Exhibit No.:	
Issue:	*Trunk Sizing Method*
Witness:	*Gary A Fleming*
Sponsoring Party:	*CenturyTel of Missouri, LLC & Spectra Communications Group, LLC d/b/a CenturyTel*
Type of Exhibit:	*Rebuttal Testimony*
Case No.:	*TC-2008-0225*
Date Testimony Prepared	*December 19, 2008*

CENTURYTEL OF MISSOURI, LLC
and
SPECTRA COMMUNICATIONS GROUP, LLC
d/b/a CENTURYTEL

REBUTTAL TESTIMONY

OF

GARY A. FLEMING

CASE NO. TC-2008-0225

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

Socket Telecom, LLC, Complainant, v. CenturyTel of Missouri, LLC and Spectra Communications Group, LLC d/b/a CenturyTel, Respondents.	)	**Case No. TC-2008-0225**

AFFIDAVIT OF GARY A. FLEMING

STATE OF TEXAS)
) SS.
COLLIN COUNTY)

I, **Gary A. Fleming**, of lawful age and being duly sworn, state as follows:

1. My name is Gary A. Fleming. I am presently self employed as a consultant.

2. Attached hereto and made a part hereof for all purposes is my Rebuttal Testimony in the above-referenced case.

3. I hereby swear and affirm that my statements contained in the attached testimony are true and correct to the best of my knowledge, information and belief.

Gary A. Fleming

Subscribed and sworn to before me this 19th day of December, 2008.

CARLY ANDREWS NOTARY PUBLIC STATE OF TEXAS EXPIRES 09-22-12

Notary Public

My Commission expires: 9-22-12
(SEAL)

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REBUTTAL TESTIMONY

OF

GARY A. FLEMING

CASE NO. TC-2008-0225

I. INTRODUCTION

Q: PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A: My name is Gary A. Fleming. My business address is 6820 Creekside Ln, Plano, TX 75023

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

A: I am self employed as an independent consultant.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS MATTER?

A. I am testifying on behalf of CenturyTel of Missouri, LLC and Spectra Communications Group, LLC d/b/a CenturyTel (to be referred to collectively as "CenturyTel").

Q: PLEASE DESCRIBE YOUR EDUCATION BACKGROUND.

A: I hold a Bachelor of Science degree in General Engineering from Oklahoma State University. In addition I have attended a number of telecommunication educational courses including traffic systems concepts and engineering courses related to network design.

Q: PLEASE DESCRIBE YOUR WORK EXPERIENCE.

A: I began my telecommunications career in 1972 at Southwestern Bell Telephone (SWBT). From 1972 until 1985 I held a number of management positions with responsibilities for

traffic engineering and network design, network administration and network maintenance of switching systems and connecting trunk facilities. From 1985 to 1989 I was employed by Bell Communications Research, initially as a Member of Technical Staff where I developed and administered national industry guidelines for allocation of numbering resources, and later as Director-Carrier Technical Liaison with responsibilities for moderating a national industry forum comprised primarily of local exchange and interexchange carriers with the purpose of addressing technical interconnection issues. From 1989 to 1996 I held a variety of director level positions with SWBT/SBC with responsibilities which included network planning, trunk forecasting and servicing, external industry liaison on numbering issues, and network representative to the interconnection negotiation team. In late 1996 I was named Director-Number Portability and assigned the task of implementing local number portability (LNP) in the southwest five state region. During that assignment I interfaced with CLECs, ILECs and cellular carriers regarding LNP issues on both a national and regional basis and was appointed President of the SW Region Portability Co. LLC by ILECs and CLECs operating in the region. Beginning in 1998 I led an organization responsible for network interconnection negotiations, development of technical regulatory policy and associated regulatory filings, network related testimony in state and federal proceedings, and participation in industry forums addressing technical regulatory issues. I retired from SBC in November of 2001 as Vice President-Network Regulatory.

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

A: I have testified or filed testimony before commissions in the states of Arkansas, Kansas, Missouri, Oklahoma and Texas.

II. PURPOSE OF TESTIMONY

Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A: The purpose of my testimony is to address the appropriate methodologies for the trunk facility sizing consistent with Article V of the Commission ordered Interconnection Agreement (ICA) and rebut the related direct testimony of Mr. Steven E. Turner and Mr. R. Matthew Kohly.

III. EXECUTIVE SUMMARY

Q: PLEASE SUMMARIZE THE COMMISSION'S REQUIREMENTS IN ARTICLE V OF THE ICA FOR INTERCONNECTION TRUNK SIZING AND YOUR ASSESSMENT OF CENTURYTEL'S AND SOCKET'S PROPOSED TRUNK SIZING METHODOLOGIES.

A: Article V of the Interconnection Agreement calls for establishing additional POIs for interconnection trunk facilities when the total traffic between Socket's network and individual CenturyTel exchanges exceeds at peak over three consecutive months one DS1 (24 trunks) in the case of a Class I Exchange, or one DS1 (24 trunks) per 1000 access lines for Class II Exchanges. CenturyTel proposes to use actual traffic usage data and the same trunk sizing methods that it uses in its day to day administration and design of its trunking network to meet Commission service standards. The methods employed by CenturyTel are based on sound traffic engineering concepts and are the standards used by telecommunications carriers throughout the industry to size and administer trunk

facilities. Further, these methods meet the requirements set forth in Article V of the Interconnection Agreement.

Socket has decided to not use standard industry methods, but rather it proposes to try to determine the required quantity of trunks between Socket's network and each CenturyTel exchange using what it purports to be a count of simultaneous calls in the peak second over 3 months. Considering the widespread use and availability of the standard methodology, it appears that Socket has self serving reasons for proposing such a grossly oversimplified and technically unsound proposal. As I explain in more detail in this testimony, Socket's proposal is incapable of determining whether the total traffic at peak over 3 consecutive months exceeds the thresholds established by the Commission for the addition of a POI, and is contrary to both the language and clear intent of Article V of the Interconnection Agreement ordered by the Commission.

IV. TRUNK FACILITY SIZING METHODOLOGY

Q: WHAT IS MEANT BY THE TERMS TRUNKS AND BLOCKING?

A: For the purposes of my testimony, a trunk is defined as a single transmission channel, or DS0, between two points that are switching centers. In telephone traffic engineering, blocking is a criterion that specifies the maximum number of calls or service demands that fail to receive immediate service. The blocking criterion is usually expressed in probabilistic notation, such as P.01 or B.01.

Q: DO YOU HAVE EXPERIENCE IN TRUNK FACILITY SIZING?

A: Yes. Early in my career as a traffic engineer, I engineered switching systems including the sizing of trunk facilities and other switch components based on historical and trended traffic usage using statistical blocking and delay based tables. Following that assignment,

I had responsibility for administering the toll/local trunking and switching network over a broad territory which included trunk and switching data measurement, performance monitoring and corrective action. While at Bell Communication Research, I moderated a national forum that dealt with technical interconnection issues and established a workshop to address trunk performance issues, bringing in a research expert on trunk blocking and sizing to help educate participants on statistical blocking theory and its application in trunk sizing and servicing. As a district manager, I was responsible for trunk forecasting and servicing for Arkansas, Kansas, Missouri and Oklahoma. Finally, I have had extensive experience in dealing with interconnection issues as a result of my work on interconnection negotiations.

Q: WHAT ARE THE COMMISSION'S ARTICLE V ICA REQUIREMENTS FOR DETERMINING THE THRESHOLD FOR ADDITONAL POIS?

A: Paragraphs 4.3.3 and 4.3.4 set the thresholds for establishing additional POIs. The specific language is listed below. Emphasis has been added to aid in this discussion.

> 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.

However, these paragraphs were not meant to be used in isolation. Article V of the ICA also includes two paragraphs, 11.1.6 and 11.3, which establish the industry grade of blocking service standard necessary in the threshold determination process. The

specific language for those paragraphs is listed below with emphasis added to again aid in this discussion:

> 11.1.6 Reciprocal traffic exchange arrangement trunk connections shall be made at a DS-1 or multiple DS-1 level, DS-3, (Synchronous Optical Network (SONET) where technically available) and shall be jointly engineered to the appropriate industry grade of service standard. ***Socket and CenturyTel agree to jointly plan interconnection trunking to ensure that the reciprocal traffic exchange arrangement trunk groups are maintained at the appropriate industry grade of service standard (B.01).*** Such plan shall also include mutually-agreed upon default standards for the configuration of all segregated trunk groups.
>
> 11.3 Trunk Facility Underutilization.
> At least once a year, the Parties shall exchange trunk group measurement reports for trunk groups terminating to the other Party's network. In addition and from time to time, each Party will determine the required trunks for each of the other Party's trunk groups from the previous 12 months servicing data. ***Required trunks will be based on the appropriate grade of service standard (B.01).*** When a condition of excess capacity is identified, the Parties will facilitate a review of the trunk group existing and near term (3 to 6 months) traffic requirements for possible network efficiency adjustment.

Q: PLEASE EXPLAIN HOW CENTURYTEL'S METHODOLOGY IS COMPLIANT WITH THE COMMISSION'S ARTICLE V REQUIREMENTS.

A: The first requirement is to calculate the total traffic at peak over three consecutive months. As detailed in Ms. Jennifer Powell's testimony, CenturyTel is using actual SS7 detail call records to calculate the total traffic between Socket's network and each individual CenturyTel exchange. The traffic data is aggregated by hour for each day. The busiest or peak hours are then identified and averaged for the 3 consecutive month period. The next step is to determine whether this traffic exceeds the capacity of the threshold sizes of the interconnection trunks (24 channels or trunks for Class I exchange, and 24 channels or trunks per 1000 access lines in Class II exchanges). In order to make that determination two pieces of information are required – the total traffic and the

objective grade of blocking service. CenturyTel enters the total traffic at the peak busy hour that it has calculated and the Commission specified industry grade of service standard of one percent blocking or B.01 into an Erlang B trunking table to determine the necessary size of each interconnection trunk group and whether or not it exceeds the threshold. Erlang-based trunking sizing methodology is used by CenturyTel in the day to day administration of its own network. Moreover, it is the recognized industry standard used by CLECs, ILECs and interexchange carriers throughout the industry to size and administer their networks to meet specified levels of objective blocking performance.

Q: IS THERE MERIT TO MR. KOHLY AND MR. TURNER'S CLAIMS THAT THE COMMISSION LANGUAGE IN ARTICLE V, PARAGRAPHS 4.3.3 AND 4.3.4 PRECLUDES THE USE OF STANDARD USAGE MEASUREMENTS AND TIME TESTED TRUNK SIZING METHOD PROPOSED BY CENTURYTEL?

A: Based on my reading, I find such an interpretation as very unlikely for a number of reasons. First, as I explain in more detail later in my testimony, a count of simultaneous calls at a specific second is not an adequate measure of "traffic" because it omits the average call holding time which is a necessary element for determining the total usage and occupancy of a trunk group. As I discussed earlier, CenturyTel's method calculates total traffic. Second, the Commission's statement, "when the total traffic……exceeds, at peak over three consecutive months, a DS1 or 24-channels for each 1000 access lines in the exchange…" is consistent with standard industry practices of measuring the average peak busy hour over the three busiest month of the year. Finally, contrary to what Mr. Turner suggests, I believe that Article V must be taken as whole. It is unreasonable to assume that the Commission's requirement to use the industry grade of service standard

of B.01 can simply be ignored when determining whether or not traffic between Socket and a CenturyTel exchange exceeds a DS1 or 24-channels per 1000 access lines and thus requires an additional POI. The offered traffic and an objective grade of service (B.01) along with the industry standard trunk engineering methods and trunking tables are necessary in order to accurately determine the quantity of interconnection trunks required. Socket's simultaneous count method cannot meet these requirements.

Q: BUT WHAT ABOUT MR. KOHLY'S CLAIMS AT PAGES 10-11 THAT CENTURYTEL'S METHODS ARE ESTIMATES THAT HAVE BEEN REJECTED BY THE COMMISSION IN IT'S RULING IN CASE NO. TC-2007-0341 AND THAT SOCKET'S CALL COUNTING METHODS ARE CONSISTENT WITH THE COMMISSION'S RULING.

A: Mr. Kohly mischaracterizes the Commission's order. There are significant differences in the two cases that make such a conclusion inappropriate. In Case No. TC-2007-0341, the Commission ruled that CenturyTel was not allowed to require additional trunks and potentially an additional POI prior to porting the number of the Socket customer because of traffic usage that CenturyTel anticipated would result from the porting. Instead, the Commission states that the additional trunks and POIs should be based on actual traffic measured after the numbers were ported. As Ms. Jennifer Powell attests in her testimony filed in this case and in my earlier testimony, CenturyTel is using actual total traffic volumes between Socket's network and individual CenturyTel exchanges calculated from SS7 detail call records. CenturyTel is not using anticipated or estimated traffic. And as I will explain further later in my testimony, Socket's call count methodology does not provide actual traffic.

Mr. Kohly also tries to persuade us that the Commission has rejected the use of Erlang tables in determining the required quantity of trunks. Again, this is a mischaracterization of the Commission's order. In its Footnote 70, the Commission was stating that because it had ruled that CenturyTel could not use estimated traffic volumes that it anticipated as a result of the numbers that were to be ported, *any use of that estimated data* by Ms. Anderson in a statistical study involving the use of Erlang tables *was not relevant.* It is unreasonable to conclude that the Commission had ruled that use of industry standard Erlang trunking tables was not a valid means of sizing a trunk group since the Commission is well aware that Erlang tables provide the basis for trunk management throughout CenturyTel's network, and for that matter, throughout the industry.

Q: DO MR. KOHLY'S ASSERTIONS AT PAGE 11 THAT ERLANG TABLES ARE SIMPLY ESTIMATIONS, BUT THAT THE SOCKET SIMULTANEOUS CALL COUNT PROVIDES THE ACTUAL VALUE HAVE MERIT?

A: No. Mr. Kohly's attempt to dismiss the use of Erlang as an inappropriate estimation technique is again misleading. First, the Commission's requirements in Article V require total traffic which CenturyTel provides and Socket's call count method does not. Second, Erlang tables are based on statistical probability. However, that does not mean they are simply estimates. The Erlang-based trunking tables used today are the result of extensive research and study by scientists and mathematicians in such prestigious firms as Bell Labs and Telcordia. Further, their efficacy is undeniable by virtue of the fact that they have been successfully used in real life applications for years in telecommunications network of CLECs, ILECs and interexchange carrier all over the USA and the world.

Mr. Kohly would have you believe the method that Socket proposes for the purpose of this case, which I will show to be inadequate for determining trunk requirements, should be used rather than these industry standard trunk sizing methods.

Q: IS MR. TURNER CORRECT WHEN HE STATES AT PAGE 8 THAT MINUTES OF USE, BY ITSELF, IS NOT PARTICULARLY USEFUL IN DETERMINING THE SIZE OF INTERCONNECTION FACILITIES?

A: Yes, but not for the reasons he suggests. As stated previously, in order to determine the size of interconnection trunk facilities, in addition to the traffic usage in terms of minutes of use, or as used more often in traffic engineering processes, CCS (hundred call seconds) or erlangs[1], the objective grade of service standard in terms of a blocking percentage is required. As I will demonstrate later, Mr. Turner's other assertions that the maximum number of simultaneous calls at a given second is a more appropriate methodology are without merit.

Q: IS MR. TURNER'S ASSERTION AT PAGE 9 THAT CENTURYTEL HAS TAKEN A DIFFERENT APPROACH WHICH ONLY ESTIMATES THE TRAFFIC USAGE BETWEEN SOCKET'S NETWORK AND A CENTURYTEL EXCHANGE CORRECT?

A: CenturyTel's approach is different from the call count method that Socket has proposed, but it is consistent with the standard methodology used by telecommunications carriers across the United States. As Ms. Jennifer Powell describes in her rebuttal testimony, CenturyTel is using a method which not only identifies the quantity of calls, but appropriately takes into consideration call duration so that total traffic usage can be determined. And as I have stated previously, those measurements are used along with the

[1] 1 erlang = 3600 seconds

Commission's B.01 standard of service requirements to determine the amount of trunk channels required between the Socket Network and individual CenturyTel exchanges.

Q: IS MR. TURNER'S DESCRIPTION OF THE ERLANG B ENGINEERING PRINCIPLES ACCURATE?

A: I think it would be fair to say that Mr. Turner's description on Page 10 of his direct testimony is accurate, although incomplete. A. K. Erlang's education was as a mathematician with an inclination toward scientific research. He first went to work in telecommunications in 1908 for the Copenhagen Telephone Company as a scientific collaborator and later as head of its laboratory. His first work published was in 1909, and it proved that telephone calls tend to follow Poisson's law of distribution. This and his subsequent studies were translated into English, French and German, and it was even reported that one Bell Labs researcher learned Danish in order to study his papers. But the most important part that Mr. Turner omitted is that Erlang's studies have been used by Bell Labs, Bell Communications Research (now Telcordia) and other telecommunications researchers to develop the standard traffic and trunk engineering practices used today throughout the industry. In fact, the term "erlang" is used to describe a unit of traffic load equivalent to 3600 seconds of calls on a trunk group.

Q: DO YOU AGREE WITH MR. TURNER'S ASSERTIONS THAT THERE ARE CRITICAL MISSING FACTORS THAT RENDER USE OF THE INDUSTRY STANDARD ERLANG METHODS OF TRUNK SIZING USELESS?

A: Mr. Turner's statements that use of Erlang B tables requires an objective level of blocking and total traffic during the peak busy hour are correct, but his conclusions from those facts are faulty. For example, his statement that there are no industry blocking

standards for interconnection trunks between Socket and a CenturyTel exchange is clearly incorrect. As stated earlier the Commission specified at 11.1.6 and 11.3 in Article V of the Interconnection Agreement that interconnection trunking is to meet the industry grade of service of a B.01, or one percent blocking. Ironically, a little later in his own testimony (page 14) Mr. Turner acknowledges that the Commission specified an industry service standard of B.01. Mr. Turner also erred in his conclusion that Erlang B cannot be used because the Interconnection Agreement did not specify the use of busy hour calling volumes. Taking into consideration the facts that (1) the Commission did specify a B.01 industry service standard for interconnection trunks; (2) Erlang-based tables are the standard methods used by the telecommunications industry to size trunk groups to meet objective blocking service levels; and (3) Erlang tables require busy hour traffic, it is more reasonable to conclude that the Interconnection Agreement language in paragraphs 4.3.3 – 4.3.5 that the *total traffic at peak* be used to size interconnection trunk groups is referring to the standard busy hour (peak) traffic. It is certainly a more reasonable conclusion than to assume that the Commission was ordering the parties to use nonstandard and technically unsound methods to perform interconnection trunk group sizing.

Q: AT PAGES 12 – 14 MR. TURNER STATES THAT ANOTHER MISSING FACTOR FROM THE USE OF ERLANG B CALCULATIONS FOR TRUNK SIZING IS THE POTENTIAL USE OF A NETWORK CONFIGURATION WITH A DIRECT TRUNK GROUP BETWEEN A HYPOTHETICAL SWITCH A AND SWITCH B AND ANOTHER TRUNK GROUP BETWEEN EACH OF THESE SWITCHES AND A TANDEM WHICH WOULD BE USED FOR OVERFLOW

TRAFFIC FROM THE DIRECT TRUNK GROUP. DOES THIS NETWORK CONFIGURATION NEGATE THE NEED FOR ERLANG B TABLES FOR ESTIMATING TRUNK REQUIREMENTS?

A: No, it does not. The configuration that Mr. Turner describes is generally known in the industry as a High Usage/Alternate Route (HU/AR) trunking configuration and can be found in use in many metropolitan areas where central office switches and the tandem switch are geographically close to each other. Mr. Turner's implication that Erlang B tables would not be used in such a configuration is simply wrong. Three pieces of information would be necessary to size the trunk facilities in such a configuration: (1) the objective grade of service (e.g., B.01), (2) the busy hour traffic, and (3) a parameter for sizing the high usage direct trunk group which allows a determination of the amount of traffic to be overflowed, such as the Economic CCS. Once the HU trunk group is sized the overflow traffic load can be calculated using an ECCS trunk table, which incidentally is an Erlang-based table, along with the total offered traffic load. This busy hour traffic overflow load is then used to size the final trunk group from the tandem using an Erlang-based trunk table such as Erlang B. The bottom line is that these trunk configurations rely on the use of Erlang B or similar tables for trunk sizing calculations.

Q: **MR. TURNER MAINTAINS THAT A HIGH USAGE/ALTERNATE ROUTE TRUNK GROUP ARCHITECTURE IS REQUIRED TO "PROMOTE NETWORK EFFICIENCY" AND SUBSEQUENTLY TO MINIMIZE THE NUMBER OF ADDITONAL POIS. DO YOU AGREE WITH HIS CONCLUSIONS?**

A. No. First, Mr. Turner refers to section 11.1 and insists that CenturyTel is not permitted to impose any restrictions on Socket Telecom that it does not impose on its own traffic. As

Mr. Ralph Teasley explains in more detail in his rebuttal testimony, local calling within CenturyTel's network is primarily point-to-point. Secondly, the Commission's requirement for promoting network efficiency is not limited to promoting Socket's network efficiency, but rather the overall network efficiency. As I noted above, HU/AR configurations are frequently used in large metropolitan areas where central office switches and the tandem switch are geographically close. However, as indicated in Mr. Teasley's testimony, CenturyTel determined long before the entry of Socket into the telecommunications market that a point-to-point architecture provided the most cost effective network configuration due to the distance between individual exchanges and the tandem switch. In essence, the trunking efficiency gained on a high usage direct trunk group would be more than offset by the cost of the facilities for the geographically remote switches. Here Mr. Turner's argument only serves to obfuscate the fact that the Interconnection Agreement does not differentiate between direct and tandem routed trunks. It requires a determination of the *total* number of trunks needed to handle the traffic volume between Socket's network and a CenturyTel exchange.

Q: PLEASE PROVIDE AN OVERVIEW OF WHY SOCKET'S METHODOLOGY IS NOT COMPLIANT WITH THE COMMISSION'S ARTICLE V REQUIREMENTS.

A: As I indicated in the Executive Summary Section, Socket would have us believe that it developed its simultaneous call count method and chose it over the industry standard methods in use by telecommunications carriers throughout the industry because of its erroneous claims that the Commission did not envision use of those industry standard methods in its language in Article V of the Interconnection Agreement. However, as I

have shown, the industry standard methods employed by CenturyTel are clearly compliant with the Commission's requirements and the interconnection agreement terms. Socket takes the position that trunk facility sizing is simple – just count how many channels are in use in the peak second, and that's how many you need. Yet Socket did not submit testimony that it uses this method in sizing its own network. And Mr. Turner did not claim that in his experience with AT&T that he used such a method for sizing AT&T's network. So one has to wonder why Socket decided not to use industry standard sizing methodology. There are clear reasons why Socket's overly simple method is not a valid trunk sizing approach. I will summarize a few here and then deal with them in more detail in the testimony which follows.

The first is that a count of calls that occurred at a point in time does not include calls that were unable to be completed because they were blocked, so it could understate the number of simultaneous calls that were attempted.

The second is that Article V requires a measurement of total traffic. A count of calls is an only a part of a measure of total traffic. Traffic describes the product of call counts and average call holding times which can be expressed in a variety of ways – minutes of use (MOU), call seconds, CCS (hundred call seconds) or erlangs (1 erlang = 3600 call seconds).

The third is that calls alone, or for that matter the number of channels in use at a peak second simply does not give enough information to size the trunk group to the Commission's ordered service standard of a one percent probability of blocking. Socket erroneously suggests that if you had 10 calls at the peak second, you only need 10 circuits, regardless of whether there were 10 calls every second or only at one second.

While that may sound reasonable on the surface to someone who lacks an understanding of traffic engineering principles, it is not. I provide a couple of example scenarios later in my testimony that show that the same simple count of 10 simultaneous calls on a trunk group with 10 channels could result in a probability of blocking of 0.5 percent or 15.5 percent. Socket tries to dismiss the use of industry standard trunk tables as simply estimates. However, nearly 100 years of scientific research and studies along with years of experience with real life practical applications by carriers across the industry prove that Erlang-based tables provide reliable, technically sound results. As noted above and in the detailed explanation that follows, Socket's method is not reliable, and is at best an overly simplistic guess of trunk requirements that ignores sound traffic engineering concepts.

Q: IS THE METHOD PROPOSED BY SOCKET'S WITNESSES FOR MEASURING THE TOTAL TRAFFIC EXCHANGED BETWEEN SOCKET'S NETWORK AND CENTURYTEL EXCHANGES TECHNICALLY SOUND?

A: No. As Mr. Kohly and Mr. Turner attest, it is simply a count of simultaneous calls. As I explain further below, determining the total traffic requires more than a count of peak simultaneous calls at a particular second in three consecutive months. Socket's method falls short of the requirement for the use of total traffic by the Commission in Article V of the Interconnection Agreement.

Q: WHAT IS THE BASIS FOR YOUR STATEMENT THAT A MEASUREMENT OF TOTAL TRAFFIC REQUIRES MORE THAN A COUNT OF SIMULTANEOUS CALLS AT A PARTICULAR SECOND IN TIME?

A: The Alliance for Telecommunications Industry Solutions' (ATIS) glossary defines traffic as, "A quantitative measurement of the total messages **and their length**[2], expressed in CCS or other units during a specific period of time." The Irwin Handbook of Telecommunications describes traffic usage as, "In a given hour the load on any part of the network is expressed as the product of the number of call attempts **and the average holding time**[3] of all attempts. For example, if a circuit experienced six call attempts that averaged 600 seconds (10 minutes) each, the group would have carried 3,600 call-seconds of load. To express the load in more convenient terms, traffic engineers divide the number of call-seconds by 100 and express the results as hundreds of call seconds, abbreviated as CCS." Mr. Turner would have us believe that the number of simultaneous calls during a particular second is adequate to measure the "total traffic" with no indication of whether those calls lasted on average one second or 30 minutes. That is simply not true.

Q: DOES A COUNT OF THE PEAK SIMULTANEOUS CALLS PROVIDE THE NECESSARY INFORMATION TO DETERMINE HOW MANY TRUNKS ARE NEEDED AS MR. TURNER ASSERTS ON PAGES 7 TO 9 OF HIS TESTIMONY?

A: No. Knowing how many simultaneous calls occurred at an instant in time does not provide adequate information to determine how many trunk channels are needed. Let's consider the Article V threshold of 2.4 DS1s for a Class II Exchange with 2412 CenturyTel access lines[4] that Mr. Turner alluded to on page 7 his testimony. 2.4 DS1s

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[2] Emphasis added
[3] Emphasis added.
[4] Interconnection Agreement, Article V, Paragraph 4.3.4 1.

are equivalent to 58 channels or trunks[5]. Based on his testimony in lines 4 -12 on page 8, if there were 58 or less simultaneous peak calls in one second out of each of three consecutive months, Socket would conclude that that the value did not exceed the defined threshold. However, there were 59 or more simultaneous calls at peak, Socket would conclude that the threshold was exceeded and would establish a new POI. That logic is faulty in both cases. A count of a peak of 58 simultaneous calls in each of 3 consecutive months does not automatically mean that only 58 trunks are needed. First, it would exclude calls that could not be completed because they were blocked. Since the trunk groups these calls utilize are engineered with an objective level of blocking, it is certainly possible that blocking may have occurred, thereby making Socket's call count underestimate the actual call demand. It also does not provide information on how many times (i.e., seconds) the peak number of calls occurred. Were there 58 simultaneous calls only 0.1 percent of the time or were there 58 simultaneous calls 90 percent of the time? As I demonstrate later in this testimony, this factor makes a profound difference in the grade of service blocking probability that customers would encounter.

At the other end of the spectrum, a count of 59 simultaneous calls also does not necessarily mean that a total of 59 trunks are needed since all trunk groups are engineered to block at least a small percentage of calls. If you had 58 circuits and encountered 59 calls at only one second in each of the 3 consecutive months the blocking rate would be infinitesimal. For example, if the average number of simultaneous calls in non-peak seconds were only 30 calls, then in a month roughly 1 out of 78 million[6] total calls would be blocked. Again, this demonstrates that the number of seconds over which the peak

[5] 1 DS1 = 24 channels. 2.4 DS1s = 24 + 24 + (0.4 * 24) = 58 DS0 channels

[6] Total calls would be approximately 30 calls/second X 2.6 million seconds/month assuming a 30 day month.

simultaneous calls occurred is a critical factor in trying to make a determination of the number of trunk channels need. In either case, it is clear that the number of simultaneous calls occurring in a single second is not adequate information to determine the quantity of trunks required.

Q: BUT DIDN'T MR. KOHLY TESTIFY THAT SOCKET USES THIS METHODOLOGY IN ITS TRUNK FORECASTING AND SIZING OPERATION?

A: No he did not. Mr. Kohly testified at Page 9 that Socket is proposing the methodology to determine how many trunks or channels were used in order to determine whether Socket is required to establish an additional POI. Neither Mr. Kohly or Mr. Turner have indicated that Socket uses this methodology in the day to day operation of its network. I'm not surprised. In my experience in dealing with ILEC, CLEC and interexchange carriers across the United States I have not encountered any telecommunications industry standard methodology for forecasting and sizing trunk groups that uses this kind of data.

Q: WHAT KIND OF INFORMATION IS NEEDED TO DETERMINE THE NUMBER OF TRUNKS BETWEEN EXCHANGES?

A: Socket's methodology of counting the simultaneous calls occurring at a particular second omits two critical pieces of information necessary to size a trunk group. The first is the objective blocking grade of service that the trunk group is designed to meet, such as the industry grade of service blocking standard of B.01, or 1 percent blocking, established by the Commission for trunks between Socket and CenturyTel's network switches. Without that objective, it is impossible to accurately size any trunk group. However just knowing the objective blocking and a simultaneous peak call count is still not adequate. The second piece of information that is needed in order to determine the quantity of trunks

required for a B.01 performance is the amount of offered "traffic". As I have covered above, a count of peak simultaneous calls occurring in a second during each of three consecutive months does not provide the total traffic exchanged between Socket and a CenturyTel exchange. Without the total busy hour peak traffic, there is not enough information to determine the required number of trunks and in turn whether or not the Commission's threshold for establishing an additional POI has been exceeded.

Q: CAN YOU DEMONSTRATE FURTHER WHY MR. TURNER AND MR. KOHLY'S PROPOSED SIMULTANEOUS CALL COUNT DATA METHODOLGY CANNOT RELIABLY DETERMINE THE NUMBER OF TRUNKS REQUIRED?

A: Perhaps it would be easier to demonstrate the reliability problems inherent in Socket's proposed methodology by considering a hypothetical example of a trunk group with 10 trunks or channels. Based on Mr. Turner's testimony if the highest number of simultaneous calls in a second were 10, Socket would conclude that no additional trunks were needed. Mr. Kohly similarly states, that all you have to do is just count. However this count ignores the "occupancy" of the trunk group. Occupancy is a measure of the quantity of trunks that remain in use over a period of time and is another way to consider actual traffic usage. And as demonstrated below, occupancy is a critical factor. Let's consider two scenarios with this hypothetical trunk group and assume in each scenario that the Socket methodology resulted in a peak call count of 10 simultaneous calls. To simplify the example further, rather than looking at 3 months of all of the possible seconds in each day, let's assume that the peak number of calls occurred in the same hour, 8-9AM and focus on that hour. In the first scenario all 10 trunks are in use only for

one second out of the hour. During the rest of the 3599 seconds, there are only 4 trunks in use. The total traffic for that hour could be calculated by adding the 10 call seconds for the one second when all 10 trunks were busy plus 3599 X 4 call seconds for the rest of the hour when only 4 trunks were in use. This would yield a total of 14, 406 call seconds, or using a more convenient industry standard, the total traffic could be expressed as 144 CCS. Now, let's consider the second scenario where there are 10 trunks busy for 20 minutes out of the hour, and the rest of the time there were 8 trunks busy. The total traffic in this scenario would be 31,400[7] call seconds or 314 CCS. Using the CCS and an Erlang B calculator, in the first scenario the probability of blocking would be 0.5 percent, and that sounds reasonable since a caller would find 6 trunks available for all but one second of the hour. In the second scenario the probability of blocking would be 15.5 percent which also makes sense as a caller would find no trunks available for one third of the hour and would find only 2 trunks available the other two thirds of the hour. In both of these scenarios Socket would have measured 10 simultaneous call counts and would have concluded that no additional trunks were needed. Their conclusion would have been correct in the first scenario, but in the second scenario the conclusion would have resulted in an unacceptably high probability of blocking which far exceeds the Commission's industry grade of service standard. However, the real lesson here is that their method was unable to differentiate between these two vastly different outcomes. This is clear evidence that Socket's proposal to "just count" the number of simultaneous calls simply doesn't work.

Q: IS SOCKET'S PROPOSED METHODOLOGY FOR ESTIMATING INTERCONNECTION TRUNK REQUIREMENTS THROUGH USE OF A

[7] Traffic = (10 trunks X 20 minutes X 60 seconds/minute) + (8 trunks X 40 minutes X 60 seconds/minute)

COUNT OF SIMULTANEOUS CALLS CONSISTENT WITH THE COMMISSION'S REQUIREMENTS DETERMINING THE THRESHOLD FOR ADDITONAL POIS IN ARTICLE V OF THE INTERCONNECTION AGREEMENT?

A: No it is not. First, it does not measure total traffic as required by Article V. Second, it does not provide adequate information to determine the quantity of trunks between Socket and a CenturyTel exchange needed to meet the Commission's standard blocking criteria of B.01 set forth in Article V paragraphs 11.1.6 and 11.3. Finally as demonstrated above it simply doesn't work.

V. CONCLUSIONS/RECOMMENDATIONS

Q: WHAT ARE YOUR CONCLUSIONS AND RECOMMENDATIONS TO THE COMMISSION REGARDING THIS DISPUTE?

A: Socket's methodology is technically flawed, and it clearly does not meet the Commission's requirements set forth in Article V of the Interconnection Agreement. Socket would have us believe that an oversimplified process involving a count of simultaneous calls should be used for the purpose of determining whether the threshold for establishing an additional POI is exceeded rather than the standard time tested methodology employed by telecommunications carriers nationwide. Socket would also have us believe that the Commission's requirement to use total traffic, as it is defined in the industry, is not necessary. Finally, Socket would have us believe that it is not necessary to consider the industry grade of service standard required by the Commission in Article V when sizing the interconnection trunk group to determine whether the Commission's thresholds for an additional POI have been exceeded. And perhaps most

telling, as I have demonstrated in my testimony above, Socket's methodology is not reliable. It just doesn't work.

On the other hand, CenturyTel has demonstrated that it is using actual total traffic, the Commission's grade of service standard and the same industry wide standard trunk sizing methodology that it uses in the administration and sizing of its network. CenturyTel's method is straightforward and technically sound. It is also compliant with the Commission's requirements in Article V of the Interconnection Agreement. As a result I would recommend that the Commission confirm that the CenturyTel methodology is to be used for determining whether or not its thresholds have been exceeded and additional POIs are required.

Q: DOES THIS CONCLUDE YOUR TESTIMONY?

A: Yes, it does.