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**REBUTTAL TESTIMONY OF DR. RICHARD D. EMMERSON  
ON BEHALF OF BELL SOUTH TELECOMMUNICATIONS, INC.  
BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

**DOCKET NO. 960846-TP**

**SEPTEMBER 16, 1996**

**INTRODUCTION**

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Richard D. Emmerson. I am the President and CEO of INDETEC International, Inc. I am testifying on behalf of BellSouth Telecommunications, Inc. ("BellSouth" or the "Company"). My business address is 341 La Amatista, Del Mar, CA 92014.

Q. ARE YOU THE SAME RICHARD D. EMMERSON WHO FILED DIRECT TESTIMONY IN THIS DOCKET ON SEPTEMBER 9, 1996?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY IN THIS PROCEEDING?

A. MCI Telecommunications Corporation (MCI) has petitioned the Florida Public Service Commission (FPSC or Commission) to arbitrate certain terms and

1 conditions in its negotiation with BellSouth regarding interconnection,  
2 collocation, unbundled network elements (UNEs), and resale of existing  
3 services. The purpose of my rebuttal testimony is to respond to certain  
4 positions taken by Dr. Nina Cornell and Mr. Don Wood in their direct  
5 testimony for MCI.

6

7 THE COMMISSION SHOULD REJECT USE OF THE HATFIELD  
8 MODELS

9

10 Q. HAS MCI PROPOSED UTILIZING A HYPOTHETICAL MODEL OF  
11 TELECOMMUNICATIONS SERVICES?

12

13 A. Yes. Dr. Nina Cornell and Mr. Don Wood have recommended that the FPSC  
14 rely on the Hatfield models to determine the incremental costs of unbundled  
15 network elements, local transport and termination.<sup>1</sup>

16

17 Q. DO YOU AGREE WITH DR. CORNELL'S RECOMMENDATION?

18

19 A. No. There are a series of models and releases by Hatfield and associates which  
20 can generically be called "Hatfield Models." These models cannot be relied  
21 upon to provide sound and reliable estimates of TSLRIC costs of  
22 telecommunications services or elements. My comments are based on my  
23 review of the documentation of these models, my experience with such cost

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25 <sup>1</sup> Direct Testimony of Nina W. Cornell on Behalf of MCI, Docket No. 960846-TP, August 23, 1996,  
at pages 24 and 36. Direct Testimony of Don J. Wood on behalf of MCI, Docket No. 960846-TP,  
August 21, 1996, at page 13.

1 estimation models in general, including those produced by my own company,  
2 my discussions with other modelers, my knowledge of traditional  
3 engineering/economic cost models, and my knowledge of the types of data  
4 which are utilized in such systems.

5

6 Q. BASED ON YOUR KNOWLEDGE, DO THE HATFIELD MODELS  
7 UTILIZE METHODS WHICH ARE RELIABLE FOR ESTIMATING  
8 TSLRIC COSTS FOR UNES, TRANSPORT AND TERMINATION?

9

10 A. No. It appears that the Hatfield models do not provide a reliable method for  
11 estimating TSLRIC costs for unbundled network elements, transport and  
12 termination. The Hatfield models do not reflect the costs of an actual network,  
13 they produce a variety of errors, and perhaps most importantly, certain aspects  
14 of the modeling process appear to significantly bias the cost estimates  
15 downward.

16

17 Q. DO THE HATFIELD MODELS PROVIDE A REASONABLE ESTIMATE  
18 OF THE COSTS OF AN INCUMBENT LOCAL EXCHANGE COMPANY  
19 (“LEC”) OR A NEW ENTRANT?

20

21 A. No. It appears that the Hatfield models do not provide a reasonable estimate of  
22 either a new entrant or an incumbent LEC. The Hatfield models do not  
23 reasonably estimate the costs of an existing LEC placing facilities well in  
24 advance of the existence of homes and business (I will call this the franchise  
25 scenario). Further, the Hatfield models do not reasonably estimate the costs of

1 a new entrant placing facilities after homes and businesses are completely in  
2 place (I will call this the new entrant scenario).

3

4 Q. WHAT COST CHARACTERISTICS WOULD EXIST IN THE FRANCHISE  
5 SCENARIO?

6

7 A. In the franchise scenario the LEC will place facilities well in advance of the  
8 actual demand for local service at the time that developments and new  
9 construction of homes is about to occur or will possibly occur in order to  
10 provide service, or be ready to provide service, to all customers on a timely  
11 basis. This leads to relatively high levels of spare capacity at any point in time  
12 because growth only slowly catches up with capacity. Moreover, there is  
13 lumpiness in investment, uncertainty in demand forecasting, and there are high  
14 costs to retroactively expand capacity. Spare capacity leads to relatively high  
15 cable material costs.

16

17 On the other hand, the franchise scenario, with early placement of facilities,  
18 also has some corresponding cost advantages. It provides the opportunity for  
19 joint trenching with natural gas lines and limited requirements for cutting  
20 through concrete and asphalt and the associated additional labor and safety  
21 costs created when working on active streets. This scenario has relatively low  
22 structure and installation costs.

23

24 Q. WHAT COST CHARACTERISTICS EXIST IN THE NEW ENTRANT  
25 SCENARIO?

1

2 A. A new entrant may choose to place facilities only after all buildings, business,  
3 homes and streets are in place.<sup>2</sup> Under very unlikely conditions, this could  
4 lead to relatively high fill factors and relatively low costs for cable material per  
5 customer served.<sup>3</sup> On the other hand, the new entrant must face higher costs  
6 for structure and installation (e.g., trenches must be dug much more frequently  
7 through concrete, asphalt, lawns and flower beds often on busy streets,  
8 requiring care to avoid other existing structures). The costs for a new entrant  
9 may be greater than the costs in the franchise scenario.

10

11 Q. YOU STATED EARLIER THAT THE HATFIELD MODELS DO NOT  
12 ADEQUATELY REFLECT EITHER OF THESE TWO SCENARIOS.  
13 WHAT COSTS DO THE HATFIELD MODELS REFLECT?

14

15 A. The Hatfield models implicitly reflect the low cable material costs of an  
16 unrealistic new entrant scenario and yet also reflect structure costs which may  
17 be even lower than those which could be obtained in the franchise scenario.  
18 The model appears to want to have its cake and eat it too, and then wants some  
19 more.

20

21

22

23 <sup>2</sup> Of course, calculating costs for a new entrant begs the policy question of how customers received  
telecommunications services prior to the new entrant and who pays for such costs.

24

25 <sup>3</sup> This requires the critical assumption that the new entrant can somehow capture the entire market and  
serve all customers at a flash cut point in time. Of course, real entrants have no such opportunity.

1           Therefore, the Hatfield models do not properly reflect the costs that would  
2           occur for either scenario. This creates a significant underestimation bias in the  
3           models results.

4  
5 Q.       DO THE HATFIELD MODELS ASSUME FICTITIOUS CABLE ROUTES?

6  
7 A.       Yes, the Hatfield models, by utilizing inputs from the Benchmark Cost Model  
8           assumes that census block groups (CBGs) are square in shape, are assigned to  
9           the wire center closest to the centroid of the CBG, that feeder routes extend to  
10          the nearest midpoint of a side of the assumed square perimeter of the CBG (or  
11          penetrate 1/4 of the length of a perimeter side into the square CBG). These  
12          assumptions do not reflect actual customer locations. It is also not clear that  
13          the models even reflect the costs of serving an area which has uniformly  
14          distributed population (a stated assumption).

15  
16 Q.       ARE THERE OTHER PROBLEMS WITH THE HATFIELD MODELS?

17  
18 A.       Yes, there are. I have simply listed below some of the factors in the Hatfield  
19          models which are unrealistic, imprecise, may lead to certain problems and  
20          errors, or are simply wrong:

- 21          • Possible underestimation of BELLSOUTH Florida service territory by  
22          misassignment of CBGs, miscalculation of areas and/or missing CBGs.  
23          • Assignment of CBGs to the wrong wire centers.  
24          • Assignment of CBGs to the wrong serving LEC.

25

- 1 • Problems related to CBGs served by multiple wire centers and/or multiple  
2 LECs.
- 3 • Labor and switching cost inputs may be substantially understated.
- 4 • Operating expenses may be understated via cable cost multipliers.
- 5 • Fill rates for feeder and distribution cable appear unrealistically high leading  
6 to unrealistically low costs.
- 7 • Fill rates appear to be higher than stated in the models documentation.
- 8 • Implied fill rates for serving area interface (SAI) and multiplexing (MUX)  
9 appear unrealistically high.
- 10 • The models appears to be unwieldy and difficult to run.
- 11 • The source for manhole, terminal, splice and serving area interface and other  
12 costs appear to be based on “subject matter” expert judgment without  
13 documentation or validation.
- 14 • The identification of subject matter experts (SMEs) utilized by the models is  
15 not clear.
- 16 • Where and how SME expertise was utilized is not clear.
- 17 • Switching costs appear substantially understated.
- 18 • What would be expected as major changes in the model do not lead to major  
19 changes in the results of the model.
- 20 • The models do not reflect the additional costs of changing facilities which  
21 exist in a growing demand environment.
- 22 • Cost of money and depreciation costs may be unrealistically low.
- 23 • Costs for digital cross connects, SS7 network components and essential  
24 network support systems may be excluded or understated.
- 25 • Operator position costs appear understated.

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Q. DO THE HATFIELD MODELS PRODUCE RESULTS WHICH ARE CONSISTENT WITH THE CURRENT COSTS OF PLACING FACILITIES?

A. No, it appears they do not. For example, engineer James Schaaf, testifying on behalf of Pacific Bell in R-95-01-020 (the universal service cost proxy models docket) in his testimony filed April 17, 1996, considered the Hatfield results and a detailed prospective evaluation of the actual current/prospective costs for Angels Camp, California. Mr. Schaaf stated:

“The results of the study are that the BCM Hatfield results in a \$28,767 total cost for 12,376 feet of feeder distance. This is \$2.32 per foot. ... The results of the real world estimation process is \$140,043 total cost for the same distance of feeder or \$11.32 per foot. As anyone can see, the results of the BCM Hatfield are highly problematic.” (Emphasis in original).

Q. WHAT ARE THE BCM AND BCM2 AND HOW ARE THEY RELATED TO THE HATFIELD MODELS?

A. The BCM was developed initially “to identify those CBGs in which the cost of providing basic telephone service is so high that some form of explicit high-cost support may be necessary as part of a universal service solution.”<sup>4</sup> as a

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<sup>4</sup> “Benchmark Cost Model,” A joint submission by Sprint Corporation and USWEST, Inc in CC Docket No. 96-45, July 3, 1996, p. 2.

1 tool to evaluate the need for universal service funding. The Hatfield models  
2 utilize the BCM or variants of the BCM for manipulation of demographic data,  
3 especially for critical loop investment calculations. However, the BCM was  
4 widely criticized as suffering from severe problems that yielded unreliable and  
5 unrealistically low cost estimates. By early 1996, the sponsors of the BCM  
6 recognized its major shortcomings and stated that work was underway to  
7 correct these major shortcomings. By July 1996, the two remaining sponsors  
8 of the BCM, USWEST and Sprint, released BCM2 and a set of BCM2 results  
9 for all states. BCM2 appears to have corrected the major flaws inherent in the  
10 original BCM.

11

12 Q. WHAT ARE THE BCM2 RESULTS FOR FLORIDA?

13

14 A. The statewide average monthly cost for basic local exchange service is \$29.15  
15 in the BCM2 results.<sup>5</sup>

16

17 Q. WHAT IS THE COST PROXY MODEL (CPM)?

18

19 A. The CPM is a model jointly developed by Pacific Bell and INDETEC  
20 International. It enables companies and regulators to quantify the cost of  
21 providing universal service. The CPM is based on a consistent, uniform unit of  
22 geography, separates operating expenses from investment, separately develops

23

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24 <sup>5</sup> Id.

25

1 structure costs and accounts for efficiency of the LEC. In my opinion, the  
2 CPM is based on sound economic, financial and management accounting  
3 principles.

4  
5 Q. DOES THE CPM YIELD RESULTS THAT ARE SIMILAR TO BCM2?

6

7 A. Because of the corrections from the BCM1 version, the BCM2 now yields  
8 results which are similar to the Cost Proxy Model, even at geographic levels as  
9 small as a wire centers.

10

11 Q. MR. WOOD CONTENDS THAT MANY OF THE ENHANCEMENTS TO  
12 THE BCM2 ARE PRESENT IN THE LATEST VERSION OF THE  
13 HATFIELD MODEL<sup>6</sup>. IF CORRECT, WOULD THIS CHANGE YOUR  
14 RECOMMENDATION?

15

16 A. No. Saying that the Hatfield Model is "new and improved" is far different  
17 from demonstrating its superiority to other models. First of all, the new  
18 version of the Hatfield Model has not undergone the type of regulatory and  
19 other rigorous scrutiny that are normally applied before a model can be  
20 adopted for the purposes of public policy and rate setting. Therefore, using the  
21 most recent version of the Hatfield Model to estimate the incremental costs of  
22 BellSouth's unbundled network elements is not legitimate until the critical  
23 underlying BCM Plus model has withstood a thorough formal investigation.

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25 <sup>6</sup> Direct Testimony of Don J. Wood on Behalf of MCI, Docket No. 960846-TP, August 21, 1996, at page 4.

1           Despite Mr. Wood's reassurances, the latest revision to the Hatfield Model is  
2           brand new and untested. In my opinion, this arbitration proceeding is not the  
3           place to be introducing new primary cost models. Until the BCM Plus loop  
4           cost model is proven superior to other loop costing models, the Hatfield  
5           Models should not be used by the FPSC.

6

7   Q.    DID THE FCC RELY ON THE HATFIELD MODELS AND THE  
8           BENCHMARK COST MODEL (BCM) TO DETERMINE THE LEVELS OF  
9           ITS LOOP COST PROXIES?

10

11   A.    No, the FCC utilized the Hatfield and BCM models only to scale the proxy  
12           levels across states. The FCC Order states:

13

14           Based on our current information, we believe that both these models are based  
15           on detailed engineering and demographic assumptions that vary among states,  
16           and that the outputs of these models represent sufficiently reasonable  
17           predictions of relative costs differences among states to be used as set forth  
18           below to set a proxy ceiling on unbundled loop prices for each state. *We do*  
19           *not believe, however, that these model outputs by themselves necessarily*  
20           *represent accurate estimates of the absolute magnitude of loop costs.*<sup>7</sup>

21           (emphasis added)

22

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23   <sup>7</sup> The August 1, 1996, Order in the Matter of Implementation of the Local Competition Provisions in  
24   the Telecommunications Act of 1996, released August 8, 1996, CC Docket No. 96-98 (hereinafter  
  "FCC Interconnection Order I") at paragraph 794.

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Q. WHAT INFORMATION DID THE FCC UTILIZE IN DETERMINING THE BASE LEVEL FOR ITS LOOP COST PROXIES?

A. In effect, the FCC used the Hatfield and BCM cost estimates to apply the unbundled loop rates established by six states to all other states<sup>8</sup>. These six states are Colorado, Connecticut, Florida, Illinois, Michigan and Oregon. The FCC created its proxy for each state by inflating or deflating a simple unweighted average of the unbundled loop rates approved in these six states. The unweighted average rate was adjusted upward or downward according to whether the Hatfield or BCM cost estimate for a particular state was higher or lower than the simple unweighted average of the Hatfield or BCM cost estimates for the six benchmark states. Noting criticisms of the Hatfield and BCM models, the FCC concluded:

“For the purposes of setting an interim proxy, however, we note that the criticisms have been directed largely toward the absolute level of cost estimates produced by the models, rather than the relative cost estimates across states. Since our hybrid ceiling explicitly scales the model cost estimates based on existing state decisions and uses the model results simply to compute relative prices, we believe that these criticisms do not apply in the present context<sup>9</sup>.”

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<sup>8</sup> FCC Interconnection Order I, paragraph 794.  
<sup>9</sup> Ibid., paragraph 795.

1 Q. SHOULD THIS COMMISSION RELY UPON THE FCC'S UNBUNDLED  
2 LOOP PROXY RATES IN DETERMINING BELLSOUTH'S RATES FOR  
3 UNBUNDLED LOOPS IN FLORIDA?  
4

5 A. No. The FCC's proxies do not bear a reliable relationship to the incremental  
6 costs of providing unbundled loops. The manner in which the FCC derived  
7 these proxies is unclear, and the resulting rates may be less than defensible  
8 incremental cost estimates. For example, the FCC's proxy rate for Florida is  
9 \$13.68 per month, but BellSouth's estimate of the monthly long-run  
10 incremental cost (LRIC) of supplying two-wire, analog unbundled loops in  
11 Florida is much higher.  
12

13 Q. DR. CORNELL CONTENDS THAT THE FCC'S TELRIC  
14 METHODOLOGY REQUIRES STUDYING COSTS AS THOUGH  
15 BELLSOUTH IS DIVIDED INTO WHOLESALE AND RETAIL  
16 SUBSIDIARIES AND ONLY THE RETAIL SUBSIDIARY PUTS  
17 NETWORK ELEMENTS TOGETHER.<sup>10</sup> IS THIS A SOUND  
18 METHODOLOGY?  
19

20 A. No. Putting aside the question of whether her interpretation of the FCC's rules  
21 is correct, such a method fails to allow for incremental cost estimates that  
22 reflect the cost savings stemming from vertical integration. According to  
23 Professor Morris Adelman of MIT, economists describe a firm like  
24

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25 <sup>10</sup> Direct Testimony of Nina W. Cornell on Behalf of MCI, Docket No. 960846-TP, August 23,  
1996, at page 20.

1 BELLSOUTH as vertically integrated “when it transmits from one of its  
2 departments to another a good or service which could, without major  
3 adaptation, be sold in the market.”<sup>11</sup> In his book on antitrust and regulatory  
4 economics, Professor Daniel Spulber of Northwestern University explains that  
5 cost savings may result from vertical integration because of *economies of*  
6 *sequence*.<sup>12</sup> Cost estimating methods that refuse to allow for the presence of  
7 economies of sequence could easily overstate the costs of bundled retail  
8 offerings and competitively disadvantage BELLSOUTH.

9  
10 Q. DR. CORNELL EXPLAINS THAT THE HATFIELD MODEL ADDS A TEN  
11 PERCENT MARKUP TO CAPITAL AND NETWORK OPERATIONS  
12 COSTS INTENDED TO REFLECT FORWARD-LOOKING OVERHEAD  
13 COSTS.<sup>13</sup> DO YOU AGREE THIS PROCEDURE IS PROPER?

14  
15 A. No. Unfortunately, there is no formula which allows one to take incremental  
16 cost estimates and allocate shared and common costs to determine a service  
17 price. Incremental cost provides the information necessary to establish a floor  
18 for service pricing and part of the information to test for cross-subsidization of  
19 services.<sup>14</sup> However, incremental cost information by itself is insufficient to  
20 establish the upper bound for pricing or to determine the price of the service  
21 itself.

22  
23 <sup>11</sup> M. A. Adelman, “Integration and Antitrust Policy,” 63 *Harvard Law Review* 27 (1949) at 27.

<sup>12</sup> Daniel F. Spulber, *Regulation and Markets* (Cambridge, MA: MIT Press, 1989), pp. 118-120.

24 <sup>13</sup> Direct Testimony of Nina W. Cornell on Behalf of MCI, Docket No. 960846-TP, August 23,  
1996, at page 26.

25 <sup>14</sup> Service demand and revenue information provides the other source of information for testing for  
cross-subsidies.

1

2 In general, establishing service prices for the full complement of services a  
3 firm offers requires three types of information: 1) incremental cost  
4 (establishing the lower bound for the price); 2) market/demand information;  
5 and 3) the total shared and common costs of the firm (establishing the total  
6 level of contribution required from all services in total to sustain the firm in the  
7 long run).

8

9 Q. IF NO VALID FORMULA EXISTS, SPECIFICALLY HOW SHOULD  
10 PRICES BE SET TO RECOVER A FIRM'S TOTAL COSTS?

11

12 A. Service prices should be set based on market conditions in such a way that the  
13 contributions from all services (revenues in excess of incremental costs) are  
14 sufficient to cover the shared and common costs of the firm. It is the value of  
15 the service to the customer and the market conditions facing that service, not  
16 cost-based formulas, which will determine how shared and common costs can  
17 be recovered in the marketplace. By choosing among rates within the range of  
18 attainable contributions, public policy and company objectives can be  
19 accommodated. Absent special public policies to the contrary, rates which  
20 promote economic efficiency should be preferred over those which harm  
21 economic efficiency.

22

23 Q. DOES THIS CONCLUDE YOUR TESTIMONY?

24

25 A. Yes, it does.