STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

IN RE:	REVIEW OF BELL ATLANTIC-RHODE ISLAND TELRIC STUDY	: :	DOCKET NO. 2681

REPORT AND ORDER

INTRODUCTION

This protracted proceeding was initiated in 1997 as a result of the enactment of the Telecommunications Act of 1996 (Public Law 104–104, 110 Stat. 56), passed by Congress on February 9, 1996, and codified in 47 U.S.C. §§ 151, *et seq*. (hereinafter referred to as the "1996 Act"). Designed to encourage the development of competition in local telephone exchange markets, Sections 251(c) and 252(d) of the 1996 Act require that an Incumbent Local Exchange Carrier ("ILEC"), such as Verizon,[1] interconnect with Competitive Local Exchange Carriers ("CLECs"), including such parties to this proceeding as AT&T, Cox Communications, and Conversent Communications, and provide CLECs with access to unbundled network elements ("UNEs") and collocation. Pricing for this access is governed by § 252(d)(1) of the 1996 Act, which essentially establishes "cost" as the basis for pricing unbundled network elements and interconnection.[2]

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[1] We will generally refer to the Verizon entity presently serving Rhode Island -- Verizon Rhode Island (formerly Bell Atlantic-Rhode Island) -- and a party to this case, simply as "Verizon." We will use the term "Verizon Rhode Island" only in contexts, such as estimating the cost of capital, wherein it is important to distinguish the attributes of the local operating company from the holding company. In quotations from briefs, or sometimes in a historic context, Verizon may also be referred to as "Bell Atlantic," "Bell Atlantic-North," or "BA-RI."

[2] Section 252(d) is set out in full as follows:

> (d) PRICING STANDARDS --
> (1) INTERCONNECTION AND NETWORK ELEMENT CHARGES –

The Federal Communications Commission ("FCC") initially reviewed and interpreted the pricing and other statutory provisions of the 1996 Act in its 1996 *Local Competition Order* (*"LCO"*), formally titled *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, CC Docket No., 96-98, First Report and Order, 11 FCC Rcd 15499 (August 8, 1996). Among other things, the *LCO* established "pricing rules" which require that UNE pricing be determined in accordance with the "TELRIC" or Total Element Long Run Incremental Cost methodology, more fully described below. Briefly stated, under the TELRIC methodology, the prices that an ILEC, such as Verizon, charges for interconnection and UNE's shall be set to recover the forward-looking costs that are directly attributable to providing specific network elements, including a reasonable share of the ILEC's joint and common costs and a reasonable rate of return on the ILEC's investment. Thus, the TELRIC standard is both a costing and a pricing methodology or, in the words of the FCC, a "cost-based pricing standard." (*LCO*, ¶*673).*

As Cox has quite accurately observed, however, due to the number of "federal regulatory developments and court decisions [that] have continually complicated and extended the procedural schedule in this docket . . . [more than] three years have passed since the docket was

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> Determinations by a State commission of the just and reasonable rate for the interconnection of facilities and equipment for purposes of subsection (c)(2) of section 251, and the just and reasonable rate for network elements for the purposes of subsection (c)(3) of [section 251] –
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> (A) shall be –
> (i) based on the cost (determined without reference to a rate of return or other rate-based proceeding) of providing the interconnection or network element (whichever is applicable), and
> (ii) non-discriminatory, and
>
> (B) may include a reasonable profit.

initiated. During that time, the industry has been in frenetic motion."[3] Although the United States Court of Appeals for the Eighth Circuit initially stayed the FCC's pricing rules in 1996,[4] the United States Supreme Court restored the FCC's pricing authority on January 25, 1999, and remanded the *Iowa Utilities Board* case to the Eighth Circuit for consideration of the merits of the challenged rules.[5] On remand from the U.S. Supreme Court, the Eighth Circuit concluded that, while TELRIC is an acceptable method for determining costs, certain specific rules contained within the FCC's pricing rules were contrary to Congressional intent.[6] However, the Eight Circuit stayed the issuance of its mandate pending the review of its *Iowa Utilities Board II* decision by the U.S. Supreme Court. Accordingly, the FCC's pricing rules remain in effect.[7]

Moreover, while the *Iowa Utilities Board* case was being litigated, Bell Atlantic acquired NYNEX. As a condition of approving this acquisition, the FCC required the merged entity to accept the pricing and other rules the FCC had adopted in its *LCO*.[8] The FCC's pricing rules are

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3 Cox Initial Brief at 2.

4 See *Iowa Utils. Bd. v. FCC*, 109 F.3d 418 (8th Cir. 1996), 120 F.3d 753, 800, 804-06 (8th Cir. 1997), *aff'd in part, rev'd in part sub nom., AT&T Corp. v. Iowa Utils. Bd.*, 525 U.S. 366 (1999).

5 See *AT&T Corp. v. Iowa Utils. Bd.*, 525 U.S. at 397. Generally, we shall refer to this case at all levels as ***"Iowa Utilities Board."***

6 See *Iowa Utils. Bd. v. FCC*, 219 F.3d 744 (8th Cir. 2000), *cert.granted sub nom., Verizon Communications, Inc. v. FCC*, 121 S.Ct. 877 (2001).

7 See *In the Matter of Application of Verizon New England Inc., Bell Atlantic Communications, Inc. (d/b/a Verizon Long Distance), NYNEX Long Distance Company (d/b/a Verizon Enterprise Solutions) and Verizon Global Networks Inc., for Authorization to Provide In-Region, InterLATA Services in Massachusetts, Memorandum Opinion and Order,* CC Docket No. 01-9, FCC 01-130 (rel. April 16, 2001) ("**Mass 271 Approval Order**"), at ¶17.

8 See *In the Application of NYNEX Corporation, Transferor and Bell Atlantic Corporation, Transferee, for Consent to Transfer Control of NYNEX Corporation and Its Subsidiaries*, File No. NSD-L-96-10, Memorandum Opinion and Order, FCC 97-286 (rel. August 14, 1997) *("**Merger Order**"),* at ¶185. In August 2000, Bell Atlantic merged with GTE Corporation and formed a successor holding company called Verizon Communications, Inc. Verizon Communications, Inc. maintains a separate corporation in New England called Verizon New England, Inc. which does business in Rhode Island as Verizon Rhode Island. It is the UNE prices to be charged by Verizon Rhode Island that are the subject of this proceeding.

codified in 47 C.F.R. §§ 51.501 through 51.511 (hereinafter referred to as "Part 51" of the FCC's Rules).

Travel of this Case

Pursuant to the authority conveyed to this Commission by the 1996 Act and the more general authority conveyed by Title 39 of the Rhode Island General Laws, the Commission commenced a comprehensive investigation of the cost studies filed in this case in order to thoroughly examine their compliance with the FCC's TELRIC methodology. Parties engaged in substantial discovery addressing all aspects of the cost models proposed by Verizon and AT&T, which were the only parties to submit cost studies in this proceeding.[9] Between November 1998 and May 1999, the Commission held 14 days of duly noticed public hearings in this matter.[10] In the course of these proceedings, the Commission received the pre-filed testimony of numerous witnesses from Verizon, AT&T, Cox, and the Division, and parties were afforded an opportunity to cross-examine each other's witnesses at the hearings. A number of parties, most notably Verizon RI, provided written responses to a substantial number of record requests relating to issues raised in the course of the hearings. Initial Briefs and Reply Briefs were filed in June and July 2000 by Verizon, AT&T, Cox, and the Division. In addition, on March 28, 2001, the Division filed a letter with the Commission setting forth its final position in this docket.

At open meetings held on January 13, August 3, and August 18, 1999; January 31, April 13, November 9, and November 21, 2000; and April 11, 2001, the Commission considered the

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[9] On a number of occasions, the Commission also requested that the parties submit briefs addressing various issues that arose as a result of the proceedings in the *Iowa Utilities Board* case.

[10] Public hearings were conducted at the Commission's offices, 100 Orange St., Providence, Rhode Island, on November 16-19, 1998; January 6-7, 1999; March 3, 1999; and May 3-6 and May 10-12, 1999.

evidence presented on a variety of issues in this docket, and resolved certain issues on an interim basis and others on a final basis. As a result of these open meetings and the record in this proceeding, the Commission issued the following written orders in this docket: No. 15791 (February 18, 1999); No. 15976 (September 23, 1999); No. 16012 (December 6, 1999); No. 16183 on (February 7, 2000); No. 16240 (May 5, 2000), and No. 16615 (May 18, 2001).

In its most recent Order issued in this docket (No. 16615), the Commission memorialized its April 11, 2001 open meeting decision to make permanent the interim monthly recurring rates and one-time non-recurring installation charges, as well as physical collocation rates, previously adopted in Order No. 15976 and Order No. 15791 (collectively, the Interim Rates and Charges), provided, however, that the Interim Rates and Charges first be adjusted downward by an additional 7.11% to reflect benefits arising from certain mergers and process re-engineering activities engaged in by Verizon since the commencement of this proceeding. This Report and Order details the Commission's findings in approving the resulting rates as final TELRIC rates, and explains the Commission's determination that this course of action will result in rates for UNEs in Rhode Island that are and consistent with the FCC's TELRIC methodology and, therefore, will facilitate the development of local telephone exchange competition in Rhode Island.

The TELRIC Standard

As noted above, the applicable provisions of the 1996 Act and the FCC rules promulgated thereunder require that the prices charged by an ILEC for unbundled network elements ("UNEs"), collocation, and network interconnections be set using a "forward-looking" measure

of cost that is non-discriminatory and "may include a reasonable profit." The FCC has ruled that "profit" refers to "accounting profit" or normal return on investment, and not "economic profit" or "rent" (*LCO, at ¶699*). Furthermore, the FCC has determined that the relevant measure of "cost" required by §252(d)(1)(A) of the 1996 Act is the "forward-looking" economic cost as measured by the Total Element Long Run Incremental Cost or "TELRIC" of providing the network element or interconnection in question. *(LCO, ¶¶674-682).* TELRIC differs from some other measures of incremental cost in that the "increment" for TELRIC purposes is the total production cost of the network element in question. *(Id., ¶677).* Thus, TELRIC will include costs that might otherwise be excluded were the "increment" more narrowly defined.

In addition, the FCC has determined that, because some costs are common to an ILEC's operations as a whole or to a subset of elements, setting the price of each discrete network element based solely on forward-looking incremental costs that are directly attributable to the production of such network element will not recover the total forward-looking costs of serving the local exchange interconnection and UNE market. (*LCO, ¶694*). The FCC even considers that costs attributable to the company as a whole, such as the "president's desk" (an example used in many regulatory proceedings), should be allocated in a reasonable way to the network elements. (*Id.*, ¶*696*).[11] Accordingly, the FCC requires that the prices charged by an ILEC, such as Verizon, for UNE's and interconnection be set to recover not only the forward-looking costs that are directly attributable to providing interconnection or specific network elements, but also a

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[11] TELRIC as a pricing standard was also sustained in *GTE South Incorporated v. Theodore V. Morrison*,, Civ. No. 3:97CV493 (E.D. Va, May 19, 1998) (hereinafter, *"**GTE South**"*). This decision used a *"de novo"* approach rather than accepting TELRIC as an exercise of state commission discretion. See also the discussion of this decision and the original case before the Illinois Commerce Commission in Division Initial Brief at 4-7.

reasonable allocation of the ILEC's joint and common costs, as well as a reasonable rate of return on the ILEC's investment. *(Id., ¶¶694,696).* However, embedded costs, opportunity costs and universal service subsidies are excluded from TELRIC pricing. *(Id., ¶¶704-715).* Verizon carries the burden of proof with respect to all pricing issues arising under the 1996 Act. (*Id.*, ¶*680*).[12]

We note that, due to the protracted nature of the *Iowa Utilities Board* litigation and uncertainty regarding its outcome, there was for some time during these proceedings a legitimate question as to what extent, if any, this Commission was, as a matter of law, bound by the *LCO* and the FCC's pricing rules. The Commission requested and received extensive briefing on this issue from the parties. Having reviewed those briefs, we find that the effect of the U.S. Supreme Court's decision in *Iowa Utilities Board*, as well the *GTE South* decision and the FCC's *Merger Order*, has been to eliminate most of the uncertainty regarding the general applicability of the *LCO* and the FCC's pricing rules. Consequently, we conclude that the statutory plan of the 1996 Act, as construed by the FCC and the courts, requires that network elements and interconnection be priced in a forward-looking manner, including reasonable allowances for common and overhead costs and normal profits, as determined in accordance with the TELRIC methodology

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[12] *See also* AT&T Initial Brief at 1 (citing Verizon Witness Michael Anglin (Tr. 5/3/99 at 22)); Division Initial Brief at 3.

set forth in the LCO. Accordingly, the Commission finds that TELRIC is the appropriate standard for pricing interconnection and network elements.[13]

COST MODELS SUBMITTED BY THE PARTIES

Only two parties to this proceeding-- Verizon RI and AT&T -- submitted separate cost models for determining the recurring and non-recurring prices for UNE's. For recurring costs Verizon RI submitted a modified version of its Long Run Incremental Cost (LRIC) model adapted, according to Verizon, to the requirements of TELRIC. AT&T submitted the HAI Model, Version 5.0a ("HAI Model," formerly called the "Hatfield Model") developed by HAI Associates for AT&T and MCI to determine the TELRIC costs of various network elements.

With respect to the non-recurring costs, Verizon RI filed a separate cost study which it also argued was consistent with the FCC's TELRIC methodology. AT&T submitted its Non-Recurring Cost Model, Version 2.2 ("NRCM").

Each of the cost studies submitted in this docket have various parameters that are subject to adjustment, such as the cost of capital, depreciation rates, fill ratios, and others. The parties provided a great deal of testimony on the appropriate levels and methods of calculation of these parameters, as discussed in greater detail below. In addition, the Division's consultant, Mr. Thomas Weiss, developed a method recommended by the Division of applying the cost of capital to determine annual carrying charges, as also discussed below.

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[13] We also note that all parties to this proceeding agree that UNE pricing should be set in accordance with the TELRIC methodology.

Recurring Cost Studies

The HAI Model

The HAI Model for determining recurring costs was submitted by AT&T, supported by the pre-filed testimony of Mr. Stephen E. Siwek (AT&T's cost witness) and Mr. James W. Wells, Jr. (AT&T's engineering witness, adopting testimony originally filed by Mr. Thomas C. Madden). In response, Verizon submitted the pre-filed testimony of Dr. William Taylor regarding the FCC's TELRIC methodology, and of Mr. Timothy J. Tardiff who commented on the HAI model. Other witnesses discussing the HAI Model were Mr. Thomas Weiss for the Division and Dr. Francis R. Collins for Cox.

AT&T urged the Commission to adopt the HAI model, contending that it:

> . . . provides a reliable and well documented model for calculating UNE rates. It has the decided advantage of being an open model that has been tested by the FCC and can be used by the Commission to calculate federal universal service support as well as UNE prices. The HAI model complies with the requirements of the TELRIC methodology and is a sensible costing tool that should be adopted by the Commission to set recurring rates for UNEs in Rhode Island.

AT&T Initial Brief, Exec. Sum. at 14. On the other hand, Verizon criticizes the HAI Model (as well as the NRCM) as:

> . . . essentially sterile simulations of a reality that does not and will not exist. The HAI Model is the "Sim City" of telecommunications networks in which nothing is real -- every street is laid out in a perfect checkerboard pattern; there are no municipal ordinances restricting how, when, or where facilities can be built; there are no rocks, ledges, or hills in the ground affecting the manner or costs of construction; and the costs of labor, materials, and equipment are not what BA-RI or any actual firm pays in the market. The AT&T models do not use costs that BA-RI incurs, or that it can reasonably be expected to incur, to provide network elements in the state of Rhode Island,

> but instead, are litigation artifacts designed primarily to yield extraordinarily low costs.

Verizon Initial Brief at 2.

Each of these descriptions undoubtedly contains elements of truth and exaggeration. In arguing against the HAI Model, Verizon points out that other states in the Bell Atlantic North region and elsewhere have rejected the HAI model, and that the FCC also rejected major elements of the HAI Model[14] In support of its cost study, AT&T points out that some six states have accepted the most current versions of the HAI Model and that the FCC adopted major elements of the HAI model as part of its Hybrid Cost Proxy Model (HCPM), including geocoded data on customer locations, the switching and interoffice facilities modules, and the expense module.[15] We note that the record reflects that many of the states that have accepted Verizon's cost model did so only after revising the parameters to be closer to those proposed by AT&T and used in the HAI Model.

By definition, a "forward-looking" cost model will depict something that has not yet been constructed. Thus, a forward-looking TELRIC cost model should theoretically depict an efficient telecommunications network to be constructed in accordance with the TELRIC methodology. However, Verizon and AT&T disagree over the assumptions regarding the

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[14] Verizon Initial Brief, p. 44, n. 45, citing FCC, *Federal State Joint Bd on Universal Serv.*, 13 FCC Rcd. 21323, Fifth Report & Order (Oct. 28, 1998) at 51 (hereafter "***Universal Service Order***").

[15] AT&T Reply Brief at 26, 28-30, citing FCC, *In the Matter of Federal-State Joint Board on Universal Service, Forward-Looking Mechanism for High Cost Support for Non-Rural LECs,* Fifth Report and Order, FCC 98-279, CC Docket Nos. 96-45, 97-160 (Rel. October 28, 1998) (*"**FCC's Platform Order**"*). According to AT&T, regulatory commissions in Kentucky, Louisiana, Hawaii, Nevada, Minnesota and Texas have adopted "more recent, improved versions" of the HAI Model. AT&T Reply Brief at 29.

technologies to be deployed and the design and structure of this forward-looking network. According to Verizon, its cost study follows the FCC's TELRIC methodology in that:

> [A]ll forward-looking, long run incremental costs (including forward-looking joint and common costs) are included. These costs are based on the BA-RI's existing wire center locations and the most efficient technology currently available and deployed in BA-RI's network.

Verizon Initial Brief at 7 (citing Mr. Anglin's Direct Testimony, Verizon Ex. 24 at 3-7.) Verizon contends that the proper measure of forward-looking costs are the "incremental costs [an ILEC] *actually expects to incur* in making UNE's available to new entrants."[16]

In contrast, AT&T argues that:

> [TELRIC] requires that UNE costs "be measured based on the use of the most efficient telecommunications technology currently available and the lowest cost network configuration, given the existing location of the incumbent LEC's wire centers."[17]

Thus, in AT&T's view, TELRIC necessarily assumes that the ILEC's existing network will be replaced by a hypothetical new network in which the "most efficient technology available" will be deployed, using "the lowest cost network configuration" rather than the existing network configuration.[18] There are many reasons why an ILEC with substantial history and existing investments might fail in actual practice to deploy the most efficient technology available using the lowest cost network configuration. However, we find that the FCC's TELRIC methodology addresses this issue by assuming that the location of the ILEC's existing wire centers will be used in developing forward-looking TELRIC costs, while at the same time requiring that "the reconstructed local network will employ the most efficient technology for reasonably foreseeable

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16 (*Emphasis added*.) Verizon Initial Brief at 6, citing *LCO, ¶685*.
17 AT&T Initial Brief at 2, quoting 47 C.F.R. §51.505(b)(1).
18 AT&T Reply Brief at 4-5.

capacity requirements.[19] In other words, while TELRIC costs are not likely to reflect current reality, neither should they be based solely on a hypothetical cost model that bears no relationship to the costs that an efficient ILEC could reasonably be expected to incur in the future.[20]

Verizon's TELRIC Model

Verizon RI submitted a recurring cost model based on a number of incremental cost models it had previously used in proceedings throughout the NYNEX/Bell Atlantic (North) region (i.e., the New England states plus New York). Verizon's cost model was supported by the pre-filed testimonies of Mr. Michael Anglin (cost witness) and Mr. Henry Gamsby (engineering witness). In addition, Mr. Frederick K. Miller provided testimony on operator services and other miscellaneous UNEs, adopting testimony originally filed by Mr. Robert G. Grenier. Verizon RI also presented the pre-filed testimony of Dr. William Taylor, who discussed the FCC's TELRIC methodology. In response, AT&T submitted the testimony of its witnesses Ms Catherine E. Petzinger and Mr. Lee J. Globerson, who commented on Verizon RI's recurring cost model. Cox submitted the testimony of Dr. Francis R. Collins, who also commented upon Verizon RI's cost model. Mr. Thomas Weiss testified on behalf of the Division.

Verizon RI summarized the attributes of its model as follows:

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19 Id., at 5, citing *LCO, ¶685*.

20 See *Iowa Utils. Bd. v. FCC*, No. 96-3321 (8th Cir., July 18, 2000), Slip. Op. at 6-8.

> BA-RI's[21] model makes reasonable provisions for growth and sizing of its network based on the application of utilization/fill factors derived from actual data regarding Rhode Island customer locations and facilities, and the professional judgment of experienced engineers knowledgeable about BA-RI's network and the various factors that impact that deployment of telecommunications facilities in the state of Rhode Island. These engineers—charged with designing a forward-looking network that could meet current demand while maintaining a high quality of service, sized the network to meet current demand over the normal planning cycle of the facility utilized. BA-RI's assumptions for outside plant facilities . . . are reasonable and consistent with TELRIC.
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> In addition, its material investments for various components of the network are derived from reliable sources (*i.e.*, the SCIS model for switching) and where applicable the most current available discounted vendor prices.

Verizon Initial Brief, Exec. Sum. at 3.

Objections to Verizon RI's model by the other parties appear to relate to certain specific assumptions and inputs to the model, rather than the model itself. For example, in its executive summary, AT&T states:

> The key problem with the switch cost estimates recommended by BA-RI is that they are based on unreasonably high switch material costs, modeled using unreasonably low switch price discounts. . . . .
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> Furthermore, BA-RI ignored the availability of so-called GR-303 integrated digital loop carrier ("IDLC") technology. . . . .
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> Thus, when BA-RI used the Bellcore-proprietary Switching Cost Investment system ("SCIS") Model to estimate a total cost of switching plant, it used excessively high switch material prices that resulted in excessively high SCIS investment outputs. BA-RI committed several other errors in running the SCIS model. . . . .

AT&T Initial Brief, Exec. Sum. at 11.

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[21] Verizon was operating under the name "Bell Atlantic" at the time the briefs in this docket were filed. Hence, the term “BA-RI” in Verizon’s briefs refers to the Bell Atlantic (North) entity then operating in Rhode Island.

The Division and Cox similarly criticized various details of Verizon's application of its cost model. Cox alleged that Verizon's input values produced overpricing of UNE's:

> Cox's witness, Dr. Francis R. Collins, performed initial TELRIC studies for specific UNEs using input values that are more appropriate than those incorporated by BA-RI. His studies revealed that various UNEs, including unbundled Loops, Network Interface Devices ("NIDS") and Transport were overpriced by BA-RI by as much as 80.2% on a statewide basis. Dr. Collins' testimony and the testimony of other parties' witnesses amply demonstrate that the true TELRIC costs BA-RI will incur in providing UNEs to facilities-based CLECs are significantly less than those developed and filed by BA-RI in this proceeding. For example, Dr. Collins testified that BA-RI overstated the fixed monthly component of the TELRIC costs for Dedicated Transport by 184.6% and the mileage component of the TELRIC costs for Dedicated Transport by 165.6%.

Cox Initial Brief at 4-5 (footnotes omitted), citing pre-filed testimony of Dr. Collins (Cox Exhibits FRC-1 through FRC-3, and 1/7/99 Tr. at 74). *See also* pre-filed testimony of Stephen Hill (Division Exhibit 3) and pre-filed testimony of Dr. Robert Glenn Hubbard (AT&T Exhibit 21).

While accepting the basic algorithm embodied in Verizon's TELRIC model, the Division also observed that:

> The TELRIC studies presented by BA-RI in this case employ a computer model which combines the eight (8) capital cost elements into a single composite capital carrying charge factor ("CCCF") which is specific to each of BA-RI's plant accounts. (Weiss pf. at 8) No party to this case has objected to the CCCF model. Accordingly, while it is clear that disagreements do exist among the parties with respect to various CCCF model inputs, the Commission may conclude that the parties agree to the algorithm embodied in the CCCF model.
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> Several issues exist among the parties with respect to various determinants of incremental investment for individual network elements. . . . .

> The Division recommends that the Commission adopt and approve the basic approach to TELRIC studies as described above. However, with respect to details of defining incremental investments in interconnection and UNEs and the annual charge factors applicable to those investments, the Division has specific findings and recommendations. . . ..

Division Initial Brief at 12-13.

Commission Findings on Recurring Cost Models

The weight of the evidence in this proceeding indicates that the Verizon recurring cost model, when adjusted as we require below, meets the requirements of TELRIC, and has fewer conceptual problems than the HAI Model. Among other things, we find that the HAI Model does not model the amount of loop plant and distribution plant properly (*see* Verizon Initial Brief at 39-45). Accordingly, we are basing this Order on the use of Verizon RI's TELRIC model (as adjusted herein) for recurring costs. We do not preclude AT&T or any other party from presenting evidence of further development of the HAI Model in subsequent proceedings. However, we require that the parameters of any TELRIC cost models subsequently submitted by Verizon and any other parties shall conform to those set forth in our findings below.

In subsequent sections of this Order we will examine in detail the major differences in assumptions, inputs and other parameters used in the cost models submitted in this proceeding. These factors significantly affect the results produced by the cost studies and, therefore, constitute the focus of the parties' disagreement.

REVIEW OF INDIVIDUAL PARAMETERS AND FACTORS

The conceptual differences discussed above between the cost models submitted in this proceeding are important. However, equally important are the various assumptions, inputs and parameters used in the models. These parameters reflect the modelers' divergent views of the TELRIC concept, as well as the economic, financial, and engineering environment and constraints that apply to Verizon RI. Most of these parameters are adjustable, and indeed readily adjustable, because they reflect conditions that are subject to change, or about which there may be differences in informed opinion.

We have ruled on a number of these parameters at the open meetings and in the previous Orders issued in this docket listed above. The following discussion addresses the remaining significant open issues raised by the parties in their briefs.

Cost of Capital

The first major issue to be addressed is the determination of Verizon RI's forward-looking cost of capital. This is an extremely important parameter in the models, with a significant effect on the TELRIC results for the various UNEs and resulting UNE rates. Verizon, AT&T, Cox and the Division each differed in their recommended cost of capital for Verizon RI. The differences in their determinations essentially turned on whether Verizon RI's capital structure should be based upon market or book value, and whether the appropriate "proxy" or comparison group for

investment risk purposes should be the Standard & Poor's ("S&P") industrials or the regional Bell holding companies.

Verizon's witness, Dr. James Vander Weide, arrived at his recommended average cost of capital using a market-value capital structure and the S&P industrials as the comparison group for evaluating the relative investment risks of Verizon RI and its holding company. That is to say, he used the market-based percentages of debt and equity in the capital structure of competitive firms, the current required rate of return on competitive investments of comparable risk in the S&P 500, and the current cost of debt associated with corporate bonds rated AA by Moody's Investor Services. He calculated the capital structure using market valuations rather than the conventional book valuation, and calculated the cost of equity by applying the Discounted Cash Flow ("DCF") method to the S&P industrials in his comparison group. Verizon Initial Brief, at 19-22.

Dr. Vander Weide argued that, as a result of the development of competition in the local exchange market, Verizon RI faces higher risks than it previously faced as a fully regulated, non-competitive utility. In contrast to the other parties, Dr. Vander Weide postulated that Verizon RI's risk, and therefore its cost of capital, is actually greater than that of its holding company (then Bell Atlantic, consisting of the former Bell Atlantic and NYNEX, but not subsequent acquisitions, such as GTE). Verizon Initial Brief, at 22. Dr. Vander Weide's initial estimate of Verizon RI's overall weighted cost of capital was 13.18 percent, based on a capital structure containing 23.77 percent debt and 76.23 percent equity, a current cost of debt of 7.63 percent, and a cost of equity of 14.9 percent. Verizon Initial Brief, at 21 (citing Verizon Ex. 13, at 34.) AT&T points out that, in response to an information request, Dr. Vander Weide subsequently

updated his weighted average cost of capital estimate for Verizon-RI by reducing it to 12.6 percent, based on a cost of equity of 14.5 percent, a cost of debt of 6.9 percent, and a capital structure containing 25 percent debt and 75 percent equity. (AT&T Initial Brief, citing Verizon's response to Cox 1-6). However, Verizon does not mention this lower estimate in either its Initial or Reply Brief.

AT&T's witness, Dr. Robert Glenn Hubbard, also used the DCF method to estimate Verizon RI's cost of equity. In contrast to Dr. Vander Weide, Dr. Hubbard believes that the cost of capital for the Verizon holding company is greater than for the entity providing local exchange services in Rhode Island.[22] Dr. Hubbard estimated the cost of equity for Verizon RI to be 9.13 per cent, which he later updated to 10.51 per cent. AT&T Initial Brief, at 10 (citing Hubbard pre-filed testimony (AT&T Ex. 21), at 21; and Dr. Hubbard's response to ATT-PUC RR-1). Dr. Hubbard estimated the cost of debt at 6.7 per cent, using NYNEX bond issues in Standard and Poor's bond guide for April 1998, which he later updated to 5.63 per cent by including short-term debt. AT&T Initial Brief, at 18-19 (citing Hubbard prefiled testimony (AT&T Ex. 21), at 20, and Dr. Hubbard's response to ATT-PUC RR-1). Dr. Hubbard used a capital structure of 55 per cent equity and 45 per cent debt. AT&T Initial brief, at 19 (citing Hubbard pre-filed testimony (AT&T Ex. 21), at 17-18). Overall, Dr. Hubbard estimated Verizon RI's weighted average cost of capital to be 8.3 per cent. AT&T Initial Brief, at 21 (citing Hubbard prefiled testimony (AT&T Ex. 21), at 29).

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[22] As further evidence on this point AT&T cit.1(s)elci2. Dr. Hubbard used a

Cox's witness, Dr. Francis Collins, testified that Verizon RI's overall cost of capital was 9.11 per cent. Cox Initial Brief, at 11. Dr. Collins based this estimate on the holding company's cost of capital, even though he believed that Verizon-RI has a lower cost of capital than the holding company as a whole. Cox Initial Brief, at 6-7 (citing Collins pre-filed testimony, at 12, 14 and 16). Dr. Collins recommended a capital structure of 45 per cent debt and 55 per cent equity.[23] Dr. Collins recommended a DCF cost of equity of 11 per cent, and a "forward looking" cost of debt of 6.8 per cent, based on AA rated utility bonds. Cox Initial Brief, pp. 10-11 (citing Collins pre-filed testimony, at 15).

Finally, the Division's witness, Mr. Stephen Hill, used four methods of equity cost evaluation: discounted cash flow ("DCF"), modified earnings-to-price ratio ("MEPR"), market-to-book ratio ("MTB"), and the capital asset pricing model ("CAPM"). He used two sample comparison groups, the Regional Bell Holding Companies ("RBHCs") and a group of local natural gas distribution companies. Like AT&T and Cox, Mr. Hill contends that, because of diversification to riskier ventures, the RBHCs have higher risks, and thus higher costs of capital, than Verizon RI. He advocates the adoption of a capital structure based on consideration of both book and market values, rather than market value alone. The Division also points out that a number of states have rejected Verizon's use of the S&P industrials as the comparable risk group. Division Initial Brief, at 16-17.

For Verizon RI, Mr. Hill recommends a cost of equity ranging from 10.25 to 11.50 percent with a mid-point of 10.875 percent. Division Initial Brief, at 20-24. He recommends a cost of

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the cellular telephone business. AT&T Initial Brief, at 15-16 (citing Hill pre-filed testimony 6/30/98 (Division Ex. 3), at 20.)

debt of 6.91 percent, based on the rates for "AA" rated corporate debt over six-week period most recently preceding the Commission's hearings on the cost of capital issue. Division Initial Brief, at 19 (citing Hill pre-filed testimony (Div. Ex. 3), at 21). He recommends a capital structure of 37 per cent debt and 63 per cent equity, based primarily on the book value of the debt and equity. Division Initial Brief, at 18-19; Division Summary (of parties opening positions), item 4). He recommends that Verizon's explicit adjustment for flotation costs be rejected, stating that such an adjustment would be appropriate only if the stock were selling below book so that dilution would occur. Division Initial Brief, at 24-25. Mr. Hill recommends an overall weighted average cost of capital of 9.50 percent which, the Division points out, is "very near that [9.92%] currently authorized for [Verizon] in Rhode Island." Division Initial Brief, at 15, 25.

Commission Findings: The Commission last prescribed a cost of capital for Verizon of 9.92 percent in Commission Order in Docket No. 1997 dated February 2, 1993. The 12.25 percent equity return rate also authorized in that Order constituted the "threshold" of equity earnings above which BA-RI would begin sharing its profits with ratepayers. Thus, more than eight years have elapsed since the last detailed review of BA's cost of capital for ratemaking purposes, during which time significant changes have occurred in the telecommunications market due to the passage of the 1996 Act. At its open meeting on November 21, 2000, the Commission considered the evidence presented on the cost of capital issue in this docket and unanimously adopted a revised capital structure and cost of capital for Verizon RI consisting of an overall rate of return of 9.5 percent, based upon a capital structure of 63.3 percent equity and 36.7 percent debt, a cost of equity of 11.0 percent and a cost of debt of 6.91 percent. The

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[23] Cox Initial Brief, at 9-10, citing 1/7/99 Tr., at 81-84.

Commission noted that the 9.5 percent it adopted in this case is consistent with recent decisions by other state commissions within and outside the Verizon service area. *See*, *e.g.*, table and discussion in Cox Initial Brief, at 11-12. The Commission also agreed with the Division that no adjustment should be allowed for flotation costs. We further direct Verizon to use the cost of capital and capital structure approved by the Commission in this Order (i.e., based primarily on book cost of debt and equity, rather than market values) in compliance cost studies and other filings it makes in this and any subsequent proceedings, until otherwise directed by the Commission.

In future proceedings Verizon or another party may, of course, present evidence that risk or market conditions with respect to Verizon RI's cost of capital have changed. In such case, we direct that the party presenting evidence as to the cost of capital shall present evidence as to the book value of Verizon RI's debt and equity, including short-term debt, and the cost of short and long-term debt and equity. In imposing this requirement we do not pre-judge whether the use of short-term debt in the capital structure is necessarily appropriate; we merely wish to ensure that we are presented with full evidence on the cost of capital issue. Similarly, while we require that parties present us with evidence of the book value of debt and equity, we will also consider evidence of market value and expert opinion on the weight to be placed upon market value in determining Verizon RI's capital structure.

Depreciation Rates

Another parameter with a significant effect on the results produced by the TELRIC cost models is the depreciation rate schedule. The issue presented is whether the FCC's prescribed depreciation rates, or Verizon's alternative proposal, should be used in the cost models. Since

the early 1980's, the FCC has made efforts to use "economic depreciation," whereby obsolescence is a major consideration in determining the useful life of telephone plant and equipment. Obsolescence takes two forms: (1) new innovations may be so much cheaper to operate than plant that is otherwise capable of providing good service that it pays to replace the plant; or, (2) new innovations may be able to offer new services unavailable on existing equipment, thereby potentially increasing revenues. In either case, the existing equipment (that is "perfectly good" in terms of providing the services for which it was acquired) would have to be replaced prematurely.

Arguing that TELRIC requires the use of economic depreciation rather than regulatory depreciation, Verizon RI developed "economic depreciation" rates based on useful lives much shorter than those of the most recent Rhode Island depreciation prescription arrived at in three-way meetings between representatives of the FCC, this Commission, and Verizon-RI. Verizon Initial Brief, at 31-32 (citing *LCO*, ¶ 686; and 47 C.F.R. § 51.505(b)(3). In support of these rates Verizon presented the pre-filed testimony of Dr. Lawrence Vanston, of the Telecommunications Technology Forecasting Group, who argued that the depreciation lives prepared by Verizon's Capital Recovery Organization were "reasonable" and relatively consistent with the lives used for financial reporting by Verizon and other "comparable" companies. Verizon Initial Brief, at 32-33 (citing Vanston pre-filed testimony (Verizon Ex. 15), at 14, 16, 20, 25-28). Dr. Vanston also supplied rebuttal testimony on 12/1/98.

In contrast, the other parties unanimously recommended the use of the FCC's prescribed depreciation lives, pointing out that these lives now incorporate economic factors and thus are actually based on economic depreciation, and not just historic retirements. AT&T presented

testimony to this effect by Mr. Richard Lee. *See* AT&T Initial Brief, at 21-24 (citing Lee's Direct and Surrebuttal Testimony (AT&T Ex. 23 and 12/11/98). AT&T argued that: "The FCC explicitly imposes on the ILEC the burden of demonstrating, again 'with specificity,' that additional business risks faced in the provision of unbundled network elements justify some modification to existing depreciation rates." AT&T Initial Brief, at 22 (citing *LCO,* ¶702). AT&T also argued that Dr. Vanston's testimony was not based on studies specific to Rhode Island, but was based on "non-traditional" methods of depreciation analysis that were different from the methods used by Verizon in actually calculating the "economic lives" used in its cost studies. AT&T Initial Brief, at 23-24.

Cox presented testimony by Dr. Francis Collins, who also supported using the FCC's prescribed depreciation lives, and argued, along with AT&T, that Dr. Vanston's study was not "independent." Cox Initial Brief, at 12-13. Like AT&T, Cox also argued that a majority of states have accepted the prescribed depreciation rates as "economic depreciation" for purposes of TELRIC and compliance with the FCC's rules and the *LCO*. Cox Initial Brief, at 13; AT&T Initial Brief, at 25-27. The Division also argued that many states have adopted the FCC's prescribed depreciation lives as "forward-looking" for TELRIC purposes, and roundly rejected Dr. Vanston's arguments. Division Initial Brief, at 26-28.

On behalf of the Division Mr.Weiss testified in support of using the FCC's prescribed depreciation lives in the TELRIC cost studies. Mr. Weiss argued that the starting point for economic depreciation studies must be the prescribed lives, and that Verizon had not shown that the prescribed lives and parameters "do not reflect forward-looking asset lives and salvage values." Division Initial Brief, at 25-26 (citing Weiss pre-filed testimony (Div. Ex. 1), at 12;

LCO, ¶703; 47 C.F.R. §51.505(b)(3). The Division supports its argument that the FCC's prescribed rates are, in fact, economic depreciation, by citing the following FCC orders and reports:

> *Report on Telephone Industry Depreciation, Tax and Capital/Expense Policy*, Accounting and Audits Division, Federal Communications Commission, April 15, 1987 at 3; FCC, *Report and Order*, 8 FCC Rcd. 8025 (1993), the *"Depreciation Simplification Order";* FCC, Second Report and Order, 9 FCC Rcd. 3206 (1994); and FCC, *Third Report and Order*, 10 FCC Rcd. 8442 (1995).

Id., at 26 (also citing Weiss pre-filed testimony, at 12).

Commission Findings: The weight of the evidence in this proceeding persuades us that the FCC's prescribed depreciation rates are "economic depreciation" within the meaning of the FCC's rules (47 C.F.R. § 51.505(b)(3)) and the *LCO.* Verizon has not presented evidence sufficient to rebut the validity of using the FCC's prescriptions in the TELRIC studies at issue in this proceeding. Furthermore, Verizon has not made a sufficient "specific showing" that competitive or market conditions in Rhode Island have so changed since the last prescription was made as to require that we revisit the question of asset lives in this proceeding. We also find that depreciation lives and methods used for financial reporting, which are strongly influenced by the tax laws, bear no clear relationship to economic lives of the assets for regulatory or ratemaking purposes. Accordingly, we order that the FCC's most recent depreciation prescription for Rhode Island shall be used in the compliance cost studies and all future TELRIC studies filed in this proceeding. We further order that in future TELRIC proceedings, each cost study submitted shall include a "base scenario" version based on the most recent depreciation prescription for Verizon RI. This does not preclude parties from filing additional evidence as to the

appropriateness of using alternative economic lives of assets and TELRIC studies based on that evidence, but such filings shall only be *in addition to,* and not in place of, cost studies based on the FCC's most recent depreciation prescription. In connection with any such additional studies, we particularly encourage the submission of *evidence specific to Rhode Island* as to why TELRIC should be calculated using the alternative asset lives proposed.

Annual Cost Factors

The TELRIC studies use annual cost factors to convert capital investments to annual carrying charges. Thus, annual cost factors are required inputs for both the recurring cost studies and, to a lesser extent, the non-recurring cost studies. There are several major types of annual cost factors at issue in this proceeding, including a Capital Carrying Charge Factor proposed by the Division, a maintenance expense factor, and factors for operating expenses, administrative and support costs, and other taxes (*e.g.*, property or ad *valorem* taxes), as more fully discussed below.

Capital Carrying Charge Factor

The TELRIC studies presented by Verizon in this case employ a computer model which combines eight capital cost elements into a single composite capital carrying charge factor ("CCCF")[24] which is specific to each of Verizon RI's plant accounts. The CCCF model was developed and first proposed by the Division's witness, Mr. Weiss, during a workshop among the

parties to the Vermont Public Service Board's Interconnection and UNE pricing proceeding in Vermont. All parties to the Vermont proceeding reviewed the CCCF model and stipulated to its accuracy and use, and no party to the instant proceeding has objected to it. Accordingly, while the parties in this proceeding may disagree with respect to various CCCF model inputs, the Commission concludes that the parties have agreed to the algorithm embodied in the CCCF model. *See* Division Initial Brief, at 11-12.

Verizon describes the use of the carrying charge factors in its TELRIC recurring cost model as follows:

> BA-RI's TELRIC study converts the total investment for each network element into a monthly or unit cost for pricing purposes by applying carrying charge factors to the investments. (BA-RI Ex. 24, at 13, 38-42.) These factors can be categorized into three basic elements: (1) the annual carrying cost factor ("CCF"), which accounts for the recovery of the capital costs over time (with an appropriate return adjusted for income taxes) and the forward-looking maintenance costs and other expenses directly associated with the investment; (2) the direct attributable administration ("joint") cost factor, which accounts for costs that are jointly attributable to the network elements included in the BA-RI TELRIC study; and (3) the common expense cost factor, which includes other general costs that are associated with the entire operation of the company (e.g., executive costs). (BA-RI Ex. 24, at 39-42.)

Verizon Initial Brief, at 35. Neither AT&T or Cox addressed the issue of the capital carrying charge factor in its briefs.

Commission Findings: There being no dispute among the parties as to the validity of the CCCF methodology employed in Verizon's recurring cost model, we adopt the use of the CCCF methodology and order that it be used in the compliance cost studies filed in this docket. In

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[24] The CCCF reflects eight elements of the capital carrying charge: (1) cost of debt, (2) the cost of equity, (3) the subject company capital structure, (4) plant service lives, (5) plant salvage values, (6) state income taxes, (7) current and (8) deferred federal income taxes.

addition, we order that, in future TELRIC cost studies, the capital carrying charge factors shall be developed using the capital costs and depreciation rates specified in this Order.

Maintenance Expense Factor

A factor for maintenance expense is part of the overall carrying charge factor used in the Verizon's TELRIC model. Verizon Initial Brief, at 9. Verizon RI did not further define the maintenance expense factor in its briefs.

AT&T sole comment on this factor is that, because software expense (Right-to-Use [RTU] fees) is part of the maintenance expense factor for switching, it is double-counting to apply a separate switching expense factor to the RTU fees. AT&T Initial Brief, at 35; but cf. Verizon Initial Brief, at 59; AT&T Reply Brief, at 39.

Verizon denied AT&T's claim with respect to the RTU fees, claiming that *initial* fees are properly capitalized in its accounts, and thus included as switching investments, and those that are expensed are properly included as part of the maintenance expense. Verizon Reply Brief, at 14.

The Division recommended that Verizon's maintenance expense factors be accepted. Division Initial Brief, at 28-29. Cox does not comment on Verizon's maintenance factors.

Commission Findings: The Commission orders that Verizon's maintenance expense factors be adopted. AT&T's claim with respect to the "double-counting" of RTU fees appears to be based on a misunderstanding of regulatory accounting. The record indicates that the initial RTU fee for a switch is considered part of the cost of the switch and is capitalized. (Cf., 47 C.F.R. § 32.2124(c)). Subsequent upgrades or replacements to that software are considered

"maintenance" and are expensed. There has been no showing that Verizon RI has both expensed and capitalized the same expenditures, which is the only way double-counting could arise.

Administrative, Overhead, and Support Costs

The parties' treatment of administrative, overhead, and support costs is more contentious. As noted above, Verizon uses its actual Part 32 expenses and "loads" them on plant costs as part of the carrying charge factor. In contrast, AT&T's HAI model uses a "variable carrying charge" concept, resulting in an average loading factor of 10.4 percent to cover administrative, overhead, and support costs. AT&T Initial Brief, at 54-55. Verizon claims that there is no close or fixed relationship between overhead and related costs and direct costs. Verizon further points out that the 10.4 percent loading factor is based on AT&T's expenses for 1994, while the actual ratio for AT&T Communications of New York (a single-state entity) has varied between 14 and 20 percent during the 1992 to 1995 period. Verizon Initial Brief, at 53-54.

After a careful review of the law and Verizon's practices, the Division recommends that the Commission adopt Verizon's approach of developing a broadly-based factor (i.e., a ratio of expense to total plant investment). The Division concludes that this approach is not unreasonable in light of the effort and cost that would be required to more precisely attribute joint and common costs to UNE's. Division Initial Brief, at 31. Cox does not address this issue in its briefs.

Commission Findings: While AT&T's approach of finding an average ratio of overheads to expense for carrying charges arguably has some merit, AT&T has not shown that the ratio applicable to AT&T should similarly be applied to Verizon-RI. Moreover, no party has shown

that there is a simple linear relationship between overheads and either direct expenses or investments. Since Verizon RI is a small entity, it may actually have higher or lower overheads than an entity such as AT&T. Accordingly, the Commission orders that Verizon's approach with respect to the allocation of common, administrative, and support costs to plant accounts be followed in compliance cost studies to be filed in this proceeding. That is to say, each plant account at issue shall be carefully identified, and the ratio of test year expenses to test year investments for that account shall be included as part of the carrying charge factor.

Since the TELRIC is supposed to be forward-looking, and use of a specific test year may reflect unusual events in that year, we will consider (but do not require) testimony in future proceedings as to whether the overhead and maintenance expense factors should alternatively be calculated as an average of several years experience, provided, however that any such testimony also demonstrate that the average factors proposed reflect trends in productivity, cost savings and other relevant changes.

INVESTMENTS

The TELRIC for plant investments must be forward-looking. That is to say, they cannot be based on the plant accounts, which reflect past investments, or on technologies that will not be installed in the future, or on past (rather than present or future) costs of equipment. For example, the cost of electronic plant has generally been falling each year for most of the last twenty years, while the cost of other plant may have been increasing. Thus, it is reasonable to conclude for TELRIC purposes that past investments have no relation to future costs.

The most contentious areas for the parties with respect to plant investment concern the development of the TELRIC for switching and loop plant. Issues contested by the parties include the choice of appropriate forward-looking network technologies, design and construction methods, as well as the basis for determining certain plant costs and forward-looking switch material discounts. In addition, the parties disagreed on the choice of utilization of plant or "fill factors," and on the appropriate level of "sharing" of certain facilities and "support structures," such as poles, conduit, and trenches, with other utilities.

Switching Investment

Verizon calculated its forward-looking investment in switching plant through the use of the Switching Cost Information System ("SCIS") model. This engineering cost model was originally developed by Bell Laboratories, and is actually used by Verizon and other telephone companies to prepare estimates of necessary switching plant for their own construction programs. Verizon Initial Brief, at 18. Verizon's use of the SCIS model to develop its switching costs was explained in the testimony of its witness, Mr. Henry Gamsby, who testified that Verizon used SCIS to study every switch in Rhode Island and to develop incremental investment costs for each switch using actual switch characteristics and usage specific to each switch.[25]

AT&T claimed that Verizon made several "errors" in its use of the SCIS model, as detailed in the pre-filed testimonies of its witnesses, Catherine E. Petzinger and Lee J. Globerson. Essentially, AT&T's contended that Verizon's use of a number of improper inputs to the SCIS model results in excessively high switching plant costs:

> [W]hen BA-RI used the Bellcore-proprietary Switching Cost Investment System ("SCIS") Model to estimate a total cost of switching plant, it used excessively high switch material prices that resulted in excessively high SCIS investment outputs. BA-RI committed several other errors in running the SCIS model. First, it failed to use the most recent version of the model, which yielded unduly high cost estimates and again prevented BA-RI's switch cost study from being properly forward-looking. Second, BA-RI failed to include all features and functions of its switches when it ran the SCIS model. Third, it used the wrong fill factor. It should have used a 95 percent administrative fill factor (reflecting the availability of five percent of switching capacity for administrative purposes), but instead it used utilization fills running as low as 72 percent (which would assume 23 percent spare capacity plus five percent for administrative purposes). These mistakes again drove up its switch cost estimates.
>
> The high switch material costs that BA-RI improperly forced out of the SCIS model were exacerbated by the exorbitant installation factor applied to them. BA-RI assumes that installing a switch costs an additional 62.41 percent of the cost of the switching equipment. This does not reflect least cost, most efficient practices. All ILECs outside the Bell Atlantic-North region — including Bell Atlantic-South! — avoid this unnecessary cost by having the switch installed by the vendor.

AT&T Initial Brief, Ex. Sum. at 11-12. AT&T's argument that Verizon used improperly high switching material costs is based on a National Regulatory Research Institute study by Dr. David Gabel and Scott Kennedy. Verizon Reply Brief, at 8, n. 7.

Verizon RI replied that it employed the version of the SCIS model available when it prepared its study (also noting that the model is updated as often as twice a year), and used the most efficient available technology and all available features in the switch. Verizon Reply Brief, at 7-8. In addition, Verizon contends that its use of an all-growth switch material discount is appropriate because:

> As Mr. Anglin testified, because all Rhode Island switches have already been converted to digital switches, BA-RI does not expect to incur additional costs

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[25] Verizon Initial Brief, at 18.

> for new switches in the foreseeable future and additional capacity will be added by means of growth additions. BA-RI Ex. 25, at 10. Therefore, the growth discount BA-RI used in its study accurately reflects the prices BA-RI expects to pay in the foreseeable future.
>
> Furthermore, in this situation, adding capacity by means of growth additions to existing equipment is highly efficient. Indeed, the Division and BA-RI agree that the assumptions upon which AT&T's proposed switching costs are based (i.e., the One Purchase assumption) "fails to comply with the presumption of reasonableness in pricing exercise required by the [the 1996 Act] and addressed by the LCO" and, therefore, should be rejected by the Commission. Division Brief at 45 (citing 47 U.S.C. § 252(d)(1); 47 U.S.C. § 251(c)(2)(D); *LCO*, ¶685).

Verizon Reply Brief, at 9.

With regard to switch installation costs, Verizon testified that its costs were based on its actual experience in 1995, and that Verizon had "compared its Rhode Island data to the same type of data across the Bell Atlantic footprint and found the Rhode Island results to be reasonable." (Verizon Reply Brief, at 13, citing Tr., 5/3/99, at 128.) Commenting on AT&T's switch installation cost analysis, Verizon observed:

> The problem with AT&T's analysis is that it relies on data that does not capture the total costs required to engineer, furnish, and install a switch. BA-RI Ex. 25, at 4. Ms. Petzinger attempted to correct the deficiencies in AT&T's analysis in later testimony (AT&T Ex. 39 (Petzinger Surr.), at 2), but AT&T's analysis still fails to properly estimate of installation costs. Tr: 5/3/99 at 126-127.

Verizon Reply Brief, p. 13.

The Division rejected as unreasonable AT&T's "One Purchase" assumption for determining incremental switching element costs.[26] However, in generally finding Verizon's

[26] The One Purchase assumption advocated by ATT&T requires switch investment costs and demand to be input to SCIS as though the ultimate switch capacity is purchased and added to plant at the outset of switch deployment, rather than

development of switch installation costs to be reasonable for the purposes of this docket, the Division pointed out:

> Concentrating on traffic usage-sensitive data (ccs per line, trunk occupancy, etc.), on behalf of the Division, Mr. Weiss reviewed the SCIS inputs used by BA and he concluded that those inputs are not unreasonable representations of the conditions that could apply on a forward-looking basis for local switching in Rhode Island. Mr. Weiss did not evaluate the algorithms which constitute SCIS software used by BA, relying instead on his understanding of SCIS derived from his previous reviews of the SCIS model. (Weiss pf. at 26-27) Further, Mr. Weiss did not investigate the Rhode Island switch-specific inputs to the model (e.g., host/remote configurations, umbilical facilities), assuming that those inputs are fixed by BA to accurately reflect the actual configurations which currently apply in Rhode Island and which are reasonably expected to continue to apply on a forward-looking basis. *In general, then, the Division has no quarrel with the basic incremental switching element unit investment costs that BA developed through its use of SCIS. (Id., at 27.)*

Division Initial Brief, at 44- 45 (emphasis added). AT&T disputes this finding, contending:

> [T]he Division also mistakenly suggested that it was appropriate for BA-RI to gross up its switching costs by applying a 62.41 percent installation factor derived from BA-RI's historic, embedded costs. This suggestion violates the requirements of TELRIC. In calculating a forward-looking economic cost as required under the FCC's rules, the Commission may not consider any of BA-RI's embedded costs, meaning any of its past expenses. It must instead derive a forward-looking cost that reflects the least cost, most efficient way of providing unbundled switching. The undisputed evidence, presented by Ms. Petzinger, is that all other ILECs — including Bell Atlantic-South and perhaps even Bell Atlantic-New York — have reduced their comparable switch engineering and installation costs to only about 26 percent of the switch investment costs, by hiring the switch vendor to do the installation rather than doing it themselves.

AT&T Reply Brief, at 23 (footnotes omitted). Cox did not address the issue in its brief.

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added in increments of demand growth. Thus, the One Purchase assumption results in larger purchase discounts and much lower unit costs. Division Initial Brief, at 44.

Commission Findings: It is clear from the record that Verizon appropriately used the latest version of the SCIS model available at the time it performed the cost studies at issue in these proceedings. In addition, it appears from the record that Verizon's engineering inputs to the SCIS model were, for the most part, reasonable. We find that AT&T's "one purchase" assumption is not reasonable, because the evidence indicates that switches are not actually purchased in that fashion but rather, are bought at one time, subject to subsequent expansion based upon demand growth. Verizon contends that its use of an all-growth switch material discount is appropriate, because it expects to add additional switch capacity in Rhode Island *only* through growth additions. However, the Division's witness specifically noted that he did not investigate whether Verizon's Rhode Island-specific switch-specific inputs to the SCIS model in fact reflected the actual switch configurations in Rhode Island or whether these configurations would reasonably be expected to apply on a forward-looking basis.

We find that the record is not sufficient at this time to support a finding that any specific "initial purchase" and/or "expansion" discount, or any particular "mix" thereof, is the appropriate forward-looking measure of Verizon's incremental switching costs for purposes of the compliance cost studies to be filed in this docket. While we are constrained by the record at this time to accept Verizon's use of an "all growth" switching material discount, we intend to return to the question of appropriate switch material discounts in connection with the new cost studies required by this Order. Consequently, the Commission's determination on this issue shall not preclude testimony in a future TELRIC proceeding that some other switch material discount is appropriate.

Specifically, in proceedings relating to the new cost studies, the Commission requires the parties to rebut the assumption that the incremental switching cost is appropriately calculated using a weighted average of 90 percent of the discount for new switches and 10 percent of the discount applicable to upgrades. Moreover, we require the parties to present evidence regarding the appropriate "mix" of discounts for new construction and growth additions for switches in a company growing at the rate of Verizon RI. By way of guidance, we expect the resulting switching costs will be determined using some percentage of initial-construction discounts (less than the 100 per cent advocated by AT&T, but more than the zero per cent advocated by Verizon) and growth addition discounts (again, less than the 100 per cent advocated by Verizon, but more than the zero per cent advocated by AT&T). The record suggests that such a result is likely to be the most reasonable representation of the TELRIC of switching, but does not allow us to make such a determination at the present time.

In addition, we are constrained by the record at this time to accept the switch material cost inputs aused by Verizon in its cost study. The NRRI study upon which AT&T relies to demonstrate that Verizon's inputs are too high was not examined in this proceeding, and the authors were not subject to cross-examination. For example, we do not know the extent to which the Gabel-Kennedy data reflect "initial purchase" discounts or "expansion" discounts, and thus, the extent to which Gabel and Kennedy have estimated the "getting started" cost of the switch or the lifetime cost of the switch. On the present record, therefore, the NRRI study cannot be relied upon as an accurate estimate of Verizon's incremental switching costs per line. However, in view of the assertions made in the Gabel-Kennedy study, the Commission will be receptive in future TELRIC proceedings to further evidence regarding the switch material costs used by

Verizon in the SCIS model, including evidence of whether those material costs and discounts are the ones Verizon actually uses in its own calculations. In future TELRIC filings, the Commission requires the parties to show, with specificity, why the switch material prices in the Gabel-Kennedy study, as adjusted, for example, by the telephone plant price index, should not be adopted.

With respect to switch installation expenses, AT&T argued that, by installing its own switches, Verizon incurs higher installation expenses than other Bell companies, including the former Bell Atlantic operating companies. However, AT&T's alternative installation expenditures are based on data even older than Verizon's, and are not fully supported by AT&T's own witness. On the other hand, while Verizon's installation expenditures for TELRIC are indicative of its actual experience, the Commission is concerned that Verizon RI may not be as efficient in this matter as it could be: perhaps Verizon should consider letting the switch manufacturer install the switch, as do most Bell companies.

Because of the deficiencies in AT&T's study and the conflicting testimony of AT&T's own witness, Ms. Petzinger, the record constrains us at this time to accept the switch installation expenditure factors used by Verizon in its cost study. However, in future TELRIC filings, we require Verizon to provide similar calculations of switch installation costs on an individual basis for *all* Verizon companies, including the former Bell Atlantic companies as well as the former GTE companies. That is to say, Verizon shall calculate, for each of its companies and on a completely consistent basis, the costs of installing a switch as a percentage of the material costs of the switch, so that the resulting ratios can be compared with the ratio calculated for Verizon RI.

There is less discussion by the parties of Verizon's installation cost loading for dedicated interoffice transport facilities. AT&T points out that by applying an installation factor of 1.7757, Verizon grosses up its assumed investment in dedicated transport by an additional 78 percent. Verizon asserts that this figure is a "Forward Looking Engineering Estimate" but, according to AT&T, provides no evidence whatsoever to show that this estimate is reasonably based. Moreover, AT&T points outs that the installation factor used by Verizon for dedicated interoffice transport in Vermont is only 1.4, resulting in a gross-up of 40 percent, or only half, of that in

experience or attainable experience by using the most efficient practices, as required by the *LCO,* ¶685. A similar requirement shall apply to any other parties that submit TELRIC models in future cost study proceedings.

Loops: Feeder and Distribution Plant

Another area of significant contention among the parties concerned the development of Verizon's forward-looking, incremental local "loop" costs. The local "loop" (called the "link" by Verizon) consists of the copper or fiber cables and related physical support (poles, conduits, etc.) that connect a retail customer location to a Verizon RI central office, together with the associated electronics attached to those cables. Among the major issues raised in the proceedings were: concerns that the HAI model consistently underestimated the amount of cable required to provide service, particularly in rural areas; questions as to whether all feeder cable should be assumed to be fiber-optic, questions regarding the maximum amount of copper cable to assume in loops of particular lengths; and questions about the type of electronics to assume on the loop, and which version is the latest in use. In addition, the appropriate "fill" on feeder and distribution cable is also a matter of contention that we address below.

Fiber-optic Cable in the Loop

As a starting point, pursuant to ¶685 of the *LCO,* all of the cost studies assumed that Verizon's central offices would remain at existing locations, but that loop plant, as well as the actual switches, would arguably be free for redesign. Verizon utilized the existing routing of feeder and distribution as the basis for its forward-looking local loop design, claiming that the

existing routing from its current central office locations reflects the real world, including the physical and legal constraints, that would exist if a new network were to be constructed in Rhode Island. *See* Verizon Initial Brief, at 8 (citing Gamsby Direct (Verizon Ex. 8), at 13). Verizon's cost study also assumed that fiber-optic-fed digital loop carrier (DLC) transmission systems would be deployed for 100% of the feeder routes in Rhode Island. Mr. Gamsby testified that the use of fiber-optic cables is consistent with Verizon's current plans for deploying feeder facilities. Verizon Initial Brief, at 9 (citing: Gamsby Direct (Verizon Ex. 8), at 11; Tr.: 5/5/99, at 166).

AT&T objected to Verizon's 100% fiber-optic feeder assumption on the grounds that it artificially increases loop costs and is inconsistent with sound engineering practices. According to AT&T:

> In its model, BA-RI assumes that all feeder cable will be fiber optic cable, and that not even the shorter feeder runs will have any copper cable. As Mr. Wells explained, this BA-RI assumption of 100 percent fiber feeder "is a violation of the FCC mandate that the least-cost, most-efficient, and reasonable technology be assumed in TELRIC cost studies." Because the electronics required on fiber feeder is so expensive, it is cheaper to use copper feeder on loops of less than 12,000 feet in total length (including both distribution and feeder cables), or on loops with feeder runs alone of less than 9,000 feet. BA-RI has not provided any data or analysis to the contrary. Significantly, regional bell operating companies other than Bell Atlantic-North assume in their UNE cost studies that fiber feeder will only be used for feeder runs of at least 9,000 feet in length. The Vermont Public Service Board recently found that a forward-looking UNE cost model should assume that fiber feeder will only be used on feeder runs that are longer than 9,000 feet, and that copper cable will be used on feeder runs of less than 9,000 feet.

AT&T Initial Brief, p. 39 (citing Wells Surrebuttal (AT&T Ex. 43) at 13-15).

Cox did not address the question of fiber-optic cable in detail in its briefs other than to point out that according to studies by its witness, Dr. Francis Collins, Verizon's model over-

estimated the costs of a number of network elements, including unbundled loops. Cox Initial Brief, at 4-5.

The Division agreed with Verizon's assumptions that on a forward-looking basis, fiber-optic feeder cables and copper distribution cables would be used throughout the network, and that existing feeder and distribution routes constitute the most efficient forward-looking routes to reach customers within the existing wire center serving areas. Division Initial Brief, at 37. Thus, the Division concludes that Verizon's assumptions comply with the requirement of the ¶685 of the *LCO* that the "reconstructed local network will employ the most efficient technology for reasonably foreseeable capacity requirements." Id., at 38.

Commission Findings: The weight of the evidence in this proceeding supports the conclusion that, on a forward-looking basis, the industry is moving toward increased and exclusive use of fiber-optic feeder cables and copper distribution cables. As we discuss in greater detail below, the use of fiber-optic feeder cables with "integrated digital loop carrier" or "IDLC" systems is, even now, a low-cost option when maintenance and other expenses are taken into consideration. Therefore, we find that Verizon's assumption that it will deploy 100 per cent fiber optic feeder cable in Rhode Island is consistent with TELRIC, as defined by the FCC, and is, on a forward-looking basis, the most efficient alternative. Accordingly, all compliance cost studies filed in this docket shall incorporate the assumption that all feeder cables are 100 percent fiber-optic, and that all distribution cables are 100 percent copper. In future TELRIC filings in this or subsequent dockets, parties shall submit a "base scenario" or "run" of the cost model in which these assumptions are incorporated and carried through to all aspects of the model. Parties may also present alternative scenarios using alternative feeder and/or loop assumptions, with

appropriate evidence and expert testimony as to why such alternatives would be more reasonable on a forward-looking basis.

We also conclude, based on the record, that Verizon's assumed use of fiber-optic distribution cable to serve certain large buildings is also appropriate. *See* Verizon Initial Brief, at 11.

The Commission notes that the Division's witness identified a number of areas of concern regarding Verizon's calculations of loop length. According to the Division, there are errors and inconsistencies of some consequence in these calculations, resulting in an overstatement of the TELRIC costs of a 4-wire loop of as much as $3.00 per month. Accordingly, for future cost study filings, Commission directs Verizon to correct the problems identified by the Division's witness, Mr. Weiss, in his pre-filed testimony (Division Ex. 1), at 20-22. *See also* Division Initial Brief, at 36.

Digital Loop Carrier

While the parties agree that the use of integrated digital loop carrier or IDLC should be assumed on all loops with fiber-optic feeder cable, unless the more expensive "universal digital loop carrier" is required by the needs of the particular service, there is controversy as to the use of "next generation" integrated digital loop carrier, commonly called GR-303. AT&T contends that GR-303 carrier equipment will lower costs, including maintenance costs of handling moves and rearrangements and, therefore, should be assumed in Verizon's models. AT&T stresses that Verizon has conceded this point in other states. AT&T Initial Brief, at 32-33, 81-82. Verizon replied that at the time of its cost studies were prepared, GR-303 was not actually being *deployed*

in its network, and so did not have to be considered. Verizon Reply Brief, at 10 (citing *LCO,* ¶685). However, Verizon acknowledged that "[i]f the Commission directs BA-RI to file new studies here, BA-RI would likewise address this new technology." Verizon Initial Brief, at 73.

Cox agrees with AT&T, pointing out that Verizon's expert witness panel in New York acknowledged that GR-303 technology should be considered. Cox Initial Brief, at 4. The Division did not address this issue in its briefs.

Commission Findings: Paragraph 685 of the *Local Competition Order* states:

> 685. Under the third approach, prices for interconnection and access to unbundled elements would be developed from a forward-looking economic cost methodology based on the most efficient technology deployed in the incumbent LEC's current wire center locations. This approach mitigates incumbent LECs' concerns that a forward-looking pricing methodology ignores existing network design, while basing prices on efficient, new technology that is compatible with the existing infrastructure. This benchmark of forward-looking cost and existing network design most closely represents the incremental costs that incumbents actually expect to incur in making network elements available to new entrants. Moreover, this approach encourages facilities-based competition to the extent that new entrants, by designing more efficient network configurations, are able to provide the service at a lower cost than the incumbent LEC. *We, therefore, conclude that the forward-looking pricing methodology for interconnection and unbundled network elements should be based on costs that assume that wire centers will be placed at the incumbent LEC's current wire center locations**, but that the reconstructed local network will employ the most efficient technology for reasonably foreseeable capacity requirements***. (Emphasis added.)

TELRIC requires that forward-looking networks be constructed using *the most efficient technology,* and the weight of evidence in this proceeding persuades us that at present, the most efficient technology is "next generation" integrated digital subscriber line carrier, known as GR-303. This is supported by Verizon's own statement: "The Company's TELRIC network uses the UDLC [universal digital line carrier] technology for "premium" ISDN [integrated services digital

network] capable links and IDLC [integrated digital line carrier] for all other links." Verizon Initial Brief, p. 11. The Commission recognizes, however, that GR-303 was not generally available or deployed in Verizon RI's wire centers to any significant extent at the time the initial cost studies were filed in this proceeding over three years ago, and that therefore, the UNE rates developed under Verizon's recurring cost model did not take GR-303 into account. The availability and deployment of GR-303 has increased significantly since that time, and even Verizon's own experts have conceded that GR-303 must now be taken into account in a proper TELRIC cost study. Accordingly, the Commission orders that costs associated with GR-303 carrier equipment shall be used in Verizon's compliance cost studies and all future TELRIC cost studies, except for those services, if any, for which GR-303 is shown to be unsuitable. Moreover, we construe ¶685 of the *Local Competition Order* to require that, as more advanced technologies become commercially available and deployed in some ILEC networks, the use of such technologies on a forward-looking basis must also be assumed in Verizon's future TELRIC studies, regardless of whether Verizon-RI is actually deploying such advanced technologies in its own network (unless the advanced technology is shown to be less efficient than some older technology in a particular case).

Sharing Structures

Under some circumstances, a telephone company will construct "structures," such as poles, conduit, or trenches for buried cable, and then "share" space on the structure with other utilities, such as electric companies, cable companies, and even gas and water companies (e.g.,

trenches).[27] Sharing the cost of structures can produce significant savings. Thus, the question arises as to how much "structure" sharing should be reasonably assumed on a forward-looking basis.

AT&T assumed rather high levels of structure sharing in its HAI model (AT&T Reply Brief, at 26-27, 31, 33-34), which Verizon criticizes as unrealistic and beyond historic levels. However, Verizon did not propose alternative sharing levels. Verizon Initial Brief, at 4, 44, 47; Verizon Reply Brief, at 25. Neither Cox or the Division addressed the issue of structure sharing in their briefs.

Commission Findings: The evidence indicates that some structure sharing will occur and that the disincentives for sharing are diminishing: there is less use of ratebase–rate-of-return regulation (with its incentives to increase ratebase), and there are pressures from municipalities to reduce the disruptions caused by multiple utility construction projects. However, the record is insufficient at this time to permit the adoption of specific, forward-looking sharing levels. While, on the one hand, AT&T has presented no evidence that the levels of sharing assumed in the HAI Model are realistically achievable in the near future, Verizon, on the other hand, has presented no evidence that levels of sharing achieved in the past will not be achieved in the future. Therefore, we are constrained at this time to accept the degree of sharing assumed by Verizon in its cost study, as it is supported by some actual experience.

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[27] In particular, we note that some municipalities have begun to require communications and CATV companies to coordinate their construction programs in order to minimize traffic disruptions and damage to the streets, and to conserve the limited number of possible rights-of-way under any particular street.

However, we direct that the compliance cost studies and future TELRIC cost studies, parties shall present specific evidence as to the level of sharing that will be possible in the future. In addition, we require parties to demonstrate why the forward-looking levels of structure sharing assumed by the FCC in its so-called "hybrid cost proxy model"[28] are not in full compliance with TELRIC and should not be assumed in future TELRIC cost models submitted to this Commission. Furthermore, in future TELRIC proceedings, the parties shall include the FCC-recommended levels of structure sharing in their "base scenarios." Parties are also free to submit additional scenarios using alternative sharing assumptions for Rhode Island, with appropriate evidence and expert testimony as to why TELRIC should be calculated using Rhode Island-specific sharing assumptions.

Fill Factors

Fill factors are key inputs in all parts of the cost models. Fill factors are used as assumptions in running the SCIS model for determining switch investments. They are also used in sizing the feeder and distribution cable in the loop plant, and in determining the costs and rates for interoffice transport (i.e., for sizing interoffice trunks). In view of the overriding importance of fill factors in long run incremental cost studies, including TELRIC, we discuss the issue at some length, and as a separate set of parameters of the cost studies.

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[28] FCC, *Federal State Joint Board,* Tenth Report and Order, CC Docket 96-45, November 2, 1999, appendix A2.

In a LRIC model, the "fill" is derived from an engineering consideration called the "fill at relief point" (sometimes also called "administrative fill"). When a facility is in use, as traffic increases, some portion of its capacity is occupied or utilized. As the portion being utilized approaches the relief point, the engineers administering that facility will begin to expand the facility or construct an additional facility. As a matter of practice, expansion of plant occurs at varying intervals, usually two to four years. Thus, the reasonably attainable "fill" or occupancy of a facility is somewhat less—and sometimes a great deal less—than the engineering "fill at relief" or "administrative fill." The lower the attainable or effective fill in a facility, the higher the measure of incremental cost of that facility. As AT&T states in its brief: "Even a modest reduction in estimated fill factors, from 40 percent to 30 percent, would cause estimated costs to increase 25 percent." AT&T Initial Brief, at 42 (citing Globerson pre-filed testimony (AT&T Ex. 19), at 11).

Verizon argues that:

> The utilization/fill factors included in BA-RI's TELRIC study are reasonable estimates of fills in an efficient forward-looking network architecture. Indeed they are likely too high, thereby producing lower costs. While [sic] BA-RI fully expects that in the forward-looking competitive environment it will actually experience even lower utilization factors than those used in its study due to the uncertainty of network forecasts and the resulting increased difficulty in predicting distribution area demand and network relief requirements.

Verizon Initial Brief, at 16. In particular, Verizon claims it "sized its switch investment for existing demand and assumed a high utilization to account only for a two year design period, plus a 5% allocation for administrative margin to handle short duration peak demands for ports ...." Id., at 15. With respect to fiber-optic cable, Verizon "places cable sizes beyond its

immediate need because various sizes of cable have minimal impact on cost as compared with the costs of installing additional fiber at a later time." Id., at 16. However, "when sizing a distribution cable, an engineer would properly plan to install distribution cable only once rather than incur the considerable expense of repeatedly augmenting a distribution route." Id., at 16 (citing Gamsby pre-filed testimony (Verizon Ex. 29), at 8). Verizon also notes that "high fill levels have been shown to be a contributing factor in poor customer service." Id., at 17 (citing Gamsby (Verizon Ex. 29), at 10).

AT&T replies that, in running the SCIS model, Verizon used the wrong fill factor:

> [It] used a 95 percent administrative fill factor (reflecting the availability of five percent of switching capacity for administrative purposes), but instead it used utilization fills running as low as 72 percent (which would assume 23 percent spare capacity plus five percent for administrative purposes). These mistakes again drove up its switch cost estimates.

AT&T Initial Brief, Ex. Sum. at 12. Similarly, AT&T says that Verizon used

> "inefficiently low utilization factors of only 40 percent for copper distribution, 50 percent for conduit, and 60 percent for feeder. ... BA-RI was unable to provide any useful information with respect to the development or derivation of its fill factors."

AT&T Initial Brief, at 41.

AT&T recommended the following fill factors for outside plant:

> Dr. Collins, based on his years of experience in the field, recommended that the following fill factors be used: 90 percent for fiber feeder and digital loop carrier electronics; 80 percent for copper feeder and the NID; and 57 percent for copper distribution cable. These recommendations are consistent with the fill factors approved by both the New York Public Service Commission and the Vermont Public Service Board, which were: for fiber feeder, 80 percent in New York and 75 percent in Vermont; for copper distribution plant, 50 percent in both states; and, for NIDs, 62.5 percent in Vermont.

AT&T Initial Brief, at 42 (citing Collins Tr. 5/6/99, at 101-106; Globerson pre-filed testimony (AT&T Ex. 19), at 13; Globerson Tr. 5/5/99, at 216, Vermont Public Service Board, Docket 5713, Phase II Order dated 2/4/2000, at 20-21, 99 (provided on 4/20/2000)).

For dedicated transport, Verizon used a 50 per cent fill factor. AT&T recommends a fill factor of 70 per cent. AT&T Initial Brief, at 45 (citing Weiss pre-filed testimony (Division Ex. 1), at 29).

Cox also argues that the Verizon fill factors are unduly low, and recommends that the Commission adopt the fill factors in Dr. Collins testimony (*See* Cox. Ex. FRC-2, p. 30). Cox Initial Brief, at 14-15.

The Division contends that most of Verizon's cost studies for network elements that are sensitive to fill (or usage) estimates are predicated on "severely understated fill factors." Division Initial Brief, at 32 (citing Weiss pre-filed testimony (Division Ex. 1), at 22, 29). While Verizon contends that its estimates of fill factors are based on "engineering judgment," in the Division's opinion, Verizon fails to demonstrate that its engineering judgments represent results that would be obtained in an efficiently operated local exchange company. Division Initial Brief, at 32.

During the hearings, the Division's witness, Mr. Weiss, presented a detailed analysis of the fill issue and the relationship between administrative fill and realizable or practical fill levels that will be experienced. It should be noted that, at several places, AT&T seems to concur with much of Mr. Weiss's analysis. *See, e.g.,* AT&T Initial Brief, at 42, 45; AT&T Reply Brief, at 25.

As the Division states:

> As a basic proposition, BA's link cost analyses reflect severely understated "fill" or "utilization" factors. For example, the LINKCSTR spreadsheet results reported by BA reflect copper distribution plant utilization factors in the range of 30% to 35%; copper feeder plant utilization factors of 31% to 51%; and fiber feeder utilization factors of 60%. (Weiss pf. at 22) BA indicates that its utilization factor estimates are grounded in engineering judgement, but BA engineers' judgments with respect to fill factor estimates are colored by what the engineers may be observing with respect to embedded plant in the field -- observations of conditions which have developed over years of BA engineering and construction operations in a regulated market. (Id.) BA-RI's feeder and distribution fill estimates do not reflect conditions as they would pertain in a competitive market; and they do not reflect the forward-looking approach to network development as required by the incremental cost estimates at issue in this case. (Id. at 23) For feeder plant, forward-looking utilization factors in the range of 75 percent to 80 percent are appropriate. For distribution plant forward-looking utilization factors in the range of 50 percent to 60 percent are appropriate. (Id.)

Division Initial Brief, pp. 38-39.

Moreover, as the Division points out, Verizon's calculations and statements of effective fill are inconsistent with its design fill:

> BA designs its feeder plant capacity to a minimum Design Fill At Relief ("DFAR") of 85 percent. This means that existing feeder plant capacity is supplemented with new capacity when the existing plant reaches a minimum of 85 percent utilization. When new capacity is added at the 85 percent fill level on the existing plant, the utilization factor on the total of the new and existing capacity falls immediately below 85 percent only to recover back to 85 percent as demand for the service on the feeder route increases with time, usually a period of from 2 to 4 years. Given that pattern of growth and reinforcement, it can be demonstrated that the average utilization or fill factor for a new feeder route will stabilize rather quickly in the range of from 70 percent to 80 percent. (Weiss pf. at 23-24)
>
> Mr. Weiss prepared Schedule THW-2 (Ex. Div. 1), in three pages, to demonstrate that fill on a new feeder route (i.e., a route which begins at zero percent fill) will stabilize in the range of from 70 percent to 80 percent after only a few reinforcement cycles with reinforcement triggers at 2 years, 3 years and 4 years.

Division Initial Brief, at 39.

Verizon attempts to rebut this calculation in its brief, arguing:

> During the hearing, Mr. Weiss drew a graph to explain how the "relief" point for feeder cable equates to the point when a feeder run is 85% utilized, a point dictated by the time needed to construct the new feeder and the fact that 3-5% of a run will be consumed by administrative lines and a 3-5% allowance needs to be made for damaged or defective pairs. See Tr. 5/12/99 (Weiss), at 192-198; Div. Ex. 8. He then presented an analysis showing that if a feeder line is regularly replaced when it reaches 85% utilization, as a specific run grows over time, it will reach a "steady state" utilization above 70%. Div. Ex. 8. (Attachment 1.) However, this analysis, fully accepted, does not mean a TELRIC study should incorporate a feeder utilization above 70%.
>
> A TELRIC study measures average utilization of total plant, not a single feeder run. At any point in time, the outside plant of a network will consist of hundreds of feeder cables with a mix of "ages;" not every cable will be a mature cable with a fill between 70% - 85%. If, hypothetically, the network had a mix of runs equally spread in age among the five time periods calculated by Mr. Weiss in his example for a single cable, then the average fill for the total network would be 65%.

Verizon Initial Brief, at 51-52.

However, the Division counters that:

> The key assumption in BA-RI's analysis (clearly stated by BA-RI in its argument) is that all feeder cables in the state would be equally distributed to these "Weiss Feeder Stages." However, that assumption remains a giant leap for three reasons. First, Mr. Weiss' example begins with the assumption that the feeder route is brand new and, therefore, begins at a fill factor of zero percent. This is a very conservative assumption in BA-RI's favor since, in actuality, no feeder route would be placed in service at zero percent fill (if so, the route would not have been needed in the first place). Second, in actual fact, all feeder cables in the state would not be distributed (in terms of fill) equally between 44 percent and 85 percent because BA-RI's own plant reinforcement practice (the LEPPADS document, Division Exhibit 6) calls for reinforcement when the DFAR (demand fill at relief) reaches 85 percent - the high end of the fill range. Third, there are some feeder cables that at any given time will exhibit a fill ratio greater than 85 percent because they are deployed on routes where the growth rate is actually lower than that which is embodied in the 85 percent DFAR practice. In summary, BA-RI's attempt to

> mischaracterize Mr. Weiss' analysis should be rejected by the Commission as failing to represent the real world of feeder plant.

Division Reply Brief, at 2-3.

Commission Findings: It is clear from the weight of evidence in this proceeding that Verizon's fill factors for switching, outside plant, and transmission plant are not credible.[29] They are extremely low. While such low fills may be observed in the field, they do not necessarily represent the most efficient, forward-looking practice, and so are not consistent with TELRIC. (See *LCO*, ¶685, which states: "... the reconstructed local network will employ *the most efficient technology* for reasonably foreseeable capacity requirements." (Emphasis added.))

The fill factors recommended by the Division's witness, Mr. Weiss, have not been effectively rebutted by any party. They are generally consistent with the testimony of the witnesses from AT&T and Cox, and are based on sound engineering principles. Indeed, in some instances, as discussed above, they are derived using sound engineering principles from Verizon's own stated engineering practices. Accordingly, we adopt as TELRIC-compliant the fill factors proposed by Mr. Weiss for switching, interoffice transmission, and local feeder and distribution cable, and order that they be used in all compliance cost studies filed in this proceeding. We further order that they be used in the "base scenario" for all future TELRIC cost studies. Since engineering practices are subject to change, particularly for new types of equipment, parties remain free to propose other fill factors in subsequent proceedings, but they

[29] Verizon's fill factors have been rejected by the state commissions in both New York and Vermont. AT&T Initial Brief, Exec. Sum. At 13.

must be supported by expert evidence as to how and why the proposed alternatives are consistent with TELRIC, ¶685 of the *Local Competition Order,* and modern engineering practice.

OPERATIONS SUPPORT SYSTEMS

Operations Support Systems ("OSSs") are the computer programs that a competing carrier must use in order efficiently to submit orders for UNEs. These systems are defined in 47 C.F.R. § 51.319(f) and discussed in the FCC's *LCO,* at ¶516 (*see also* § 251(c)(3) of the 1996 Act), and must be made available to all CLECs. Verizon RI seeks to recover a proportionate share of the approximately $107.6 million in expense and $19.2 million in ongoing costs it has incurred to implement access to, and modifications of, its Operations Support Systems covering New York and New England. Verizon contends that these expenses were incurred as a direct result of the FCC's *LCO,* and that they reflect the direct cost of compliance with the requirement to provide access to OSS, which itself constitutes a UNE whose recovery is specifically provided for in the *LCO,* ¶¶516,525. Verizon Initial Brief, at 55-56. The overall amount of OSS costs incurred by Verizon is not in serious dispute. However, the parties disagree as to what portion of the total cost actually represents expenses incurred as a result of the *LCO,* and what portion is attributable to ordinary and regular maintenance and updating of the OSS that would have been incurred in any event. Moreover, the method for recovering these costs is also in dispute. Verizon proposes to prorate these costs throughout the New England-New York (i.e., the former Bell Atlantic North) region. Other parties propose prorating these costs over a much broader region, i.e., throughout Verizon's entire territory (consisting, at the time of the briefs, of Bell Atlantic

North's (formerly NYNEX) territory and Bell Atlantic South's (formerly Bell Atlantic) territory; and would now, presumably, include GTE's former territory, as well).

Verizon presented testimony on operations support systems from David J. Kelly, Louis D. Minion, and William N. Orosz, as well as Dr. William Taylor. Testimony critical of BA-RI's OSS proposal was filed by Mr. Weiss for the Division and Dr. Janusz Ordover, Dr. Lee L. Selwyn, and Lee J. Globerson for AT&T.

Verizon argues that the FCC has concluded that access to OSS is a UNE, citing the *Local Competition Order,* ¶¶516, 525. Thus, Verizon argues, the cost recovery for OSS-UNEs should be no different than for any other UNEs: the carrier obtaining the element pays for it (citing 47 U.S.C. § 252(d)(1)). Verizon claims that, for this reason, the Commission need not even reach the issue of who the "cost-causer" is. The mere fact that CLECs and resellers obtain access to OSS means they should pay for the OSS-UNEs they request. Verizon Initial Brief, at 56. The other parties strongly disagree with this interpretation..

AT&T replies that OSS costs are not forward-looking in any respect, and that Verizon merely seeks to recover embedded computer maintenance costs it has already incurred and fully expensed in 1996 and 1997, and previously recovered through retail rates. Furthermore, according to AT&T, Verizon RI made no attempt to account for the substantial forward-looking savings available due to the ability of Bell Atlantic-North (formerly NYNEX) and Bell Atlantic-South (formerly Bell Atlantic) to share their OSSs.

AT&T also argues that, because no other state has approved the recovery of OSS costs from the former Bell Atlantic-North states and Verizon has assigned none of its OSS costs to the former Bell Atlantic-South states, this Commission's approval of Verizon's OSS cost recovery

proposal for the Bell Atlantic-North region would mean that Rhode Island CLECs would bear a disproportionate share of the proposed OSS charges. In other words, the Bell Atlantic-South states would enjoy the benefit of the OSSs for which Verizon is asking Rhode Island's CLECs to pay. AT&T Initial Brief, Ex. Sum. at 14-16. In particular, AT&T objects to Verizon's proposal to impose a fixed monthly charge of $2,606 on all resellers for five years, a fixed monthly charge of $4,993 on all UNE purchasers for five years, and per transaction charges that will be paid by both resellers and UNE purchasers, because these amounts were determined by prorating Verizon's OSS costs only among Verizon's New England states and New York states (and not also among the other 6 Verizon states of New Jersey through West Virginia, and the District of Columbia). AT&T Initial Brief, at 62-63.

Cox does not address the issue of operations support systems in its brief. The Division has somewhat different criticisms of this aspect of the study. In addition to questioning the amount and application of some of the claimed expenditures, and whether recovery, if any, should extend beyond the former Bell Atlantic-North service area (that is, be prorated among additional states), the Division argues that Verizon improperly seeks to exempts itself from paying the OSS access charges it seeks to impose upon its competitors.:

> Though BA-North claims that it incurred OSS costs in order to comply with regulatory mandates, BA-North has failed to carry its burden of proving that it did not incur these costs, at least in part, for its own benefit. ILECs, like BA-North, initiated mechanization programs to enhance their own efficiency and ability to compete, and the costs of these programs have been justified by improved service quality and reduced operating costs associated with the ILECs' own retail businesses. ([Selwin Direct (AT&T Ex. 9)], at 14) That is, ILECs incurred the costs of developing advanced OSS systems in order to achieve their own purposes, not to comply with the requirements of TA96. These advanced OSSs can, with very few modifications, facilitate compliance

> with TA96 and promulgated regulations to achieve pro-competitive objectives. (Id. at 17).

Division Initial Brief, at 49, 51 (citing Selwyn pre-filed testimony (AT&T Ex. 9), at 14, 17).

> The record in the instant case supports the conclusion that if recovery of the alleged costs is allowed, then the costs should be spread over all LECs — including BA-North — in proportion to each LEC's share of total customers. Dr. Ordover, testifying on behalf of AT&T, explained that competition onset costs are in no sense caused by new entrants. (Ordover pf. at 38-39; Ex. AT&T 11) Even if no competitors were to enter the BA-North region, Dr. Ordover elaborated, BA-North would still have to incur these costs in anticipation of competition. (Id. at 38, 39) Since Congress mandated local competition for the benefit of end-users, who, if TA96 is successfully implemented, will see lower prices, better quality and more choices, the principle of cost causation dictates that all end-users ultimately should bear these competition onset costs. (Id.) Indeed, the competitive neutrality requirement embodied in TA96 bar BA-North's proposal to recover from new entrants and their customers only. (Id.).

Id., at 52. Moreover, the Division and other parties contend that at least a portion of the OSS costs should be recovered from Verizon itself. According to the Division:

> Further, the Commission must bear in mind that all provider-participants in this market -- including new entrants -- have incurred or will incur competition onset costs. ...
>
> Dr. Selwyn agrees with Dr. Ordover that it is the introduction of competition, rather than any individual new entrant, "caused" competition onset costs. Dr. Selwyn rejects BA-North's argument that new entrants caused these costs because BA-North's argument implies that the existing monopoly paradigm is more efficient than the competitive paradigm, a premise that Congress has flatly rejected." Moreover, ILECs benefit from the advent of competition since once effective competition is in place, they will be in position to achieve a long-sought goal -- a less competitive regulatory regime. The benefit will be even greater for the RBOCs such as BA-North, because they will achieve another long-sought goal -- removal of the restriction from offering interstate toll service from within its region.

Division Initial Brief, at 53 (footnotes omitted) (citing Janusz Ordover (AT&T Ex. 11), at 41; Lee Selwyn (AT&T Ex. 9), at 15-16, 19-20, 21; and Thomas Weiss (Division Ex. 1), at 39). Thus, the Division recommends that the Commission "not permit Bell Atlantic-North to recover alleged onset costs associated with OSS modifications because each carrier, including Bell Atlantic-North, should bear its own costs." Id., at 58. The Division also concludes that Verizon has failed to carry its burden of proving its cost estimates. Id.

Commission Findings: It is clear that it is not forward-looking, and hence contrary to TELRIC, to permit Verizon to recover OSS costs incurred in the past. Moreover, as these costs have already been fully recovered as part of Verizon's revenue requirement, to the extent they were also recovered from other sources, such as CLECs, a refund would arguably be due to ratepayers. However, this action would require a "rate-based proceeding" which is specifically proscribed for setting UNE rates by §252(d)(1)(A) of the 1996 Act. Furthermore, since it is clear that Verizon spends a great deal of money each year to upgrade and modernize its computer systems, it would be necessary to segregate the annual OSS maintenance costs that would have been incurred in any event and thus, should not be recovered. It would also be necessary to segregate those costs specifically mandated by the 1996 Act and the FCC's rules promulgated thereunder, but from which Verizon benefits. Such costs might, on a forward-looking basis, be allocated among Verizon and the CLECs; however, these costs would have to be removed from the revenue requirement that is collected in Verizon's regular rates. Again, this would require a "rate-based proceeding," which is specifically proscribed for setting UNE rates by §252(d)(1)(A) of the 1996 Act, unless it can be shown that the costs in question are entirely new and thus, not already included in Verizon's revenue requirement. Similarly, costs specifically mandated by

the 1996 Act and the FCC's rules that benefit only the CLECs might be allocated on a forward looking basis among the CLECs and Verizon, but only after removal from Verizon's revenue requirement or a showing that they are entirely new costs.

The evidence in this proceeding does not permit us to make any such determinations at this time. First, we find that Verizon has improperly combined embedded and historic OSS costs with the ongoing OSS maintenance costs it would have incurred in any event.[30] Verizon has not identified any OSS costs that are clearly new or "incremental," nor has it shown that any of the OSS costs it reports are new. Accordingly, we can grant no allowance for OSS development costs in this proceeding. Even forward-looking or anticipated OSS costs that might arguably be considered incremental and appropriate for recovery have not been identified, either in amount or in nature. The nature of such costs is important, as it will govern the determination of whether particular OSS costs should be recoverable from other parties, or simply remain part of the costs that all firms must incur as a result of the passage of the 1996 Act and the transition to competition. Accordingly, we order that no OSS development costs be included in any charges, recurring or nonrecurring, in any compliance cost studies filed in this proceeding. Any claim for recovering future OSS costs in any future proceedings must be properly identified, as discussed herein, before the merits of such claim can be considered.

Secondly, it is clear that the OSSs will be useful beyond Verizon-North. Indeed, they will be used in Verizon-South, and possibly by other Verizon companies (such as the former GTE companies). It is also conceivable that the OSSs will be (or have been) licensed to other ILECs

[30] AT&T notes that the Massachusetts, New York and Vermont commissions have already rejected Verizon's proposed OSS charges for the former Bell Atlantic-North region for this reason. AT&T Reply Brief, at 39. .

needing to install OSSs that meet FCC standards. Therefore, we also find that Verizon's OSS cost recovery proposal is unreasonable in that it seeks to recover a disproportionate share of the OSS costs from Rhode Island CLECs, and not from itself or other Verizon entities and/or unaffiliated companies to which Verizon might license the systems. If Verizon makes any requests to recover *forward-looking* OSS development costs in any future proceeding, its cost recovery plan shall include a method of recovering such costs in an appropriate manner from *all* beneficiaries thereof, including Verizon itself, other Verizon entities, and other licensees of Verizon's OSS.

NONRECURRING COSTS

Nonrecurring costs ("NRCs") refer to costs that are incurred on an irregular basis, or only when certain events occur. The term is a traditional tariff designation for these types of costs. For example, the costs associated with acquiring a new customer are considered "nonrecurring" because they occur only once for each customer. Similarly, costs of moves and rearrangements may occur many times for each customer, but they occur only sporadically, so they are considered nonrecurring.

Verizon's Approach to Nonrecurring Costs

In support of its proposed Nonrecurring Charges ("NRCs"), Verizon filed an non-recurring cost study sponsored by Mr. Bruce Meacham (its NRC cost witness) and Mr. Henry Gamsby (its NRC engineering witness). Mr. Weiss for the Division, as well as Mr. Lee Globerson, Mr.

James F. Recker, and Dr. Lee Selwyn for AT&T, provided testimony critiquing various aspects of Verizon's nonrecurring cost study.

Verizon describes its nonrecurring cost study as follows:

> BA-RI's nonrecurring cost studies are based on actual forward-looking estimates of the time required to perform nonrecurring activities from the very Bell Atlantic employees who will be performing these activities. Indeed, BA-RI reduced its current work times to account for future mechanization. ...
>
> BA-RI's nonrecurring cost study identifies the one-time costs BA-RI incurs to provide various UNEs to telecommunications carriers. The study analyzes the nonrecurring costs of providing loop and transport facilities, line and trunk side interconnection of the local switch, trunk side interconnection of the tandem switch, and interconnection to the BA-RI signaling network. BA-RI's model is based on the work activities required to provide UNEs and estimates of the time required to perform those tasks by the actual people who spend their days provisioning these UNEs.
>
> To calculate the cost of each work function, BA-RI identified the work functions necessary to install each UNE, developed estimates of the time required for each identified work function and multiplied those time estimates by a fully assigned labor rate. The cost to interconnect each UNE is the sum of all work function costs for that element.

Verizon Ex. 10, at 33; Verizon Ex. 11, at 6-7.

> BA-RI used a three-step process to develop work times. First, BA-RI identified the specific work operations required to provision each UNE studied. BA-RI exhaustively reviewed all of the processes needed to offer each UNE, and broke these processes down into the specific work functions. (BA-RI Ex. 10, at 33-35.) Next, subject matter experts used these work-activity descriptions to estimate a minimum, maximum and most-likely time to complete each task. ...

Verizon Initial Brief, at 73-75 (footnotes omitted).

The other parties made a number of detailed objections to the manner in which Verizon performed the study. For example, AT&T contended:

> Even on its own terms, the BA-RI model fails to specify properly the work functions that would have to be performed when a CLEC asks Bell Atlantic to provide a UNE. The network architecture assumed for the purposes of BA-RI's NRC model is not forward-looking, and is dramatically different than the network architecture assumed for the purposes of its recurring charge proposals. BA-RI should not be allowed to pick and choose among network assumptions in a transparent effort to drive up each and every charge that it seeks to assess on its competitors.
>
> Because the BA-RI NRC Study improperly assumes the use of embedded network technology and ignores time-saving technologies that should be incorporated in a forward-looking model as required by the TELRIC methodology, the BA-RI models assume an excessive amount of manual intervention in the provisioning process. Even where central office wiring would be required, BA-RI's estimate of how long that work would take is six to seven times too high, as shown by evidence presented by Bell Atlantic in New York. ...

AT&T Initial Brief, Exec. Sum. at 17. AT&T further points out that both the New York and Massachusetts commissions found that it is improper for Verizon to determine non-recurring costs using network assumptions that are inconsistent with the network assumptions used to determine recurring costs. AT&T Initial Brief, at 80. Indeed, the Massachusetts commission specifically ruled that the use of inconsistent network assumptions in recurring and nonrecurring costs models "invites cherry picking, i.e., producing the higher recurring costs associated with all-fiber feeder and the higher non-recurring costs associated with a network composed primarily of copper feeder." Id., at 81 (citing Mass. DTE *Consolidated Arbitrations* Docket, Phase 4-L Order of 10/14/99, at 19. The Division concurs, stating that "at the very least, UNE rates and nonrecurring costs should be based on the same forward-looking technology." Division Initial Brief, at 60.

AT&T's Nonrecurring Cost Model

AT&T introduced a Non-Recurring Cost Model ("NRCM") sponsored by Mr. James F. Recker, who also provided a critique of Verizon's nonrecurring cost study. AT&T says of its model:

> It is an open and accessible model, which allows the user to adjust the inputs. Indeed, the AT&T NRC Model is complete in terms of its consideration of the functional activities necessary to complete and document service orders, is quite logical in organization and user friendly, and accurately depicts the functional activities required for information to move through an ILEC service ordering system. ...
>
> The AT&T NRC Model accurately specifies non-recurring work functions in a forward-looking environment. Consistent with TELRIC methodology, it assumes that BA-RI will deploy advanced OSSs and other efficient, available forward-looking technology, including fiber feeder and Next Generation Digital Loop Carrier ("NGDLC"), to maximize electronic provisioning and to minimize manual activities. ….

AT&T Initial Brief, p. 19.

Verizon characterizes AT&T's NRCM as follows:

> AT&T has proposed a non-recurring cost model ("NRCM") in this proceeding which bases costs on a completely hypothetical network and uses times obtained from hired consultants, not individuals who will be actually performing these activities. In fact, AT&T's *own experts* have challenged many of the fundamental assumptions in the AT&T NRCM, including the NRCM's assumption regarding the amount of manual activity required in the forward-looking environment. ...

Verizon Initial Brief, Exec. Sum. at 6.

The Division's view of AT&T's NRCM was based on an analysis and assessment by Mr. Weiss:

> In his review of the NRCM, Mr. Weiss found: (i) that the time estimates for activities described in the NRCM comported to his expectations of the time required by ILECs to perform similar activities; (ii) that the NRCM specifies the correct individual work functions necessary to compete new entrant service orders; and (iii) the NRCM properly separates NRCs associated with service termination from NRCs for service initiation.

Division Initial Brief, at 65-66 (citing Weiss prefiled testimony (Division Ex. 1),at 42-47).

Commission Findings Regarding Nonrecurring Cost Models

The record in this proceeding suggests that both Verizon RI's and AT&T's nonrecurring cost models are not without flaws and that each has its merits. The question for the Commission is whether either of the models may be adjusted in a manner that allows the Commission to reasonably identify the appropriate forward-looking nonrecurring costs for Rhode Island. While either of the nonrecurring costs models could, when properly adjusted, generate appropriate forward-looking rates, as in the case of the recurring cost models, we conclude at this time that the Verizon's nonrecurring cost model, adjusted as specified below and as modified by the applicable parameters set forth elsewhere in this Order, is the appropriate TELRIC model for determining nonrecurring costs, and shall be used in the compliance cost studies required by this Report and Order.

We note that a number of the modifications we prescribe to Verizon's nonrecurring cost model, especially with regard to the parameters and assumptions to be used therein, are similar to those proposed by AT&T in its NRCM and, therefore, should result in reductions to Verizon's nonrecurring costs. In particular, we concur with the Division, AT&T and our sister states that it is improper for Verizon to employ inconsistent network assumptions in the recurring and

nonrecurring cost models submitted in this proceeding. Accordingly, we order that Verizon's compliance cost studies filed in this docket, as well as any future TELRIC cost studies, be based on the use of consistent network assumptions for both recurring and nonrecurring cost models. In addition, for purposes of such filings, we require the use of the fill factors and "fall-out" rate we adopt below, and the use of Rhode Island-specific labor rates, as well as the cost of capital, depreciation, and other parameters we prescribe herein. We also require that any sampling of "experts" by Verizon be better-documented, statistically appropriate, and based on specific plans for its revised Operations Support Systems, and not just the experts' unguided and undocumented speculations as to how Verizon's operations might change as a result of local exchange competition. Finally, we note that, as we have previously determined (above), the OSS development costs for which Verizon seeks recovery in this proceeding are not forward-looking, TELRIC costs for which recovery in UNE rates is appropriate and, therefore shall not be included in future non-recurring cost studies.

Notwithstanding the foregoing, we do not preclude AT&T from re-filing its nonrecurring cost study in accordance with the parameters established in this Order.

Having determined that Verizon's nonrecurring cost model, with the adjustments herein specified, shall be used to determine nonrecurring costs in accordance with TELRIC, the following sets forth our findings regarding the modification of certain parameters that are applicable to Verizon's nonrecurring cost model.

The "Fall Out Rate"

The operating support systems that Verizon has developed are designed to electronically process most CLEC orders for UNEs in an automated manner. However, a certain percentage of

these orders will be rejected or “fall out” of the automated process, thereby requiring manual processing at greater expense. The percentage of orders expected to “fall out” is called the "fall out rate."

According to Verizon, the AT&T’s NRCM understates the amount of human intervention required to provision a UNE, because the NRCM assumes that all types of UNE orders — regardless of complexity — will have a "fall out rate" of only 2%. According to Verizon, none of the AT&T witnesses was able offer any credible evidence that Verizon's OSS will be able to achieve this level of flow-through in the future. Verizon also claims that AT&T's own experts have questioned the validity of the 2% assumption, and that AT&T's witnesses have conceded that the its NRCM fails to include the required level of manual activity necessary for more complex orders. Verizon Initial Brief, at 78.

AT&T, on the other hand, points out that Verizon assumes that fully 15% of all UNE service orders would fall out of the electronic ordering systems and have to be handled manually. In AT&T's view, a 15% fall out rate is many times higher than one would expect to experience using an efficient, well-functioning OSS. AT&T proposes that the appropriate forward-looking assumption would be a fallout rate of only 2%, citing a decision by the Massachusetts commission which recently found that "the two percent fall out rate offered by the CLECs is indicative of likely experience with forward-looking technologies in this industry," and is the appropriate assumption to use in a TELRIC-compliant nonrecurring cost analysis. AT&T Initial Brief, at 82-83 (citing Massachusetts DTE *Consolidated Arbitrations* Docket, Phase 4-L Order dated 10/14/99, at 16).

The Division recommends a slightly higher fall out rate (5%) than AT&T, explaining that:

> [I]f BA-North's OSSs operate properly, the only condition under which manual processing should be required should be for complex orders. (Weiss pf. at 46) Further, "given the alleged sophistication of [BA-North's] OSSs (not to mention their cost)," a significant proportion of complex orders should be processed by OSSs without manual intervention. (Id.) Indeed, whether or not BA-North has deployed the best available technology, that technology should be assumed for purposes of setting NRCs. *Accordingly, a more realistic assumption for the rate of manual intervention would be no more than five percent.* (Id.)

Division Initial Brief, at 62 (emphasis added) (citing Weiss pre-filed testimony (Division Ex. 1), at 46).

By comparison, according to testimony from AT&T's witness James F. Recker, Southwestern Bell has indicated it can achieve a fall out rate of only *one* percent, and Bell South has indicated it can achieve a fall out rate of three percent. Division Initial Brief, at 62 (citing Recker pre-filed testimony (AT&T Ex. 25), at 25-27). Cox does not address the issue in its briefs.

Commission Findings: While it is difficult to predict what may be attainable in a electronic ordering system that is still under development in an operating environment that is still in flux, it is clear from the record that, from a forward-looking point of view, a fall out rate of 15% is more than likely too high and is unsupported by the evidence. Having ordered Verizon, as noted above, to adopt consistent network assumptions in its recurring and nonrecurring costs models, we expect that the amount of manual intervention required for processing CLEC orders on a forward-looking basis to decrease significantly, thereby resulting in a commensurate decrease in Verizon's nonrecurring charges for OSS. Accordingly, we find that a fall out rate of 5%, as recommended by the Division, is reasonable and we adopt this rate for use in compliance cost studies filed in this proceeding, as well as future TELRIC proceedings. In future

proceedings, we will also consider evidence from Verizon in this and other states, and from other ILECs, as to the fall out rates achieved, the trends in fall out rates, and projections as to what fall out rates may eventually be achievable. However, we will likely require that a 5% fall out rate continue to be used in the "base scenario."

Cost of Disconnection

Verizon contends that, because all customers must eventually be disconnected, the nonrecurring charge to be imposed on a CLEC for connecting a customer should at the outset include both the cost of connecting the customer and the cost of eventually disconnecting that customer. In contrast, AT&T and the Division contend that the collection of disconnection costs up-front is without merit, results in a windfall for Verizon, and will constitute an artificial barrier to competitive entry. Division Initial Brief, at 61. The Division and AT&T also agree that the Commission should establish separate disconnection charges to be imposed on a CLEC, if appropriate, only at the time that the CLEC terminates its use of particular unbundled network elements, and not at the time that the UNE is first provisioned to the CLEC. *See* AT&T Initial Brief, at 84-85; Division Initial Brief, at 60-61.

Commission Findings: While the inclusion of disconnection costs has long been a standard practice in the calculation of Verizon's nonrecurring *retail* installation charges, we are not convinced that the inclusion of similar costs at the time of service initiation are warranted, or even appropriate, in the case of *wholesale* installation charges. Rather, we are persuaded by the Division's concern that imposing such a requirement on CLECs "does not reflect the realities of the interconnection and UNE market because interconnection and UNE customers are unlikely to

leave the ILEC "holding the bag.'" Division Initial Brief, at 61. Accordingly, we hereby prohibit Verizon from including in its nonrecurring costs a disconnection charge at the time of service initiation. In addition, we require that in future TELRIC cost studies, the cost of disconnection shall be made a separate rate element from the cost of connection.

The Coordination Bureau

Verizon also seeks to recover, in its nonrecurring charges, the costs of a "coordination bureau." Verizon argues that nonrecurring costs should cover activities such as performing coordination and verification work to ensure that the CLEC orders are provisioned without affecting the end-user customer's service. Verizon Initial Brief, at 73. AT&T argues:

> BA-RI seeks to levy a Coordination Bureau ("CB") charge on every order for an unbundled loop or switching. But this "coordination" work is nothing more than verification that other BA-RI employees are doing their job properly. BA-RI concedes that no CB work is required when BA-RI provides a CLEC with a UNE-P order. This follows from a more general point: No work should be required by the CB to provision UNE orders electronically, as nearly all orders should be in a properly forward-looking network.

AT&T Initial Brief, at 83.

The Division says simply:

> [T]he work proposed to be performed by the Coordination Bureau, such as verification of completed work, is unnecessary. Such verification that employees are doing their jobs is the responsibility of management and through the overhead factors applied to labor rates, BA-North is already being compensated for conducting this oversight function.

Division Initial Brief, at 64.

The Commission shares the Division's concern that the costs associated with the Coordination Bureau are unnecessary. Special coordination charges that apply only to work being done for UNEs might well amount to double-recovery of ordinary supervision overhead expenses and could, therefore, constitute a barrier to entry. Accordingly, we order that no such costs be included in any future TELRIC cost studies in this docket.

Work Times

After careful analysis, the Division recommended that we adopt either the NRCM's functional work time estimates to set nonrecurring costs or, in the alternative, if the Verizon NRC model is used, that we adopt the New York commission's approach of using minimum, rather than mean, Task Oriented Costing times. By making this adjustment to Verizon's nonrecurring cost model, the time estimates used to develop Verizon's NRC's will be reduced to approximately 57% of those originally filed by Verizon. *See* Division Initial Brief, at 64. We find the Division's recommendation reasonable and order Verizon in its compliance cost studies to make a similar adjustment to its NRC model.

Activation of New "Exchange" Numbers

Verizon seeks to recover a cost for activating new exchanges—the cost of inserting the new "NNX" in its switches routing look-up tables. The new NNXs that stem from competition could be deemed to be a cost to all carriers (and to private parties who maintain such NNX

routing tables in their PBXs). Accordingly, we order that no such cost or charge be included in any future TELRIC cost studies.

Labor Rates

In all compliance cost studies and future TELRIC filings, labor rates specific to Rhode Island shall be used. National labor rates and multi-state Verizon average rates shall not be used.

ADJUSTMENT FOR THE COST SAVINGS FROM THE BELL ATLANTIC-NYNEX MERGER

When Bell Atlantic merged with NYNEX ,the parties made a number of public statements, often under oath or with penalty for misrepresentations, about the savings that would result—and have resulted—from that merger. [31] On a forward-looking basis, any savings in cost should be reflected in TELRIC. In a conventional rate proceeding (which is prohibited for determining TELRIC rates by §252(d)(1)(A) of the 1996 Act), the cost savings that are actually realized would automatically accrue to ratepayers. Prospective cost savings might be reflected in rates to the extent that they are "known and certain," and subject to a state commission's practices with respect to "future test years," and "known and certain changes."

In the case at hand we have evidence of merger-related cost savings that are subsequent to, and therefore not included in, the TELRIC studies filed in these proceedings. Thus, these cost savings are analogous to post- test year costs incurred in a conventional rate case.

Both AT&T and the Division raised the issue of Verizon's failure to recognize merger-related cost savings in their initial briefs. AT&T stated:

> [I]t is undisputed that Bell Atlantic will be experiencing tremendous cost savings as a result of its merger with NYNEX, and as a result of its ongoing process re-engineering efforts. But BA-RI ignored all of these substantial savings in coming up with its UNE cost and rate proposals.

AT&T Initial Brief, Ex. Sum. at 9.

> In the near future, once Bell Atlantic completes its merger with GTE, it will have even greater buying power and should be able to negotiate even better switch prices.

AT&T Initial Brief, Ex. Sum. at 11.

> In its cost studies, BA-RI ignores the savings that it has achieved since 1996 as a result of the merger between Bell Atlantic and NYNEX. Bell Atlantic has publicly stated that these merger savings are in excess of one billion dollars, and yet BA-RI insists on basing its cost estimates on 1996 expense data without making any adjustment for these acknowledged savings. BA-RI similarly ignores the all savings that have accrued from its process re-engineering efforts since 1996, and will continue to accrue over the life of the UNE rates to be set by the Commission in this proceeding. Unless those savings are taken into account, the UNE rates for BA-RI can never satisfy the requirements of TELRIC as they will never be forward looking.

AT&T Initial Brief, at 4.

> [A] truly forward-looking TELRIC study would consider the anticipated economic impact on OSS costs of the merger between NYNEX and Bell Atlantic. Bell Atlantic has identified about $1.8 billion in annual expense savings and increased revenues as a result of the merger and it specifically attributes a substantial portion of its merger savings to the ability to "consolidate[e] and integrat[e] networks and operating systems." This estimate is not speculative, as Bell Atlantic is on track to meet or exceed its projected merger expense savings.

AT&T Initial Brief, at 65.

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[31] Such statements were made in filings before the several state commissions with jurisdiction over the companies, the Federal Communications Commission, the United States Department of Justice, and in financial filings with the Securities and Exchange Commission, Annual Reports to Shareholders, and other documents.

Using publicly available documents, the Division calculated the annual expense savings as a result of the merger and process re-engineering, as follows:

> BA's cost studies purport to be forward-looking, yet BA has not accounted for operating cost savings it represented to regulators and the public at large that it will enjoy as the result of its efforts at process reengineering and its mergers with NYNEX and with GTE. For example, BA neglected to reflect in its proposed interconnection and UNE prices, the on-going cost savings from BA's efforts at process reengineering which, according to Mr. Globerson testifying on behalf of AT&T, is expected to amount to $400 Million annually.
>
> BA did not reflect in its forward-looking cost studies the anticipated annual system-wide savings of $600 Million that it projects will result from the BA-NYNEX (a/k/a "the New Bell Atlantic") merger, and some $2.0 Billion annual system-wide savings that it expects to result from the New Bell Atlantic merger with GTE. These figures are not mere speculation by BA; in fact, the estimates are likely to be somewhat conservative in their magnitude because, under securities law, BA may not include speculative information in its public statements. BA and NYNEX represented the $600 Million annual expense savings to the FCC and other regulators in order to justify the merger. *Merger Order* at ¶ 160 ("Bell Atlantic and NYNEX contend that the proposed merger will produce substantial cost savings that are 'hard, real, and certain'"); ¶ 161 ("Applicants expect to achieve annual cost savings that approach $1 billion per year").
>
> The annual expense savings which BA has publicly represented that it will enjoy due to its process reengineering efforts and its merger activities are not reflected in the prices which BA-RI proposes to charge its competitors for interconnection and UNEs. The Division has determined, directly from publicly available documents, that BA-RI's share of the savings from the two mergers discussed above represents 5.60 percent of BA-RI's annual operating expenses, including depreciation and taxes. Also, from publicly available documents, the Division has determined that BA-RI's share of the system-wide savings from process reengineering constitutes an additional 1.51 percent of BA-RI's operating expenses, including depreciation and taxes; the calculations and sources of the information used to develop these savings percentages are shown at Exhibit A. *This total 7.11 percent (5.60 percent plus 1.51 percent) should be deducted from the interconnection and UNE costs that the Commission otherwise finds applicable to the interconnection and*

> *unbundled network elements at issue here. More specifically, to effect its recommendation, the Division proposes that the Commission apply a factor of 0.9289 (1 minus 0.0711) to the interconnection and UNE costs determined without recognition of the savings from the mergers and process reengineering activity.*

Division Initial Brief, at 9-11 (emphasis added).

Verizon contends that the Commission should not take notice of the savings from the merger because the expense savings reductions calculated by the Division are not measured against *historical* costs:

> AT&T and the Division argue that BA-RI failed to include in its TELRIC studies cost savings arising out of the merger between Bell Atlantic and NYNEX and BA-RI's process reengineering efforts. See AT&T Brief at 4-5; Division Brief at 9-10. Drawing on estimates apparently derived from public statements made in various contexts, the Division's witness, Mr. Weiss, submits for the first time in this proceeding his "analysis" of what he believes to be BA-RI's merger and process reengineering savings and argues that the Commission should deduct 7.11 percent from BA-RI's UNE costs to reflect these savings. See Division Brief at 10-11 and attached Exhibit A.
>
> On its face, Mr. Weiss' calculation contains many layers of speculation and should not be relied on by this Commission. The $600 million dollars in savings to which Mr. Weiss repeatedly refers was an estimate of savings that the combined company expected to realize "as a result of consolidating operating systems and other administrative functions and reducing management positions." See *id.* at Exhibit A, Page 1. It does not represent out-of-pocket *expense reductions measured against some past historical period.*

Verizon Reply Brief, at 3 (emphasis added).

Commission Findings: The point of TELRIC is that it is *forward-looking.* We are specifically prevented by § 252(d)(1)(A) of the 1996 Act from setting TELRIC rates based upon historic costs in a "rate-based proceeding." Thus, it is entirely appropriate, for purposes of setting TELRIC-compliant rates in this proceeding, to examine Verizon's initial estimates of its

forward-looking costs with those that might have been estimated after the *forward-looking* cost savings of the merger are considered. Accordingly, in accepting the Division's analysis at its open meeting on April 11, 2001, the Commission ordered that the Interim Rates and Charges be reduced by 7.11 percent to reflect savings from mergers and process re-engineering activities, and that the resulting rates be deemed final TELRIC rates for purposes of this proceeding.

APPROVED TELRIC RATES

On May 18, 2001, the Commission issued an Order memorializing its April 11, 2001 open meeting decision approving the Interim Rates and Charges, adjusted downward by 7.11% to reflect merger-related savings as discussed above, as final TELRIC rates in this docket. *See* Order No. 16615. We hereby confirm our determination that the final rates established by that Order are consistent with TELRIC. First, the interim recurring charges made permanent in that Order were nearly identical to the recurring charges that had been recommended as final rates by the Division.[32] In addition, the Division has proposed that the Verizon RI recurring cost model be adopted with certain modifications, and has concluded that the resulting recurring rates are consistent with TELRIC. The Commission finds that the Division's recommendation is reasonable and its conclusion that these rates are consistent with TELRIC is supported by substantial evidence in the record of this proceeding.

[32] With the exception of the loop rates, the interim recurring rates approved by the Commission on August 18, 1999, were the rates that were derived from the Division's proposed adjustments to Verizon RI's recurring cost TELRIC study. Following the Commission's April 11, 2001 decision and its subsequent written order dated May 18, 2001 (Order No. 16615) directing Verizon RI to make a compliance filing, Verizon RI revised its interim rates—including its loop costs

With regard to the determination of non-recurring costs, as discussed above, the Commission finds that the Verizon's non-recurring cost study, when adjusted as prescribed herein, generates rates that are consistent with the TELRIC methodology and that this conclusion is supported by substantial evidence in the record of this proceeding. The interim nonrecurring charges approved by the Commission represented a 36.5% reduction from the rates that Verizon RI had originally filed, and together with the additional 7.11% reduction to Verizon RI's proposed non-recurring charges, brings Verizon RI's rates into compliance with TELRIC.[33] In addition, we find that the resulting rates are just and reasonable and will facilitate the development of local exchange competition in Rhode Island. *See* Order No. 16615, at 2.

At an open meeting held on November 15, 2001, the Commission approved the compliance rates filed by Verizon on May 21, 2001 as consistent with the Commission's April 11, 2001 open meeting decision and the requirements of TELRIC as prescribed by the 1996 Act and the *Local Competition Order*. In addition, the Commission ordered Verizon to file, not later than the earlier to occur of: (1) the 30th day after Verizon's receipt of §271 approval from the FCC, or (2) May 1, 2002, new rates in this proceeding, based on fresh cost studies using the Verizon recurring and nonrecurring cost models, as adjusted in accordance with the parameters and other applicable directives set forth in this Order.

Accordingly, it is

(16793) ORDERED:

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to—reflect the Commission's rulings as set forth herein. Thus all of the current recurring rates are consistent with TELRIC. *See* Verizon RI Compliance Filing dated May 21, 2001.

[33] The Commission finds that Verizon RI's revised recurring and nonrecurring charges for physical collocation that were filed with the Commission on May 21, 2001, are reasonable and consistent with TELRIC.

1. The appropriate cost methodology for determining the pricing of Unbundled Network Elements (UNEs) is Total Element Long Run Incremental Cost (TELRIC), as defined in the Telecommunications Act of 1996 and the FCC Rules promulgated thereunder, the FCC's *Local Competition Order*, and relevant court decisions.
2. For purposes of determining Verizon's recurring and nonrecurring costs for UNEs , collocation and interconnection in accordance with TELRIC, the recurring and nonrecurring cost models submitted by Verizon, as refined and modified by the adjustments specified in this Report and Order, shall be used.
3. All cost studies shall comply with the directives set forth with the Commission's Order No. 16012 (issued December 6, 1999) regarding the combining of Unbundled Network Elements (i.e., UNE-P, for "platform").
4. Verizon Rhode Island's overall rate of return shall be 9.5 percent, based upon a capital structure consisting of 63.3 percent equity and 36.7 percent debt, reflecting a cost of equity of 11.0 percent and a cost of debt of 6.91 percent.

5. Verizon shall use the most recent depreciation rates prescribed by the FCC in all compliance filings in this proceeding and in all future TELRIC filings.

6. The fill factors for switching, interoffice transmission, and local feeder and distribution cable recommended by the Division's witness, Thomas Weiss, in this proceeding are hereby adopted.

7. A fall out rate of 5% for Verizon's operations support systems is hereby adopted.

8. Labor rates specific to Rhode Island shall be used in all TELRIC cost studies.

9. The savings resulting from Verizon's mergers and process re-engineering activities are determined to be 7.11 percent and shall be applied to all compliance filings in this docket.

10. The compliance rates filed by Verizon on May 21, 2001 are consistent with the Commission's April 11, 2001 open meeting decision and the requirements of TELRIC, and are hereby approved as final TELRIC rates for effect April 11, 2001.

11. Verizon shall file new rates in this proceeding, based on fresh TELRIC cost studies using the Verizon recurring and nonrecurring cost models, as adjusted in accordance with the parameters and other applicable directives set forth in this Order. These new cost studies and rates shall be filed not later than the earlier to occur of: (1) the 30th day after Verizon's receipt of §271 approval from the FCC, or (2) May 1, 2002.

12. Verizon shall comply with all other findings and instructions contained in this Report and Order.

EFFECTIVE AT WARWICK, RHODE ISLAND ON APRIL 11, 2001, PURSUANT TO AN OPEN MEETING DECISIONS ON NOVEMBER 9 AND NOVEMBER 21, 2000 AND APRIL 11 AND NOVEMBER 15, 2001. WRITTEN ORDER ISSUED NOVEMBER 18, 2001.

PUBLIC UTILITIES COMMISSION

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Kate F. Racine, Commissioner

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Brenda K. Gaynor, Commissioner