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Sponsoring Party: CenturyTel of Missouri, LLC and Spectra Communications Group, LLC d/b/a CenturyTel
Case No.: TO-2006-0299
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March 21, 2006

DIRECT TESTIMONY

OF

R. WAYNE DAVIS

ON BEHALF OF CENTURYTEL OF MISSOURI, LLC AND SPECTRA COMMUNICATIONS GROUP, LLC d/b/a CENTURYTEL

CASE NO. TO-2006-0299

OF THE STATE OF MISSOURI

PETITION OF SOCKET TELECOM, LLC FOR COMPULSORY ARBITRATION OF INTERCONNECTION AGREEMENTS WITH CENTURYTEL OF MISSOURI, LLC AND SPECTRA COMMUNICATIONS, LLC PURSUANT TO SECTION 252(b)(1) OF THE TELECOMMUNICATIONS ACT OF 1996	))))))))	**CASE NO. TO-2006-0299**

STATE OF LOUISIANA

PARISH OF OUACHITA

AFFIDAVIT OF R. WAYNE DAVIS

I, R. Wayne Davis, of lawful age and being duly sworn, state:

1. My name is R. Wayne Davis. I am retired, but prior to my retirement, I was employed as Vice President Strategic Planning by CenturyTel Service Group LLC.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Wayne Davis
R. Wayne Davis

Subscribed and sworn to before this 20th day of March, 2006.

Wanita W Jones
Notary Public

My Commission expires: Death

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ON BEHALF OF CENTURYTEL OF MISSOURI, LLC AND SPECTRA COMMUNICATIONS GROUP, LLC d/b/a CENTURYTEL

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is R. Wayne Davis. I am currently retired. My previous business address was 100 CenturyTel Park Drive, Monroe, La. 71203.

Q. ON WHOSE BEHALF ARE YOU SUBMITTING DIRECT TESTIMONY?

A. I am submitting direct testimony on behalf of CenturyTel of Missouri, LLC and Spectra Communications Group, LLC, collectively referred to herein as "CenturyTel."

I. BACKGROUND

Q. HOW LONG HAVE YOU BEEN RETIRED?

A. I have been retired since December, 2004.

Q. BEFORE YOUR RETIREMENT, BY WHOM WERE YOU EMPLOYED AND IN WHAT CAPACITY?

A. Prior to my retirement, I was employed as Vice President Strategic Planning by CenturyTel Service Group LLC.

Q. WHAT WERE YOUR PRIMARY RESPONSIBILITIES AS VICE PRESIDENT STRATEGIC PLANNING?

A. As Vice President Strategic Planning, I was primarily responsible for leading the assessment of new and emerging technology and evaluating its impact on the development and refinement of the Corporate Strategy and Business Plan, including:

- Recommending technology and strategies for new product/service offerings outside of or in addition to existing product families (target markets/customer

segments, product/service offerings, and competitive advantage)

- Reviewing and developing technology, providing the CEO with insights to support the business strategy
- Coordinating with the CFO for the development and recommendation of long-range plans and strategies to achieve business growth and enhanced profitability through acquisitions, mergers, joint ventures, licenses and divestitures.
- Coordinating with the different groups within the organization for the assessment of the required level of financial commitment, profit potential and the general appropriateness of selected business opportunities relative to the objectives of the overall strategic plan.

Q. PLEASE DESCRIBE YOUR BACKGROUND AND EXPERIENCE IN THE TELECOMMUNICATIONS INDUSTRY.

A. I was in the telecommunications industry for approximately 38 years, with CenturyTel for 30 1/2 of those years. I started in the telecommunications industry as an Assistant Engineer with a local telephone company that became part of Contel. I worked for Contel for approximately two years assisting in the design of outside plant. After that I worked for a number of consulting firms as a Design Engineer, providing services to GTE and BellSouth, designing outside plant facilities for upgrading their networks to all one party service. I started with CenturyTel in 1974 as an Outside Plant ("OSP") Engineer. Over the course of thirty-plus years with CenturyTel, I held a number of jobs, including OSP Engineer, Field Engineer, State Manager OSP Engineering, Corporate OSP Engineering Manager, Director - Network Design, Director - Budget and Administration, Director - Network Planning, Vice President - Telco Engineering, Vice

President - Engineering, Vice President - Operations and Engineering, and Vice President - Strategic Planning.

As a result of my experience in the telecommunications industry and the specific jobs and responsibilities I held for almost forty years, I acquired substantial knowledge and experience regarding the positioning of rural service providers networks to provide and deliver present and future services. Indeed, I designed and built numerous local and inter-exchange telecommunications networks across a large part of rural America. I have also lead large teams in assessing new technology and its impact on network strategies, and the resulting design of the most effective and efficient networks for rural service areas.

Toward the end of my career, I led in the assessment of future technologies for the development of viable Business Plans to create growth and sustainable competitive advantage for a rural service provider. I facilitated the work of matrix teams to assess technology along with strategic intents, and identify the change programs necessary to achieve the chosen strategic targets. In other words, I have built networks, I have designed networks, and I have spent a great deal of time studying the appropriate forward-looking design of networks in light of technological developments.

Q. HAVE YOU BEEN A MEMBER OF ANY TELECOMMUNICATIONS INDUSTRY ORGANIZATIONS?

A. Yes, my Past Industry Memberships include the Siemens DCO User Group, Southeast Area Borrowers Association – Rural Utility Services, United States Telephone Association - National Services Advisory Committee, and I was a Board Member for the Alliance for Telecommunications Industry Standards.

II.
PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to explain the engineering design and network assumptions, including fill factors and equipment costs, CenturyTel utilized in developing its proposed DS1 and DS3 recurring rates for CenturyTel of Missouri LLC and Spectra Communication Groups LLC (collectively "CenturyTel") and demonstrate that the design and assumptions are reasonable and forward-looking. CenturyTel models an efficient forward-looking network and includes forward-looking data inputs in its DS1 and DS3 recurring rate cost studies.

III.
OUTSIDE PLANT DESIGN

Q. PLEASE GENERALLY DESCRIBE CENTURYTEL'S OUTSIDE PLANT.

A. The outside plant ("OSP") is comprised of the communications paths that connect an end user customer's location to a central switching office. This is typically a pair of copper wires, but it may also be a channel over a pair of glass lightguides or fiber system to a Digital Loop Carrier (DLC) at the feeder/distribution interface (FDI) and then cross connect to a pair of copper wires to the end user customer premises. CenturyTel's OSP network consists of all facilities from the Main Distribution Frame ("MDF") or equivalent in the Central Office ("CO") to the demarcation point at the end user customer's premises, typically the termination at the Network Interface Device ("NID"). The facilities are grouped into three general categories: (1) "Feeder" facilities, which extend from the CO to the feeder/distribution interface ("FDI"); (2) Distribution facilities, which extend from the FDI to terminals that serve multiple customers, and (3) Drop wire

or entrance cable, which is the final connection from the terminal to the end user customer's premises. The feeder facilities are the larger copper cables or fiber cable facilities that start at the central office and extend outward to the larger concentrations of customers. The distribution facilities branch off of the feeder facilities that fan out to specific streets or alleys to reach the end user customer location. The drop wire or entrance cable is the final connection to the end user customer's premises.

In some of its most recent facility installations, CenturyTel is installing the new technology of Fiber to the Premise (FTTP), which utilizes optical transmission terminals at the CO and the end user customer premises transported over a single or pair of glass lightguides. In other words, under the FTTP design, fiber optic facilities extend all the way from the CO to the end user customer premises.

Q. WHAT ARE SOME OF THE CRITICAL FACTORS CENTURYTEL CONSIDERS WHEN DESIGNING OUTSIDE PLANT?

A. CenturyTel designs and deploys its outside plant with the intent of being economical and efficient. Some of the critical factors it considers include:

a) Service requirements (new service requests);

b) Defective pairs (cable pairs that will not support services);

c) Random nature of additional lines and new growth;

d) High cost and disruption of reinforcing existing facilities versus the incremental cost of additional facilities.

e) Delay and high cost associated with rearrangements (i.e., additional truck rolls) to provide or restore service in areas with insufficient spare capacity;

f) Industry-wide standard cable sizes and 25-pair modular splicing;

g) Transmission characteristics; and

h) Future cable pair requirements for vacant lots within a distribution area (DA).

Q. WHAT ARE SOME OF THE TYPICAL CABLE SIZES CENTURYTEL USES IN ITS OUTSIDE PLANT DESIGN?

A. The actual sizing of the feeder and distribution cables is done by the engineer when planning each job. However, the cables are generally constructed by manufacturers in 25 or 50 pair bundles referred to as complements or binder groups. CenturyTel's copper feeder cable sizes in Missouri generally range from 300 pairs to 900 pairs. Distribution cable sizes generally range from 25 pairs to 200 pairs.

Q. WHAT IS A DS1 DIGITAL LOOP?

A. A DS1 (digital level 1) loop is a point-to-point digital loop facility that provides a full duplex transmission path capable of supporting 1.544 mbps.

Q. COMPARED TO A DS1 LOOP, WHAT IS A DS3 DIGITAL LOOP?

A. A DS3 (digital level 3) loop is a point-to-point digital loop facility that is equal to 28 DS1s and is capable of supporting ~45 mbps.

Q. WHAT IS THE FORWARD-LOOKING LOOP DESIGN FOR DS1 AND DS3 LOOPS?

A. The forward-looking loop design for DS1 and DS3 loops in the rural service exchanges primarily served by CenturyTel mirrors the loop design employed by CenturyTel today. At some point in the future there may be a shift to more fiber supporting the local loop as reinforcement or augmentation of the loops at issue is required and the economics shift to support greater deployment of these eventual all optical solutions, but this will in all likelihood be over an extended period of time as we have seen with the current fiber to the node (FFTN) technology that has been available for approximately 20 years and has still not seen a full deployment even in the more urban service areas of larger telephone companies. In the meantime, and especially for the more rural areas CenturyTel serves, there will continue to be a hybrid approach of technology solutions in the network based on the service needs, current facility exhaust and economics of deployment.

Q. DESCRIBE THE FORWARD-LOOKING TECHNOLOGY USED IN OSP.

A. CenturyTel incorporates forward-looking technology in the OSP when it is economically justified. That forward-looking technology may include the new technology of Fiber to the Premise (FTTP) that I mentioned previously. FTTP utilizes optical transmission terminals at the CO and at the NID, transported over a single or pair of glass lightguides. Additionally, there are other fiber technologies available to service providers today that are viewed as steps to this all optical network solution. These include Fiber to the Node (FFTN) and Fiber to the Curb (FTTC), both of which have been and are being utilized by CenturyTel in its network today. These are solutions that are available to the design engineers as they seek viable and economic solutions to CenturyTel's service needs.

IV.
LOOP COST NETWORK INPUT METHODOLOGY

Q. WHAT IS THE BASIS FOR THE NETWORK DESIGNS USED IN CENTURYTEL'S COST MODELS?

A. CenturyTel employed multiple network design configurations based on the various possible configurations that would be encountered across a real world multi-exchange network of the type CenturyTel maintains (*i.e.*, assuming location of existing wire centers and end user customer locations, with applicable topography, etc.). These design configurations most closely approximate the potential real world network configurations found in a rural service provider's network for copper and fiber deployments (OC1, OC3, OC12 or OC48) or combination of copper and fiber in the local loops (FFTN). Then, based upon the real world network configurations for the sample exchanges, a design configuration or combinations of design configurations was used within the cost model to most closely represent the actual network.

Q. WHY IS IT APPROPRIATE FOR CENTURYTEL TO USE THE CURRENT NETWORK AS THE BASIS FOR THE FORWARD LOOKING NETWORK BEING MODELED?

A. CenturyTel's current network architecture provides the best representation of a forward-looking network given the existing location of CenturyTel wire centers. Further, disregarding the current network completely would result in a purely theoretical design that may not be any more efficient or economical than the current design and may not be feasible. Using theoretical forward looking data ignores the incumbent's true cost of provisioning a network to serve the more rural areas of the country. This is particularly true as it applies to non-traditional services like broadband, where adoption and take rates are still unknown due to the lack of empirical data for the more rural markets. CenturyTel's current network configuration, facilities deployment and sizing, and fill are, in my opinion, adequately forward-looking to be used in the DS1 and DS3 recurring rate cost models.

Q. WHY DOESN'T CENTURYTEL PROPOSE COSTS BASED ON BUILDING A NEW NETWORK WITH ALL OF THE LATEST AND FUTURISTIC TECHNOLOGIES?

A. Not only is that not required based on my understanding of the FCC's guidance, but the costs of building a new network using all the latest technology and future possible technologies, a so-called scorched node cost modeling, would be extremely expensive and impractical. It would be cost prohibitive and would result in rates that would be too much for customers to bear. Therefore, using the existing efficient network as the base results in rates that are just and reasonable.

Q. IS THE NETWORK DESIGN USED IN THE DEVELOPMENT OF THE DS1 AND DS3 RECURRING MONTHLY RATES AN EFFICIENT DESIGN?

A. Yes, it is. Addressing the demands and necessities of the real world environment, primarily the existing placement of CenturyTel's wire centers for both the host exchange and intra-exchange remote wire centers (DLCs), any network provisioning must accommodate the extensive deployment of the existing physical network facilities. To the extent these physical facilities meet the service requirements of the network today and in the foreseeable future, they help keep the cost lower due to the lower original cost of acquisition and placement in years past. CenturyTel's network provisioning is a hybrid approach, employing today's technology and cost benefits while leveraging yesterday's physical investments. An example of this is the leveraging of existing copper cable facilities and existing DLC locations and extending fiber cable facilities to these DLC locations (mini-wire center locations within the exchange serving area) from the exchange host wire center and replacing the outdated DLC with a current technology Next Generation Digital Loop Carrier (NGDLC) that is a multi-service platform capable of providing both narrowband (64kb) services and broadband (>128kb) services. This approach helps keep costs low by providing multiple services from the same network rather than building parallel networks for narrowband (POTS) service and newer broadband (BB) services. Network provisioning strategies and the resulting investments in infrastructure are much more complicated today because incumbents must accommodate the resellers' service strategy as well as their own service strategy, which may be diametrically opposed to one another. Whereas the incumbent must focus on universal service and multiple services across the entire service area, the reseller may "cherry pick" select customers with selected services. These differing strategies result in dramatically different views on provisioning the network. One is very limited due to

being focused on a limited and select customer base while the other is focused on a broad range of services across a diverse and varied customer base spread across a large and sometimes sparsely populated geographic area.

Q. DOES CENTURYTEL'S NETWORK PROVISIONING STRATEGY RESULT IN THE MOST EFFICIENT AND COST EFFECTIVE NETWORK FOR ITS SERVING AREAS?

A. Yes. The network and resulting cost from provisioning this network reflects the best of both worlds. A forward looking cost benefit is that CenturyTel employs the latest available technology and resulting cost benefits when service demands make it economically viable while leveraging the lower cost benefits of existing physical network facilities. This fact is illustrated by CenturyTel's deployment of DSL and the resulting availability percentages (71%). These are especially high percentages of availability given the diversity of CenturyTel's service areas and the density ranges of two (2) customers per route mile of cable facilities to forty-seven (47) customers per route mile of cable facilities with an average of eleven (11) customers per route mile of facilities.

Q WHAT METHODOLOGY DID CENTURYTEL USE TO SELECT THE EXCHANGES FOR THE COST STUDIES?

A. CenturyTel utilized a sampling methodology to determine the appropriate exchanges to incorporate in its cost studies. Under this sampling approach, CenturyTel first segmented its serving exchanges into the Rate Schedule Groups (1-4) previously defined in the local tariff. These Rate Schedule Groups are based on the exchange serving area access line count for each exchange by company. Then the facility criteria for the exchanges within each Rate Schedule Group and company were analyzed to determine those exchanges that would most aptly represent the real world network for that Rate Schedule Group and that company based on comparing all of the exchanges within each Rate Schedule Group

to the averages for each Rate Schedule Group and company, and then selecting those exchanges that most closely matched the average. This resulted in eighteen (18) exchanges across all rate schedule groups being selected for the cost studies, representing ~8% of the exchanges and ~30% of the access lines across both companies.

Q HOW WERE THE LOOPS SELECTED FOR CENTURYTEL'S DS1 AND DS3 RECURRING COST STUDIES?

A. To appropriately select the loops serving as underlying data points for CenturyTel's recurring cost studies, CenturyTel took the sample exchanges that had been identified from the sampling methodology described above and then collected actual loop lengths for as many customers as there was factual loop data available. This data was then available for input to the cost model by each engineering design zone (Zone 1-5) that represented customers' loop characteristics:

Zone 1 - short loop cooper distribution (0 - .5 miles)

Zone 2 - medium loop copper distribution (>.5 miles – 1 mile)

Zone 3 - long loop copper distribution (>1 mile - 12kft)

Zone 4 – hybrid - fiber feeder and copper distribution (total loop >12kft - 36kft)

Zone 5 – hybrid - fiber feeder and copper distribution (total loop > 36kft)

Q. WHAT ARE THE AVERAGE LOOP LENGTHS AT ISSUE?

A. As explained above, the selection of loops was segmented into the engineering design zones within each exchange and, therefore, the average loop lengths vary by zone. The following table shows the aggregate number of loops sampled and the resulting average loop lengths by engineering design zone.

	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5
No. of Loops Studied	**11,735**	**10,524**	**18,426**	**39,704**	**10,871**

Avg. Loop Length	1.28 kft	3.64 kft	8.33 kft	23.26 kft	53.70 kft

Q. ARE THOSE LOOP LENGTHS REASONABLE?

A. Yes. CenturyTel serves some of the more rural areas of the state. CenturyTel has over 38,000 total route miles of cable facilities within the state to serve its customers, equating to an average of eleven (11) access lines per route mile of cable facilities. The sampled exchanges have over 6700 route miles of cable facilities serving 133,489 access lines. Given these data points, these loops lengths are reasonable, are representative of the loops serving CenturyTel's customers in Missouri, and are consistent with a forward-looking network design.

Q DOES THIS SAMPLING OF LOOPS FAIRLY REPRESENT THE TOTAL LOOPS FOR CENTURYTEL?

A Yes. This is a total sampling of 60% of the loops within the selected exchanges.

V.
FILL FACTORS

Q WHAT IS A FILL FACTOR?

A. A fill factor is the measure of the number of working cable pairs to the total number of available cable pairs at a specific point. Stated differently, a cable fill factor is an indicator of the available spare capacity in a network. For example, the fill factor for an outside plant cable is determined by dividing the number of working cable pairs by the total number of pairs available for use within the cable. A 300 pair cable with 200 working pairs has a (200/300) 66.67% fill rate. And the available spare capacity is (100/300) 33.33%.

Q. PLEASE EXPLAIN WHAT IS MEANT BY "SPARE CAPACITY" AND ITS RELATION TO FILL FACTORS.

A. Spare capacity represents the portion of network facilities that is not currently being used by customers. To use a simplified example, assume CenturyTel uses a 100 pair cable to serve 60 customers, each of which has one working pair in service. In this scenario, the 40 pairs that are not being used represent spare capacity. This spare capacity can be used to serve future demand for additional lines from existing customers or demand from new customers who build homes in the area, or to replace existing pairs that become defective. Spare capacity could be another way to describe "fill." In this example, the fill factor for the 100 pair cable would be 60%, and the spare capacity would be 40%.

Q. DOES AN EFFICIENT NETWORK HAVE SPARE CAPACITY?

A. Yes, an efficiently designed and engineered network will necessarily have spare capacity, particularly in outside plant facilities. New cable placements will have more spare capacity at the outset to meet long-term customer service demands on a timely basis and to maintain low overall network costs. Spare capacity, however, is also a by-product of the fact that cables can only be purchased from equipment vendors in fixed size increments and cannot be sized exactly to fit the expected demand along any particular route. In addition, outside plant is specific to the particular route/geography that it serves, and spare capacity cannot be ported to other parts of the serving area.

Q. SO IT IS APPROPRIATE TO PROVISION A NETWORK WITH SPARES OR EXTRA CAPACITY?

A. Yes. There are multiple reasons for a real world network to be provisioned with spares. In some instances spare capacity is a matter of timing and/or the result of the logical sizing of network facilities. For example, as I note briefly above, copper cable facilities come in standard increments, such as 25 pair, 50 pair, 100 pair etc. This is also true with certain technology sensitive equipment; a new DLC shelf, for example, comes in

incremental sizes of 120 lines, 240 lines, 360 lines, and card components normally come in multiples of four (4) or eight (8). The inability, aside from undesirability, of obtaining cable facilities and certain equipment at the precise level to meet existing demand necessarily dictates that a network will have spares or extra capacity. Further, as networks are constructed, the forecasting of service take rates and exact location demand will also create spares. It is unrealistic to believe that a company operating in the real world would with 100% certainty know when and where the service demand would arise. As a practical matter, a company cannot predict with accuracy which customer will take what service and when. As such, facility-based local exchange carriers must provision the network with sufficient spares in advance of this demand to meet a quality of service delivery that is predefined by the regulatory body. To build out to each customer individually as they register demand is impractical. Therefore, facilities-based providers must provision the network with a degree of spares or what appears to be over provisioning to accommodate the unknown demands of future customers. The cost incurred to provision the network to accommodate this degree of uncertainty is a reasonable cost of providing service today in an efficient network. Finally, networks are also intentionally designed with a degree of spares in anticipation of faults and failures due to acts of nature or external causes. Accordingly, spare capacity is a legitimate cost of provisioning a real world network as well as a forward looking network.

Q. HOW DO STANDARD SIZING AND VENDOR MANUFACTURING SUPPLY PRACTICES AFFECT THE FILL LEVEL?

A. Spare capacity, and lower fill levels, naturally results, in part, from the way in which cable facilities are manufactured. Equipment vendors provide cables in a limited number of sizes. Standard cable sizing during manufacturing creates break points because of the

limited number of sizes in which cables are made and/or the best economics that are negotiated with vendors. For example, if a job requires 15 pairs in the distribution cable, CenturyTel may place 25 pair cables because that is the standard size manufactured and available at the lowest price negotiated. It is also important to note that copper cables used by CenturyTel are available in certain sizes, e.g., 25 pair, 50 pair, 100 pair, 200 pair, etc. Therefore, if a design engineer wants to size the distribution cable at 2.25 pair per living unit into a new 35-lot subdivision, the engineer is compelled to place at least a 100 pair cable to meet the 79 pair requirement (35 * 2.25 = 78.75, rounded up to 79), since 79 pairs is not a standard product. This limitation in available cable sizes affects the actual fill factors. In addition, the physical manufacturing constraints of the cable play a large part in the determination of the fill factor. Feeder cables come in a limited variety of standard sizes (e.g., 900, 1200, 1500, 1800, 3000, etc. pairs) due to the economics of the manufacturing cycle time and supply and demand. In some cases, it may be cheaper to purchase a larger size cable than the theoretically correct size due to excess supply. It is impossible to match demand exactly with cable size.

Q. DOES THE RANDOM NATURE OF SERVICE NEEDS AND NEW GROWTH AFFECT THE FILL LEVEL?

A. Yes. Additional line requests are somewhat random. Forecasts can be performed to project general trends in an area, but one cannot say with certainty which business or residence will request additional capacity. Additions can be for any of a myriad of services: a dedicated fax line, a dedicated business line, additional lines for a spouse, teenager, burglar alarm, DSL line, credit card or cash register EDI link, or DS1 service. Each of these could require a separate, extra copper pair, or more, from the CO, so, generally, extra copper pairs need to be easily available for each customer.

In addition, when plant is sized for the conditions stated above, and existing customers disconnect service, those spare distribution cable facilities are not physically available for another customer who lives across town and adds an additional phone line and needs a cable pair. It is not physically possible to rearrange plant in that manner. Extra capacity is provided at the time of the build to balance the costs of the initial build anticipating future service demands with minimizing excess unusable capacity and avoiding the costs of rearrangements and subsequent disruption of physical infrastructure (e.g., yards, streets, sidewalks) to place additional cable facilities.

Q. DOES THE COST OF CABLE REINFORCEMENT AFFECT FILL?

A. Yes, it does. Once a neighborhood is established, home/landowners tend to improve their properties, even that portion of their properties that is on an easement or public right-of-way, where telephone plant cable resides. CenturyTel may be responsible for the restoration of the property if it were to damage the property during reinforcement. If the last house or business on the block requires reinforcement, everyone on the block potentially is affected. The cost of restoration of driveways, buildings and improved property (including expensive plants or trees) that are damaged during reinforcement is borne by CenturyTel. This work adds additional cost to reinforcement jobs, which CenturyTel attempts to avoid by initially deploying facilities with built-in spare capacity. Legal action is sometimes required in order to gain access rights from landowners who object to this work. CenturyTel may decide to do intrusive reinforcement, with all of the resultant expensive restoration, or use very high-cost non-intrusive reinforcement methods, such as directional boring. Cable reinforcements are expensive and disruptive undertakings, but these issues are virtually non-existent during initial construction. This is relevant to the fill issue, because if CenturyTel installs the ultimate capacities to begin

with, which ultimately leads to a more efficient network operation, the overall average fill will be lower.

Q. DO OUTSIDE PLANT REARRANGEMENTS AFFECT FILL FACTORS?

A. Yes, they do. At times it is possible to make rearrangements to existing plant to provide or restore service without having to make costly and disruptive cable reinforcements. These rearrangements come in many forms and serve to increase the cable fill in a given cable complement. This is frequently the preferred and sometimes only method available to the engineer to meet a given service demand within the prescribed time frame. These rearrangements add work content and cost and increase the activity levels or stress on the plant. These rearrangements and added stress often accelerate deterioration of the plant. Stress shortens its useful life while also creating service-affecting cable trouble. The engineer must constantly balance the investment in additional capacity with the increase in operating costs that follows rearrangements and higher fills.

Q. DO TRANSMISSION CHARACTERISTICS AFFECT FILL FACTORS?

A. Yes. The design of loop plant requires adherence to established standards for certain transmission characteristics on a given loop. These standards are in place to assure the quality of service that is provided by a given loop. Theoretically, an engineer could design copper plant to have multiple appearances in different sections or "legs" of cable to get higher utilization or fill. This arrangement, however, would be undesirable. Each additional appearance of that cable pair outside of the direct electrical path between the end user and MDF is known as bridged tap. The distance from the end user to the end of the cable is referred to as end section. Most circuits tolerate a limited amount of bridged tap combined with the length of end section beyond the serving terminal. The multiple appearances of a cable pair in different cable sections is referred to as a "multiple."

Aside from the transmission issues that excessive multiple pairs create, this situation also increases the chances for service-affecting cable trouble. Any additional or "multiple" appearance of a cable pair presents another opportunity for trouble to develop on a customer's line. There is also the issue of cross talk or high frequency interference (noise) encountered with the assignment of multiple digital services and/or multiple digital technologies (*e.g.*, T-1, HDSL, ADSL, etc.) in the same or adjacent copper cable binders (25 pair group). As digital services become more prevalent throughout the network this has even stricter limitations on the amount of bridged tap that can be tolerated, as well as the assignment of these digital services within the copper loop facilities.

Q. DO DEFECTIVE PAIRS AFFECT FILL FACTORS?

A. Yes. As previously discussed, fill factors are the ratio of the number of working cable pairs to the total number of available cable pairs. Even though defective pairs are not in the fill factor equation, they are a real business cost that any telephone provider must be able to recover. An efficient provider must plan on defective network elements and design the outside plant with sufficient capacity to provide efficient and reliable service on demand.

Q. WHAT TYPE OF FILL FACTOR INFORMATION UNDERLIES THE TELRIC STUDIES PRESENTED IN THIS CASE?

A. CenturyTel utilized data demonstrating its actual fill factors for the DS1 and DS3 loops at issue. The serving exchanges were segmented into the previously defined Rate Schedule Groups (1-4) based on the exchange serving area access line count. Then the facility criteria for the exchanges within each Rate Schedule Group were analyzed to determine those exchanges, minimum of two, that would most aptly represent the network for that

Rate Schedule Groups. The list was then reviewed to ensure that sufficient facility data was available to generate a true cost basis. Once this was determined, real facility fill data was collected for the identified exchanges. From this data an average was calculated for input to the cost model as a representative of the provisioned networks for each company.

Q. WHY ARE THE ACTUAL FILL FACTORS USED IN THE COST STUDY THE MOST APPROPRIATE?

A. CenturyTel's fill factors are based on current, actual fill rates and represent the most efficient use of a rural network. These actual, real world fill factors are most appropriate, particularly for a rural service provider such as CenturyTel, because of the lower density of customers and the slower adoption rates of newer more broadband sensitive services. To provision an intra-exchange serving wire center (DLC) for services greater than POTS (64kb), such as DS1/DS3, requires significant incremental facilities for each service deployment and customer deployment and therefore the use of real world fill data is a better indication of facility usage for the exchanges being studied. Moreover, based on my analysis of the facilities and routes at issue, considering the critical factors outlined above that impact fill, these fill factors represent an efficient network for a rural service provider and are therefore also representative of expected fill factors in the future for a rural service provider.

Q. IS THERE ANY REASON TO BELIEVE FILL FACTORS MAY POSSIBLY DECREASE ON A GOING FORWARD BASIS FOR CENTURYTEL?

A. Yes, CenturyTel's continuing loss of access lines suggests that forward-looking fill factors may decline. For example, access lines for CenturyTel of Missouri have declined 8% since 2002, while Spectra's access lines have decreased 7.4% since 2000. This decline is due primarily to facility based carriers and wireless competition eroding the

respective companies' customer base. If this trend continues, it would be reasonable to assume the utilization of the network would decline, causing the fill factors to decrease from their current levels. Therefore, using current fill factors based on actual network usage represents a conservative approach. Also, actual current fill factors can be easily verified and removes the temptation of the parties in this arbitration to speculate on the utilization of a forward looking network.

Q. SHOULD THE COMMISSION RELY ON THEORETICAL OR OBJECTIVE FILL FACTORS RATHER THAN REAL WORLD FILL FACTORS?

A. No, doing so would not render accurate results or comply with TELRIC methodology. Fill factors based on current fill levels provide the appropriate method of cost recovery in accordance with the FCC's TELRIC methodology. The current fill levels, based on historic fill conditions, are the best means by which to estimate the incremental costs CenturyTel actually expects to incur on a forward-looking basis in making network elements available to new entrants, rather than using theoretical or objective factors. Moreover, theoretical or objective fills do not appropriately model either what is practical or achievable on an average basis in the distribution loop plant or what has actually occurred over time.

Q. IS THE USE OF ACTUAL FILL LEVELS CONSISTENT WITH THE FCC'S APPARENT DIRECTION?

A. Yes. The FCC in its TELRIC NPRM appears headed toward rules that approve the use of actual fill levels as the appropriate forward-looking fill factors for TELRIC pricing. As I understand it, the FCC has tentatively concluded that "TELRIC rules should more closely account for the real-world attributes of the routing and topography of an incumbent's network in the development of forward-looking costs" and the "UNE pricing methodology, while forward-looking, must be representative of the real-world and should

not be based on the totally hypothetical cost of a most-efficient provider building a network from scratch." TELRIC NPRM at paragraphs 52, 53. Thus, consistent with CenturyTel's methodology, the FCC stated that "the UNE cost study should be based upon the incumbent LEC's actual network topography and current available, forward-looking technologies." TELRIC NPRM at paragraph 53.

Q. ARE THESE FILL FACTORS NECESSARILY LOWER FOR A RURAL SERVICE PROVIDER?

A. Yes. As I noted above, physical network facilities are not designed to match a single customer demand on a customer-by-customer basis, but are designed based on cable and equipment manufacturer production economics. This, combined with the lower density of customer per mile of facilities, necessarily results in lower fill factors for rural facilities-based service providers as opposed to those serving more metropolitan denser areas. Density averages of a rural facilities-based service provider of twenty (20) customers per square mile will naturally have an impact on fill factors compared to a more metropolitan facilities-based service provider with density averages exceeding two hundred and fifty (250+) customers per square mile.

Q. ARE CENTURYTEL'S PROPOSED FILL FACTORS FORWARD-LOOKING?

A. Yes. CenturyTel expects fill to occur at approximately the same level in the future. That is, the current fill levels based upon the historical development are the most reasonable estimates of actual usage in the future.

VI.
COST STUDY INPUTS

Q. PLEASE DESCRIBE THE METHODOLOGY BY WHICH CENTURYTEL DEVELOPED THE UNDERLYING EQUIPMENT COSTS AND OTHER DATA INPUTS FOR ITS DS1 AND DS3 COST STUDIES.

A. As I explained in the context of fill factors, CenturyTel used actual data from representative serving exchanges to develop its DS1 and DS3 loop recurring rates. First, CenturyTel segmented its serving exchanges into the previously defined Rate Schedule Groups (1-4) based on the exchange serving area access line count. Then, CenturyTel examined the facility criteria for the exchanges within each Rate Schedule Group to determine those exchanges, minimum of two, that most adequately represented the CenturyTel network for that Rate Schedule Group. Third, CenturyTel reviewed the list to ensure that sufficient facility data was available to generate a true cost basis. Once this was determined, CenturyTel collected real facility fill data, actual loop lengths, most current year in-placement cost, etc. for the identified exchanges. This data was then available for input to the cost model as a representative of the provisioned networks for each Rate Schedule Group. This process was separately completed for CenturyTel of Missouri, LLC and Spectra Communications Group, LLC.

Q. WHAT IS THE CABLE FACILITY AND EQUIPMENT COST SOURCE FOR THE COST MODEL?

A. The physical cable facility cost for both copper and fiber cable facilities was obtained from the company's in-place property records for the most current year available (2005). These costs are by cable size ranges representing the actual composite in-place cost to include both material and labor cost. Facility equipment cost for material was obtained from the company's purchase agreements with the manufacturers, which represents the price benefits from its total corporate purchasing volumes. CenturyTel obtained the labor cost for installation of the equipment from competitively sourced labor contracts for the specific exchanges benefiting from local labor sources within the state.

Q. WERE THE INVESTMENT COSTS ADJUSTED FOR INFLATION?

A. Although this could have been done, CenturyTel decided that a more conservative approach should be taken by basing its forward looking model on verifiable existing data. While inflation may exist and there is upward pressure on labor costs, there are also potentially offsetting productivity gains. Therefore, rather than project the investment cost for CenturyTel, CenturyTel used existing current investment cost data as a proxy for future investment cost.

Q. DID CENTURYTEL "DEAVERAGE" UNE LOOP RATES BY ZONE?

A. Yes, CenturyTel developed DS1 and DS3 loop rates using four Rate Schedule Groups. These Rate Schedule Groups are defined by access line size and group the exchanges accordingly into four common zones for development of rates.

Q. HAVE YOU REVIEWED CENTURYTEL'S DS1 AND DS3 LOOP RECURRING RATE COST STUDIES?

A. Yes, I have.

Q. FROM A NETWORK ENGINEERING PERSPECTIVE, DO YOU HAVE AN OPINION ON THOSE COST STUDIES?

A. Yes, after reviewing the specific network inputs into the cost studies (e.g., architecture, configuration, loop lengths, fill factors, etc.) it is my opinion that the cost studies model an efficient, forward-looking rural network consistent with my understanding of the FCC's TELRIC guidance.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.