

**BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

WASHINGTON UTILITIES AND  
TRANSPORTATION COMMISSION,

Complainant,

v.

CENTURYLINK COMMUNICATIONS, LLC,

Respondent.

DOCKET NO.: UT-181051

**RESPONSE TESTIMONY**

**OF**

**MARTIN D. VALENCE**

**ON BEHALF OF**

**CENTURYLINK COMMUNICATIONS, LLC**

**March 31, 2022**

1 support team responsible for providing process and project support to production units of  
2 the National Network Services Service Delivery line of business. From 2011-2014, I  
3 served as Director, Ethernet & DSL Network Reliability Centers. In that role, I led a team  
4 of network professionals providing service provisioning, network management and  
5 technical support to company Ethernet, ATM-Frame Relay, and high-speed internet/IP  
6 television networks. From 2015-2017, I served as Director, Global Network Event  
7 Management and Public Safety Services. In that role, I led a team of professionals  
8 specializing in public safety services (911) and network management. My key  
9 responsibilities included developing operational strategies to position CenturyLink to meet  
10 evolving federal public safety requirements and cost structure alignment goals and leading  
11 operational transition to a next generation IP-based public safety services operation.

12 **Q. HAVE YOU TESTIFIED BEFORE THIS COMMISSION OR ANY OTHER**  
13 **REGULATORY OR JUDICIAL BODY?**

14 **A.** I have spoken to both the Nebraska and Arizona Commissions on behalf of CenturyLink,  
15 but neither required formal pre-filed written testimony. Those opportunities were  
16 engagements where I was made available to answer questions from the Commissioners.

17 **Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

18 **A.** My testimony focuses on three primary points.

19 First, the completion of 911 calls during the December 2018 network event had very  
20 different impacts on the 15 PSAPs served by CenturyLink than on the 47 PSAPs served by  
21 Comtech. Calls destined for the PSAPs served by CenturyLink were unaffected by the  
22 network event, while some calls destined for Comtech's PSAPs failed as a result of the

1 network event. The difference between the two carriers was network design. CenturyLink  
2 ensured the signaling links supporting its 911 calling were provisioned with supplier  
3 diversity; as a result, none of the calls failed as a result of the outage. In contrast, all four of  
4 Comtech’s SS7 signaling links were provisioned on the Infinera Green network—  
5 something Comtech knew created the potential for problems, and something Comtech kept  
6 hidden from everyone else. Had Comtech communicated this fact to CenturyLink,  
7 CenturyLink could have ensured the signaling links were provisioned on diverse networks,  
8 which would have eliminated the problem that caused the failed calls altogether.

9 Second and relatedly, CenturyLink’s ordering process gives carriers the ability to ask that  
10 circuits be provisioned with network diversity. All Comtech needed to do was check a box,  
11 and pay a bit more money. Comtech opted to save the money and run the risk. This left  
12 CenturyLink in the dark. CenturyLink had no idea that the circuits ordered would be used  
13 for SS7 signaling, let alone SS7 signaling to support 911 calling.

14 Third, Staff witness Mr. Webber states that a packet storm experienced on the Red Infinera  
15 network in February 2018 should have led CenturyLink to close a management channel on  
16 its entirely separate Green Infinera network. On this point, Infinera’s technical lead,  
17 Thomas McNealy, and I agree. There are no meaningful similarities between the outage on  
18 the Red Network and the outage on the Green network. [REDACTED]

19 [REDACTED]  
20 [REDACTED]  
21 [REDACTED]  
22 [REDACTED]  
23 [REDACTED]  
24 [REDACTED]

1 [REDACTED] To claim that CenturyLink is financially  
2 responsible under these circumstances is frankly absurd, especially when the true cause of  
3 the outage was Comtech’s network design—a design Comtech knew all along was faulty  
4 and ignored it nonetheless.

5 **II. LUMEN’S OPTICAL NETWORKS**

6 **Q. HOW MANY DIFFERENT OPTICAL NETWORKS DOES CENTURYLINK**  
7 **HAVE?**

8 **A.** In addition to its TDM networks, CenturyLink has six separate, stand-alone optical  
9 networks, including the “Infinera Green” network (legacy CenturyLink) and the “Infinera  
10 Red” network (legacy Level 3).

11 **Q. DO THESE OPTICAL NETWORKS OVERLAP, MEANING DO MULTIPLE**  
12 **OPTICAL NETWORKS SERVE THE SAME GEOGRAPHIC AREAS?**

13 **A.** Yes, the six networks do geographically overlap. CenturyLink understands that there are  
14 times when it is important to have redundant services on separate networks. Overlapping  
15 networks allow CenturyLink to create supplier diversity without having to go outside of  
16 the CenturyLink family of companies.

17 **Q. IN TESTIMONY IN THIS PROCEEDING, WHAT DOES PUBLIC COUNSEL**  
18 **ASSUME ABOUT THE NUMBER OF OPTICAL NETWORKS DEPLOYED BY**  
19 **CENTURYLINK?**

20 **A.** Public Counsel’s witness, Mr. Brian Rosen, appears to assume that CenturyLink has only  
21 one optical network. He says “CenturyLink built its optical network using multiple

1 optical network switches supplied by one vendor, Infinera Corporation. Had CenturyLink  
 2 deployed two vendors, the nationwide failure that impacted Washington’s 9-1-1 system  
 3 either would not have happened, or the scope and duration of the failure would have been  
 4 Reduced dramatically.”<sup>1</sup> That Lumen has multiple optical networks demonstrates that it is  
 5 not reliant upon a single vendor. That way even if one optical network fails, the other  
 6 networks should ensure that calls still complete.

7 Indeed, on the very same page of his testimony, Mr. Rosen states “I believe the failure  
 8 occurred because all four links used the same optical network. In building 9-1-1 systems,  
 9 I generally advise that supplier diversity be used to guard against the kind of failure that  
 10 occurred here. In this case, there was no supplier diversity.”<sup>2</sup> As will be explained below,  
 11 with its multiple optical networks and separate TDM network, CenturyLink could have  
 12 provided Comtech with supplier/network diversity had Comtech just informed  
 13 CenturyLink that the circuits in question were to be used for signaling links to support  
 14 911 calling and that diversity was required.

15 **III. SUPPLIER DIVERSITY**

16 **Q. IN CENTURYLINK’S PROVISION OF 911 SERVICE TO THE 15 REMAINING**  
 17 **PSAPS IT WAS RESPONSIBLE FOR IN DECEMBER 2018, DID CLC USE**  
 18 **SEPARATE NETWORKS TO CREATE SUPPLIER DIVERSITY FOR THE**  
 19 **SIGNALING LINKS USED TO SUPPORT ITS 911 NETWORK?**

20 **A.** Yes, it certainly did and this is exactly the point to be understood. CLC [REDACTED]  
 21 [REDACTED]

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<sup>1</sup> Direct Testimony of Brian Rosen (Dec. 15, 2020), Exh. BR-1CT (“Rosen Direct”), at 20.

<sup>2</sup> Rosen Direct, at 20-21.

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[REDACTED]

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[REDACTED]. In other words, CLC did the very thing Mr. Rosen

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recommended; it used supplier diversity to “guard against” a network outage on one of

4

the networks.<sup>3</sup>

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**Q. BECAUSE CENTURYLINK USED SUPPLIER DIVERSITY TO PROVISION SIGNALING TO SUPPORT 911 SERVICES TO ITS 15 PSAPS, HOW DID THE OUTAGE ON THE INFINERA GREEN NETWORK IMPACT CENTURYLINK’S ABILITY TO DELIVER 911 CALLS IN WASHINGTON IN DECEMBER 2018?**

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**A.** It did not impact CLC’s ability to complete 911 calls in the state of Washington. I realize that Staff’s witness, Mr. Webber, states that a small number of 911 calls destined for the 15 CenturyLink-served PSAPs did not complete due to the network event. However, this is incorrect, as Mr. Klein explains in his Response Testimony.<sup>4</sup> While some calls did not complete for various reasons such as the caller hung up, none failed to complete due to the network outage on the Infinera Green network. Again, CenturyLink utilized route diversity for its own signaling links; while such prudent network design was available to Comtech, it chose not to avail itself of this industry recommended practice. CLC witness Steven Turner explains Comtech’s failure to provision signaling links using route diversity, the likely reasons leading to that decision (cost savings), and the ultimate breakdown of the Comtech 911 network as a result of Comtech’s flawed design

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<sup>3</sup> CLC informed all parties of the diversity of its SS7 links in a November 2021 discovery response. Yet, Mr. Rosen makes no mention of that information. See Exhibit MDV-2C, CLC Response to Staff DR 27c.

<sup>4</sup> Response Testimony of Carl D. Klein, at 11-12.

1 decisions.<sup>5</sup>

2 **Q. IF COMTECH HAD ASKED CENTURYLINK TO PROVIDE SIGNALING**  
3 **LINKS ON DIFFERENT NETWORKS, WOULD CENTURYLINK HAVE BEEN**  
4 **ABLE TO DO SO?**

5 **A.** Absolutely. CenturyLink had capacity on different networks that would have allowed  
6 CenturyLink to provision signaling links to Comtech over unique networks for  
7 completion of 911 calls in the state of Washington.

8 **Q. DID COMTECH EVER MAKE CENTURYLINK AWARE THAT IT LACKED**  
9 **SUPPLIER DIVERSITY ON THE SIGNALING LINKS IT USED TO SUPPORT**  
10 **911 CALLS IN WASHINGTON?**

11 **A.** No. Indeed, Comtech admits that it never informed CenturyLink of this fact even though  
12 Comtech knew its SS7 links should be provisioned using supplier diversity. Comtech’s  
13 response to discovery requests in this instance is telling. First, Comtech states that it  
14 “seeks supplier diversity as a matter of practice.”<sup>6</sup> Comtech continues that “supplier  
15 diversity is a generally good practice, if available, based on the significant expertise of its  
16 employees and general industry guidance, such as the National Emergency Number  
17 Association (“NENA”) i3 materials”, which state “multiple circuits from multiple  
18 providers is assumed to create greater diversity and Redundancy.”<sup>7</sup>

19 Comtech stated that it did not obtain supplier diversity because 

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<sup>5</sup> CenturyLink has also confirmed that its vendor, Intrado, provisioned SS7 links using supplier diversity for the SS7 links that connected the Intrado STP and the Comtech/TNS STP. The weak link in the proverbial diversity chain was Comtech.

<sup>6</sup> See Response Testimony of Stacy Hartman, Exhibit SJH-12C, Comtech Response to CTL DR 2(a).

<sup>7</sup> See Exhibit SJH-12C, Comtech Response to DR-CTL7.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]<sup>8</sup> This is an odd statement as CenturyLink could have provided Comtech with  
 5 supplier diversity by itself (by provisioning circuits for SS7 from different networks).  
 6 Comtech may have assumed that CenturyLink only had one network to offer, thus  
 7 demonstrating its [REDACTED] was anything but.

8 To compound the problem, Comtech admits that it knew CLC was providing the circuits  
 9 for all of its signaling links,<sup>9</sup> but did not disclose its lack of supplier diversity to CLC,  
 10 WMD, Commission Staff or others.<sup>10</sup> For unknown reasons, Comtech kept its lack of  
 11 supplier diversity a secret from apparently everyone.

12 **Q. WHAT IS YOUR REACTION TO COMTECH’S FAILURE TO DISCLOSE TO**  
 13 **ANYONE THAT IT LACKED SUPPLIER DIVERSITY ON THE SIGNALING**  
 14 **LINKS IT USED TO SUPPORT 911 CALLS IN WASHINGTON?**

15 **A.** In my view this is highly inappropriate. Carriers understand the importance of having  
 16 SS7 signaling links provisioned through diverse supplier networks or on separate and  
 17 distinct networks of the same supplier, and this concern is heightened when the SS7  
 18 circuits are supporting 911 calling. Carriers uniformly understand the importance of 911  
 19 calling. Had Comtech just communicated its lack of supplier diversity to CenturyLink,  
 20 *CenturyLink could have helped Comtech rectify the issue in short order.*

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<sup>8</sup> See Exhibit SJH-12C, Comtech Response to DR-CTL-1.

<sup>9</sup> See Exhibit SJH-12C, Comtech Response to DR-CTL-2(e).

<sup>10</sup> See Exhibit SJH-12C, Comtech Response to DR-CTL-4(c).



1 **Q. WHAT IS COMTECH’S REACTION TO ITS LACK OF SUPPLIER**  
2 **DIVERSITY?**

3 **A.** This is the interesting thing; even Comtech knew that its lack of supplier diversity created  
4 significant risk. This is validated by two emails exchanged between Comtech and its  
5 signaling vendor, TNS. The first is from January 2018 [REDACTED]

6 [REDACTED]  
7 [REDACTED] The second is from September 2018, three months before the outage, and it  
8 recognizes that CenturyLink provided all four signaling links, which Comtech described  
9 as “obviously not an ideal situation.”<sup>11</sup> To compound the problem [REDACTED]

10 [REDACTED]  
11 [REDACTED]  
12 **Q. HAD COMTECH OBTAINED SUPPLIER DIVERSITY ON THE SIGNALING**  
13 **LINKS IT USED TO SUPPORT 911 CALLS IN WASHINGTON, WOULD 911**  
14 **CALLS DESTINED FOR COMTECH’S PSAPs HAVE DROPPED IN**  
15 **DECEMBER 2018 WHEN THE GREEN INFINERA NETWORK WENT DOWN?**

16 **A.** No, they would not. This is the entire purpose of supplier diversity.

17 **Q. GIVEN THIS FACT, WHAT CAUSED THE CALLS DESTINED FOR**  
18 **COMTECH’S 47 PSAPs IN DECEMBER 2018 TO DROP?**

19 **A.** This answer is simple. It was Comtech’s failure to design the signaling supporting its 911  
20 calling in Washington with supplier diversity. Addressing this one issue—an issue  
21 Comtech knew it should address—would have prevented the 911 calls destined for

<sup>11</sup> See Exhibit SJH-12C, Comtech Response to DR-CTL4(c).

1 Comtech PSAPs from dropping.

2 **Q. DOES PUBLIC COUNSEL’S WITNESS AGREE THAT A LACK OF SUPPLIER**  
3 **DIVERSITY CAUSED THE OUTAGE?**

4 **A.** Yes, although he tries to blame CLC for it. As noted earlier, Mr. Rosen admits that the  
5 dropped 911 calls were caused by a lack of supplier diversity: “I believe the failure  
6 occurred because all four links used the same optical network. In building 9-1-1 systems,  
7 I generally advise that supplier diversity be used to guard against the kind of failure that  
8 occurred here. In this case, there was no supplier diversity.”<sup>12</sup>

9 **IV. NETWORK OUTAGES**

10 **Q. TO WHAT DOES COMMISSION STAFF ATTRIBUTE COMTECH’S FAILURE**  
11 **TO COMPLETE 911 CALLS IN DECEMBER 2018?**

12 **A.** Commission Staff takes a completely different position from Public Counsel on the direct  
13 cause of the outage. Mr. Webber states that CLC experienced an outage due to a packet  
14 storm on its Red (i.e., legacy Level 3) network in February 2018, which should have led  
15 CenturyLink to close a “management channel” on its Green (i.e., legacy CLC) Infinera  
16 network—the network that experienced the outage in December 2018.

17 **Q. WHAT IS YOUR REACTION TO STAFF’S POSITION?**

18 **A.** I completely disagree. Mr. Webber’s testimony is highly superficial and, from my  
19 reading, made no attempt to understand the details of the February 2018 Red Outage or  
20 the December 2018 Green Outage. A review of the facts shows that the two outages,

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<sup>12</sup> Rosen Direct, at 20-21.

[REDACTED]

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**V. CIRCUIT ORDERING**

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**Q. IN YOUR OPINION, WAS THE OUTAGE ON THE INFINERA GREEN NETWORK THE DIRECT CAUSE OF COMTECH’S FAILED 911 CALLS IN DECEMBER 2018?**

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**A. No.** [REDACTED]

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[REDACTED]. Despite this, had Comtech designed its 911 network with supplier diversity on its SS7 links as it should have, 911 calls destined for Comtech’s 47 PSAPs would have completed.

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**Q. DOES CENTURYLINK HAVE A PROCESS TO ENSURE CIRCUIT DIVERSITY WHEN IT KNOWS THAT CIRCUITS WILL BE USED TO SUPPORT 911 CALLING?**

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**A.** Yes, if a service provider/carrier ordering circuits indicates that the circuits support 911 calling and that they would like to order circuits with some form of diversity, CenturyLink would identify diversity options based on what was ordered and what diversity options were available based on the situation. That could include ensuring geographic diversity, network diversity and commitments not to groom circuits without approval from the customer. It is the responsibility of the customer to identify the need for circuit diversity. CenturyLink’s Wholesale Product Catalog for 911 service ordering

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<sup>23</sup> Exhibit MDV-3C at ¶¶ 23-24.

1 (available to all customers online)<sup>24</sup> makes this explicit:

2 You can order diverse routing for 911/E911 circuits, if facilities are available.  
3 These trunks must be provisioned to conform to the standard CAMA signaling  
4 format. When CenturyLink facilities are available, CenturyLink will comply with  
5 diversity of facilities and systems as ordered by you. Where there is alternate  
6 routing of 911/E911 calls to a PSAP in the event of failures, CenturyLink shall  
7 make that alternate routing available to you.  
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9 **Q. HOW DO CARRIERS MAKE CENTURYLINK AWARE OF THE FACT THAT**  
10 **A CIRCUIT WILL REQUIRE DIVERSITY?**

11 **A.** CenturyLink’s online wholesale ordering tools provides at least three opportunities for  
12 the customer to indicate the need for special protection for the services and/or seek  
13 diversity. See Exhibit MDV-6, which contains the online ordering form for wholesale  
14 private line services. First, the customer is required to inform CenturyLink whether it  
15 requires Telecom Priority Status (“TSP”) for the private line services being ordered.<sup>25</sup> In  
16 discovery, Comtech acknowledged that it didn’t bother seeking TSP (for which it would  
17 have incurred a fee). “[Comtech] did not seek TSP 1 classification for the four  
18 CenturyLink DS-1 circuits in large part due to the expected redundancy and reliability  
19 that should come with utilizing four different DS-1 circuits.”<sup>26</sup> Second, the ordering form  
20 contains an entire section that seeks diversity-related information.<sup>27</sup>

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<sup>24</sup> <https://www.centurylink.com/wholesale/pcat/911.html>

<sup>25</sup> TSP service is more fully described on CenturyLink’s website at <https://www.centurylink.com/wholesale/clecs/tsp.html>

<sup>26</sup> See Exhibit MDV-7C, Comtech response to data request PC-5.

<sup>27</sup> See Exhibit MDV-6.

The screenshot shows a web form with two main sections. The top section, titled "Diversity Information", contains four input fields: "Diversity Design Date" (a date picker), "Diversity Request Description" (a text box), "Type of Diversity" (a dropdown menu with "--Select--"), and "Local Access Diversity" (a dropdown menu with "--Select--"). The bottom section, titled "Multiplexing Information", contains a single dropdown menu labeled "Multiplexing Option" with "--Select--" as the selected value.

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Finally, the online ordering portal provides a customer the opportunity to attach relevant documentation and input open-ended comments. As discussed below, Comtech did not take advantage of any of these opportunities to seek and ensure diversity for its SS7 links.

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**Q. IS THERE A COST ASSOCIATED WITH THE ADDITIONAL STEPS PERFORMED BY CENTURYLINK WHEN A CIRCUIT WILL BE USED TO SUPPORT 911 SERVICE?**

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**A.** Yes. TSP status carries non-recurring and monthly recurring fees, as specified in CenturyLink’s federal and state tariffs.<sup>28</sup> In terms of diversity, a wholesale customer will be charged non-recurring and/or monthly recurring charges, as reflected in its wholesale services agreement.

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**Q. DID COMTECH SUBMIT ORDERS FOR THE SS7 LINKS THAT WERE TO BE USED FOR 911 SERVICES IN WASHINGTON DIRECTLY TO CENTURYLINK?**

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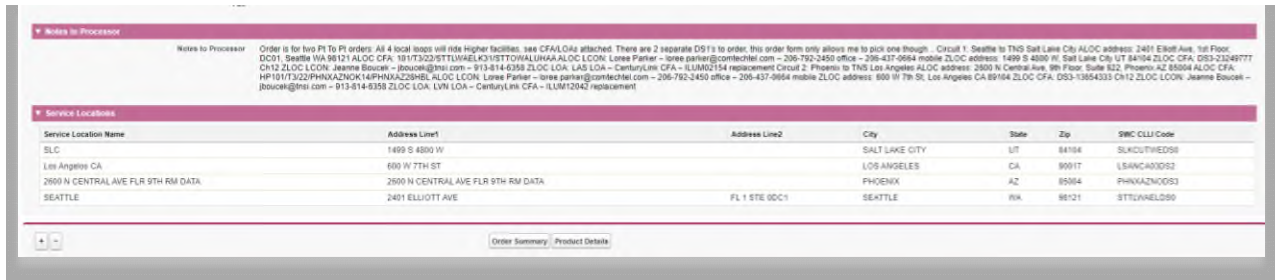
**A.** In part yes and in part no. Comtech ordered two circuits for itself, and its SS7 vendor TNS ordered two of the circuits.

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<sup>28</sup> See [https://www.centurylink.com/tariffs/fcc\\_clc\\_ixc\\_rss\\_no\\_8.pdf](https://www.centurylink.com/tariffs/fcc_clc_ixc_rss_no_8.pdf) (Schedule No. 3, Section 4, Original Page 8; Schedule No. 3, Section 6, 1st Revised Page 24).

1 **Q. DID THE CIRCUIT ORDERS THAT COMTECH SUBMITTED TO**  
 2 **CENTURYLINK IDENTIFY THE CIRCUITS AS ONES TO BE USED TO**  
 3 **SUPPORT 911 CALLING OR REQUEST DIVERSITY?**

4 **A.** No. Comtech did not avail itself of any of these opportunities to share with CenturyLink  
 5 that it required diversity. In fact, Comtech did not utilize the wholesale portal at all. Instead,  
 6 Comtech merely emailed a retail order that simply identified its need for circuits connecting certain  
 7 locations. Comtech did not identify the purpose of the circuits and did not indicate any need for  
 8 network diversity or other special treatment. See Exhibit MDV-8C. The only details provided by  
 9 Comtech are indicated in the “Note to Processor” field below:



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11 **Q. DID THE CIRCUIT ORDERS THAT TNS SUBMITTED TO CENTURYLINK**  
 12 **IDENTIFY THE CIRCUITS AS ONES TO BE USED FOR 911 CALLING?**

13 **A.** No. Comtech simply submitted a retail order for point-to-point circuits to specific  
 14 locations with no further explanation or detail.

15 **Q. WHAT DID THIS MEAN TO CENTURYLINK?**

16 **A.** Circuits on CLC’s national network are, by design, basic circuits unless the customer  
 17 completes an order form indicating otherwise. Circuits are customizable, meaning  
 18 customers can use these basic circuits for many potential uses, and customers do not have

1 to inform CLC of their intended use.

2 **Q. HAD COMTECH INFORMED CLC THAT THESE 4 CIRCUITS (TWO**  
3 **ORDERED DIRECTLY AND TWO ORDERED VIA TNS) WERE TO BE USED**  
4 **FOR 911 SS7 FUNCTIONALITY, WHAT WOULD CENTURYLINK HAVE**  
5 **DONE?**

6 **A.** Had Comtech informed CLC that these 4 circuits were to be used for 911 SS7  
7 functionality, CLC would have attempted to assist Comtech in securing supplier  
8 diversity, and would have recommended that Comtech place circuits on different  
9 CenturyLink networks.

10 **Q. HAD COMTECH TAKEN THIS BASIC STEP, WOULD THE GREEN OUTAGE**  
11 **HAVE IMPACTED 911 CALLING IN WASHINGTON?**

12 **A.** No. Despite the packet storm, had Comtech designed its network appropriately, 911 calls  
13 would have completed in December 2018.

14 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

15 **A.** It does.