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State of Florida

Public Service Commission

-M-E-M-O-R-A-N-D-U-M-

DATE: November 14, 2002
TO: Mary Andrews Bane, Executive Director
FROM: Walter D'Haeseleer, Director of Competitive Markets & Enforcement
RE: Revisions to Docket No. 990649B-TP - Investigation Into Pricing of Unbundled Network Elements - Sprint Track

In response to questions asked by the Commission at its October 14, 2002, Special Agenda Conference, staff will be filing revised pages for three sections of its Sprint recommendation in Docket No. 990649B-TP. The revisions are meant to clarify certain matters as well as to provide additional historical information. No staff recommendations are being changed. In addition, staff includes an errata to Issue 7(b). The revisions are outlined below.

- **CASE BACKGROUND** - Staff is adding more detail regarding the various phases of this docket. In addition, staff is providing information regarding Sprint's current tariff for UNE rates and the Interim Rate Stipulation.

- **ISSUE 7(g) - FILL FACTORS** - At the October 14, 2002, Special Agenda, the Commission asked several question regarding Verizon's application of fill factors. As such, staff is providing additional information for its fill factor issue for Sprint. Staff's recommendation in this issue has not changed. Information added to this issue is to clarify staff's recommendation.

- **ISSUE 7(s) - LOADINGS** - At the October 14, 2002, Special Agenda the Commission asked several questions regarding Verizon's application of its loading factors. Loading factors were also a critical issue in the BellSouth UNE docket and were discussed at the Verizon Special Agenda Conference. Staff is providing additional information on this topic. As with Issue 7(g), staff's original recommendation has not changed.

- **ISSUE 7(b) - DEPRECIATION** - The life of circuit equipment should be changed from 8 to 9 years. The life of poles should be changed from 35 years to 36 years. The correct values were used in the model runs, but were noted incorrectly in Table 7(b)-1, pg. 70.

Since fewer than 20 pages of the 325 page recommendation are being amended, staff is filing revised pages with the Clerk's Office on or about November 20, 2002. These revised pages should be inserted in the original recommendation which was filed on October 2, 2002. All revised pages will be marked "REVISED" and the revised material highlighted. Staff is replacing the Case Background, Issue 7(b), Issue 7(g), and Issue 7(s) in their entirety.

CC: Kay Flynn
Harold McLean
Kevin Bloom

CASE BACKGROUND

The federal Telecommunications Act of 1996 (Act) made sweeping changes to the regulation of telecommunications common carriers in this country. Of particular importance, it provided for the abolition nationwide of the incumbent local exchange carriers' monopolies over the provision of local exchange service. The Act envisioned three strategies for firms to enter the local exchange services market: (1) through resale of the incumbent's services; (2) via pure facilities-based offerings, thus only requiring a competitor to interconnect with the incumbent's network; and (3) through a hybrid involving the leasing of unbundled network elements (UNEs) of the incumbent's network facilities, typically in conjunction with network facilities owned by the entrant.

Although the Act generally spelled out the broad policy terms, the implementation details were left to the Federal Communications Commission (FCC). Specifically, the Act required that the FCC promulgate rules to implement the resale, interconnection, and UNE requirements within six months after passage of the Act. The rules subsequently established by the FCC provided detailed implementation requirements for pricing and provision of services. Of importance to this docket, the FCC's Local Competition Order, released August 8, 1996, included in its pricing rules Rule 51.507(f), which requires each state commission to establish rate zones for UNEs (the deaveraging rule). That rule states:

> State commissions shall establish different rates for elements in at least three defined geographic areas within the state to reflect geographic cost differences. (EXH 1, 47 CFR §51.507(f))

Since their establishment, these pricing rules have been the subject of a number of court decisions and FCC actions, which have directly impacted this issue and its resolution.

RECENT COURT DECISIONS

On May 13, 2002, the Supreme Court upheld the FCC's TELRIC pricing standard, stating that "[t]he FCC can require state commissions to set the rates charged by incumbents for leased elements on a forward-looking basis untied to the incumbent's investment." The Court rejected the incumbents' arguments that rates must be tied to past costs. The Court also held that the FCC can require incumbents to combine elements of their networks for competitors in certain circumstances. (Verizon Communications Inc., et al. v. Federal Communications Commission, et al., 152 L. Ed. 2d 701, 122 S. Ct. 1646, 2002 U.S. Lexis 3559 (May 13, 2002))

On May 24, 2002, the Court of Appeals for the D.C. Circuit remanded the Local Competition Order and the Line Sharing Order to the FCC for consideration in accordance with the Court's findings. United States Telecom Association v. FCC, 290 F.3d 415 (D.C. Circuit 2002) In doing so, the court found that the FCC's uniform national unbundling requirement failed to evaluate the competitive impairment in any particular market. Id. The court also found that the FCC's requirement to unbundle the high-frequency spectrum of the copper loop failed to consider the relevance of competition in broadband services from cable and satellite.

PETITION OF THE COMPETITIVE CARRIERS

On December 10, 1998, in Docket No. 981834-TP, the Florida Competitive Carriers Association (FCCA), the Telecommunications Resellers, Inc. (TRA), AT&T Communications of the Southern States, Inc. (AT&T), MCIMetro Access Transmission Services, LLC and WorldCom Technologies, Inc. (MCI WorldCom), the Competitive Telecommunications Association (Comptel), MGC Communications, Inc. (MGC), Intermedia Communications Inc. (Intermedia), Supra Telecommunications and Information Systems (Supra), Florida Digital Network, Inc. (FDN), and Northpoint Communications, Inc. (Northpoint) (collectively, "Competitive Carriers") filed their Petition of Competitive Carriers for Commission Action to Support Local Competition in BellSouth's Service Territory. Among other matters, the Competitive Carriers' Petition asked that this Commission set deaveraged unbundled network element (UNE) rates.

On May 26, 1999, this Commission issued Order No. PSC-99-1078-PCO-TP, granting in part and denying in part the Competitive Carriers' petition. Specifically, the Commission granted the request to open a generic UNE pricing docket for the three major incumbent local exchange providers, BellSouth Telecommunications, Inc. (BellSouth), Sprint-Florida, Incorporated (Sprint), and GTE Florida Incorporated (GTEFL). Accordingly, this docket was opened

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to address the deaveraged pricing of UNEs, as well as the pricing of UNE combinations and nonrecurring charges.

On November 2, 1999, the FCC released FCC Order 99-306 in CC Docket No. 96-45, which ordered the stay of the deaveraging rule to be lifted on May 1, 2000. The FCC had ordered the stay on May 7, 1999, after decisions by the U.S. Court of Appeals for the Eighth Circuit and the Supreme Court. The stay was ordered to allow the states to bring their rules into compliance. Order FCC 99-306 provided that "[b]y that date, states are required to establish different rates for interconnection and UNEs in at least three geographic areas pursuant to section 51.507(f) of the Commission's rules." (FCC 99-306, ¶ 120)

The original schedule established in Docket No. 990649-TP would not have resulted in permanent deaveraged UNE rates being in effect until after May 1, 2000. Accordingly, the parties were encouraged to develop and stipulate to interim deaveraged rates to avoid seeking a waiver of the deaveraging rule or conducting an accelerated proceeding. With staff's assistance the parties agreed to interim deaveraged rates, and on December 7, 1999, the parties filed a Joint Stipulation Regarding Interim Deaveraging (Interim Rate Stipulation). In the Interim Rate Stipulation, the parties agreed that "this Stipulation is not intended to set a precedent for the resolution of any issue related to permanent deaveraged rates; . . ." (Order No. PSC-00-0380-S-TP, p.3)

Sprint currently has, and had at the time of the Interim Rate Stipulation, deaveraged recurring loop rates tariffed in Section E19 of its intrastate Access Service Tariff.[1] The Interim Rate

[1]Staff notes that Sprint's tariffs are presumptively valid, and as such, the tariffed rates were not scrutinized. Further, the impetus for the tariffed rates were the negotiated rates arising out of the Sprint/MCImetro arbitration, Docket No. 961230-TP, Order No. PSC-98-0829-FOF-TP. Those negotiated rates were stipulated to by the parties and filed as an amendment to their interconnection agreement. The negotiated recurring rates replaced interim rates for analog 2-wire loops, Bands 1 through 6; local switching, Bands 1 through 6; signal transfer points port and switching; SS7 links; line information database (LIDB) query transport and database query; dedicated transport DS-1 and DS-3; tandem transport, common; directory assistance (DA)

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Stipulation states that these tariffed rates will be Sprint's interim deaveraged rates. For BellSouth and Verizon (then GTEFL), interim rates were determined by staff using the procedures set forth in ¶5 of the Interim Rate Stipulation.

An administrative hearing was held on July 17, 2000, on the Part One issues identified in Order No. PSC-00-2015-PCO-TP, issued June 8, 2000. Part Two issues, also identified in Order No. PSC-00-2015-PCO-TP, were heard in an administrative hearing on September 19-22, 2000. On August 18, 2000, Order No. PSC-00-1486-PCO-TP was issued granting Sprint's Motion to Bifurcate Proceedings, for a Continuance and Leave to Withdraw Cost Studies and Certain Testimony, as well as Verizon Florida Inc.'s (formerly GTEFL) Motion to Bifurcate and Suspend Proceedings.

By Order No. PSC-01-1592-PCO-TP, issued August 2, 2001, the controlling dates for Phase III were established. By Order No. PSC-01-2132-PCO-TP, issued October 29, 2001, the issues were established and the Docket was divided into 990649A-TP, in which filings directed towards the BellSouth track would be placed, and 990649B-TP, in which filings directed towards the Sprint-Verizon track would be placed. An administrative hearing was held on April 29-30, 2002.

POST-HEARING

Post-hearing briefs were filed on May 28, 2002. AT&T Communications of the Southern States, LLC (AT&T), WorldCom, Inc., on behalf of its Florida operating subsidiaries MCI WorldCom Communications, Inc., MCImetro Access Transmission Services, LLC, and Intermedia Communications, Inc. (collectively WorldCom), and Florida Digital Network, Inc. (FDN) filed a joint brief. For purposes of the Sprint phase of this docket, AT&T, WorldCom and FDN are collectively known as the "ALEC Coalition". On May 29, 2002, KMC TeleCom III, LLC, filed a letter adopting the position of the ALEC Coalition. The Florida Cable Telecommunications Association (FCTA) did not file a post-hearing brief but expressed a desire to

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database query service, toll and local assistance service; DA operator service; and 911 tandem port and lines service per DS-0 equivalent port.

remain a party.

RULINGS ON MOTIONS

On June 19, 2002, Sprint-Florida Inc. (Sprint) filed a Motion to Strike Portions of FDN's Post-Hearing Brief. In support of its Motion, Sprint alleges that FDN's use of facts from other proceedings to support its position are information outside the record, which does not qualify as competent substantial evidence upon which a decision may be based. On June 28, 2002, FDN filed its response, stating that Sprint's motion was procedurally improper. In Order No. PSC-02-1128-PCO-TP, issued August 19, 2002, the Commission denied Sprint's Motion, ruling that, as in past dockets, when a motion to strike portions of a post-hearing brief is filed, the Commission has chosen to deny the motion and to ignore facts outside the record.

ISSUE 7(b): What are the appropriate assumptions and inputs for the following items to be used in the forward-looking recurring UNE cost studies?

(b) depreciation;

RECOMMENDATION: The appropriate lives and net salvage values to be used in the development of Sprint's forward-looking recurring unbundled network element (UNE) cost studies are those proposed by Sprint as shown on Table 7(b)-1. **(P. Lee)**

POSITION OF THE PARTIES

SPRINT: The appropriate assumptions and inputs that should be used in the development of forward-looking economic recurring costs are those set forth in the cost studies filed by Sprint-Florida on November 7, 2001, and as explained in the prefiled testimony of Sprint-Florida witnesses Michael Hunsucker, Kent Dickerson, Brian Staihr, Talmage Cox, Jimmy Davis and Terry Talken (Mr. Talken's testimony to be adopted by Michael Fuller).

FDN: Stipulate to Sprint's position.

KMC: Stipulate to Sprint's position.

STAFF ANALYSIS:

PARTIES' ARGUMENTS

Sprint witness Dickerson testifies that the Federal Communications Commission's (FCC) Total Element Long Run Incremental Cost (TELRIC) pricing requirement for unbundled network elements requires the depreciation component of TELRIC be based on forward-looking economic lives of the underlying UNE asset categories. (FCC First Report and Order, 96-98 ¶703; TR 69). Accordingly, witness Dickerson states that Sprint has developed forward-looking economic lives for all UNE asset categories and normally utilizes these lives in its UNE cost studies. In this filing, however, witness Dickerson explains that Sprint has made what it hopes the Commission will find to be an appropriate and practical concession, and has used the depreciation lives approved for BellSouth in this proceeding. (See, Order No. PSC-01-1181-FOF-TP, issued May 25, 2001, and Order No. PSC-0102051-FOF-TP, issued

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October 18, 2001) (TR 69-70) Those inputs are shown in Table 7(b)-1.

TABLE 7(b)-1: Live and Salvage Inputs		
Account	**Life (Yrs.)**	**Salvage (%)**
Motor Vehicles	8	16
Special Purpose Vehicles	7	0
Garage Work Equipment.	12	0
Other Work Equipment	15	0
Buildings	45	0
Furniture	15	10
Office Support Equipment	11.5	5
Computers	4.5	2
Digital Switching	13	0
Operator Systems	10	0
Radio	9	(5)
Circuit Equipment	~~8~~ 9	0
Station Apparatus	6	0
Other Terminal Equipment	6	5
Poles	~~35~~ 36	(55)
Aerial Cable Metallic	18	(14)
Aerial Cable Fiber	20	(14)
Underground Cable Metallic	23	(8)
Underground Cable Fiber	20	(8)
Buried Cable Metallic	18	(7)
Buried Cable Fiber	20	(7)
Submarine Cable Metallic	18	(5)
Submarine Cable Fiber	20	(5)
Intrabuilding Cable Copper	20	(10)
Intrabuilding Cable Fiber	20	(10)
Conduit	55	(10)

Source: Order No. PSC-01-1181-TP, pp. 172-174; PSC-01-2051-FOF-TP, p.30.

ANALYSIS

As noted in the post hearing positions of the parties participating in the Sprint proceeding, all have agreed with Sprint to use the depreciation inputs as ordered by Order No. PSC-01-2251-FOF-TP for BellSouth. Sprint states:

> By adopting the depreciation rates approved for BellSouth, Sprint-Florida recognizes that the economic lives and salvage values of its forward-looking investment are similar to that of BellSouth. The economic lives of Sprint-Florida and BellSouth's network investments are both shaped by the common effect of technology changes, market competition, and physical wear and tear thus resulting in common depreciation rates. (EXH 10, p. 350)

Staff agrees with Sprint and the parties that it is reasonable to assume that similar plant exposed to similar factors of obsolescence such as technology, market competition, and physical wear and tear would exhibit similar depreciation lives and salvage values.

CONCLUSION

In conclusion, the appropriate lives and net salvage values to be used in the development of Sprint's forward-looking recurring unbundled network element (UNE) cost studies are those proposed by Sprint as shown on Table 7(b)-1.

ISSUE 7(g): What are the appropriate assumptions and inputs for the following items to be used in the forward-looking recurring UNE cost studies?

(g) fill factors;

RECOMMENDATION: The appropriate assumptions and inputs for fill factors in the forward-looking UNE cost studies should be those fills filed by Sprint. **(Cater)**

POSITION OF THE PARTIES

SPRINT: Sprint-Florida's feeder cable fill factors were developed based on Florida wire center-specific data for feeder cable fills, and reflect Sprint's real-life experience.

FDN: Sprint's fill factors are generally too low and do not reflect a forward-looking, least-cost network built for a reasonable projection of actual demand. The Commission should find the fill factors to be no lower than 85%. Sprint's assumptions as to residential and business lines far exceed current levels of demand.

KMC: KMC concurs with the position and analysis of Florida Digital Network (FDN).

STAFF ANALYSIS:

SPRINT'S POSITION ON FILL FACTORS

In his direct testimony, Sprint witness Dickerson describes fill factors as ". . .the percentage of available network capacity utilized." He continues his testimony by describing the three factors that contribute to utilization:

- Anticipation of future needs is that factor whereby telecommunications companies determine their future plant needs considering the fact that it is cheaper to install facilities for future demand than to install facilities as they are needed,

- Capacity Acquired in "Blocks" is the element that capacity is only available in certain sizes; therefore, unused capacity will exist, and

- <u>Construction Time</u> is the amount of time needed to plan and construct facilities when replacing or expanding capacity. (TR 74)

Witness Dickerson continues that in order to efficiently deploy cable facilities, one must look at the cost-benefit relationship of unused capacity and the cost of installation. If there is not enough capacity, the company will not be able to meet expected installation intervals. Sprint's current cable fill allows for most customers to receive a new service installation within three days. In order to achieve parity, the same level of cable fill is needed to meet the expectations of the ALECs. (TR 75)

Concerning the FCC Order[2] and fill factors, Sprint witness Cox provides the following quote from the FCC Order:

> "Per-unit cost shall be derived from total costs using reasonably accurate "fill factors" (estimates of the proportion of a facility that will be "filled" with network usage); that is, the per-unit costs associated with the element must be dérived by dividing the total cost associated with the element by a reasonable projection of the actual total usage of the element." (TR 167-168)

In an interrogatory response, Sprint described fill and described the kinds of fill by saying that it assumes that each household will have two lines; therefore, distribution fill is set at 100 percent. Fiber cable fill is set at 75 percent. (EXH 11, p. 1)

In the same interrogatory response, Sprint defines the following terms in regards to fill:

<u>Actual fill</u> is defined as "the total feeder pairs in service divided by total feeder pairs available in each wire center." (EXH

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[2] *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996,* First Report and Order, CC Docket No. 96-98 Order No. FCC 96-325 (August 8, 1996), ¶ 682.

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11, p. 1) In order to determine feeder cable size one must divide the "total pairs served by the feeder fill input factor for the applicable density zone. The result of this calculation is then mapped to the cable size that meets or exceeds the cable pairs required."(EXH 11, p. 2)

Effective fill "is a term Sprint uses to represent the pairs served divided by the total pairs available." (EXH 11, p. 2)

SLCM fill "is the input into the model that results in cable utilization that approximates the actual fill." (EXH 11, p. 2) If the actual fill was used in the model, the effective fill that would result would be lower than the actual fill. In determining SLCM fill, "the input is increased so that the resulting cable utilization approximates the actual fill." (EXH 11, p. 2)

FEEDER FILL

Describing the fill factors used in this filing, witness Dickerson states that feeder fill factors are based on Florida wire center-specific data, and they are adjusted to allow for the fact that the model must select cable sizes that result in additional unused cable pairs. (TR 75)

In Loop Workpaper 11, Sprint shows its company-wide actual feeder fill to be 50.67 percent, its effective fill to be 49.99 percent, and its SLCM fill to be 59.17 percent. (EXH 2, Loop Workpaper 11, p. 2) In his deposition, witness Dickerson states that this workpaper only showed the fill on Sprint's copper feeder plant and concedes that the feeder fills in the model are Sprint's actual fills. The witness also states that he needs fills of these levels in order to make installations in three days or less. (EXH 14, pp. 13-14, 16)

Witness Dickerson, by deposition, provides the following explanation of the differences between actual, effective, and SLCM fill used for copper feeder cable:

> The actual fill is drawn from our actual cable pair assignment records differentiated between 400 pair and

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> above copper cables defining the feeder cable. So with that in mind, we went and looked at 400 pair and larger cables in Florida based on our actual cable pair assignment records. We identified wire centers that best fit the nine density zones in the model, and therefore, we looked -- for example, Wire Center 9 -- or excuse me, Density Zone 9. We had wire centers that were mapped to that density zone. We looked at cable pairs assignment for those wire centers and came up with our actual fill in the network for those size cables for those wire centers was 42 percent.
>
> We then turned around and through an iterative process arrived at an input of 50 percent, 50.7, and that produces an effective fill of 47.72. Now, that same work paper shows in the aggregate for the whole run, the whole state, the whole run and the average input that our average fill for feeder cables in Florida is 50.67 percent. The effective fill in the model comes out 50 percent, and the input that will produce that effective fill as an end result in the model is 59.17. (EXH 14, pp. 12-13)

Sprint witness Dickerson states that the fiber feeder fill is set at 75 percent in the model. (EXH 14, p. 81) The reason that the fiber feeder fill is higher is due to the fact that ". . .fiber fill is determined by [the] number of individual systems that need to be served on it [fiber feeder cable] and [the] number of individual high-capacity loop circuits or interoffice circuits that need to be served off of it." (EXH 14, p. 81) He explains that the appropriate cable size for fiber feeder plant is determined by taking the requirement of pairs needed and dividing it by the .75 fill factor, and then modeling the closest cable size that meets the required demand. (EXH 14, p. 66)

The witness continues by explaining the reason for the difference in fills between copper and fiber feeder. The witness explains that in order to add additional customers to a copper feeder system you must place additional copper, while with fiber you can "add terminals and create greater bandwidth on the same

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number of lit strands." Due to this difference between copper and fiber, one must place additional copper cable to avoid additional construction costs every time an additional copper pair is needed. (EXH 14 pp. 81-82) Additionally, the witness points out that copper feeder would be deployed for customer locations less than 12,000 feet from the central office, while fiber feeder would be deployed for customer locations greater than 12,000 feet from the central office. (EXH 14, p. 82)

DISTRIBUTION FILL

In his direct testimony, witness Dickerson explains that the distribution fill was set at 100 percent and the model is set for two distribution pairs per household. Two distribution pairs is the forward-looking, least-cost method to meet demand for multiple lines, and avoids inefficient construction in the future. (TR 75-76)

In his deposition, witness Dickerson explained the distribution fill and the reasons that it is modeled for two pairs per household. Where there are more pairs in service than households, you will have a fill greater than 50 percent. Their reasoning behind modeling two pairs per household is the difficulty in predicting how many households would want a second line. Also, the Sprint witness notes that 60 percent of the cost of cable construction is labor, so most of the additional cost in initially laying additional plant is the small increase in the cost of the cable. He continues by stating that people do not like it when Sprint comes through neighborhoods to place additional cable. (EXH 14, pp. 13-14)

While distribution cable is placed at a rate of two pairs per residential unit, Sprint witness Dickerson concedes that Sprint's actual utilization factor for distribution plant to residential units is between the low thirties and high forties. (EXH 14, p. 73)

TRANSPORT FILL

Per the transport cost model, the utilization factors of the transport rings range from about 15 percent to about 95 percent.

(EXH 2, Transport Module, pp. 6-71). Based on the testimony of witness Cox concerning the cut-over of transport plant, these utilization factors appear to be reasonable. Concerning whether or not Sprint will have theoretically high fill factors, witness Cox responds that "[w]ith certain sections of Sprint-Florida being rural it does not have sufficient traffic to maintain a high utilization factor. This is in large part due to the nature of transmission capacity." He continues by providing an example of migrating from an OC-3 system to an OC-12 system, where at cutover, one would have a utilization rate of less than 25 percent. (TR 169)

THEORETICAL UTILIZATION FACTORS

In various interrogatory responses, Sprint indicates that the lead time for adding capacity ranges from 6 months for transport electronics and switching to 12 months for cable and digital loop carriers. (EXH 10 p. 90) Depending on the type of equipment and growth rate, capacity is expanded when the current network reached 80 to 90 percent capacity. (EXH 10, p. 91)

FLORIDA DIGITAL NETWORK'S POSITION

FDN advocates in its brief (and KMC concurs) use of a fill rate of 85 percent or higher for Sprint. (FDN BR at 17). FDN did not provide any testimony concerning this issue, but in its brief quoted the Florida USF Order (Order No. PSC-99-0068-FOF-TP; Docket No. 980696-TP) in which the Commission ordered that 1.5 pairs per residential unit be assumed. (FDN BR at 19, quoting Order No. PSC-99-0068-FOF-TP). FDN also believes that "Sprint is not basing its fill factors on a 'reasonable projection' of the usage of the element in the future 'most efficient' network, but instead is basing it on the actual current usage of its embedded network." (FDN BR at 18)

In the BellSouth Telecommunications, Inc. (BellSouth) track of this docket (Docket No. 990649A-TP), it was determined that BellSouth's feeder cable inputs resulting in an effective fill of approximately 74 percent were reasonable. The Commission also found that BellSouth's distribution fill factors, resulting in utilizations of 47 percent, to be reasonable. (Order No. PSC-01-1181-FOF-TP, p. 202)

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Concerning distribution cable, the Commission agreed with BellSouth's proposal of "2 pairs per household" for residential customers and using the "actual number of lines" for businesses. (Order No. PSC-01-1181-FOF-TP, p. 202)

When asked to explain the difference in BellSouth's approved feeder fill of 74 percent and Sprint's which is around 50 percent, Sprint witness Dickerson replies that he believes that the trend is for rural areas to have lower fill than urban areas due to slower growth. He also said that BellSouth's customers are in more urban areas than Sprint's and would therefore probably have more growth. He continued by saying that he did not think that Sprint could manage its network, for both ALEC and retail customers, with a three day turn around, with a fill of 74 percent over the life of the cable. (EXH 14, pp. 14-16)

COMPARISON TO VERIZON'S RECOMMENDATION

During the October 14, 2002, special agenda conference, a Commissioner expressed concerns whether staff's recommended fill factors for Verizon were consistent with those recommended for Sprint. The Commissioner's primary concern was over the difference in distribution fills between these two companies.

Verizon's cost model does not use fill factors per se, but uses cable sizing factors. Feeder cable is designed to be reinforced, so it lays the feeder cable required at the mid-point of a four-year planning horizon. It utilizes an engineering factor of 1.011 to determine what size cables are needed.(Verizon Rec. p. 115) The model then places plant to meet the demand for the cable sizes needed, based on the sizes that are available. (Verizon Rec. p. 129) As an example, if the model determined that an 86 pair cable was needed on a given feeder route, the model would multiply 86 by the engineering factor of 1.011 to determine that 86.9 cable pairs were needed. It would then place a 100 pair cable on that route since that is the next size cable that would be available. The effective fill on that fiber route would be 86 percent.

In sizing its distribution cable, Verizon uses an approach similar to what it uses to size feeder cable. The primary

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difference is that distribution plant is built to meet ultimate demand. In order to meet ultimate demand, the model places 2.16 lines per lot. (Verizon Rec. pp. 119-120) The 2.16 lines per lot is a weighted average of the lines per lot placed in each of the density zones, adjusted for the removal of secondary lines. (Confidential EXH 52, Supporting Documents, Run Time Options, Distribution, FLdfactor)

In addition, Verizon's ICM Model uses an administrative fill input. Verizon originally proposed an administrative fill input of .98, which means if the cable size that would meet the needs of a route is more than 98 percent utilized, the model would place the next largest cable size. (Verizon Rec. p. 126) Staff recommended that there is adequate room for growth in the cable sizing factors; therefore, the administrative fill input was set at 1.0. (Verizon Rec. p. 130)

Like Verizon, Sprint also uses cable sizing factors. For copper feeder cable, the SLCM fill rate is utilized which provides the model an effective fill that replicates what is actually in Sprint's network. (EXH 11, pp. 1-2; EXH 14, pp. 12-13) For fiber feeder, cable size is determined by taking the requirement of pairs needed and dividing it by the .75 fill factor, and then modeling the closest cable size that meets the required demand. (EXH 14, p. 66)

Sprint also models distribution cable for ultimate demand or 100 percent fill. The model does this by placing 2 cable pairs per household, and then modeling the appropriate cable size to meet this demand. (EXH 2, KWD-3, Loop Module, pp. 27-28)

Staff notes that while Sprint's proposed method of sizing cables is different than what the Commission approved for Verizon, Sprint's approach is similar to that proposed and subsequently approved by this Commission for BellSouth. BellSouth models feeder cable by using a "cable sizing factor and standard size cables to determine the required cables to be placed." The BellSouth model provided an effective feeder cable fill of 74 percent. (Order No. PSC-01-1181-FOF-TP, p. 195) The cable sizing factor for a particular route is based on:

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> [T]he density zone the route falls within, a table lookup is made to obtain the sizing factor. The working pairs on a route are then divided by the factor to arrive at the pair requirements. The model then picks the next largest cable of sufficient size to serve that route.
>
> . . .the model divides working pairs by the available fill to determine the effective fill. (Order No. PSC-01-1181-FOF-TP, p. 197)

As an example, if you take an 86 pair cable and divide it by a fill factor of .825, the BellSouth model will show a need for a 104.24 or 105 pair cable. The model will then place a 200 pair cable to meet this need for a 105 pair cable.

CONCLUSION

Staff agrees with Sprint that when considering the placing of plant and the resulting fill, one must assess the cost/benefit relationship. Staff agrees that a company must consider future needs, the availability of capacity only in certain sizes, and the lead time for adding new facilities when it determines how to lay plant.

Staff agrees with the distribution fill being set at 100 percent, with two lines per household. This is more effective than adding an additional line when a household requests a second line.

~~Concerning~~ FDN's position is that presumably all fill factors should be at least 85 percent. While FDN did argue this position in its brief, there is nothing in the record to support this position, other than that Sprint considers adding capacity to its network when 85 percent actual fill is attained. For its argument for 1.5 pairs per household for distribution plant, FDN relies on Order No. PSC-99-0068-FOF-TP, in Docket No. 980696-TP, *In re: Determination of the cost of basic local telecommunications service, pursuant to Section 364.025, Florida Statutes.* Staff points out that this order was issued on January 7, 1999, and the purpose for that proceeding was to develop the forward-looking economic cost of basic service in Florida, which is defined as flat

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rate residential and single-line flat rate business. (Order No. PSC-99-0068-FOF-TP, p. 143) Staff also notes that this Commission approved the modeling of 2 pairs per household for BellSouth and a weighted average of 2.16 pairs per household for Verizon.

For feeder cable, FDN argues that Sprint's fiber fill factor of 75 percent is based on its embedded network, for which it does not provide any justification. (FDN BR at 21) FDN continues by pointing out that while offering additional services that will increase its utilization rate for fiber, "Sprint cannot legitimately contend that its current fiber utilization rate will remain constant in the forward-looking network." Finally, FDN points out, but does not cite a specific place on the record, that there is double counting of the costs of spare fiber in the loop and transport cost studies and in the dark fiber study. As an alternative, FDN proposes a fiber cable utilization rate on a forward-looking basis of at least 90 percent, but does not provide any justification for its proposed utilization factor. (FDN BR at 22)

Due to these considerations and the fact that Sprint serves an area that is more rural than BellSouth, staff believes that BellSouth's ordered feeder fill of 74 percent should serve as the maximum rate for Sprint's fill factors. Understanding that Sprint's customers are more rural, coupled with the lack of record evidence proposing another fill rate, staff believes that Sprint's feeder fill in the model should be set at its SLCM fill of 59.17 percent.

Therefore, staff recommends that the appropriate assumptions and inputs for fill factors in the forward-looking UNE cost studies should be the fills filed by Sprint.

ISSUE 7(s): What are the appropriate assumptions and inputs for the following items to be used in the forward-looking recurring UNE cost studies?

(s) loadings;

RECOMMENDATION: Staff recommends that Sprint's loading factors be accepted for purposes of establishing recurring UNE rates in this proceeding, subject to staff's adjustments in other issues. **(P. Lee)**

POSITION OF THE PARTIES

SPRINT: In addition to the cable material costs, there are engineering, placing and splicing labor that are added on a "per foot" basis. Overheads, such as supervisory labor for the engineers or outside plant construction workers, are added as a "per foot" amount because the activities do not vary by cable size. These "loadings" are based upon the most current, Florida-specific, geographic-specific information available. There are also "loadings" applicable to structure costs that are similar to the material costs.

FDN: No position at this time.

KMC: No position.

STAFF ANALYSIS: Sprint is the only party proffering testimony regarding loading factors. Cost model documentation, supporting workpapers, and discovery responses form the basis for staff's recommendation.

PARTIES' ARGUMENTS

Sprint witness Dickerson explains that loading factors for taxes, engineering, placement, splicing, exempt material, and overhead costs are added to the per foot cost of cable. (TR 77; EXH 2, KWD-2, Loop Workpaper 1, pp. 4-7) In this way, the per foot cost of cable is converted into a fully engineered, furnished, and installed (EF&I) cost.

Taxes

The sales tax represents the tax paid on the purchase of materials and exempt materials. It represents all state and local taxes applied to the purchase. (EXH 2, KWD-2, Volume 1, III.B., Loop Module, p. 7)

Engineering, Placement, Exempt and Other Material, and Overheads

Witness Dickerson explains that cable loading factors are based on an analysis of Sprint's cable installations in Florida for 1998-2000 from the Project Administration and Costing System (PACS). (TR 77) The costs include exempt and other material, such as splice enclosures and cable mounting hardware, overhead and cable placement, splicing and engineering costs. (TR 77; EXH 10, pp. 330, 340-342, 348)

The cost of engineering includes such things as route layout, obtaining permits, securing rights-of-way, and joint use coordination. (EXH 2, KWD-2, Volume 1, III.B., Loop Module, p. 8) According to the cost study methodology, Sprint develops cable engineering cost on a per foot basis. The cost is based on actual Sprint loaded labor rates for Outside Plant Engineering and an estimate of engineering hours per mile of cable placed, by type of placement. The average per foot cost of engineering cable is developed from Sprint's PACS data by dividing the 1998-2000 expenses incurred with engineering each type of copper and fiber cable (aerial, buried, or underground) by the total feet placed of each type of copper and fiber cable. (EXH 10, pp. 231, 233, 347)

Placement costs account for the placing of the cable on a pole line, in a trench, or in a conduit. (EXH 2, KWD-2, Volume 1, Loop Module, III.B., Section 4.2, p. 8) The costs are developed on a per foot basis and are based on the relationship of total expenditures in PACS related to placing the given type of cable divided by the total number of feet of that cable placed. (EXH 10, pp. 343-344)

Sprint notes that its engineering and placement costs can vary by size, location, and type of cable. Sprint explains:

> Logic stipulates that engineering costs will be greater

> for larger cables compared to smaller cables. However, when engineers design a route, they will design the entire route, not one piece of cable. Therefore, the inputs to the cost study reflect that routes will be engineered. Sprint-Florida's engineering and placing inputs for a given type of cable do not vary by size of cable. Engineering inputs do not vary by location, but vary by aerial, buried, and underground cable types. Likewise, placing inputs do not vary by cable size, but vary by aerial, buried and underground plant type. Placement inputs for buried cable will vary by density zone as the result of changes in the mix of placing activities and shown in the inputs to SLCM. (EXH 10, p. 330)

Regarding exempt materials, Sprint explains that these materials are comprised of items of small value not warranting separate tracking within Sprint's Continuing Property Records system. (EXH 10, p. 340; EXH 14, p. 25) Examples of exempt materials include aerial cable lashing wire and clamps, gravel used in the bottom of buried cable pedestals/closures, pole steps, bolts, clamps, and markers. (EXH 2, KWD-2, Volume 1, III.B., Loop Module, Section 4, p. 10; EXH 10, p. 340)

Sprint witness Dickerson explains that the loading factors for exempt materials are based on a relationship of exempt material to material costs using PACS data. (EXH 10, pp. 231, 341-342) In this way, the loading factors vary by cable size. Witness Dickerson notes that this ". . . allows there to be a logical differentiation that larger cables will incur larger levels of exempt material usage." (EXH 14, pp. 23-24)

In addition to the direct labor activities, an overhead loading factor is added to the material cost. Sprint notes that overheads account for the indirect support costs associated with activities that are not directly related to engineering or construction but are necessary components of construction. (EXH 2, KWD-2, Volume 1, III.B., Loop Module, Section 4, p. 6 of 39; EXH 10, p. 338) The model documentation explains that overheads are added as a per-foot cost because the activities do not vary by cable size. (EXH 2, KWD-2, Volume 1, III.B., Loop Module, Section 4, p. 6 of 39; EXH 2, KWD-2, Volume III, Loop Workpaper 1, pp. 4-7)

Splicing Costs

Sprint explains that "[s]plicing cost accounts for joining two or more cables together by connecting the conductors." (EXH 2, KWD-2, Volume 1, III.B., Loop Module, p. 7) The SLCM documentation explains that Sprint develops splicing costs on a per pair foot basis based on the total number of pairs placed and the total number of feet placed obtained from 1998-2000 cable placement records. The total expenses incurred to splice cable is then divided by the total number of pair feet placed to determine a cost per cable foot of splicing. (EXH 2, KWD-2, Volume 1, III.B., Loop Module, p. 7) The cost is multiplied by the number of cable pairs for the splicing cost for the particular size cable. In this way, splicing costs vary by size of cable placed. (EXH 14, p. 26) Sprint's splicing rates per pair foot of cable for each type of cable are shown below in Table 7(s)-1:

TABLE 7(s)-1: Splicing Costs

Account	Splicing Cost Per Pair Foot
Copper	
Aerial	$0.0056
Underground	$0.0047
Buried	$0.0028
Fiber	
Aerial	$0.0044
Underground	$0.0022
Buried	$0.0058

Source: EXH 2, KWD-2, Volume III, Loop Workpaper 1, pp. 4, 7.

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The development of Sprint's loading factors is shown in Loop Workpaper 1. (EXH 2, KWD-2, Volume III, Loop Workpaper 1, pp. 4-7) Five factors are added to provide an EF&I cost: exempt and other material, placement, splicing, engineering, and overheads. (Dickerson TR 77; EXH 2, KWD-2, Loop Workpaper 1, pp. 4-7) Additionally, sales tax is added. (EXH 2, KWD-2, Volume 1, III.B., Loop Module, Section 4, p. 6) The total cost represents an EF&I cost.

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Witness Dickerson testifies that loading factors for exempt and other material, placement, and engineering costs are developed on a cost per foot basis from Sprint's 1998-2000 PACS data. (TR 77) The costs for each of these items are based on the ratio of actual 1998-2000 expenses incurred for copper and fiber cable and specific plant type (aerial, buried, and underground cable) to the total feet of each type of cable placed. (EXH 10, p. 347) In this way, these loading costs are the same cost per cable foot regardless of the size of the cable (i.e., not linear). However, the costs vary depending on the particular cable type whether copper or fiber and also whether the cable is aerial, buried, or underground.

Sprint notes that its engineering and placement costs can vary by size, location, and type of cable. Sprint espouses that engineering costs will be greater for larger cables compared to smaller cables. However, entire cable routes are engineered rather than one piece of cable and the cost study inputs are reflective of this. Sprint's engineering and placement inputs for a given type of cable do not vary by size of cable. Engineering inputs do not vary by location, but vary by aerial, buried, and underground cable types. Likewise, placement inputs do not vary by cable size, but vary by aerial, buried and underground plant type. Placement inputs for buried cable are noted to vary by density zone as the result of changes in the mix of placing activities and shown in the inputs to SLCM. (EXH 10, pp. 330, 348)

In addition to the direct labor activities, an overhead loading factor is added to the material cost. The factor accounts for indirect support costs associated with activities that are not directly related to engineering or construction but are necessary components of construction. (EXH 2, KWD-2, Volume 1, III.B., Loop Module, Section 4, p. 8) The model documentation explains that overheads are added as a per-foot amount because the activities do not vary by cable size. (EXH 2, KWD-2, Volume 1, III.B., Loop Module, Section 4, pp. 7-9)

Sprint's development of the cable loading factors (engineering, placement, minor materials, and overhead) results in a constant dollar factor that is added to the per foot material cost. (EXH 2, KWD-2, Volume III, Loop Workpaper 1, pp. 4-7). The

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percent of total EF&I costs associated with these loading factors increases as the size of the cable decreases. For example, 23 percent of the total EF&I costs for a 4200-pair copper underground cable is associated with loading factors. The percentage increases to about 91 percent for a 100-pair cable and about 95 percent for a 50-pair cable. (EXH 2, KWD-2, Volume III, Loop Workpaper 1, p. 5).

Sprint's splicing costs are developed on a per pair foot basis and also rely on PACS data. Total splicing costs obtained from PACS are divided by the total pair feet of cable placed. The per pair foot cost is multiplied by the number of cable pairs for the splicing cost for the particular size cable. In this way, splicing costs vary by size of cable placed; the larger the cable size, the ~~less~~ greater the splicing ~~factor or ratio is to the total~~ costs. (EXH 14, p. 26)

Staff believes Order No. PSC-99-0068-FOF-TP (Universal Service Order), issued January 7, 1999, in Docket No. 980696-TP regarding the determination of the cost of basic local telecommunications service and Order No. PSC-01-1181-FOF-TP (BellSouth Phase II Order), issued May 25, 2001, in Docket No. 990649A-TP, can offer some guidance in analyzing Sprint's cable cost inputs. Staff does not believe the inputs adopted in either referenced order are appropriate to use in this instant proceeding but should only serve as a reference source in staff's analysis. The Universal Service proceeding related to a legislative mandate and the inputs are more than two years old. Regardless, the adopted inputs were Sprint-specific and can serve as a check for reasonableness of Sprint's proposed inputs in the instant docket. Sprint's total EF&I costs for aerial and underground fiber cable are generally lower than those adopted by the Universal Service Order. Buried fiber cables reflect a slight increase in larger cables to over a 54 percent increase in the smallest sized cables. On the other hand, Sprint's EF&I total costs for copper cables indicate a more substantial increase over those adopted in the Universal Service Order. Again, the increase is found with the smallest sized cables. The greatest increases in total EF&I costs appear in underground copper cables. For example, Sprint's EF&I costs for a 500-pair underground copper cable are almost 300 percent more than the similar cost adopted in the Universal Service Order.

Sprint explains that larger sized cables are found in urban areas; smaller sized cables are found in more rural areas. (EXH 14, p. 28) Staff believes it is then logical that the total EF&I costs will be greater in smaller sized cables. A closer look at the make up of Sprint's loadings can indicate the major contributors. Table 7(s)-2 shows a percentage breakdown of the components of the exempt and other material, engineering, placement, and overheads factor for each type of cable.

TABLE 7(s)-2: Eng., Plcg., EM,, OH Components				
	Exempt &			
	(%)	(%)	(%)	(%)
Copper				
Aerial	12	20	31	37
Buried	22	33	NA	46
Underground	12	11	45	31
Fiber				
Aerial	9	15	40	36
Buried	19	33		48
Underground	8	10	47	35

Source: EXH 2, KWD-2, Volume III, Loop Workpaper 1, pp. 4-7.

As indicated above, the major portion of the exempt and other material, engineering, placement, and overhead factors are attributed to placement and overheads. It is intuitive that placement costs would comprise a significant portion of the loading factors. However, staff is concerned with overheads contributing 31 percent to 46 percent of the total loading factor. Sprint represents that overheads are indirect support costs associated with activities that are not directly related to engineering or construction but are necessary components of construction. Staff is puzzled and surprised by the portion of Sprint's loading factors comprised of overhead costs; however, we are unable to discern the cause.

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The Universal Service Order indicates that Sprint's total cable costs submitted in that proceeding included tax, labor overhead for placing and splicing, and engineering. Staff is unable to compare the factors used in the instant proceeding with those used in the Universal Service proceeding, as Sprint did not provide its loading factors in that proceeding. However, the Universal Service Order notes:

> Our analysis demonstrates that actual cable material cost as a percent of total cost for 26 gauge buried copper cable ranged from less than 9 percent for 12 pairs, to almost 64 percent for 4200 pair cable. As the proportion of actual material cost increased, then, of course, the proportion of loading factors decreases. This implies that some economies of scale for non-material costs exist as the size of cable increases. (See Order No. PSC-99-0068-FOF-TP at p. 154)

In this instant proceeding, Sprint's loading factors result in a similar result. Sprint's actual cable material cost as a percent of total cost for 26-gauge buried copper cable ranges from about 6 percent for 12 pairs, to 56 percent for a 4200-pair cable. (EXH 2, KWD-2, Volume III, Loop Workpaper 1, p. 6) Thus, some economies of scale for non-material costs exist as the size of cable increases. Additionally, splicing accounts for about 1 percent of the total EF&I costs for 12 pairs to about 33 percent for 4200 pair. Engineering, placement, exempt and other material, and overheads range from 92 percent of the total EF&I costs for a 12-pair cable to about 7 percent for a 4200-pair cable.

For comparison purposes only, BellSouth's material costs adopted by Order No. PSC-01-1181-FOF-TP for 26-gauge buried copper cable accounted for 14.6 percent of the total EF&I costs; loading factors for placement, including engineering and exempt materials, accounted for about 85 percent of total EF&I costs. (See Order No. PSC-01-1181-FOF-TP at pp. 216-217) BellSouth's loading factors were linear in that the percent of total EF&I cost attributed to other materials and engineering were the same regardless of cable size. The Commission found that linear loading factors will distort the cost relationships between rural and urban areas. (See

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Order No. PSC-01-1181-FOF-TP at p. 305) As such, the Commission ordered BellSouth to file revised cost studies which were to eliminate linear loadings.

Staff has reviewed Sprint's loading factors. While staff is puzzled by the portion of Sprint's loading factors attributed to overhead costs, Sprint's overall total EF&I costs appear reasonable when compared to those adopted in the Universal Service Order and the Phase II BellSouth Order. Moreover, Sprint's factors do not cause significant distortions in the deaveraged cost results because the loading factors are not linear. Certain of BellSouth's and Verizon's loading factors were multipliers applied to material costs. On the other hand, Sprint's loadings are a constant dollar amount added to the per foot material cost of the cable. The BellSouth and Verizon models result in some loading costs that increase linearly with the size of the cable. Sprint's loadings do not. The percent of the loadings to the cable material cost increases as the size of the cable decreases. Larger sized cables are generally found in urban areas, smaller sized cables in more rural areas. Logically, the total percentage of loadings to total installed cost will be greater in smaller sized cables. In Sprint's case, the loadings represent a cost per foot for each type of cable rather than a cost that increases by cable size.

Sprint's splicing costs are developed on a per pair foot basis by dividing splicing expenses by the total number of pair feet placed. The cost is multiplied by the number of cable pairs to arrive at splicing cost for a given size of cable. For example, the splicing cost for aerial copper cable is $0.0056 per pair foot of cable. For a 100 pair cable then, the splicing cost is 100 pairs * $0.0056 per pair foot cost to yield $0.56 splicing cost per foot. In this way, splicing costs vary by the size of cable placed; the larger the cable size, the greater the splicing costs.

CONCLUSION

Staff recommends that Sprint's loading factors be accepted for purposes of establishing recurring UNE rates in this proceeding, subject to staff's adjustments in other issues. Sprint's loading

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factors appear to be reasonable. Moreover, Sprint's application of its loading factors appear to be consistent with the Commission's preferred non-linear approach.