

1 **2. Bell Atlantic -New Hampshire's UNE Cost Studies**

2
3 *Problems with BA-NH's Approach*

4
5 **Q. Why do you say that the Company's studies are not truly consistent with the long-run**
6 **planning horizon concept?**

7 A. The Company's approach is not a true long-run approach--at least as this term is used by
8 economists--in several respects. Most notably, it's cost modeling deviates from a long-run
9 approach in two very important particulars: first, a failure to use the most cost effective feeder
10 technology, leading to excessive deployment of fiber in locations near the wire center, second, a
11 failure to closely match cable sheath sizes with the volume of output being studied (low cable fill
12 factors).

13 In a long-run context, the appropriate technology choice is the one that provides the
14 lowest-cost solution in each particular situation, taking into account all relevant factors. In the
15 *Local Competition Order*, the FCC made an exception to the absolute "least-cost" solution in
16 that it rejected a purely hypothetical network (i.e., a "scorched earth design"). Aside from this
17 one exception, the FCC generally endorsed the traditional interpretation of the long-run and
18 envisioned a "most efficient" network using the ILEC's existing wire centers with an optimal
19 application of current technology.

20
21 Prices based on the least-cost, most efficient network design and technology
22 replicate conditions in a highly competitive marketplace by not basing prices on
23 existing network design and investments unless they represent the least-cost
24 systems available for purchase. This approach, however, may discourage
25 facilities-based competition by new entrants because new entrants can use the
26 incumbent LEC's existing network based on the cost of a hypothetical least-cost,
27 most efficient network. [¶683.]

28
29 ... We, therefore, conclude that the forward-looking pricing methodology for
30 interconnection and unbundled network elements should be based on costs that
31 assume that wire centers will be placed at the incumbent LEC's current wire
32 center locations, *but that the reconstructed local network will employ the most*
33 *efficient technology for reasonably foreseeable capacity requirements.*

1 [¶685, emphasis added.]
2

3 The Company's invariant choice of fiber feeder technology is not consistent with this approach.

4 According to Mr. Baker,

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6 the switched network, interoffice facilities, local distribution network and other
7 unbundled network element components are engineered and constructed using
8 efficient, currently available technology. Thus in effect, the network, which
9 includes the network elements, *is replaced with the technology presently*
10 *being used for most growth and replacement projects.* Each element is
11 constructed of its essential components to ensure that the mix of technology is
12 consistent with our current practice. [Baker Direct Testimony, p. 3, emphasis
13 added.]
14

15 That is, under Bell's interpretation, the appropriate technology for the "scorched node"
16 replacement of the feeder network is fiber, because this is the technology the Company
17 currently favors in its ongoing process of network modernization, upgrading and expansion.
18 Mr. Bradley has confirmed this interpretation in his response to PUC Request 2.2-15. When
19 asked why the Company chose to use fiber feeder even where copper feeder would be less
20 costly, he replied that

21
22 BA-NH chose to use fiber feeder in its cost studies in this proceeding because
23 fiber is the technology choice for feeder relief.
24

25 As explained in Mr. Bradley's testimony, BA-NH's forward-looking modeling of the
26 link divides it into two main components, the feeder section, which is wholly fiber, and the
27 distribution section, which is copper.
28

29 Thus the typical modern loop [link] facility consists of the copper drop, and
30 copper distribution cable from the customer location to the RT [remote terminal]
31 of the fiber optic based DLC feeding the local Carrier Serving Area. It also
32 includes the digital channel on the fiber optic based DLC system, from the RT to
33 the wire center. Depending on density, the RT is located as close to the
34 customer as possible, thus minimizing the length of the distribution cable and
35 maximizing the efficiency of fiber over copper. In very concentrated
36 applications, like high rise buildings or large multi-unit dwellings, it may be
37 economically efficient to install the optical RT in the basement or other common

1 space within the building. [Bradley direct testimony, p. 10.]
2

3 The Company's explanations may create the impression that fiber is always less costly
4 than copper, but this is not necessarily the case—particularly in the context of a long-run planning
5 horizon in which one is creating a completely new network. Where large quantities of copper
6 already exist on a particular feeder route, it could be logical for an incumbent carrier to diversify
7 with fiber during feeder relief projects. However, it is another matter entirely to suggest that
8 copper feeder would never be included in a network being built from scratch, regardless of
9 circumstances. To the contrary, copper feeder continues to be the least costly option in some
10 situations—particularly in locations close to the wire center. As I will show later in my testimony,
11 the use of copper feeder cable on shorter routes can reduce the cost of unbundled links.
12

13 **Q. Isn't fiber is the wave of the future in wired networks?**

14 A. I don't deny the possibility that copper feeder cable will become economically obsolete over
15 the next couple of decades, due to the inherent advantages of fiber over copper. The difficulty is
16 in predicting when this might occur. Looking only at the cable and support structures, fiber
17 tends to be much less costly than copper. It is important to recognize, however, that the digital
18 loop carrier electronics and other miscellaneous investments required for an optical system
19 continue to be fairly costly. If one is attempting to analyze the economic trade-offs between
20 copper and fiber technology, it is necessary to determine demand for bandwidth as well as to
21 determine whether the cable cost savings are sufficient to offset the cost of the electronics and
22 miscellaneous investments associated with a fiber system.

23 Both fiber optic cable and the associated electronics continue to decline in cost, and
24 thus fiber holds the potential for economically handling video dial tone, broadband data
25 services, and other offerings that require an enormous amounts of bandwidth. These new
26 offerings cannot be handled as easily over metallic cable. Even so, that does not mean that new
27 installations of copper cable will become an albatross hanging around a carrier's neck. To the
28 contrary, manufacturers are working aggressively on new technologies that hold the potential
29 for offering higher bandwidth services over ordinary copper wires.

1 Charles J. McMinn, CEO of Covad Communications Co., predicts that ADSL
2 modems will replace analog modems in “on the order of five-plus years.” [*tele.com*, April
3 1998, p. 72.] In that case, it would be technically feasible and cost effective to provide the
4 average small business or household with enough bandwidth on copper to meet the demand for
5 high-speed Internet connections and to provide VHS quality video signals. In essence,
6 deployment of ADSL will serve the bandwidth demand of certain customers, extend the life of
7 copper cable, and potentially, help stabilize or reduce rates for customers using POTS. At
8 present, ADSL electronics cost about \$500 per subscriber [Id., p. 73.] However, economies
9 of scale and the declining cost curve characteristic of electronics products should cut deeply
10 into this figure within the five-year time frame.

11 While fiber may eventually replace copper in telecommunications network, that time has
12 not yet arrive. Copper cable continues to have an appropriate role in modern voice grade
13 networks and in a long-run cost study. There is no logical reason to rely upon fiber feeder and
14 electronics in situations where this is more costly than copper feeder.

15 Given the current level of fiber electronic costs, an all-fiber feeder system is not the
16 most cost effective choice at this time. In DE-96-252, as interpreted by the Arbitrator, AT&T
17 argued that Bell’s cost modeling sought to recover “costs for a non-regulated video network
18 that just happened to carry regulated voice traffic.” [Arbitrator’s Final Report, 40ARBF.BH1.]
19 A case can be made that the Company’s all-fiber modeling approach would make New
20 Hampshire CLECs pay the costs of a broadband network, despite the fact that they are not
21 receiving the benefits of such a network. (Despite paying for fiber and fiber electronics, CLEC
22 traffic would be routed over existing copper feeder cables.)
23

24 **Q. Is the Company’s strategy of diversifying away from copper during feeder relief**
25 **projects a sound one?**

26 A. Very possibly. However, the Company has not made any showing that a purely fiber feeder
27 network is a cost-effective configuration for use in developing unbundled element rates in this
28 proceeding. To the contrary, the assumed network does not appear to be a cost-effective
29 configuration for the provision of ordinary voice grade links to ordinary end-use customers and

1 CLECs. Even if the proposed configuration would be profitable in the context of a network
2 providing video dialtone, broadband data services, and ordinary telephone service on an
3 integrated basis, the cost estimates do not account for the increased bandwidth *and traffic*
4 associated with such a scenario, and thus they overstate the cost of providing links to the
5 Company's competitors on an unbundled basis during the near future.

6 Given all the complexities and conjecture associated with analyzing the cost of
7 providing voice and other narrowband services on a broadband network, it is preferable to
8 model an efficient narrowband network, sized to meet current and reasonably foreseeable
9 demand for ordinary telephone services.

10 While this approach ignores some of the economies of scale achieved when
11 narrowband services are provided over a broadband network, it is a simpler and more
12 reasonable approach than the Company's. BA-NH's studies create the appearance that a fiber
13 network will be very costly, because they assume widespread fiber deployment in conjunction
14 with costly fiber electronics, yet they ignore the potential for economies of scale and equipment
15 cost savings that may ultimately be achieved when voice traffic is handled as a minor
16 component of a high-volume video dial tone/broadband network.

17 Under the Company's approach, its competitors will be forced to pay for costs that are
18 directly related not to the links they are actually renting, but instead to the building and
19 operation of a hypothetical all-fiber feeder network. This approach is particularly inappropriate
20 when the associated cost studies, like those in this proceeding, ignore the offsetting revenue
21 streams, economies of scale and operational benefits that will devolve on such a network once
22 it is actually deployed and marketed.

23 For example, the Company has developed higher costs and rates for "conditioned"
24 links. These rates will potentially apply when CLECs acquire links for use with 2 and 4 wire
25 digital services. The estimated cost of these higher grade links range from \$31.63 (2 wire urban
26 digital conditioned) to \$304.19 (4 wire rural digital conditioned) per month. Perhaps these
27 extremely high costs make sense in the context of the existing analog network, where digital
28 conditioning and 4 wire signaling capabilities require extraordinary effort; but, in the context of a
29 broadband fiber network, it seems reasonable to assume this type of network element could be

1 provided on a routine, less costly basis. The Company's approach tends to burden the CLECs
2 with extra costs associated with a hypothetical assumption of extensive fiber deployment,
3 without providing them with sufficient offsetting benefits to justify this assumption.
4

5 **Q. Should the Commission discourage the Company's deployment of fiber?**

6 A. Certainly not. BA-NH should still be free to diversify away from copper and to reap the
7 potential rewards—including revenues from video dial tone and broadband data services. The
8 issue in this proceeding is a different one: should BA-NH's competitors pay higher unbundled
9 loop rates based upon the cost of a hypothetical fiber network spread over the current volume
10 of narrowband links? I think not. If BA-NH wants to expand its use of fiber optic cable in
11 order to increase its potential revenues from video dial tone or other broadband services, the
12 cost of deploying such a network should be borne by its stockholders and/or the video dial tone
13 and broadband customers who will benefit from such an advanced network. If the Company is
14 allowed to burden CLECs with the cost of a fiber optic network that they do not need and
15 cannot efficiently use, the wrong price signals will be sent to potential new entrants.
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