3. SWBT's Cost Studies

Overview

Q. Let's turn to SWBT's cost studies. Would you please give an overview of the Company's studies and methodology?

A. Yes. According to SWBT, its proposed UNE cost study process is an adaptation of the IRC study process it has used for many years to set retail tariff rates. [SWBT, Description of Unbundled Network Element Cost Studies, 1997.] The Company also maintains that its studies are "consistent with the FCC requirements in CC Docket 96-98." [Id., p. 6.] Thus, the Company believes its proposed approach is consistent with the FCC's TELRIC approach.

Generally, SWBT begins by calculating plant investment, using a series of proprietary models specific to certain kinds of plant. These include, among others, its loop cost model (LPVST) and Bellcore's switching cost model (SCIS). As SWBT explains,

> [P]lant investments are computed for each component reflecting the mix of equipment used today to provide the component, appropriate equipment quantities, vendor prices, capitalized engineering and labor costs, support assets (such as power equipment and buildings) and others. [Id., p. 9.]

SWBT determines investment per unit by applying fill factors based on projected utilization percentages (i.e., the ratio of plant in use to installed plant over the life of the asset), and uses its CAPCOST model to compute capital costs. Capital costs include depreciation, income taxes, and the cost of money. SWBT then calculates recurring operating expenses, such as maintenance, ad valorem taxes and administrative expenses. Finally, the Company uses its Automated Cost Extraction System (ACES) to calculate the annual and monthly cost of the item in question.

SWBT develops loop investments using a series of unlinked database sample files, intermediate spreadsheets, and models. I have attached a flow chart which represents my

understanding of the linkages and flows of data within this series of data files, spreadsheets, and models. I will provide a more detailed explanation of the process later in my testimony when I discuss the loop modeling process specifically. I would note here that the Commission's misgivings about the inaccessibility and lack of user friendliness of SWBT's proprietary models, as expressed in its December 1997 Order, have been amply borne out in my experience in analyzing those models in this proceeding.

Review Difficulties

Q. Did you encounter any problems reviewing the Company's studies?

A. Yes. We experienced two types of problems. The first type involved the structure and format of the Company's models. The second type of problem involved the supporting documentation provided by SWBT.

Q. Could you elaborate upon your problems with the Company's cost models?

A. Yes. We encountered numerous difficulties in our efforts to trace through the Company's cost modeling process. The models and studies are spread across numerous different computer files and paper documents. Although the Company ultimately provided electronic copies of most of the key components of the modeling process, these copies were not all received at the beginning of our investigation, and they were not linked in a way that would enable an auditor to trace from inputs to outputs. Compounding this problem, several of the most important portions of their cost modeling process were not provided to us in an electronic format that would have allowed us to study the algorithms and more quickly understand the inner workings of the studies. With these models (e.g., SCIS, ACES, LPVST and CAPCOST) we could see only what goes in and what comes out. At least from our perspective, it would be fair to characterize these models as "black boxes."

Q. Are other popular cost models also "black boxes" where the user can only see what goes in and what comes out?

A. No. For example, the BCPM and Hatfield models (previously reviewed and rejected by the Commission) are "open" models developed using the popular Microsoft Excel software. With these "glass box" models, a user can view algorithms and formulas and trace all the way from the input data to the output values, thereby gaining a much more complete and precise understanding of the model. Furthermore, these models are publicly available and can be operated using public data, thereby eliminating confidentiality concerns and the cumbersome restrictions that apply to the use of proprietary data.

In contrast, the SWBT models and supporting data were all provided under the terms of stringent proprietary agreements that complicate an auditor's work. For example, results of the models obtained in one jurisdiction or proceeding are unusable for purposes of a critique or comparison in another jurisdiction or proceeding, which precludes directly making comparisons and "reality checks" of the results of different studies and different assumptions. More critically, the models' lack of integration increases the time required to vary inputs experimentally, and an outside analyst cannot be certain that the resulting outputs are directly comparable to those submitted by the Company. Whether intentional or not, the lack of integration and the presence of proprietary restrictions make it more difficult for the parties to gain a solid understanding of the models and make it harder for the Commission to gain any perspective on the validity, or lack of validity, of particular cost estimates. As I will explain further below, the Commission should require SWBT to correct these deficiencies in their models.

Q. Did you largely overcome these problems?

A. I believe we did overcome most of the problems with analyzing the loop cost studies, the area in which we concentrated most of our efforts. As I will explain in greater detail later, with a concerted effort we succeeded in understanding--and subsequently duplicating in a spreadsheet format--the IPVST and ACES models. Furthermore, we electronically linked these models to various other data files and spreadsheets, thereby recreating SWBT's loop cost modeling process in a largely automated system. This helped us fully understand the process, and aided in our investigation of various issues. With regard to studies other than loop costs, we encountered similar problems, but due to time constraints we were not able to accomplish the same sort of replication or integration.

Q. Would you now discuss the second type of problems, involving SWBT's supporting documentation?

A. Over the course of our investigation we dealt with numerous Company personnel, all of whom were highly cooperative and often went out of their way to answer our questions and to track down data we had requested. Despite this high level of cooperation, we encountered numerous problems throughout the discovery process. Some of the problems may have been due to miscommunication and misunderstandings, and some of the problems may have been due to heavy workloads of the SWBT personnel and the fact that they are handling multiple proceedings in multiple jurisdictions. However, a root cause of these problems seems to be the fact that SWBT has so many different cost studies, each with many different components and data sources, and there are apparently few, if any, people within SWBT who fully understand and are familiar with the full picture.

Chief among the problems we encountered were substantial delays in obtaining complete copies of the cost studies, including workpapers and source documents integral to those studies. We had trouble gaining full access to the Company's loop cost model process and its associated

investment development spreadsheets. For example, GEOKS96forRFI.xls is an integral part of the loop cost study; it involves numerous inputs, intermediate calculations, and outputs that become inputs to LPVST. We finally received an electronic copy of this portion of the loop study approximately 7 weeks after our initial request.

What SWBT styles the "Broad Gauge Report" is another integral component of the SWBT loop model process; from it installed cable costs are input to the GEOKS96forRFI.xls spreadsheet. We obtained a hard copy of the 1995 Broad Gauge Report early in the discovery process. In an effort to analyze this data and understand the modeling process, we expended many hours of labor unsuccessfully trying to trace this data through other steps of the cost modeling process. As we slowly gained an understanding of other parts of the process, we became increasingly convinced there was a problem in this area. Ultimately, we were able to confirm (through verification by a SWBT Subject Matter Expert (SME), the nature of the problem: the TELRIC Loop results filed by SWBT actually used data from the 1996 Broad Gauge Report, but we were not provided a copy of this information, nor was a copy made available during the discovery phase. Finally, on May 7, 1998, almost 11 weeks after it was initially requested, we received an electronic copy of the 1996 Broad Gauge spreadsheet.

This, unfortunately, was not a unique experience. On two other occasions, we engaged in extensive reviews of studies or workpapers provided by the Company and long but futile attempts to trace numbers, only to find out later that the material we were working with was outdated or didn't match other parts of the studies. This happened in our review of the Company's Cost Factor Binder, and in our review of Loop Service Order costs, as well as in our attempts to use the Broad Gauge Report.

Q. Do you believe the Company was being deliberately obstructive in these instances?

A. No, I don't. I believe the problems I have described are symptoms of weaknesses in the Company's classification, processing, and dissemination of technical information. But, mostly the

problem is the excessive complexity of SWBT's cost studies, which is compounded by the fact that the various components have not been electronically linked with each other.

We were often frustrated by the disorganized manner in which SWBT provided studies and source documents—most of which were delivered to us without the indexes, tabs, or other dividers that were apparently included in the originals filed with the Commission, and in copies provided to other parties such as AT&T. Also, it appears that SWBT occasionally used different titles for the same study or source document. Compounding the problem, SWBT often provided stacks of source documents in a general response to numerous specific Information Requests, without indicating which portions of the stack of papers applied to each specific request. This made it difficult or impossible to confirm whether or not we had received all of the relevant studies and supporting documentation that had been requested. While this "dumping" of paper undoubtedly saved SWBT time in preparing their discovery responses, it increased the risk of items falling between the cracks (e.g. items not arriving that SWBT had intended to send) and it certainly made it more difficult to determine which items, if any, were responsive to specific portions of our requests.

Q. What impact did these problems have on your investigation?

A. They impeded the progress of our investigation to some extent, and because we were working under both time and budget constraints, they have prevented us from delving as deeply as we would have liked into some areas.

Q. What are your recommendations concerning the problems you have been discussing?

A. I recommend that the Commission address these weaknesses in the SWBT study approach, which it recognized in the previous phase of this proceeding, and this time include language in the final order in this proceeding requiring SWBT to revise and improve its approach in at least two ways.

First, the various data files, models and other components of the study process should be converted into standard personal computer formats (e.g. Access data bases, Excel spread sheets) to the maximum extent feasible, and copies should be provided to the Commission, the staff and the other parties in an electronic format at the time of filing. This would allow everyone to analyze the studies "on screen" rather than being forced to work with hard copies or to ask for electronic copies of the studies during the discovery process.

Second, the data files, models and other components of the study process should be electronically linked together, or integrated, to the maximum extent feasible. This would simplify the review process, and reduce the need for extended discovery. When the data flows through a continuous electronic process, it is easier to document the studies, and easier to understand the inputs, assumptions and algorithms used in preparing the studies. I believe a higher level of electronic integration would largely eliminate the types of discovery problems we encountered in this proceeding, and it would allow the Staff and other parties to gain a deeper understanding of the cost studies.

As I mentioned earlier, we have largely accomplished this type of conversion and linkage process for the lbop studies. The primary exception is the CAPCOST model which we did not receive or link to the other parts of the lbop studies. However, it would certainly be feasible for SWBT to develop analogous carrying charge factors without the use of CAPCOST, using a spreadsheet that could be freely distributed to the Staff and other parties. In turn, this could be linked with the other elements of the study process, thereby ensuring that the entire study process would be electronically linked together and distributed to the parties. Based upon our success in recreating and linking elements of the lbop studies, I feel confident that SWBT could accomplish similar improvements in other areas (e.g. nonrecurring costs, transport costs), in response to appropriate language in the Commission's order in this phase of this proceeding.