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RECORDS AND  
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December 22, 1998

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Ms. Blanca Bayo, Director  
Division of Records and Reporting  
Room 110, Easley Building  
Florida Public Service Commission  
2540 Shumard Oak Blvd.  
Tallahassee, Florida 32399-0850

Re: Docket No. 981745-TP

Dear Ms. Bayo:

Enclosed for filing in the above captioned docket on behalf of e.spire Communications, Inc. are an original and fifteen copies of the following documents:

1. The Direct Testimony of James C. Falvey: ~~14478-98~~
2. The Direct Testimony of Marvin H. Kahn: ~~14479-98~~
3. The Direct Testimony of William Stipe, III; and ~~14480-98~~
4. The Direct Testimony of Tony Mazraani: ~~14481-98~~

Please acknowledge receipt of these documents by stamping the extra copy of this letter "filed" and returning the same to me.

Thank you for your assistance with this filing.

Sincerely,

  
Norman H. Horton, Jr.

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cc: James C. Falvey, Esq.  
Parties of Record

ORIGINAL

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by e-spire Communications, )  
Inc. for Arbitration with BellSouth )  
Telecommunications, Inc., pursuant to the )  
Telecommunications Act of 1996 )

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DOCKET NO. 981745-TP  
Filed: December 22, 1998

DIRECT TESTIMONY OF DR. MARVIN H. KAHN

ON BEHALF OF

e-spire COMMUNICATIONS, INC.

DOCUMENT NUMBER-DATE

14479 DEC 22 88

FPSC-RECORDS/REPORTING

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

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Inc. for Arbitration with BellSouth ) DOCKET NO. 981745-TP  
Telecommunications, Inc., pursuant to the ) Filed: December 22, 1998  
Telecommunications Act of 1996 )

**EXHIBITS ACCOMPANYING THE  
DIRECT TESTIMONY OF DR. MARVIN H. KAHN**

**ON BEHALF OF**

**e-spire COMMUNICATIONS, INC.**

1 DIRECT TESTIMONY OF DR. MARVIN H. KAHN

2  
3 I. QUALIFICATIONS AND PURPOSE

4 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

5 A. My name is Marvin H. Kahn. I am a Senior Economist and a founding principal of  
6 Exeter Associates, Inc. My office is located at 12510 Prosperity Drive, Silver  
7 Spring, Maryland 20904.

8 Q. PLEASE REVIEW YOUR BACKGROUND AND QUALIFICATIONS.

9 A. I am an economist specializing in public utility regulation, communications, energy,  
10 and antitrust analysis. My primary research interest is in the application of microeco-  
11 nomic principles to public policy issues in these areas. Over the last several years,  
12 my focus has turned to matters regarding the restructuring of the natural gas pipeline,  
13 electric and telephone industries and the regulation of firms in these industries  
14 operating simultaneously in competitive and non-competitive markets. Particular  
15 issues addressed include unbundling services, TELRIC analyses, the effects of  
16 imposing line of business restrictions on regulated firms, assessments of alternative  
17 regulatory structures, and matters regarding cost allocation and rate design.

18 In addition to my consulting experiences, I taught economics or lectured at  
19 the University of Tennessee, the University of Missouri in St. Louis, Washington  
20 University in St. Louis, at Merrimac College and at The Johns Hopkins University.  
21 I served as a senior economist with the Institute of Defense Analysis and the MITRE  
22 Corporation, both not-for-profit Federal Contract Research Centers in the  
23 Washington, D.C. metropolitan area. I also served as a senior staff economist with

1 an Ad Hoc Committee of the U.S. House Committee on Currency and Banking,  
2 focusing on energy and employment issues.

3 I am a graduate of Ohio Northern University and hold a Ph.D. in Economics  
4 from Washington University in St. Louis. Further details of my experience and a  
5 complete list of testimonies is included as my Exhibit \_\_ (1HK-1).

6 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

7 A. My testimony is organized in six sections, including this initial introductory section.  
8 In Section II, I discuss the economic principles of pricing and open access.  
9 Specifically, I explain why pricing at economic or forward-looking cost is necessary  
10 to achieve competitive benefits established as the goal of the Act. I also explain why  
11 the TELRIC/TSLRIC costing and pricing methodology [adopted by the Commission  
12 in its recent generic proceeding] should be applied to all interconnection and  
13 unbundled network elements. No distinction in pricing is appropriate if widespread  
14 consumer benefits remain the goal of the telecommunications policy. I note and  
15 describe why requiring all aspects of the ILEC network to be made available in the  
16 form of unbundled network elements and through interconnection is consistent with  
17 the underlying premise and goals of the Act. Doing so would result in CLECs  
18 having access to HICAP loops, interoffice transport, as well as to data (i.e., advanced  
19 communications services such as packet switching), and other network elements on  
20 an unbundled basis at rates based on economic cost. Finally, I explain why pricing  
21 parity is necessary to avoid price discrimination and price squeeze, as well as to  
22 provide widespread consumer benefits to telecommunications customers.

1           In Section III, I discuss issues particular to non-recurring charges. I explain  
2 why careful attention must be paid to cost development and pricing proposals for  
3 these charges, if only because this is an area that is both new and different. In the  
4 two and one-half years since the passage of the Telecommunications Act, ILECs,  
5 CLECs and commissions have gained a great deal of knowledge and experience in  
6 estimating the forward-looking costs of the non-recurring activities associated with  
7 unbundled network elements. Recognizing that suggests that these cost estimates  
8 and rates should be reviewed with adjustments made as new information is gained.  
9 I explain the concerns with regard to both pricing and costing in Section III. I also  
10 explain why TELRIC pricing and establishing ceilings based on BellSouth's charges  
11 to its own customers for comparable activities are appropriate.

12           Section IV deals with collocation. The Commission has established a set of  
13 rates and charges for a number of collocation activities in its recent generic costing  
14 proceeding. There are a number of aspects of collocation that can act as a barrier  
15 to entry. I explain why the Commission should require the establishment of  
16 alternatives which allow the CLECs to minimize the time and costs involved with  
17 interconnection. This would include optional, space-saving forms of collocation,  
18 such as cageless and cage sharing, and even alternatives to a collocation requirement,  
19 such as through the extended loop.

20           Section V deals with call transport and termination. This section deals with  
21 the appropriate method of establishing the costs and prices associated with this  
22 activity. I also discuss the potential differences in ILEC and CLEC costs and why

1 rates based on of e-spire's cost of this activity would be appropriate for reimbursing  
2 e-spire for calls terminated on e-spire's network.

3 Finally, Section VI deals with several remaining issues related to unbundled  
4 network element, interconnection and pricing issues. For example, I discuss the  
5 appropriateness of establishing unbundled network elements associated with xDSL  
6 functions, packet switching functions and geographic deaveraging. In many  
7 instances, the information necessary to actually identify the appropriate TELRIC has  
8 not been made available by BellSouth. In such circumstances, the information will  
9 be sought during discovery and estimates will be provided to the Commission upon  
10 review and examination of those data. A summary and conclusions are provided in  
11 Section VII.

## 12 **II. COSTING AND PRICING PRINCIPLES**

### 13 **A. OVERVIEW**

#### 14 **1. Pricing and Network Access Required for Entry**

15 **Q. WHAT ECONOMIC POLICY OBJECTIVES SHOULD GOVERN THE**  
16 **ESTABLISHMENT OF PRICES, TERMS AND CONDITIONS FOR**  
17 **INTERCONNECTION ARRANGEMENTS AND NETWORK ELEMENTS?**

18 **A.** The 1996 Act and made it clear that the national telecommunications' policy goals  
19 could be better met through the workings of a competitive market than through  
20 regulated monopoly. The intent of the Act is that consumers benefit from an increase  
21 in competitive activity through lower retail prices and a diversity of high quality,  
22 advanced service options. This is articulated in the preamble to the Act:

1 To promote competition and reduce regulation  
2 in order to secure lower prices and higher  
3 quality service for American  
4 telecommunications consumers and encourage  
5 the rapid deployment of new technology.

6 Thus, the primary economic policy objective of the Act is the attainment of a  
7 "competitive outcome."

8 The Act established a vehicle to allow meaningful and effective competition  
9 to develop in the markets for local exchange services. That vehicle is based on free  
10 and unfettered entry into the market for local services. This requires that the market  
11 be free of barriers to entry, which in turn, requires the appropriate pricing (which  
12 includes imputation requirements for non-discrimination) and the availability of  
13 network resources (which incorporates unbundling to the extent needed by CLECs).  
14 The pricing of unbundled network elements is one of the critical components of any  
15 open market policy implementing the new Sections 251(c)(3) and 252(d)(1) of the  
16 Act. Since the market is not now competitive, regulatory oversight remains  
17 necessary to achieve this outcome. A key policy objective for the Commission  
18 should be to establish prices for all interconnection and network elements that are  
19 consistent with and support a competitive market outcome. That result can only be  
20 achieved through a pricing policy which includes prices based on economic cost and  
21 which prevents discrimination.

22 **Q. WHAT ROLE DOES PRICING PLAY IN ACHIEVING THESE  
OBJECTIV**



1 A. Adherence to economic pricing principles is key to achieving the competitive  
2 outcome. The methodology used to determine the price ILECs charge for use of their  
3 facilities must send the correct price signals, encourage the entry of efficient  
4 competitors, and, thus, allow consumers to benefit from an increase in competitive  
5 activity including lower retail prices and a diversity of service choices. The ultimate  
6 goal of the Act is the creation of these potential consumer benefits.

7 To accomplish these goals, BellSouth should be required to establish rates for  
8 interconnection and unbundled elements pursuant to a forward-looking economic  
9 cost pricing methodology. Only a forward-looking methodology will encourage  
10 efficient competitive entry and promote competition throughout the state. In  
11 addition, BellSouth must be required to adequately unbundle and provide access to  
12 the unbundled elements and the interconnection necessary to promote efficient entry.  
13 Reasonable imputation standards are also necessary to reduce the potential for  
14 discrimination.

15 **Q. WHAT ARE THE EFFICIENCY IMPLICATIONS ASSOCIATED WITH**  
16 **THE COMPETITIVE MARKET OUTCOME?**

17 A. In a competitive market, characterized by a sufficient number of buyers and sellers  
18 so that no market participant can dictate the price or quantity available, the market  
19 yields important efficiencies. Relevant aspects include operational and allocative  
20 efficiencies.

21 Operational efficiency results when the lowest cost method of production is  
22 utilized to produce the good or service in question. Market competition promotes

1 this result. For instance, new entrants into the market are not required to adopt the  
2 same operating methods or technologies used by the incumbent. Instead, they are  
3 able to adopt the lowest cost method of production. With lower costs, these firms  
4 will tend to lower the price charged in order to gain market share from higher-cost  
5 incumbents. Since market price tends to fall as new entrants increase supply,  
6 inefficient producers are forced to either become more efficient or lose market share  
7 or possibly cease production altogether.

8 Allocative efficiency results when resources are channeled into the production  
9 of those goods and services that are valued more highly than the resources necessary  
10 for production. As long as the market price covers the cost to produce an additional  
11 unit of output, that unit of output would be produced in a competitive market. Since  
12 society has scarce resources, it is in society's interest to have these resources used in  
13 a way to maximize the value of what is produced with those resources.

14 **Q. IS PRICING IMPORTANT TO BOTH SELLERS AND END USERS IN**  
15 **PROMOTING THE OBJECTIVES OF THE TELECOMMUNICATIONS**  
16 **ACT?**

17 **A.** Yes. Pricing sends signals to both buyers and sellers and affects the decisions of  
18 both. In a most general sense, pricing plays two roles: cost compensation and  
19 rationing of limited quantities.<sup>1</sup>

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20 <sup>1</sup> For a more general discussion of the role of prices in the regulated model, see  
21 Bonbright, Principles of Public Utility Rates, Columbia (1961), Chapter VI.

1            Sellers turn to price signals to make decisions with regard to market entry and  
2            production alternatives. By comparing prices to their own costs, producers determine  
3            the markets and the services that are profitable, and thus make entry (or exit)  
4            decisions. In addition, price signals are important inputs into "make-buy" decisions.  
5            That is, these signals are key in determining whether entry will be "facilities based,"  
6            using the CLECs own facilities with or without UNEs, or whether entry will instead  
7            involve resale.

8            Price signals are used by buyers to select among alternative goods and  
9            services, and among alternative service providers. Since both producers and buyers  
10           react to pricing, the greatest opportunity to realize the allocative and operational  
11           efficiencies discussed above exists if prices reflect the underlying cost. Thus, to  
12           promote the competitive outcome, prices should be cost based. With cost based  
13           prices, the most efficient producers are rewarded and are ensured adequate  
14           compensation for the goods and services produced. At the same time, consumers are  
15           asked to pay the full additional cost of the resources used to produce the additional  
16           output. Cost based prices, by sending efficient price signals, promote the goals of the  
17           Act.

1 B. **TELRIC**

2 Q. **WHAT IS THE APPROPRIATE METHODOLOGY FOR DEVELOPING**  
3 **RATES FOR INTERCONNECTION AND UNBUNDLED ELEMENTS?**

4 A. Decisions in a competitive market are made based on forward-looking costs, not  
5 historic costs. Thus, the appropriate cost methodology to be used in conjunction with  
6 a policy intending to promote the competitive outcome and economic efficiency is  
7 one which focuses on economic, forward-looking costs. The TELRIC/TSLRIC  
8 methodology which has been adopted by the FCC [and relied upon by this  
9 Commission in setting prices for interconnection and network elements] is such an  
10 approach.

11 Q. **WHAT IS THE DIFFERENCE BETWEEN THE TELRIC METHODOLOGY**  
12 **AS PROPOSED BY THE FCC AND THE TSLRIC METHODOLOGY**  
13 **OFTEN USED BY STATE COMMISSIONS?**

14 A. TELRIC and TSLRIC are both measures of average incremental costs; both are  
15 generally based on the same costing logic. In fact, the FCC refers to TELRIC as the  
16 application of TSLRIC principles to network elements and BellSouth uses its  
17 TELRIC model and TELRIC Calculator to produce both TELRIC and TSLRIC  
18 estimates. These methods do differ, however, in two broad respects.

19 First, a TSLRIC focuses initially on services, whereas a TELRIC focuses on  
20 network elements. It is not unusual for network elements to be used to provide  
21 multiple services. Thus, there may be a number of costs and expenses that are  
22 directly attributable to a network element, but are shared among the services using

1 these elements. As such, there are a number of costs and expenses which are  
2 considered direct in a TELRIC, but are considered shared in a TSLRIC.

3 Second, TSLRIC typically examines costs of services in the retail or end-user  
4 market, whereas, TELRIC focuses on costs to service providers, i.e., in the  
5 "wholesale" market. As such, there are certain retail-related costs and expenses that  
6 are properly included in a TSLRIC that should be excluded from a TELRIC.

7 Since the differences between a TSLRIC and a TELRIC deal more with  
8 application than concept, I will use the terms TSLRIC and TELRIC interchangeably  
9 in what follows.

10 **Q. WHY DOES TELRIC PROVIDE A REASONABLE MEASURE OF COSTS**  
11 **FOR PRICING PURPOSES?**

12 A. Using TELRIC will result in prices for network elements which reflect forward-  
13 looking, efficiently incurred costs. As noted, it is appropriate that prices be based on  
14 forward- looking costing methodologies. Efficient decisions regarding market entry,  
15 exit and expansion are based on forward-looking comparisons of expected revenues  
16 and expected costs. To ensure that price signals are correct and that market entry is  
17 efficient, forward-looking costs should be used.

18 The appropriate cost study is also *long run in nature*, i.e., it is based on a time  
19 horizon long enough to allow entry or exit to occur and/or for substantial changes in  
20 capacity or technology to occur. Costs affecting entry, exit, capacity expansion or  
21 technology adoption decisions are forward-looking and variable. A properly  
22 structured cost measure or cost study should, therefore, include forward-looking

1 capital costs and maintenance expenses, and the preponderance of all other expenses  
2 should be viewed as variable, *i.e.*, shared and common costs should amount to a  
3 relatively small fraction of total costs.

4 The relevant increment of demand to estimate interconnection or network  
5 element costs is the *total demand by all users*, including the incumbent. Hence, the  
6 "total service" or "total element" designation. ILECs realize economies of scale.  
7 Focusing on any volume of output smaller than the total market may result in higher  
8 estimates of per unit costs than are actually realized.

9 The incremental cost calculation is intended to capture the added cost from  
10 producing or the cost avoided from discontinuing the service, assuming all other  
11 ILEC outputs remain unchanged. For example, the incremental cost of a switch port  
12 is calculated assuming no change in the volume of loops, and the incremental cost  
13 of loops is calculated assuming no change in the volume of ports. Since all else is  
14 held constant, the calculations focus exclusively on the cost of the unbundled  
15 network element.

16 Similarly, the study should capture all costs associated or attributable to that  
17 network element, but only those so attributed. For instance, the cost of an unbundled  
18 voice-grade loop should be based on a network designed for narrowband, voice-grade  
19 services. Costs not necessary for the provision of this grade of service should not be  
20 included in the cost study.

21 The TELRIC/TSLRIC model is a method that adheres to these principles and,  
22 thus, promotes the competitive outcome.

1 Q. MANY OF THE PRICING PROVISIONS OF THE FCC ORDER HAVE  
2 BEEN VACATED. THAT FACT NOTWITHSTANDING, IS THE TELRIC  
3 CONCEPT AS DESCRIBED BY THE FCC ECONOMICALLY SOUND?

4 A. Yes. The FCC adopted specific requirements in its *First Report and Order*  
5 governing the methodology to be used in developing cost-based rates for  
6 interconnection and unbundled elements (including transport and termination) which  
7 are consistent with the economic principles I outlined above. The FCC's general  
8 pricing standard requires that rates be established equal to what is termed the  
9 forward-looking economic cost of an element. This forward-looking economic cost  
10 of an element is defined by the FCC as the sum of the total element long-run  
11 incremental cost of the element (TELRIC), and a reasonable allocation of forward-  
12 looking joint and common costs.<sup>2</sup> These costing and pricing principles adopted by  
13 the FCC governing pricing rules are economically sound and are designed to promote  
14 the competitive outcome.

15 Importantly, the merits of the FCC approach have not been successfully  
16 challenged. In vacating portions of the *First Report and Order*, the Eighth Circuit  
17 Court of Appeals did not address the merits of the FCC's pricing rules. The opinion  
18 was based solely on jurisdictional issues. Nothing in the Decision by the Eighth  
19 Circuit affects the appropriateness of TELRIC/TSLRIC pricing for promoting the  
20 competitive outcome.

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21 <sup>2</sup> *First Report and Order*, Appendix B-Final Rules, § 51.505(d).

1 **Q. HOW CAN UNBUNDLING REDUCE BARRIERS TO ENTRY?**

2 A. Incumbents have an obvious incentive to increase the costs of competing providers,  
3 whenever possible. One way to do this is to bundle elements or develop rate  
4 structures in such a way that CLECs are forced to take and to pay for unnecessary  
5 elements.<sup>3</sup> If the competitive outcome is to be promoted, however, there should be  
6 no artificial barriers that discourage CLECs from entering a market or from offering  
7 services using their own equipment. From a financial perspective, increased costs  
8 are an entry barrier, and entry barriers preclude the competitive outcome. The level  
9 of bundling, the rate "structure" and the flexibility of the offerings to CLECs by  
10 incumbent LECs should be such that CLECs do not pay unnecessary or uneconomic  
11 costs.

12 In addition to the other duties of Section 251(c), each incumbent LEC has a  
13 duty to provide, to any requesting telecommunications carrier, the following:

14 nondiscriminatory access to network elements on an  
15 unbundled basis at any technically feasible point on rates,  
16 terms and conditions that are just, reasonable and  
17 nondiscriminatory in accordance with ... this section and  
18 section 252.<sup>4</sup>

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19 <sup>3</sup> Since the ILEC also competes for the customers targeted by CLECs, the ILEC has an  
20 obvious incentive to discourage the entry of competitors to the extent it can. To accomplish  
21 this, the CLEC could be forced to purchase unneeded services as part of a bundle in order  
22 to get the service or access to the facility that is actually needed for it to provide the  
23 particular telecommunications service in question. Or, the ILEC may bundle a "bottleneck"  
24 function with other nonessential functions in a way that discourages CLECs. The effect is  
25 to unnecessarily increase the cost to CLECs, creating a relative advantage for the ILEC and  
26 a disincentive for CLEC entry.

27 <sup>4</sup> Section 251(c)(3).



1 Therefore, incumbent LECs have a duty to provide the same nondiscriminatory  
2 access to equipment and facilities needed to provide advanced services, such as frame  
3 relay, as is required to provide voice service; and at rates based on forward-looking  
4 costs.<sup>5</sup>

5 **Q. DOES THE RECENT 706 ORDER ADDRESS UNBUNDLING?**

6 A. Yes. The FCC's recent ruling in the 706 Order reinforces this by clarifying that the  
7 provision of all advanced services, including packet-switched services and  
8 collocation are subject to the unbundling requirements of Section 251(c).<sup>6</sup> In that  
9 Order, the FCC ruled that ILECs must offer unbundled access to the "equipment used  
10 in the provision of advanced services." This ruling is subject only to consideration  
11 of technical feasibility.<sup>7</sup>

12 **Q. SHOULD BELL SOUTH BE REQUIRED, FOR EXAMPLE, TO PROVIDE**  
13 **FOUR-WIRE DSO, DS3, OC3, OC12 OR OC48 LOOPS AS UNBUNDLED**  
14 **LOOPS ?**

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15 <sup>5</sup> "Network elements" is defined to include any facility or equipment used to provide a  
16 "telecommunications service," and includes any "features, functions and capabilities that  
17 are provided by means of such facility or equipment." 706 Order, ¶50. ¶52 clarifies that  
18 this applies to loops capable of transporting high speed digital signals, and ¶57 clarifies  
19 that it applies to "advanced services" and the facilities and equipment used to provide  
20 advanced services.

21 <sup>6</sup> 706 Order ¶57 (... all equipment and facilities used in the provision of advanced  
22 services are "network elements" as defined by Section 153(29).)

23 <sup>7</sup> 706 Order, ¶11.

1 A. Yes. As I indicated, from an economic policy perspective, fulfilling the goals of the  
2 Act requires that *all* segments of the ILEC network be available at economically  
3 based prices and at non-discriminatory terms and conditions. What I have referred  
4 to as adequate access or availability does not exclude certain loops, or  
5 interconnection associated with certain types of service, or unbundled transport, or  
6 any other necessary element/function/service simply because (a) they have not been  
7 offered before or, (b) because the ILEC has not yet completed cost studies or (c)  
8 because the loop, UNE or function is associated with an advanced service rather than  
9 a voice grade service. Public policy considerations, and not the ILEC's commercial  
10 interests, should be the basis of decisions on the extent of unbundling.

11 In addition, attempts to exclude any UNE, service or function is inconsistent  
12 with the Act and the 706 Order (subject only "technically feasible" constraints).  
13 The successful elimination of entry barriers, requires access to all such elements is  
14 necessary and must be available at forward-looking cost based rates. The loop  
15 elements listed above, as well as the other elements sought by e-spire and  
16 interconnection are not constrained by technical feasibility.

17 **D. IMPUTATION**

18 **Q. WHAT ARE THE ECONOMIC CONSEQUENCES OF DISCRIMINATION?**

19 A. Discrimination provides an advantage to one or a group of market participants. For  
20 instance, if the ILEC charged the CLECs amounts that differed from the costs  
21 incurred or if the ILEC provides network elements under terms and conditions  
22 dissimilar to those it experiences in its own operations, barriers to entry may result

1 as entry will be more costly to or more difficult for the CLEC. By requiring that  
2 prices (as well as terms and conditions) for network elements and interconnection are  
3 non-discriminatory, the relative efficiencies of the market participants -- and not the  
4 prices charged -- will determine market performance, market share and the market  
5 outcome.

6 If prices are discriminatory, an anticompetitive price squeeze may result.  
7 Price squeeze occurs when the ILEC prices an input that is used by a CLEC to  
8 provide service in competition with the ILEC at a level that puts the CLEC at an  
9 automatic disadvantage and effectively bars entry. For instance, if the price  
10 BellSouth charges a CLEC for an unbundled network element is higher than the price  
11 BellSouth charges its own end user for the retail service which uses that UNE, a price  
12 squeeze results. The CLEC can be as efficient as, or even more efficient than,  
13 BellSouth, and yet because of the price charged for the UNE, the CLEC cannot  
14 expect to operate in this market and fully recover its costs. Entry is blocked by price  
15 squeeze. Imputation is a policy that addresses needed to deal with the price squeeze  
16 and cross-subsidy issues which inevitably arise in an industry where one firm has  
17 market power in the wholesale market and competes with others in the retail or end  
18 use market.

19 **Q. HOW CAN THE COMMISSION ADDRESS THIS MATTER?**

20 **A.** The Commission can address this matter by establishing an imputation requirement.  
21 The ILEC has control over certain input facilities and functions (which the ILEC also  
22 uses in the provision of its own retail services) needed by a CLEC to provide

1 telecommunications services. It is this control over "bottleneck" or "essential"  
2 facilities and functions which creates potentially non-competitive problems and  
3 which creates the potential for anti-competitive problems.

4 **Q. WOULD YOU PLEASE EXPLAIN?**

5 A. Yes. When the ILEC has market power over the services/functions required by the  
6 CLEC, and the ILEC competes with the CLEC to provide the same retail service,  
7 there is an incentive, facilitated and disguised by the bundling involved, to engage  
8 in price discrimination. If the ILEC can effectively charge competitors a higher price  
9 for these functions than it incurs itself, the ILEC will have a market advantage of the  
10 type specifically proscribed by the Act. Under the Act, ILECs must make these  
11 functions or services available at rates that are just, reasonable and non-  
12 discriminatory. Charging CLECs costs which exceed the costs the ILEC in essence  
13 charges itself, clearly violates the non-discrimination provision of the Act. Other  
14 non-competitive activities are possible as well. For example, the ILEC may use high  
15 prices for functions over which it has market power to subsidize its services that are  
16 subject to more competitive forces.

17 Importantly, if the ILEC's cost of providing these functions is lower than the  
18 charge to competitors (i.e., the rate CLECs must pay) for the identical function, the  
19 ILEC can charge a lower end-use rate (than its competitors) for any service that uses  
20 that function. That is, the ILEC can beat the CLEC's price even when the CLEC is  
21 the technically more efficient provider. And, competitive entry does not occur.

1 competition is impaired, and the benefits of competition envisioned by Congress in  
2 passing the Act will not occur.

3 **Q. PLEASE EXPLAIN HOW AN IMPUTATION POLICY CAN BE**  
4 **IMPLEMENTED.**

5 A. One method of implementing an imputation policy would be to require that  
6 BellSouth charge a CLEC no more than it "charges itself" for a similar element,  
7 service or functionality.

8 To help understand how an imputation policy will be implemented, consider  
9 the following hypothetical. BellSouth provisions a particular service utilizing two  
10 cost components, which I simply call A and B. A is a network element over which  
11 BellSouth has extensive market control, and for which an unbundled network  
12 element must be made available. Component B is made up of a variety of activities  
13 and expenses incurred by BellSouth in providing the final service, but which are not  
14 subject to unbundling or necessarily made available in the form of an unbundled  
15 network element. An imputation policy will require BellSouth to establish a *cost for*  
16 *pricing purposes* equal to the sum of the TELRIC for component A and the TSLRIC  
17 for component B.<sup>8</sup> This is consistent with the non-discriminatory pricing and  
18 efficiency conditions described above will result.

---

19 <sup>8</sup> The imputed amount should be the price for the UNE in question, Component A in this  
20 instance. The assumption is that the UNE price is equal to the TELRIC. TELRIC or  
21 TSLRIC includes a reasonable profit and thus meets the pricing requirements of Section  
22 252(d) of the Act.

1 Q. HOW WOULD SUCH IMPUTATION STANDARDS ADDRESS THE  
2 CONCERNS YOU EXPRESSED ABOVE?

3 A. This policy has two important implications. First, it results in rates that are non-  
4 discriminatory. Both BellSouth and the CLECs would be subject to the same prices  
5 for UNEs. Second, it would promote efficiency in the market for communications  
6 services. With BellSouth and the CLECs being charged the same price for similar  
7 elements or functionalities (i.e., for UNEs), it would be the relative efficiencies of the  
8 two organizations in the more competitive aspects of their operations that would  
9 determine the least cost producer. Similarly, with this policy, the least cost producer  
10 would be able to establish a lower price, capture a larger market share and/or earn  
11 higher profits. Moreover, if BellSouth is forced to charge itself and the CLEC the  
12 same price for similar functionalities, BellSouth has every incentive to improve the  
13 efficiency of the provision of that network element and to minimize the price charged  
14 to both parties.

15 As noted above, the stated goal of the Telecommunications Act is to promote  
16 competition in order to secure lower prices and higher quality telecommunications  
17 services for consumers.<sup>9</sup> This goal is promoted if the approach is competitively  
18 neutral. Competitive neutrality implies not only that rates be cost based and non-  
19 discriminatory, but that the rates not negatively affect the ability of CLECs to  
20 compete with the ILEC or other carriers. A rate charged which is not based on

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21 <sup>9</sup> Preamble, Telecommunications Act of 1996.

1 economic cost, or which exceeds that rate an ILEC would charge itself and its own  
2 customer for the same function is not competitively neutral and will discourage  
3 efficient entry.

### 4 III. NRCs

#### 5 Q. WHAT ARE NON-RECURRING CHARGES?

6 A. Non-recurring charges ("NRCs") are the charges which an ILEC assesses to recover  
7 the one-time or non-recurring costs associated with establishing, moving and/or  
8 changing the service received by a particular customer. Typically, NRCs consist of  
9 multiple elements which include charges for activities such as service orders, central  
10 office line connections and premise visits. Non-recurring charges are based on labor  
11 intensive activities, whereas recurring charges are based on capital intensive  
12 activities.

#### 13 Q. WOULD YOU PLEASE SUMMARIZE THE CONSIDERATIONS FOR 14 ESTABLISHING CHARGES FOR NON-RECURRING ACTIVITIES?

15 A. Yes. There are several considerations that are necessary in establishing prices for  
16 non-recurring charges for unbundled network elements.

17 First, non-recurring charges can serve as a barrier to entry. These are one-  
18 time, up-front charges that are incurred before service or the underlying element is  
19 provided. In that regard, an excessive non-recurring charge may have a greater  
20 deterrence than does an excessive recurring charge. To allow Bell South the  
21 opportunity to fully recover all costs incurred, but to prevent anticompetitive pricing  
22 (i.e., entry barriers), charges for non-recurring activities should be based on the same

1 standards as are charges for recurring activities. NRCs should be forward-looking,  
2 cost based, and include recovery of a reasonable overhead, as discussed in Section  
3 II.

4 Another consideration involves the potential for discriminatory pricing (even  
5 at alleged cost based charges), and how the market can be used to maintain a  
6 benchmark for comparison. That is, the Commission should consider establishing  
7 a ceiling for non-recurring charges to CLECs associated with unbundled network  
8 elements at the level which would apply if BellSouth were providing this service to  
9 a customer which it serves directly, less any retail costs which the ILEC does not  
10 incur in serving the CLEC instead of a retail end user. This ceiling serves two  
11 purposes. One, it provides a reasonableness check on any cost study provided by  
12 BellSouth in this proceeding. Two, it ensures that the non-recurring charges  
13 established are truly non-discriminatory. As discussed above with regard to price  
14 squeeze, if BellSouth is allowed to establish a charge to its competitors that is  
15 allegedly cost based, yet exceeds the costs that it would incur in providing service to  
16 itself, the goal of fostering competition is thwarted. More specifically, the ceiling  
17 should be set at the charge established by the Commission for non-recurring  
18 activities associated with end-use services, less the wholesale discount established  
19 by the Commission.

20 **Q. THE COMMISSION HAS RECENTLY ADDRESSED NON-RECURRING**  
21 **CHARGES FOR THE UNES CURRENTLY IN PLACE. WHY IN YOUR**



1           **OPINION ARE THOSE CHARGES NOT APPROPRIATE FOR A NEW**  
2           **CONTRACT, AS e-spire IS SEEKING HERE?**

3    A.    When the Commission set rates in the generic docket, it based its decision on the best  
4           cost information available at that time. In some instances, cost data may remain  
5           reasonably accurate over the next one, two or more years. In others, they may not.  
6           The available data suggest that cost information regarding many of the NRCs is  
7           likely to change materially over the near term.

8                     The NRC for loop elements is a clear case in point. BellSouth's cost  
9           estimates are based in part on using its legacy system for taking service orders for  
10          loop UNEs and provisioning these UNEs. BellSouth has suggested that the  
11          unbundled loop provisioning process bears resemblance to design circuit -- e.g., a  
12          special access line -- rather than a POTS loop. It is also my understanding that  
13          BellSouth expects its estimate of the difference in the cost of providing an unbundled  
14          loop and a POTS loop to diminish with time. Thus the cost estimate for NRCs can  
15          be expected to change materially over a period as short as one year. Cost estimates  
16          set for contract rates expected to last into the next one, two or more years, should be  
17          reviewed to ensure that they are consistent with what is currently the best information  
18          available.

19    Q.    **ILECs HAVE ASSERTED THAT IT IS LESS COSTLY TO PROVIDE**  
20           **SERVICE TO THEMSELVES THAN TO PROVIDE SERVICE TO**  
21           **COMPETITORS. SHOULD THAT BE CONSIDERED WHEN**  
22           **ESTABLISHING NRCs?**

1 A. No. There are both efficiency and equity considerations that suggest that the costs,  
2 net of ILEC retail marketing activities, of performing a non-recurring activity should  
3 be considered the same, whether undertaken on behalf of the ILEC or a CLEC.

4 First, the costing exercise is to be a total element long run incremental cost  
5 ("TELRIC"). TELRIC is the per unit incremental cost of providing the entire  
6 volume of service, net of ILEC retail marketing activities. A single TELRIC is  
7 established for unbundled loops or ports, for instance, irrespective of whether the  
8 element is to be used by the ILEC or by a CLEC, or whether the end user is a  
9 residence or business customer. Similarly, the TELRIC for a non-recurring activity  
10 should be the same irrespective of the service provider or of the end user.

11 Second, and somewhat related, is that a properly structured TELRIC  
12 presumes that the ILEC is separated into two operating divisions, a wholesale  
13 element provider and a retail service provider. The non-recurring charge is that  
14 which would be levied by the wholesale element provider to any and all retail  
15 service providers, , irrespective of whether that retail service provider were the ILEC  
16 or a CLEC. The same costs and the same cost based rates should apply to both.

17 Third, even if one accepts arguendo that the cost of the ILEC providing  
18 service to itself is less than that of providing service to a CLEC, allowing the ILEC  
19 to take advantage of its monopoly position in establishing costs and rates is clearly  
20 inconsistent with the competitive goal established by the Telecommunications Act.  
21 The result would be an unwarranted competitive advantage realized by the ILEC,  
22 thwarting the non-discriminatory, pro-competitive goals of the Act.

1           In short, there are both efficiency and equity considerations which argue  
2 strongly for comparability in establishing NRCs associated with ILEC and CLEC  
3 activities.

4 **Q. WHAT IS YOUR RECOMMENDATION FOR THE NRCs TO THE CLECS?**

5 A. NRCs should be based on the efficiently incurred, forward-looking expenses of these  
6 functions. This requirement leads to two considerations in setting NRCs for UNEs.

7           First, the cost estimates should be reviewed with some frequency. Providing  
8 UNEs is an activity never before performed by ILECs. Greater experience should  
9 provide improved capability in measuring and capturing the relevant costs, and in the  
10 efficiency with which the service provisioning occurs. Further, reliance on legacy  
11 systems will diminish over the next few years. Cost estimates used to set charges for  
12 existing contracts should not be used to set rates for contracts expected to last one,  
13 two and more years into the future.

14           Second, for NRCs to be non-discriminatory, they should be capped at the rate  
15 charged by BellSouth for comparable end use services, less the appropriate avoided  
16 cost adjustment. As an example, the NRC for a POTS loop UNE should not be  
17 higher than the NRC for a retail business POTS loop.

18 **IV. COLLOCATION**

19 **Q. PLEASE EXPLAIN WHAT IS MEANT BY COLLOCATION?**

20 A. Collocation involves the placement and connection of one telecommunications  
21 carrier's equipment (located on the premises of another telecommunication carrier)  
22 to the equipment (network) of the host carrier. Collocation can be physical or virtual.

1 **Q. HOW DOES COLLOCATION POLICY RELATE TO THE DEVELOPMENT**  
2 **OF LOCAL COMPETITION?**

3 A. The terms and conditions, including pricing, of collocation are critical to the  
4 development of local competition. For competition to successfully emerge, it is  
5 necessary that CLECs be able to interconnect with the incumbent's network to  
6 exchange traffic. As noted, the Act establishes a framework for access to the ILECs'  
7 facilities on an unbundled network element basis. For most CLECs, collocation is  
8 necessary to access unbundled network elements most efficiently. In this context,  
9 collocation is clearly an "essential" element which should be made available under  
10 rates, terms and conditions which do not create barriers to entry.

11 **Q. HOW CAN COLLOCATION TERMS BE A BARRIER TO ENTRY?**

12 A. From an economic perspective, collocation is no different than an unbundled network  
13 element, as it allows the entrant access to an essential portion of the incumbent's  
14 network. As discussed in Section II above with respect to unbundling, pricing can  
15 become an artificial barrier to entry. If the price charged for this facility is  
16 excessive, or if the CLEC is required to purchase a component of collocation that is  
17 not necessary, the entrant will immediately be placed at an economic disadvantage.  
18 Competition will be harmed as a barrier to competitive entry will result.

19 Certain options can help eliminate barriers and promote efficient market  
20 entry. In a competitive market, firms can be expected to seek alternative methods  
21 of achieving collocation to reduce the cost, or of finding lower cost alternatives to  
22 collocation. Not all firms will find the same collocation options attractive. The

1 [PSC] should require that a number of collocation options be established, again  
2 subject only to technical feasibility constraints. Otherwise, the lack of availability  
3 (or lack of flexibility) creates barriers to entry.

4 Collocation space is finite and thus is obviously a potential barrier.  
5 Increasing central office space may be costly. Therefore, the Commission should  
6 pursue policies that minimize the space required for collocation and also allow  
7 efficient, offsite arrangements. Allowing "closet POPs" in neighboring buildings or  
8 extended link arrangements are two approaches to reducing this barrier.

9 **Q. WHAT ARE THE COLLOCATION REQUIREMENTS OF THE ACT?**

10 A. Section 251(c)(6) of the Act addresses unbundling. That portion of the statute  
11 provides

12 ... for the physical collocation of equipment necessary for  
13 interconnection or access to unbundled network elements at  
14 the premises of the local exchange carrier, except that the  
15 carrier may provide for virtual collocation if the local  
16 exchange carrier demonstrates to the State commission that  
17 physical collocation is not practical for technical reasons or  
18 because of space limitations.  
19

20 **Q. DID THE FCC ADDRESS COLLOCATION?**

21 A. Yes. Section 251(c)(6)<sup>10</sup> of the Act requires ILECs to provide for collocation on  
22 rates, terms and conditions that are just, reasonable, and non-discriminatory.<sup>11</sup> The

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23 <sup>10</sup> *Additional Obligations of Incumbent Local Exchange Carriers.*

24 <sup>11</sup> This is the same language used in the Act for unbundled access and interconnection.

1 FCC adopted national rules for physical and virtual collocation.<sup>12</sup> The FCC found  
2 that specific rules defining minimum requirements for non-discriminatory collocation  
3 arrangements were necessary:

4 Our experience in the *Expanded Interconnection* proceeding  
5 indicates that incumbent LECs have an economic incentive to  
6 interpret regulatory ambiguities to delay entry by new  
7 competitors. We and the states should therefore adopt, to the  
8 extent possible, specific and detailed collocation rules.<sup>13</sup>  
9

10 The FCC's findings were consistent with the incentives discussed above for  
11 ILECs to increase the costs of competing providers, if possible.

12 The FCC subsequently acknowledged collocation as a potential entry barrier  
13 to CLECs in the provision of advanced services (as well as local voice services).

14 One of the major barriers facing new entrants that seek to  
15 provide advanced services on a facilities basis is the lack of  
16 collocation space in many LEC central offices ... Because  
17 incumbent LECs have the incentive and capability to impede  
18 competition by reducing the amount of space available for a  
19 collocation by competitors, the Commission, in the Local  
20 Competition Order, required incumbent LECs that deny  
21 requests for physical collocation on the basis of space  
22 limitations to provide the state commission with detailed floor  
23 plans or diagrams of their premises.<sup>14</sup>  
24

25 ... we believe that incumbent LECs have a statutory  
26 obligation to offer cost efficient and flexible collocation  
27 arrangements.<sup>15</sup>

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28 <sup>12</sup> First Report and Order, CC Docket No. 96-98, Implementation of the Local Competition  
29 Provisions in the Telecommunications Act of 1996, ¶551 and ¶¶653-772, August 8, 1996.

30 <sup>13</sup> *Ibid.*, ¶558.

31 <sup>14</sup> 706 Order (Advanced Services Order), ¶145.

32 <sup>15</sup> *Ibid.*, ¶64.

1           As I have discussed, the policy approach should be one which ensures that  
2           costs are not unduly increased to CLECs and that the limited amount of available  
3           collocation space is efficiently utilized.

4   **Q.   WHAT OPTIONS ARE AVAILABLE TO COMMISSIONS TO ENSURE**  
5   **THAT COLLOCATION COSTS TO CLECS AND SPACE**  
6   **CONSIDERATIONS DO NOT CREATE ENTRY BARRIERS?**

7   **A.**There are a number of options available to the Commission. For example, cageless  
8           collocation and sharing of space allows a scarce resource (collocation space) to be  
9           utilized by a greater number of CLECs than would otherwise be the case.

10           Similarly, requiring ILECs to provide the CLEC with an extended link<sup>16</sup>  
11           reduces the entry barrier created by unavailable or uneconomic collocation. This  
12           approach also prevents ILECs from forcing CLECs to purchase expensive collocation  
13           unnecessarily.

14           Another rather subtle option is to allow CLECs to self-provision collocation  
15           , subject to meeting quality standards (e.g., from an ILEC approved set of  
16           contractors.) Among other things, this provides a market-based reality check on the  
17           charges levied by the ILEC.

18   **Q.   WHAT ARE THE RATEMAKING IMPLICATIONS OF THESE**  
19   **CONCERNS?**

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20   <sup>16</sup> See the testimony of Mr. Falvey for an explanation of the extended link.

1 A. The implications are that this Commission should ensure that BellSouth's charges  
2 for collocation are cost based and procompetitive. For instance:

3 (1) Care must be taken to ensure that there not be double recovery of costs, once  
4 through UNEs, then again through collocation charges;

5  
6 (2) The method by which shared costs of collocation are included in collocation  
7 charges should be non-discriminatory;

8  
9 (3) Costs should be recovered in a manner consistent with how they are incurred.  
10 Doing otherwise runs the risk of inefficient price signals and of the  
11 overrecovery of costs; additionally, there is temptation to try to recover  
12 through associated non-recurring costs any recurring costs the Company may  
13 not be allowed to recover in other UNE rates;

14  
15 (4) Anticompetitive allocation of overhead costs should be avoided;

16  
17 (5) And, costs associated with items that the entrant does not need in order to  
18 provide service, and does not want, should not be included.

19  
20  
21 **Q. WHAT IS THE BASIS OF YOUR CONCERN WITH REGARD TO DOUBLE**  
22 **RECOVERY OF COSTS THROUGH CHARGES FOR UNBUNDLED**  
23 **NETWORK ELEMENTS AND THEN AGAIN THROUGH CHARGES FOR**  
24 **COLLOCATION ACTIVITIES.**

25 A. The ILECs have typically undertaken cost studies for UNEs using traditional costing  
26 methods. These methods have been developed in an environment where the ILEC  
27 and only the ILEC had access to its facilities. This assumption is challenged by the  
28 concept of collocation. Take central office space as an example. In its cost studies,  
29 BellSouth identifies the land and buildings associated with its central office facilities  
30 and assigns all such investment and associated costs to the various central office  
31 functions, services or network elements. This results in the recovery of 100 percent



1 of the central office related land and building costs. Collocation charges, however,  
2 include a charge for central office floor space, a charge which is apparently  
3 redundant.

4 **Q. WHAT IS YOUR CONCERN WITH REGARD TO SHARED COSTS OF**  
5 **COLLOCATION?**

6 A. It is e-spire's experience that ILECs claim that they incur costs in preparing central  
7 office space for CLEC collocation. Large portions of this cost are further claimed  
8 to be a fixed "space prep" cost, that is, invariant with the quantity of square feet  
9 involved or the number of CLECs that collocate.<sup>17</sup> Typically, the first CLEC to  
10 collocate agrees to reimburse the ILEC for these charges, subject to a provision that  
11 the ILEC will recover a proportionate share of all these costs from subsequent  
12 collocators, and provide this as a reimbursement to the first entrant. e-spire has such  
13 agreements with BellSouth. The difficulty is that reimbursements or refunds have  
14 not occurred. This behavior by BellSouth penalizes the first entrant, and can reduce  
15 the willingness to be the first to collocate in a market area.

16 **Q. WHAT IS YOUR CONCERN WITH REGARD TO OVERHEAD COSTS?**

17 A. The Commission has issued orders limiting the markup for overhead costs. I would  
18 still caution that if the markup was based upon dividing total overhead costs by total  
19 direct costs, total direct costs included in that calculation may not recognize any  
20 collocation activities. This is true where an extrapolation of past experiences is used

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21 <sup>17</sup> There are other costs, such as cage construction, that are dependent on square feet  
22 taken.

1 rates proposed. Hence, a benchmark of some type would be most helpful in  
2 evaluating the rates charged by the Company in this regard.

3 **Q. BASED ON THE ABOVE, WHAT IS YOUR RECOMMENDATION WITH**  
4 **REGARD TO ESTABLISHING RATES AND CHARGES FOR**  
5 **COLLOCATION?**

6 **A.** In addition to the options recommended above, I suggest that the Commission  
7 establish a two-pronged approach to pricing collocation. In the first, a collocation  
8 tariff, both physical and virtual, must be established at TELRIC-based rates. Without  
9 an explicit collocation tariff, including the rates and charges for each of the activities,  
10 each request for collocation will be on an individual contract basis ("ICB") which  
11 means that it will require negotiation between the ILEC and CLEC. Clearly, the  
12 ILEC has all the information, no incentive to facilitate its competitor's entry into the  
13 market, and therefore can exercise its monopoly power in the negotiation process.  
14 This type of arrangement could also result in complaints to the Commission on a  
15 fairly regular basis.

16 With a tariff in place, the Commission will have established a set of prices  
17 that are just and reasonable and can be used as a standard or a benchmark for any of  
18 these activities. If the parties agree mutually that there is a superior set of terms,  
19 conditions or prices, that should be acceptable, as long as the default, or benchmark,  
20 exists.

21 **Q. YOU INDICATED A TWO-PRONGED APPROACH. WHAT IS THE**  
22 **SECOND ASPECT OF YOUR RECOMMENDATION?**

1 A. In addition to tariffing collocation activities, I recommend that the Commission adopt  
2 policies that recognize that collocation space is limited. These policies should seek  
3 options that reduce the space requirements per collocation and allow options for  
4 offsite collocation.

5 This arrangement will allow a market test or sanity check of the  
6 reasonableness of the tariffed rates on a regular and ongoing basis. It will provide  
7 both the ILEC and the Commission with continual feedback as to the reasonableness  
8 of the rates and the reality of market conditions.

#### 9 **V. TERMINATION**

10 **Q. WHAT COSTS ARE TO BE RECOVERED THROUGH CHARGES FOR**  
11 **TERMINATION AND TRANSPORT?**

12 A. The requirements for pricing interconnection services including termination and  
13 transport are specified at Section 252(d)(2) of the Act. The Act specifies that prices  
14 for transport and termination should be based on the costs of the carrier terminating  
15 the call that are associated with that function and that these costs should be the  
16 "additional costs" of terminating such calls. From an economic perspective, the  
17 concept of additional cost incurred by the carrier terminating the call refers to the  
18 incremental costs of the termination and transport functions.

19 The FCC established rules are totally consistent with this economic  
20 interpretation. The FCC identified the additional cost as the "forward looking,

1 economic cost,"<sup>19</sup> of the service or element, including reasonable margins for profit  
2 and recovery of joint and common costs. TELRIC provides an appropriate measure  
3 of these costs.

4 **Q. DIDN'T THE FCC ESTABLISH A PRESUMPTION OF SYMMETRICAL**  
5 **RATES BASED ON THE ILEC'S COSTS FOR TRANSPORT AND**  
6 **TERMINATION?**

7 A. Yes. However, the FCC concluded that if the costs of efficiently configured and  
8 operated systems of competing local service providers justify a different rate, state  
9 commissions could and should adopt rates that are not symmetrical.<sup>20</sup> Symmetrical  
10 compensation was adopted as an interim measure for many reasons, not the least of  
11 which was because there was no cost information for CLECs and, thus, no evidence  
12 at the time that costs were other than symmetrical.<sup>21</sup> The Local Interconnection  
13 Order, however, clearly anticipated that state commissions would review the  
14 symmetry presumption, and directed those state commissions to "give full and fair  
15 effect to the economic costing methodology" of the Order when evaluating the cost  
16 studies of CLECs.

---

17 <sup>19</sup> FCC, First Report and Order, CC Docket No. 96-98, para. 1057. In regulatory  
18 terminology, these would be the "traffic sensitive" costs associated with the local  
19 network.

20 <sup>20</sup> Local Interconnection Order, ¶¶1085-1089.

21 <sup>21</sup> Ibid., ¶1089

1 Q. IS THERE REASON TO BELIEVE THAT THE COST FOR A CLEC TO  
2 TERMINATE A CALL IS DIFFERENT THAN THE ILEC'S COST TO  
3 PROVIDE THE SAME FUNCTION?

4 A. Yes. First, CLECs tend to develop their network using a ring topology rather than  
5 the pine tree topology used by the ILECs. This would generally lead to a more traffic  
6 sensitive network. In addition, I would expect the ILEC to realize greater economies  
7 of scale and scope at the network level than would a CLEC. Newer and smaller  
8 entrants will not buy equipment in the same volumes or provide the same diversity  
9 and scope of services as the ILEC. There is also evidence of scale economies in  
10 switching systems.<sup>22</sup> Finally, a CLEC is likely to realize a higher cost of capital than  
11 does the ILEC. These differences could result in higher equipment costs and higher  
12 expenses. Thus, there is reason to expect that the CLEC's relevant unit costs may  
13 exceed the ILEC's.

14 Q. HAVE YOU PREPARED A TELRIC ESTIMATE OF THE CALL  
15 TRANSPORT AND TERMINATION FUNCTION ON THE e-spire  
16 NETWORK?

17 A. A TELRIC estimate of e-spire's call transport and termination function is in progress  
18 and the results will be provided when the analysis has been completed. The TELRIC  
19 methodology will be similar to that developed by BellSouth and will include three  
20 major steps. First, facility requirements and investment cost estimates are identified;

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21 <sup>22</sup> See Further Notice of Proposed Rulemaking, Federal State Joint Board on Universal,  
22 Service, CC Docket No. 96-45, July 18, 1997.

1 next, expense factors will be developed; finally, the expenses will be calculated and  
2 summed.

3 **Q. HOW ARE INVESTMENT COSTS DETERMINED?**

4 A. We interviewed e-spire personnel and other industry personnel to identify the  
5 appropriate forward-looking technologies and facility requirements. The costs are  
6 based on vendor prices for the facilities, plus installation costs. The vendor prices  
7 are taken from the vendor's current price list and adjusted to include hardware, spare,  
8 generic software and other system related costs. These costs will then be further  
9 adjusted to reflect anticipated discounts and inflation.

10 **Q. HOW ARE EXPENSES CALCULATED?**

11 A. Expenses are being calculated using the BellSouth TELRIC calculator methodology.  
12 To calculate expenses, we first identified a set of expense factors appropriate for  
13 e-spire. These factors were then applied to the investment costs developed. Expense  
14 factors were obtained or developed for capital, maintenance, other tax, shared and  
15 common expenses. Capital costs are developed utilizing the phi factor method  
16 incorporated into the BellSouth TELRIC Calculator. Depreciation service life, cost  
17 of money and plant specific expenses are based on factors reflecting e-spire costs.  
18 Gross receipts, shared and common expense factors, are those approved by the  
19 Commission.

20 **VI. OTHER ISSUES**

21 **4-WIRE LOOPS**

22 **Q. HOW SHOULD RATES FOR 4-WIRE LOOPS BE SET?**

1 A. Rates for 4-wire loops should be based on TELRIC. In general, 4-wire loops require  
2 twice the material as do 2-wire loops. However, there is virtually no incremental cost  
3 associated with installation or support structures. That is, a 4-wire loop does not  
4 require twice as many poles, twice the plowing or trenching or twice the installation  
5 cost associated with a 2-wire loop.

6 To account for this, a 4-wire loop TELRIC should include twice the material  
7 as a 2-wire loop, but only a proportionate increase in the amount of engineering,  
8 furnishing and installation costs and only a proportionate increase in the amount of  
9 support structure.

10 **Q. HAVE YOU ESTIMATED THE TELRIC OF A 4-WIRE LOOP?**

11 A. Yes. Using the BellSouth TELRIC Calculator, as adjusted by the Commission, I  
12 calculated the TELRIC for a 4-wire voice grade loop distribution element. Including  
13 twice the material, but no incremental support structure results in an estimated cost  
14 of \$5.49, which consists of

15

16

Table 1

17

4-Wire Loop Cost-Based Price

18

TELRIC \$5.22

19

Common Cost \$0.23

20

Cost-Based Price \$5.49

21

1 Q. SHOULD THIS SAME METHOD BE APPLIED IN ESTIMATING THE  
2 TELRIC FOR OTHER 4-WIRE UNE LOOPS?

3 A. Yes. This methodology is applicable to other unbundled 4-wire loops.

4 **UNBUNDLING REQUESTS**

5 Q. IS THE e-spire REQUEST FOR ADDITIONAL UNBUNDLED NETWORK  
6 ELEMENTS CONSISTENT WITH THE ACT?

7 A. Yes. As I explained, the Act selected entry as the vehicle to transform the market for  
8 local services from one of regulated monopoly to one that is structurally competitive.  
9 e-spire is asking that network facilities that are in place and used by BellSouth be  
10 made available as unbundled network elements. The elements include copper and  
11 fiber loop facilities, subloop unbundling, high capacity transport facilities, xDSL and  
12 packet switching facilities, among others. These requests are consistent with the  
13 open-entry provisions of the Act.

14 Q. HOW SHOULD CHARGES FOR LOOP CONDITIONING BE  
15 ESTABLISHED?

16 A. Charges for loop conditioning should be cost-based and non-discriminatory.  
17 TELRIC information should be accumulated to determine the relevant cost level.  
18 Prices charged to CLECs for loop conditioning should be on the same basis as that  
19 which BellSouth charges its own end users. For instance, if BellSouth does not  
20 charge its end users for this activity or may waive the charge under certain  
21 conditions, the same terms should apply to charges to the CLEC. Unless the CLECs



1 and the BellSouth end users are subject to the same pricing terms and conditions,  
2 pricing will be discriminatory.

3 **GEOGRAPHIC DEAVERAGING**

4 **Q. SHOULD THE COMMISSION MOVE TOWARD THE GEOGRAPHIC**  
5 **DEAVERAGING OF RATES FOR UNBUNDLED ELEMENTS?**

6 **A.** It is e-spire's position that the Commission should require the geographic  
7 deaveraging of rates for unbundled network elements, where significant  
8 geographically based cost differentials exist. Generally, one would expect that to be  
9 the case for the various loop elements, though not necessarily with regard to other  
10 network elements.

11 The case for cost deaveraging of unbundled network elements rests on both  
12 procompetitive and practical considerations. First, a primary goal in establishing  
13 prices for unbundled network elements is to achieve a competitive market outcome.  
14 Price signals to the market participants should promote efficient market entry and  
15 exit decisions and efficient facility make/buy decisions. If efficient decision-making  
16 is to result, then the prices charged must accurately reflect the underlying cost of the  
17 facilities in question.

18 Cost studies and engineering analysis point unquestionably to the fact that the  
19 cost of providing unbundled loop elements will vary across geographic areas within  
20 most states. This applies to 2-wire and 4-wire voice grade facilities, DSO and DS1  
21 channels, and fiber loop facilities (DS3, OC3, OC12, OC48 and Dark fiber). If  
22 efficient price signals are to result, the cost calculation should reflect these

1 differentials as should the resulting prices. Hence, rates for unbundled loops should  
2 be geographically deaveraged.

3 Further, the FCC, in its decision with regard to the Ameritech-Michigan  
4 Section 271 Application, found that approval will rest on, among other things, cost  
5 based and geographically deaveraged prices for unbundled loop elements (hence, the  
6 practical reality of proposing geographically deaveraged rates).

7 **Q. WHAT ARE THE MATTERS THAT MUST BE CONSIDERED IN**  
8 **ESTABLISHING GEOGRAPHICALLY DEAVERAGED RATES?**

9 A. If geographically deaveraged rates are to be established consist with the intent of the  
10 Act, then the rates must be cost based. The structure of rates should be driven by  
11 cost differences, not a LEC marketing strategy. This would suggest, for instance,  
12 that geographically deaveraged rates could be based on wire centers, but not on  
13 exchanges.

14 TELRIC estimates are based on a "scorched node" model. This is the basis  
15 of the BellSouth study and most other cost models (for instance, the HAI, BCPM and  
16 HCPM). Using a wire center is therefore reasonable both from a policy as well as  
17 a practical perspective. Exchanges, on the other hand, often include several wire  
18 centers. Where this is the case, the exchange cost represents an average of the costs  
19 of the individual wire centers. In that manner, cost differences are masked, rather  
20 than serve as the basis of geographically deaveraged rates.

21 Moreover, basing geographically deaveraged rates on exchanges can be  
22 anticompetitive. There is no reason to require that CLECs establish calling areas

1 comparable to the exchanges used by the ILEC, and there are no data to suggest that  
2 it is efficient for CLECs to do so. Cellular carriers provide a case in point.  
3 Therefore, there is no basis to use the calling area currently established by ILEC as  
4 the basis for geographically deaveraged rates for elements taken by the CLEC. Using  
5 these exchanges as the basis for geographically deaveraged rates will require the  
6 CLEC to mirror the calling areas of the ILEC to take full advantage of pricing  
7 differentials. The implication is clearly anticompetitive.

8 **Q. DOES THE BELL SOUTH TELRIC MODEL INCLUDE DATA ALLOWING**  
9 **THE DETERMINATION OF COST BASED DE AVERAGED RATES?**

10 A. Yes. BellSouth used a sample of loops in estimating loop costs. This sample  
11 included loops serving business and residence customers, loops of various lengths  
12 and located in different density areas. These same data should be able to describe  
13 costs on a geographically deaveraged basis. Complete data on the entire sample used  
14 by BellSouth were not included with the filing in the generic cost proceeding. e-spire  
15 is seeking these data, and upon their receipt and review, geographically deaveraged  
16 costs based on the BellSouth TELRIC will be presented.

17 **Q. ARE THERE ALTERNATIVE DATA SOURCES THAT THE COMMISSION**  
18 **CAN RELY ON TO SET DE AVERAGED RATES?**

19 A. Yes. There is a possibility that the BellSouth data will either not be available or not  
20 be useful in estimating geographically differentiated loop costs. If that is the case,  
21 one option is to rely on an alternative data source to deaverage the statewide rate.  
22 The Hatfield 5.0 (HAI), BCPM 3.1, and FCC Hybrid Cost Proxy Model (HCPM)

1 models can be used in that manner. I present an illustration of cost based  
 2 geographically deaveraged rates using the HAI 5.0 model as the source of data for  
 3 deaveraging as Table 2. To determine these rates, I began with the statewide 2-wire  
 4 voice grade unbundled loop rate of \$17 in the e-spire agreement. This rate is for the  
 5 loop including the NID, which is tariffed separately at \$1.08. I applied the ratios to  
 6 the rate for the loop less the NID (i.e., \$15.92) and then added back the rate for the  
 7 NID.

8 Table 2

9 Geographically Deaveraged  
 10 2-Wire Voice Grade Unbundled Loop

	Cost Ratio	TELRIC	Percent of Loops
11 Statewide Average		\$17.00	
12 Zone 1	0.632	\$11.14	20.2%
13 Zone 2	0.990	\$16.84	74.1%
14 Zone 3	2.419	\$39.59	5.7%

15 Q. WHY DID YOU USE HAI 5.0 IN YOUR ILLUSTRATION?

16 A. The HAI 5.0 data were readily available. Any of these other models could be used  
 17 for this purpose, however. HAI data for Florida are currently available, whereas  
 18 [HCPM data are not yet available for Florida.] e-spire is seeking BCPM data for  
 19 Florida from BellSouth. When these other data are available, we will be able to  
 20 provide comparable results using them as well.

21 Q. HOW WERE THESE RATES DEVELOPED?

1 A. Appreciating the policy issues involved in deaveraging rates, I limited the analysis  
2 to three rate groups. Using HAI 5.0, I calculated the relative structure of these rates  
3 and applied that to the Commission-approved statewide area rate. Switches with per  
4 line costs below \$90 were included in Zone 1, between \$90 and \$190 were included  
5 in Zone 2 and above \$190 in Zone 3.

6 **Q. ARE THERE OTHER DATA AVAILABLE THAT THE COMMISSION CAN**  
7 **DRAW ON TO DEAVERAGE UNES?**

8 A. Yes. BellSouth has geographically deaveraged rates for interstate special access.  
9 These rates are based on differences in density and could be used as the basis for  
10 geographically deaveraged unbundled loop rates, as well.

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

12 A. Yes, it does.

MARVIN H. KAHN

Education:

B.A. Business Administration, 1965  
Ohio Northern University

Ph.D. Economics, 1974  
Washington University

Previous Employment:

1977-1980 - Senior Economist, J.W. Wilson & Associates,  
Inc., Washington, D.C.

1975-1977 - Economist, MITRE Corporation, McLean, Virginia,  
Department of Energy Planning and Analysis.

1975 - Economist, Institute for Defense Analysis,  
Arlington, Virginia, Program Analysis and  
Evaluation, Cost Analysis Group.

1974 - Staff Economist, Ad Hoc Committee on the Domestic and  
International Monetary Effect of Energy and Natural Resource  
Pricing, U.S. House of Representatives, Committee on Banking and  
Currency, Washington, DC.

1969-1974 - Assistant Professor, Economics, University of Tennessee, Knoxville,  
Tennessee.

### Professional Work:

At J.W. Wilson & Associates, Inc., Dr. Kahn had the principal responsibility of developing and managing the firm's work dealing with analysis of the telecommunications industry. His efforts included basic and applied economic research into the cost of providing telecommunications services and market demand characteristics. He had lead responsibility in the firm's work involving cost of service, rate design, competition, and regulatory policy in telephony.

At the MITRE Corporation, Dr. Kahn directed much of the economic analysis into energy related issues. He was engaged in energy supply and demand analysis examining economic, life style, and growth implications of energy policies and issues; energy facilities siting issues; cost benefit analysis; and utility pricing policies. Particular efforts included econometric investigations of electricity demand, examinations of foreign peak load pricing experience, assessing the economic potential and effect of federal regulations on coal, nuclear and advanced electricity generation technologies, and examining the impact of energy conservation on electric utility growth, load factors and finances.

While at the Institute for Defense Analysis, Dr. Kahn was engaged in economic and cost analysis for the Office of Program Analysis and Evaluation, Office of Assistant Secretary of Defense. He developed an econometric model of manpower supply to naval and private shipyards.

At the Ad Hoc Committee, Dr. Kahn directed and assisted in preparation of committee studies on domestic and international effects of higher energy prices and analysis of energy legislation and policies. He served as the principal investigator in the study of energy price effects on domestic employment, production and price levels.

While serving on the faculty of the University of Tennessee, Dr. Kahn taught a variety of courses in economics including microeconomic, macroeconomic and labor market theory.

### Other Professional Activities:

- |            |   |  |
|------------|---|--|
| Chairman   | - | Workshop on Long Run Energy Demands, sponsored by National Science Foundation, 1976. |
| Consultant | - | National Republican Senatorial Committee   |
|            | - | OAO Corporation  |
|            | - | ABT Associates   |

### Selected Publications and Reports:

An Economic and Ratemaking Assessment of Issues Regarding IntraLATA Competition for Telecommunications Services, Exeter Associates, Inc., September 1993.

The Pennsylvania Telecommunications Infrastructure, Exeter Associates, Inc., March 24, 1992, (Co-author).

Report on the Status of Intrastate Incentive Regulation in the United States, Exeter Associates, Inc., March 1992, (Co-author).

Market and Regulatory Effects of the Elimination of the Manufacturing Restriction on the Bell Operating Companies, Exeter Associates, Inc., November 1989, (Co-author).

Assessment of Issues Related to the MFJ Information Services Restrictions, Exeter Associates, Inc., November 1989, (Co-author).

An Analysis of the Open Network Architecture (ONA) Costing and Tariff Plans Filed by the Regional Bell Holding Companies, National Regulatory Research Institute, October 1988, (Co-author).

A Review and Evaluation of the Load Forecasts of Houston Light & Power Company and Central Power & Light Company: Past and Present, Exeter Associates, Inc., 1985, (Co-author).

Study of the Pricing Precedents in Public Utility Industries, Exeter Associates, Inc., November 1983, (Co-author).

Competition, Contribution and Cross Subsidy: An Examination of AT&T Costing and Pricing Procedures, Exeter Associates, Inc., August 1981.

Product and Market Diversification of Regulated Utilities: An Assessment of Competitive, Market and Regulatory Implications, Exeter Associates, Inc., May 1981.

A Study of Jurisdictional Separations to Compare AT&T's Interstate Settlements Information Systems with the Separations Manual and Division of Revenues Process, J.W. Wilson & Associates, Inc., September 1980, (Co-author).

Competition and Growth: An Economic Analysis of the Domestic Market for Private Branch Exchanges, J.W. Wilson & Associates, Inc., September 1978, (Co-author).

"Separations Analysis of New Jersey Bell Telephone Company," J.W. Wilson & Associates, Inc., July 1978.



"Conservation and Utility Pricing Policies," paper presented at Engineering Foundation Conference on Economic Impacts of Energy Conservation, sponsored by Committee on Science and Technology, U.S. House of Representatives, July 1978.

"An Economic Assessment of Market Potential for Advanced Intermediate and Peaking Electric Generating Technologies," MITRE Corporation, 1978, (Co-author).

Public Policy and Power Plant Siting, MITRE Corporation, March 1977.

Commercialization Case Study: The Light Water Reactor, MITRE Corporation, December 1976.

Fuel Choice vs. Fuel Use: An Economic Analysis of Residential Electricity Demand, MITRE Technical Report, 1976. Paper presented at NSF Workshop on Long Run Energy Demands, June 1976.

Long Run Energy Demands, MITRE Technical Report, 1976.

Electric Utility Financial Problems and Potential Solutions, MITRE Technical Report, April 1976.

Implications of Ownership Patterns on Financing and Development of Western Coal Resources, MITRE Technical Report, May 1976.

"Some Short Run Dynamics of Residential Electricity Consumption," presented at the NSF Workshop on Electric Utility Financial Problems and Potential Solutions, August 1975.

Energy Security and the Domestic Economy: Impact on Prices, Employment and Consumption, Ad Hoc Committee on the Domestic and International Monetary Effect of Energy and Natural Resource Pricing, 93rd Congress, 2nd Session, 1974.

"Layoff Behavior in Manufacturing Industries," (unpublished dissertation), Washington University, St. Louis, Missouri, 1974.

"The Homestead Provision: Its Costs and Those of Some Alternatives," unpublished working paper, Haney for Governor Committee, 1974.

"Extending the Tennessee Sales Tax: Estimates of its Revenue Potential, Distributional Effects, and Cyclical Sensitivity," unpublished working paper, Haney for Governor Committee, 1974.

## Expert Testimony

Presented by Marvin H. Kahr:

### Before State Commissions:

Alabama Public Service Commission, Docket No. 17743; testified on separations and affiliated relations.

Alabama Public Service Commission, Docket No. 19983, testified on price cap regulation, local competition and universal service.

Alabama Public Service Commission, Docket No. 25625; testified on the application of TSLRIC/TELRIC principles in the pricing of unbundled network elements.

Alabama Public Service Commission, Docket No. 26029, testified on TELRIC estimates and pricing of unbundled network elements.

Alaska Public Utility Commission, Docket U-78-65; testified on cost of service and rate design of competitive service.

Arizona Corporation Commission, Docket No. E101-91-004; testified on telephone rate design.

Arizona Corporation Commission, Docket Nos. U-3021-96-448, U-3245-96-448, E-1051-96-448; testified on the application of TSLRIC/TELRIC principles in the pricing of unbundled network elements.

Arkansas Public Utility Commission, Docket 83-045-U; testified on access charges, impact of divestiture on revenue requirements and revenue sources, and rate design.

California Public Utilities Commission, Case No. 10001; testified on cost of service and rate design for Centrex service.

California Public Utilities Commission, Docket No. 93-04-003; testified on costing and pricing principles for unbundled network elements.

California Public Utilities Commission, Docket No. R.95-01-020; testified on discrimination and shared and common cost identification, and Universal Service Fund mechanics.

California Public Utilities Commission, Docket No. R.95-04-043; testified on pricing flexibility and local competition rules.

California Public Utilities Commission, Application No. 96-03-007; testified on regulatory policy for certification of a separate subsidiary under Section 272 of the Telecommunications Act of 1996.

California Public Service Commission, A.97-03-004; testified on rate reductions consistent with the PUC's competitively neutral mandate.

Colorado Public Utilities Commission, I&S Docket No. 1720; testified on utility rate design.

Delaware Public Service Commission, Docket No. 89-24T; testified on customer specific pricing of communication services.

Delaware Public Service Commission, Docket No. 91-35T; testified on pricing of Centrex services.

Delaware Public Service Commission, Docket No. 93-47; testified on Rate Design.

Public Service Commission of the District of Columbia, Formal Case No. 777; testified on telephone utility costs of service and rate design.

Public Service Commission of the District of Columbia, Formal Case No. 814, Phase III; competitive status of various services and cost support for pricing competitive services.

Public Service Commission of the District of Columbia, Formal Case No. 827; testified on rate design.

Public Service Commission of the District of Columbia, Formal Case No. 828; testified on regulatory principles and structure regarding competitive services.

Public Service Commission of the District of Columbia, Formal Case No. 828-II; testified on regulatory principles and structure regarding competitive services.

Public Service Commission of the District of Columbia, Formal Case No. 926; rate design.

Florida Public Service Commission, Docket No. 860984-TP; testified on market for interexchange services, pricing of access services and cost methodologies.

Florida Public Service Commission, Docket No. 880069-TL; testified on regulatory policy and depreciation practices.

Florida Public Service Commission, Docket No. 960916-TP; testified on the application of TSLRIC/TELRIC principles in the pricing of unbundled network elements.

Florida Public Service Commission, Docket No. 961537-TP; testified on local competition, unbundling network elements, TELRIC/TSLRIC, pricing.

Georgia Public Service Commission, Docket No. 3765-U; testified on Centrex Costs and Pricing Policies.

Georgia Public Service Commission, Docket No. 3882-U; testified on Alternative Regulatory Structures.

Georgia Public Service Commission, Docket No. 3893-U; testified on Depreciation Policy.

Georgia Public Service Commission, Docket No. 3905-U; testified on incentive regulation.

Georgia Public Service Commission, Docket No. 3914-U; testified on EAS.

Georgia Public Service Commission, Docket No. 4018-U; testified on design and structure of an ONA policy.

Georgia Public Service Commission, Docket No. 4232-U; testified on N11 Service arrangements.

Georgia Public Service Commission, Docket No. 7061-U; testified on costs of unbundled network elements, competitive based markups.

Indiana Public Service Commission, Cause No. 35181; testified on telephone utility rate structures, unbundling of services and implications of FCC Registration Program.

Indiana Public Service Commission, Cause No. 36732; testified on telecommunication cost of services and rate design.

Illinois Commerce Commission, Docket No. 89-0033; testified on regulatory structure and policy and cost study methodology for competitive services.

Illinois Commerce Commission, Docket No. 92-0448; testified on regulatory structure and policy.

Illinois Commerce Commission, Docket No. 93-0319, testified on comparable service requirements to promote gas supply competition.

Kentucky Public Service Commission, Case No. 285; testified on LMS policy.

Kentucky Public Service Commission, Case No. 90-256; testified on telephone rate design.

Kentucky Public Service Commission, Case No. 10109; testified on regulatory policy, telephone productivity growth and price caps.

Kentucky Public Service Commission, Administrative Case No. 323; testified on intra-ATA toll competition.

Kentucky Public Service Commission, Case No. 92-297; testified on competitive and ratemaking implications of an extended area service policy.

Kentucky Public Service Commission, Case No. 94-121; testified on appropriate method of regulation.

Kentucky Public Service Commission, Case No. 355; testified on local competition rules.

Kentucky Public Service Commission, Case No. 96-467; testified on the application of TSLRIC/TELRIC principles in the pricing of unbundled network elements.

Kentucky Public Service Commission, Case No. 97-074; testified on rate restructuring implications of rebundling network elements.

Louisiana Public Service Commission Docket No. U-17949-(A); testified on negative attrition and alternative regulatory structures.

Louisiana Public Service Commission, Docket No. U-17949-(B); testified on toll competition issues.

Louisiana Public Service Commission, Docket No. U-17949-(D); testified on alternative regulatory structures.

Louisiana Public Service Commission, Docket No. U-17949-(E); testified on total factor productivity, economic depreciation, and an economic analysis of construction programs.

Louisiana Public Service Commission, Docket No. U-17957; testified on AOS policy.

Louisiana Public Service Commission, Docket No. U-18976; testified on cellular service.

Louisiana Public Service Commission, Docket No. U-20710; testified on competitive service pricing.

Louisiana Public Service Commission, Docket No. U-20925; testified on alternative regulatory structures.

Louisiana Public Service Commission, Docket No. U-22020; testified on avoided cost discounts.

Louisiana Public Service Commission, Docket No. U-22022, 22023; testified on costs of unbundled network elements, competitive based markups.

Maine Public Utilities Commission, Docket No. 92-345, Phase I; testified on regulatory policy and structure, and incentive regulation.

Maine Public Utilities Commission, Docket No. 92-345, Phase II; testified on Staff Plan for alternative regulation for Central Maine Power.

Maryland Public Service Commission, Case No. 7435; testified on affiliated relations and utility rate design.

Maryland Public Service Commission, Case No. 7467; testified on jurisdictional separations.

Maryland Public Service Commission, Case No. 7788; testified on the regulatory principles and structure regarding interexchange communications carriers.

Maryland Public Service Commission, Case No. 7851; testified on telephone utility rate design.

Maryland Public Service Commission, Case No. 7902; testified on category cost of service study methodologies.

Maryland Public Service Commission, Case No. 8763; testified on the application of the New Services Test to private coin services.

Massachusetts Department of Public Utilities, DPU No. 19843; testified on affiliated relations, Western Electric pricing.

Michigan Public Service Commission, Case No. U-5197, et al.; testified on Western Electric costs and pricing.

Michigan Public Service Commission, Case No. U-6002; testified on separations.

Mississippi Public Service Commission, Docket No. 97-AD-544; TELRIC and pricing standards.

Nevada Public Service Commission, Docket No. 91-7026; testified on rate design.

New Mexico Public Service Commission, Case No. 96-307-TC; testified on the application of TSLRIC/TELRIC principles in the pricing of unbundled network elements.

New York Public Service Commission, Case No. 27710/27995; testified on costs and rates of local coin service.

New York Public Service Commission, Case No. 27995; testified on category costs of service utility rate design and deregulation.

New York Public Service Commission, Case No. 28264; testified on category costs of service, costs of local service, and design and structure of local exchange rates.

New York Public Service Commission, Case No. 29469; testified on competition and regulation of cellular services.

Ohio Public Utilities Commission, Case No. 79-1184-TP-AIR; testified on rate design and rate structure.

Ohio Public Utilities Commission, Case No. 83-300-TP-AIR; testified on rate design and rate structure.

Ohio Public Utilities Commission, Case No. 83-464-TP-COI; testified on regulatory structure and access charges.

Ohio Public Utilities Commission, Case No. 83-115-TP-AIR; prepared analysis of rate design.

Pennsylvania Public Utility Commission, R.I.D. No. 289, et al.; testified on utility cost of service methodologies and rate design for competitive telecommunications service offering.

Pennsylvania Public Utility Commission, Docket R-811512; provided telephone utility cost of service study, testified on rate design.

Pennsylvania Public Utility Commission, Docket R-811819; testified on telephone utility cost of service and rate structure.

Pennsylvania Public Utility Commission, Docket R-832316; testified on access charges, impact of divestiture on revenue requirements and revenue sources, and rate design.

Pennsylvania Public Utility Commission, Docket No. P-830452; testified on the impacts of divestiture on operating company operations and carrier access charges.

Pennsylvania Public Utility Commission, Docket No. R-842779; testified on telephone rate design and stand alone costing procedures.

- Pennsylvania Public Utility Commission, Docket No. R-850044; testified on telephone rate design.
- Pennsylvania Public Utility Commission, Docket No. R-850170; testified on policy issues regarding public, semipublic and privately owned coin stations and services.
- Pennsylvania Public Utility Commission, Docket No. R-850229; testified on rate design.
- Pennsylvania Public Utility Commission, Docket No. 860923; rate design and depreciation practices.
- Pennsylvania Public Utility Commission, Docket No. R-930715; testified on regulatory structure, productivity growth and utility costs.
- Pennsylvania Public Utility Commission, Docket No. 940587; testified on total service long run costs and revenue-cost comparisons of competitive services.
- Pennsylvania Public Utility Commission, Docket No. 951005; testified on alternative regulatory structures for small telephone companies.
- Pennsylvania Public Utility Commission, Docket No. 963556; testified on rate design for services and network elements.
- Pennsylvania Public Utility Commission, Docket No. R-00951005; testified on alternative regulatory structures, total factor productivity, price cap plans.
- Pennsylvania Public Utility Commission, Docket No. R-00963534; testified on rate rebalancing in the context of a price cap plan.
- Pennsylvania Public Utility Commission, Docket No. A-310203F0002(III), *et al.*; testified on local competition, TELRIC/TSLRIC pricing of unbundled network elements.
- Pennsylvania Public Utility Commission, Docket No. I-00960066; testified on issues related to access charge rate structure and universal service policies.
- Rhode Island Public Utilities Commission, Docket No. 1475; testified on rate design and rate structure.
- Rhode Island Public Utilities Commission, Docket 1631 (Phase I); testified on revenue requirements and merits of company cost of service studies.
- Rhode Island Public Utilities Commission, Docket 1631 (Phase II); provided telephone utility cost of service study.



Rhode Island Utilities Commission, Dockets 1560R, 1631, and 1654; testified on utility cost of service and rate design.

Rhode Island Public Utilities Commission, Docket 1687; testified on rate design and structure of local and toll rates.

Rhode Island Public Utilities Commission, Docket 1698; testified on rate design.

Rhode Island Public Utilities Commission, Docket 1878; testified on rate design.

South Carolina Public Service Commission, Docket 79-305-C; testified on cost of service, rate design, separations and affiliated relationships.

South Carolina Public Service Commission, Docket 82-291-C; testified on telephone utility cost of service methodologies and rate structure.

South Carolina Public Service Commission, Docket No. 97-374-C; testified on costs of unbundled network elements, competitive based markups.

Tennessee Regulatory Authority, Docket No. 96-01331; testified on avoided cost discount.

Texas Public Utility Commission, Docket No. 8585; testified on cost study methodology and the pricing of competitive services.

Texas Public Utility Commission, Docket Nos. 16189, 16196, 16226, 16285, 16290; testified on the application of TSLRIC/TELRIC principles in the pricing of unbundled network elements.

Texas Public Utility Commission, Docket No. 16473; testified on local competition, unbundling network elements, TELRIC/TSLRIC, pricing.

Utah Public Service Commission, Docket No. 94-999-01, Phase III; testified on pricing of unbundled network elements, colocation services and interim number portability.

Virginia Corporation Commission, Docket PUC 920029; testified on incentive regulation, utility productivity, utility construction programs.

Virginia Corporation Commission, Docket PUC 930039; testified on productivity growth, construction programs and incentive regulatory plans.

Washington Utilities and Transportation Commission, Case No. U-75-54; testified on cost of service methodologies for competitive telecommunications service offerings.

Washington Utilities and Transportation Commission, Cause Nos. U-86-34, *et al.*; testified on the establishment of rules and procedures regarding the detariffing of utility products and services.

West Virginia Public Service Commission, Case No. 84-747-T-42T; testified on rate design, access charge structures and affiliated relationships.

West Virginia Public Service Commission, Case No. 85-282-T-GI; testified on the policy of interexchangeable competition.

West Virginia Public Service Commission, Case Nos. 85-490-T-P, *et al.*; testified on access charge structures.

West Virginia Public Service Commission, Case Nos. 86-038-T-C, *et al.* testified in complaint case regarding independent telephone company earnings.

West Virginia Public Service Commission, Case No. 86-364-T-GI; testified on access charge structures.

West Virginia Public Service Commission; Case No. 89-206-T-42T; Telephone Rate Design and Local Calling Plans.

West Virginia Public Service Commission; Case No. 90-522-T-42T; Telephone Rate Design and Local Calling Plans.

West Virginia Public Service Commission, Case No. 94-1103-T-GI; testified on total service long run incremental costs and local service competition.

Wisconsin Public Service Commission, Docket No. 6720-TI-103; testified on cost standards for competitive services and compensatory pricing of Centrex service.

Wisconsin Public Service Commission, Docket No. 6720-TI-102; testified on productivity and rate implications of rate moratorium.

Wisconsin Public Service Commission, Docket No. 6720-TR-104; testified on incentive regulation proposals.

Before the Federal Energy Regulatory Commission (FERC):

Natural Gas Pipeline Company of America, Docket No. 87-141; filed testimony on the GIC.

Tennessee Gas Pipeline Company, Docket No. RP-88-228-000 *et al.*; filed testimony on comparable service.

Before Canadian Commissions:

Prince Edward Island Public Utilities Commission, complaint case; testified on cost of service and rate design for PBX equipment, and the economic implications of interconnection.

Before U.S. Postal Commission:

Docket MC79-3; testified on cost of service and rate design for second-class mail.

Before Legislatures:

Committee on Commerce, U.S. Senate, Subcommittee on Communications; expert witness testifying for Subcommittee Staff on U.S. Department of Transportation Study on Impacts of Daylight Savings Time Act.

Committee on Banking and Currency, U.S. House of Representatives, Ad Hoc Committee on the Domestic and International Monetary Effect of Energy and Natural Resource Pricing; appeared as Staff witness on inflationary and unemployment effects of the oil embargo, and on utility pricing policy proposals.

Committee on Consumer Affairs, Pennsylvania House of Representatives, appeared on behalf of the Office of Consumer Advocate, testified on regulatory policy regarding telecommunications.

Other:

District Court of Lancaster County, Nebraska, in Re: Norstan Communications vs. State of Nebraska, Docket No. 355; testified on the market for telecommunications services and the effect of emerging competition.

U.S. District Court for the District of Columbia, in RE: US. vs. AT&T et al., C.A. No. 74-1698; testified on Western Electric PBX Pricing.

U.S. District Court for the Southern District of Florida, in Re: Eugene Steele d/b/a Yacht Buyers Group vs. Morgan Yacht, et al., Case No. 82-2757-CIU-JE; testified on economic estimate of damages.

U.S. District Court for the District of Maryland, in Re: Fred Menke's Car Store, Inc. and Fred R. Menke, Sr. vs. Volvo North America Corporation, C.A. No. H86-1150; testified on economic estimate of damages.

U.S. District Court for the Eastern District of Pennsylvania, in Re: Design Sales Associates, Inc. vs. Pitcon Industries, Inc., C.A. No. 87-0805; testified on economic estimate of damages.