4. General Problems with Approach and Inputs

Embedded Data

Q. You say the Company has failed to make an adequate transition from an embedded approach to a true long run approach to costing. Why do you say this?

A. The Company has not implemented a true *long run* approach--at least as this term is used by economists--because the Company takes many aspects of its existing network design as a given, without adequately adjusting the data to reflect the greater degree of optimization which occurs in a true long run planning horizon.

This problem is demonstrated by the case of the mix of cable sizes included in the loop and transport studies. Along any given route, there is a single "best" cable size, or combination of sizes which will minimize the cost of serving the specified demand (e.g., providing the required volume of loops or circuits). In the long run, the optimal cable size (number of pairs) and type (copper or fiber) can be selected. The cable mix that is observed within an existing network will generally differ from the optimal mix that would be selected in a true long run planning horizon.

If an existing network has slowly evolved over many years, one would expect to find a larger than optimal number of cables, of smaller than optimal size. As demand grows, it may be cheaper for the firm to keep the existing cables in place and simply add new cabling adequate to meet the growth. Thus, for example, a feeder route might have three different cables of varying ages, in sizes of 200, 400, and 600 pairs--totaling 1,200 pairs. If the firm were to build a network from scratch, its engineers would not install this embedded mix of cables; instead, they would probably install a single cable of 1,200 pairs because this would probably be the most cost effective option. In general, when looking at data describing an embedded network

that has evolved over time, one will often find situations where two or more cables are running parallel along the same route. That same number of customers could be served at lower cost by a single, larger cable.

Q. Did SWBT use the least costly mix of cable sizes?

A. No. Rather than looking at the optimal mix of cable sheath sizes that would be installed in a long run planning horizon, SWBT just looked at its historical cable mix. At least with regard to cable sheath sizes, SWBT's costing approach is more of an embedded costing approach or a short run costing approach. It is not consistent with a true long run cost minimization approach, as that concept is defined in the economics literature.

Q. Regulators have long relied upon embedded cost data. Why should the Commission be concerned if SWBT uses embedded data, without fully making the transition to a forward-looking, long run cost approach?

A. For one thing, the Company claims it has developed long run cost studies, consistent with the KCC's order, and it is fair to examine that claim. For another thing, the Company has made many forward-looking upward adjustments to its costs (e.g., to reflect higher labor and material costs incurred currently); it is important to consider whether it has made all the appropriate downward adjustments as well, in order to maintain consistency. Furthermore, the pricing standards set forth in the 1996 Telecom Act appear to reject an embedded cost approach, since the latter has always been associated with rate-of-return proceedings and such proceedings are expressly prohibited as a means of pricing unbundled network elements by section 252(d) of the Act. Similarly, in laying out the methods by which intercarrier transport and termination charges are to be set, the Act's rules of construction expressly deny commissions a rate-of-return based option. The section is NOT to be construed

> (ii) to authorize the Commission or any State commission to engage in any rate regulation proceeding to establish with particularity the additional costs of transporting or terminating calls, or to require carriers to maintain records with respect to the additional costs of such calls. [§252(d)(2)(B).]

Q. Has this view been tested in court?

A. Yes. A federal judge in the Eastern District of Virginia recently rejected an attempt by GTE-South, Inc. to recover its "historic" costs and overturn the Virginia State Corporation Commission's use of a TELRIC approach to setting rates for interconnection and UNEs. In the opinion, the court said that §252(d)(1)(A) of the Act "is best read as not allowing historical costs" to be recovered by the incumbent local exchange carrier. Rather, the court said, the FCC's TELRIC approach, which the Virginia Commission relied upon, was consistent with the provisions of the Act. The court noted that, despite the Eighth's Circuit's invalidation of the FCC's costing and pricing rules on procedural grounds, "[t]he "underlying pricing methodology remains valid and instructive." [*TeleCompetition Report*, May 28, 1998, p. 2.]

Both this Commission and the FCC have concluded that unbundled element prices should be based upon long run economic costs in order to best implement the Telecom Act of 1996. This is a sound approach, which is fully consistent with the public interest. Hence, I recommend that the Commission require changes to SWBT's studies that result in the use of a true long run costing approach to the maximum extent feasible. As I will show in succeeding parts of my testimony, various aspects of the Company's studies deviate from this standard, translating into higher cost estimates than if it had followed a true long run approach.

Q It could be argued that the long run requirement can be met by an analysis that assumes that all costs vary but does not assume that all costs vary simultaneously. Do you agree?

A. No. Of course, such an argument would have a certain intuitive appeal, if one assumes the "long run" involves a very long period of time. If it takes a long time to adjust to changing conditions, it may seem logical to assume that the firm can minimize only a portion of its costs in any given time period, and thus costs will tend to fall above the minimum level, because the firm never quite gets to the point where it has optimized all of its operations in order to truly minimize costs. For example, one might argue that over a long period of time, it is logical to install a series of smaller cables, rather than a single large one. Any such argument is misplaced, because the appropriate focal point in this proceeding is the level of costs that would be incurred if the firm were operating in an equilibrium, or optimal, status. The potentially higher level of costs that might be incurred during a transition to equilibrium would not be an appropriate standard for setting UNE prices.

Q. How long is the long run?

A. By definition, in the long run all inputs can be optimized. Thus, the long run is whatever length of time it takes for all costs to be variable, so that the firm can reach a true optimum. As I said earlier, in a typical long run cost study, the only thing that doesn't vary is the wire center and the location of the households and businesses. The latter simplification has become a standard practice in the industry--known as the "scorched node" approach--because it fits the theory well yet simplifies the modeling process by retaining the all the existing network end points (i.e., the wire center locations as well as the customer locations). Also, it makes it easier to relate the cost results back to the real world than in the pure scorched earth approach, where even the wire center locations are a variable. But aside from this simplification, everything should be

allowed to vary, in order to appropriately match the size of the network to the assumed level of demand.

Some are troubled by the theoretical nature of the long run planning horizon, which makes it seem irrelevant to real world problems. However, it is actually a very important concept in economics. Long run cost curves provide us with an understanding of certain tendencies, or limits, within which normal firms operate, as well as a better understanding of the equilibrium conditions towards which markets gravitate. The long run can be particularly useful to regulators, since it provides a benchmark indication of the level of costs that would be incurred if a firm were to select an optimal mix of technologies, and carefully match the scale and scope of its operations to the actual level of market demand.

Q. Since the Company's studies are not truly long run, would it be more accurate to describe them as providing short run estimates?

A. No. Granted, the Company's cost studies include many assumptions and elements that are tied to its existing network, and to a degree they resemble short run cost estimates. However, there are important differences between SWBT's approach and a true short run cost analysis. The real world is a very different place from the one the Company's studies assumes, because real world firms have sunk costs and heavily depreciated but still functional assets. The Company's studies don't appropriately capture the effect of these existing assets on the firm's short run cost curves, or its real world optimization process.

When modeling a firm that operates using an existing network (as opposed to a hypothetical new network), it is necessary to carefully analyze the appropriate treatment of the fixed and sunk costs of this existing infrastructure. For instance, in a short run study, it wouldn't be logical to make wholesale substitutions of fiber for copper technology, especially on routes where ample capacity has already been installed. Although I have no direct knowledge of the

age of copper loops in SWBT's service territory, there are probably some distribution cables and drops that are decades old and have been heavily depreciated yet continue to provide useful service. While maintenance costs may exceed those of new fiber cable, such existing plant will continue to be useful and also continue to impose maintenance costs that are below those of installing and maintaining a new fiber system, including the required fiber electronics.

With regard to the mix of cable technologies, the Company has assumed the use of digital line carrier (DLC) technology on fiber cable for all loops with lengths of 15,000 feet or more, without regard to the existing technology or the level of spare capacity in the current cables. In this regard, its studies are clearly not consistent with short run cost minimization; rather they have followed a long run costing approach.

Similarly, while taking its existing cable mix as a key source of data in developing its studies, SWBT has assumed that it is necessary to incur the full cost of installing such cables, at current labor and material rates. In a true short run study, many, if not all, of these cables would be treated as having sunk costs, which would not be included in the final cost results.

Accordingly, it is fair to say that SWBT has not used either a short run or an embedded cost approach. Rather, it has attempted to follow a long run approach but has fallen short of the mark in some regards. The major problem is that SWBT relies heavily upon data reflecting its internal costs, and various aspects of its network, which have not been adequately adjusted to match a true long run approach.

Q. Is it appropriate for the Commission to insist upon true long run studies from the Company?

A. Yes. The significance of a long run approach lies in its relationship to the dynamics of a competitive market. To the extent the Commission prices network elements based upon long run costs, the Commission will be able to set prices with desirable and predictable impacts on

competition. By de-emphasizing embedded costs and focusing instead on long run economic costs, the Commission can ensure that its pricing decisions are consistent with its policy goal of a competitive market. In particular, to encourage a rapid transition towards effective competition, the Commission will need to adopt regulatory policies that help break down barriers to entry and exit. The magnitude of the cost-related barriers can best be analyzed in terms of long run cost—the type of cost typically faced by a potential entrant.

For example, if the Commission were to set unbundled element prices well above the long run costs that would be incurred by a new entrant installing its own facilities, it would not achieve one of the goals of the Telecom Act, which is to reduce barriers to entry by making available elements of the incumbent's network for rental at fair and reasonable rates. Stated differently, if unbundled element prices are set at unduly high levels, very few unbundled elements will be acquired by new entrants, and the situation will be essentially the same as if unbundling had not been mandated. Competitors will be reduced to just two options (pure resale and pure facilities based entry), and the latter form of entry will be more costly and risky than if UNEs could be rented as a means of filling out or completing competitors' networks prior to the time those competitors are able to install ubiquitous facilities.

. In effect, unbundled element rates (or, for that matter, wholesale rates for resold services) that are well above long run average cost will create a barrier to entry by resale or mixed mode competitors, thereby limiting entry to those firms that have the wherewithal to install their own network facilities. By the same token, however, unbundled element rates that are well *below* long run average cost will have the effect of discouraging facilities-based entry, since a CLEC will not be able to reduce its costs by substituting its own facilities for SWBT's unbundled facilities. A consistent long run approach to costing provides a useful benchmark, which can help the Commission avoid setting element prices that are so high they don't reduce

barriers to entry or so low that little or no incentive will exist for the installation of new facilities by new entrants.