. 85-01-034, Pacific Bell Test Year 1986 General Rate Case, 4/22/85.
- CP National South Lake Tahoe Gas General Rate Case, 12/84.

Colorado Public Service Commission

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

Connecticut Department of Public Utility Control

- Petition for Arbitration of MCI Telecommunications Corporation for an Interconnection Agreement with The Southern New England Telephone Company, 12/96.
- Docket Nos. 95-06-17 *et al.*, Application of The Southern New England Telephone Company for Approval to Offer Unbundled Loops, Ports and Associated Interconnection Arrangements, 9/8/95.

Delaware Public Service Commission

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

District of Columbia Public Service Commission

- Formal Case No. 962, In the Matter of the Implementation of the District of Columbia Telecommunications Act of 1996 and Implementation of the Telecommunications Act of 1996, Order No. 10916, 3/24/97, 5/2/97, 5/9/97.

Federal Communications Commission

- File No. E-98-12, MCI Telecommunications Corp. and MCImetro Access Transmission Services, Inc., Complainants, v. Bell Atlantic Corp., Defendant, 12/19/97, 3/25/98.
- CC Docket No. 94-1, In the Matter of Price Cap Performance Review for Local Exchange Carriers, 6/29/94.
- W-P-C 6913 *et al.*, In re the Matter of the Application of Pacific Bell for Authority Pursuant to Section 214 of the Communications Act of 1934, and Section 63.01 of the Commission's Rules and Regulations to Construct and Maintain Advanced Telecommunications Facilities to Provide Video Dialtone Services to Selected Communities.

Florida Public Service Commission

- Docket No. 990649-TP, In re: investigation into the pricing of unbundled network elements, 8/11/99, 9/10/99, 10/15/99.
- Docket No. 930424-EI, In re: Request for Approval of Proposal for Incentive Return on Demand-Side Management Investments by Florida Power Corporation, 11/22/93.
- Docket No. 93-444-EI, In re: Request for Approval of Proposal for Revenue Decoupling by Florida Power Corporation, 11/22/93.

Hawaii Public Service Commission

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

Illinois Commerce Commission

- Petition for Arbitration of MCI Telecommunications Corporation for an Interconnection Agreement with Ameritech - Illinois, 12/96.

Kansas Corporation Commission

- Docket No. 190, 192-U, In the Matter of a General Investigation into Competition within the Telecommunications Industry in the State of Kansas, 11/14/94.

Maryland Public Service Commission

- Case No. 8820, In the Matter of the Investigation into Affiliated Activities, Promotional Practices and Codes of Conduct of Regulated Gas and Electric Companies, 10/1/99, 10/26/99, 12/10/99.
- Docket No. 8797, In the Matter of The Potomac Edison Company's Proposed: (a) Stranded Cost Quantification Mechanism; (b) Price Protection Mechanism; (c) and Unbundled Rates, 1/26/99.
- Docket No. 8795, In the Matter of Delmarva Power and Light Company's Proposed Stranded Cost Quantification Mechanism, Price Protection Mechanism, and Unbundled Rates, 12/28/98.

- Docket No. 8794, In the Matter of Baltimore Gas and Electric (BGE)'s Proposed Stranded Cost Quantification Mechanism, Price Protection Mechanism, and Unbundled Rates, 12/22/98, 7/23/99, 8/3/99.
- Docket No. 8786, In the Matter of the Investigation of Non-Recurring Charges for Telecommunications Interconnection Service, 5/27/98, 11/16/98, 12/18/98.
- Docket No. 8731, Phase II, In the Matter of the Petitions for Approval of Agreements and Arbitration of Unresolved Issues Arising Under §252 of the Telecommunications Act of 1996, 3/7/97.
- Case No. 8731, In the Matter of the Petitions for Approval of Agreements and Arbitration of Unresolved Issues Arising under Section 252 of the Telecommunications Act of 1996, 10/96.
- Case No. 8715, In the Matter of the Inquiry into Alternative Forms of Regulating Telephone Companies, 11/95, 4/1/96.

Massachusetts Department of Telecommunications and Energy

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

Michigan Public Service Commission

- Case No. U-10755, In the Matter of the Application of Consumers Power Company for Authority to Increase Its Rates for the Sale of Natural Gas and for Other Relief, 6/9/95.
- Case No. U-10685, In the Matter of the Application of Consumers Power Company for Authority to Increase Its Rates for the Sale of Electricity, 3/29/95, 5/5/95.
- Case No. U-10647, In the Matter of the Application of City Signal, Inc., for an Order Establishing and Approving Interconnection Arrangements with Michigan Bell Telephone Company, 8/5/94, 11/7/94, 11/30/94.

Nevada Public Service Commission

- Docket No. 96-9035, In re a Petition by the Regulatory Operations Staff to Open an Investigation into the Procedures and Methodologies that Should Be Used to Develop Costs for Bundled or Unbundled Telephone Services or Service Elements in the State of Nevada, 5/8/97, 5/23/97.

New Jersey Board of Public Utilities

- Docket No. TX95120631, Notice of Investigation into Local Exchange Competition for Telecommunications Services, 8/30/96, 12/20/96.

New York Public Service Commission

- Case No. 98-C-1357, Proceeding on Motion of the Commission to Examine New York Telephone Company's Rates for Unbundled Network Elements, 9/23/99, 10/18/99, 10/22/99.
- Case Nos. 94-E-0098 *et al.*, Niagara Mohawk Fuel Adjustment Clause Target and S.C. 6 Update Filing, 11/17/95.
- Case Nos. 93-E-0912 *et al.*, Proceeding on Motion of the Commission to Review Long-Run Avoided Cost Estimation Policies and Methods, 5/10/95, 5/31/95.
- Central Hudson Gas & Electric Company General Rate Case
- Niagara Mohawk Power Corporation General Rate Case

- Case Nos. 91-E-0863 *et al.*, New York State Electric & Gas Corporation General Rate Case, 1/92.
- Case Nos. 91-E-0765 *et al.*, Rochester Gas & Electric Corporation General Rate Case, 11/91.
- Case No. 91-E-0506, Central Hudson Gas & Electric Company General Rate Case, 9/91, 10/91.
- Case Nos. 29327 *et al.*, Niagara Mohawk General Rate Case, 3/91.
- Docket No. 89-E-176, In the Matter of the Proceeding on Motion of the Commission to Examine Ratemaking Practices and Incentive Mechanisms Promoting Least-Cost Planning and Demand-Side Management by Electric Utilities, 4/19/90, 5/4/90, 4/18/91, 6/20/91.

North Carolina Utilities Commission

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

Pennsylvania Public Utility Commission

- Docket Nos. R-00994697 and R-994697C0001, Pennsylvania Public Utility Commission v. Bell Atlantic – Pennsylvania, Inc./ Rhythms Links Inc., Complainant v. Bell Atlantic – Pennsylvania, Inc., Respondent, 12/21/99.
- Docket Nos. P-00991648, Joint Application of NEXTLINK Pennsylvania, Inc., *et al.* and P-00991649, Joint Application of Bell Atlantic – Pennsylvania, Inc., *et al.*, 4/22/99, 6/11/99.
- Docket Nos. A-310200F0002 *et al.*, In re the Joint Application of Bell Atlantic Corporation and GTE Corporation for Approval of Agreement and Plan of Merger, 3/23/99; 5/19/99.
- Docket No. I-00960066, Generic Investigation of Intrastate Access Charge Reform, 6/30/97; 7/29/97; 8/27/97.
- Petition for Arbitration by MCI Communications Corporation for an Interconnection Agreement with Bell Atlantic - Pennsylvania, 9/96.
- Petition for Arbitration by AT&T-PA for an Interconnection Agreement with GTE-PA, 9/96.
- Petition for Arbitration by Eastern TeleLogic for an Interconnection Agreement with Bell Atlantic - Pennsylvania, 9/96.
- Petition for Arbitration by AT&T-PA for an Interconnection Agreement with Bell Atlantic - Pennsylvania, 9/96.
- Docket No. I-940035, Formal Investigation to Examine and Establish Updated Universal Service Principles and Policies for Telecommunications Services, 1/11/96, 2/14/96, 2/27/96.
- Docket No. A-310203F002, Application of MFS Intelenet of Pennsylvania, Inc., for Approval to Operate as a Local Exchange Telecommunications Company, 1/30/95, 2/22/96, 3/22/96, 1/13/97, 2/97.

South Carolina Public Service Commission

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

Texas Public Utility Commission

- Docket Nos. 20226, Petition of Accelerated Connections, Inc. d/b/a ACI Corp. for Arbitration to Establish an Interconnection Agreement with Southwestern Bell Telephone Company, and 20272, Petition of DIECA Communications, Inc., d/b/a Covad Communications Company for Arbitration of Interconnection Rates, Terms and Conditions and Related Arrangements with Southwestern Bell Telephone Company, 2/19/99, 4/8/99.

Vermont Public Service Board

- Docket No. 5780, Green Mountain Power Company General Rate Case, 1/13/95.
- Docket No. 5695, Green Mountain Power Company General Rate Case, 1/94.

Virginia State Corporation Commission

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

Washington Utilities and Transportation Commission

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

Wisconsin Public Service Commission

- Petition for Arbitration of MCI Telecommunications Corporation for an Interconnection Agreement with Ameritech - Wisconsin, 12/96.

Civil Proceedings

- Nationwide Business Telephones and Team Centrex, Plaintiffs, vs. Introlink Communication Systems, Inc., Pacific Bell, Inc., *et al.*, Defendants, 5/96.
- Power Producers v. Pacific Gas & Electric, 6/93.
- WindTec, Inc. v. Southern California Edison Company, 7/90.

Education

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

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

ATTACHMENT TLM-2

LIST OF DATA RESPONSES CITED

DATA RESPONSES PROVIDED IN THIS ARBITRATION

SWBT Response to Covad Data Request No. 65
SWBT Response to Covad Data Request No. 82
SWBT Response to Covad Data Request No. 6
SWBT Response to Covad Data Request No. 22
SWBT Response to Covad Data Request No. 43
SWBT Response to Covad Data Request No. 51

DATA RESPONSES PROVIDED IN TEXAS ARBITRATION

SWBT Response to ACI Data Request No. 3-20
SWBT Response to ACI Data Request No. 3-24
SWBT Response to ACI Data Request No. 3-22
SWBT Response to ACI Data Request No. 2-25
SWBT Response to ACI Data Request No. 3-28