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Confidential direct testimony of Michael Starkey filed on behalf of MCI Telecommunications Corp. (87 pgs)

MCI Ex. 20

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	)	Case No. 96-899 TP-ALT

DIRECT TESTIMONY OF MICHAEL STARKEY
ON BEHALF OF
MCI TELECOMMUNICATIONS CORPORATION

CONFIDENTIAL VERSION

DECEMBER 23, 1997

Q. Please state your name and business address for the record.

A. My name is Michael Starkey and my business address is as follows: Competitive Strategies Group, Ltd., 70 East Lake Street, Seventh Floor, Chicago, Illinois 60601. I am a Principal member of Competitive Strategies Group, Ltd. ("CSG"), a Chicago-based telecommunications and economics consulting firm. I currently serve as Vice President of the firm's Telecommunications Services Division.

Q. Please describe your background and your professional experience.

A. Prior to joining CSG I was most recently employed by the Maryland Public Service Commission as Director of the Commission's Telecommunications Division. Prior to joining the Maryland Staff I was employed as Senior Policy Analyst of the Illinois Commerce Commission's Office of Policy and Planning. I began my career as an Economist with the Missouri Public Service Commission within the Commission's Utility Operations Division-Telecommunications Department.

In the course of my work with CSG's clients and the utility commissions identified above I have participated in a number of proceedings involving the regulation of telecommunications services. I have testified on a variety of issues including alternative regulatory frameworks, the introduction of local exchange competition, area code number exhaust, competitive market measurement, the structuring of switched access charges and most recently implementation of the pro-competitive policies embodied in the Telecommunications Act of 1996 ("TA96" or "the Act"). I have throughout my career analyzed and critiqued a

number of telecommunications cost studies (TSLRIC, LRIC, TELRIC, embedded, etc.) including studies presented by Ameritech, Southwestern Bell, U.S. West, NYNEX, GTE, Bell Atlantic, Bell South, United Telephone Systems (Sprint), and a number of other smaller telephone carriers. A more detailed listing of my experience and my educational background is included with this testimony as Attachment MS-1.

Q. Have you previously testified before the Public Utilities Commission of Ohio ("Commission")?

A. Yes, I have testified before this Commission on a number of occasions. I have also provided testimony before the FCC and a number of other state jurisdictions including Missouri, Illinois, Maryland, Michigan, Wisconsin, Indiana, New Jersey, Pennsylvania, Massachusetts, Wyoming, Hawaii, Georgia, Oklahoma and Mississippi.

Q. On who's behalf are testifying in this proceeding and what is the purpose of your testimony?

A. My testimony is provided on behalf of the MCI Telecommunications Corporation ("MCI"). The purpose of my participation in this proceeding has focused on reviewing the cost study documentation provided by Cincinnati Bell Telephone ("CBT") in support of its rates for unbundled network elements and interconnection services. The purpose of my review and my testimony is to ensure that CBT's proposed prices for network elements and interconnection services are consistent with the Telecommunications Act of 1996 and the

Commission's "Local Service Guidelines" promulgated in Case No. 95-845-TP-COI.

Q. Did you participate as a witness in this Commission's arbitration of unresolved issues between MCI and CBT in Case No. 97-152-TP-ARB?

A. Yes, I did.

Q. Were the costs and prices for CBT's unbundled network elements and interconnection services an issue in that proceeding?

A. Yes, they were. However, given the substantially constrained timeframe within which that arbitration was required to be completed, a thorough review of CBT's cost studies supporting its proposed rates was not possible at that time. Hence, the Commission provided in this proceeding the opportunity to gather the information necessary to more thoroughly analyze CBT's studies and determine the extent to which they comply with the Act and the Commission's Local Service Guidelines. It is my understanding that the Commission will, via this proceeding, establish rates for unbundled network elements and interconnection services which will replace the "interim" rates resulting from Case No. 97-152-TP-ARB.

Q. Can you describe your review of the CBT cost studies?

A. Yes, I can. Over the past few months members of CSG have undertaken a detailed examination both of CBT's alternative regulatory proposal as well as the cost studies presented in support of CBT's proposed rates for unbundled

network elements and interconnection services. We have also had an opportunity to review the *Staff Report of Investigation* ("Staff Report") issued by the Commission's Staff on November 17, 1997. During our review of the Staff Report and CBT's underlying Total Element Long Run Cost ("TELRIC") studies, we found a number of areas wherein we agree with the Staff's analysis. We also, however, have identified additional areas of concern wherein it appears obvious that CBT has departed from the standards embodied in the Telecommunications Act of 1996 and the Commission's Local Service Guidelines. CBT's departure from those standards has resulted in proposed costs and rates that far exceed CBT's actual forward looking economic costs for the provision of unbundled network elements and interconnection services. CBT's departure from the Act and the Commission's guidelines and the extent to which that departure results in overstating costs and rates for unbundled network elements and interconnection services are the primary focus of my testimony.

Q. Does your testimony include the entirety of MCI's concerns regarding CBT's TELRIC studies and the proposed rates they are meant to support?

A. No. Mr. Brad Behounek, a Senior Consultant with CSG, is also filing testimony on behalf of MCI. His testimony addresses additional areas within CBT's studies that MCI believes lead to inaccurate and overstated TELRIC costs. Ms. Charlotte TerKeurst has also filed testimony in this proceeding on behalf of MCI, however, her testimony focused primarily on issues surrounding CBT's proposed alternative regulatory structure.

Q. Does MCI's testimony address each unbundled network element and/or interconnection service offered by CBT?

A. No. Resource constraints have required that MCI's analysis and testimony focus only on those issues most directly affecting its provision of competitive local exchange services in CBT's service territory. Specifically, MCI's testimony regarding CBT's proposed prices for unbundled elements and interconnection services focuses solely on the following areas:

AREA OF CONCERN	TESTIMONY
1. UNBUNDLED LOOP	
- STUDY PARAMETERS	
De-averaging by Band	Starkey
- LOOP DESIGN / CONSTRUCTION	
Structure Investment Factors	Starkey
Fill Factors (Utilization)	Starkey
Electronic Circuit Equip.	Starkey
Miscellaneous Cable Costs	Starkey
- FACTORS	
Land and Buildings Factor	Behounek
Miscellaneous Common Equipment and Power Factor	Behounek
Annual Charge Factors	Behounek
2. NON RECURRING COSTS	
Loop Establishment Charge	Starkey
Service Order Charge	Starkey
Line Connection Charge	Starkey
Loop Conditioning Charges	Starkey
3. COLLOCATION CHARGES	Starkey
5. COMMON COSTS	Behounek

I. UNBUNDLED LOOP

Q. Please summarize your concerns regarding CBT's TELRIC studies which estimate costs for unbundled loops?

A. After reviewing CBT's unbundled loop studies, the Staff Report, significant amounts of discovery and observing the deposition of CBT's lead cost witness Mr. Norbert Mette, I have the following concerns:

a. In an attempt to capture disparate costs associated with loops provisioned within differing geographic regions of CBT's service territory, CBT measures loop costs in three distinct "rate bands." An analysis of CBT's cost studies indicates that the primary variable influencing the level of loop costs within each rate band is the average length of the loops included in that band. CBT's choice of end office groupings indicates a wide disparity of loop lengths within its most densely populated band (Band 1) indicating that a more consistent distribution of end offices amongst bands may result in a more accurate representation of loop costs.

b. Several of CBT's assumptions regarding the construction and design of its unbundled loops fail to meet the requirements of the Act and the Commission guideline's regarding a "forward looking...currently available" network design. More specifically:

i. CBT's development of its telephone pole and conduit investment factors suffer from two major errors, (1) CBT includes in its calculations investments associated with its Kentucky and Indiana operations, and (2) CBT fails to consider the fact that pole and conduit structure investment is not 100% incremental to CBT services using aerial and underground cable (i.e. loop services).

ii. In estimating the percentage of its forward looking network design that will be filled with network usage, CBT fails to recognize the most efficient use of its network resources. As a result, the "fill factors" used within CBT's unbundled loop study significantly underestimate the level of utilization that can be achieved and maintained for its facilities.

iii. CBT includes within its unbundled loop study investment related to advanced digital loop carrier ("DLC") equipment. However, in designing its unbundled loops CBT fails to incorporate many of

the cost saving characteristics of the advanced DLC equipment it has assumed. Instead, CBT incorporates additional costs (costs in addition to the premium paid for the advanced DLC system) associated with less efficient equipment and processes. In addition to this error, CBT, within its unbundled loop study, fails to account for contract discounts it receives from its DLC vendor in purchasing the DLC equipment.

iv. Many of the "cost factors" included within CBT's studies are overstated. Mr. Behounek addresses these concerns in his testimony.

v. There are a number of miscellaneous areas within CBT's derivation of its cable costs that are either largely unsubstantiated or unreasonably exaggerated.

I.a. RATE BAND GROUPING

Q. Please describe the CBT loop sample and explain its significance?

A. In an effort to estimate the costs incurred in providing loops within its current service territory, CBT undertook a sampling of its current loop plant to determine its average loop characteristics. The primary focus of the sampling effort was aimed at determining the average loop length per loop segment (loop segments within the CBT sample were generally distinguished as loop feeder and loop distribution) within disparate geographic bands and amongst service types (i.e. business and residence loops). CBT performed its loop sample by examining the characteristics of approximately 929 individual business and residence loops from central offices located in four general geographic areas:

(1) its West 7th central office in downtown Cincinnati (serving approximately 11,712 loops per square mile),

(2) Rate Band 1 - central offices included in its most urban areas excluding its West 7th office (exhibiting density characteristics ranging from 4,459 loops per square mile to 647 loops per square mile),

(3) Rate Band 2 – central offices outside of its most urban areas (including density characteristics ranging from 633 loops per square mile to 86 loops per square mile), and

(4) Rate Band 3 – central offices in its more rural areas (exhibiting density characteristics ranging from 81 loops per square mile to 17 loops per square mile).

After performing its loop sample in this fashion, the decision was made by CBT to combine the loops sampled from the West 7th central office with the loops sampled from within Band 1. This combination of the West 7th office and the original Band 1 offices comprised the Band 1 grouping proposed by CBT in this proceeding. Using this newly structured Band 1 sample, CBT devised loop segment length characteristics based upon three geographic areas, Band 1, Band 2 and Band 3. These loop segment length characteristics were included within the Loop Cost Analysis Tool ("LCAT") used by CBT to estimate its loop costs.

Q. Can you describe your concerns regarding CBT's loop sample and its use in establishing rate bands for estimating loop segment length?

A. My concern regarding CBT's choice of placing particular central offices within specific rate bands centers on CBT's choice to include the West 7th central office in Rate Band 1 after having sampled it separately. More specifically, my analysis of CBT's loop sample data suggests that a more efficient manner of grouping central offices with respect to loop length differences could be accomplished. My recommendation in this respect would be to separate the West 7th central office as its own rate band (Rate Band 1) and then combine the

remaining offices of CBT's proposed rate Band 1 with its offices designated as Rate Band 2. Rate Band 3 would remain as proposed by CBT.

Q. Why would you recommend that changes be made to CBT's proposed Rate Bands 1 & 2.

A. It seems apparent that CBT's original sampling method recognized, at least intuitively, that the West 7th central office exhibited loop length (and hence loop cost) characteristics significantly different than those in any other central office. For example, CBT's information shows that the West 7th Central office provisions 11,712 loops per square mile compared to the Avondale exchange (CBT's second most densely serviced exchange) provisioning 4,459 loops per square mile. While 20 CBT central offices service between 1,000 and 4,000 loops per square mile, no other office comes close to the West 7th office with respect to density. The same can be said for corresponding loop lengths. The average combined loop length within the West 7th central office was significantly shorter than loops sampled within other central offices in Rate Band 1. For example, the average copper business loop within the West 7th central office had a composite length of 4,502 ft. compared to 7,105 ft. for similar loop types in other Band 1 exchanges: nearly 65% shorter.

These differences in loop length result in significant differences in estimated costs for a given loop. CBT's proposal to average loop lengths from its West 7th central office with much less densely populated central offices serves only to mask the actual loop costs in its most densely populated areas. This is

inconsistent with an effort aimed at grouping loops to the extent possible on similar loop cost characteristics. This point is probably best made by analyzing the results of implementing my recommendation made above. Assuming that the Commission were to implement my recommendation above (i.e. separate the West 7th central office into its own rate band and combine the remaining rate band 1 exchanges with rate band 2), the actual average loop length would drop not only for the newly designed Rate Band 1, but also within the newly designed rate Band 2. For example, the following table compares the average loop lengths resulting from the use of CBT's proposed rate bands as well as the groupings I have described above:

	CBT Proposed Copper	MCI Proposed Copper	CBT Proposed DLC	MCI Proposed DLC
RATE BAND 1				
Residence	7,184*	7,201	17,227	13,130
Business	6,403	4,502	15,676	13,512
RATE BAND 2				
Residence	8,533	7,947	22,281	20,480
Business	6,522	5,135	23,770	16,008

* all measurements are in feet

Simply by redesigning both Rate Band 1 and Rate Band 2 to more effectively group central offices exhibiting similar loop characteristics, the average loop length within each band is lowered compared to CBT's original groupings. This alone is a clear indication that CBT's proposed grouping inaccurately averages central offices exhibiting significantly disparate loop cost characteristics. For this reason the Commission should require the following modifications to the CBT study:

1. CBT should be required to revise its proposed rate bands establishing loops provisioned solely from its West 7th C.O. as Rate Band 1 loops.

2. Recombine all other current Rate Band 1 offices with offices currently included within Rate Band 2 to form a new Rate Band 2.

3. Repopulate the LCAT model replacing its current loop length inputs with the average loop segment lengths that result from the reclassification described above (as specified under the headings "MCI Proposed" in the table above). Likewise, CBT should repopulate its unbundled loop study to incorporate the percentage of Copper Loops and DLC loops included in each restructured rate band.

I.b. LOOP CONSTRUCTION AND DESIGN

STRUCTURE INVESTMENT FACTORS

Q. Can you describe the way in which CBT derives investment associated with telephone poles and conduit systems in its unbundled loop study?

A. CBT derives a separate "Support Structure Investment Factor" for both its telephone poles and its conduit systems. In essence, each factor represents the relationship of support structure investment currently booked (either pole or conduit), compared to the currently booked investment in cable (either aerial or underground) that requires the particular support structure. For example, because aerial cable requires telephone poles to support its placement, the telephone pole factor is determined by calculating CBT's total booked investment in telephone poles compared to CBT's total booked investment in aerial cable (both copper and fiber). The resulting factor is then multiplied by the total amount of aerial cable investment required to provision a given loop to arrive at a per loop investment associated with telephone poles. The same

relationship is used for conduit system investment and underground cable to arrive at a conduit factor.

Q. Do you have concerns regarding CBT's pole and conduit factors?

A. Yes, I have two major concerns with CBT's calculation of its pole and conduit factor. First, CBT does not remove from its pole and conduit factors investment associated with its other jurisdictional service areas. Additional analysis shows that including CBT's investments associated with its less urban Kentucky and Indiana service areas upwardly skews the pole and conduit factor required for its Ohio service territory. Second, CBT's method of calculating its pole and conduit factors fails to recognize that its telephone pole and conduit system costs are incremental to other services in addition to those supported by aerial and underground cable. CBT's failure to allocate a portion of its telephone pole and conduit investment to these other services (i.e. pole attachment and conduit occupancy services offered to cable television providers and competitive carriers) serves to inappropriately allocate the entirety of its investment associated with telephone poles and conduit to its loop and transport services which require the use of aerial and underground cable.

Q. Can you describe in more detail your concern regarding CBT's use of non-Ohio investments in its pole and conduit factor calculations?

A. CBT's telephone pole and conduit factors are based upon CBT's total booked investment in those facilities, including investment from its less densely populated Kentucky and Indiana exchanges. Further analysis of CBT's

underlying workpapers supporting its telephone pole and conduit factors shows that by removing non-Ohio investments, CBT's telephone pole factor for aerial cable falls significantly (nearly 22% for aerial fiber cable). Likewise, removing non-Ohio investments from CBT's conduit factor calculations lowers slightly its factor associated with copper cable while raising slightly its factor for underground fiber cable.

Q. Did the Staff also voice a concern regarding the inclusion of non-Ohio facilities and investments in its pole and conduit factor?

A. Yes, at page 89 of the Staff Report, Staff voiced much the same concern regarding the inclusion of Kentucky and Indiana investments in calculating CBT's telephone pole and conduit factors. Staff recommended that CBT be required to recalculate its pole and conduit factors after having removed investments associated with non-Ohio facilities because it believed those non-Ohio facilities may well be overestimating the pole and conduit factors required to recover Ohio specific investments. My initial analysis regarding the effects of removing non-Ohio investments (included as Attachment MS-2) from the pole and conduit factor calculations confirms the Staff's concerns. It seems clear that non-Ohio investments are indeed overestimating CBT's Ohio specific pole and conduit investment factor calculations, in some cases to a significant degree.

Q. Would you recommend that the Commission simply adopt your recalculated pole and conduit factors included in Attachment MS-2?

A. No. Like the Staff I also had difficulty isolating total Ohio specific investments in telephone poles and conduit. To remedy this problem my analysis makes a simplifying assumption that each pole and foot of conduit generally adds an equal amount of investment to CBT's total investment in those facilities. Using this assumption I attempted to isolate CBT's total Ohio investment in poles and conduit by proportionally allocating investment based upon the number of poles and conduit feet in each jurisdiction. While my analysis provides a proxy distribution of total investment, it likely is deficient in recognizing that the investment associated with poles and/or conduit in CBT's more rural service areas in Kentucky and Indiana contribute higher per pole and conduit investments than do similar investments in its Ohio exchanges. Therefore, it is likely that my analysis is unnecessarily conservative. For this reason, CBT should be required to recalculate both its pole and conduit factors in an effort to establish Ohio specific ratios based upon more detailed accounting records which adequately allocate investments and cable pair miles amongst its jurisdictions.

Q. Can you describe in more detail your concerns regarding CBT's failure to allocate pole and conduit investments to services other than those using CBT aerial and underground cable?

A. CBT's methodology for calculating telephone pole and conduit factors serves to allocate all telephone pole and conduit investment to services using CBT's aerial and underground cable facilities. Said another way, whenever costs for all of CBT's services using aerial and underground cable (loops and transport

services) are determined, the entirety of CBT's telephone pole and conduit systems investment would be allocated to those services as direct incremental costs. This process would work effectively if all of CBT's services using telephone poles and conduit systems also used CBT's underground or aerial cable. Unfortunately, this underlying assumption does not hold true.

CBT provides pole attachment and conduit occupancy services to third parties such as cable television providers and competing local exchange carriers. These carriers use those services to attach their own cables to CBT's poles and within CBT's conduit. Pole attachment and conduit occupancy services do not require the use of CBT's aerial or underground cable and hence, under CBT's method, they are not allocated a portion of the telephone pole and conduit system investment. Instead, the entirety of CBT's pole and conduit investment continues to be recovered from its loops and transport services (i.e. any services using CBT aerial or underground cable) even though it is clear that less than 100% of the telephone pole and conduit investment is incremental to those loop and transport services. At least some of that investment should be considered directly incremental to pole and conduit occupancy services. This is a major shortcoming of CBT's approach to determining pole and conduit factors.

Q. **If CBT allocates too large a proportion (100%) of its pole and conduit investment to loops and transport services, does it correspondingly allocate too small a proportion to its pole and conduit occupancy services thereby resulting in rates that are too low for those services?**

A. No. CBT actually determines investment associated with its pole and conduit occupancy services in a completely different manner. For example, CBT calculates its pole attachment rates based upon an FCC prescribed equation that allocates the relative use of a given pole amongst CBT and the attaching party. It is the combination of these two separate and distinct approaches that allows CBT to double-recover the investment associated with its telephone poles and conduit systems.

For example, as we stated above, CBT's method of calculating its pole and conduit factors for its cost studies allocates the entirety of its booked telephone pole and conduit investment across its services using aerial and underground cable. Whenever all of those aerial and underground cable investments are deployed for use by an unbundled network element or a retail network access line, and the costs are recovered via the rates for those services, CBT has effectively recovered the entirety of its pole and conduit investments. Hence, any additional recovery for those investments via any other charge or service which does not use aerial or underground cables (i.e. attachment services) simply over-recovers CBT's actual booked investment.

One of the most troubling aspects of this shortcoming within the CBT study centers on the fact that pursuant to the Telecommunications Act of 1996's provision in Sections 251, 252 and 703, access to (and revenues generated from) CBT's poles and conduit facilities by third parties is likely to increase dramatically in the coming years. Unless the Commission in this proceeding remedies CBT's study to account for the double counting that exists in this

respect, CBT's over-recovery of its support structure investments will only increase over time.

Q. How should the Commission revise CBT's methodology to ensure that it is not double-recovering its pole and conduit investments?

A. Functionally there are two ways to remedy the CBT approach to protect against the double recovery of its pole and conduit investments from its loop/transport and occupancy rates. Because CBT's current approach recovers all of its pole and conduit investments from aerial and underground cable based services, CBT could be required to provide attachment and occupancy services at no cost to its attaching parties. This, however, is not the most economically rational approach. It is reasonable to assume that some of CBT's investment in its pole and conduit systems should be recovered through its pole attachment and occupancy rates. Hence, the second and more economically rational approach would be to allow CBT to recover a portion of its pole and conduit investments as direct economic costs of its pole attachment and conduit occupancy services (pursuant to the recommendation included later in my testimony). However, CBT must recognize that this portion of its pole and conduit investment is considered incremental to occupancy and attachment services and hence, not incremental to cable based services. Therefore, CBT should be required to remove from its pole and conduit factors a level of investment consistent with that recovered through its attachment and occupancy services. This process would allow CBT full recovery of its pole and conduit investments yet would ensure that it was not allowed to double recover those investments.

Q. How should the Commission incorporate your recommendation to consider a portion of CBT's telephone pole and conduit system investment incremental to attachment services and not incremental to cable based services?

A. First, the amount of CBT's total pole and conduit investment incremental to pole attachment services must be determined in relation to the percentage of that total investment associated with cable based services. The percentage incremental to attachment and occupancy services must then be removed from the total pole and conduit investment when calculating the pole and conduit factors used within the cable based services studies.

CBT in response to MCI Data Request 1.48 reported receiving pole attachment revenues of $250,004.49 in 1995. These revenues were generated by rates set by the FCC's pole attachment equation explained in CBT's response to Staff Data Request No. 52, "Pole Attachment Study, Rate Case Filing." According to CBT's pole attachment study, CBT's rates for pole attachments are currently set to recover only the carrying charges associated with the pole investment used for the attachment service. Common costs are not included or recovered within those rates. Hence, determining the percentage of telephone pole costs incremental to pole attachment services in relation to costs associated with cable based services is a fairly simple exercise. Because CBT claims that it includes no recovery of common costs, the $250,004.49 of pole attachment revenue received in 1995 can be considered to be the direct incremental cost

associated with pole attachment services. Compare this with the 1995 Ohio specific cost associated with the entire telephone pole investment (i.e., multiply CBT's 1995 Ohio specific telephone pole investment by the corresponding telephone pole annual charge factor ultimately adopted by the Commission). To finish the exercise, then simply reduce the investment used in the telephone pole factor model by the percentage incremental to attachment services.

FILL FACTORS

Q. Can you describe the guidelines that CBT is required to meet with respect to utilization (fill) factors assumed within its TELRIC studies?

A. The Commission's Local Service Guidelines at Section V.8 provide the following guidance with respect to fill factors to be used in TELRIC studies:

> The investment developed above shall be adjusted to reflect reasonably accurate "fill factors." Fill factors are the proportion of a facility that will be filled with network usage. The ILEC shall have the burden to justify the reasonableness of the fill factors used in its TELRIC studies.

The Commission provided further guidance with respect to the fill factors in its Entry on Rehearing in Case No. 96-922-TP-UNC. Specifically, the Commission, at paragraph 20 of its Rehearing Entry rejected Ameritech's interpretation of its Local Service Guidelines as follows:

> Ameritech's interpretation fails to acknowledge that this standard ["reasonably accurate"] is modified by the parenthetical clarifying that it is an estimate of a facility that will be filled with network usage. The "reasonably accurate" language is also modified by the concept of "reasonable projection of the actual usage of the element." The Commission's 845 Guidelines were intended to capture these additional concepts as well. <u>When the applicable language is considered *in toto* it is apparent that something more than actual current usage was</u>

contemplated. We also note that nowhere in our 845 Guidelines did we set forth an actual usage standard. [emphasis added]

Q. In your opinion do the fill factors included in CBT's TELRIC studies meet the guidelines described above?

A. No, they do not. In fact, because CBT's fill factor assumptions included within its TELRIC studies are based almost exclusively on an analysis of actual fill levels experienced in its current network, they are in direct conflict with the Commission's interpretation of its Local Service Guidelines as demonstrated above in the quote its Entry on Rehearing in Case No. 96-922-TP-UNC. Moreover, CBT has provided little if any corroborative evidence other than its current utilization levels to support its fill assumptions.

Q. Are CBT's fill factors included in its TELRIC studies reasonable?

A. No. Several shortcomings regarding CBT's fill factors are evident and I will discuss each of them in my testimony below. However, perhaps the most telling evidence of the unreasonable nature of CBT's fill factor assumptions comes from my own experience over the past five years analyzing cost studies presented by local exchange companies throughout the United States. To date, CBT's fill factor assumptions rank as the lowest I have seen even though CBT's territory is primarily urban in nature compared to other more rural LECs like GTE and US West.

Q. Can you provide an analysis comparing CBT's fill factor assumptions with fill factor assumptions you have seen for other companies or in other jurisdictions?

A. Unfortunately, like CBT, each of the companies whose cost studies I have analyzed maintains that the fill factor assumptions within their studies are proprietary. Hence, I am prohibited by a number of protective agreements from disclosing that information. However, recently in Illinois Case No. 96-0486 [the Illinois Commerce Commission's examination of Ameritech Illinois' proposed rates for unbundled elements], Ameritech Illinois made a number of fill factor assumptions included in its internal cost documentation available on the public record. I have attached the relevant pages of that transcript to my testimony as Attachment MS-3.

Specifically, Ameritech via the public cross examination of its chief cost witness, Mr. William Palmer, made available the fill factor assumptions used within its Ameritech Cost Analysis Resource (ACAR). The ACAR is an internal Ameritech document used by its own cost analysts in calculating long run service incremental costs (LRSIC) associated with the services it provides to its customers. Ameritech's willingness to make these fill factor assumptions available on the public record gives us a unique opportunity to publicly view the costing process actually used by a major ILEC when that ILEC is attempting to understand its own internal cost structure. The following is a comparison of the fill factor assumptions proposed by CBT in this case versus those included within Ameritech's ACAR documentation:

FACILITY	PROPOSED BY CBT	AMERITECH'S ACAR
Copper Drop	85%	85%
Copper Distribution	35%	85%
Copper Feeder	60%	90%
Fiber (Loop Feeder and Interoffice transport)	33%	33% or 66%
Digital Loop Carrier Circuit Equipment	70%	96%

As you can quickly see, CBT's proposals in this case lag significantly below those fill factors contained in Ameritech's internal cost documentation.

Q. **Do you have reason to believe that the Ameritech ACAR factors above are a more reasonable estimate of utilization on a forward looking basis?**

A. Yes, there are a number of factors that suggest the Ameritech ACAR factors better represent the level of fill a forward looking network will. First, there are a number of inconsistencies within CBT's own cost study documentation which indicate that when CBT's engineers are provided more direct input into the determination of fill factors, their assumptions closely mirror those determined by the Ameritech engineers in the ACAR. For example, from the table above you notice that CBT's utilization used within the "drop" segment of its loop is 85%, exactly the same as that within the ACAR. You'll also notice that CBT's 85% assumption for "drop" stands out as significantly higher than the other fill percentages it has proposed.

Q. Has CBT provided an explanation for the fact that its utilization factor associated with the drop segment of its loop is significantly higher than the utilization for the other segments of its loop?

A. The only explanation provided so far is taken from Mr. Mette's deposition as follows:[1]

> Q. Can you tell me more about where the 85 percent comes from?
>
> A. No, I cannot. I would have to go back to the outside plant engineer who worked this sheet up to see where that came from.
>
> Q. We'd like to see whatever support you can find for the 85 percent.
>
> A. Okay.

In response to MCI Data Request #3.46, CBT provided its response to our request for additional information:

> No documentation exists for use of an 85% fill factor for businesses. The calculations shown in the Drop and NID document were performed after an initial estimate of the drop and NID costs was developed. An 85% fill was shown on the business calculation only to determine what fill factor would be needed in order to obtain similar results as the initial estimate. CBT believes the actual fill factor will be less than this amount.

A couple of things regarding Mr. Mette's response as well as the data request response require further mentioning. First, CBT's fill factor for the drop segment of its loop is to my knowledge one of the only utilization factors applied outside of the LCAT model. Second, it has been provided only in response to discovery requests from the Staff and was not part of CBT's initial filing. Third, it appears that Mr. Mette, CBT's lead cost witness in this proceeding, had little involvement in its development. And fourth, it appears that CBT arrived at the 85% by first,

[1] Deposition of Norbert Mette, November 24, 1997, pages 90, 91.

estimating what it believed a reasonable estimate of drop costs would be and then backing into what sort of fill factor would be needed to achieve that cost figure.

Q. Why are these points important to note?

A. I note these particular points simply because it seems obvious from Mr. Mette's deposition that the 85% was chosen not by Mr. Mette or his cost study team but instead by outside plant engineers. Throughout his deposition when asked about other fill factors in the studies Mr. Mette was able to point to CBT's study of its actual utilization in an attempt to justify the utilization factors.

With respect to the fill factor associated with drop, however, Mr. Mette was unable to explain the figure and suggests that it was developed by the outside plant engineers in their estimation of drop costs. Further, CBT's discovery response indicates that the 85% factor was developed first by estimating the drop costs actually incurred by CBT with respect to its subcontractor contract, and then determining what type of fill assumption was required to generate the appropriate level of recovery. What I find interesting is the simple fact that when CBT's engineers were primarily responsible for developing utilization assumptions (instead of the cost analysts) they relied upon an underlying contract for the loop segment involved, backed into the fill factor required to reach a level of recovery consistent with that contract, and ultimately arrived at a fill factor percentage equal to the fill factor that Ameritech's engineers included in the ACAR for the same facility.

Q. Is there other evidence suggesting that CBT's engineers view fill assumptions differently than the fill factors included in CBT's run of the LCAT model?

A. Yes. CBT engineer Mr. Paul Meier in his deposition provided some excellent insight into the way in which he would engineer a network with respect to network utilization. His design parameters in many instances conflict directly with the fill factor assumptions included in CBT's studies and instead support the figures included in Ameritech's ACAR. The most dramatic conflict can be found in Mr. Meier's description of how he would engineer the use of fiber optic cable:[2]

> Q. Ultimately, of the 12 strands in a 12-strand fiber cable, how many would you like to use?
>
> A. Got to watch my answer. One short – One less than what we really have. No. I want to make sure that we have enough out there for the future so I do not have to reinforce it.

Even though Mr. Meier somewhat prefaces his original answer, it seems obvious that using 4 out of 12 fibers (consistent with the 33% fill proposed by CBT) is not the way he would design a fiber network on a going forward basis. This is further substantiated by his comments on the same page of that transcript regarding the manner by which CBT would reinforce fiber feeder routes requiring additional capacity:

> Q. Would it be true that if the route were a reasonable length and you were going to need three more OC-3s, that in fact, you would put OC-12 on each side of it?

[2] Deposition of Paul Meier, December 16, 1997, page 117.

A. Presently, the economics to upgrade an OC-3 to an OC-12 – If the Fiber strands are available, we would generally elect to try to put in an additional OC-3 system, but at some point in time, yes, we would probably utilize the OC-12 electronics to increase our capacity.

This exchange between Mr. Berns and Mr. Meier is particularly interesting to me for two reasons. First, it indicates that on a 12 strand fiber route (4 of those strands which must be dedicated to each OC-3 system as explained by Mr. Meier earlier in his deposition), when CBT requires additional capacity it would add an additional OC-3 system, thereby using 8/12 fibers on that route (or 66%). Hence, only routes very early in their installation would ever maintain CBT's proposed 33% (4/12) utilization level.

Second, it is important to note Mr. Meier's acknowledgement that CBT could significantly increase the capacity of a given fiber route simply by exchanging the electronics at the ends of the same four fibers (from OC-3 capable of supporting approximately 2,016 voice grade lines to OC-12 capable of supporting 8,064). I find this interesting because it suggests that developing unitized cost (one of the primary purposes of a fill factor) is a dynamic concept with respect to fiber optic cable. In fact, it is simply the electronics attached to each end of the fiber cable that restrain the number of voice grade circuits or telephone lines that fiber can support. Hence, it is the electronic DLC equipment which determines the number and percentage of lines that can be active within a given route.

Q. Can you describe in more detail your statement that unitizing costs via the use of a fill factor with respect to fiber optic cable is restrained only by the electronics currently utilizing the fiber?

A. Assume that we are attempting to recover the costs associated with a 100 pair copper cable. We realize that some percentage of that cable will not be used to generate revenue either because it is defective, we require certain of its pairs for testing, or simply because when we engineered it our assumptions regarding the level of demand it would support were less than accurate. In essence we have arrived at a 90% fill factor. Hence, if we assume that 90% of the pairs in that cable will support revenue generation and that we invested $1,000 in the cable, we know that we must recover $11.11 from each of the 90 revenue generating pairs to recover the entire investment of the cable:

(Investment / Fill Factor) / Cable Capacity

($1,000 / .9) / 100) = $11.11

90 x $11.11 = $1,000

With fiber optic cable, however, the same scenario is far more difficult to conceptualize. For example, the first and most important question asked in the equation above is how many revenue generating customers can we support? The answer when asked of a fiber optic route is that it depends upon what type of electronic equipment (OC-3, OC-12, OC-48) you place on each end of the fiber. As discussed earlier OC-3 can support 2,016 voice grade circuits where OC-12 can support four times that many. Regardless of the number of revenue generating customers, however, our investment in the cable itself does not

change. While our investment in the electronic equipment may change depending upon the level of carrier we use (OC-3, OC-12, OC-48), once we have placed the fiber optic cable in the ground, it's investment is unlikely to change regardless of the number of customers we use it to support. Hence, the fill associated with the fiber optic cable is directly proportional to the fill attributed to the electronics which utilize its capacity.

Q. Given this unique characteristic of fiber optic cable how should a fill factor be applied?

A. Because the electronic equipment used to light the fiber optic cable is the restraining factor in the fiber's utilization, the level of utilization assumed for the electronic equipment lighting the fiber should also be used for the fiber cable itself. In this way, if OC-3 equipment were used with the fiber optic cable, the investment in that cable would be unitized in exactly the same fashion as would the OC-3 equipment. Understanding that the OC-3 equipment can service 2,016 voice grade circuits, but also understanding that it will not always be utilized to capacity (assume 96% as Ameritech did in its ACAR), we can assume that the particular OC-3 route in question will be servicing approximately 1,935 customers (2,016 x 96%). It seems clear that the fiber optic cable supporting the OC-3 system will also be supporting at least 1,935 customers (it could even be supporting more if another OC-3 or OC-12 system is utilizing another 4 of its cables). Hence, it appears reasonable to assume that the investment associated with the fiber optic cable should be recovered on a unitized basis from each of those 1,935 customers which it serves.

Q. Understanding your recommendation that the fill factor assumed for fiber optic electronic equipment should also be used for the fiber optic cable itself, what level of utilization would you recommend the Commission adopt for other equipment used in the CBT studies?

A. I would recommend the Commission adopt all of the fill factor assumptions listed in my table above as they are taken from Ameritech's ACAR document. Ameritech's ACAR documentation provides us insight into the fill factor assumptions developed by a major local exchange carrier who uses that information in estimating its own internal costs. Likewise, the Ameritech ACAR factors appear to closely resemble factors used by CBT when those factors are chosen by the outside plant engineers who actually design CBT's network.

Q. Has the Commission relied upon Ameritech's ACAR factors in the past?

A. Yes it has. The Commission in its Opinion and Order in Case No. 96-922-TP-UNC adopted the ACAR fill factors for use in Ameritech's cost studies. It adopted those factors in part because Ameritech's own ACAR documentation described those factors as reflecting "the best, most technically efficient resources using the least cost and forward-looking technologies." Certainly CBT has provided little support in this case to refute the Commission's previous finding. Instead, CBT has relied only upon its current utilization factors as evidenced in its network today. For these reasons, the Commission should reject CBT's fill factor assumptions and rely instead on the fill factors included in the table above as taken directly from Ameritech's ACAR documentation.

DIGITAL LOOP CARRIER EQUIPMENT

Q. Can you describe how CBT incorporates the use of digital loop carrier equipment in its design of a forward looking loop?

A. CBT in each of its six different unbundled and retail loop cost studies develops costs for two different types of loops – shorter loops and longer loops.[3] Shorter loops are designed to use copper cable throughout the total loop span, both within the feeder and distribution segments. Longer loops, however, are designed to incorporate fiber optic cable in the feeder portion of the loop through the use of digital loop carrier equipment. Digital loop carrier equipment (basically comprised of electronic aggregation, multiplexing and digital/analog conversion equipment) is placed both in the central office from which the loop originates, as well as in a remote terminal in the field. The remote terminal serves to terminate the fiber optic cable and house and power the DLC equipment as well as to convert and de-multiplex the derived circuits within the fiber cable for connection with the sub-primary feeder or distribution segments of the loop.

Q. Do you have concerns regarding CBT's use of the DLC architecture in its loop design?

[3] CBT develops a loop study for both residential and business service in each of rate bands 1, 2 and 3 for a total of 6 separate unbundled and 6 separate retail loop studies. Shorter loops in rate band 1 are considered to be loops less than 12,000 ft. in length. Longer loops in rate band 1 include all loops greater than 12,000 ft in length.

A. Yes, I have two fundamental concerns regarding CBT's assumptions with respect to DLC equipment used in its unbundled loop.

First, CBT incorporates into its unbundled and retail loop studies material costs associated with its DLC equipment purchased from a single vendor – Fujitsu Network Transmission Systems, Inc. ("Fujitsu").[4] For purposes of incorporating material prices for DLC equipment into its loop studies, CBT uses the "Base Price" for that equipment as established in its current Fujitsu contract. CBT fails to recognize in its study, however, that it currently receives, and over the next five years is scheduled to receive additional discounts from that base price. Those discounts are scheduled to reach 17% off of the base price in some cases.

Second, the Fujitsu equipment which CBT plans to deploy exclusively on a going forward basis is an advanced, highly sophisticated digital loop carrier platform. It allows a carrier significant flexibility in provisioning facilities and services using the carrier's existing loop plant. CBT's design of its unbundled loops as recognized in its cost studies, however, while incorporating material prices for this sophisticated equipment (likely to be significantly higher than lesser featured DLC systems), fails to incorporate many of the system's advanced cost saving features. CBT, by designing its forward looking network in this fashion, incorporates the proverbial "double whammy" on TELRIC costs. CBT incorporates more expensive, feature rich equipment and then, by failing to

use the very features for which a premium is paid, incorporates additional costs associated with underutilizing the equipment.

Q. Can you explain in more detail your concern regarding CBT's use of its "Base Price" for DLC equipment?

A. In response to MCI Data Request 3.11, CBT provided its current "Master Agreement for Products and Services from Fujitsu Network Transmission Systems, Inc." ("CBT / Fujitsu agreement"). Appendix II to the CBT / Fujitsu agreement details the prices and discounts afforded to CBT pursuant to the contract. Generally, CBT's prices paid to Fujitsu for digital loop carrier equipment are established as a "Base Price" from which discounts are provided pursuant to particular time frames and spending level targets. For example, the original CBT / Fujitsu agreement was signed in the early portion of 1994 and a number of "Amendments" have been made since that time. It appears that the most recent amendment, "Amendment Number Two," was incorporated as recently as August 20, 1997. Included in Amendment Number Two is an amended pricing schedule detailing CBT's base price as well as its potential discounts through the year 2001. According to the amended pricing schedule, CBT is eligible for the following discounts:

MINIMUM DISCOUNTS

- As of 1/01/97 CBT was provided a 7% discount from the base price
- As of 1/01/98 CBT will maintain the 7% discount it was afforded in 1997

[4] Mr. Mette in his deposition suggested that CBT considered the Fujitsu equipment to be the only DLC equipment it would be deploying on a "go-forward" basis. Deposition of Norbert J. Mette, November 24, 1997, pages 67, 68.

- As of 1/01/99 CBT will be provided a 9% discount from the base price
- As of 1/01/00 CBT will maintain the 9% discount it was afforded in 1999
- As of 1/01/01 CBT will be provided a 11% discount from the base price

ADDITIONAL DISCOUNTS

In any period within which CBT spends $20 million pursuant to the contract in the two years prior, CBT will receive the following discounts:

- 1999 11%
- 2000 11%
- 2001 15%

In any period within which CBT spends $30 million pursuant to the contract in the two years prior, CBT will receive the following discounts:

- 1999 12%
- 2000 12%
- 2001 17%

At a minimum, the CBT / Fujitsu contract illuminates the fact that CBT in 1997 paid 7% less than the "Base Price" for equipment it purchased from Fujitsu – likewise it paid 7% less than "Base Price" it included in its TELRIC studies. It seems equally clear that throughout the contract period (which matches closely with the study horizon used for CBT's TELRIC studies), CBT will be afforded additional discounts potentially reaching as high as 17%. It takes only a cursory comparison of CBT's TELRIC studies and the CBT / Fujitsu agreement, however, to understand that CBT uses the "Base Price," without recognition of discounts, as DLC investment inputs to its studies. CBT's failure to incorporate the prices it actually pays for DLC equipment results in an overestimation of the required investment to provision its loops.

Q. How should the Commission remedy CBT's overestimation of its DLC equipment investment?

A. The Commission should require that CBT recalculate its unbundled and retail loop studies incorporating the actual prices it will pay for its Fujitsu DLC equipment over the next five years including any discounts. I would recommend that the prices used within the studies incorporate an 11% discount. An 11% discount represents the average discount that CBT would pay for equipment over the next four years if it were to purchase $20 million in equipment every two years. My calculations deriving this discount are included as Attachment MS-4.

Q. Can you describe in more detail your contention that CBT's costs for its unbundled loops are overstated because of its underutilization of its chosen DLC architecture?

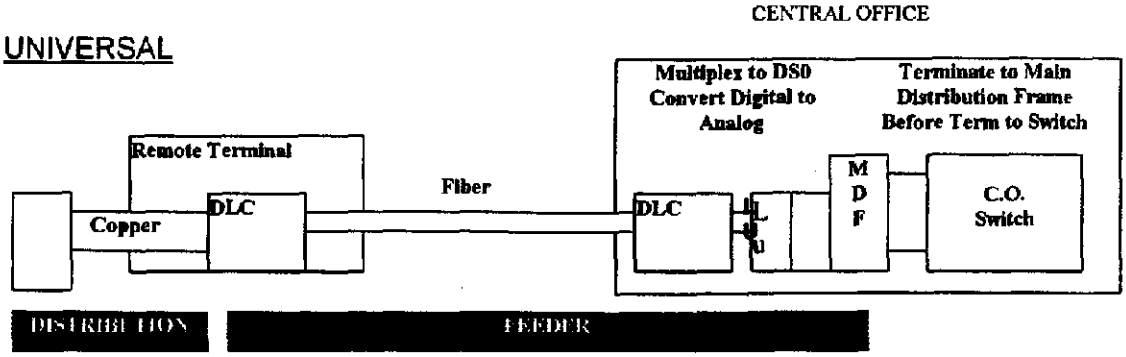
A. One of CBT's primary assumptions with respect to its unbundled loop cost study is that all unbundled loops provisioned via DLC technology will rely upon the "universal" DLC architecture. Correspondingly, all CBT retail loops will be provisioned via the "integrated" DLC architecture. Use of the "universal" architecture for unbundled loops increases the DLC costs associated with the unbundled loop by nearly 55% over the same CBT retail loop.[5] Further analysis of the Fujitsu FACTR DLC platform, however, indicates that it is engineered specifically to accommodate unbundled loops in an integrated fashion. This fact

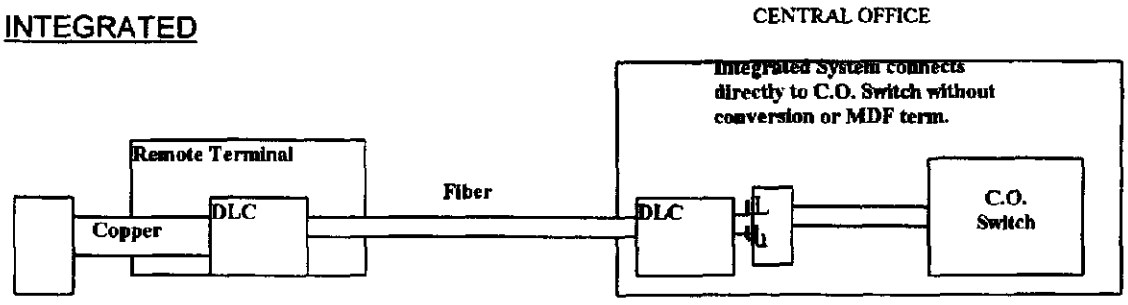
[5] For example, CBT's LRSIC study for its Band 1 Retail Business Loop indicates a total integrated DLC investment of $230.29 per loop as compared to its TELRIC study for an unbundled business loop in Band 1 which indicates a universal DLC investment of $356.38, a difference of 54.7%.

renders CBT's assumptions regarding the use of the more expensive universal DLC architecture only for its provision of unbundled loops unreasonable.

Q. Can you describe in more detail the difference between universal digital loop carrier and integrated digital loop carrier systems?

A. The terms "universal" or "integrated" when used with respect to DLC systems deal primarily with the manner by which those loop provisioning systems interface with the central office switch from which they draw dialtone. The two following diagrams provide a more detailed comparison between the two architectures.





As the diagram above explains, the universal architecture requires that the digital signal retrieved from the DLC system be de-multiplexed and converted from a digital to an analog voice grade signal. That voice grade analog signal is then terminated to the main distribution frame ("MDF") within the central office

before being terminated to the central office switch. The switch then reconverts that analog voice grade signal to a digital signal for purposes of processing, switching and transporting the call. However, the integrated DLC architecture, because it is a more efficient system, avoids a number of the steps and pieces of equipment required by the universal system. For example, the digital-to-analog conversion and the termination on the main distribution frame that is required by the universal architecture is not required when using the integrated architecture. Because the signal provided to the DLC central office terminal is already a digital signal, after the appropriate multiplexing is done, the signal can be fed directly to the switch. Because it is being provided a digital signal, the switch is not required to then convert the signal to a digital level as it was with the signal provided by the universal architecture. The efficiency gained by this system accounts for the significant cost disparity between the two systems, as shown within the CBT cost studies.

Q. Why does CBT assume the use of the less efficient and more costly universal carrier architecture for its unbundled loops instead of the integrated carrier architecture it assumes for its retail loops?

A. Mr. Mette suggests in his deposition that CBT is able to use an integrated DLC architecture for its "bundled" loops because "....there's no need to provide access to the unbundled loop in the bundled service; so is able to provide – or, able to use an integrated digital loop carrier in that situation."[6] Fundamentally, CBT's argument centers on the fact that because competitive carriers will need access to the unbundled loop before it reaches the switch located in CBT's

central office. Hence, CBT claims that it must provision those loops via the universal DLC architecture, demultiplex and convert those loops to an analog voice grade signal, terminate those loops to the main distribution frame, and then cross connect those loops from the main distribution frame to a competitive carrier's equipment located in its collocation space.

Q. Is this a reasonable approach?

A. It is not the most efficient approach available given the digital loop carrier equipment that CBT assumes within its studies and deploys throughout its system. Universal digital loop carrier systems incorporate older less efficient technology than do newer integrated carrier models. The equipment CBT is deploying, however (the Fujitsu FACTR system), is an even more advanced technology than the standard integrated carrier system. The Fujitsu FACTR system is compliant with Bellcore standard TR-303 and can be referred to as a Next Generation Digital Loop Carrier ("NGDLC") system. NGDLC systems incorporate the ability to "groom" from the integrated digital bit stream, individual circuits at the DS0 level. In other words, the technology inherent in the Fujitsu FACTR system would allow CBT when requested for connection to an unbundled loop, to "groom" that loop from the integrated bit stream, connect the DSO signal comprising that loop to a digital cross connect system such that the interconnector could then retrieve that signal at a digital level. This process would avoid a number of steps for both CBT and the interconnector: (1) it would be unnecessary for CBT to convert the digital signal retrieved at the C.O. DLC terminal to an analog signal for purposes of terminating the loop on the main

[6] Deposition of Norbert J. Mette, November 24, 1997, page 49.

distribution frame, (2) likewise, the interconnecting carrier would avoid re-digitizing the signal for purposes of transporting the loop to its own switching platform. All of these avoided functions when combined with avoiding the equipment they require results in significant cost savings.

Q. Have you seen additional information which leads you to believe that the scenario you have described above is possible given the equipment CBT assumes within its studies?

A. Yes, I have. After Mr. Mette's explanation in his deposition that CBT would be deploying the Fujitsu FACTR system exclusively within its network, I contacted Fujitsu to retrieve some additional information regarding the FACTR product.[7] I first visited Fujitsu's internet site at http://www.fujitsu.com where I was able to retrieve a significant amount of information regarding the FACTR product. I subsequently telephoned the Fujitsu Chicago Sales office and was forwarded additional literature. I have included the literature I was able to retrieve as Attachment MS-5 to my testimony. It is obvious from the Fujitsu literature that the FACTR system is an advanced, NGDLC platform capable of providing all of the functionality I have described above. For example, the following is a quote taken directly from the FACTR sales literature obtained from the Fujitsu homepage:

> FACTR also supports TR-08, TR-303 switch interfaces, and integrated digital loop carrier operations, as well as Digital Cross-Connect (DACS) systems for DS0 grooming for services that bypass the local switch.[8]

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[7] See the Deposition of Norbert J. Mette, November 24, 1997, pages 67,68.
[8] Attachment MS-5, page 5. Downloaded from Fujitsu internet site http://www.fujitsu.com/FNC/products/datasheets/factr.html on December 3, 1997.

The DSO grooming described in the Fujitsu literature excerpt above is exactly the process I have described. This is confirmed by the deposition transcript of CBT engineer Paul Meier. The following excerpt from Mr. Meier's deposition makes it clear that CBT's inability to utilize the full capability of the Fujitsu FACTR system for purposes of grooming unbundled loops on a DSO basis is based upon CBT's own internal inventory tracking system, not on the technology of the DLC equipment:[9]

> Q. To your knowledge, does the Fujitsu FACTR system, either as illustrated on Exhibit 97 or as described in the press release, and let me also refer you to Exhibit No. 100, which I'll tell you is also more promotional material we received from Fujitsu, does the Fujitsu FACTR system support grooming out of DS-0 services at a central office without the use of some of the equipment shown on the universal diagram?
>
> A. Presently, as CBT is using the system, and presently, on a going-forward basis, we are not grooming out services any other way except using the universal mode.
>
> Q. And to confirm what you said before, and the reason for that is that the inventory system cannot track circuits that are groomed out before the switch in an integrated system?
>
> A. To my knowledge, that is correct.
>
> Q. Is there any other reason to your knowledge?
>
> A. No.

Q. Should limitations with respect to CBT's internal inventory tracking system allow it to foist costs for less efficient network architecture on its competitors?

A. Absolutely not. MCI and other carriers should not be precluded from enjoying the full functionality of forward looking network facilities, especially when being

[9] Deposition of Paul Meier, December 16, 1997, pages 113, 114.

forced to pay for them within the context of CBT's TELRIC study. The NGDLC equipment incorporates new technology to solve a problem (i.e DS0 grooming). It is a forward looking technology built to accommodate forward looking demands (i.e. unbundled loops). If CBT's internal inventory system is unable to maximize the functionality of this technology, CBT's inventory system and its classification as a forward looking component of CBT's network must be questioned.

Q. How would you recommend that the Commission remedy CBT's failure to fully utilize the Fujitsu FACTR system so as to provision unbundled loops in an efficient forward looking manner?

A. The Commission should require that CBT return to its unbundled loop studies and substitute investments associated with the more efficient integrated digital loop carrier system inherent within the FACTR platform. These investments should replace the universal DLC investments currently included in those studies. The applicable digital loop carrier investments associated with FACTR's integrated architecture can be found in CBT's retail, bundled access line studies (MCI Deposition Exhibits 9-11 and 39-41).

MISCELLANEOUS CONCERNS

Q. Do you have other concerns regarding CBT's loop study?

A. Yes. There are other areas within the CBT studies where CBT's assumptions are either completely unsubstantiated or exaggerated to the point of significantly

overestimating CBT's actual underlying TELRIC costs. I will address two specific examples below.

First, CBT's cost studies for its unbundled and bundled loops includes a per pair, per foot investment for the copper and fiber cable required to provision service. The CBT model begins with a raw, per cable, per foot investment taken from its "Perpetual Inventory Record" (MCI Deposition Exhibit # 55). The CBT model then adds to this raw material per cable, per pair investment a number of additional investments associated with preparing, splicing, engineering, placing, and generally installing the cable for use in its network. The product of this calculation is then placed in the LCAT model as per pair, per foot cable investment (see MCI Deposition Exhibit #49). The additional services and equipment investments added to the initial raw investment figures account for as much as 650% of the total per pair, per foot cable investment used by the LCAT model.[10] However, even though these additional inputs account for such an enormous proportion of the cable investment assumptions, CBT has provided little if any support for these investments.

For example, included within the final investment figures for buried copper cable (both within the distribution and feeder loop segments), CBT includes $2.10 per each cable foot for trenching, restoration and placement expenses associated with burying the cable. In its November 21, 1997 deposition of Mr. Mette, MCI

[10] For example, the per pair, per foot material price for buried copper distribution cable (45C) derived from the Perpetual Inventory Record system amounts to $0.0101 per pair, per foot. After additional expenses and investments associated with placement, engineering, splicing, etc. are included by CBT, the per pair per foot investment amounts to $0.0657, an amount 6.50 times greater than the original investment amount.

requested that CBT provide data or materials (preferably a subcontractor invoice since Mr. Mette explained that all buried cable was placed for CBT by subcontractors) to support the $2.10 figure. To my knowledge, CBT has provided no such information. However, the support material that is included in response to both MCI DR # 3.8 and 3.44 (supporting other areas of CBT's studies) directly conflicts with the $2.10 figure. For example, in response to MCI DR # 3.8 CBT provided the internal documentation used by its outside plant personnel when provisioning facilities in its network. Specifically, CBT provided its "Service Wire Placement" guidelines. Within its guidelines, a number of placement scenarios (i.e. economic comparisons regarding whether cable should be placed as aerial, underground or buried) can be found. For the placement of buried cable, the CBT guidelines provide the following cost parameters:[11]

> 5.03 To provide buried service to the same customer, the costs incurred would be as follows:
>
> 1000 feet of service wire buried and terminated.....$415.90
> (this includes service wire and termination)
>
> **TOTAL COST TO PROVIDE BURIED SERVICE WIRE $415.90**

By simply dividing this CBT internal cost estimate for placing 1,000 feet of buried cable by 1,000 feet, we arrive at a per foot cost of approximately $0.42 per foot. It should be noted that the above documentation also makes clear that this figure includes the cost of the cable itself as well as terminating and burying the cable. This $0.42 per foot for the entire cable burying scenario stands in

[11] CBT response to MCI Third Discovery Request Number 3.8, *Service Wire Placement*, DSL 117 (TSL XXX) Issue 1, 6-30-97.

stark contrast to CBT's $2.10 assumption meant to account simply for burying, restoration and placing a buried cable.

Additionally, in response to MCI Data Request # 3.44 CBT provided a copy of its current *Master Agreement* with the Spectronics Corporation. Included in the pricing schedule of the *Master Agreement* (Exhibit A), CBT contracts to pay Spectronics $640.00 per Service Wire it buries when that service wire is between 1000 and 2500 feet in length. A note at the bottom of the contract states as follows:

> NOTE: BURIED SERVICE WIRE UNIT PRICES SHALL INCLUDE ALL ASSOCIATED MATERIAL AND RESTORATION. RESTORATION MUST BE COMPLETED PRIOR TO BUYER PAYMENT.[12]

Again, simply by dividing $640.00 first 1,000 feet and then by 2,500 feet we arrive at a per foot burying, restoration and material cost ranging from $0.64 - $0.26 per foot. While these numbers do seem to substantiate the numbers taken from the CBT *Service Wire Placement Guidelines* ($0.42 per foot, nearly the perfect average of $0.64 and $0.26), they are again in stark contrast to the $2.10 per foot cost included in the CBT TELRIC studies.

Q. How should the Commission remedy CBT's overstatement of its trenching costs?

A. CBT has provided no support for its $2.10 burial, restoration and placement cost assumptions within its TELRIC studies. Moreover, it appears that information

[12] CBT response to MCI Third Discovery Request Number 3.44, *Master Agreement*, Spectronics Corporation, *Buried Service Wire Installation & Repair.*

provided by CBT in response to other discovery requests discredits the $2.10 figure. For these reasons, CBT's $2.10 trenching cost should be removed from its per pair, per foot cable cost derivation within its TELRIC studies. If the Commission believes that some trenching, restoration and placement cost for should be reintroduced into the studies, it should rely upon the documentation that CBT has presented and require that CBT replace its $2.10 estimate with the $0.42 estimate provided within its own internal documentation.

Q. Are there other miscellaneous costs within CBT's TELRIC studies that you find troubling?

A. Yes, there are. My second concern again arises from within CBT's derivation of its per pair, per foot cable costs. After CBT has loaded onto its raw cable investment costs associated with trenching, engineering, splicing, pedestals, placing and miscellaneous materials (growing the raw cable investment by as much as 650%), it simply adds an 10%. Staff also questioned this 10% "Miscellaneous Cost" markeup in its Data Request Number 79 (and in the Staff Report at page 11). In response to the Staff data request CBT explained its 10% Miscellaneous Cost as follows:

> The miscellaneous cost represents items such as transportation and taxes on material plus additional costs associated with garage time and job interruptions. The cost is an assumption of CBT.

In its response above CBT fails to explain why expenses associated with transportation, garage time, and taxes would not be recovered in its annual charge factors for maintenance and taxes or through its common cost or

administrative factors (the manner in which such expenses are recovered for other investments included in its studies). Likewise, CBT does not explain what types of job interruptions it might be referring to or even how such interruptions would be relevant. In short, CBT has provided no documentation substantiating its 10% markup. For this reason, CBT's 10% "Miscellaneous Cost" markup should be rejected by the Commission and CBT should be required to remove it from its cable investment calculation.

II. NON-RECURRING COSTS

Q. Can you described CBT's proposed non-recurring charges?

A. CBT includes a number of non-recurring charges in the *CINCINNATI BELL PRICING SCHEDULE FOR INTERCONNECTION* included with the testimony of Ms. Maggard as Attachment 1. Specifically, by my calculation, CBT's pricing schedule includes no fewer than 30 separate non-recurring charges associated with the purchase of unbundled network elements.

Q. Do you have concerns regarding all 30 of CBT's non-recurring charges?

A. I have not reviewed the entirety of CBT's support for all of its non-recurring charges. I have reviewed the cost support for only the following charges:

1.	Establish 2-wire POTS Loop	$108.47
2.	Service Order Charge	$11.63
3.	Line Connection	$26.81
4.	Improved Voice Grade Loss	
	Qualification	$50.48
	Conditioning	$60.02

5.	Non-Loaded Copper Loop Guarantee	
	Qualification	$50.48
	Load Removal	$502.52
6.	ISDN Compatible Conditioning	
	Qualification	$86.71
	Conditioning copper loop	$506.49
	Conditioning derived loop	$65.92

Q. Do you have concerns regarding these charges?

A. Yes, I do. I also, however, have a concern dealing with a non-recurring study I was unable to review. CBT failed to conduct TELRIC studies for non-recurring charges associated with network element combinations even though those combinations are included in its agreement with MCI. My experience with other ILECs has shown that a lack of non-recurring charges specific to a combination of elements is a strong indication that the ILEC intends to charge all non-recurring charges associated with the individual elements included in the combination. Regardless of the extent to which this is CBT's intention, it seems reasonable, and consistent with the Commission's guidelines, that if CBT intends to levy non-recurring charges associated with combinations, it should be required to support those charges with a TELRIC study.

Q. Do you have concerns with the studies you were able to review?

A. Yes, I do. Like the Commission's Staff, my primary concern centers on the fact that CBT's non-recurring charges are based upon studies which fail to incorporate the most efficient, forward looking technology available. This concern centers on CBT's failure to recognize an interactive mechanized operation support system ("OSS") interface used for purposes of accepting and

processing service orders. Also, again as the Staff also recognizes in its Report (page 114), I have concerns regarding CBT's estimated labor times within its non-recurring studies.

Q. Can you be more specific with respect to your concerns regarding CBT's failure to incorporate the most efficient, forward looking technology available?

A. Each of CBT's non-recurring studies that I reviewed incorporates significant time and expense associated with manual operations ranging from receiving a faxed order from a New Entrant Carrier ("NEC") dispatching a technician to a central office for purposes of "running a jumper" from the main distribution frame. Many of these manual operations (and the majority of the expense they generate) are likely to be replaced by the implementation of integrated and mechanized operations support systems required by the FCC's *Report and Order* in C.C. Docket No. 96-98.

Q. Hasn't CBT requested that the Commission grant it a waiver of requirements regarding the implementation of a mechanized OSS interface?

A. Yes, however, as explained in the testimony of Ms. TerKeurst as well as in the Staff Report, this request has little merit and should be rejected. Likewise, CBT's non-recurring cost studies which simply assume that a mechanized OSS interface does not and will not exist should be rejected on the same grounds.

Q. Do you agree with the Commission Staff's analysis regarding CBT's failure to incorporate the use of mechanized operation support systems within its non-recurring cost studies?

A. Yes, I do. I agree completely with Staff's analysis at page 104 of its Staff Report:

> Accordingly, Staff finds that, due to the accelerated OSS implementation schedule and the time passage since CBT conducted its analysis for this TELRIC study, CBT's proposed time estimates do not reflect the actual time that will be needed once the OSS functions are in place and are not reasonable to be used in developing TELRIC for non-recurring activities on a forward looking basis.

Q. Can you be more specific with respect to your concerns regarding each of the non-recurring rate elements you identified above?

A. Yes, I can. It is my understanding from the review of discovery submitted by CBT and after attending Mr. Mette's deposition that the "Loop Establishment Charge" is meant to recover expenses associated with filling a competitive carrier's request for an unbundled loop when no such loop currently exists in the required location (see responses to Staff Data Request No. 88 and 81). My first concern regarding this rate element is that nowhere within either CBT's testimony or its cost studies is the application of the "Loop Establishment Charge" explained with respect to under which circumstances it will apply. It is unclear what CBT means by the term "new loop" used within its study. Because CBT has not provided proposed tariffs for its unbundled elements, CBT should be required in this proceeding to provide further clarification for the circumstances under which this charge will apply.

Second, and most importantly, however, my fundamental concern regarding the "Loop Establishment Charge" centers on the cost study supporting its $108.47 rate. CBT recognizes the following work functions and work times associated with the "Loop Establishment Charge":

Work Description	Installation Minutes	Removal Minutes
Receive faxed order from CLEC, verify, and issue service order.	10.00	4.00
Pull order from printer and sort by due date for pick-up by 251 clerk.	3.00	.27
Assign order in OS/Plant & COSMOS. Format and distribute in OS/Order.	4.60	.41
Research order and develop plan to provide facilities for the order.	9.90	
Run jumpers between CLEC tie cable and cable appearance on main distribution frame.	6.00	4.00
Make terminal connections, qualify loop, test facilities, run wires and test line; 86% of orders require a technician dispatch.	78.26[13]	
Total	**111.76**	**8.68**

There a number of problems associated with the work functions and times described above. First, it is obvious that this study completely ignores the fact that an electronic, interactive, ordering, provisioning and maintenance interface is required. For example, the above analysis assumes that the competitive carrier's order for an unbundled loop will be received via fax. This fax transmission will be accepted by CBT personnel who will then interact with CBT's actual ordering and provisioning system to facilitate the loop's provision. In total this process will require 32.18 minutes of CBT labor. It is exactly this

process that an electronic OSS ordering and provisioning interface is meant to avoid. Via an operational interface allowing the competitive carrier to achieve mitigated electronic access with CBT's ordering and provisioning systems, it is MCI personnel, not CBT personnel who will be inputing data directly into the CBT system for purposes of ordering service. Likewise, with the implementation of an electronic OSS interface the time associated with receiving, interpreting and inputing the data from a faxed order will be completely avoided by CBT.

Doubt must also be cast on the additional 88.2 minutes CBT associates with dispatching a technician to the field to "run jumpers" and "terminate" cables on the main distribution frame. CBT's first error in these calculations arises because CBT fails to consider any possibility that more than one loop may be ordered or established at one time. As Mr. Mette explained in his deposition, the times detailed above reflect the establishment of a single loop, giving no consideration to the likelihood that in at least some circumstances, more than one loop could be established via the same order.[14] The problem with this assumption on the part of CBT is perhaps most easily seen with respect to the time associated with a technician's visit to the central office to run jumpers and make terminal connections. According to Mr. Mette, a portion of the 91 minutes allotted for this work function includes a technician's travel time to and from a particular central office. Unfortunately, the CBT's Loop Establishment study is structured in such a way that if a particular technician were given 100 loops to

[13] CBT actually includes 91 minutes for this function but assumes that it is required only 86% of the time. To determine a total average time required for each loop establishment I have simply multiplied the 91 minutes by the 86% to arrive at 78.26 minutes.

[14] Deposition of Norbert J. Mette, November 26, 1997, page 46.

establish for a given competitive carrier at a given location, perhaps a medium size business account, for each loop, the technician would travel to the central office, unpack his/her tools, perform the function required, repack his/her tools and return to his/her assigned station. This same process, including all travel and set-up time, would then be repeated for each of the 100 loops. In all, CBT has assumed that establishing the 100 unbundled loops to this business customer would require 9,100 minutes (156.66 hours or 19.6 work days), a large portion of which would be spent simply driving to and from the central office and unpacking / packing tools. Obviously this is an unreasonable assumption that simply tends to overestimate CBT's actual costs associated with establishing an *unbundled loop*.

Q. Do you have other concerns regarding CBT's Loop Establishment charge?

A. Yes, I do. A review of the literature provided by Fujitsu with respect to its FACTR system discussed earlier, indicates that the FACTR system is engineered to interface directly with a LEC's operation support systems. While I am still researching the impact of this capability, the deposition of CBT engineer Mr. Meier sheds additional light on the potential savings such an integrated system could provide. Mr. Meier suggests that with the FACTR system, many of the cross connects previously accomplished by "running jumpers" and "terminating" facilities to the main distribution frame are "software cross-connects" and could possibly be performed remotely.[15] It is possible that this type of remote, software cross connect system could minimize the need to dispatch personnel to the central office for purposes of running jumper wires

and terminating facilities on the main distribution frame. Likewise, this type of technology could significantly reduce the 91 minutes CBT associates with this type of activity. CBT, however, makes no mention of this technological capability within its Loop Establishment cost study. For this reason, as well as for the multiple reasons stated above, CBT's analysis of its Loop Establishment Charge is fundamentally flawed and should be rejected *in toto* by the Commission

Q. Can you describe in more detail your concerns with CBT's Service Order Charge?

A. CBT's service order charge of $11.63 is intended to recover the costs associated with 15 minutes of labor expense. The activities generating that 15 minute labor expense are described by CBT as follows:

> Receive faxed order from CLEC; verify existing account, create, verify, and issue service order for additional service or change to account.[16]

As discussed above, CBT's assumptions with respect to receiving orders via facsimile are misplaced given the current requirement to implement an interactive, electronic ordering, provisioning and maintenance interface. Again, the labor associated with generating an order, populating the relevant systems and manipulating the services and elements a customer chooses will be the function of MCI personnel, not CBT personnel. For this reason, CBT's analysis of its Service Order charges are fundamentally flawed and should be rejected *in toto* by the Commission.

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[15] Deposition of Paul Meier, December 16, 1997, page 33.
[16] Taken from MCI Deposition Exhibit 67, page 7.

Q. Can you describe in more detail your concerns regarding CBT's Line Connection Charge?

A. Again, like the Line Establishment Charge and the Service Order Charge, CBT's Line Connection Charge includes three major assumption errors: (1) it fails to recognize the use of a mechanized ordering, provisioning and maintenance interface, (2) if fails to recognize that in some circumstances, multiple loops will be ordered and provisioned within the same order, and (3) it fails to account for the use of advanced DLC technology which may significantly reduce the need to physically "run jumpers" between CBT's and MCI equipment in the central office.

In addition to the three general concerns above, Staff includes in its Report (at page 114) an additional concern regarding CBT's consistency in estimating labor times associated with provisioning unbundled elements and retail services. Staff's review of CBT's retail non-recurring cost studies indicates that the line connection activities included in the unbundled Line Connection Charge are reported to be up to three times greater than the labor expense and labor time reported for similar functions included in the retail study. My review of CBT's retail studies leads me to the same conclusion. For this reason, as well as those included above, CBT's analysis of its Line Connection Charge is fundamentally flawed and should be rejected *in toto* by the Commission.

Q. Can you summarize your recommendations with respect to CBT's Loop Establishment Charge, Service Order Charge and Line Connection Charge?

A. Yes, I can. Because CBT's studies supporting these charges are fundamentally flawed and serve to grossly overestimate CBT's actual expenses associated with these functions, CBT's cost studies and charges for these functions should be rejected by the Commission.

Q. Staff has recommended much the same thing but has suggested that CBT be required to file new studies implementing a number of its suggestions. Do you agree?

A. I agree with the majority of Staff's concerns regarding CBT's non-recurring cost studies and the resulting rates. I disagree to some extent, however, with the Staff's recommendation that CBT should be allowed to make a number of changes and re-submit its cost studies for approval by the Commission. CBT's studies supporting its non-recurring rates are so riddled with methodological and assumption errors that they form no credible support for CBT's non-recurring rates. Indeed, they completely ignore possibly the largest single factor (mechanized operation support system interaction) that is likely to drive the forward looking non-recurring cost structure. They should not be re-submitted with corrections, they should instead be completely rejected.

Q. If the Commission completely rejects CBT's non-recurring cost studies as you have recommended, what should CBT's rates for non-recurring

charges be in the interim and how should the Commission establish permanent rates?

A. With respect to CBT's Line Establishment Charge, Service Order Charge and Line Connection Charge the Commission should adopt non-recurring rates equal to 50% of CBT's proposed rates. It should then provide CBT with an opportunity at any time within the future wherein it feels it can reasonably substantiate rates greater than this level to submit new cost studies and proposed rates. The Commission should be clear that any new cost studies submitted by CBT will need to include forward looking assumptions incorporating CBT's obligations to provide operation support systems at a level of parity (both in terms of quality and in terms of mechanization) with that provided to itself, as well as incorporating time-and-motion analysis sufficient to substantiate any proposed work functions. CBT should also include assumptions which maximize the use of advanced equipment it has deployed within its forward looking loop study or explain why such technology fails to improve its ordering or provisioning process.

Q. Are you aware that CBT and MCI have a "true-up" clause within their contract?

A. Yes, I am.

Q. How would such a clause affect your recommendation?

A. It would not. I realize any difference between an interim rate for non-recurring charges and the final rate adopted by the Commission may require a true-up.

However, MCI is currently in the process of building its business in the CBT service area. During this critical marketing period inflated non-recurring charges are extremely destructive to its business plan. Hence, understanding that CBT's non-recurring charges as currently proposed (and as included in MCI's current contract) are overstated, and that filing new studies will require time in arriving at more appropriate cost based rates, the Commission should institute interim rates equal to 50% of those proposed – even in the context of a true-up requirement.

Q. Can you describe in more detail your concerns regarding CBT's Improved Voice Grade Loss and Non-Loaded Copper Loop Guarantee charges?

A. CBT's Improved Voice Grade Loss and Non-Loaded Copper Loop Guarantee charges recover expenses associated with ensuring that a given loop will conform to the technical parameters required for a given service. This guarantee is necessary when specific loop parameters are required for a given service such as ISDN or particular types of PBX or key system signaling.

My concern with CBT's proposed charges in this area stem from the simple fact that the conditions on a given loop which would degrade the conductivity of the loop to a point where special conditioning for signal loss would be required will not be evident in the forward looking loop included in CBT's unbundled loop study. For example, CBT's "Non-Loaded Copper Loop Guarantee Charges," totaling a non-recurring payment of $553.00, are comprised mainly of expenses associated with 545 minutes of CBT technical labor time. CBT's study indicates

that this amount of time will be required to perform the following functions with respect to "Qualification" and "Removal of Load Coils:"[17]

Sheet B3, 2-Wire Analog POTS Loop, Non-Loaded Qualification

1. The NE (Network Engineer) receives a request from the service order system to prepare a work order for unloading a copper pair.

2. The NE references schematics of CBT's network (cable plats) and determines the length and makeup of the circuit to be unloaded. To accomplish this, the NE traces the circuit from the main distribution frame to the customer location and identifies the location of each load coil on the circuit.

3. The NE enters the gathered information into the Computer Outside Plant Engineering System (COPES), a computer graphics system that maintains, stores, queries, and produces the outside plant records and schematics. A work order is then generated by the system and distributed to a splicer.

4. After the copper pair is unloaded, the NE reviews the information on the work order and updates the plant location records to indicate that the copper pair has been unloaded.

Removal of Load Coils

Per the determination of the designer as a result of loop qualification, load coils may need to be removed from a copper loop. An OSP Engineer will write a work order to initiate this work. A network technician is dispatched to remove these load coils at specific points in the loop. When this requires the technician to open a manhole, the technician must perform standard safety steps to prepare the surrounding area, purge the manhole of water and gasses, open the splice case within the manhole, and remove the load coils. Upon completion, the technician must then secure the manhole. If the work involves aerial cable, the technician must perform standard safety steps to prepare the surrounding area prior to opening the splice case, and secure the splice case upon completion.

Each of the functions required by CBT personnel as described above, both with respect to qualification and un-loading a particular loop in question, is required

[17] Taken from MCI Deposition Exhibit #68, pages 9 and 10.

to remove load coils from CBT's loop plant. The problem with these labor times and the expenses they generate, however, lies in the fact that the forward looking network CBT has constructed in its unbundled loop TELRIC studies, and for which MCI will pay recurring monthly charges to recover, is not engineered to include load coils.

Q. Can you explain what a load coil is and what it does within the outside plant network?

A. My understanding is that a load coil is placed within the loop network whenever the voice signal provisioned over a loop has degraded below the standard decibel (db) parameters required. The load coil actually amplifies the signal being carried over the copper pair conductor, accounting for the attenuation, or db signal loss, that has occurred over the span of the loop to that point. Load coils, while helpful in accounting for db loss associated with voice circuits, are not, however, conducive to non-voice (such as T1, switched 56 or ISDN) systems. Indeed, this is the reason that those coils must be removed in certain circumstances to provision certain types of services.

Q. Can you explain the basis for your statement that the forward looking network included for recovery within CBT's TELRIC studies does not include the use of load coils?

A. Yes. In our initial review of CBT's TELRIC studies we discovered no investments associated either with load coils or with digital repeaters. Mr. Mette in his deposition was asked about this apparent inconsistency between the load

coil removal charges described above and the lack of original load coil investment in the studies. The following is his response:

> A. In Exhibit 49 [CBT's TELRIC study for an unbundled loop] we're costing out the forward-looking cost of a loop, identifying the ongoing costs associated with that loop. The assumptions in that loop are that there is no load coils on a forward-looking basis to establish the loop.

Later in his deposition Mr. Mette reiterates this point in response to the following question:

> Q. Just focusing on the loop study, is the forward-looking assumption of Exhibit 49 that load coils are not required if the loop is actually provisioned as it was illustrated and designed, for example, on the picture on page 76 of Exhibit 49?
>
> A. Can I have that again?
>
> Q. Is that because load coils would not be needed on such a forward-looking loop?
>
> A. That is correct.
>
> Q. How about repeaters and bridge tap, same answer be true of them for the forward-looking basic loop?
>
> A. The forward-looking design of installing new loops would not include repeaters, would not include designing bridge tap either.
>
> Q. Okay.
>
> A. But I'll just say that it doesn't remove it from the existing network and cause forward looking non-recurring costs to go away, those still exist.

Q. Do you agree with Mr. Mette's opinion that forward looking non-recurring costs do not go away simply because you've designed, and costed, a network that doesn't require load coils (and hence load coil removal)?

A. No, not at all. It isn't reasonable to assume that CBT should be allowed to design and charge its competitors for the use of a state-of-the art network that is engineered (undoubtedly at some additional cost) to operate without the use of load coils, bridge tap or digital repeaters, and then also charge those competitors to remove these impediments from the embedded network. I believe that Mr. Mette misses the point in his response that forward looking non-recurring costs don't go away because CBT will still be required to remove load coils to meet particular technical parameters. When MCI purchases an unbundled loop from CBT will be paying a price based upon a network designed to operate without the use of load coils, hence, it should be safe to assume that MCI will be given a loop that includes no load coils. If MCI must pay the price for the state-of-the-art loop as well as the price required to improve CBT's embedded loop to the technical standard included in the TELRIC study, it has undoubtedly paid twice for the technical capabilities inherent in the loop it receives. Such a circumstance would be unreasonable.

Q. How should the Commission remedy CBT's error with respect to non-recurring charges associated with the removal of load coils, bridge tap or digital repeaters?

A. Quite simply, the Commission should recognize that MCI when paying for the loop designed within the TELRIC study should receive the loop designed within the TELRIC study. Likewise, it should receive that loop at the level of quality and network design that is assumed within the study. It should not be required to pay both the TELRIC price as well as additional charges to "improve" CBT's

network to meet the standards of the forward looking loop. In recognizing this fact, the Commission should require that CBT return to its non-recurring cost studies, specifically those supporting its Improved Voice Grade Loss, Non-Loaded Copper Loop Guarantee, and ISDN Compatible Conditioning charges, and remove any time, material or expense associated with altering the loop to meet the technical standards achieved by the loop designed within the TELRIC studies. More specifically, the Commission should, at a minimum, ensure that CBT removes from its non-recurring cost studies any time, material or expense associated with removing load coils, bridge tap, or digital repeaters which will not exist on the forward looking loop.

III. COLLOCATION CHARGES

Q. To your knowledge, did CBT provide TELRIC studies supporting the Collocation charges included in its proposed *CINCINNATI BELL PRICING SCHEDULE FOR INTERCONNECTION* that was included with the testimony of Ms. Maggard?

A. To my knowledge, CBT has not provided any cost documentation in support of the collocation charges included in its proposed pricing schedule. In fact, it is my understanding that CBT has refused to provide the cost study documentation that was used to support the collocation charges included in its federal tariffs, even though it proposes to charge MCI intrastate rates equal to those included in its federal tariffs.

Q. Absent such cost documentation can you determine the extent to which CBT's proposed charges for collocation are reasonable?

A. No, I cannot.

Q. Given that CBT has failed to file TELRIC studies supporting its collocation rates and has refused to provide studies supporting the federal rates it is proposing in this case, how should the Commission establish CBT's collocation rates?

A. The Commission should require that CBT file rates for collocation services equal to 50% of the rates it currently charges in its federal tariffs for similar services/elements. CBT should then be allowed to provide TELRIC studies at some point in the future supporting rates that it believes are more reasonably based upon its underlying costs.

Q. Why do you believe that the Commission should adopt rates equal to 50% of CBT's currently tariffed federal rates?

A. CBT's obligations with respect to rates it proposes to charge interconnecting local exchange carriers are clearly defined within the Commission's Local Service Guidelines. One of the most important requirements within the Guidelines is found at V.B.1(g):

> For each element provided by an ILEC to requesting telecommunications carriers, the ILEC shall prove to the Commission's satisfaction, that the price of the element does not exceed the forward-looking economic cost per unit of providing that element.

Clearly this obligation is difficult to misconstrue. It is difficult to believe that CBT fails to understand its obligation to support its proposed collocation rates with cost information. Regardless, it has provided none. On an additional note, it is important to remember that this is the second time CBT has completely failed to meet its obligations regarding cost support for its collocation services. In my original testimony in Case No. 97-152-TP-ARB, filed on April 2, 1997, I pointed to the fact that CBT had provided zero cost support for its collocation services. Regardless of the fact that nearly nine months has passed since that time, MCI has still yet to see any CBT collocation cost information; either TELRIC or FCC in nature.

Good public policy requires that the Commission not allow CBT simply to ignore its Local Service Guidelines or to assess charges without any type of cost support. Instead, the Commission should place the impetus on CBT to prove that the collocation rates it proposes to charge are cost based. Toward this goal the Commission should discount CBT's proposed rates by 50%. Such an action will provide CBT the incentive to hasten its development of TELRIC based collocation costs upon which reasonable rates can be established.

Q. The Commission Staff recommends that "the Commission require that the above studies which have not yet been provided by CBT [including collocation] be filed three months after the issuance of the Commission's decision on TELRIC's." Do you agree with this recommendation?

A. I agree that CBT should be required to file TELRIC studies supporting its proposed rates, however, I believe that the Commission should in this proceeding establish a rate that will be available to MCI and other requesting carriers until those studies are completed.

The Commission's Staff in its Staff Report (at page 84) recognized that "the unavailability of these [collocation] elements, at TELRIC-based prices, would significantly impair a NEC's ability to offer service by greatly increasing the NEC's costs." I agree. However, the rates that CBT is proposing in this case have actually been included in the MCI / CBT agreement without cost support since August of this year. Given that the Commission will require time after the closing of this proceeding to issue an order and that Staff recommends CBT be given three months after that time to file its studies, it is not unlikely that CBT's proposed collocation could be in place until mid-summer. This is especially likely given the fact that the collocation studies ultimately submitted by CBT will need to be reviewed for reasonableness. In such a circumstance CBT will have been allowed to charge its proposed collocation rates for nearly a year even though it has completely failed to meet is obligations to support them with cost information. The Commission should not allow such a circumstance to occur. It should instead, require CBT to file, as soon as possible, rates equal to 50% of its current interstate rates. Those rates should remain in effect until a reasonable TELRIC study supporting cost based rates is approved by the Commission.

Q. Is it your understanding that the "true-up" provision mentioned earlier would also apply to collocation charges?

A. Yes, that is my understanding. However, my rationale with respect to "truing-up" non-recurring charges also applies to collocation charges.

Q. Does this conclude your testimony?

A. Yes, it does.

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- Graduate Coursework, Finance
  - Southwest Missouri State University, Springfield, Missouri
  - Lincoln University, Jefferson City, Missouri

PROFESSIONAL EXPERIENCE

- **Maryland Public Service Commission**
  Telecommunications Division
  Director

- **Illinois Commerce Commission**
  Office of Policy and Planning
  Senior Telecommunications Policy Analyst

- **Missouri Public Service Commission**
  Utility Operations Division
  Telecommunications Department
  Economist

PROFESSIONAL ACTIVITIES

- Former member of the Missouri Public Service Commission's Task Force on FCC Docket Nos. 91-141 and 91-213 regarding expanded interconnection, collocation, and access transport restructure

- Former member of the AT&T / Missouri Commission Staff Total Quality Management Forum responsible for improving and streamlining the regulatory process for competitive carriers

- Former member of the Missouri, Oklahoma, Kansas, Texas, and Arkansas five state Southwestern Bell Open Network Architecture (ONA) Oversight Conference

- Former delegate to the Illinois, Michigan, Indiana, Ohio, and Wisconsin Ameritech Regional Regulatory Conference (ARRC) charged with the responsibility of analyzing Ameritech's "Customers First" local exchange competitive framework for formulation of recommendations to the FCC and the U.S. Department of Justice

- Former member of both the Illinois and Maryland Local Number Portability Industry Consortiums responsible for developing and implementing a permanent data-base number portability solution

TESTIMONY
PROFILE AND EXPERIENCE

Before the Public Utilities Commission of the State of Hawaii
Docket No. 7702
In the Matter of the Public Utilities Commission Instituting a Proceeding on Communications, Including an Investigation of the Communications Infrastructure of the State of Hawaii
On behalf of GST Telecom Hawaii, Inc.

Before the State of Indiana Utility Regulatory Commission
Cause No. 40849
In the Matter of Petition of Indiana Bell Telephone Company, Incorporated d/b/a Ameritech Indiana for the Commission to Decline to Exercise in Whole or in Part its Jurisdiction Over, and to Utilize Alternative Regulatory Procedures for, Ameritech Indiana's Provision of Retail and Carrier Access Services Pursuant to I.C. 8-1-2.6 et seq.
On behalf of AT&T Communications of Indiana, Inc.

Before the Federal Communication Commission
C.C. Docket No. 97-137
In the Matter of Application by Ameritech Michigan for Authorization under Section 271 of the Communications Act to Provide In-Region, InterLATA Service in the State of Michigan
On behalf of the AT&T Corporation

Before the Indiana Utility Regulatory Commission
Cause No. 40611
In the Matter of the Commission Investigation and Generic Proceeding on Ameritech Indiana's Rates for Interconnection, Service, Unbundled Elements and Transport and Termination under the Telecommunications Act of 1996 and Related Indiana Statutes
On behalf of the MCI Telecommunications Corporation

Before the Public Utilities Commission of Ohio
Case No. 97-152-TP-ARB
In the matter of the petition of MCI Telecommunications Corporation for arbitration pursuant to section 252(b) of the Telecommunications Act of 1996 to establish an interconnection agreement with Cincinnati Bell Telephone Company
On behalf of the MCI Telecommunications Corporation

Before the Michigan Public Service Commission
Case No. U-11280
In the matter, on the Commission's own motion to consider the total service long run incremental costs and to determine the prices of unbundled network elements, interconnection services, and basic local exchange services for AMERITECH MICHIGAN
On behalf of the MCI Telecommunications Corporation

Before the Illinois Commerce Commission
Docket No. 96-0486
Investigation into forward looking cost studies and rates of Ameritech Illinois for interconnection, network elements, transport and termination of traffic
On behalf of the MCI Telecommunications Corporation

Before the Public Utility Commission of Ohio
Case No. 96-922-TP-UNC
In the Matter of the Review of Ameritech Ohio's Economic Costs for Interconnection, Unbundled Network Elements, and Reciprocal Compensation for Transport and Termination of Local Telecommunications Traffic
On behalf of the MCI Telecommunications Corporation

Before the New Jersey Board of Public Utilities
Docket No. TX95120631
In the Matter of the Investigation Regarding Local Exchange Competition for Telecommunications Services
On behalf of the MCI Telecommunications Corporation

Before the Michigan Public Service Commission
Case No. U-11104
In the matter, on the Commission's Own Motion, to Consider Ameritech Michigan's Compliance With the Competitive Checklist in Section 271 of the Telecommunications Act of 1996
On behalf of AT&T Communications of Indiana, Inc.

Before the Public Utility Commission of Ohio
Case Nos. 96-702-TP-COI, 96-922-TP-UNC, 96-973-TP-ATA, 96-974-TP-ATA, Case No. 96-1057-TP-UNC
In the Matter of the Investigation Into Ameritech Ohio's Entry Into In-Region InterLATA Services Under Section 271 of the Telecommunications Act of 1996.
On behalf of AT&T Communications of Ohio, Inc.

Before the Illinois Commerce Commission
Docket No. 96-0404
Investigation Concerning Illinois Bell Telephone Company's Compliance With Section 271(c) of the Telecommunications Act of 1996
On behalf of AT&T Communications of Illinois, Inc.

Before the Commonwealth of Massachusetts Department of Public Utilities
In the Matter of: D.P.U. 96-73/74, D.P.U. 96-75, D.P.U. 96-80/81, D.P.U. 96-83, D.P.U. 96-94, NYNEX - Arbitrations
On behalf of the MCI Telecommunications Corporation

Before the Pennsylvania Public Utility Commission
Docket No. A-31023670002
In the Matter of the Application of MCI Metro Access Transmission Services, Inc. For a Certificate of Public Convenience and Necessity to Provide and Resell Local Exchange Telecommunications Services in Pennsylvania
On behalf of MCImetro Access and Transmission Services, Inc.

Before the New Jersey Board of Public Utilities
Docket No. TO96080621
In the Matter of MCI Telecommunications Corporation for Arbitration with Bell Atlantic-New Jersey, Inc. Pursuant to Section 252 of the Telecommunications Act of 1996
On behalf of the MCI Telecommunications Corporation

Before the Wisconsin Utility Regulatory Commission
Cause No. 40571-INT-01
Petition for Arbitration of Interconnection Rates, Terms and Conditions, and Related Arrangements with Wisconsin Bell Telephone Company d/b/a Ameritech Wisconsin
On behalf of AT&T Communications of Wisconsin, Inc.

Before the Public Utilities Commission of Ohio
Case No. 96-752-TP-ARB
Petition for Arbitration of Interconnection Rates, Terms and Conditions, and Related Arrangements with Ohio Bell Telephone Company d/b/a Ameritech Ohio
On behalf of AT&T Communications of Ohio, Inc.

Before the Illinois Commerce Commission
Docket No. 96-AB-003
Docket No. 96-AB-004 *Consol.*
Petition for Arbitration of Interconnection Rates, Terms and Conditions, and Related Arrangements with Illinois Bell Telephone Company d/b/a Ameritech Illinois
On behalf of AT&T Communications of Illinois, Inc.

Before the Michigan Public Service Commission
Case No. U-11151
Petition for Arbitration of Interconnection Rates, Terms and Conditions, and Related Arrangements with Michigan Bell Telephone Company d/b/a Ameritech Michigan
On behalf of AT&T Communications of Indiana, Inc.

Before the Indiana Utility Regulatory Commission
Cause No. 40571-INT-01
In the Matter of the Petition of AT&T Communications of Indiana, Inc. Requesting Arbitration of Certain Terms and Conditions and Prices for Interconnection and Related Arrangements from Indiana Bell Telephone Company, Incorporated d/b/a Ameritech Indiana Pursuant to Section 252 (b) of the Communications Act of 1934, as Amended by the Telecommunications Act of 1996.
On behalf of AT&T Communications of Indiana, Inc.

Before the Missouri Public Service Commission
Case No. TT-96-268
Application of Southwestern Bell Telephone Company, Inc. to Revise P.S.C. Mo.-No. 26, Long Distance Message Telecommunications Service Tariff to Introduce the Designated Number Optional Calling Plan
On behalf of the MCI Telecommunications Corporation

Before the Corporation Commission of the State of Oklahoma
Cause No. PUD 950000411
Application of Southwestern Bell Telephone Company for an Order Approving Proposed Revisions in Applicant's Long Distance Message Telecommunications Service Tariff Southwestern Bell Telephone Company's Introduction of 1+ Saver Direct[sm]
On behalf of the MCI Telecommunications Corporation

Before the Georgia Public Service Commission
Docket No. 6415-U and 6537-U *cons.*
Petition of MCImetro to Establish Nondiscriminatory Rates, Terms and Conditions for the Unbundling and Resale of Local Loops
On behalf of MCImetro Access Transmission Services

Before the Public Service Commission of the State of Mississippi
Docket No. 95-UA-358
Regarding a Docket to Consider Competition in the Provision of Local Telephone Service
On behalf of the Mississippi Cable Television Association

Before the Maryland Public Service Commission
Docket No. 8705
In the Matter of the Inquiry Into the Merits of Alternative Plans for New Telephone Area Codes in Maryland
On behalf of the Staff of the Maryland Public Service Commission

Before the Maryland Public Service Commission
Docket No. 8584, Phase II
In the Matter of the Application of MFS Intelenet of Maryland, Inc. for Authority to Provide and Resell Local Exchange and Inter-Exchange Telephone Service; and Requesting the Establishment of Policies and Requirements for the Interconnection of Competing Local Exchange Networks

In the Matter of the Investigation of the Commission on its Own Motion Into Policies Regarding Competitive Local Exchange Telephone Service
On behalf of the Staff of the Maryland Public Service Commission

Before the Illinois Commerce Commission
Docket No. 94-0400
Application of MCImetro Access and Transmission Services, Inc. For a Certificate of Exchange Service Authority Allowing it to Provide Facilities-Based Local Service in the Chicago LATA
On behalf of the Office of Policy and Planning, Illinois Commerce Commission

Before the Illinois Commerce Commission
Docket No. 94-0315
Petition of Ameritech-Illinois for 708 NPA Relief by Establishing 630 Area Code
On behalf of the Office of Policy and Planning, Illinois Commerce Commission

Before the Illinois Commerce Commission
Docket No. 94-0422
Complaints of MFS, TC Systems, and MCI against Ameritech-Illinois Regarding Failure to Interconnect
On behalf of the Office of Policy and Planning, Illinois Commerce Commission

Before the Illinois Commerce Commission
Docket Nos. 94-0096, 94-0117, and 94-301
Proposed Introduction of a Trial of Ameritech's Customers First Plan in Illinois, et al.
On behalf of the Office of Policy and Planning, Illinois Commerce Commission

Before the Illinois Commerce Commission
Docket No. 94-0049
Rulemaking on Line-Side and Reciprocal Interconnection
On behalf of the Office of Policy and Planning, Illinois Commerce Commission

Before the Illinois Commerce Commission
Docket No. 93-0409
MFS-Intelenet of Illinois, Inc. Application for an Amendment to its Certificate of Service Authority to Permit it to Operate as a Competitive Local Exchange Carrier of Business Services in Those Portions of MSA-1 Served by Illinois Bell Telephone and Central Telephone Company of Illinois
On behalf of the Office of Policy and Planning, Illinois Commerce Commission

Before the Illinois Commerce Commission
Docket No. 94-0042, 94-0043, 94-0045, and 94-0046
Illinois Commerce Commission on its own motion. Investigation Regarding the Access Transport Rate Elements for Illinois Consolidated Telephone Company (ICTC), Ameritech-Illinois, GTE North, GTE South, and Central Telephone Company (Centel)
On behalf of the Office of Policy and Planning, Illinois Commerce Commission

Before the Illinois Commerce Commission
Docket No. 93-0301 and 94-0041
GTE North Incorporated. Proposed Filing to Restructure and Consolidate the Local Exchange, Toll, and Access Tariffs with the Former Contel of Illinois, Inc.
On behalf of the Office of Policy and Planning, Illinois Commerce Commission

Before the Public Service Commission of the State of Missouri
Case No. TC-93-224 and TO-93-192
In the Matter of Proposals to Establish an Alternate Regulation Plan for Southwestern Bell Telephone Company
On behalf of the Telecommunications Department, Missouri Public Service Commission

Before the Public Service Commission of the State of Missouri
Case No. TO-93-116
In the Matter of Southwestern Bell Telephone Company's Application for Classification of Certain Services as Transitionally Competitive
On behalf of the Telecommunications Department, Missouri Public Service Commission

REMOVAL OF NON-OHIO ASSETS FROM POLE FACTOR CALCULATION

ALL JURISDICTIONS

Pole Investment $43,130,768.00

	FIBER AERIAL CABLE	COPPER AERIAL CABLE
Proportion of Aerial Cable	4%	96%
Pole Investment Assigned	$1,725,230.72	$41,405,537.28
Pole Investment per Fiber (Copper Pair) Foot	$0.020334	$0.004877
Aerial Fiber (Copper Pair) Cable Investment per Fiber (Copper Pair) foot	$0.10353	$0.01916
Ratio of Pole Investment to Cable Investment	0.19641	0.25447

AERIAL CABLE	SHEATH MILES	CONDUCTOR (or Fiber) MILES	TOTAL INVESTMENT	INVESTMENT PER PAIR FOOT OR FIBER FOOT
3C	77.93	3,346.98	N/A	
22C	8,461.84	3,231,207.07	$163,470,400.00	$0.01916
822C	355.92	16,068.75	$8,783,855.00	$0.10353
Total				

OHIO ONLY

Pole Investment $28,547,209.56

	FIBER AERIAL CABLE	COPPER AERIAL CABLE
Proportion of Aerial Cable	4%	96%
Pole Investment Assigned	$1,141,888.38	$27,405,321.18
Pole Investment per Fiber (Copper Pair) Foot	$0.016678	$0.004233
Aerial Fiber (Copper Pair) Cable Investment per Fiber (Copper Pair) foot	$0.10353	$0.01916
Ratio of Pole Investment to Cable Investment	0.16109	0.22088

AERIAL CABLE	SHEATH MILES	CONDUCTOR (or Fiber) MILES	TOTAL INVESTMENT	INVESTMENT PER PAIR FOOT OR FIBER FOOT
3C	77.93	1,129.84	N/A	
22C	8,461.84	2,465,330.37	$124,723,636.32	$0.01916
822C	355.92	12,967.04	$7,088,329.78	$0.10353
Total				

	POLES		*CONDUCTOR (or Fiber) MILES 3C*		CONDUCTOR (or Fiber) MILES 22C		CONDUCTOR (or Fiber) MILES 822C	
Ohio	101,588	66.19%	1,129.84	33.76%	2,465,330.37	76.30%	12,967.04	80.70%
Kentucky	50,640	32.99%	2,145.49	64.10%	741,768.48	22.96%	2,974.11	18.51%
Indiana	1,257	0.82%	71.65	2.14%	24,108.22	0.75%	127.60	0.79%
Total	153,485	100.00%	3,346.98	100.00%	3,231,207.07	100.00%	16,068.75	100.00%

REMOVAL OF NON-OHIO ASSETS FROM CONDUIT FACTOR CALCULATION

ALL JURISDICTIONS

Conduit Investment $89,825,274.00

	FIBER UNDRGRND CABLE	COPPER UNDRGRND CABLE	UNDRGRND CABLE	SHEATH MILES	CONDUCTOR (or Fiber) MILES	TOTAL INVESTMENT	PER PAIR FOOT OR FIBER FOOT
Proportion of Underground Cable	13.83%	86.17%	5C	2,903.39	4,816,598.95	$116,490,426.00	$0.00916
Conduit Investment Assigned	$9,656,835.39	$80,168,438.61	5C-CoAx	20.80	n/a	n/a	
Conduit Investment per Fiber (Copper Pair) Foot	$0.063040	$0.004759	85C	469.39	29,012.38	$18,459,179.00	$0.12050
Undrgrnd Fiber (Copper Pair) Cable Investment per Fiber (Copper Pair) foot	$0.12050	$0.00916	Total	3,393.58	4,845,611.33	134,949,605.00	
Ratio of Conduit Investment to Cable Investment	0.52315	0.51946					

OHIO ONLY

Pole Investment $56,923,230.37

	FIBER UNDRGRND CABLE	COPPER UNDRGRND CABLE	UNDRGRND CABLE	SHEATH MILES	CONDUCTOR (or Fiber) MILES	TOTAL INVESTMENT	PER PAIR FOOT OR FIBER FOOT
Proportion of Underground Cable	13.83%	86.17%	5C		3,976,135.45	$96,163,645.18	$0.00916
Conduit Investment Assigned	$7,872,482.76	$49,050,747.61	5C-CoAx		-	n/a	n/a
Conduit Investment per Fiber (Copper Pair) Foot	$0.063676	$0.004673	85C		23,415.42	$14,898,103.12	$0.12050
Undrgrnd Fiber (Copper Pair) Cable Investment per Fiber (Copper Pair) foot	$0.12050	$0.00916	Total		3,999,550.87	$111,061,748.31	
Ratio of Conduit Investment to Cable Investment	0.52642	0.51008					

	CONDUIT DUCT MILES		CONDUCTOR (or Fiber) MILES 5C		CONDUCTOR (or Fiber) MILES 5C - COAX	CONDUCTOR (or Fiber) MILES 85C	
Ohio	4,743.18	81.52%	3,976,135.45	82.55%	-	23,415.42	80.71%
Kentucky	1,060.01	18.22%	839,273.76	17.42%	-	5,588.02	19.26%
Indiana	15.06	0.26%	1,189.74	0.02%	-	8.94	0.03%
Total	5,818.23	100.00%	4,816,598.95	100.00%	-	29,012.38	100.00%

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right?

A Yeah, that's basically what that assumption says.

Q And the idea behind that is that would be consistent with the capacity costing methodology, correct?

A Correct.

Q And, in fact, on Page 4.1, there's a reference to "SCIS model offices will use the marginal run option," right?

A Except for federal filings --

Q Right.

A -- where a separate set of model office runs produce an average run option, right.

Q And so if you were performing a cost study in Illinois under the terms of your alternative regulation plan, if your retail counterpart was performing that cost study, he or she would use the marginal run option, correct?

A Correct.

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Q Now, for the actual loop facilities themselves -- if we go to Pages 5.1 through 5.5, I think -- this part of the AOE guidelines lays out the different fill factors in this area that are used to calculate the investment of the outside plant, correct?

MR. LIVINGSTON: What page are we on?

THE WITNESS: It's 5.1, Ted.

MR. LIVINGSTON: Okay.

THE WITNESS: That's correct.

MR. QUINN: Q And if we go back to Pages 5.4 and 5.5 within that tab, we've got a number of different fill factors listed on those two pages, correct?

A Correct.

Q The copper fill and the feeder plant in the AOE guidelines is 90 percent, right?

A That's right.

Q And the copper fill factor in the distribution and drop is 85 percent, correct?

A Correct.

Q And your retail counterpart, in going

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to perform LRSIC studies, has in the past, and will continue until you change this manual, to use those as the fill factors for the outside plant, correct?

A Correct.

Q Now, the AOE guidelines themselves have a couple of underlying principles contained within the definitional section, right?

A I think that's a fair statement.

Q One is regional consistency, correct?

A Where that's possible, that's definitely an objective.

Q Okay.

So where you're using labor that's specific to Illinois, you're going to have to use a labor rate that is Illinois-specific, but that's just because you can't get around that, right?

A That's -- yeah. We basically have to comply with what the rules are, what the customs or practices are of the various state Commissions.

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Q In terms of, for example, fill factors, however, Ameritech has taken the position, at least for purposes of its LRSIC studies, that it's appropriate to use the same fill factor in all five states; isn't that correct?

A For purposes of its LRSIC studies?

Q Yes, sir.

A Yes.

Q And with respect to cost of capital, for purposes of its LRSIC studies, Ameritech has taken the position that it is also appropriate to use the same cost of capital across all five states, right?

A Well, we think it's appropriate, but haven't been able to do it, especially here in Illinois -- Illinois because of the order we got in the alt. reg. case. It was 92-0448 that set weighted average cost of capital at 10.6 percent, and all the other states for retail studies we've been using an 11-1/2 percent cost of money, which is what we're asking to be

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feeder electronics, the circuit equipment in the feeder, from 96 down to 90 percent?

A I'm looking for my cheat sheet. That sounds about right though.

MR. LIVINGSTON: We will accept your representation. Bob, you don't have to get that.

MR. QUINN: I just want to make sure I got it right. That's all. I think I can do that quickly.

Let me mark as AT&T Cross Exhibit 2 your cheat sheet.

Your Honor, if I could get that marked as AT&T Cross Exhibit 2.

(Whereupon, AT&T Cross Exhibit No. 2 was marked for identification.)

MR. QUINN: Q I believe that this can be public now; is that right?

A Sure.

Q Mr. Palmer, I've handed you what we have marked as AT&T Cross Exhibit 2, which is AT&T's second set of data requests No. 6 served on

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Ameritech on this docket along with the Ameritech response and an attachment, which is the third page of the exhibit.

Is that attachment your cheat sheet?

A This is my cheat sheet. Thank you.

Q Just so I've got this correct, the engineered utilization column, that would equate to the fresh look column; is that correct?

A That's right.

Q For the loop feeder, you took the electronics from 96 percent to 90 percent, right?

A That's correct.

Q While it's not represented on your cheat sheet, did you also take the electronics in the nner office equipment from 98 percent to)2 percent?

A Sounds about right.

Q Now, the difference between the AOE ıtilization column and the fresh look or :ngineered utilization column, that's essentially going to represent the additional administrative,

maintenance and testing that's required when you provision unbundled loops; is that right, unbundled elements?

A That's correct.

Q Now, in arriving at the fresh look figures, who did you or your group consult with?

A It depended on the factor in question, you know. For loops, it was outside plant engineering people. For switching, basically people with responsibility for switch engineering and traffic engineering responsibilities.

Q Who picked the numbers, the fresh look numbers?

A Ultimately, after those discussions, I picked the numbers. I picked the numbers that were absolutely used.

Q What information were you given to come up with your choice of numbers?

A I guess we can talk about -- we could talk about loops first and what drove my decision there.

There was a lot of concern about

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churn and forecast uncertainty with respect to unbundled loops. I first got that concern from people in the AIIS business unit that I was responsible for the provision of the loops, the unbundled loops.

Basically, you know, that led us to discussions with the outside plant engineering people that given churn, forecast uncertainty and what we had been using in our cost studies prior to this time -- and we also talked to them about what we had to assume for usable capacity or theoretical maximum and are any adjustments in order.

They basically agreed that, you know, given that these -- that it was likely that, you know, that the offices with a higher concentration of business, business traffic, business demand, that it was reasonable to reduce the estimates of usable capacity reflect those conversations.

Q Did they give you numbers?

A No. They didn't give me an absolute

AVERAGE FACTR DISCOUNTS OVER THE LIFE OF THE EXISTING AMENDMENT

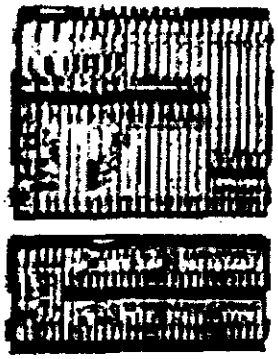
		1997	1998	1999	2000	2001
	Base Price	Year 1 Discount	Year 2 Discount	Year 3 Discount	Year 4 Discount	Year 5 Discount
	all discounts from original base price					
Minimum	100%	93%	93%	91%	91%	89%
20 million in first 2 years	100%	93%	93%	89%	89%	85%
30 million in first 2 years	100%	93%	93%	88%	88%	83%

A piece of equipment with a base price of $1.00 could be purchased in the following years at the following discounts if CBT meets its commitment to purchase $20 million worth of equipment from the contract every two years.

	Base Price	Discount Applied	Purchase Price
1998	$1.00	7%	$0.93
1999	$1.00	11%	$0.89
2000	$1.00	11%	$0.89
2001	$1.00	15%	$0.85

Average purchase price over the four year period: $0.89
Simple Average Discount applied over four year period: 11.00%

FACTR® FUJITSU ACCESS & TRANSPORT SYSTEM UNIVERSAL ACCESS PLATFORM



FACTR is Fujitsu's SONET transport and access platform for delivering narrowband DS0 and broadband services from advanced telephony and LAN support to interactive multimedia and video on-demand. FACTR provides the same flexible bandwidth management capabilities and ring survivability found in FLM SONET add/drop multiplexers, and extends these features to the DS0 level.

FACTR supports a full complement of survivable DS0-based services and hi-cap offerings from DS1 to OC-3c. FACTR's survivability is provided through integrated high-speed OC-3 path protection switched ring optics. If additional bandwidth is needed, the FACTR OC-3 ring can be upgraded in-service to OC-12 and has the ability to drop all 12 STS1s worth of bandwidth from one FACTR Network Element. FACTR also supports TR-08, TR-303 switch interfaces, and integrated digital loop carrier operations, as well as Digital Cross-Connect (DACS) systems for DS0 grooming for services that bypass the local switch.

Features	Technical Specifications
SONET Configurations • OC-3/OC-12 path protection switched ring • Linear Add/Drop • Terminal • SONET (optical) hub • OVTG optical extension to FLM 6 • *Interconnected rings (drop and continue or virtual)*	

Narrowband Configurations
• Universal mode for analog switches
• Integrated mode for digital switches and DCS
  • TR-08 DS1 interface
  • TR-303 DS1 interface
  • Integrated Network Access (INA)
	Protection Ratio
	OC-3/OC-12 facility...1 + 1
	DS1 (CMS) trib...7 : 1

Factr

Interfaces

DS0...2W/4W specials, POTs, ISDN, DDS (2.4 Kbs to 64 Kbs), UVS, ANI, DID,
Alarm Services, P-Phone, COIN, CLASS™
Low Speed trib...Fractional DS1, DS1, OVTG
Middle Speed trib...DS3, EC-1, OC-3/3c
High Speed facility...OC-3, OC-12
LAN tribs...Ethernet®, Token Ring (4 & 16 Mbps)
ATM...DS3 UNI, OC-3 UNI

Capacity

- 12 STS-1s in flexible combinations

Time Slot Assignment

- 2016 x DS0 TSA
- 84 x VTI.5 TSA
- 3 x STS-1 TSA (OC-3)
- 12 x STS-1 TSA for OC-12 ring

Narrowband Features

- Large line size
  - 1920 DS0s
- 4:1 ISDN TDM or 3 DS0 ISDN

***Broadband Platform* Features**

- Full service network
  - Voice, Video, Data over single network
- Open interface, open network management
- ATM in the distribution loop
- 51 Mb/s digital bandwidth (downstream) to the home or business, plus analog broadcast signals
- 5 Mb /s upstream for interactive services
- HDTV, PPV, NVOD supported
- Video telephony, video games, electronic shopping supported (interactive video)

Optics

DS1 (NBS/OAS) trib...1 : 0
DS3, STS-1 trib...1 : 1
OVTG trib...1 + 1
OC-3 trib...1 + 1

Tributary Interfaces

DS0...1920
DS1 (CMS)...28
DS1 (NBS)...56
DS3, STS-1 (OC-3/OC-12 feeder)...2 / 11
OC-3 (OC-3/OC-12 feeder)...2 / 5
OVTG (Protected)...4
OVTG (Unprotected)...7

Connectors

Optical...FC/PC, SC, ST, D4
DS3, EC1...BNC
DS1...64-pin amp champ
DS0...50-pin amp champ

Modes of Operation

TR-08...Mode I, Mode II, Mode III
TR-303...Hybrid

Operations Interfaces

X.25/TL1...37-pin D-Sub
LCN (ethernet)...Modular 8-pin jack
Craft...RS-232C ASCII
Orderwire...2W/4W VF
Housekeeping...16 inputs/outputs 4 control outputs

Operating Environment

Temperature...-40°C to 65°C(-40°F to 149°F)
Humidity...5 to 95% (non-condensing)
Extended temperature operation and convection cooling for all applications.

Physical Characteristics

Common Shelf...19.25"H x 21.5"W x 12"D
Narrowband Shelf...9.6"H x

Optics

- 1310 nm and 1550 nm optical units available

Operations

- Integrated X.25 and local communications network (LCN) interfaces
- Local and remote provisioning and software download
- Remote memory backup
- Interface to Fujitsu's open platform FLEXR® Plus network management software
- Interface to PC-based FLEXR graphical user interface
- Integrated access for industry standard OSs (NMA, OPS/INE)
- Interoperable with all Fujitsu Broadway products

21.5"W x 12"D

Specifications subject to change without notice.

For more product information, contact your local sales office.

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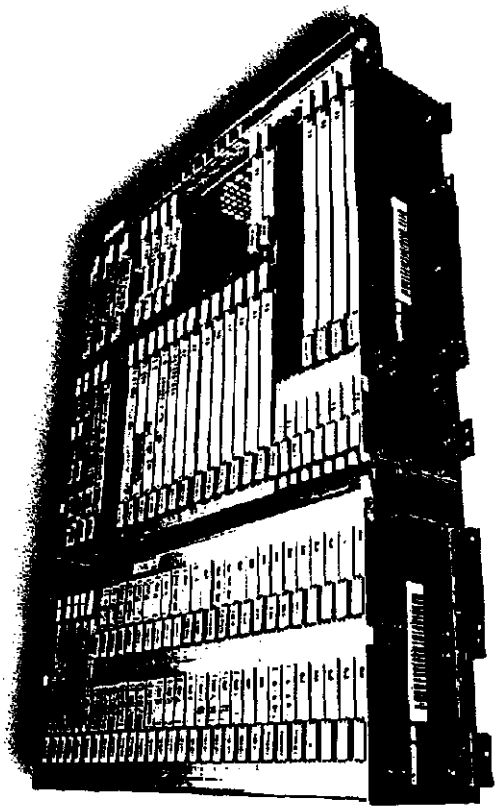
Fujitsu Access And Transport System



FACTR is Fujitsu's SONET transport and access platform for delivering narrowband DS0 through broadband OC-3c including internet access and multimedia services.

FACTR combines the same flexible network configurations found in Fujitsu's FLM family of ADMs with a wide variety of access services providing an "equip-as-you-need" approach for all business and residential applications.

NGDLC Solution

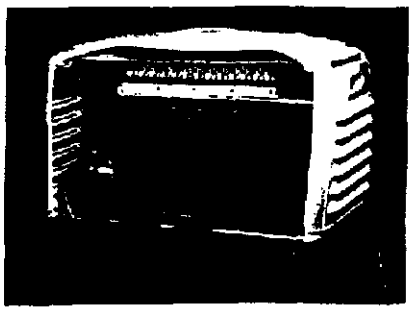
FACTR's compatibility with TR-008 & TR-303 switch interfaces provide a variety of DS0-based services and hi-cap offerings from DS1 to OC-3c.

LAN/ATM Interconnection

Fujitsu's FASTLANE LAN/ATM plug-in cards allow FACTR to provide an easy solution for interconnecting SONET with Ethernet, Token Ring or ATM user networks.

Broadband FITL Solution

The FACTR access network can be easily upgraded to a Full Service Network with the integration of ATM switching. The FACTR DSLAM solution utilizes xDSL technology to provide each end-user with up to 51Mbps of downstream and 1.6Mbps of upstream bandwidth-on-demand for high-speed internet access, video, telephony and work at home applications.



SONET Dependability

Provides complete OC-3/12 ADM functionality with path protected switched ring optics.

OAM&P Operation

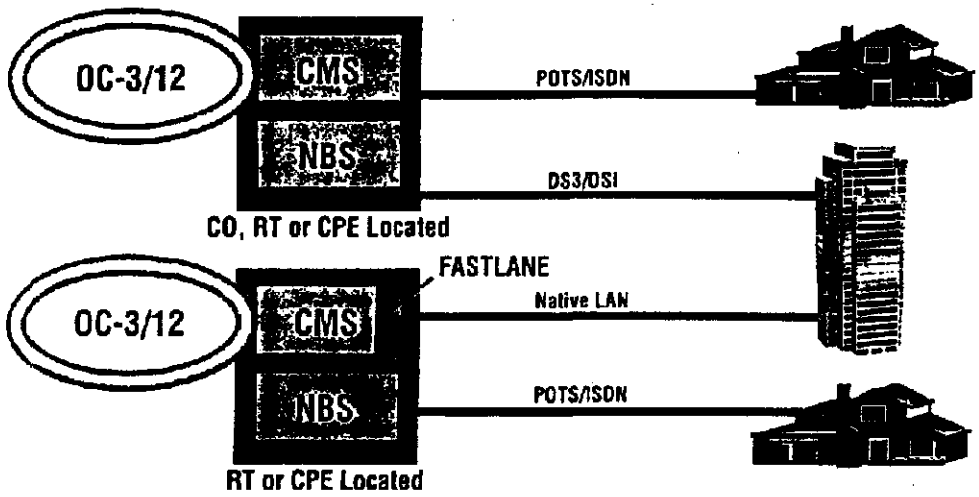
FACTR communicates with standard network management OSs and is fully compatible with Fujitsu's FLEXR network management software.

FUJITSU

FACTR Product Migration

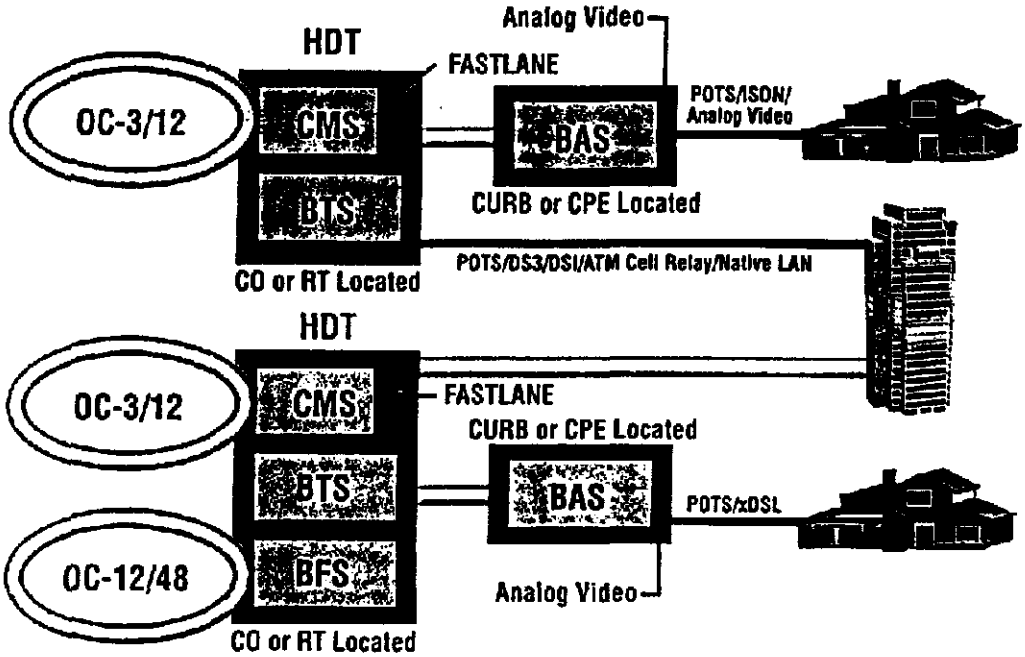
IGDLC
- Telephony
- Hi-Cap

IGDLC
- Telephony
- Hi-Cap
- LAN



TL-Broadband Ready
- Telephony
- Hi-Cap
- LAN
- Analog Broadcast

TL-Broadband
- Telephony
- Hi-Cap
- LAN
- xDSL
- Analog Broadcast



Features

SONET Configurations
- OC-3/OC-12 path protection switched ring
- Linear Add/Drop
- Terminal
- SONET (optical) hub
- OVTG optical extension to FLM 6
- Interconnected rings (drop and continue or virtual)

Narrowband Configurations
- Universal mode for analog switches
- Integrated mode for digital switches and DCS
  - — TR-08 DS1 interface
  - — TR-303 DS1 interface
  - — Integrated Access Network (INA)

Broadband Configurations
- Broadband Ready
  - — TR-57/909
  - — Multiple Lan interfaces
- Broadband
  - — TR-57/909
  - — Multiple LAN interfaces
  - — xDSL (HDSL, SDSL, ADSL, VDSL, DAVIC A1)

Broadband Capabilities
- Full service network
  - — Voice, Video, Data over single network
- ATM from the Central Office to the Set-Top Box
- ATM Edge Switch functionality
- Bridge/Router functionality
- Multiple LAN and cell relay interfaces
  - — OC-3 UNI, DS3 UNI, 10BaseT, Token Ring
- 51Mbps digital downstream bandwidth to the home or business including analog broadcast signals
- 1.6Mbps digital upstream bandwidth for interactive services

Interfaces
- High Speed facility.....OC-3, OC-12
- ATM.....DS3 UNI, OC-3 UNI
- LAN tribs.....Ethernet, Token Ring (4 & 1.6Mbps)
- Middle-speed tribs.....DS3, EC-1, OC-3/3c
- Low-speed tribs.....DS1, OVTG
- xDSL up to 51Mbps downstream / 1.6Mbps upstream
- DS0.....2W/4W specials, POTS, ISDN, DDS, UVC, ANI, DID, Alarm Services, P-Phone, COIN, CLASS

Capacity
- 12 STS-1s in flexible combinations

Time Slot Assignment
- 2016 x DS0
- 84 x VT1.5
- 3 x STS-1 (OC-3)
- 12 x STS-1 for OC-12 ring

Optics
- 1310 nm and 1550 nm optical units

Operations
- X.25 and LCN operations interface
- TL1 messages over 7 layer OSI
- Remote software download of new features/enhancements
- Local provisioning
- Interface to Fujitsu's open platform FLEXR *Plus* network management software
- Interface to PC-based FLEXR graphical user interface
- Industry standard OSs (NMA, OPS/INE)
- Interoperable with all Fujitsu transmission products

FACTR

Technical Specifications

Protection Ratio

OC-3/OC-12 facility	1 + 1
DS1 (CMS) trib	7 : 1
DS1 (NBS/OAS) trib	1 : 0
DS3, STS-1 trib	1 : 1
OVTG trib	1 + 1
OC-3 trib	1 + 1

Tributary Interfaces

DS0	1920
DS1 (CMS)	28
DS1 (NBS)	56
DS3, STS-1 (OC-3/OC-12 facility)	2/11
OC-3 (OC-3/OC-12 facility)	2/5
OVTG (Protected/Unprotected)	4/7

Connectors

Optical	FC/PC, SC, ST, D4
DS3, EC1	BNC
DS1	64-pin amp champ
DS0	50-pin amp champ

Modes of Operation

TR-08	Modes I, II, III
TR-303	Hybrid

Operations Interfaces

X.25	37-pin D-Sub
LCN (Ethernet)	Modular 8-pin jack
Craft	RS-232C ASCII
Orderwire	2W/4W VF
Housekeeping	16 inputs / 16 outputs control outputs

Operating Environment

Temperature	-40°C to +65°C (-40°F to +149°F)
Humidity	5 to 95% (non-condensing)

Extended temperature operation and convection cooling for all applications

Physical Characteristics

Common Shelf (CMS)	19.25"H x 21.5"W x 12.0"D
Narrowband Shelf (NBS)	9.6"H x 21.5"W x 12.0"D
Broadband Trib Shelf (BTS)	14.0"H x 21.5"W x 12.0"D
Broadband Feeder Shelf (BFS)	24.5"H x 21.5"W x 12.0"D
Broadband Access Shelf (BAS):	
— Aerial Enclosure	12.0"H x 22.0"W x 11.0"D
— Pedestal	30.0"H x 36.0"W x 24.0"D

Specifications subject to change without notice.

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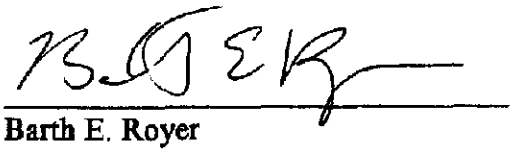
CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing testimony has been served upon the following by overnight delivery or by first class U.S. mail, postage prepaid, this 23rd day of December 1997.



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Confidential Release

Case Number: 96-899-TP-ALT

Date of Confidential Document:
4/7/1999

Today's Date:

Confidential rebuttal testimony of Dr. August Ankum filed on behalf of MCI Telecommunications Corp. by J. Sanders. (25 pgs.)

25 pgs.

FROM
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To

CASE NO. 96-899-TP-ALT

CONFIDENTIAL REBUTTAL TESTIMONY
OF DR. AUGUST ANKUM ON BEHALF OF
MCI TELECOMMUNICATIONS CORPORATION

CONFIDENTIAL

00-0507

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	)	Case No. 96-899-TP-ALT
May Result In Future Rate Increases	)	

REBUTTAL TESTIMONY OF

DR. AUGUST ANKUM

ON BEHALF OF

MCI TELECOMMUNICATIONS CORPORATION

CONFIDENTIAL VERSION

April 7, 1999

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	))))	Case No. 96-899-TP-ALT

REBUTTAL TESTIMONY OF DR. AUGUST H. ANKUM
ON BEHALF OF MCI TELECOMMUNICATIONS CORPORATION

Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Dr. August H. Ankum. I am an economist and consultant, specializing in telecommunications. My business address is 1350 North Wells, Suite C501, Chicago, IL 60610.

Q. ARE YOU THE SAME DR. AUGUST H. ANKUM WHO PREVIOUSLY FILED TESTIMONY IN THIS PROCEEDING?

A. Yes, I am.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to discuss issues raised in the direct and cross-examination testimony of various witnesses in this proceeding.

AMERITECH'S FILL FACTORS AND PRICES ARE DIRECTLY RELEVANT AS BENCHMARKS FOR CBT – WHICH SOONER OR LATER WILL BE A COMPETITOR OF AMERITECH (OR SBC)

Q. HAS THERE BEEN A DISCUSSION ABOUT THE EXTENT TO WHICH THE COST CHARACTERISTICS OF OTHER LOCAL EXCHANGE CARRIERS, SUCH AS AMERITECH OHIO, ARE RELEVANT TO THE CURRENT PROCEEDING?

A. Yes. For example, MCI and other interveners have recommended that the Commission order CBT to use in its cost studies the fill factors for various technologies that the Commission approved for use in Ameritech Ohio's cost studies. Other parties, most notably CBT, believe, however, that it is inappropriate to use the same standards for CBT as the Commission did for Ameritech. The Commission Staff under cross-examination appears to express similar reservations about comparing CBT's costs to Ameritech's.

During cross-examination, the MCI attorney Ms. Van Duzer asked Staff witness, Ms. Soliman, whether CBT would not be forced to attain Ameritech's fill factors if the two companies were to compete at some point in the future. Ms. Soliman responded:

> [...] Although they may be equally efficient in utilizing the sources, you might have a different utilization factor just because of all those factors. (TR 13, 68 lns. 6-9).

Q. IN YOUR OPINION, SHOULD THE COMMISSION COMPARE CBT'S COST STUDIES TO AMERITECH'S COST STUDIES?

A. Yes. First, the Commission should consider that the cost studies in the current proceeding are supposed to be TELRIC studies. Given that TELRIC estimates the costs of building and operating a least cost forward-looking network – subject to limited considerations regarding company specific characteristics, such as switch locations – the costs, by definition, are fairly generic and applicable to any company operating under similar circumstances.

Second, part of TELRIC is the consideration that it should emulate the costs of companies operating in competitive circumstances. Thus, it is entirely appropriate to consider– for TELRIC purposes – the as of yet hypothetical situation of Ameritech and CBT competing in the same serving areas. Clearly, in a competitive industry, companies would be forced to align their cost structures to those of the most efficient firms in the industry. In the computer industry, companies such as IBM and Compaq Computers have been forced to adopt the more efficient inventory management system of Dell Computers. While IBM and Compaq initially resisted adopting the build-to-order system introduced by Dell, they had no choice when Dell's procedures proved more efficient and the company continued to gain market share. Similarly, therefore, one should assume – for TELRIC purposes – that CBT and Ameritech in a competitive setting would be forced to achieve comparable levels of efficiency.

Q. IS IT REALISTIC TO ASSUME THAT AT SOME POINT IN THE FUTURE AMERITECH AND CBT WILL INDEED BE COMPETITORS?

A. Yes. In the SBC/AIT merger stipulation, Ameritech makes an explicit commitment to offer local exchange services and compete in a number of new local exchange markets. Specifically the company is committed to compete in Cincinnati, which includes "the Cincinnati exchange area that is currently served by Cincinnati Bell." (*In Re the Application of SBC and Ameritech Ohio*, Case No. 98-1082-TP-AMT, Jt. Ex. 1 [Stipulation], page 22 [excerpts are attached hereto as Attachment 1])

Q. IS AMERITECH'S COMMITMENT TO COMPETE WITH CBT PREDICATED ON THE CONDITION THAT THE COMMISSION WILL APPROVE AN INTERCONNECTION AGREEMENT WITH CBT THAT IS REASONABLY COMPARABLE TO THOSE BETWEEN AMERITECH AND NECS?

A. Yes. Section D.2.(iii) of the Stipulation states that SBC/Ameritech's commitment will become effective

> upon SBC/Ameritech's obtaining a Commission-approved interconnection agreement with the ILEC serving the specified market that is fully compliant with Section 251 of the Telecommunications Act of 1996 and that is *reasonably comparable* to the agreements that Ameritech Ohio has with NECs. (Emphasis added.) (Stipulation, page 23)

Thus, the SBC/Ameritech merger stipulation further emphasizes the importance of approving cost studies that result in terms and conditions for obtaining UNEs from CBT that are approximately comparable to those for obtaining UNEs from Ameritech.

Q. DOES THE FCC USE "BENCH MARKING" – THE PRACTICE OF COMPARING COST RESULTS ACROSS COMPARABLE COMPANIES – IN ITS PUBLIC POLICY DECISIONS?

A. Yes. The FCC routinely gathers cost information to determine how various RBOCs compare in terms of their proposed service offerings. In fact -- in the absence of competitive markets -- the practice of 'benchmarking" is one of the few tools available to a public agency in evaluating how reasonable the service offerings of specific companies are.

In sum, the recommendation, made by various parties to this proceeding, that the Commission mandate the fill factors approved for Ameritech in CBT's cost studies is consistent with sound economics and well-accepted regulatory practices.

AMERITECH'S ACAR FILL FACTORS ARE NOT SPECIFIC TO AMERITECH'S COST STUDIES BUT TO LEAST-COST FORWARD LOOKING TECHNOLOGIES

Q. DOES STAFF AGREE THAT THE ACAR FILL FACTORS ARE SPECIFIC TO LEAST-COST TECHNOLOGIES?

A. Yes. As the exchange below demonstrates, the ACAR fill factors are not fill factors that are specific to Ameritech's cost studies; rather they apply to specific pieces of technology.

> Q. Miss Soliman, is it your understanding that the fill factors included in Ameritech's ACAR are usable capacity factors as you define them?

> **A.** That's my understanding, yes.
> (TR. 13, 71.)

Obviously, one would have to make sure that these fill factors – if approved by the Commission – are appropriately applied in CBT's studies. Nevertheless, the ACAR fills themselves reflect the level of fill -- according to Ameritech's engineers -- at which certain types of technologies, *under efficient least-cost, forward-looking circumstances,* can be operated.

Q. DOES STAFF CORROBORATE THAT THE ACAR FILLS HAVE BEEN USED BEFORE THIS COMMISSION ON MANY OCCASIONS?

A. Yes. The ACAR fills have been used by Ameritech before the Ohio Commission prior to their use in the TELRIC proceeding. Ms. Soliman discusses the history of the ACAR fills in the following exchange with the MCI attorney, Ms. Van Duzer:

> **Q.** I would ask you both of those questions. How Ameritech uses ACAR?
>
> **A.** During Ameritech's – Up to the time of the Ameritech TELRIC proceeding, my understanding was Ameritech used to use ACAR for their LRSIC studies, long run incremental cost studies, to develop a floor price for its retail services, ...
> (TR. 13, 72.)

Q. WHAT DO YOU RECOMMEND WITH RESPECT TO THE USE OF AMERITECH'S ACAR FILLS IN CBT'S COST STUDIES?

A. I recommend that the Commission adopt the ACAR fills for CBT's cost studies. The

Commission has approved the use of the ACAR fills on numerous occasions as the appropriate fill for certain technologies operated under least-cost, forward-looking circumstances. Given that CBT's cost studies are supposed to be TELRIC studies, the circumstances for which the ACAR fills have been approved are precisely those that apply to the current studies.

THE FILLS ON CBT'S I/O STUDY SHOULD BE NO LOWER THAN THOSE ON CBT'S DLC SYSTEMS

Q. DOES STAFF RECOMMEND A FILL FACTOR FOR I/O TRANSPORT STUDIES THAT IS LOWER THAN THE CORRESPONDING FILL FOR DLC SYSTEMS USED IN THE LOOP STUDIES?

A. Yes. As indicated in the exchange below, Ms. Soliman recommends a fill of 70 percent for the electronics used in the I/O SONET rings.

> **A.** I am recommending the approval of the 70 percent fill factor for SONET facilities, as well as the common – common equipment component of the SONET electronics. (Tr. 13, 57).

By contrast, Ms. Soliman recommends fills for electronics used in the feeder that are higher. Specifically, she recommends fill factors of 88% for DS0, 77% for DS1 and 80% for DS3 facilities. (Direct Testimony of Nadia Soliman, page 26.)

Q. DOES CBT USE SOME OF THE SAME TECHNOLOGIES FOR THE I/O NETWORK

AND THE FEEDER FACILITIES?

A. Yes. For example, the DLC system used in the feeder portion of the loop is a OC-3 SONET technology. This same OC-3 SONET technology is used in the I/O network to provide I/O transport.

Q. WOULD ONE EXPECT A HIGHER LEVEL OF FILL ON THE I/O NETWORK THAN IN THE OUTSIDE PLANT FACILITIES?

A. Yes. The traffic volumes on the I/O network are substantially larger than those on individual feeder routes. Further, feeder routes are dedicated to specific locations and the amount of traffic that needs to be accommodated is relatively fixed (except for growth on the network.) Traffic on the I/O network, however, can be re-routed on short notice to ensure optimal utilization of the available technologies.

Further, as CBT witness Mr. Meier indicated during his cross-examination, there are certain circumstances under which the DLC system cannot be used to full capacity:

> All of those circuits will work in a digital loop carrier site. However, you *cannot* utilize all the pairs associated with that particular slot. So what happens, say, for instance, you have a coin line in a SLC-96 Series 5 type system, when you pull out a dual channel which could use two POTS customers and put a coin plug in, you can only feed one coin line out of that system -- or, out of that slot. (Emphasis added.) (Tr. 3, page 10.)

None of the circumstances identified by Mr. Meier, however, apply to the I/O network.

Again, therefore, one would expect the fill on the I/O electronics to be at least as high as those on the feeder facilities.

Q. IS THE ISSUE THAT SONET TECHNOLOGY MAY BE RELATIVELY NEW IN CBT'S NETWORK RELEVANT UNDER THE TELRIC METHODOLOGY?

A. No. The TELRIC methodology assumes that a firm, CBT, is operating in the long run and is able to select least cost, forward-looking technologies. It is irrelevant, therefore, that the SONET technology is relatively new in CBT's network.[1]

This point is acknowledged by Ms. Soliman:

> **Q.** And on Line 7, you say that SONET is a relatively new technology, correct?
>
> **A.** Correct.
>
> **Q.** Okay. Would you agree that it is irrelevant in a TELRIC proceeding whether or not SONET technology is new for CBT?
>
> **A.** Yes, I believe that in TELRIC when you, as Cincinnati Bell have done, assumed that all their interoffice facilities are SONET, it is irrelevant if it is new or not. (Tr. Vol. 13, 57-

[1] While the I/O TELRIC studies assume a 100% SONET architecture, CBT's real I/O network does not consist of all SONET technology. See page 143 of Mette's 12/4/98 deposition:

> Q. Okay. So the redesign of the interoffice network that you did, it doesn't reflect CBT's actual network, right?
> A. No, it does not.

58.)

Q. YET, DOES MS. SOLIMAN APPEAR TO DEVIATE FROM THE TELRIC METHODOLOGY WHEN SHE RECOMMENDS THE FILL FOR THE I/O NETWORK?

A. Yes. During cross-examination she noted the following:

> At the same time, the fill factor does not necessarily reflect – it reflects what is expected to be the fill *during the study period*, and you take into consideration the expected use of the facility and the capacity included in the study. (Tr. Vol. 13, 58.)

There is no reason to restrict the examination of fill to the relatively short time span of the "study period." The "study period," as indicated in the Staff Report, is five years. Given that SONET technology is a relatively new technology for CBT, fill factors may be low during those five years. But, this is irrelevant under TELRIC. TELRIC studies assume a long run framework and a least-cost (optimally efficient) utilization of facilities. Ms. Soliman's considerations, therefore, involve short-run and intermediate run analyses.

Q. IN THE LONG RUN, WOULD THE I/O SONET RINGS BE USED AT UTILIZATIONS THAT ARE HIGHER THAN 70%?

A. Yes. The 70% fill recommended by Staff is by no means the maximum that can efficiently be sustained on these SONET rings. Staff itself recognized this in the following exchange:

> **Q.** Would you agree that it's possible for CBT to run the SONET rings at fills that are higher than 70 percent?
>
> **A.** Yes; and as I described earlier in our discussion of the spare facilities, that the 70 percent that Cincinnati Bell proposed and I am

> recommending represents the fill factor, the average fill factor over the entire network, not necessarily a specific ring, so some rings will have higher fills and some will have lower fills. (Tr. Vol. 13, 61.)

Thus, in a long run framework, as required under the TELRIC methodology, fill factors on SONET technologies would have a substantially higher fill than the 70% fill that corresponds to a short run or intermediate run framework for new technologies.

Q. IF HIGHER LEVELS OF FILL ARE MANDATED FOR I/O STUDIES, COULD THE NETWORK BE REDESIGNED TO BE MORE EFFICIENT?

A. Yes. As I have demonstrated during my own cross-examination by CBT's attorney, Mr. Hart, some of CBT's larger multi-node rings can be replaced by smaller, cheaper rings, if a higher fill factor is adopted.

For example, one of CBT's larger rings, ring #299, which is an OC-48 SONET ring between three offices, Evendale, Avondale and West 7th, can be efficiently replaced by three OC-12 SONET rings. In terms of capacity, the OC-48 at a 70% fill accommodates 940 DS1s (.7*1344). Three OC-12 rings, between these three offices, can accommodate 1008 DS1s (3*336). This means that if 940 DS1s need to be accommodated on these three OC-12 rings, then the effective fill on these rings is 93%, a fill factor well short of the corresponding ACAR fill.

The corresponding cost savings of this reconfiguration are substantial. A DS1 on an OC-48 ring with three nodes costs $317.97 for Ring Fixed Investments Per Unit alone. By contrast, a DS1 on an OC-12 ring with two nodes costs only $247.66. This means a cost saving for Ring Fixed Investments of approximately $70 per DS1, or *cost savings of about 20%*. Of course, the costs of $247.66 per DS1 is still premised on a fill of only 70%, so that additional savings would materialize if the studies were to reflect the higher fills that would automatically be achieved simply by redesigning the I/O network (in the TELRIC study.)

In short, if higher fills were implemented in the I/O studies there would be cost savings for two reasons. First, there would be the obvious direct effect of using higher fills, which will lower the per unit costs of DS0, DS1, and DS3 circuits on the individual rings. Second, the higher fill factors would allow a redesign of the I/O network in the studies in which expensive multi-node rings are replaced by lower level two node rings that are far less expensive on a DS0, DS1, and DS3 basis.

Q. IF THIS WERE TRULY A COMPETITIVE MARKET, WOULD CBT ITSELF BY STRIVING TO ATTAIN THE HIGHEST POSSIBLE LEVEL OF FILL IN ORDER TO CURTAIL ITS COSTS?

A. Yes. The irony is that CBT's arguments against using higher fills are all premised on the unfortunate reality that local exchange markets in Cincinnati continue to be dominated by a

near monopoly provider, CBT.

Q. WHAT IS YOUR RECOMMENDATION?

A. My recommendation is that the Commission should order CBT to implement a fill factor of 96% on the electronics for the SONET rings. In the alternative, the fill factor on the I/O SONET rings should be no lower than the fills recommended by Staff for the same technologies used in the DLC systems. Further, when a higher fill factor is implemented, CBT should also review all of its rings, and consider if at the higher fill, smaller rings with fewer nodes can be implemented (as discussed above) to replace the more expensive larger rings.

CBT'S I/O STUDIES DO NOT MEET THE BASIC STANDARDS FOR TELRIC STUDIES

Q. IS ONE OF THE BASIC REQUIREMENTS OF THE FCC'S TELRIC METHODOLOGY THAT THE COSTS OF AN UNBUNDLED NETWORK ELEMENT BE BASED ON TOTAL DEMAND FOR THE ELEMENT?

A. Yes. As the FCC mandated in the Local Competition Order, "the increment that forms the basis for a TELRIC study shall be the entire quantity of the network element provided." (See paragraph 690, page 335.)

Q. DOES CBT EVEN KNOW WHAT LEVEL OF DEMAND THE I/O STUDY SHOULD BE ACCOMMODATING?

A. No. As Mr. Mette indicated during his cross-examination, the interoffice network is used for both switched and dedicated traffic. After further cross-examination on this issue, Mr. Mette indicated that nowhere in the I/O study is there a consideration of the total demand for interoffice transport:

> **Q.** Okay. So I guess if I understand your answer, there is nowhere that I could find in these cost studies a call volume for the usage on the -- on the interoffice network, correct?
>
> **A.** Not in these dedicated studies, no.
> (TR**** page 153.)

Q. DOES THIS MEAN THAT THE COMMISSION HAS NO BASIS FOR DETERMINING WHETHER OR NOT THE I/O STUDY CONSTRUCTED BY MR. METTE IS IN FACT A LEAST-COST NETWORK FOR CBT'S SWITCHED AND DEDICATED INTEROFFICE TRAFFIC?

A. Yes. Mr. Mette constructed an I/O network without knowing the total demand of switched and dedicated traffic that this network is supposed to accommodate under the TELRIC methodology. Quite possibly, therefore, Mr. Mette might have constructed a network that is altogether too large for CBT's total level of demand.

Q. ARE THERE INDICATIONS THAT MR. METTE HAS IN FACT OVER-BUILD THE I/O

NETWORK?

A. Yes. CBT assumes a 70% fill on the I/O network. Given the fixed nature of the theoretical I/O network (i.e., there is a fixed number of rings of fixed capacity, OC3, OC12, and OC48), a 70% fill translates into a *certain volume* of switched and dedicated traffic. But, CBT's actual fills are only between 40% and 60%, which would translate into a much *lower volume* of switched and dedicated traffic than a 70% fill. Thus, it appears that Mr. Mette has sized a I/O network that in fact may be substantially larger than a least-cost network.

Q. WHAT IS YOUR RECOMMENDATION?

A. In view of the possibility that CBT has designed an I/O network with substantial excess capacity, I recommend that the Commission order CBT to use higher fill factors and review the I/O study in order to replace the expensive higher capacity multi-node rings with smaller, two node rings.

THE MULTI-TENANT NATURE OF CENTRAL OFFICES WITH COLLOCATION DO NOT JUSTIFY THE EXORBITANT COBO CHARGES

Q. DOES STAFF MAINTAIN THAT A MULTI-TENANT BUILDING COSTS MORE ON A PER SQUARE FOOT BASIS THAN A SINGLE TENANT BUILDING?

A. Yes. Staff expressed its opinion on this issue during cross-examination:

> Q. Why do you think it would cost more per square foot to build a multi-tenant office?
>
> A. [I]f you are building a multitenant building, you would have

> to consider partitioning between tenants, if they would need specific security arrangements, you have to consider that, you have to consider different level of environmental conditioning based on the requirements of the safety codes, you have to consider – I just – I can't think of more examples, but you have to consider all those factors in designing the building.
>
> (Tr. Vol. 13, 81.)

Q. IN GENERAL, ARE MULTI-TENANT BUILDINGS CHEAPER ON A PER SQUARE FOOT BASIS THAN SINGLE TENANT BUILDINGS?

A. Yes. In general, multi-tenant buildings are cheaper on a per square foot basis. For example, a 2000 square foot apartment in an apartment building is cheaper than a 2000 square foot house.

Q. DOES THIS MEAN THAT THE RS MEANS FIGURE – TO THE EXTENT THAT IT MAY REFLECT SINGLE-TENANT STRUCTURES – OVERESTIMATES THE PER SQUARE FOOT COSTS OF COLLOCATION SPACE?

A. Yes. Though no body knows precisely what costs are recovered in the RS Means data used by CBT, if the per square foot data reflects a single tenant structure, then it probably over-states the per square foot costs of a multi-tenant structure. For example, if the RS Means data are based on a two story building for a single tenant, the ILEC, then calculating the costs on the basis of a three story building for a multi-tenant arrangement, that also accommodates collocators, would surely result in *lower costs per square foot*.

B. PLEASE COMMENT ON THE ADDITIONAL COSTS IDENTIFIED BY STAFF?

A. Staff identifies three types of additional costs: partitioning; security arrangements; and environmental conditioning.

There will be additional costs for partitioning the collocation spaces. However, there are separate charges for the cage construction. So there is no reason to include these in the COBO charges.

There may also be additional costs for security arrangements. Clearly, some security arrangements are already included in the rental fee, based on the RS Means data. To the extent that additional measures are required, those costs may have to be recovered from the cost causers, the collocators.

The amount of environmental conditioning is related to the amount of equipment per square foot of central office space. While CBT may have to extent its AC and heating ducts to provide additional hating and cooling to the collocators areas, it is not clear that the amount of costs included in the monthly rental charges do not already recover the costs for cooling and heating the collocation spaces. For example, if the per square foot costs of heating and cooling is based on a two story single tenant building, then the per square foot costs for heating and cooling a three story multi-tenant building may well be lower. In this case, no

additional charges – over and above of the monthly rental charges – would be in order.

Q. EVEN IF THERE WERE ADDITIONAL COSTS ASSOCIATED WITH A MULTI-TENANT ARRANGEMENT, OTHER THAN THOSE IDENTIFIED BY STAFF, COULD THIS POSSIBLY JUSTIFY THE EXORBITANT COBO CHARGES PROPOSED BY CBT?

A. No. The Commission should consider that the RS Means figure, used by CBT, indicate that a brand new central office can be build for *$135 per square foot.* Now, CBT's proposed COBO charges for the West 7th Street office are $290,560 for 1000 square feet of collocation space, or over *$290 per square foot.* This means that CBT wants the Commission to believe that modifying central office space costs more than *two times* as much as building a brand new central office space. This proposition is absurd.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

ATTACHMENT 1

Jt. Signatory Ex. 1

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Joint Application of SBC Communications Inc., SBC Delaware, Inc., Ameritech Corporation, and Ameritech Ohio for Consent and Approval of a Change of Control.	))))))	Case No. 98-1082-TP-AMT

STIPULATION AND RECOMMENDATION

C. Customer Service Employee Reports. For a period of 2 years following the Merger Closing Date, Ameritech Ohio shall maintain records of the number of its employees engaged in end user customer contact positions and NEC-interface staffing as described in Section IV.C.2. Ameritech Ohio will provide and report the number of such employees to the Commission Staff and OCC as of the dates 6 months, 12 months, and 24 months following the Merger Closing Date. This report will disaggregate the number of employees into marketing, non-marketing, and other appropriate categories.

D. Commitment to Provide Local Competition in Four New Markets.

1. Following the Merger Closing Date, and subject to the terms and conditions set forth in Sections VII.D.2. and VII.D.3., SBC/Ameritech will offer basic local exchange service to both residential and business customers at reasonable rates in the following 4 markets where Ameritech Ohio is currently not the incumbent local exchange carrier ("ILEC") (the "Ohio Competitive Services"):

   a. Cincinnati - to include the Cincinnati exchange area that is currently served by Cincinnati Bell;

   b. Lebanon/Mason - to include the Lebanon and Mason exchange areas northeast of Cincinnati that are currently served by United/Sprint;

   c. Hudson/Twinsburg - to include the Hudson, Twinsburg and Northfield exchange areas south of Cleveland that are currently served by Western Reserve/AllTel; and

   d. Delaware - to include the Delaware and Cheshire Center exchange areas north of Columbus that are currently served by GTE.

SBC/Ameritech shall determine, in their sole discretion, subject to the rules and regulations of the Commission and the terms and conditions set forth in Sections VII.D.2. and VII.D.3., the manner in which they provide the Ohio Competitive Services in each of these markets.

2. SBC/Ameritech's commitment to provide the Ohio Competitive Services in a specified market shall become effective: i) upon the Commission's

approval, within 2 years of filing, of SBC/Ameritech's certification application; ii) upon the Commission's approval of appropriate tariffs filed by the serving entity; and iii) upon SBC/Ameritech's obtaining a Commission-approved interconnection agreement with the ILEC serving that specified market that is fully compliant with Section 251 of the Telecommunications Act of 1996 and that is reasonably comparable to the agreements that Ameritech Ohio has with NECs, specifically:

a. SBC/Ameritech must have access to the same unbundled network elements and to the same collocation arrangements that Ameritech Ohio has been required to provide to NECs, excluding the promotional collocation provisions set forth in Section IX.C.4. below; and

b. SBC/Ameritech must have electronic ordering capability (or reasonable substitutes), and the ILEC must provide sufficient capacity to handle the expected volume of orders.

3. SBC/Ameritech's commitment to provide the Ohio Competitive Services will be in accordance with the following:

a. SBC/Ameritech will file with the Commission a request for all required certifications no later than 30 days following the Merger Closing Date.

b. SBC/Ameritech will make a formal request for an interconnection agreement with each affected ILEC no later than 30 days following the Merger Closing Date. SBC/Ameritech agree to negotiate in good faith with each affected ILEC and to seek arbitration of any issues that cannot be resolved under the negotiation process.

c. For purposes of the time commitments made in Sections VII.D.3.e. through VII.D.3.g. below, inclusive, the "Start Date" for each market is the latest of:

(A) the date upon which, for that market, the Commission issues an order granting SBC/Ameritech's certification application and approves appropriate tariffs filed by the serving entity;

(B) the date upon which, for that market, the Commission issues an order approving an interconnection agreement between SBC/Ameritech and the affected ILEC meeting the conditions set forth above in Section VII.D.2.; or

(C) 10 months from the Merger Closing Date.

CERTIFICATE OF SERVICE

I hereby certify that true copies of the foregoing Rebuttal Testimony were served upon the parties listed below, by electronic transmission, facsimile or first-class U.S. mail, postage prepaid, this 7th day of April 1999.

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