Exhibit No.:
Issue:
Witness: Steven E. Turner
Sponsoring Party: Socket Telecom, LLC
Type of Exhibit: Direct Testimony
Case No.: TC-2008-0225

BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION

SOCKET TELECOM, LLC,	)	
	)	
COMPLAINANT,	)	
	)	
V.	)	**CASE NO. TC-2008-0225**
	)	
CENTURYTEL OF MISSOURI, LLC DBA CENTURYTEL AND SPECTRA COMMUNICATIONS GROUP, LLC DBA CENTURYTEL	)	
	)	
RESPONDENTS.	)	

DIRECT TESTIMONY OF

STEVEN E. TURNER ON BEHALF OF

SOCKET TELECOM, LLC

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ATTORNEYS FOR SOCKET TELECOM, LLC

November 17, 2008

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I. BACKGROUND AND EDUCATION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Steven E. Turner. My business address is FTI Consulting, 1101 K Street NW, Washington, DC 20005.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am a Managing Director at FTI Consulting responsible for the telecommunications practice in the Network Industry Strategies group.

Q. PLEASE DESCRIBE YOUR EDUCATION BACKGROUND.

A. I hold a Bachelor of Science degree in Electrical Engineering from Auburn University in Auburn, Alabama. I also hold a Masters of Business Administration in Finance from Georgia State University in Atlanta, Georgia.

Q. PLEASE DESCRIBE YOUR WORK EXPERIENCE.

A. From 1986 through 1987, I was a Research Engineer for General Electric in its Advanced Technologies Department developing high-speed graphics simulators. In 1987, I joined AT&T[1] and, during my career there, held a variety of engineering, operations, and management positions. These positions covered the switching, transport, and signaling disciplines within AT&T. From 1995 until 1997, I worked in the Local Infrastructure and Access Management organization within AT&T. In this organization, I gained familiarity with many of the regulatory issues surrounding AT&T's local market entry, including issues concerning the unbundling of incumbent local exchange company

[1] In this section of my testimony describing my work experience, when I use the name "AT&T", I am referring to the AT&T entity prior to its merger with SBC.

(incumbent) networks. I was on the AT&T team that negotiated with Southwestern Bell Telephone Company concerning unbundled network element definitions and methods of interconnection.

From 1997 to 2006 I was President of my own consulting firm, Kaleo Consulting. Kaleo Consulting was a boutique consulting firm specializing in providing expert testimony in technical and financial areas related to telecommunications. My projects involved issues related to contractual terms and conditions between telecommunications service providers, the costs for network elements including interoffice transport, collocation, loops (media used to connect to customer premises), switching, signaling, and other related areas. My consulting assignments also included the responsibility of negotiating interconnection agreement terms and conditions between new entrants and incumbents or negotiating settlements with numerous companies including AT&T and Verizon. To the extent that these contracts required the inclusion of rates for telecommunications services, I developed and/or evaluated numerous models pertaining to the development of network component costs. Finally, my firm provided strategic consulting services to companies regarding where and how to enter various telecommunications markets.

In December 2006, I moved to FTI Consulting as a Managing Director and continue to provide consulting services in the telecommunications industry. A copy of my resume along with testimony that I have previously submitted in proceedings is provided as Schedule SET-1.

Q. HAVE YOU PREVIOUSLY TESTIFIED OR FILED TESTIMONY BEFORE A PUBLIC UTILITY OR PUBLIC SERVICE COMMISSION?

A. I have testified or filed testimony before the commissions in the states of Alabama, Arkansas, California, Colorado, Delaware, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Puerto Rico, South Carolina, South Dakota, Tennessee, Texas, Washington, and Wisconsin. Additionally, I have filed testimony before the Federal Communications Commission ("FCC").

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I am testifying on behalf of Socket Telecom, Inc. ("Socket Telecom") regarding an on-going dispute between Socket Telecom and CenturyTel of Missouri, LLC d/b/a CenturyTel and Spectra Communications Group, LLC d/b/a CenturyTel (collectively "CenturyTel"). My testimony addresses the dispute between Socket Telecom and CenturyTel involving the interpretation of Article V: Interconnection and Transport and Termination of Traffic – an article within the Interconnection Agreement between Socket Telecom and CenturyTel.

Q. DO YOU HAVE ANY SPECIFIC EMPLOYMENT EXPERIENCE OR EDUCATION THAT BEARS ON THE ISSUES IN THIS PROCEEDING?

A. Yes. As part of my employment with AT&T, I was responsible for performing switch engineering within the AT&T network. As part of my training for this position, I

attended courses related to Traffic Engineering. Traffic engineering is a set of principles used to determine the sizing of circuits between switches and the balance of that traffic between different collections of circuits (known as trunk groups). This training was applied in practice in that I reviewed the usage of AT&T's network and determined when to add or reduce capacity in the switches for the exchange of traffic. Further, in my consulting assignments, I have on several projects been required to use this same training and experience to advise clients in the sizing and engineering of their interconnection networks.

III. REQUIREMENTS OF THE INTERCONNECTION AGREEMENT

Q. COULD YOU PLEASE REVIEW THE SPECIFIC REQUIREMENTS OF THE INTERCONNECTION AGREEMENT AS IT PERTAINS TO THE ISSUE OF ESTABLISHING ADDITIONAL POIS?

A. Yes. Section 4.1 of Article V indicates the following:

> When the Parties directly interconnect for the mutual exchange of traffic covered by this Agreement, the Parties will initially interconnect their network facilities at a minimum of one technically feasible POI on CenturyTel's network in each LATA in which Socket offers telecommunications services.[2]

As an initial matter, if it interconnects directly, Socket Telecom is only required to establish one POI in each LATA in which Socket Telecom offers telecommunications services. However, as of the time of the execution of this agreement between Socket Telecom and Century Tel, there were LATAs where Socket Telecom actually had more

than one POI. Matt Kohly discusses the various issues surrounding the transition from the prior interim arrangements to arrangements under the new agreement in his direct testimony. One issue in this present dispute between the parties involves a disagreement about the basis for determining quantifiably whether Socket Telecom must add additional direct POIs (or can remove them) within a LATA or not. The language that defines how to make this calculation is clear and is fully implemented in the quantitative approach used by Socket Telecom. Moreover, the approach used by CenturyTel to develop its calculations is not supported by the language of the Agreement whatsoever. The specific language addressing this issue is found in Sections 4.3.1, 4.3.3, 4.3.4, and 4.3.5, as follows:

> 4.3 As the volume of traffic exchanged between the parties increases, Socket must establish additional POIs as follows:
>
> 4.3.1 CenturyTel's exchanges are classified on a thousand-access-line basis as follows:
>
> a. Exchanges of 1,000 CenturyTel access lines or less are "Class I Exchanges"; and
>
> b. Exchanges of more than 1,000 CenturyTel access lines are "Class II Exchanges".
>
> c. If there is a dispute between the Parties as to the number of CenturyTel access lines in an exchange, the Staff of the Commission will assist with resolution of the dispute. If the dispute persists, either Party may seek Commission resolution of the dispute without following the normal dispute resolution process in the interconnection agreement.

[2] CenturyTel – Socket Telecom Interconnection Agreement, Article V: Interconnection and Transport and Termination of Traffic, Section 4.1.

4.3.3 Socket is required to establish an additional POI in a Class I Exchange when the total traffic covered by the Agreement it exchanges with CenturyTel to or from an existing POI and a Class I exchange exceeds, at peak over three consecutive months, a DS1 or 24-channels.

4.3.4 Socket is required to establish an additional POI in a Class II Exchange when the total traffic covered by the Agreement it exchanges with CenturyTel to or from an existing POI and a Class II exchange exceeds, at peak over three consecutive months, a DS1 or 24-channels for each 1,000 access lines in the exchange, rounded to the nearest 1/10 of a DS1.

a. *E.g.*, for an exchange of 2,412 CenturyTel access lines, this threshold is reached when the total traffic covered by the Agreement exchanged between the Parties exceeds, at peak over three consecutive months, 2.4 DS1s of traffic to or from an existing POI and that exchange;

b. *E.g.*, for an exchange of 10,550 CenturyTel access lines, this threshold is reached when the total traffic covered by the Agreement exchanged between the Parties exceeds, at peak over three consecutive months 10.6 DS1s of traffic to or from an existing POI and that exchange; and,

c. *E.g.*, for an exchange of 28,100 CenturyTel access lines, this threshold is reached when the total traffic covered by the Agreement exchanged between the Parties exceeds, at peak over three consecutive months, 28.1 DS1s of traffic to or from an existing POI and that exchange.

4.3.5 Socket will no longer be required to maintain a POI in exchanges where Socket establishes a POI pursuant to Sections 4.3.3 or 4.3.4 when the volume of traffic exchanged between the Parties falls below, at peak over 3 consecutive months, a DS1 or 24-channels in a Class I exchange, or a DS1 or 24-channels for each 1,000 access lines in a Class II exchange, rounded to the nearest 1/10 of

> a DS1. Socket shall provide CenturyTel with written notice of its intention to decommission a POI pursuant to this section. Socket shall not decommission such POI until the earlier of the 90th day after providing the written notice to CenturyTel or CenturyTel's notice to Socket that CenturyTel has re-provisioned trunking. If there is a dispute between the Parties about whether a threshold for decommissioning a POI as described in this section has been met, the Parties will follow the expedited dispute resolution process described in Article III, Section 18.4. Socket shall not be permitted to decommission a POI in a disputed exchange until the dispute resolution process concludes with an award.[3]

This language appears to be straightforward from my perspective. The parties are supposed to track the traffic between Socket Telecom and CenturyTel and determine the peak usage to each exchange in CenturyTel's network. The parties then compare this peak usage to the size of the exchange. The contract even provides specific examples. If the exchange is a Class I Exchange, the test is to see if the actual usage exceeds 24 DS0s. If the exchange is a Class II Exchange and the exchange has 2412 CenturyTel access lines (in one of the examples found in the Agreement), then the test evaluates whether the peak actual usage between Socket Telecom and Century Tel has exceeded 2.4 DS1s. Finally, the last part of the test examines whether this peak actual usage is exceeded for three consecutive months.

[3] CenturyTel – Socket Telecom Interconnection Agreement, Article V: Interconnection and Transport and Termination of Traffic, Sections 4.3.1, 4.3.3, 4.3.4, and 4.3.5.

Q. IS NOT TRAFFIC TYPICALLY MEASURED IN MINUTES OF USE?

A. "Minutes of use" is a parameter that can be used to measure usage. However, minutes of use, by itself, is not particularly useful in determining the sizing of interconnection facilities. Another parameter, which the language above points to by its reference to the number of DS1s that are used for traffic, is the number of simultaneous circuits (often referred to in the world of interconnection as "trunks") that are occupied by traffic to an exchange. Based on the language above, this is the parameter that is called for in this test. In other words, Socket Telecom and CenturyTel should be monitoring the maximum (peak) number of simultaneous call paths or trunks that are occupied to each exchange in CenturyTel's network each month and determine whether this value exceeds the defined threshold (based on line count) for three consecutive months to determine whether a new direct POI is required.

Q. IS THIS THE POSITION THAT SOCKET TELECOM HAS TAKEN?

A. Yes. Socket Telecom tracks for each of the LATAs and each exchange in those LATAs the peak usage in DS0s. This information is based on the Call Detail Records that are taken off of the billing records from the switch. This information provides the exchange in CenturyTel's network that was involved in either originating or terminating the call. Based on this information, it is possible to determine the maximum number of simultaneous calls that existed to each of the exchanges and simply track this value by month.

The way that Socket Telecom tracks this information is to literally look second by second through the month to see the number of simultaneous calls that are in process between the Socket Telecom switch and the CenturyTel exchange. During the 2.6 million seconds that occur in a 30-day month, Socket Telecom identifies the second or seconds with the highest number of simultaneous calls between the Socket Telecom switch and the CenturyTel exchange and records this value. This number of used trunks or circuits is then compared to the relevant threshold from Sections 4.3.3 and 4.3.4 above to determine if the peak used trunks in three consecutive months exceeds the threshold required by the Agreement.

Q. IS CENTURYTEL SATISFIED WITH THIS ANALYSIS THAT SHOWS THAT THREE ADDITIONAL POIS ARE REQUIRED?

A. No. CenturyTel has proposed a completely different approach for estimating, rather than counting, the DS1 usage, which leads to many more exchanges requiring additional POIs than are calculated based on actual peak usage.

Q. WHAT APPROACH HAS CENTURYTEL PROPOSED THAT IS CAUSING THE CONFLICT?

A. It is my understanding from Mr. Matthew Kohly of Socket Telecom (who has participated in the discussions with CenturyTel regard this issue) that CenturyTel wants to determine whether additional POIs are needed by using Erlang-B traffic engineering principles.

Q. WHAT ARE ERLANG-B TRAFFIC ENGINEERING PRINCIPLES?

A. Erlang-B traffic engineering principles are named after inventor Agner Erlang. Mr. Erlang was an engineer with the Danish telephone company between 1908 and 1928. He was a mathematician by training and sought to solve the question of how many operators were needed to provide an acceptable level of service. In the days that he was solving this problem, telephone exchanges were manned by teams of operators who would receive the dialing instructions from the caller and then patch-board through the call to the terminating exchange. Mr. Erlang developed a mathematical function that allowed telephone operators to determine the number of operators that would be required based on the busy-hour traffic and the probability that the telephone carrier would want to block an incoming call attempt (the call quality component).

Q. IS THERE ANY REFERENCE IN THE CONTRACT LANGUAGE BETWEEN SOCKET TELECOM AND CENTURYTEL TO USE OF ERLANG TRAFFIC ENGINEERING FOR THE DETERMINATION OF AN ADDITIONAL POI?

A. No. The language indicated above which provides the entirety of the language for determining whether an additional direct POI is required or not simply requires that the parties track the peak number of simultaneously used trunks or circuits (in terms of the number of DS1 circuits) between Socket Telecom and CenturyTel and determine whether this maximum number of simultaneous calls (or used circuits) is greater than the threshold determined based on the size of the exchange for three months in a row. There is nothing in this language that indicates that Erlang traffic engineering principles would

be used for this calculation. Moreover, there are critical factors that are missing from the language that render the calculation of an Erlang-based number of trunks moot.

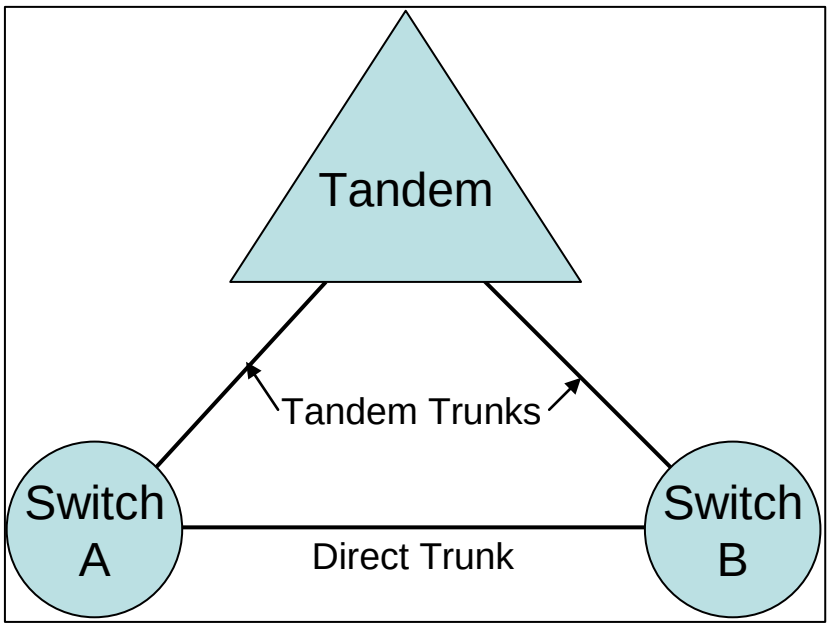
Q. WHAT ARE THESE MISSING FACTORS?

A. There are two. *First*, there are missing variables that would have been required in the contract language if Erlang-B calculations were going to be used to determine the DS1 equivalent circuits. One of the critical variables that must be established in determining the number of trunks based on Erlang-B calculations is the probability of blocking. In other words, if the contract had contemplated that Erlang-B calculations would be used to determine the DS1 level of circuits, the contract would have needed to specify the percentage of blocking for this calculation. There are no industry standards for the type of interconnection circuits that are being contemplated with the addition of these new direct POIs. As such, this variable would have needed to be specified in the contract.

The other critical variable would have been to specify that this calculation would have to based on busy hour calling volume. This is typically what is done in an Erlang-B calculation. However, there is no reference to the use of busy hour traffic calculations as the basis for the number of DS1 circuits that are used between Socket Telecom and CenturyTel in the contract language cited above.

Q. YOU INDICATED THAT THERE WERE TWO MISSING FACTORS FROM CENTURYTEL'S RELIANCE ON ERLANG-B CALCULATIONS FOR CIRCUIT REQUIREMENTS. WHAT IS THE SECOND CONCERN?

A. *Second*, the determination of circuit counts using Erlang-B calculations does not occur in a vacuum. Specifically, there are different engineering principles that are applied to interconnection facilities depending upon whether those facilities have the opportunity to overflow into other facilities or if those facilities must stand on their own to provide the capacity to complete calls between two switches. The diagram below may be helpful to illustrate this point.



Typically, in interconnection arrangements between switches, there are tandems and end office switches. Often in the engineering of the Direct Trunks between the end office switches, good traffic engineering principles recommend that you have an opportunity to "overflow" traffic onto Tandem Trunks. This "overflow" occurs whenever the traffic on

the Direct Trunk arrangement becomes too high for the number of circuits established and instead of the calls being blocked, they simply roll over to the Tandem Trunks. In this way, it is often the practice to use a higher blocking percentage for the Direct Trunk (so as to lessen the overall cost of these arrangements) knowing that if a blockage occurs there will be a roll over to the Tandem Trunks so that the calls will still be completed. In the case of the Tandem Trunks, since they are the last option for completing the calls between Switch A and Switch B, they often utilize a lower blocking percentage – typically in the 0.01 range (1% in the busy hour).

This approach of using a higher blocking percentage for the Switch A to Switch B connection is entirely consistent with good engineering economics approaches. If you size the Direct Trunk to have 0.01 blocking, then effectively you will put in sufficient trunks that in the busy hour – *on that Switch A to Switch B interconnection* – only one call in 100 would be blocked. For that one call, however, it would flow over the Tandem Trunk connection from Switch A to the Tandem and then from the Tandem Trunk connection from the Tandem to Switch B. In other words, the call is not blocked, it is simply routed a different way – through the Tandem Trunk. The other 719 hours in the month (in a 30-day month), no calls would ever flow over this Tandem Trunk arrangement because the usage in anything other than the busy hour (which is normally selected as the busiest hour in a month, quarter, year) would not be sufficient to ever use more than the trunks sized for the Direct Trunk arrangement. This is not an efficient use of telecom equipment resources. As such, typically the Direct Trunk route will use a much higher blocking percentage knowing that the Tandem Trunk route is still available

to lower the size (and therefore telecom equipment investment) of the Direct Trunk connection but still maintain a high level of performance (0.01 blocking) through the Tandem Trunk connection.

Q. IS THERE LANGUAGE IN THE AGREEMENT THAT ADDRESSES THE 0.01 BLOCKING PARAMETER FOR INTERCONNECTION FACILITIES?

A. Yes. Section 11.1.6 of Article V calls for an "appropriate industry grade of service standard" of B.01. This B.01 blocking standard is what I referred to earlier as being typical within the industry.[4] However, it is clear that the language in this section is directed towards the planning across "reciprocal traffic exchange arrangement trunk groups" (emphasis on the plural). In other words, the language of this section is describing exactly what I explained earlier in my testimony. It is necessary to plan for an overall level of 0.01 blocking through the interconnection network between Socket Telecom and CenturyTel. However, each individual Direct Trunk connection between the Socket Telecom switch and CenturyTel exchange does not need to be engineered to the 0.01 standard in that the overflow can occur at the Tandem Trunk level making the overall performance (between Direct and Tandem Trunks) at the 0.01 standard. Using this holistic approach is in the best interest of both Socket Telecom and CenturyTel in that it minimizes the overall investment required in interconnection facilities while still providing for the direct connections which CenturyTel wants (as required in Section 4.3.3

[4] CenturyTel – Socket Telecom Interconnection Agreement, Article V: Interconnection and Transport and Termination of Traffic, Section 11.1.6.

and 4.3.4) and maintaining an appropriate level of call completion (0.01 blocking) across the network.

Q. IS THERE LANGUAGE IN THE CONTRACT BETWEEN CENTURYTEL AND SOCKET TELECOM THAT INDICATES THAT THIS TYPE OF NETWORK EFFICIENCY APPROACH IS REQUIRED?

A. Yes. It is spelled out just prior to the B.01 performance requirement in Section 11.1:

> Trunking Requirements: The interconnection of Socket and CenturyTel networks shall be designed to promote network efficiency. CenturyTel will not impose any restrictions on Socket that are not imposed on its own traffic with respect to trunking and routing options afforded to Socket. In accordance with Article III, it will be necessary for the Parties to have met and discussed trunking, forecasting, availability and requirements in order for the Parties to begin exchange of traffic.[5]

The design of the interconnection arrangement between CenturyTel and Socket Telecom must "promote network efficiency." Further, CenturyTel is not permitted to impose any restrictions on Socket Telecom that are not imposed on its own traffic. Every incumbent network that I have reviewed (and standard engineering practice in the industry for large networks) is to use Tandem switches as an alternative path for interconnection between end offices. CenturyTel is not permitted to limit Socket Telecom from being afforded this same opportunity.

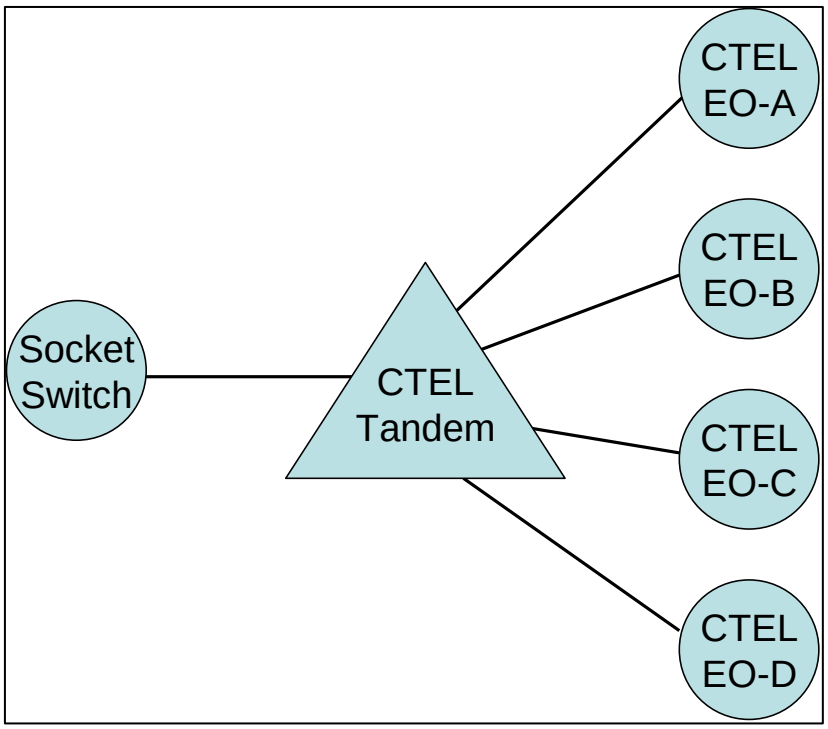
[5] CenturyTel – Socket Telecom Interconnection Agreement, Article V: Interconnection and Transport and Termination of Traffic, Section 11.1.

Q. CAN YOU SUMMARIZE YOUR TESTIMONY ON THESE ISSUES?

A. My point in going through this discussion is that none of this detail has been incorporated into the language in Article V between Socket Telecom and CenturyTel, showing that the use of Erlang-B based traffic engineering principles was not in mind in determining whether a new POI was required. Instead, a much simpler threshold was called for to determine whether sufficient traffic was actually flowing to an exchange or not.

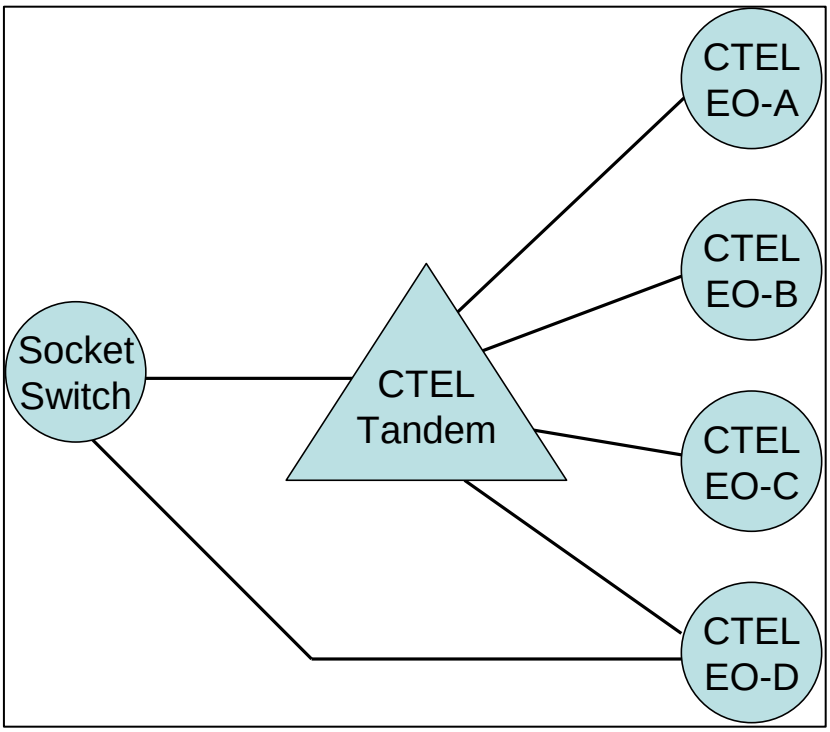
Q. CAN YOU PROVIDE A SIMPLE BEFORE-AND-AFTER DIAGRAM THAT MIGHT ILLUSTRATE THE QUESTION THAT IS BEING CONSIDERED WITH THE LANGUAGE IN ARTICLE V?

A. Yes. First of all, the language in Article V assumes that there is already a direct POI within the LATA. Typically, the way that CLECs will establish this POI is to identify the incumbent Tandem switch in the LATA and interconnect with this switch. The before situation would look something like the following.



Within a LATA, for CenturyTel of Missouri and the initial POI, Socket Telecom would have a connection to the CenturyTel Tandem. CenturyTel would then be responsible to provide facilities on its side of the POI from the Tandem to the exchanges – facilities that CenturyTel would already have established as part of its switch-to-switch network.

The issue that is addressed by the language in Article V is whether Socket Telecom is exchanging sufficient traffic with one of the exchanges behind the CenturyTel Tandem such that Socket Telecom should initiate a new POI (or later on should remove one). As discussed earlier, each of the calls exchanged between Socket Telecom and CenturyTel has information that permits Socket Telecom (or CenturyTel) to know which of the exchanges the call originated from or terminated to. Assuming that the End Office-D in the diagram above is a Class II exchange with 2412 lines, the test would be to determine if there is more than 2.4 DS1s worth of traffic between CenturyTel and Socket Telecom at its highest point (peak) in three consecutive months. Each DS1 can serve 24 conversations. As such, 2.4 DS1s worth of traffic would require more than 57.6 simultaneous conversations (2.4 DS1s multiplied by 24 conversations per DS1) in each of three consecutive months for a separate POI to be required. If this were to occur, the diagram from above would look like the following:



Socket Telecom would establish separate Direct Trunks between its switch and the Century Tel switch through the newly established POI. However, the Tandem Trunk access to the Century Tel switch would continue to exist and be available for call completion. In many respects, this arrangement between the Socket Switch, the CTEL Tandem, and the CTEL EO-D very much looks like the arrangement previously discussed with Switch A, Switch B, and a Tandem. The blocking factor that would be used to size the interconnection facilities between the Socket Switch and the CTEL EO-D switch would not be the same parameters that would be used between the Socket Switch and the CTEL Tandem. These parameters were not documented in Article V. Moreover, they did not need to be in that the method being used to determine if a new POI is

required is based on simultaneous conversations – not calculations based on Erlang-B traffic engineering calculations.

Q. WHAT THEN IS YOUR FINAL RECOMMENDATION TO THE COMMISSION ON THIS DISPUTE?

A. Quite simply, Socket Telecom has implemented an analytical approach that precisely and reasonably implements the language of Sections 4.3.3 and 4.3.4 by tracking the actual usage between the Socket Telecom switch and each CenturyTel exchange to determine the peak usage in each month. Socket Telecom then compares that peak usage to see if it exceeds the thresholds identified in Sections 4.3.3 and 4.3.4. I understand Socket Telecom is prepared to implement the additional direct POIs that are called for based on this empirical approach (and also desires to remove certain POIs). This is the approach that the Commission should confirm in this dispute.

There is nothing in the language of Sections 4.3.3 or 4.3.4 that call for the use of Erlang-B traffic engineering approaches. Moreover, as documented above, the Agreement does not contain critical information that would have been required if Erlang-B traffic engineering estimation was to be used, such as the blocking criteria on the Direct Trunks and the determination of busy hour usage. The lack of this critical information and the fact that there is no reference to the use of Erlang-B traffic engineering approaches in Sections 4.3.3 and 4.3.4 should be sufficient to confirm that the Commission should not accept CenturyTel's proposed interpretation.

In short, the Commission should confirm the approach used by Socket Telecom.

Q, DO YOU HOLD THE OPINIONS YOU EXPRESS IN THIS TESTIMONY TO A REASONABLE DEGREE OF CERTAINTY AS AN EXPERT REGARDING TELECOMMUNICATIONS MATTERS?

A. Yes.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.