BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, Complainant, v. CENTURYLINK COMMUNICATIONS, LCC, Respondent.	DOCKET UT-181051 WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION STAFF'S POST-HEARING BRIEF

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I. INTRODUCTION AND RELIEF REQUESTED

1. In December of 2018, a network utilized by CenturyLink Communications, LLC (CenturyLink) to fulfill its obligations to the Washington Military Department to provide 9-1-1 services in Washington State suffered a significant packet storm resulting in a major 9-1-1 outage across Washington. The outage lasted for 49 hours. The packet storm was preventable and CenturyLink should have prevented it, but did not. After CenturyLink knew about the outage, it did not notify any Public Safety Answering Point (PSAP); not even those that it continued to serve under its contract with the Military Department.

2. CenturyLink is responsible for this 9-1-1 outage, and its failure to maintain the networks that served the Washington 9-1-1 system resulted in several breaches of the law, including RCW 80.36.080, RCW 80.36.220, WAC 480-120-412, and WAC 480-120-450. The Commission should rule that CenturyLink violated each of these statutes and rules in connection to the December 2018 outage. As a result, the Commission should order CenturyLink to pay penalties in the amount of [redacted]

II. STATEMENT OF THE EVIDENCE

3. Between the early morning hours of December 27, 2018 until 9:01 p.m. PST on December 29, 2018 Washington State suffered an outage of 9-1-1 services.[1] During the outage, [redacted] 9-1-1 calls failed.[2] The inability for Washington callers to dial 9-1-1 and reach emergency personnel seriously impacted residents of the state, and threatened Washingtonians' public health and safety.[3] For convenience, this brief will refer to this event as "the 9-1-1 Outage."

4. At the time of the 9-1-1 Outage, Washington's 9-1-1 system was in the midst of a transition. CenturyLink had been the incumbent 9-1-1 provider in Washington for years,

[1] Jones, JHJ-1CT 5:5-5:15.
[2] Webber, JDW-1CT 52:11, 56:2.
[3] Jones, JHJ-1CT 8:5-8:15.

but in June of 2016 the Washington Military Department (WMD) contracted with a separate company, TeleCommunications Systems, Inc. ("Comtech"),[4] to gradually assume responsibility for Washington's 9-1-1 system.[5]

5. This section of Staff's brief will first discuss the background of Washington's 9-1-1 system, how the transition to Comtech was agreed to and designed, discuss the failure of the CenturyLink Green Network and its relationship to the 9-1-1 Outage, a previous outage on the CenturyLink Red Network, and finally summarize the conflicting opinion testimony.

A. Background of 9-1-1 Systems and CenturyLink's Historical Provision of 9-1-1 in Washington

6. CenturyLink entered into a contract with WMD in 2009 to develop and maintain an Internet Protocol-enabled Emergency Services Information Network infrastructure, known as "ESInet I".[6] Separately, in 2011, CenturyLink acquired indirect control of a family of Qwest-branded companies, which, starting in 2004, provided E9-1-1 services in Washington and other states.[7] As part of this acquisition, CenturyLink assumed all of Qwest's responsibilities related to 9-1-1.[8]

7. CenturyLink had numerous failures of its responsibilities related to 9-1-1 from 2009 to 2018. These included a ten-day 9-1-1 outage on San Juan Island in 2013, a six-hour statewide 9-1-1 outage in 2014, and a two-day outage affecting two Washington counties in 2016.[9] As a result, CenturyLink paid over $3,000,000 in penalties and entered into settlement agreements with the Commission admitting to violations of law related to its 9-1-1 obligations.[10]

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[4] TeleCommunications Systems, Inc. is known as "Comtech" or "TYSY." For convenience, this brief will refer to it as "Comtech."
[5] Exh. JHJ-3C at 8.
[6] Exh. JHJ-3C at 6.
[7] *Id.*
[8] *Id.*
[9] *Id.* at 6-7.
[10] *Id.*

B. The Transition of Washington's 9-1-1 System to Comtech and the Design of the Interconnection between CenturyLink's and Comtech's Networks

8. In 2016, WMD awarded the contract for Washington's 9-1-1 system to Comtech.[11] WMD contracted with Comtech to build and maintain a system known as "ESInet II."[12]

9. This necessitated that CenturyLink and Comtech work together in order to plan for and accomplish the transition.[13] A contract amendment was made to CenturyLink's contract with WMD to specify CenturyLink's responsibilities during the transition period.[14]

10. The general plan was for the transition to take place in phases, with the gradual transition of PSAPs to ESInet II.[15] While PSAPs were transitioning to ESInet II, [redacted].[16] [redacted] Accordingly, CenturyLink and Comtech had to interconnect ESInet I and ESInet II in some fashion.

11. Comtech originally proposed that the companies connect their networks with IP connections.[18] CenturyLink refused, however, and insisted that [redacted].[19] Transaction Network Services, Inc. ("TNS") was a vendor providing Signaling Transfer Points (STPs) for SS7 connectivity.[20] SS7 utilizes separate voice and signaling pathways to set up a call.[21] [redacted]

[11] Exh. JHJ-3C at 8.
[12] Exh. BR-4C at 19.
[13] Klein, CDK-1TC 5:12-6:5; Exh. JHJ-3C at 8.
[14] Exh. BR-4C.
[15] *Id.*
[16] Exh. BR-4C at 8-10; Exh. CDK-3C.
[17] *Id.*
[18] Exh. BR-17.
[19] *Id.*; Exh. BR-18C.
[20] Rosen, BR-1CT at 9:8-9:15.
[21] *E.g.*, Turner, SET-1TC 15:17-18:6.

[redacted]

12. The contract between WMD and CenturyLink also delineated each party's responsibility for calls that would traverse both ESInets.[25] The contract language referenced a "demarcation point," the point at which Comtech would be "solely responsible for routing calls" to a PSAP.[26] Paragraph 11.1.a of Amendment M to that contract read:

> Covered 911 Service Provider during PSAP Migration. The Department is transitioning the ESINet services to a successor provider via a phased cutover of PSAPs from Contractor's ESInet I to New Contractor's ESInet II ("PSAP Migration"). Prior to this cutover, Contractor shall route calls over ESInet I to the appropriate PSAPs and, as such, during this time, Contractor is a Covered 911 Service Provider as defined in 47 C.F.R. § 12.4(a)(i)(A) ("Covered 911 Service Provider") for all PSAPs in the State. Upon the Department's cut over of one or more PSAPs to ESInet II ("Migrated PSAPs"), the Department's successor provider shall be a Covered 911 Service Provider for such Migrated PSAPs and shall be solely responsible for routing calls from the Demarcation Point between ESINet I and ESINet II to such Migrated PSAPs. During the PSAP Migration, Contractor remains responsible for routing calls intended for Migrated PSAPs to the Demarcation Point at ESInet II, at which point the successor provider assumes responsibility for delivering such calls to Migrated PSAPs and is therefore the Covered 911 Service Provider.[27]

13. The 9-1-1 Outage occurred before all of the PSAPs transitioned to Comtech.[28] At the time of the 9-1-1 Outage, 47 PSAPs had transitioned to Comtech, and 15 PSAPs were still on CenturyLink's ESInet I.[29] During this time, CenturyLink continued to have

[22] Exh. BR-4C at 29, 34.
[23] Turner, SET-1TC at 17:4-18:6.
[24] Turner, SET-1TC at 24:1-24:4.
[25] Exh. BR-4C at 19.
[26] *Id.*
[27] *Id.*
[28] Exh. JHJ-3C at 9.
[29] *Id.*

responsibilities under the contract with WMD to provide 9-1-1 services including "network" and "transport" services.[30]

14. The interconnection between ESInet I and ESInet II was complicated, and several simplified diagrams were produced to help memorialize and understand it (both for litigation purposes and not). The contract between CenturyLink and WMD diagramed the interconnection this way:

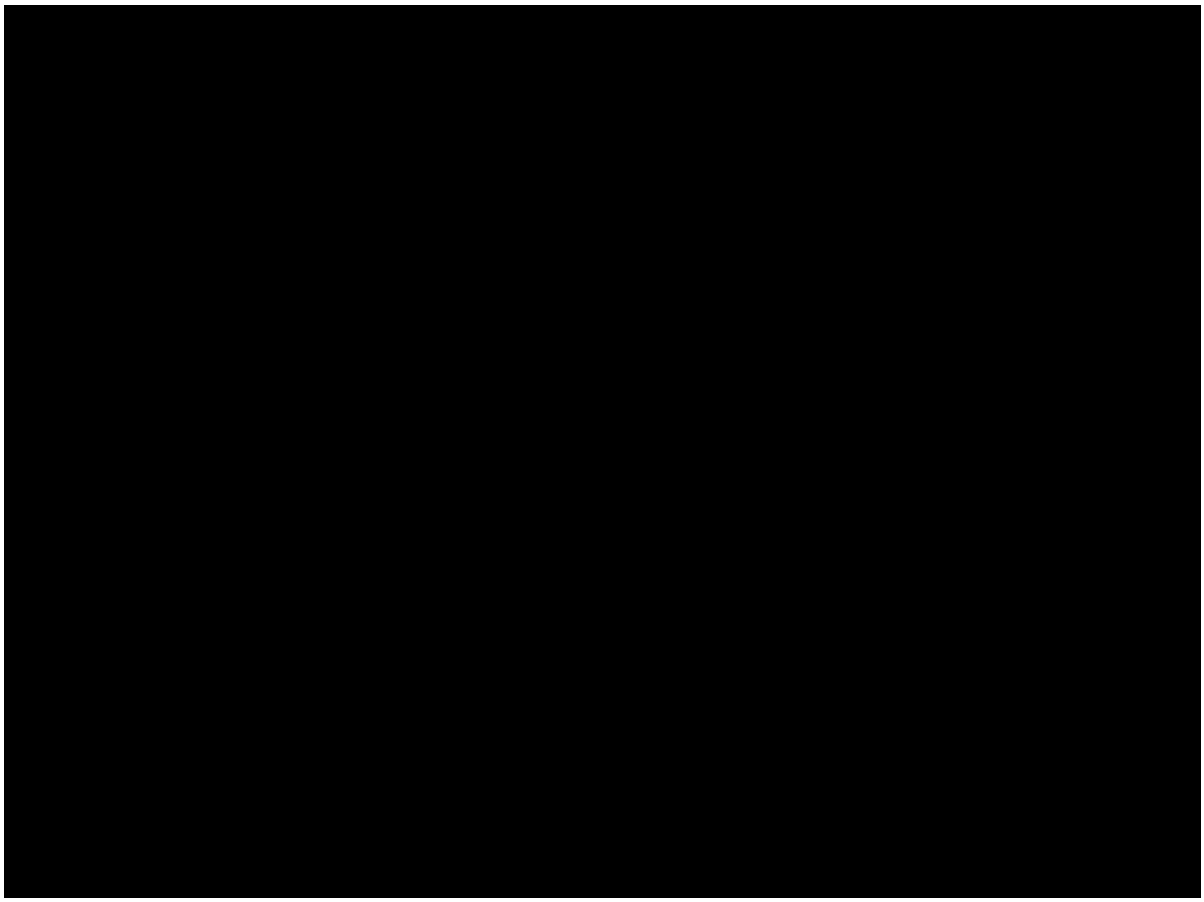

Figure 1[31]

[30] Exh. BR-4C at 15 ("This solution must include, but is not limited to, network, transport, PSAP interfaces, 911 trunk support, selective routing and ALI interfaces.").
[31] Exh. BR-4C at 29.

15. CenturyLink created its own diagram for the purposes of this matter, and represented the interconnection as set out in Figure 2. CenturyLink's diagram includes specification of where CenturyLink believes a demarcation point between ESInet I and ESInet II is located. It also distinguishes between itself and the vendor that CenturyLink contracted with to provide these services. The corporation "Intrado (formerly known as West) served as CenturyLink's underlying 9-1-1 provider—both for signaling and voice communications—for Washington 9-1-1 services."[32]

Figure 2[33]

[32] Klein, CDK-1TC at 7:10-7:11.
[33] Exh. CDK-3C.

16. Comtech created a slightly different diagram that nonetheless agreed with CenturyLink on most of the basic points, with a different location of the demarcation point:

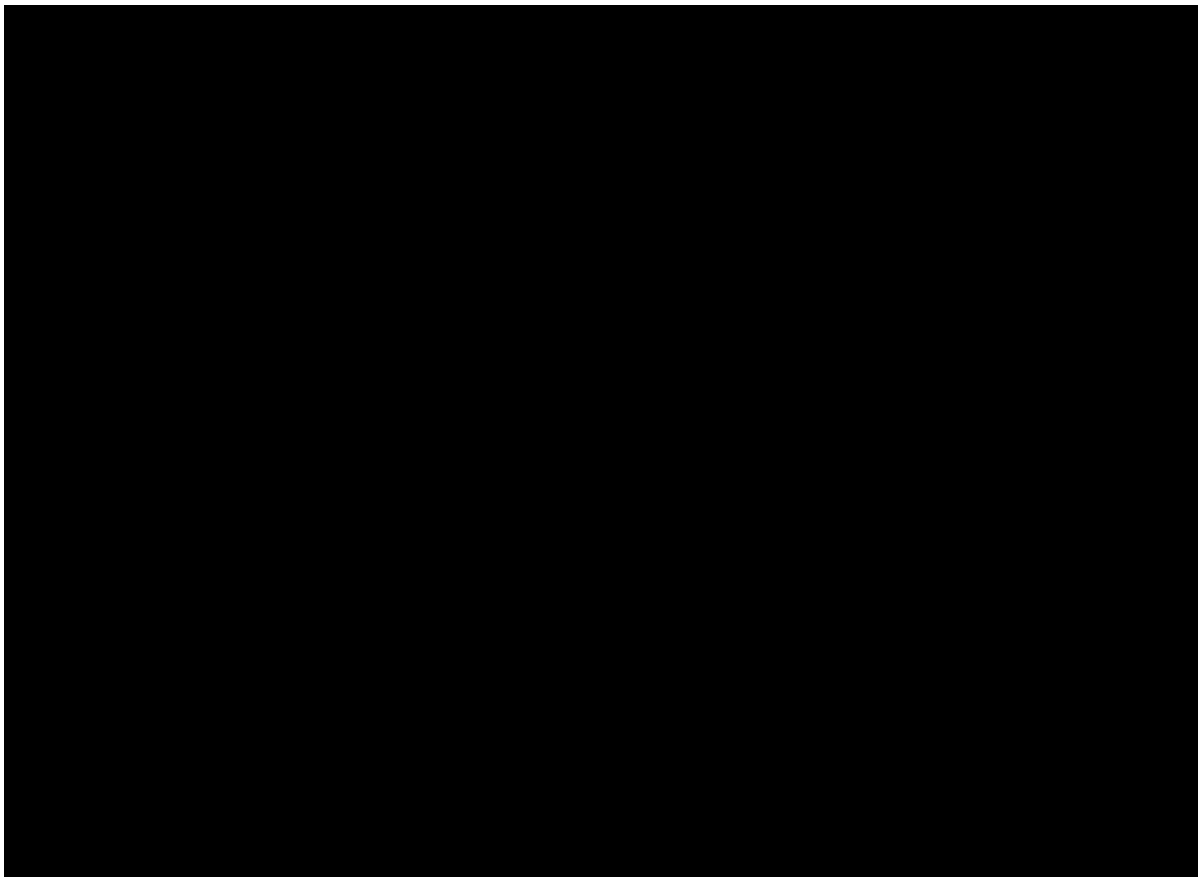

Figure 3[34]

17. These diagrams depict a call flow process that uses a signaling system to set up a voice call between ESInet I and ESInet II. The steps were generally as follows:

[34] Exh. BR-32C.

[redacted]

18. While CenturyLink only identified one demarcation point on the diagram it created for purposes of this matter, [redacted].[43] [redacted]

[35] Turner, TR. 377:11-380:18; Klein TR. 422:2-424:10.
[36] *Id.*
[37] *Id.*
[38] *Id.*
[39] *Id.*
[40] *Id.*
[41] *Id.*
[42] *Id.*
[43] Turner, TR. 382:9-386:18; Klein, TR. 424:12-428:8.
[44] *Id.*

[redacted]

19. Comtech, however, did not change its position that there was only one demarcation point, and it only took responsibility for a call when it arrived at [redacted].[48] As discussed below, one of the expert witnesses who testified, Brian Rosen, opined that there was no demarcation point because no demarcation point had been explicitly agreed to.[49]

C. The CenturyLink "Green Network" Was Used to Connect the Comtech RCL to the TNS Signaling Network and the Green Network Failed Causing the 9-1-1 Outage

20. CenturyLink and Comtech were each responsible for provisioning links between the TNS signaling network and their respective RCLs.[50] In December of 2018, Comtech had [redacted] such links, each of which was ordered from CenturyLink and traversed a CenturyLink interstate transport network called the "Green Network."[51] [redacted].[52]

21. The Green Network used equipment supplied by CenturyLink's vendor, Infinera.[53] This equipment was organized into "nodes," "line modules," and "switching

[45] *Id.*
[46] *Id.*
[47] *Id.*
[48] Exh. BR-32C.
[49] Rosen, BR-30CT at 20:12-21:2.
[50] Exh. BR-4C at 34; Exh. BR-15C.
[51] Webber, JDW-1CT at 38:15-38:18.
[52] Exh. JDW-22C at 2.
[53] Exh. JDW-4 at 5-6.

modules."[54] These parts worked together to direct network traffic along the correct network path and ultimately to its correct destination.[55]

22. The Infinera nodes used by the Green Network had a proprietary communications channel "designed to allow for very fast, automatic rerouting of traffic to avoid a loss of traffic during a failure in the network."[56] These channels, called the Infinera General Communications Channels (IGCCs), enabled "line modules to send packets directly to other connected nodes without receiving network management instructions about how to route traffic."[57] [redacted][58] so that a locked channel had no ability to transmit any packets.[59] [redacted].[61]

23. In December of 2018, the Green Network's IGCC channels were unlocked and also not configured, meaning CenturyLink did not use them for anything but also did not completely disable them, so that they still could transmit packets.[62] Instead of disabling those IGCCs, CenturyLink had a filter in place that prevented packets of 64 bytes or fewer from

[54] *Id.*
[55] *Id.*
[56] Exh. JDW-4 at 6.
[57] *Id.*; Webber, JDW-1CT at 20:3-20:11.
[58] McNealy, TR. 462:21-465:9; JDW-1CT at 21:3-21:4.
[59] McNealy, TR. 463:6-463:10.
[60] McNealy, TR. 463:19-463:25 [redacted]
[61] McNealy, TR. 464:1:-464:12.
[62] Exh. JDW-4 at 6 ("CenturyLink was aware of the channel but neither configured nor used it.").

using the channel.[63] [redacted] And unfortunately that is what ended up occurring, with devastating consequences for the Green Network and Washington's 9-1-1 system.

24. Sometime early in the morning on December 27, 2018, four packets were spontaneously generated in a switching module on CenturyLink's Green Network that had a combination of features permitting them to pass through the filter and travel along the IGCCs.[67] The packets' headers contained instructions directing the packets to be replicated and broadcast to all connected devices, with no packet expiration time, and the packets were larger than 64 bytes in size.[68] This meant that they traveled to all connected network devices via the IGCCs, and, once at their new location, traveled to all connected network devices again (including the one they were just transmitted from).[69] This process created exponentially multiplying network traffic, a phenomenon known as a "packet storm," that quickly overwhelmed the network's capacity.[70] "[T]he result was multiple outages across CenturyLink's network."[71]

[63] Exh. JDW-4 at 6.
[64] McNealy, TR. 463:11-17.
[65] McNealy, TJM-1TC at 5:6-5:9.
[66] McNealy, TR. 469:11-18.
[67] Exh. JDW-4 at 6.
[68] Exh. JDW-4 at 7; JDW-1CT at 22:2-22:9.
[69] Webber, JDW-1CT at 22:12-23:9.
[70] *Id.*
[71] Exh. JDW-4 at 8.

25. And because the packet storm also prevented CenturyLink's network administrators from gaining access to those overloaded nodes on a remote basis so that they could diagnose and take steps to rectify the problem, the outages were prolonged considerably.[72] CenturyLink was able to painstakingly disable IGCC channels "[redacted]."[73] This gradually allowed CenturyLink to regain control of the Green Network and restore normal network function.[74] The Green Network was stabilized at 12:01 p.m. on December 29, 2018.[75]

26. This meant that between about midnight on December 27 and noon on December 29, 2018, the Comtech RCL had only intermittent connection to the TNS signaling network connecting ESInet I and ESInet II.[76] During this period, [redacted] 9-1-1 calls destined to Comtech PSAPs failed.[77] This was about [redacted] of all 9-1-1 calls to Comtech PSAPs during this time.[78] The 9-1-1 Outage was most severe from about [redacted], with certain time periods experiencing nearly [redacted] call failures.[79] These failures represented times when each of the [redacted] links connecting the Comtech RCL to the TNS signaling network were impacted by the Green Network packet storm.[80]

[72] Webber, JDW-1CT at 23:6-9 (citing Exh. JDW-4 at 8).
[73] McNealy, TR. 483:25-484:3.
[74] Webber, JDW-1CT at 23:14-23:16.
[75] Exh. JDW-4 at 8.
[76] Webber, JDW-1CT at 37:13-37:15, 43:14-43:27.
[77] Webber, JDW-1CT at 44 Table 1.
[78] *Id.*
[79] Webber, JDW-1CT at 53 Table 2.
[80] Webber, JDW-33CT at 8:18-9:4; Exh. JDW-19C at 2.

D. A Disproportionate Number of 9-1-1 Calls Destined to CenturyLink PSAPs Failed During the Green Network Outage Too, but the Reason is Unknown

27. CenturyLink witnesses consistently testified that its ESInet I was not impacted by the Green Network packet storm because its signaling links used network diversity, and were not wholly reliant on the Green Network.[81]

28. Analysis of 9-1-1 call failures, however, show a disproportionate number of 9-1-1 call failures to CenturyLink PSAPs.[82] During precisely the time that the most call failures occurred for calls to Comtech PSAPs, the percentage of 9-1-1 call failures to CenturyLink PSAPs jumped from a baseline level of about two percent to between five and fourteen percent.[83] A total of [redacted] calls to CenturyLink PSAPs failed during the Green Network packet storm.[84] CenturyLink claims that the bulk of these failures represent calls where the caller hung up.[85] But CenturyLink cannot explain why a greater percentage of calls failed exactly when the Green Network packet storm was at its worst, instead testifying that the number of call failures was higher because the number of 9-1-1 calls was higher too.[86] Of course, if the number of total calls were higher, and that drove the number of failed calls higher, that would not affect the *percentage* of failed calls unless an unusually large number of the additional calls failed.

29. Further, the failed 9-1-1 calls to CenturyLink PSAPs were concentrated on only two PSAPs in King County.[87] Ultimately, however, why [redacted] 9-1-1 calls destined to CenturyLink PSAPs failed during the Green Network outage is unknown.[88]

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[81] *See*, *e.g.*, Valence, MDV-1TC at 5:20-7:1.
[82] Webber, JDW-1CT at 55 Table 3.
[83] Webber, JDW-1CT at 53 Table 2, 55 Table 3.
[84] *Id.*
[85] Klein, CDK-1TC at 11:12-11:15.
[86] Klein, TR. 435:25-436:7.
[87] Webber, JDW-1CT at 59:12-59:13.
[88] Webber, JDW-1CT at 59:11-59:18; Webber, TR. 199:21-199:23 ("[W]hen I look at the data, it appears to me that there may have been more going on. But we did not prove that all of those were.").

E. CenturyLink Did Not Notify Any PSAP in Washington State of the Green Network Outage, Nor Did It Notify Comtech

30. CenturyLink did not inform any of the PSAPs in Washington of the packet storm on the Green Network.[89] And, Comtech first reached out to CenturyLink to inform it of the difficulties that Comtech was experiencing receiving calls from ESInet I.[90]

F. The Red Network Outage

Months before the 9-1-1 Outage, in [redacted], another of CenturyLink's networks using Infinera equipment, the "Red Network," experienced a packet storm caused by unexpected traffic entering the IGCCs. [redacted]

[89] Jones, JHJ-1CT at 7:3-7:6.
[90] JHJ-3C at 21; Rosen, BR-1CT at 12:4-12:8.
[91] Webber, JDW-1TC at 25:3-25:5.
[92] Webber, JDW-1TC at 25:5-25:6.
[93] McNealy, TJM-1TC at 6:2-6:7.
[94] Webber, JDW-5C at 1-12.
[95] Webber, JDW-5C at 3.
[96] Webber, JDW-5C at 5 and 8.
[97] McNealy, TJM-1TC at 6:17-6:22, 7:1-7:10.

[redacted][98]

32. [redacted]

33. [redacted]

[98] Webber, JDW-1TC at 25:9-25:17 (citing JDW-5C).
[99] McNealy, TR. 471:22-472:4.
[100] McNealy, TR. 479:7-480:19.
[101] McNealy, TR. 480:21-480:23.
[102] McNealy, TR. 481:1-482:9.
[103] *Id.*
[104] McNealy, TR. 481:1-482:9, 487:22-487:
[105] McNealy, TR. 483:1-483:8.

[redacted]

34. [redacted]

G. Opinions and Analyses About the Causes of and Responsibility for the 9-1-1 Outage

35. Staff, Public Counsel, and CenturyLink each provided expert witness testimony about what CenturyLink should or should not have done and what entity or entities ultimately bear responsibility for the 9-1-1 Outage. Additionally, the Federal Communications Commission (FCC) wrote a detailed report about the Green Network outage and what caused it. This section summarizes those opinions and analyses.

1. Staff Witnesses Opined that CenturyLink Bore Primary Responsibility for the Outage

33. Staff admitted expert opinion testimony from James Webber and Robert Akl.[109] Witness Webber, a long-time telecommunications industry professional,[110] testified generally that CenturyLink should have locked the IGCCs on the Green Network, especially after the packet-storm on the Red Network, and that CenturyLink's failure to do so was the primary and avoidable cause of the 9-1-1 Outage.[111] Witness Webber's opinion was that, essentially, because the IGCCs were not used they should have been disabled and that if they had been disabled, the Green Network outage could not have occurred, which would have prevented the Comtech RCL from losing connection to the TNS signaling network.[112] This

[106] McNealy, TR. 486:22-486:25.
[107] McNealy, TR 491:5-491:7 ("Ultimately, the decision comes down to, you know, the network operators with the vendors suggesting what course of action to take.").
[108] McNealy, TR 476:8-477:4.
[109] *See generally* Webber, JDW-1CT; Webber, JDW-33CT; Akl, RA-1CT.
[110] Exh. JDW-2.
[111] Webber, JDW-1CT at 6:19-8:4.
[112] *See*, *e.g.*, Webber, JDW-1CT at 21:9-21:11.

was especially true, in Witness Webber's opinion, because the Red Network event just a few months prior had shown the danger of leaving the IGCCs unlocked and unconfigured.[113]

34. Witness Webber's opinion was that Comtech satisfied all legal requirements and industry guidelines in ordering its links to the TNS signaling network through CenturyLink. Witness Webber noted that the evidence showed that Comtech's links to the TNS signaling network were physically and geographically diverse.[114] In particular, Comtech responded to a data request by stating Comtech [redacted] Witness Webber commented that the links did not share a single point of failure, in part based on Comtech's representations and in part based on his own analysis of call failures to Comtech PSAPs.[116] Because call failures occurred intermittently, it was Witness Webber's opinion that it is unlikely that the [redacted] circuits connecting the Comtech RCL to the TNS signaling network shared a single physical point of failure.[117]

35. Further, Witness Webber opined that CenturyLink should have, and likely did, know that that the links Comtech used to connect its RCL to the TNS signaling network were used for the purpose of connecting its ESInet II to CenturyLink's ESInet I, or, at the very least, for the purposes of 9-1-1 services generally.[118] First, CenturyLink participated in testing of these circuits when they were initially provisioned to ensure that they functioned in connecting ESInet I to ESInet II.[119] Second, for at least [redacted] of the links connecting the Comtech RCL to

[113] *E.g.*, Webber, JDW-1CT.
[114] Webber, JDW-33CT at 7:21-9:16.
[115] Webber, JDW-33CT 7:9-7:12; Exh. JDW-22C at 2.
[116] Webber, JDW-33CT at 8:18-10:13.
[117] Webber, JDW-33CT at 10:2-10:13.
[118] Webber, JDW-1CT at 42:10-43:10;
[119] Webber, JDW-1CT at 41:15-42:6; Exh. JDW-22C at 2.

the TNS signaling network, CenturyLink was aware that they connected Comtech to TNS.[120] According to Witness Webber, this should have made CenturyLink aware of the purpose of the links because Comtech was a known 9-1-1 provider in Washington and TNS was the vendor (that CenturyLink itself had suggested) to connect ESInet I and ESInet II.[121] Finally, even if CenturyLink was not aware that the links were used specifically to connect ESInet I and ESInet II, because "the vast majority of [Comtech] circuits are used for 9-1-1 services" CenturyLink should have known that the links were for 9-1-1 services generally.[122]

36. Witness Akl is a tenured professor at the University of North Texas with expertise in communications technology and networking hardware.[123] He opined that the primary and avoidable cause of the Green Network packet storm was the failure to lock the IGCCs and CenturyLink's decision to keep them unlocked and unconfigured.[124] He also responded to certain CenturyLink witnesses who testified generally that the packet storm on the Red Network was substantively different than that on the Green Network, and therefore it was appropriate for CenturyLink to keep the IGCCs unlocked and unconfigured after the packet storm on Red.[125] Witness Akl opined, in part, "[I]n both networks' failures, their vulnerability to a packet storm was directly caused by the fact that CenturyLink left the IGCCs on those networks enabled (i.e., open to transmit packets), even though it was <u>not using them</u>."[126] At hearing, Witness Akl testified that it has been best practice in the telecommunications industry to disable unused communications channels "as far back as the late '90s" when he was an undergraduate student.[127]

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[120] Exh. JDW-40C.
[121] Webber, JDW-33CT at 40:14-41:7; Webber, TR. 205:4-206:16.
[122] Webber, JDW-1CT at 42:26-43:1.
[123] Exh. RA-2.
[124] *See generally* Akl, RA-1CT.
[125] Akl, RA-1CT at 6:13-7:2.
[126] Akl, RA-1CT at 7:7-7:10.
[127] Akl, TR. 253:18-253:22.

2. Public Counsel's expert witness Brian Rosen testified that CenturyLink was at fault for the 9-1-1 Outage

37. Brian Rosen is an expert in Next Generation 9-1-1 systems, and has authored standards governing such systems.[128] He testified that CenturyLink's insistence to connect ESInet I and ESInet II via SS7 and TNS instead of through IP technology directly contributed to the 9-1-1 Outage.[129] He also testified that CenturyLink should have been aware that its circuits connecting Comtech to TNS were being used to connect the CenturyLink ESInet I with Comtech's ESInet II, and that CenturyLink had responsibility for the connection to Comtech using SS7 technology and TNS because CenturyLink was the primary driver of that network design decision.[130]

38. Witness Rosen also disagreed with CenturyLink's opinion regarding the demarcation point.[131] Pointing out that the contract did not define any specific demarcation point and that WMD believed the demarcation point to be at the Comtech RCL, Witness Rosen opined that "CenturyLink was not yet relieved of its obligation as a Covered Service Provider at the point where the problem occurred."[132] In his response testimony, Witness Rosen elaborated on this point. In Witness Rosen's opinion, a point of demarcation must be an agreed point between providers and in this case there was no agreement.[133] So, while WMD's and Comtech's opinion that the point of demarcation was the Comtech RCL was, in Witness Rosen's opinion, reasonable, it nonetheless was not the point of demarcation.[134] As a result, CenturyLink still retained responsibility for the call at the point where the failure

[128] Exh. BR-2.
[129] Rosen, BR-1CT at 21:13-22:13.
[130] Rosen, BR-1CT at 26:3-27:7.
[131] Rosen, BR-1CT at 29:3-30:3.
[132] *Id.*
[133] Rosen, BR-30CT at 20:14-20:18.
[134] *Id.*

occurred, namely on the CenturyLink Green Network which was being used to connect the Comtech RCL with the TNS signaling network.[135]

39. Witness Rosen went on to opine regarding the reasonability of CenturyLink's opinion about the demarcation point, that it was at the Comtech STP within the TNS signaling network.[136] In his opinion, such a demarcation point was not tenable because it was beyond where either CenturyLink or Comtech connected to the TNS signaling network.[137] "[A] point in the middle of TNS's network would not have been observable or manageable by either CenturyLink or Comtech."[138]

40. The point identified by WMD and Comtech, meanwhile, was at least tenable (even though not agreed to), in Witness Rosen's opinion.[139] "Since CenturyLink provided the links and it was a CenturyLink network that failed, it lends credence to the argument that the point of demarcation was on the Comtech side of the TNS-to-Comtech links."[140]

41. Witness Rosen also testified that the root cause of the failure on the Green Network was a combination of a lack of software diversity (i.e., each piece of Infinera equipment was using the same software), as well as the failure to lock the IGCCs.[141] In Witness Rosen's opinion after "[t]he Red network failure showed that it was possible for the entire optical network to fail when the management channel, which was not being used, became clogged with packets and exhausted resources in the switch to the point where revenue traffic was impeded" CenturyLink should have insisted that Infinera disable the management channel entirely on all of the Infinera-based networks it was using, including the

[135] Rosen, BR-30CT at 20:18-21:2.
[136] Rosen, BR-30CT at 21:5-21:14.
[137] *Id.*
[138] *Id.*
[139] Rosen, BR-30CT at 21:17-22:8.
[140] *Id.*
[141] Rosen, BR-30CT at 13:13-14:16, 15:20-17:8.

Green Network.[142] Witness Rosen testified, "The management channel should have been disabled in such a way that it could not send packets, and reception of packets could not tie up the switches' resources."[143]

3. CenturyLink's expert witness placed responsibility for the Outage on Comtech

42. Steven Turner is a long-time telecommunications industry professional.[144] He testified primarily to four main points: 1) the point of demarcation was at the Comtech STP within the TNS signaling network, the failure happened past that point, and therefore Comtech was responsible for the failure; 2) SS7 was an appropriate signaling technology to use to connect ESInet I and ESInet II; 3) the Red Network packet storm was different from the Green Network packet storm and was not a reason to lock the IGCCs on the Green Network; and 4) Comtech failed to provision appropriate network diversity in its signaling links between the Comtech RCL and the Comtech STP and this failure fell below industry best practice.[145]

4. The FCC investigated the outage on the Green Network and concluded CenturyLink's decision to keep the IGCCs unlocked and unconfigured contributed to the failure

43. The FCC released a report detailing the chronology and causes of the Green Network outage.[146] The FCC concluded that "[t]his outage was caused by an equipment failure catastrophically exacerbated by a network configuration error."[147] The "network configuration error" referenced was the decision by CenturyLink to keep the IGCCs unlocked and unconfigured.[148] The FCC concluded that "[t]here are several best practices that could

[142] Rosen, BR-30CT at 15:20-17:18.
[143] Rosen, BR-30CT at 17:16-17:18.
[144] Exh. SET-2.
[145] *See generally* Turner, SET-1TC.
[146] *See generally* Exh. JDW-4.
[147] Exh. JDW-4 at 3.
[148] Exh. JDW-4 at 7 ("As a result, the packets were transmitted along the enabled and unconfigured proprietary management channel.").

have prevented the outage, or at least mitigated its effects" and among these was locking the IGCCs.[149] The FCC concluded, in part:

> System features that are not in use should be turned off or disabled. In this case, the proprietary management channel was enabled by default so that it could be used if needed. While CenturyLink did not intend to use the feature, CenturyLink left it unconfigured and enabled. Leaving the channel enabled created vulnerability in the network that, in this case, contributed to the outage by allowing malformed packets to be continually rebroadcast across the network.[150]

III. LEGAL STANDARD

44. This matter was initiated by a complaint filed by Commission Staff.[151] Accordingly, Staff has the burden of proof and persuasion on each of its causes of action. *See Wash. Util. & Transp. Comm'n v. Puget Sound Power & Light Co.*, Cause No. U-84-27, 1984 WL 1022556 (Wash. U.T.C. Sep. 28, 1984) ("[T]here can be no doubt that the burden of proof in a case of this kind rests upon the complainant.").

IV. ARGUMENT

45. Commission Staff made four allegations against CenturyLink, each of which has been proved. The Commission has jurisdiction to penalize CenturyLink for its failures in administering the Green Network because Century Link used the Green Network to fulfill its obligations to WMD to provide 9-1-1 services to Washington State, a purely intrastate service. The Commission should find that CenturyLink violated RCW 80.36.080, RCW 80.36.220, WAC 480-120-412, WAC 480-120-450 and assess penalties against CenturyLink for these violations of [redacted].

[149] Exh. JDW-4 at 15.
[150] Exh. JDW-4 at 15.
[151] Complaint, December 22, 2020.

A. CenturyLink's Failure to Lock the IGCCs on the Green Network is Subject to the Commission's Jurisdiction

46. Because CenturyLink utilized its Green Network to provide 9-1-1 services in Washington State, it is subject to the Commission's jurisdiction for its failure to administer the Green Network according to Washington law.

47. CenturyLink has incorrectly suggested that the services it provided via the Green Network were interstate services and not subject to the Commission's jurisdiction.[152] Such an argument is wrong because CenturyLink entered into a contract with the WMD to provide 9-1-1 services in Washington State and used the Green Network to fulfill its obligations under that contract. As such, it is subject to regulation by Washington State for these intrastate services.

48. The FCC has exclusive jurisdiction over interstate communications services and federal law preempts state law regarding such services. 47 U.S.C. § 152(a); *see also In re Vonage Holdings Corporation Petition for Declaratory Ruling Concerning an Order of the Minnesota Public Utilities Commission*, WC Docket No. 03-211, Memorandum Opinion and Order, 19 FCC Rcd 22404, 22412, ¶ 16 (2004). But state regulatory bodies retain jurisdiction over intrastate services, which are determined using an end-to-end analysis of the service at issue. *Vonage*, 19 FCC Rcd at 22413 ¶ 17. "Using an end-to-end approach, when the end points of a carrier's service are within the boundaries of a single state the service is deemed a purely intrastate service, subject to state jurisdiction for determining appropriate regulations to govern such service." *Id.*

49. In this case, the service at issue is CenturyLink's agreement to provide *9-1-1 services* in Washington State.[153] CenturyLink agreed to 1) route 9-1-1 calls to the demarcation

[152] Hartman, SJH-1TC at 18:11-18:20 ("I do not believe the Commission has jurisdiction over those services or that specific network.").
[153] *See* Exh. BR-4C.

point between ESInet I and ESInet II; and 2) provide network and transport service to support Washington's 9-1-1 system. CenturyLink employed its Green Network to fulfill these purely intrastate obligations and its failures, which lead to the packet storm on the Green Network and the 9-1-1 Outage are subject to Commission jurisdiction.

1. The demarcation point, to the extent there was one, was located at the Comtech RCL making CenturyLink responsible for any failure occurring in between the Intrado RCL and the Comtech RCL

50. The contractual language specifying that Comtech "shall be solely responsible for routing calls from the Demarcation Point between ESInet I and ESInet II"[154] is not compatible with CenturyLink's opinion that three demarcation points existed. To the extent there even was a demarcation point in the absence of an explicit agreement between CenturyLink and Comtech, only Comtech and WMD's placement of it at the Comtech RCL is compatible with the contractual language.

51. Contracts are interpreted according to their language to effect the intent of their drafters. *Hearst Communications, Inc. v. Seattle Times Co.*, 154 Wn. 2d 493, 503-04 (2005). Courts "attempt to determine the parties' intent by focusing on the objective manifestations of the agreement, rather than on the unexpressed subjective intent of the parties." *Id.* at 503. Courts "do not interpret what was intended to be written but what was written." *Id.* at 504. "Courts will not revise a clear and unambiguous agreement or contract for parties or impose obligations that the parties did not assume for themselves." *Condon v. Condon*, 177 Wn. 2d 150, 163 (2013).

52. Here, the language of the WMD contract with CenturyLink anticipates only one demarcation point. It states that Comtech, the "successor provider" "shall be solely responsible for routing calls from **the Demarcation Point** between ESInet I and ESInet II" to

[154] *Id.* at 19.

the PSAPs migrated to ESInet II.[155] Comtech and WMD each represented their positions that there was one and only one demarcation point at the Comtech RCL.[156] But CenturyLink, in an effort to avoid responsibility for the 9-1-1 Outage caused by the failure of the Green Network, opined instead that demarcation points existed 1) at the Comtech STP on the TNS signaling network; 2) at the Intrado STP on the TNS network; and 3) between the Intrado RCL and the Comtech RCL for the voice part of the call.[157] This is straightforwardly inconsistent with the contractual language which uses "the Demarcation Point" in the singular.

53. CenturyLink's position regarding the demarcation point also renders incoherent the contractual language about Comtech's responsibility. Once the demarcation point between ESInet I and ESInet II is passed, Comtech became "solely responsible" for routing the call to the PSAP.[158] If the demarcation point is at the Comtech RCL, like Comtech and WMD think, this makes some sense because once the signaling pathway is complete, and a voice call is delivered to the Comtech RCL, CenturyLink does not have to do anything in order to get a call to a PSAP served by Comtech.[159] But in CenturyLink's version of the demarcation point, Comtech becomes "solely responsible" for routing a call to a PSAP at the Comtech STP, then stops being "solely responsible" at the Intrado STP, then starts being "solely responsible" again when the third demarcation point for the voice part of the call has passed. That is simply not what "solely responsible" means.

54. The context of the contract further suggests that the parties intended that the Comtech RCL be the demarcation point. The contract read in part "During the PSAP Migration, [CenturyLink] remains responsible . . . for routing calls intended for Migrated

[155] Exh. BR-4C at 19 (emphasis added).
[156] Exh. BR-32C; Exh. BR-28.
[157] Turner, TR. 382:9-386:18; Klein, TR. 424:12-428:8.
[158] Exh. BR-4C at 19.
[159] [redacted]. Klein, TR 430:10-430:14.

PSAPs to the Demarcation Point **at ESInet II**."[160] And in the [redacted].[161] In other words, the signaling network was not a part of either CenturyLink's ESInet I or Comtech's ESInet II as those terms were used in the contract. So, when the contract gives CenturyLink a responsibility to route calls "to the Demarcation Point at ESInet II", it means at the Comtech RCL, the first point outside of the TNS signaling network.

55. Finally, the history of the parties' negotiations also supports a finding that the demarcation point was intended to be at the Comtech RCL. Comtech originally proposed that ESInet I and ESInet II be connected via IP.[162] But CenturyLink refused, and suggested that the parties employ TNS as a common vendor for SS7 connectivity.[163] Because it was CenturyLink's proposal to utilize SS7 and TNS as a common vendor, it would make sense for CenturyLink to be responsible for the SS7 signaling pathway and the TNS signaling network.[164]

56. To the extent there was a demarcation point, it was at the Comtech RCL, not the Comtech STP on the TNS signaling network.[165] This means that CenturyLink agreed to provide the intrastate service of routing 9-1-1 calls to the Comtech RCL. That it used an interstate national transport network to do so is irrelevant for purposes of the Commission's jurisdiction. *See In the Matter of Connect America Fund et al.*, 26 FCC Rcd. 17663, 17893 n. 1206 (November 18, 2011) ("[A] call's jurisdiction is typically not determined until after the

[160] Exh. BR-4C at 19 (emphasis added).
[161] *Supra* Figure 1; Exh. BR-4C at 29.
[162] Exh. BR-17.
[163] Exh. BR-18C.
[164] *See* Rosen, 30CT at 21:5-21:7 ("Based upon my professional experience and review of the evidence, it appears to me that CenturyLink defined how the interconnect would work and instructed Comtech to use TNS as the SS7 signaling network.").
[165] In the alternative, if there was no demarcation point then CenturyLink remained responsible for the 911 call even past the Comtech RCL and the Commission would also have jurisdiction over CenturyLink's provision of intrastate 911 services.

call signaling process occurs."). Because CenturyLink failed to provide the intrastate service it promised to WMD in accordance with Washington's laws and rules, this Commission may and should penalize it.

2. CenturyLink retained duties to WMD to provide "network" and "transport" services for the purposes of Washington's 9-1-1 system which CenturyLink used the Green Network to fulfill

57. In addition to the specific contractual agreement CenturyLink made to route 9-1-1 calls to the Comtech RCL, it also agreed to generally provide "network" and "transport" services to support Washington's 9-1-1 system.[166] These are also intrastate services under the FCC's end-to-end analysis for jurisdictional purposes because a 9-1-1 call in Washington goes to a PSAP in Washington. *See Vonage*, 19 FCC Rcd at 22413 ¶ 17.

58. In this case, CenturyLink used its Green Network to connect the Comtech RCL to the Comtech STP on the TNS signaling network.[167] CenturyLink had reason to know that its Green Network was being used for this purpose because it participated directly in the testing of these circuits for SS7 connectivity between ESInet I and ESInet II after they were provisioned.[168] Further, CenturyLink knew that the circuits were being used to connect TNS to Comtech.[169] TNS, of course, was the vendor that CenturyLink itself suggested to connect ESInet I and ESInet II.[170] And Comtech, obviously, was the provider of ESInet II that CenturyLink was working with to transition Washington's 9-1-1 system.[171]

59. CenturyLink attempts to paint itself as a more or less uninterested third-party with respect to how the Comtech RCL got connected to the TNS network.[172] In its version of events, the Green Network is wholly divorced from CenturyLink's obligations to the WMD

[166] Exh. BR-4C at 15.
[167] *E.g.*, Webber, JDW-1CT at 34:4-34:8.
[168] Webber, JDW-1CT at 41:15-42:6.
[169] Webber, JDW-30CT at 40:14-41:7.
[170] Exh. BR-17; Exh. BR-18C.
[171] *E.g.*, BR-4C.
[172] *See*, *e.g.*, Turner, SET-1TC at 32:7-37:4; *see also* Hartman, SJH-1TC at 32:13-33:2.

to provide 9-1-1 services in the state of Washington, and Staff's complaint in this matter is a gross overreach.[173] But CenturyLink can only make this point by ignoring its obligations under its contract with WMD. Far from being an uninterested party, CenturyLink retained obligations to provide network and transport services to support Washington's 9-1-1 system. Its Green Network was used to fulfill these services, and CenturyLink had reason to know (if not actual knowledge) that its network was being used for this purpose. CenturyLink's failure to maintain the Green Network in accordance with Washington law is subject to the Commission's jurisdiction as related to the intrastate service of providing a 9-1-1 system in Washington.

B. By Failing to Lock the IGCCs on the Green Network CenturyLink Failed to Render its Service in Manner Consistent with RCW 80.36.080

60. CenturyLink should have, but did not, lock the IGCCs on the Infinera equipment it used for the purposes of its Green Network. Its failure to lock the IGCCs fell below the standard of a reasonable telecommunications company, it failed to render services necessary to Washington 9-1-1 system in a "prompt, expeditious, and efficient manner," it failed to maintain its "facilities, instrumentalities and equipment" "in good condition and repair", and it failed to provide "modern, adequate, sufficient and efficient" "appliances, instrumentalities and service." It therefore violated RCW 80.36.080.

61. RCW 80.36.080 requires that "the service so to be rendered any person, firm or corporation by any telecommunications company shall be rendered and performed in a prompt, expeditious and efficient manner and the facilities, instrumentalities and equipment furnished by it shall be safe, kept in good condition and repair, and its appliances, instrumentalities and service shall be modern, adequate, sufficient and efficient."

[173] *See* Hartman, SJH-1TC, 32:3-32:9.

62. In this case, CenturyLink provided 9-1-1 services to WMD and also links to Comtech to enable it to connect to the TNS signaling network, which it fulfilled using its Green Network with Infinera equipment where the IGCCs were unlocked and unconfigured. The evidence is overwhelming that failing to lock the proprietary communication channels was a deviation below the best practice of a telecommunications company and rendered CenturyLink's services out of compliance with RCW 80.36.080. Staff's experts thought so.[174] Public Counsel's expert thought so.[175] And the FCC thought so.[176]

63. Importantly, CenturyLink did not use the IGCCs on the Green Network and the cost of locking them prior to the December 2018 packet storm would have been minimal. It entailed only [redacted].[178] No CenturyLink witness could ever point to a concrete reason not take the commonsense step of turning off a feature that was not used,[179] a practice that had been best practice in the telecommunications industry since the late 1990s.[180] Especially after the packet storm on the Red Network, which showed the vulnerability posed by leaving the IGCCs unlocked and unconfigured, CenturyLink should have locked them on the Green Network. CenturyLink's failure to do so was a failure to live up to the requirements of RCW 80.36.080.

[174] Webber, JDW-1CT at 33:18-33:23; Akl, RA-1CT at 9:7-9:16.
[175] Rosen, BR-30CT at 17:16-17:18.
[176] Exh. JDW-4 at 15.
[177] McNealy, TR. 486:22-486:25.
[178] *Id.*
[179] *See*, *e.g.*, McNealy, TR. 496:1-496:7.
[180] Akl, TR. 253:18-253:22.

C. CenturyLink Failed To Transmit Calls From the Comtech STP on the TNS Network to the Comtech RCL and Violated RCW 80.36.220

64. CenturyLink failed to appropriately "receive and transmit messages for any person" when it failed to route 9-1-1 calls it received on ESInet I to ESInet II. Its failure was due to its own neglect of the Green Network in failing to lock the IGCCs. Accordingly, CenturyLink violated RCW 80.36.220.

65. RCW 80.36.220 requires telecommunications companies to "receive, exchange and transmit each other's messages" and to "receive and transmit messages for any person." "In case of the refusal or neglect of any telecommunications company to comply with the provisions of [RCW 80.36.220], the penalty for the same shall be a fine of not more than five hundred nor less than one hundred dollars for each offense." *Id.*

66. As discussed above, CenturyLink had an obligation to route 9-1-1 calls it received on ESInet I to ESInet II.[181] It failed to do so because the Green Network experienced a packet storm causing the connection between the Comtech STP on the TNS network and the Comtech RCL to become unstable.[182] As discussed above, CenturyLink's decision to keep the IGCCs on its Infinera equipment serving the Green Network unlocked and unconfigured was the direct cause of this failure.[183]

67. Accordingly, CenturyLink failed to transmit the 9-1-1 calls sent to its ESInet I to Comtech's ESInet II. CenturyLink did not "refuse" in the language of the statute, but its "neglect" to lock the IGCCs was the direct cause of the failure to transmit the 9-1-1 calls. This violated RCW 80.36.220, and the Commission should so rule.

[181] Supra § III.A.1; *see also* BR-4C at 19.
[182] *E.g.*, Webber, JDW-1CT at 37:13-37:20.
[183] *See*, *e.g.*, Exh. JDW-4 at 15 ("Leaving the channel enabled created a vulnerability in the network that, in this case, contributed to the outage by allowing malformed packets to be continually rebroadcast across the network.").

D. CenturyLink Did Not Notify the PSAPs It Served of the Major Outage on the Green Network, Violating WAC 480-120-412

68. CenturyLink did not notify anyone of the major outage on the Green Network; not the Commission, not Comtech, and not the PSAPs that it served. This violated WAC 480-120-412 requiring telecommunications companies to notify various parties of major outages.

69. "When a company receives notice of or detects a major outage, it must notify the commission and any PSAP serving the affected area as soon as possible." WAC 480-120-412. A "major outage" means:

> [A] service failure lasting for thirty or more minutes that causes the disruption of local exchange or toll services to more than one thousand customers; total loss of service to a public safety answering point or emergency response agency; intercompany trunks or toll trunks not meeting service requirements for four hours or more and affecting service; or an intermodal link blockage (no dial tone) in excess of five percent for more than one hour in any switch or remote switch.

WAC 480-120-021 ("Major Outages").

70. The 9-1-1 Outage was certainly a "major outage" as that term is defined in Commission rule. It lasted for more than 49 hours and potentially affected each and every Washington resident.[184] Whether characterized as a failure of CenturyLink's own local exchange services,[185] a total loss of service to PSAPs,[186] or a failure to meet service requirements between CenturyLink and Comtech,[187] there is no doubt that it was a major outage.

[184] Jones, JHJ-1CT at 6:8-6:11.
[185] *Id.*
[186] Exh. JHJ-3C at 12.
[187] *See* Exh. BR-4C at 19.

71. Because it was a major outage affecting the whole state, CenturyLink had an obligation to notify *at least* the PSAPs that it served.[188] Even if these PSAPs were not affected directly by the packet storm on the Green Network, they still needed to know that 9-1-1 calls could not be connected to PSAPs on ESInet II. As the contract between WDM and CenturyLink makes clear, 9-1-1 calls have to be transferred between PSAPs on ESInet I and ESInet II regularly.[189] The rule requires that a company "notify . . . any PSAP serving the affected area as soon as possible." WAC 480-120-412(2). Here, the "affected area" was the whole state.[190] The 15 PSAPs still served by CenturyLink, therefore, should have been notified. They were not though, and CenturyLink violated WAC 480-120-412(2).

E. CenturyLink Failed to Provide E9-1-1 Service and Violated WAC 480-120-450

72. CenturyLink agreed to provide, but failed to provide, 9-1-1 services to Washington State. This violated WAC 480-120-450(1).

73. "Local exchange companies . . . must provide enhanced 9-1-1 (E9-1-1) services . . . ." WAC 480-120-450(1).

74. As discussed above, CenturyLink agreed to route 9-1-1 calls at least to the demarcation point at the Comtech RCL, and agreed to provide network and transport services to support Washington's 9-1-1 system generally.[191] These were intrastate services that CenturyLink used its Green Network to fulfill.[192] Accordingly, for these purpose, CenturyLink was acting as a local exchange company because it was receiving, routing, and exchanging 9-1-1 calls from Washington callers to Washington PSAPs. *See* WAC 480-120-

[188] Jones, JHJ-1CT at 7:17-7:18; *see also* Rosen, BR-1CT at 17:7-17:10 (opining that CenturyLink should have notified all PSAPs in Washington "not just the ones for which it would explicitly have been the 'Covered 9-1-1 Service Provider.'").
[189] Exh. BR-4C at 26-27.
[190] Jones, JHJ-1CT at 6:8-6:11.
[191] *Supra* § III.A.
[192] *Id.*

021 ("'Local exchange company (LEC)' means a company providing local exchange telecommunications service.").

75. But by failing to lock the IGCC on the Green Network, CenturyLink failed in its obligation to provide the 9-1-1 services that it contracted with WMD to provide and that it was obligated to provide under WAC 480-120-450(1).[193] The Commission should hold CenturyLink liable for this failure.

F. Whether or Not Comtech Also Bears Responsibility for the 9-1-1 Outage is Irrelevant

76. Significant evidence and opinion was admitted about whether or not Comtech bears responsibility for all or a part of the 9-1-1 Outage. This is irrelevant. The sole question for the Commission is whether or not CenturyLink violated statutes and rules enforced by the Commission.

77. Eager to pin the 9-1-1 Outage on somebody else, CenturyLink made a cornerstone of its defense to Commission Staff's complaint the allegation that Comtech was to blame.[194] It suggested that Commission Staff should have investigated Comtech more thoroughly and, if it had, it might have issued a complaint against Comtech instead of CenturyLink.[195]

78. But the question before the Commission is not whether Comtech did or did not violate any statute or rule the Commission enforces. The question is whether *CenturyLink* violated RCW 80.36.080, RCW 80.36.220, WAC 480-120-412, and WAC 480-120-450.[196] None of these statutes or rules require one and only one telecommunications provider to be at fault for any failure. Even if, as CenturyLink seems to allege, Comtech failed in one or more of its duties that would not absolve CenturyLink of its independent obligations. As argued

[193] *See*, *e.g.*, *supra* § III.B.
[194] *See*, *e.g.*, Turner, SET-1TC at 34:7-37:4.
[195] *See*, Hartman, SJH-1TC at 44:3-45:6.
[196] *See* Complaint at 4.

above, CenturyLink should have locked the IGCCs on the Infinera equipment running its Green Network.[197] It did not, and as a result it failed in its obligations to provide a 9-1-1 system in Washington State. Whether or not Comtech shares in the blame for the 9-1-1 Outage does not change this conclusion one bit.

G. The Commission Should Penalize CenturyLink [redacted]

79. Commission Staff stand by their method of calculating the appropriate penalty—if not the exact numbers suggested in earlier filings. CenturyLink should pay $100 for each of its violations of RCW 80.36.080, RCW 80.36.220, and WAC 480-120-450. And it should pay $1,000 for each of the PSAPs it served that it did not notify contrary to WAC 480-120-412. Tallying this up yields a total penalty of [redacted]. The Commission should so order.

80. The objectives of the Commission "when enforcing statutes, rules, orders, and tariffs is to ensure services within the Commission's jurisdiction are delivered safely, adequately, efficiently, and at rates and charges that are just and reasonable." *Enforcement Policy of the Washington Utilities and Transportation Commission*, Docket A-120061 at 6 ¶ 9 (January 7, 2013). When determining whether a penalty is appropriate, and the degree of the penalty, the Commission considers 11 non-exclusive factors. *Id.* at 7-8 ¶ 15. These are:

1) The seriousness of the violation and the harm to the public;
2) Whether the violation is intentional;
3) Whether the company self-reported the violation;
4) Whether the company was cooperative and responsive;
5) Whether the company promptly corrected the violations and remediated the impacts;

[197] *See generally supra.*

6) The number of violations;

7) The number of customers affected;

8) The likelihood of recurrence;

9) The company's past performance regarding compliance, violations, and penalties;

10) The company's existing compliance program; and

11) The size of the company.

Id. Not listed, but clearly a factor that the Commission should consider, is the range of penalties authorized by the Legislature. For example, RCW 80.36.220 specifies a penalty of not less than $100 and not more than $500 per violation. The Commission would not be authorized to issue a penalty outside of this range for a violation of RCW 80.36.220.

81. Commission Staff Jacque Hawkins-Jones applied these factors to CenturyLink's violations related to the 9-1-1 Outage and concluded that a penalty of $100 for each violation resulting in a failed 9-1-1 call and $1,000 for each failure to notify a PSAP is appropriate.[198] In particular, Staff focused on the seriousness of the violations, which related to 9-1-1 service, and threatened the health and safety of everyone in Washington State.[199] Second, Staff focused on "the fact that CenturyLink failed to take steps to prevent readily foreseeable violations."[200]

82. There were at least [redacted] 9-1-1 calls that failed to complete because of CenturyLink's failures, each resulting in a violation of RCW 80.36.020, RCW 80.36.220, and WAC 480-120-450(1).[201] This justifies a penalty of [redacted]. Additionally, CenturyLink should have notified at least the 15 PSAPs still served by ESInet I, for an additional $15,000 penalty. The Commission should order CenturyLink to pay a penalty of [redacted]

[198] Jones, JHJ-1CT at 13:1-18:18.
[199] *Id.*
[200] *Id.* at 18:4-18:5.
[201] This total does not include the [redacted] calls to CenturyLink PSAPs that failed to complete. As discussed above, *supra* § II.D, the reason these calls failed is unknown.

V. CONCLUSION

83. The Commission should rule that CenturyLink committed [redacted] violations of RCW 80.36.080, RCW 80.36.220, and WAC 480-120-450(1). It should further rule that CenturyLink committed 15 violations of WAC 480-120-412. Based on these rulings regarding liability, it should order CenturyLink to pay penalties of [redacted]

DATED this 17th day of January 2023, at Olympia, Washington.

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