

1 **II. Onset Costs**

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3 **Q. Let's start with the OSS. The FCC's Local Competition Order lists OSS functions**
4 **among the network elements that ILECs must unbundle and provide to their**
5 **competitors. What are OSS functions?**

6 A. According to the FCC, OSS functions include pre-ordering, ordering, provisioning,
7 maintenance and repair, and billing functions supported by the ILEC's databases and
8 information. [47 C.F.R. §51.319(f)(1).] Of course, in order to make use of these functions,
9 CLECs and resellers will need access to them.

10

11 **Q. What costing principles for OSS onsets are required by the FCC?**

12 A. During its efforts to obtain approval of the Bell Atlantic/NYNEX merger, Bell Atlantic
13 committed to using "forward-looking economic cost" for both recurring and nonrecurring
14 charges. The FCC has established long run cost as its preferred form of forward-looking
15 economic cost for all forms of UNE pricing. Hence, the TELRIC concept applies to unbundled
16 access to OSS, as well as other network elements. According to the FCC,

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18 [W]e conclude here that prices for interconnection and unbundled elements
19 pursuant to sections 251(c)(2), 251(c)(3), and 252(d)(1), should be set at
20 forward-looking long-run economic cost. In practice, this will mean that prices
21 are based on the TSLRIC of the network element, which we will call Total
22 Element Long Run Incremental Cost (TELRIC), and will include a reasonable
23 allocation of forward-looking joint and common costs. [FCC 96-325, 672.]
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25 The Company claims that it is using TELRIC costing concepts in the context of its
26 recurring charges for loops, ports, and other network elements. For consistency, the costs of
27 the Company's OSS functionalities should also be determined by TELRIC principles.
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1 **Q. Does the Company claim that its costs are based on TELRIC principles?**

2 A. Yes. According to Mr. Minion, Bell Atlantic - North's OSS related onset costs

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4 reflect the one-time and ongoing costs incurred by BAN specifically to meet the
5 requirements of resellers and Competitive Local Exchange Carriers (CLECs)
6 associated with regulatory compliance as well as other services resulting from
7 arbitration proceedings. They are developed consistent with TELRIC criteria.
8 [Att. A, p. 1.]
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10 **Q. Do you agree that the Company's procedures for estimating onset costs are consistent**
11 **with TELRIC methodology?**

12 A. No. To the contrary, it has estimated the accounting costs associated with providing access to
13 its existing legacy OSS. This is essentially an embedded costing approach, and it is completely
14 inconsistent with the TELRIC approach used in pricing other network elements.

15 The Company possesses functioning OSS which have evolved over many years. These
16 systems are not identical to what the Company would create if it were to start with a clean slate
17 and purchase an optimal, maximally efficient OSS for use in a multicarrier environment. To the
18 extent any "onset" OSS costs are appropriate in a forward-looking, long-run economic costing
19 context, it would be the additional costs required to include these capabilities within such a
20 system. It is not appropriate to focus on the actual costs required to retrofit or adapt existing
21 legacy systems to make them usable in a multicarrier environment.

22 In applying the TELRIC concept to the present context, the applicable OSS costs are
23 the *long-run incremental* costs that would be incurred by Bell Atlantic - North in order to
24 provide these functions to CLECs and resellers, as well as to the Company itself. They are not
25 the accounting costs incurred when modifying Bell Atlantic - North's present OSS to
26 accommodate a competitive environment. The relevant question is not, "How much is it costing
27 Bell Atlantic - North to adapt its legacy OSS to make them usable for CLECs?" Rather, the
28 question is: "What is the incremental difference in projected costs between a state-of-the-art
29 OSS designed to provision numerous carriers on Bell Atlantic - North's network, and a state-
30 of-the-art OSS designed to provision only Bell Atlantic - North's retail customers?" In
31 comparing these two figures, one should assume that the multicarrier capabilities are being

1 incorporated into the system specifications from day one, at the time the OSS is being
2 purchased or created in the first place.

3 The Company's OSS cost figures reflect the retrofitting of Bell Atlantic - North's
4 legacy systems. The Company has not provided any evidence concerning what it would cost to
5 include these same OSS capabilities in a system that would be designed and purchased today
6 to accommodate a multicarrier environment. While modifying the existing systems might be the
7 most practical option in actual practice, this doesn't provide us with information about TELRIC,
8 which is more of a hypothetical costing concept.

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10 **Q. It seems obvious that retrofitting existing systems will be more costly than including**
11 **features and functions into the design of a system at the time it is initially created. Is**
12 **there a similar problem with the Company's accounting cost data for its computer**
13 **hardware costs?**

14 A. Yes. The Company's cost data for its General Purpose Computer investments required to
15 support the OSS applications are based upon Bell Atlantic - North's actual historical
16 expenditures on computer hardware, rather than on the forward-looking cost of the least costly,
17 most efficient computer systems that could be acquired in a long-run planning horizon. The
18 Company follows a highly centralized approach to computer systems, relying upon massive
19 main frame computers and associated peripherals that are "bought in bulk and assigned to
20 systems as needed":

21
22 All projects within a given year are attributed the same costs per GIG [gigabyte
23 of memory] and MIPS [million processing instructions per second] based upon
24 the total corporate budget. For 1996 this attribution was \$3,000 per GIG and
25 \$25,000 per MIPS; for 1997 it is estimated to be \$3,000 per GIG and \$20,000 per
26 MIPS. The total capital expenditures for OSS access and functionalities are
27 estimated to be \$30.9 million. [Minion Direct, p. 21.]
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29 The Company has not demonstrated that this centralized approach is the most cost
30 effective one available. At least for a small state like New Hampshire, it might be more efficient
31 to use a less centralized approach, relying upon smaller, less costly computers that serve more

1 limited functions and more limited geographic areas. It seems quite plausible that telephone
2 network in New Hampshire could be maintained and operated on a largely stand-alone basis,
3 without the need for continual, real-time access to data concerning the network in New York
4 or Massachusetts. To the extent an employee in New Hampshire occasionally needs to obtain
5 access to data concerning network systems or services located elsewhere in the region, this
6 could potentially be achieved by much the same methods used for the Internet--where millions
7 of small computers can share information, albeit not instantly.

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9 **Q. Potentially, the Company's cost data for gigabytes and MIPS could be compared to**
10 **the analogous costs of gigabytes and MIPS that a hypothetical firm would incur if it**
11 **were purchasing the most efficient, least costly computer hardware available today.**
12 **Can gigabytes and MIPS be used for comparison purposes in this manner?**

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14 **A.** To some degree, yes. Gigabytes and MIPS are simply measures of computer storage capacity
15 and processing capacity, respectively. While the specific measures being referenced by the
16 Company are taken from a context of main-frame computers and peripherals, much the same
17 concepts apply to mini-computers and the more familiar personal computers. Of course, the
18 analysis can become quite complicated if one wants to ensure full comparability across the
19 various options. For example, a specific type or class of computer may be less costly for some
20 tasks and more costly for others.

21 The cost of all types of computer hardware continues to decline, although the rate of
22 decline has not been uniform across different markets. We are all familiar with the dramatic
23 reductions in cost which have occurred in the personal consumer market, where mass
24 production and rapid technological progress have translated into extreme reductions in cost. As
25 a result, storage and processing capacities that were once beyond the reach of all but the
26 largest corporations with the deepest pockets are now readily available to small businesses and
27 consumers.

28 As an example of the complexity of such an analysis, consider mass-market hard
29 drives. The most popular, least costly type of drives (IDE) with 4.3 gigabytes of storage

1 capacity can currently be purchased for less than \$300 retail. This works out to approximately
2 \$70 per gigabyte. However, a more robust system, with redundant SCSI hard drives offering
3 9.1 gigabytes of net storage capacity, would cost about \$3,500, or approximately \$400 per
4 gigabyte.

5 Similarly, major brand industry-standard personal computers equipped with 333 Mhz
6 Pentium II chips are available for under \$2000 retail. Intel, the manufacturer of the Pentium
7 processors, claims these top-of-the-line chips are capable of processing roughly 200 million
8 instructions per second. Thus, according to Intel's ratings, the cost per MIPS works out to
9 approximately \$10. This same processor, placed into far more robust systems, with complete
10 redundancy, an uninterruptible power supply, advanced networking capabilities, and so forth,
11 might cost as much as \$20,000, or a cost per MIPS of approximately \$100.

12 Needless to say, the massive main frame computing systems being used by Bell Atlantic
13 - North are not directly comparable to the personal computers we are all familiar with. These
14 massive computers are produced in much smaller quantities, and they offer advanced
15 capabilities which cannot be matched by, or directly compared with, personal computers.
16 Nevertheless, the basic concepts of storage capacity and processing capacity are applicable to
17 both markets. Furthermore, a degree of convergence is occurring across the personal, mini-,
18 mid-frame and main-frame computer markets.

19 In the mass market, millions of small computers are now sold every year. Fueling this
20 rapid growth have been extraordinary reductions in cost and huge increases in capacity. It is fair
21 to say that today's personal computers are capable of performing many tasks that were once
22 feasible only on massive main-frame computers costing upwards of a million dollars. As a
23 result, personal computers are becoming ubiquitous even in large corporate environments,
24 which once relied almost exclusively on centralized main-frame computers maintained by
25 specialized data processing departments. Of course, many factors are retarding the shift from
26 large to small computers, including the complications and difficulties associated with converting
27 legacy software from a large computer environment to a small computer operating system.

28 Despite the many differences that remain between the various segments of the computer
29 market, it is fair to say that considerable convergence is occurring. The overall trend has been

1 towards distributed processing, as computing resources are deployed in small quantities to
2 serve the specific needs of individual employees, in conjunction with networking schemes that
3 provide employees with access to additional information on an as-needed basis. For example,
4 Compaq, one of the largest personal computer manufacturers, is acquiring Digital Equipment
5 Corporation, one of the largest minicomputer manufacturers, and in 1997 it acquired Tandem
6 Computers, a major provider of high-end, "mission critical" computers.

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8 **Q. Bell Atlantic - North notes that its "actual underlying OSS systems and operations ...**
9 **are generally centralized." [Minion Direct, Att. A, p. 1.] Is this one reason why it relies**
10 **upon main-frame computing equipment?**

11 A. Yes. While the forward looking trend is toward distributed processing the Company currently
12 uses a centralized approach. Hence, its existing OSS and other software systems operate on
13 massive main-frame computers. The cost information submitted in this proceeding is consistent
14 with this approach to data processing, providing a further indication of the embedded nature of
15 this cost data. However, it begs the question of what would be the most efficient and cost-
16 effective approach to use in the context of a long-run planning horizon, where all inputs are
17 variable.

18 TELRIC is supposed to be a strictly forward-looking cost approach, which avoids
19 passing on to CLECs and their customers any inefficiencies that might be enshrined in legacy
20 systems like those operated by Bell Atlantic. The Company has supplied only accounting type
21 information concerning the actual cost of its existing systems; it has provided no estimates of
22 what it would cost to perform these functions using the least costly available technology and
23 approach. Conceivably, some of these functions could be performed less expensively with a
24 less centralized system tailored to the specific needs of the New Hampshire network. There
25 appears to be no economic necessity for billing a handful of New Hampshire CLECs by way of
26 a complex of massive main-frame computers in New York. Intuitively, it seems that bills that
27 need to be rendered to CLECs in New Hampshire each month could be developed and printed
28 using a few Pentium computers in Manchester.

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1 **Q. In addition to its claims of one-time (onset) costs for OSS, does the Company also**
2 **project ongoing costs?**

3 A. Yes. The Company lists associated ongoing costs of \$18.5 million per year for its computer
4 operations and of \$8.077 million per year for the Resale Service Center. The computer costs
5 include both annual system maintenance expenses of \$7.241 million and annual capital costs of
6 \$11.292 million. [Minion Direct, Attach. A, WP II.] The latter (capital) costs were calculated
7 by summing the project's shares of Company budgeted computer expenses for 1996 (\$14.926
8 million) and 1997 (\$16.003 Million) and multiplying the result by the arbitrated annual carrying
9 charge factor of 0.3651. [Id., WP III.] These capital expenditures were derived from the
10 estimated cost per gigabyte of \$3,000 and the estimated cost per MIPS of \$25,000 and
11 \$20,000 for 1996 and 1997 respectively.

12 According to Mr. Minion, the system maintenance costs were estimated

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14 based on a factor which was applied to the expense of developing the new
15 functionality within the Billing and Provisioning systems. This factor was derived
16 from subject matter experts who estimate that approximately 15% of any initial
17 program development costs are incurred annually on a going-forward basis in
18 support of the existing functionality, for program upgrades, enhancements and
19 modifications. [Minion Direct, p. 22.]
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21 The Company explains its RSC ongoing expenses as

22 separate and apart from the establishment costs.... Based upon the resold access
23 line demand and associated service orders, the Company estimated the number
24 of employees that would be required in the fifth year of operation. This number
25 was then multiplied by the appropriate fully assigned wage rate. The estimate of
26 personnel requirements assumes appropriate mechanization is in place, and is
27 based on the expectation that the current types and relative quantities of
28 orders/inquiries as they exist in today's retail environment would continue in a
29 resale environment. [Minion Direct, p. 23.]
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31 The Company's assumptions in this regard appear reasonable. In particular I would
32 note the use of the fifth-year estimate, which should dispose of "any short-term anomalies that
33 may result in increased cost due to the learning curve associated with the emergence of the new
34 market." [Id.] This is a principle the Company should have employed more widely, especially
35 in regard to its nonrecurring costs (discussed in the next section).

