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Confidential rebuttal testimony of Norbert J. Mette filed on behalf of applicant by D. Hart. (56 pgs.)

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Cincinnati Bell Telephone Company for Approval of a Retail Pricing Plan Which May Result In Future Rate Increases and for a New Alternative Regulation Plan	))))))	Case No. 96-899-TP-ALT

00-0507

REBUTTAL TESTIMONY OF

NORBERT J. METTE

ON BEHALF OF

CINCINNATI BELL TELEPHONE COMPANY

(UNREDACTED VERSION)

April 7, 1999

FILED UNDER SEAL

Q. Please state your name, by whom you are employed, and your position.

A. My name is Norbert Mette. I am employed by Cincinnati Bell Telephone (CBT) in the capacity of Director of Service Costs.

Q. Are you the same Norbert Mette who originally submitted initial testimony in this docket?

A. Yes, I am.

Q. What is the purpose of your testimony?

A. The purpose of this Rebuttal Testimony is to address issues that have been raised by other parties in this proceeding. These include issues raised in Direct Testimonies, Supplemental Testimonies, and cross-examination of AT&T, Corecom, MCI, and Commission Staff witnesses. My discussion of these issues is arranged by each topic.

TELRIC METHODOLOGY

Q. During cross-examination, several intervenor witnesses claimed that there is an assumption of "perfect information" when a TELRIC study is performed. Are you aware of any such assumption for performing a TELRIC cost study?

A. No, I am not aware of any reference in the FCC rules or the Commission's Local Service Guidelines which requires an ILEC to assume that it has "perfect information" when it conducts a TELRIC cost study. In fact, the FCC's First Report and Order in Docket No. 96-98 in paragraph 682 states that costs are developed based on a "reasonable projection of the actual total usage of the element." This

indicates that costs are not based solely on current demand. Also, a reasonable projection will include estimated growth, which is not perfect information.

Q. What impact would assuming "perfect information" have on the development of the cost of an unbundled element or service?

A. Assuming perfect information would artificially lower the costs of an unbundled element. For example, some intervenor witnesses claim that CBT should assume that it knows exactly which customers have multiple lines and which customers do not. If CBT's engineers had this knowledge, they could obviously install facilities exactly where they are required and never incur any rearrangement or reinforcement costs. The lack of perfect information is one reason that CBT's engineers install enough capacity for ultimate demand in the distribution plant. Clearly, costs could be lower in this "perfect world." However, this perfect knowledge does not exist and it is not appropriate to force such unrealistic assumptions on the TELRIC cost studies.

Q. Should the selection of the technology to be used in the cost studies be based on "perfect information" assumptions?

A. No. FCC rule 51.505(b)(1) requires that costs should be "based on the use of the most efficient telecommunications technology currently available . . . ." Thus, the technology used must be currently available and should be the most economical for providing the unbundled element studied.

Q. Are technologies such as ATM switching appropriate for TELRIC cost studies?

A. ATM switching is currently available but I am told by CBT engineers that this is not the most economical means to provide switched services for the study period associated with CBT's cost studies. Therefore, ATM technology is not appropriate for developing switch costs in CBT's studies. However, ATM technology is expected to ultimately replace current switching technology and hence ATM technology is a factor in determining the economic life of the current switching technology.

Q. On page 54 of his Direct Testimony, Dr. Ankum claims that CBT will be able to "practically give away" spare facilities for its services and to establish prices "far below the TELRIC costs." Do you agree with his claims?

A. No. It is apparent that Dr. Ankum is not familiar with the Long Run Service Incremental Cost (LRSIC) guidelines that CBT must follow. These guidelines do not allow CBT to give away facilities. In addition, I cannot see how the LRSIC guidelines could allow LRSIC costs to be established for comparable services and network elements that are far below the TELRIC costs. The costs of facilities, such as the cost of cable, would be the same in both types of studies. Also, in a LRSIC study there will be costs such as marketing expenses that would not be included in a TELRIC study. Therefore, no claims can be made that LRSIC costs will be "far below the TELRIC costs."

DISTRIBUTION FILL FACTOR

Q. Mr. Francis of the Commission Staff recommends a range of 55% to 65% for

the distribution fill factor. He suggests using 60%, the midpoint of this range, for the distribution fill factor? Do you agree with his recommendation?

A. No, I do not agree with this recommendation.

Q. Why do you believe that a 60% distribution fill factor is inappropriate?

A. There are several reasons why the 60% distribution fill factor is not appropriate. First, this level of utilization is extremely high compared to CBT's current distribution fill factors. CBT provided its actual distribution fill factor for 1992 and 1998. These fill factors are derived from a statistical sampling process and the results of these studies show that the fill factor has been stable. The total company distribution fill factor in 1992 was 35% while the Ohio only fill factor in 1998 was 36%. In order for CBT's distribution fill factor to increase from 35% to 60% at the midpoint of the study period of 1999 through 2003, CBT would have to experience an annual growth in demand of approximately 20% assuming that no additional facilities are added to the network. If additional facilities are added to CBT's network, then an even higher growth would be required. This contrasts with CBT's historical annual access line growth rate of 3% - 4% per year.

Q. For what other reason is this fill factor not appropriate?

A. The second reason is that a 60% distribution fill factor is not reasonable in relation to the network design for distribution plant. I will discuss this first in relation to serving residence customers. As Paul Meier has testified, distribution plant for both residence and business customers is designed for ultimate demand in order to minimize total

costs over the life of the plant. This design criteria is not unique to CBT. In fact, this design criteria is the same as what was used by the Texas Commission on page 31 of the order referenced by Mr. Francis. In the case of residence customers, building for ultimate demand is one reason why CBT engineers use a two pairs per household design for distribution. Again this is also consistent with the recommendation provided by AT&T's 1994 Outside Plant Engineering Handbook. Because business customers' telecommunications demands vary more significantly than residence customers, there are no simple rules for engineering distribution plant for business customers. Hence, my discussion will focus on residence customers. Now, if one first considers only the primary line, then the fill factor for residence distribution plant will be 50%, assuming that one could purchase cables in the exact sizes necessary to match the customer demand. Assuming that 11% of the customers have second lines, which is CBT's percentage of residence additional access lines at the end of 1998, the fill factor would increase to 55.5%, again assuming that cables can be purchased in the exact sizes needed to match customer demand.

Q. Can cables be purchased in unlimited sizes?

A. No, there are a limited number of standard cable sizes that can be purchased. The cable sizes used by CBT in developing its distribution cable costs for its cost studies are based on 25, 50, 100, 200, 300, and 600 pair cables.

Q. What impact does limited cable sizes have on the fill factor for distribution plant?

A. Obviously, having a limited number of cable sizes reduces the fill factor. Breakage is a term that is used to describe the situation that occurs when capacity cannot be purchased in exact sizes to match demand. Because of the variety of cable sizes, it is not possible to give an exact estimate of what impact the limited cable sizes has on the distribution fill factor. However, it is possible to provide a reasonable estimate of the impact of the limited cable sizes. I have attached an analysis of the impact as Exhibit 1 to my testimony. For example, in this analysis, if 70 pairs are required, a 100 pair cable would be installed. This is the approach used by CBT's engineers since it avoids the additional cost of two installations as well as taking up two ducts in a conduit system or two places on a pole.

Exhibit 1 shows that one could expect to have approximately 23.5% of the capacity unused because of breakage.

Q. How do these results impact the 55.5% fill factor that you previously developed for residence customers?

A. As I explained previously, one could expect that the residence distribution fill factor to be 55.5% if one could match cable sizes exactly to customer demand. Since this cannot be done, one can adjust this 55.5% fill factor to account for breakage by eliminating the capacity that one expects to be unused due to breakage. Multiplying 55.5% by the breakage factor of 76.5%, one obtains a fill factor of 42.5%. Therefore, one could expect a fill factor closer to the 42.5%.

Q. Is this expected fill factor consistent with the recommended 60% fill factor?

A. No, it is not consistent. I claim this because the recommended 60% fill factor is a composite fill factor for both residence and business distribution. In CBT's case, the percentage of residence customers is approximately 67%. Although residence and business customers may share the same distribution plant, in most cases the plant is distinct due to the nature of where the customers are located. Therefore, a composite fill factor would be approximately 67% of the residence fill plus 33% of the business fill. Previously, I showed how one could expect a residence fill of 42.5%. If the composite fill is to be 60% for both residence and business, then the business fill would have to be approximately 95.5% (= (60% - (42.5%*.67)) / .33). This fill factor is extremely high and unrealistic for distribution plant, especially considering the fact that it does not include an adjustment for breakage. I have seen no companies claim that distribution plant can be operated at this high fill factor. Therefore, since an unrealistic business fill factor is implied by the composite 60% fill factor, I believe that the 60% composite fill factor is unreasonable.

Q. Do you have any other concerns with using a 60% fill factor in the loop cost model used by CBT?

A. Yes, I am concerned that the proposed 60% distribution fill factor does not properly measure the amount of unused capacity.

Q. Why do you have this concern?

A. My concern is based on how CBT developed its average loop characteristics and

distribution fill factor. As CBT has explained in testimony and responses to various data requests, CBT developed its loop costs by calculating the cost of an average loop. One of the characteristics of an average loop is its length. CBT developed the average loop length by taking a sample of customer loops and measuring both the feeder length and the distribution length. In the case of distribution, the length extends from the serving area interface, or SAI, to the customer's drop terminal. When a cable passes a customer's location, the cable usually will not stop at that point. For example, as a 50 pair cable runs down a street, pairs are pulled from this cable to serve customers on that street. Once a pair is pulled out to serve a customer, it is no longer available to other customers. However, the cable size does not taper down at individual drop terminals. All pairs continue in the cable until the cable ends or is tapered down to a smaller cable size at a further point. CBT's loop sample measured the length of the customers loop, not the length of the cable until it ends or tapers. A fill factor used in CBT's cost model must, therefore, account for the unused portion of the copper pairs that continue past the customer location.

As CBT has explained in testimony and responses to data requests, CBT's distribution fill factor was developed by studying a statistically valid sample of serving area interfaces (SAIs). For each sampled SAI, CBT drew a 600 feet circle around the SAI and determined the fill factor of all distribution cables at that point. Based on my previous explanation of how pairs serve customers, unused pairs at that point will represent pairs that are available to serve new customer demand plus pairs that are "dead" because these pairs already served customers within the 600 feet circle.

Hence, CBT's distribution fill factor captures not only unused capacity in terms of spare pairs within a cable, but also "dead" pairs beyond where a customer is served.

Although the recommended 60% fill factor has been recommended by Mr. Francis as the input to CBT's loop cost model, there is no justification for how the recommended 60% fill factor accounts for unused plant beyond where a customer is served. The fill factors provided by Mr. Francis from other TELRIC cases do not explain how the factors are applied in the companies' cost models. Hence, I cannot determine if the cost of unused capacity beyond the served customer is calculated in a different manner in these other companies' loop cost models. If this cost is calculated differently by these companies, then a fill factor for these companies models could not be used in loop cost calculations in the same manner that CBT uses this factor.

Q. If the Commission orders a fill factor other than that proposed by CBT, will other changes be required when unbundled loop costs are developed?

A. Yes. As I just explained with respect to unused capacity, the fill factor cannot be examined outside of the context of how it is applied in a model. The unbundled loop cost study was developed based on numerous interrelated assumptions. For example, the cable unit investments were developed by weighting the costs of various cable sizes together in order to develop an average cable unit investment. The weights represent the proportion that each cable is used in CBT's network and these weights assume the network design that CBT currently uses. If a high fill factor is used, then this implicitly assumes that a different design is used and that smaller cable sizes are used. Therefore, CBT will need to adjust the cable size weights in order to be

consistent with the fill factor that is ordered by the Commission. Similarly, CBT assigns support investments such as pole investments based on CBT's ratio of pole investments to aerial cable investments. If a fill factor is ordered which implies a reduced cable investment, then applying this to CBT's ratios of pole to cable investments will artificially reduce the pole investments. Therefore, CBT may need to adjust its pole to cable investments if reduced cable investments result from inflated fill factors. This is appropriate because the same number of poles will still exist.

LOOP ELECTRONICS FILL FACTOR

Q. Mr. Francis of the Commission Staff recommends that the fill factor that is applied to the interoffice electronic circuit equipment at the DS0 level be applied to the digital loop carrier (DLC) electronic equipment. Do you agree with this recommendation?

A. No. The interoffice DS0 fill factor that Mr. Francis refers to is discussed in Ms. Soliman's Testimony. Its value is given on page 26 of Ms. Soliman's testimony as 88%. The DLC fill factor used in CBT's cost studies is 70%.

Q. Why do you believe that the 88% fill factor is not appropriate for DLC electronic equipment?

A. The primary reason that this proposed fill factor is unrealistic is that it is inconsistent with CBT's actual fill for DLC equipment. CBT provided its historical fill factor for DLC equipment in response to MCI Data Request 4.12. Although this fill factor has shown a modest upward trend, it cannot reasonably be projected to approach the

recommended fill factor during the next five years. Exhibit 2 to this rebuttal testimony provides the fill factors that were provided in response to MCI Data Request 4.12. This exhibit also provides the fill factor at the end of 1998, which was not available at the time that the data request response was developed. In order to develop a forward-looking estimate of the fill factor, a linear regression trend analysis was performed on the historical data using Excel's regression capability. The results of this regression are shown in Exhibit 2 to this testimony. Based on this regression, a projected fill was developed. Exhibit 2 shows that the average value of this fill over the 1999 to 2003 study period is 70.1%, which is consistent with CBT's fill factor that was used in its cost studies. Hence, the 88% recommended fill factor is unrealistic for DLC electronics equipment. Mr. Gose provides, on page 75 of his Direct Testimony, the results of other commission decisions which show no fiber feeder loop electronics fill factor greater than 85%. In fact, the average of all of these decisions is 80%, with the lowest fill being 74%.

Q. Shouldn't the fill factor for DLC electronic equipment be the same as for interoffice equipment because it is the same equipment?

A. First, it is not true that the same equipment is used for provisioning unbundled DLC loops as is used in the interoffice network. The Fujitisu FACTR equipment that is used in the loop plant is not the same equipment as that used in the interoffice network. Second, the interoffice network can combine large numbers of DS0 circuits at one central office for transport to a distant central office. Through multiplexing equipment, all of the DS0 circuits that must be transported can be combined together

for transport purposes, thereby realizing efficiencies due to the high volume. In the case of DLC equipment, the equipment is remotely located near the customer locations and the amount of DS0 circuits that can be combined is limited. As a result, the efficiencies are less in this situation than in the case of interoffice circuits.

Q. If changes are made to the DLC electronic fill factor, should the same fill be used for all equipment?

A. CBT used the same fill factor for all equipment components of a DLC system. Some components are common to the entire system while other components such as plug-in cards are associated with smaller groups of customers. For example, the card for providing a POTS unbundled loop can serve four customers. CBT used the same fill factor for all components because CBT has found that it is more economical to provision a full shelf of plug-in cards rather than send a technician out each time that service is ordered. If the Commission orders a fill factor other than that proposed by CBT, CBT would strongly object to the application of that adjusted fill factor to anything other than plug-in type components. CBT's proposed fill factor of 70% should continue to be applied to the common components.

INTEROFFICE DS1 & DS3 FILL FACTORS

Q. Ms. Soliman of the Commission Staff recommended fill factors for interoffice DS1 and DS3 electronics. Her recommendations were based on the historical change in these fill factors from 1992 to 1997. Is there recent data for these fill factors?

A. Yes. Fill factor information is available for both the DS3 and DS1 fill factors.

Q. What were the historical fill factors for the DS3 electronics and what is the most recent fill factor?

A. The December 1992 DS3 fill factor was 71% and the June 1997 fill factor was 75%. I requested an update of this fill factor from CBT's Network Engineering group. The March 1999 fill factor for DS3 electronics was 75%.

Q. What were the historical fill factors for the DS1 electronics and what is the most recent fill factor?

A. The December 1992 DS1 fill factor was 80.2% and the June 1997 fill factor was 85%. I requested an update of this fill factor from CBT's Network Engineering group. The March 1999 fill factor for DS1 electronics was 74%.

Q. Do you have any explanation for why the DS3 fill did not increase and the DS1 fill factor decreased?

A. I discussed these fill factor results with CBT's Network engineering group. Although no single specific factor accounted for these fill factor results, the updated data suggests that reliance on a single year's data would be inappropriate because of the volatility of the data. However, it is reasonable to expect that the fill factor should increase as demand increases and also to decrease as new interoffice systems are installed. This suggests that CBT will likely never reach the usable fill on these facilities on an overall basis.

Q. What conclusions do you have based on these results?

A. I believe that these results demonstrate why one cannot trend fill factor results and expect the fill factor to continually increase. Fill factors will continually vary over time, increasing with increased demand and decreasing as new capacity is added. Based on these results, I recommend that the DS1 fill factor be no greater than the 85% fill that was experienced in 1997.

The DS3 fill factor results have not exceeded 75% and applying a trend analysis to this historical data may have limited validity. However, if the Commission determines that a trend analysis should be performed, the trend analysis suggested by Ms. Soliman should be modified as follows: The trend should begin in 1999 at the 75% level. The growth that occurred when the fill changed from 71% to 75% should then be applied. The fill factor would then be 77.3% at the midpoint of the 1999 to 2003 study period.

DS1 and DS3 CROSS CONNECTS FILL FACTORS

Q. Ms. Soliman of the Commission Staff recommends that her proposed fill factors for the interoffice network be used for the collocation cross connects. Do you agree with this recommendation?

A. No. The fill factors for cross connects are driven by NEC demand for cross connects from their collocation cages. The interoffice network, however, is driven by the demand for all interoffice circuits. As such, the demand for the interoffice network

would show different characteristics than cross connect demand for collocation. Therefore, there is no basis for requiring that these two fill factors be the same and I recommend that if the interoffice network fill factors are changed, then the fill factors for collocation cross connects remain as proposed.

Q. In CBT's TELRIC cost studies, the fill factors for the DS1 and DS3 interoffice network were the same as those used for collocation cross connects. Please explain why you are recommending that this not be maintained if the interoffice fill factors are changed.

A. Although it is true that these two fill factors were the same in CBT's cost studies, this was not by design. If the interoffice network fill factors change as a result of this proceeding, I am simply recommending that the collocation cross connect fill factor remain as proposed as there is no logical connection between these two fills.

ENGINEERING STUDY OF FILL FACTORS

Q. Have any of the parties in this proceeding recommended an engineering study to develop fill rates?

A. Yes. James Webber of AT&T, on page 7 of his Direct Testimony, mentions the possibility of CBT providing "an engineering study to determine usable capacity fill rates." Allen Francis of the Commission Staff, states on page 30 of his Testimony, "To the extent that CBT has an engineering study that defines capacity fill factors consistent with the Commission's Local Service Guidelines those fills should be used in the TELRIC studies."

Q. What concerns do you have with these recommendations for conducting an "engineering study" to determine fill factors?

A. First, with respect to Mr. Webber's recommendation, a study to develop the "usable capacity" is not consistent with the Commission's Local Service Guidelines. Mr. Francis, on page 28 of his Direct Testimony, and Ms. Soliman, on page 29 of her testimony, define "usable capacity" and indicate that a usable capacity fill rate is not consistent with the Commission's Local Service Guidelines. Therefore, Mr. Webber's recommendation is not appropriate for developing fill rates.

Mr. Francis also recommends an "engineering study," but qualifies it by stating that it should define fill factors consistent with the Commission's Local Service Guidelines. Mr. Francis provides no further details on how such a study should be performed. Although this type of study might be able to identify usable capacity, it will not develop fill rates appropriate for a TELRIC study. As Mr. Francis correctly points out on page 30 of his testimony, an appropriate starting point for determining the fill factors is the current or actual fill factor. An appropriate fill factor for a TELRIC study must ultimately be based on projected demand for service and not the theoretical usable capacity. Therefore, the Commission should not require CBT to perform an engineering study for fill rates used in TELRIC studies.

Finally, numerous intervenor witnesses have recommended the use of the Ameritech ACAR fill factors. CBT has not been given access to any supporting documents on how these fill rates were developed and has no basis to conclude that the ACAR fills

are based on engineering studies. In addition, the ACAR fills have also been described as determining the usable capacity fill rates, which is not the appropriate standard under TELRIC. If an engineering study is intended to replicate an analysis that ultimately calculates usable capacity, then this is not appropriate for CBT's TELRIC studies.

COST OF SPARE CAPACITY

Q. On page 44 of Dr. Ankum's Testimony, he performs calculations that claim to demonstrate that the cost of spare capacity implied by CBT's distribution fill factors is excessive. Please describe his analysis.

A. Dr. Ankum creates two hypothetical examples based on $1,000 of "Up-front Investment in Spare Facilities." The two examples are for Aerial and Underground cable. Dr. Ankum multiplies the hypothetical cost of spare, i.e. the $1,000, times the respective annual charge factors to develop an annual cost. From this, he calculates numbers that he represents as the "Carrying Cost" for 3, 10, and 20 years. Based on his calculations, Dr. Ankum concludes that "if demand does not materialize within three years, CBT would have been better off not building the spare facilities up-front, but going back at a later date and reinforcing the facility as needed."

Q. Do you agree with Dr. Ankum's conclusions?

A. No, I do not. There are three reasons for why Dr. Ankum's conclusions are not correct. The first reason is that his analysis completely ignores the difference in cost between installing initial incremental facilities and reinforcement facilities. The

second is that he ignores reinforcement and rearrangement costs. Finally, he is misusing the annual charge factors for calculating carrying costs.

Q. Please explain why Dr. Ankum's analysis must consider the initial and reinforcement costs.

A. Dr. Ankum's hypothetical example uses $1,000 as the up-front cost of spare facilities. In reality, such a number would be calculated as the difference between two different scenarios for placing plant. For example, the first scenario could have an initial cost of $101,000 and would provide for spare facilities. The second scenario would then have an initial cost of $100,000 and have less spare facilities. Hence, there would be a difference of $1,000 in initial costs and would be consistent with Dr. Ankum's example. Clearly, if an additional $100,000 would be needed to reinforce plant in this example, it is most economical to spend the additional $1,000 up-front.

Alternatively, a second example could be created where the first scenario costs $1,001 and it provides spare facilities while the second scenario has an initial cost of $1 and provides less spare facilities. Again, the difference is $1,000 and is consistent with Dr. Ankum's example. In this case, if additional facilities can be added for $1, it is more economical to reinforce as demand arises. Hence, I have created two examples that are both consistent with Dr. Ankum's analysis with each having very different conclusions. This demonstrates that one cannot simply create a hypothetical analysis assuming $1,000 of spare facilities while ignoring the base from which the $1,000 is calculated. No conclusions can be drawn from only knowing the initial cost of the incremental spare.

Q. Please explain the impact of rearrangement and reinforcement costs.

A. If one installation scenario assumes that less spare is installed than in another, there is a greater likelihood that there will be an increased need to rearrange facilities over time in order to move plant to where the new demand occurs. For example, with a two pair per household network design, there are adequate facilities for whenever a customer requests a second access line. However, if a design uses less than two pairs per household, then there will be customers for which no spare facilities exist. If demand should arise at one of these locations, CBT will need to rearrange facilities to move the spare from one location to another. The cost of these rearrangements is not included in the hypothetical considered by Dr. Ankum. As a result, the scenario with less spare will always understate the actual cost of this design.

Q. Please explain why the annual charge factors are used inappropriately in Dr. Ankum's analysis.

A. Annual charge factors are used to assign annual capital costs and expenses to investments in the TELRIC cost studies. The expense items included in the annual charge factor include maintenance, direct administrative expenses, and the new costs identified by CBT. The annual charge factor assigns incremental costs but also assigns costs that are best classified as shared or joint. These costs do not really change according to cable sizes. The annual charge factor allocates these costs over all UNEs, but in reality the incremental facilities do not cause these costs. For example, the new cost component in the annual charge factor assigns new costs to

unbundled elements based on the investment associated with that element. However, when one is comparing the cost difference between two different installation scenarios, one would only want to include those costs caused by the two different installation scenarios. Although it is proper to recover new costs in a TELRIC cost study, new costs are not associated with different installation scenarios and would not be considered in such an analysis. Similar statements can be made for other components of the direct administrative expense component such as billing. Finally, the difference in maintenance costs between two different installation scenarios will be driven more by the number of working lines in the cables rather than investments. The inclusion of spare pairs is unlikely to change the maintenance expense. The purpose of a fill factor is to allocate costs to working elements, the number of which will not change. In conclusion, although annual charge factors provide an appropriate means to assign costs to unbundled elements in a TELRIC study, they are not appropriate for comparing alternative installation scenarios as performed by Dr. Ankum.

Q. Dr. Ankum's example is based on CBT's distribution fill factor of 35%. Does an actual fill factor of 35% mean that the cost of the installed plant is approximately three times the cost of plant that exactly matches the required demand?

A. Absolutely not. There are significant economies of scale to installing plant. As I have previously explained, some costs of installation, such as trenching, placement, engineering, and support structure, will not change if a larger cable is installed instead

of a smaller cable. Hence, one cannot assume that costs vary proportionately with the fill factor. As Paul Meier explained in his Direct Testimony, engineers design networks to minimize overall costs. They do not design to meet a certain fill factor. As a result, the fill factor is an output of the process, not an input and one cannot assume that inefficiencies exist because one fill factor from one network design is lower than another from a different network design.

ELECTRONICS versus FIBER FILL

Q. Please explain the difference between an electronics fill factor and a fiber fill factor?

A. An electronics fill factor determines the amount of the electronic equipment's capacity that is used by customer demand. A fiber fill factor refers to the number of fibers used within a fiber cable by customer demand.

Q. Is it appropriate to include both the fiber and electronics fill factors to develop the cost of a fiber optic cable facility when it is used to provide a SONET ring?

A. Yes, it is necessary to apply both fiber and electronics fill factors to determine the cost of the fiber optic cable facilities needed to provide a SONET ring. The fiber fill factor is used to determine the cost of the fiber optic cable used by the SONET ring. Once the cost of the fiber optic cable is developed, it is then necessary to assign this cost to the customer demand served on the SONET ring provisioned with the fiber optic cable. The electronics fill factor is used to assign this cost since only a portion of the ring's capacity is actually utilized to satisfy customer demand. The electronics

fill is applied to capture the spare ring capacity. The net effect of including both fill factors is to assign the cost of the fiber optic cable to the total customer demand served on the cable.

DIGITAL LOOP CARRIER FIBER OPTIC PAIR EQUIVALENTS

Q. During your cross examination by the Staff counsel, your were asked to explain one of the inputs to the loop cost model. This was the digital loop carrier (DLC) fiber optic pair equivalents. Please explain that input.

A. This input to the cost model relates to assigning the cost of the fiber optic cable that is used to support digital loop carrier loops. Since DLC equipment multiplexes numerous loops onto one DLC system, it is necessary to assign the cost of the fiber optic cable to the individual loops. This is typically performed by dividing the cost of the fiber by the capacity of the system.

Q. Is there a change that should be made to CBT's original cost study for this input?

A. Yes. The cost studies that have been provided in this case were originally developed using a mix of various DLC technologies. In the end, the only technology that was used in the study was the Fujitsu FACTR equipment. This equipment has the capacity of multiplexing a total of 1,920 customers onto four strands of fiber optic cable. As I explained in cross examination, the original study used 1,979. In order to be consistent with the DLC electronics equipment that is used in the study, this input should be changed to the 1,920 that is associated with the Fujitsu equipment.

INTEGRATED DIGITAL LOOP CARRIER

Q. Are CBT's cost studies for unbundled DS0 loops based on the use of integrated digital loop carrier (IDLC) technology?

A. No. CBT's cost studies for unbundled DS0 loops are based on universal digital loop carrier technology (UDLC).

Q. Why is it not appropriate to use the IDLC technology for developing the cost of an unbundled DS0 loop?

A. There are several reasons why IDLC technology was not used. First, the cost studies that were performed are for unbundled DS0 loops. It is not possible to provide an unbundled DS0 loop directly from an IDLC system. Second, although there are other methods of providing a DS0 interface using an IDLC system, these methods require the use of additional equipment. For example, it is possible to obtain unbundled DS0 loops through hairpinning. However, this involves additional switch and transmission equipment. I have compared the cost of the switch equipment required to provide a DS0 through hairpinning and determined that the UDLC method used by CBT is more economical than using the IDLC technology with the additional switch and transmission equipment.

Third, I do not believe that the other parties have clearly defined what they are asking for with respect to providing unbundled loops using IDLC. The concept of multihosting which certain witnesses have discussed is not something that even exists

in CBT's current network. As I have just discussed, providing a DS0 interface is more economical using UDLC technology. If the NECs are actually asking for a DS1 interface that combines multiple loops, then this is very different from what CBT's DS0 unbundled loop is studying. This raises many issues that have not been addressed. For example, a DS1 interface cannot be costed on a DS0 basis because it is not known how many DS1s will be being purchased by the NEC and this will vary by remote terminal site. Hence, it is not possible to blend costs with providing a DS1 interface with costs derived from individual DS0 interfaces. Also, the NECs assume that providing a DS1 interface is easily done and practical. Paul Meier has identified various operational and technical issues that raise doubts about the practicality of this approach at this time. Thus, CBT should not develop costs using this technology since it has not proven economical or practical.

RESIDENCE / BUSINESS WEIGHTING OF LOOP COSTS

Q. What change did CBT propose in its development of unbundled loop costs?

A. CBT modified its original unbundled loop cost study to develop its unbundled loop costs based on the actual proportions of residence and business loops in CBT's network. This change replaced the original proportions of 20% residence loops and 80% business loops.

Q. Was it appropriate for CBT to use proportions for residence and business loops that did not reflect the total demand for loops in CBT's network?

A. No, it was not correct for CBT to develop its unbundled loop costs based on

proportions of loops which imply a demand that is less than the total demand for loops in CBT's network.

Q. Is there any justification in the FCC's rules or the Commission's Local Service Guidelines for using proportions of residence and business loops that do not reflect the total demand for loops in CBT's network?

A. No. Both the FCC's rules and the Commission's Local Service Guidelines require that the cost for an unbundled element is developed based on the total demand for an unbundled network element. FCC rule 51.505(b) requires that "the total quantity of the facilities and function" be used in the TELRIC study. Similarly, the PUCO Local Competition Guidelines state in paragraph V.B.4.b.11 that the total quantity of units provided to NECs and used by the ILEC be used as the basis for performing a TELRIC cost study. Based on these references, it is clear that the total demand is the appropriate assumption in the cost studies for unbundled network elements and it is inappropriate to use proportions of residence and business loops that do not reflect the total demand for loops in CBT's network.

TRENCHING COSTS

Q. Please explain how CBT could share trenching costs when it places buried cables.

A. Generally, if CBT is placing new buried cable when a subdivision is being developed, CBT is placing this cable simultaneously with other utilities placing their facilities in the development. As a result, there may be the opportunity for CBT to share the cost

of trenching with these utilities. If CBT places cable at a later point in time, CBT will not be able to share trenching costs because other utilities will most likely not be placing facilities at that time.

Q. Can trenching costs be shared on both feeder and distribution cable plant?

A. Trench sharing will generally occur only with the placement of distribution cables. This occurs because when a subdivision is being developed, all utilities are typically installing their facilities at the same time and to the same locations. Feeder plant, however, is not shared since this represents plant from CBT's central office locations to the serving area interface locations in CBT's loop plant. The placement of these cables will not coincide with placement of other utilities' facilities nor are these facilities located in the same locations. Hence, it is not possible to share trenching costs for feeder cables. Therefore, any recognition of shared trenching costs must be limited to buried distribution cables.

Q. In Exhibit 6 of your September 28, 1998 Supplemental Testimony, you show a 1999 minimum trenching cost of $2.72 per foot. Why do you claim that this is a minimum cost?

A. The $2.72 per foot minimum cost is developed from CBT's A. J. Daniel contract. This cost only includes the cost of digging with a backhoe, placing a cable in the trench, back-filling the trench, and placing seed and straw. The A. J. Daniel contract lists numerous charges that can and often apply when other conditions are

encountered. Costs may be higher due to requirements to place sod, provide concrete backfill, perform hand digging, or excavate rock. These additional costs are especially likely to occur in the case that CBT is reinforcing cables in an established area because the installation must then deal with items such as developed yards, concrete driveways, and sidewalks.

UNBUNDLED LOOP CABLE INVESTMENT

Q. CBT's cable unit investments that were developed for its unbundled loop cost studies included a 10% miscellaneous cost factor. The Commission Staff and the intervenor witnesses recommended that this factor be removed from the calculation of the cable cost development. Do you agree with these recommendations?

A. No, I do not. I explained in my Additional Supplemental Direct Testimony of December 23, 1997 the reasons for including this factor. The other witnesses do not dispute the existence of miscellaneous costs but they assert that without documentation, this factor should not be considered in developing cable costs. Since bad weather is one cause for additional costs beyond those explicitly identified by CBT in its cable cost development, Mr. Gose claims that there is an offsetting "good weather" adjustment that negates the need for considering the impact of bad weather. His claim is not appropriate as CBT's cable costs represent a baseline cost of installing cable with no interruptions for weather. In effect, CBT's cost development assumed that "good weather" exists when the cable is installed. Mr. Starkey also

claims that since the A. J. Daniels contract provides fixed unit prices, then there is no need to apply a miscellaneous cost factor. Although it is true that the unit prices are fixed in the A. J. Daniels contract, there are two reasons why the miscellaneous cost factor is very relevant. First, A. J. Daniels only performs a portion of the work required to install cable. Second, CBT only included the cost for trenching, back-filling, and placing seed and straw. This represents a limited number of the potential charges from this contract. Other charges can apply and are charged to CBT as unique circumstances arise. Therefore, additional miscellaneous costs are still applicable from this contract.

With respect to documenting CBT's miscellaneous costs, Exhibit 3 to my December 23, 1997 testimony provides explicit calculations of easement and warehousing costs associated with copper and fiber optic cables. This exhibit shows that easements and warehousing costs represent, on average, 5.2% of the total cable investment. Therefore, in order to include these costs in the cable unit investment development, it would be necessary to include an easements and warehousing factor of 1.054 (= 1 / (1 - .052)).

Although no witness criticized these calculations, no one recognized their existence. I continue to recommend that the 10% miscellaneous factor be included in the cable cost development. However, at a minimum, this exhibit provides explicit documentation on using a factor of 1.054 in the cable unit investment development.

Mr. Francis also questioned the Miscellaneous Conduit Material that is included in CBT's cable cost development. This item represents items such as conduit that runs above ground on a pole to an SAI and the concrete pad for an SAI. CBT recommends that the cost of this item be included in the cable cost development.

FUJITSU TRANSMISSION EQUIPMENT DISCOUNTS

Q. CBT's contract with Fujitsu provides discounts on transmission equipment which are dependent on the amount of equipment that CBT purchases from Fujitsu. In terms of dollars purchased, how much equipment did CBT buy from Fujitsu in the two year period 1997 and 1998?

A. CBT purchased $12,228,272 in 1997 and $13,303,860 in 1998 for a combined total of $25,532,132.

Q. Based on these purchases, what discount applies for equipment purchases in 1999?

A. Exhibit 7 of my September 28, 1998 Supplemental Direct Testimony provides the appropriate discounts that would apply to purchases in 1999. Based on CBT's purchases in 1997 and 1998, the $20M table in this exhibit provides the appropriate discounts. However, this exhibit also shows that the discount varies by equipment type with some equipment, such as cabinets, not receiving any discounts.

INTEROFFICE LEAST COST ROUTING

Q. In the Dedicated Interoffice cost study, Dr. Ankum suggests that CBT's circuit file did not represent least cost routing and a different formula should be used. Did you change the formula and what was the impact?

A. Yes, I did. The formula that was suggested by Dr. Ankum was not correct as it did not insure that a continuous circuit was created in the cost calculations. The formula CBT used in columns Z, AG, AN and AU of the RCIRCUIT.XLS file, was changed to show the minimum cost developed in the routing of circuits through the Evendale and West Seventh St central offices. The formula used makes sure that there is a continuous circuit routing throughout the network. The new formula for column Z of the spreadsheet follows. The formula for the other columns is analogous.

T12+IF(U12+W12=0,IF(V12+X12=0,0,V12+X12),IF(V12+X12=0,
U12+W12, MIN(U12+W12,V12+X12)))+Y12

Q. What impact did this change have on the end result in these studies?

A. I made the comparison in the revised DS1 cost study. In this study, there are a total of 3,184 DS1 circuits. The study submitted by CBT shows that the total investment for these circuits is $7,693,800. By changing the formulas as I discussed previously, 133 circuits were affected with the total investment decreasing to $7,681,362. This difference of $12,438 represents a .16% reduction. Thus there is negligible impact on the cost. In fact, the 133 circuits that change are limited in scope with the vast

majority of the changes occurring in circuits to the Rossmoyne office.

Q. Are you suggesting that Dr. Ankum's recommendation be incorporated in CBT's model?

A. No. I performed the above calculations simply to measure the impact of this suggestion. Dr. Ankum's suggestion would mean that all circuits between two end offices would all be transported through a single hub office. As a result, there would be increased vulnerability to CBT's network. The above analysis shows that there is little additional cost for CBT designing a network that has improved survivability characteristics.

Q. During cross-examination of Dr. Ankum by Mr. Hart, Mr. Hart used different numbers than you provide in your previous response. Can you explain the difference?

A. Yes. Two versions of the interoffice study were developed and provided to the parties in this proceeding. The numbers used by Mr. Hart are taken from the initial version of the study and did not reflect the changes that occurred in the revised version.

Q. Ms. Soliman recommends that CBT use the probability of an interoffice circuit being routed through the Evendale hub versus the West 7th Street hub when calculating the costs for interoffice circuits. Have you determined what this probability would be?

A. Yes. There are nine node offices with rings that pass through West Seventh or Evendale. These rings are both OC-12 and OC-48 rings. In calculating those rings passing through either West Seventh or Evendale based on total DS3 capacity, the percentages were very close to the 50 – 50 percentage used in CBT's interoffice study. The breakdown is as follows:

Ring Type	CO	Number	#DS3	Percentage
OC12	EV	7	84	
OC48	EV	4	192	
Total			276	53%
OC12	WS	8	96	
OC48	WS	3	144	
Total			240	47%

Q. Mr. Gose, on page 74 of his Direct Testimony, discusses an example of a circuit between the West 7th Street and the Evendale central offices. Is his analysis appropriate to routing circuits through the West 7th Street and Evendale hub offices?

A. No. Mr. Gose discusses a circuit between the West 7th Street and Evendale central offices. He then presents costs which are related to routing this circuit through the Avondale and Rossmoyne central offices. His Exhibit PJG-30 presents a diagram of his analysis. His conclusions are not relevant as there is no circuit between the West 7th Street and Evendale offices which would route as he has described it in his example. The West 7th Street and Evendale offices are hub offices and circuits between these offices are direct and do not route through other offices. Therefore, his conclusions are incorrect.

PER CIRCUIT PRICING OF INTEROFFICE CIRCUITS

Q. Peter Gose , on behalf of CoreComm, wants CBT to price interoffice circuits on a circuit by circuit basis. Do you agree with his suggestion?

A. No, I do not. CBT has a total of 56 central offices with 41 of these located in Ohio. Mr. Gose's suggestion would cause CBT to have 840 rates just for DS1 circuits in Ohio and 1,540 rates for total company. In addition, the same number of additional rates would have to be developed for DS3 circuits and for the loop transport combinations. Neither CBT, nor any other ILEC to CBT's knowledge, has ever priced interoffice transport in this manner. This would add an extreme amount of complexity for CBT in its billing system. Also, CBT's interexchange carrier account managers believe that carriers would not want this level of complexity as it would make the bill verification process extremely complicated from their perspective. Therefore, I continue to recommend the rate structure that CBT initially proposed.

INTEROFFICE HUBS

Q. On behalf of CoreComm, Mr. Gose claims that using two hubs in the interoffice network is not necessary since SONET technology is utilized. Do you agree with his suggestion?

A. No, I do not. SONET technology only provides redundancy within a single ring in the case of a fiber optic cable cut. CBT's hub offices are where traffic is transferred

from one ring to another. SONET technology does not provide any redundancy in this situation. By using two interoffice hubs, CBT has at least allowed for the interoffice network to still function if one hub office is destroyed. If all of CBT's interoffice circuits were routed through a single hub, this location becomes a potential point of failure in the case of a catastrophe at that location.

KENTUCKY CIRCUITS AND RINGS IN INTEROFFICE STUDY

Q. In her testimony, on behalf of the PUCO Staff, Nadia Soliman, questioned the use of Kentucky circuits being included in the Interoffice study. Have you included Kentucky circuits in the study?

A. No, I have not. All of the interoffice circuits included in the study are Ohio circuits with both the A and Z offices located in Ohio. However, the Ring Inventory table in CBT's study shows both rings in Ohio and Kentucky. Since only Ohio circuits are included in the study, only Ohio rings are used in the study.

Q. During cross-examination of Ms. Soliman, she suggested that interoffice circuits between Ohio central offices and Kentucky central offices should be included in CBT's dedicated interoffice cost study. Do you have any concerns with this recommendation.

A. Yes. If CBT takes this approach, then an average rate would be developed which would combine both Ohio to Ohio circuits with Ohio to Kentucky circuits. With this approach, I assume that when CBT has a similar proceeding in Kentucky, it would

then develop an average rate that would combine Kentucky to Kentucky circuits with the Ohio to Kentucky circuits. I would not expect the rate developed in the Ohio proceeding to be the same as that developed in the Kentucky proceeding. As a result, there would be two different rates that could apply to the circuits between offices in Ohio and Kentucky. This is problematic and I do not believe it is appropriate at this time to mix Ohio to Ohio circuits with Ohio to Kentucky circuits.

CONCENTRATION RATIOS FOR DEDICATED INTEROFFICE CIRCUITS

Q. Mr. Gose recommends the use of a "concentration ratio" in calculating the cost of dedicated interoffice circuits. Is this recommendation appropriate?

A. No. The application of a concentration ratio is not appropriate in a cost study for dedicated interoffice circuits. CBT's interoffice cost study is based on the total demand for interoffice circuits, consisting of both switched and dedicated interoffice circuits. The number of circuits associated with CBT's switched traffic is determined through traffic engineering studies performed by CBT to achieve an acceptable grade of service. Once the number of switched circuits is determined, this number is fixed and the circuits that carry switch traffic are in effect dedicated circuits between switches. At this point, concentration is irrelevant.

Q. Does CBT use concentration ratios in any of its unbundled network element studies?

A. Yes. Concentration ratios are applied in the development of the unbundled port switching costs. Concentration ratios arise from the fact that on the customer side of

the central office switch, the customers share the use of the switch resources. For example, a 4-to-1 concentration ratio means that if more than 1 out of 4 customers attempt to utilize the switch simultaneously, then the next customer will not have access to the central office switch. One result of this could be that a customer may receive a delayed dial tone. The concept of concentration arises because customers are sharing the use of the switch resources. The concentration ratios used by CBT can be seen in the inputs to the Switching Cost Information System, (SCIS) model for developing switch related costs.

Q. Why is the concept of concentration ratios not appropriate for dedicated interoffice circuits?

A. As I just explained, a concentration ratio implies a sharing of resources. A dedicated interoffice circuit, however, is dedicated entirely to a single customer and there is absolutely nothing to share between customers. For example, in the case of a dedicated DS1 interoffice circuit, the customer has dedicated use of the specific electronics equipment used to provide this circuit and dedicated use of one DS1's worth of bandwidth. No other customer has access to this equipment or facilities even if the dedicated DS1 customer purchases the circuit and never transmits any data over this circuit. In fact, customers who purchase dedicated circuits expect total control and use of the circuit they have purchased. Hence, it is appropriate to assign 100% of the cost of this equipment and facilities to this dedicated circuit. A concentration ratio simply does not apply in this situation and is not relevant to any calculation of the cost of a dedicated interoffice circuit.

ENTRANCE FACILITIES

Q. In his Supplemental Testimony, Mr. Starkey claims that CBT has "too narrowly defined the concept of an entrance facility." Is this true?

A. No. The definition of the entrance facility can be found in CBT's Interconnection Agreements. For example, the MCI Agreement, in Schedule 9.2.4, states that an "'Unbundled dedicated entrance facility' is a dedicated facility connecting CBT's transmission equipment in an CBT Central Office with MCIm's transmission equipment in MCIm's Switching Center for the purposes of providing Telecommunications Services." This definition is consistent with the cost studies that CBT performed in its various Entrance Facilities cost studies. CBT's Entrance Facilities cost studies are also consistent with the types of equipment that CBT expects to use when provisioning Entrance Facilities to NECs. For example, CBT expects that all NECs will want entrance facilities provisioned on fiber optic cables because of their demand for services but also because of the reliability of fiber optic cable facilities. CBT sees evidence of the use of fiber by the NECs in that all NECs who are currently collocating have brought fiber optic cables to CBT's central offices. No NEC has pulled copper cable to CBT's central offices. It is for this reason that CBT would not develop an Entrance Facilities cost based on technologies such as HDSL since these are copper cable based technologies and are typically used for small numbers of DS1 circuits to a customer's premises.

Q. Ms. Soliman of the Commission Staff recommends that the Entrance Facilities

rate structure be deaveraged so that distinct rates are created for the three different serving technologies that are assumed in the cost study. Do you have any concerns with this recommendation?

A. Yes. Some of CBT's concerns center on administrative issues such as the special billing treatment that this would cause, but CBT has not had sufficient time to investigate these issues. However, if the Commission orders such a rate structure, CBT should have the option to modify its cost studies to be consistent with this approach. For example, if a "pure" point-to-point dedicated entrance facility is offered, then this facility is essentially dedicated to a NEC and the NEC should pay for its entire cost. Therefore, the cost should be developed to assign 100% of the facility and equipment's cost to the NEC. In this manner, the cost would not be based on an estimated number of circuits provisioned over the facility.

UNBUNDLED TANDEM SWITCHING

Q. Commission Staff witness Soliman's testimony questioned whether CBT provided a TELRIC study for unbundled tandem switching. Has CBT provided a TELRIC study for unbundled tandem switching?

A. Yes, CBT's cost for unbundled tandem switching was provided as CBT Exhibit 8-16

Q. Does CBT's tandem switching element meet the requirements for tandem switching capability as defined by the FCC's in 47 C.F.R. §51.319(c)(2), and the FCC First Report and Order in CC Docket 96-98, ¶ 425?

A. Yes, CBT believes its tandem switching cost study captures the TELRIC cost of

trunk to trunk switching through its access tandem switch regardless of whether a call terminates in operator services or at an end office. Additionally, CBT does not offer any other tandem switching options or features. This is consistent with the tandem switch that is offered in CBT's Access Tariff.

LOOP TRANSPORT COMBINATION

Q. During cross-examination, Mr. Starkey claimed that too much FLM transmission equipment is included in a loop transport combination? Is Mr. Starkey's claim correct?

A. No.

Q. Please explain why this equipment is required for the loop transport combination.

A. The FLM transmission equipment is used on all interoffice SONET rings and can also be used for loops served by a digital loop carrier system. CBT does not double recover FLM equipment in its loop transport combinations. Mr. Starkey's claim overlooks the fact that FLM equipment on two distinct SONET rings is required for loop transport combinations. These two rings do not and cannot share the same FLM equipment. CBT provides the loop transport combination by cross-connecting FLM equipment on a loop ring with FLM equipment on an interoffice ring. This equipment is located in the same central office. Of course, there is a third piece of FLM transmission equipment located in the distant central office where the loop transport combination is handed to a collocating NEC.

COLLOCATION

Q. In your cross examination by MCI, there was discussion as to the amount of collocation space in the West 7th Street Central Office. How many collocation spaces are there in the West 7th Street Central Office?

A. There are ten collocation spaces in the West 7th Street Central Office.

Q. What is the total square feet of the collocation area in the West 7th Street Central Office?

A. The total square feet of the collocation area in the West 7th Street Central Office is 1,780. This shows how the common area factor for West 7th Street arises as 1,780 / 1,000 = 1.78.

Q. What would the Central Office Build Out cost for the West 7th Street Central Office be on a per square foot basis?

A. The Central Office Build Out cost for the West 7th Street Central Office per square foot is $163. This is calculated as $290,560 (total COBO cost) / 1,780 (total sq. ft. of collocation area) = $163

Q. During cross-examination of Dr. Ankum, there was discussion of electrical work and the various rate elements related to power. Please describe the rate elements that recover power related costs.

A. There are three rate elements where electric and power related costs are recovered. The first is the Power Consumption rate element which is charged on a per amp basis.

This recovers the cost of the DC power plant, the emergency AC power plant, and the cost of commercial power that is used to feed the DC power plant. The Power Lead Delivery rate element is solely the cost of the power leads that connect the power distribution panel located in CBT's portion of the collocation area to the collocator's cage. This rate element is charged on a per power lead basis. Finally, the Central Office Build Out rate element recovers various electrical and power related costs. The electrical work covers various electrical work for items such as security, lighting, and providing a common ground to the collocation area. This work could have been performed in the collocation area but also in the basements of the central offices where collocation exists because that is where the power will typically enter the building. The Central Office Build Out rate element also includes the cost of the cables from the power plant in the basement to the power distribution panel that is located in CBT's portion of the collocation area. There is no overlap between these three charges

Q. In Mr. Gose's testimony, he claims that CBT "gerrymandered" the collocation conduit data pool by drawing information from central offices with higher conduit costs, rather than using the conduit costs from the Avondale, Evendale and Rossmoyne Central Offices. Did CBT gerrymander the input data to the collocation conduit cost study?

A. No, CBT did not gerrymander the input data to the collocation conduit cost study. At the time the collocation conduit cost study was performed, CBT used a sample of

the most recent conduit jobs as the basis for its cost study. CBT's conduit engineer gathered those jobs completed in the previous year which provided a good representation of typical conduit jobs. He removed jobs where CBT encountered excessive costs due to extraordinary items such as severe traffic restrictions during the conduit placement or the existence of excessive rock. At the time, there were no conduit jobs for Avondale, Evendale, or Rossmoyne. CBT will look at the most recent conduit jobs to determine if there have been any jobs done for Avondale, Evendale and Rossmoyne since the time that the sample was gathered. If there have been, CBT will include those jobs in the compliance conduit cost study. In a preliminary discussion with CBT's conduit engineer, he indicated that there was a strong possibility that there will be no recent jobs for these offices.

DIRECTORY LISTINGS COST STUDY

Q. One of the inputs to the Directory Listings cost study is the projected demand. The study submitted by CBT assumed 3 customers where one of the customers was a third party who would create a data base that would allow an NEC to dip this data base for listings. Has any NEC started using this service?

A. No. Although CBT initially included this third party in its demand, no NEC has come forward to subscribe to this service. As a result, this option has yet to be implemented. Therefore, CBT has not realized its projected demand forecast.

INTERIM NUMBER PORTABILITY

Q. On page 88 of his Direct Testimony, Mr. Gose suggests that CBT recover its

costs of providing interim number portability in Butler County in a competitively neutral manner. Is his statement relevant to this proceeding?

A. No, it is not. Permanent number portability is currently available in Butler County. CBT equipped its Butler County switches for LNP at the same time that it equipped its other switches. Although CBT's switches in Butler county are LNP capable, LNP is not activated in a Butler County central office switch until a bona fide request is received. The first request was received in late December, 1998, and LNP was activated in the Crescentville switch on March 1, 1999. This date was within sixty days of the request, as was agreed upon in the Ohio local number portability workshops. Since interim number portability will not be available, this issue is moot.

INTEROFFICE & ENTRANCE FACILITIES NON-RECURRING STUDIES

Q. **On page 58 of his Supplemental Testimony, Mr. Starkey claims that CBT's non-recurring cost studies for OC-3, OC-12, OC-48, DS1, and DS3 entrance facilities and interoffice services are inflated due to the omission of NGDLC technology from its study assumptions. Do you believe this to be the case?**

A. No. First of all, NGDLC can only be used to provide a DS1 or a DS0 on the line side of the switch. Thus the only study that could possibly be impacted by Mr. Starkey's allegation is the DS1 entrance facility study. However, CBT makes limited use of NGDLC for providing DS1 entrance facilities. Second, CBT's non-recurring cost studies were designed to recover the costs of service order initiation, engineering, design, and testing of circuits. No costs were included for the installation of equipment, NGDLC or otherwise. Therefore, the question of whether NGDLC is

used to provide facilities does not apply to CBT's non-recurring cost studies.

NONRECURRING COST STUDY ISSUES

Q. Mr. Francis recommends in his Testimony that CBT not recover any costs associated with the qualification process if it is required when a NEC orders an unbundled loop. Do you agree with this recommendation?

A. No. The qualification process is required when a NEC orders a loop that may require additional conditioning in order to provide the requested loop. For example, it may be necessary to provide loop repeaters or special digital loop carrier line cards, which are knows as BRITE cards, for loops that will provide ISDN service. The qualification process determines if this equipment is required. Because CBT incurs this cost for providing these loops, it is appropriate for CBT to recover this cost. CBT incurs this cost when it qualifies loops for its retail services and it is appropriate to recover this cost when it is incurred for its wholesale services.

Q. Do you believe that the NEC benefits from the rate structure that CBT has proposed for conditioned loops?

A. Yes. I will explain why using the ISDN loops as an example. CBT has separated the monthly conditioning charges from the basic loop charge so that a NEC need not pay for conditioning if it is not required. In the case of ISDN loops, a NEC may not need additional repeaters or BRITE cards. As a result, the NEC will pay the same rate as for a Basic Voice Grade loop if the loop can provide ISDN service without the additional conditioning. However, CBT does not know if a loop meets the standards

FACTR equipment, which is NGDLC compatible, is located on the feeder side of the serving area interface (SAI). In the course of completing a service order for new loop installations, a field technician must be dispatched to make a physical connection between the feeder cable and the distribution cable at the SAI, as well as subsequent connections as required at pedestals, splice cases, or terminals. The connections at the SAI are not made until specific pairs are assigned in order to make more efficient use of these facilities. As a result, the cost of these connections is not included in the monthly cost study for unbundled loops and must be included in the nonrecurring cost for installing a new loop, where a new loop is a loop that does not provide service to an existing customer.

Regardless of the need to make a physical connection by placing jumpers in the distribution plant, any new loop will require a field visit in order to install a drop or, at a minimum, connect the additional pair to the drop terminal at the customer premise. Therefore, there is no basis for a 50% reduction in the cost for dispatching a field technician.

Q. The Direct Testimony of Commission Staff witness Francis includes a recommendation that the Loop Assignment Center (LAC) costs be developed on a per-occasion, per- location basis taking multi-loop orders into consideration. Does CBT agree with this recommendation?

A. Yes. CBT agrees with the Staff's recommendation and made this same proposal to recover the LAC costs for establishment of a new unbundled loop on a per order

basis in Mette's Supplemental Testimony in Exhibits 13 and 14. The LAC costs are levied once per order regardless of the number of items ordered .

Q. If NECs submit orders electronically for unbundled network elements, are there any changes in the work functions performed by the LAC?

A. No. The work functions performed by the LAC are not affected by a NEC submitting an order electronically. The LAC functions are downstream from the ordering process and the same functions would occur if the order is submitted electronically or manually.

Q. In regard to the disparity reflected in Commission Staff's witness Francis' testimony related to central office technician work required to complete a line connection, could you please explain CBT's assumptions and why there are two different time estimates for seemingly the same work performed?

A. As correctly stated in Mr. Francis' testimony, the work performed by the CTO central office technician is the same whether the order is for a new loop or the migration of an existing loop. In both cases, the technician will perform central office work to connect the unbundled loop to NEC facilities. The work functions are different, however, when consideration is given to the need for service coordination between the NEC technician and CBT technician. For a new unbundled loop, there is no service coordination required because there is no customer service that can be interrupted. In other words, CBT's central office technician will perform the cross-

connect for a new loop in conjunction with other service orders and is not constrained by meeting a NEC technician schedule.

For a migrating loop, however, a top priority is to ensure that the migrating customer is not out of service for an extended period of time. Therefore, the NEC and CBT technicians will coordinate their schedules which requires that the CBT technician be at the migrating customer's central office at the cut-over time. CBT's technicians receive the day's work orders at the beginning of their tours and organize them to most efficiently complete the orders with minimal time spent moving between locations. As all CBT's central offices are not manned, CBT's technicians may be required to travel between offices in an inefficient manner to accommodate NEC technicians. The additional work time included in the loop migration charge is meant to capture this additional time.

MANUAL & ELECTRONIC NONRECURRING RATES

Q. The Commission Staff recommends that two sets of nonrecurring rates be developed. One rate would cover the case when a NEC places a manual order for an unbundled network element. The other rate would cover the case when a NEC places an electronic order for an unbundled element. Do you have any concerns with this recommendation?

A. Yes. My concern is that the interface guidelines for the electronic interface are established within the Telecommunications Industry Forum (TCIF) of the Alliance for Telecommunications Industry Solutions (ATIS) and not by CBT. These standards

are called the Local Service Ordering Guidelines. Since these guidelines define what services can be ordered electronically, it may be possible that there are unbundled elements that do not have electronic ordering interface guidelines defined. If this is the case, then CBT should only provide a manual rate for those UNEs. I recommend that when CBT provides its compliance cost studies, that CBT only provide manual rates for unbundled elements for which there are no electronic guidelines defined. It will be CBT's burden to provide the necessary documentation that verifies which unbundled elements do not have electronic interface guidelines defined.

TIME & MOTION STUDIES

Q. Commission Staff witnesses Francis and Soliman have recommended that time-and-motion studies be completed to provide work times to be used in developing nonrecurring costs associated with unbundled network elements. What are CBT's objections to this recommendation?

A. CBT believes that requiring time-and-motion studies for each unbundled network element is inappropriate for several reasons. First, time-and-motion studies are typically associated with analyzing work flows for high volume, standardized tasks. As CBT is a mid-sized company and the provisioning of unbundled network elements is not highly standardized, trying to capture the complexities of completing orders for unbundled network elements within a time-and-motion study would require an inordinate amount of time and expense. CBT has not performed any analysis to determine what would be the necessary number of observations. However, a

statistical sampling process often requires numerous observations, possibly more than 100. Given that there are nearly 40 nonrecurring rate elements, there could be thousands of observations needed. Personnel do not exist who could independently observe all of the steps that are required to complete nonrecurring orders for unbundled elements. CBT would have to hire personnel who are familiar with the various work functions ranging from the order taking process to the field installation process so that the proper observations of the tasks are made. For these reasons, CBT suggests that if some type of study is required, then these studies should be based on self reporting of the times required to perform the various functions. Also, certain unbundled network elements are not expected to be ordered with any frequency. For example, based on the comments made during this proceeding, no NEC has indicated strong interest in unbundled ports because the NECs are installing their own central office switches. Also, CBT provisions all installations of OC-3, OC-12, and OC-48 entrance facilities during the night when there is less chance of impacting existing traffic. Therefore, time-and-motion studies would be completed at a significant cost without providing a significant benefit.

ANNUAL CHARGE FACTORS

Q. CoreComm witness Gose states on page 20 of his Direct Testimony that CBT has used prescribed depreciation lives for its retail services. Is this correct?

A. No. The depreciation lives used for CBT's retail services cost studies are identical to the lives proposed by CBT for its TELRIC cost studies. In both cases these are the economic lives proposed by CBT. These lives were provided in response to PUCO

classifications available is specific for the telecommunications industry. A check of the web site information indicates that CBT's wage increases are lower than the average increase experienced by the communications industry as a whole. CBT's cost studies include labor inflation of approximately 3.5% per year. The Bureau of Labor Statistics web site shows that Total Compensation for communications workers increased by 2.2% in 1997 and 5.7% in 1998. This results in an annual average increase of 3.9%. Hence CBT's labor rate index is reasonable compared to that experienced in the communications industry.

UNBUNDLED AIN ELEMENTS

Q. What is CBT's recommendation with respect to providing a TELRIC cost study for Advance Intelligent Network (AIN) services?

A. Although CBT and MCI had been working together through an implementation team to determine what AIN elements need to be provided, this effort has stopped with no communication between the companies on this issue for over one year. My understanding is that this implementation team approach was taken because of the numerous operational and technical issues associated with providing unbundled access to the AIN platform. For example, I am told that there are network compatibility issues that will need to be addressed when providing access to the AIN platform and there are security issues related to protecting both CBT's and the NEC's software code should an NEC desire access to the Service Creation Environment. CBT does plan to offer access to its AIN platform, but the degree and nature of the access will depend upon each individual NEC and the manner in which

they will use the AIN platform. As a result, CBT has not started work on developing any cost studies for unbundled AIN services, and I do not believe that it is feasible to provide a cost study for these services until the technical and operational issues are resolved as they will likely have cost consequences. Therefore, CBT suggests that a cost study for AIN services is deferred until CBT has a bona fide request for a particular use of the AIN platform.

CONCLUSION

Q. Would you please summarize your testimony?

A. Yes. I have reviewed various TELRIC related issues raised by the parties in this proceeding. In each case, I have reviewed CBT's position and demonstrated why CBT's position is the appropriate response to the specific issue.

Q. Does that conclude your testimony?

A. Yes, it does.

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Cable Breakage Impact

Minimum Pairs Required	Maximum Pairs Required	Average Number of Customers Served	Required Cable Size	Fill Factor
A	B	C	D	E=C/D
1	25	12.5	25	50.0%
26	50	37.5	50	75.0%
51	100	75.0	100	75.0%
101	200	150.0	200	75.0%
201	300	250.0	300	83.3%
301	600	450.0	600	75.0%
	Total:	975.0	1,275.0	
		Breakage Factor:	**76.5%**	
		(=Total C / Total D)		

DIGITAL LOOP CARRIER ELECTRONICS FILL FACTOR

Year	Month	Trend Value	Fill	Projection
1992	12	0	61.2%	59.2%
1993	9	9	60.6%	60.1%
1994	9	21	55.0%	61.3%
1995	9	33	65.8%	62.5%
1996	12	48	64.3%	64.1%
1997	3	51	64.2%	64.4%
1997	6	54	65.6%	64.7%
1997	9	57	64.6%	65.0%
1998	3	63	66.0%	65.6%
1998	6	66	65.9%	65.9%
1998	12	72	65.9%	66.5%
1999	12	84		67.7%
2000	12	96		68.9%
2001	12	108		70.1%
2002	12	120		71.4%
2003	12	132		72.6%
		1999 - 2003 Average Fill:		**70.1%**

SUMMARY OUTPUT OF EXCEL TREND ANALYSIS

Regression Statistics	
Multiple R	0.715410944
R Square	0.511812818
Adjusted R Square	0.457569798
Standard Error	0.025054734
Observations	11

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.00592307	0.00592307	9.435551648	0.01331662
Residual	9	0.005649657	0.00062774		
Total	10	0.011572727			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	Upper 95%
Intercept	**0.5918674**	0.016101449	36.7586443	4.04427E-11	0.555443406	0.628291479
X Variable 1	**0.0010136**	0.000329985	3.07173431	0.01331662	0.000267147	0.001760102

The trend value starts at 0 for December of 1992 and increments by 1 for each subsequent month. The projection value is calculated as the Intercept Coefficient plus the X Variable Coefficient multiplied times the Trend Value.