WASHINGTON UTC UTILITIES AND TRANSPORTATION COMMISSION

Investigation Report

Qwest Corporation d/b/a CenturyLink QC

UT-140597

Staff Investigation
Consumer Protection and
Regulatory Services

December 2014

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PURPOSE, SCOPE, AND AUTHORITY

Purpose

The purpose of this staff investigation was to determine whether Qwest Corporation d/b/a CenturyLink QC (CenturyLink) complied with Washington law and Utilities and Transportation Commission public safety rules during an outage of portions of the state's emergency 911 system that lasted approximately six hours on April 9 and 10, 2014.

Scope

The investigation focuses on issues concerning the technical functionality of the statewide 911 network, as well as, CenturyLink's business practices prior to, during, and following the outage. This report presents the findings of a staff investigation and recommendations for action by the three-member commission in a subsequent proceeding. Conclusions and recommendations contained in this report are those of commission staff and not the commissioners.

Authority

Staff undertakes this investigation pursuant to Revised Code of Washington (RCW) 80.01.040 (General powers and duties of commission) and 80.04.070 (Inspection of books, papers, and documents), which grants the commission authority to regulate in the public interest and regulate the rates, services, facilities, and practices of all entities operating under public service laws. Staff also conducts this investigation pursuant to RCW 80.04.380, which authorizes the commission to penalize public service companies for violations of commission rules and other requirements.

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EXECUTIVE SUMMARY

On April 9 and 10, 2014, Washington residents experienced a statewide outage of the state's 911 system, severely disrupting emergency and public safety communications. The 911 system failed at 11:54 p.m. PDT on April 9, 2014, and was restored a little more than six hours later, at 6:06 a.m. PDT on April 10, 2014. In Washington, the 911 outage encompassed a loss of access to the state 911 system in all of the state's 39 counties across 56 Primary Public Safety Answering Points (PSAPs) and 12 secondary PSAPs in Washington.[1]

Staff determined that during the outage approximately 5,840 attempted 911 calls failed to reach emergency services. The statewide 911 outage affected wireline telecommunications companies, wireless cellular providers, and Voice over Internet Protocol (VoIP) providers. Although Washington was the only state to experience a complete statewide outage, the 911 failure was responsible for partial outages in six other states[2] affecting the public safety of nearly 11.3 million people, 6.9 million of those in Washington state.

Staff undertook this investigation to determine the following:

- What caused the statewide 911 system outage;
- Whether CenturyLink restoration efforts were sufficient;
- Whether CenturyLink timely and effectively communicated with affected customers during the outage; and
- To what extent CenturyLink and CenturyLink's 911 vendor facilities were adequate to provide service as required by state law.

In addition to examining the cause of the outage and the steps taken, or not taken, by CenturyLink to fulfill its public safety obligations, a goal of this investigation is to prevent a serious and potentially life threatening outage from recurring.

Staff recognizes that CenturyLink and its predecessor operating entities have effectively provided safe and reliable 911 service in Washington state for many years without major interruption or impairment prior to the statewide 911 outage that is the subject of this investigation. Staff anticipates the heightened focus on the specific root causes of the outage undertaken by CenturyLink and CenturyLink's 911 vendor, Intrado, state and local government officials, and the information gleaned pursuant to staff's investigation, will materially reduce or eliminate the possibility of a recurrence of the statewide 911 outage of the scope and duration experienced by Washington residents earlier this year.

Staff Findings

CenturyLink's 911 vendor operates two Emergency Communications Management Centers (ECMC), located in Englewood, Colorado, and Miami, Florida. During the April 2014 statewide

[1] On April 9, 2014, all PSAPs in Washington provided Enhanced 911 service. Since the outage, eight PSAPs have converted to IP based Next Generation 911 (NG911) service. NG911 offers Enhanced 911 service along with text messaging and other data services.

[2] The April 9 and 10, 2014, emergency system outage also affected California, Florida, Minnesota, North Carolina, South Carolina, and Pennsylvania.

911 outage, the Colorado ECMC stopped processing 911 calls placed by Washington residents and automatic traffic rerouting to the Florida ECMC did not occur as designed. As a result, approximately 5,840 calls to 911 in Washington state failed over a six-hour period. The statewide 911 outage was caused by a call threshold counter that had been set to receive up to, but no more than, 40 million 911 calls. On April 9, 2014, the threshold of 40 million calls was exceeded and the system ceased processing additional 911 calls that originated from Washington. Eventually, after more than six hours, CenturyLink's 911 vendor manually re-routed 911 calls from the Colorado ECMC to the Florida ECMC creating a stop-gap measure to return 911 services to normal operations. Based on the vendor's response, coupled with information gleaned from CenturyLink and other sources, staff has determined that the statewide 911 network outage was caused by four primary deficiencies in the statewide 911 system:[3]

- CenturyLink's 911 vendor relied on a call threshold counter that was limited to processing a total of 40 million 911 calls and the threshold counter was not properly managed to ensure that the limit would not be exceeded;
- Automatic rerouting capabilities did not function as designed and Washington's 911 calls were not rerouted from the Colorado ECMC to the Florida ECMC in a timely manner;
- CenturyLink's 911 vendor did not properly manage network alarms designed to signal system issues or outages; and
- The primary route designation for Washington's 911 traffic was to the Colorado ECMC rather being shared between the Colorado and Florida centers. This lack of traffic balancing between the two centers magnified the impact of the outage that centered on functionality in the Colorado ECMC.

Staff has determined that the emergency system design and implementation failed to perform as required, and the state 911 system did not have a reliable infrastructure network.

Staff also found that Washington residents were denied access to vital emergency services during the six-hour 911 outage. Staff found that 5,840 emergency calls in Washington were placed to 911 and went unanswered. In addition, staff found that CenturyLink failed to provide prompt and critical information to PSAPs, hampering the PSAPs ability to reroute calls.

As a result of this investigation, staff concludes that CenturyLink violated the following state laws and commission rules:

- RCW 80.36.080 Rates, services and facilities
- WAC 480-120-450(1) Obligations of local exchange companies
- WAC 480-120-412(2), Major outages - Notification to commission and public safety answering point (PSAP)

Penalty Recommendation

Staff recommends the commission issue a formal complaint against CenturyLink and assess a penalty of up to $2,932,750 for 11,731 violations of commission laws and rules. The elements of the penalty recommendation are as follows:

[3] The summary conclusions will be discussed in more detail later in this report.

- Up to $250 for each of 5,840 violations of RCW 80.36.080 for failing to route 911 calls as required, for a potential penalty of $1,460,000.
- Up to $250 for each of 5,840 violations of WAC 480-120-450(1) for failed calls to 911, for a potential penalty of $1,460,000.
- Up to $250 for each of 51 violations of WAC 480-120-412(2) for failing to promptly notify PSAPs of a major outage, for a potential penalty of $12,750.

Technical Recommendations

Staff recommends the commission require CenturyLink implement the following safeguards to assure reliability, availability, and survivability of the network to prevent outages causing the April 2014 statewide failure.

- Ensure that Washington's primary PSAP functionality and 911 traffic is distributed between the Colorado and Florida ECMCs to balance call volumes and reduce risk of another statewide outage.
- Provide a quarterly report to the commission listing each PSAP's primary route and ECMC designation.
- Provide a detailed report to the commission on all corrective actions and other measures implemented during and after the April 2014 outage to prevent a recurrence of such an outage and present those findings to the commission at an Open Meeting.
- Provide quarterly reports to the commission on call volumes processed by the PSAP Trunk Member (PTM) threshold counter, and a measure of how close call volumes come to reaching a call limit that could affect call processing for each ECMC that processes Washington 911 calls.
- Submit quarterly corrective action progress reports to the commission on implementation of Next Generation 911 (NG911) in Washington until all PSAPs have been transitioned to NG911.
- Submit annual status reports to the commission that describe in detail any major enhancements, audits, and results[4] to all components of the state 911 network and also submit annual audits pertaining to network design[5] until all Washington PSAPs are transitioned to NG911.
- Report to the commission all 911 emergency system network outages in every state in which the company provides such services within 24 hours of the outage.

In this investigation, staff reviewed national data, state laws, commission rules, data requests and responses from CenturyLink and CenturyLink's 911 vendor; Washington Military Department (Military Department) data, and information and input provided by county emergency managers and PSAP resources. Staff has determined CenturyLink did not adequately provide the necessary safeguards to protect the state 911 system and had those safeguards been in place, there would

[4] Specifically, staff recommends that CenturyLink be required to submit all FCC Communications Security Reliability and Interoperability Council (CSRIC) Best Practice Network Diversity Audit results.

[5] "Network Operators and Public Safety should periodically audit the physical and logical diversity called for by network design of their network segment(s) and take appropriate measures as needed" in Washington state. (Reference CSRIC II Working Group 6: Best Practice Implementation's Final Report). http://www.fcc.gov/encyclopedia/communications-security-reliability-and-interoperability-council-ii CSRIC Best Practice number 9-9-0532 as a recommended means to improve network reliability. In addition, the FCC recently released a Notice of Proposed Rulemaking (NPRM) to seek opinions on 911 issues.

not have been a statewide outage. CenturyLink and CenturyLink's 911 vendor have made some changes to address the threshold counter issue and now actively monitor 911 calls to ensure those calls are properly sent through their network and reach the proper PSAP. To date, CenturyLink and CenturyLink's 911 vendor have not made substantial changes to balance Washington PSAPs, and therefore 911 call loads, between the Colorado and Florida ECMCs.

Report Format

This staff investigation report is divided into five sections:

1. Background;
2. Investigation: Outage and Restoral of Service;
3. Investigation: Communications During the Outage;
4. Investigation: Failed Calls to Emergency Services;
5. Investigation: Responses to Data Requests; and
6. Recommendations.

BACKGROUND

Company Information

CenturyLink is the major incumbent Local Exchange Carrier (LEC) offering telephony, data, and other services in the state of Washington, with gross intra-state annual revenue of more than $475,000,000 in 2013. Additionally, CenturyLink has statewide responsibility for the underlying elements of the state's 911 system, including 911 call processing.

In 2004, Qwest Corporation entered into a contract with Intrado to serve as the underlying provider of the company's contractual obligations to provide 911 services in Washington and other states. The contract requires both Qwest and its 911 vendor to comply with all applicable state, federal, county, and local ordinances, regulations, and codes.

On March 14, 2011, the commission issued Final Order 14 in Docket UT-100820, approving and adopting, subject to conditions, a multiparty settlement agreement authorizing CenturyLink, Inc. to acquire indirect control of Qwest Corporation, Qwest LD Corp. and Qwest Communications Company LLC. CenturyLink assumed all of Qwest's responsibilities under the contract.

Investigation Information

Between April and October 2014, staff submitted 80 data requests to CenturyLink seeking technical information about the state 911 system and the April 2014 statewide 911 outage. In response, the company provided information about maintenance, network reliability, reporting, and CenturyLink's 911 contracts with vendors and the Military Department. Staff also received information directly from CenturyLink's 911 vendor with additional information about the statewide 911 outage and other related 911 system outages.[6] Staff's investigation included in-person, full-day meetings on April 24 and Sept. 23, 2014, with CenturyLink, CenturyLink's 911 vendor, the Military Department subject matter experts, and other technical, legal, and marketing representatives, to clarify CenturyLink and CenturyLink's 911 vendor responses to the data requests.

During the investigation, staff reviewed information collected from: CenturyLink; CenturyLink's 911 vendor; the Military Department; Washington counties; Washington and Oregon PSAPs; the National Association of Regulatory Utility Commissioners (NARUC) 911 network survey; and outage reports filed in the FCC Notification Outage Reporting System (NORS). Staff also reviewed information provided by a number of wireless, VoIP, wireline service providers, public comments from consumers, public safety officials, and community officials.

The Federal Communications Commission (FCC) also initiated a proceeding to examine the circumstances surrounding the statewide 911 outage as well as 911 outages that occurred in other states around the same timeframe.[7] Numerous parties, including county and state 911 entities,

[6] CenturyLink provided Intrado responses to staff on Oct. 9 and 20, 2014. "Amended NORS report filed Sept. 5, 2014, and Confidential Responses Case File No. PSHSB-14-CCR-002 and Docket UT-140597."
[7] See Appendix A for UTC comments, *In the Matter of Public Safety and Homeland Security Bureau Inquiry into Circumstances of Major 911 Outage Centered in Washington State on April 9-10, 2014*, PS Docket No. 14-72, filed June 26, 2014.

filed comments with the FCC and staff reviewed those filings as part of its investigation. Additionally, staff directly contacted public utility commission representatives and 911 officials to discuss 911 system outages that occurred in California, District of Columbia, Florida, Idaho, Iowa, Hawaii, Maine, Minnesota, Nebraska, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Vermont, and Virginia.

911 System Network Description

AT&T developed the 911 system in the 1960s for responders to address emergency needs. In emergency or public safety situations, consumers dial '911' from any telephone to be connected to a PSAP emergency dispatch center which, depending on the situation, utilizes information provided by the caller and certain location information to dispatch emergency responders to the caller's location. In virtually all areas of the country, the 911 system automatically pairs a caller's telephone number with the physical address or location of a caller's location. Emergency 911 services are overseen by governmental entities in a majority of jurisdictions nationwide and funded through state and county taxes. The actual elements of 911 networks that receive 911 calls and dispatch emergency personnel are directly operated by governmental bodies, often county governments; while transmission, routing, and call completion functions are provided under contract with telecommunications providers such as CenturyLink.

Washington's 911 services are overseen by the Military Department's Emergency Management Division. It contracts directly with CenturyLink to provide 911 services through an Emergency Services Internet Protocol network (ESInet).

CenturyLink has contracted some functions of the 911 network have been outsourced by CenturyLink to Colorado-based Intrado, CenturyLink's 911 vendor. In fulfilling its contractual obligations to CenturyLink in Washington and other states, CenturyLink's 911 vendor operates two ECMCs, located in Englewood, Colorado, and Miami, Florida. The ECMCs provide varying levels of 911 services for more than 3,000 of the nation's approximately 6,000 PSAPs.

Washington's 911 Network

The *Network Diagram* on the next page depicts the path of a 911 call through networks operated by CenturyLink and its 911 vendor. [8]

This diagram depicts a redundant network capable of avoiding failure by transferring 911 calls over multiple routes to two IP Selective Routers (IPSR) owned by CenturyLink's 911 vendor, one in the Colorado ECMC and the other in the Florida ECMC. The diagram shows that there are primary and secondary – or back-up – routes throughout the 911 system to provide redundancy, ensuring that a 911 call will be completed in the event of an equipment or transport path failure.

In Washington state, when a customer dials 911, the call is carried to an end office and is then transported to either the Spokane or Seattle gateway[9] and then handed off to CenturyLink's 911 vendor. Each gateway contains two switches, a primary and a secondary switch, that provide redundancy in the event that one switch fails. A call is transported to either the Seattle or Spokane gateway based on the geographic origination of the 911 call. Generally, 911 calls

[8] CenturyLink provided the Network Diagram. Commission staff added the yellow and purple shaded boxes.
[9] A gateway serves as the interface or transfer point between CenturyLink's network and the network operated by CenturyLink's 911 vendor.

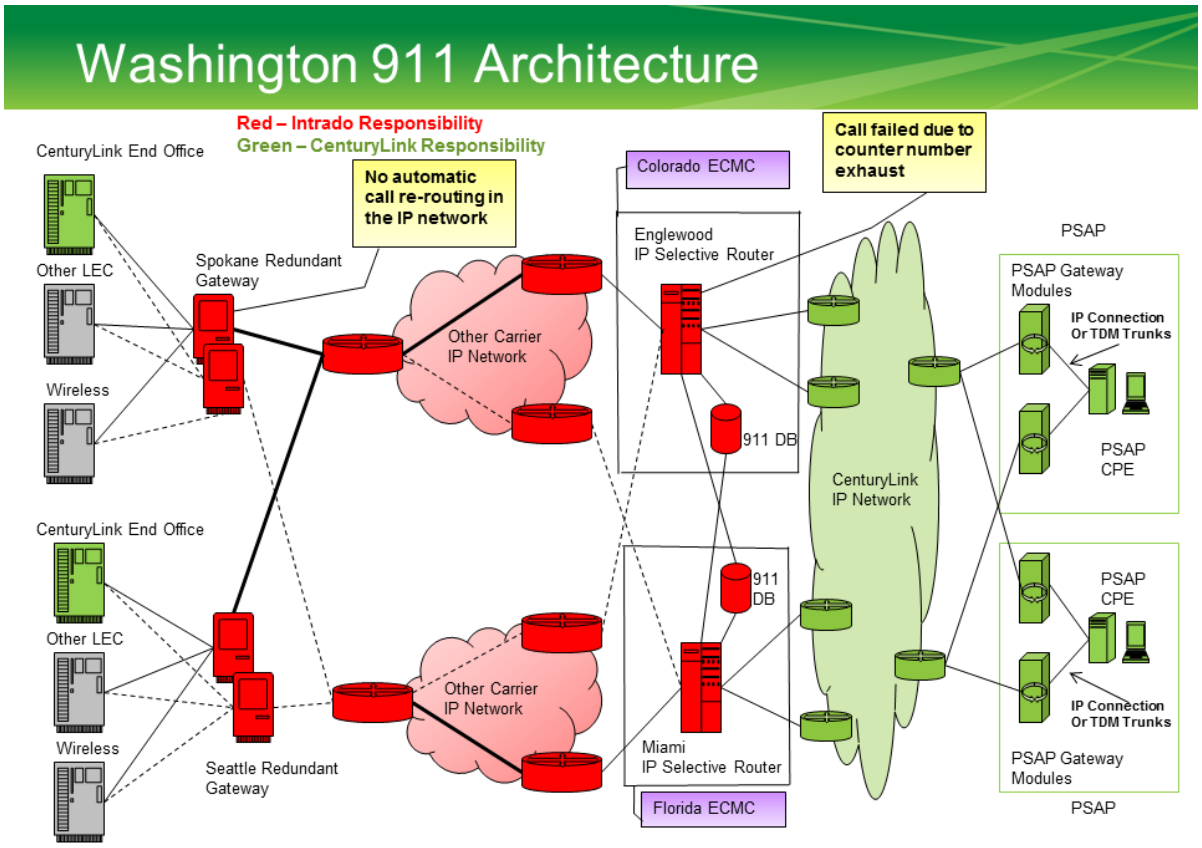
originating from locations in western Washington are directed to the Seattle gateway and 911 calls originating in eastern Washington are directed to the Spokane gateway.

The black solid line on the *Network Diagram* shows how the primary route calls travel from the central office to a gateway. The diagram also depicts a dotted line from each central office to a secondary gateway representing the alternate transmission path for a 911 call in the event the path to the primary gateway fails.

After a 911 call reaches the appropriate gateway, the call is handed off to CenturyLink's 911 vendor network. It is sent through that system to a router in the Colorado ECMC where the 911 Automatic Location Identification Database, which houses the physical address of the party calling for 911 assistance, is queried by CenturyLink's 911vendor to obtain the caller's address.

The address information associated with the telephone number used by the 911 caller is then sent back through CenturyLink's network to an appropriate PSAP giving the 911 attendant the caller's location for potential dispatch of emergency or public safety personnel.

Network Diagram



INVESTIGATION: 911 OUTAGE AND SERVICE RESTORAL

911 System Outage and Service Restoral

In a data request,[10] commission staff asked CenturyLink to identify the cause or causes of the outage. CenturyLink's 911 vendor responded as follows:

> "The cause of the failure was related to services provided by Intrado.
>
> "Incident Synopsis: Intrado's PSAP Trunk Member (PTM) threshold counter in the Englewood, Colorado Emergency Call Management Complex (ECMC) exceeded its administered threshold, resulting in the system's inability to assign trunks for PSAP CAMA call delivery via the Englewood ECMC.
>
> "Incident Root Cause: Intrado's PTM threshold counter in the Englewood, Colorado ECMC exceeded its administered threshold. Under normal operations for calls to PSAP CAMA destinations, this counter is incremented when a PSAP CAMA trunk is assigned for call delivery and is used as a unique identifier within the geographically distributed databases. When the threshold counter reached capacity, *no additional database entries to reserve a PSAP CAMA trunk could be created, resulting in the inability to assign a trunk for call delivery.*
>
> *"The system is geographically redundant and is designed to failover between core processing sites. This situation occurred at a point in the application logic that was not designed to perform any automated corrective actions.* The situation at the Englewood ECMC did not affect the processing at Intrado's Miami ECMC. Intrado initiated manual failover of all call processing to Miami, Florida ECMC when the issue was diagnosed." [11]

Based on the vendor's response and information gleaned from CenturyLink and other sources, staff has determined that the statewide 911 network outage was caused by four primary deficiencies in the statewide 911 system:

- ***Call Threshold Management.*** CenturyLink's 911 vendor system relied on a call threshold counter that was limited to processing an arbitrary cumulative total of 40 million 911 calls and the threshold counter was not properly managed to ensure that the limit would not be exceeded;
- ***Alarm Management.*** CenturyLink's 911 vendor did not properly manage network alarms designed to signal system issues or outages;
- ***Lack of Automatic Call Rerouting.*** Automatic rerouting capabilities did not function as designed and Washington's 911 calls were not rerouted from the Colorado ECMC to the Florida ECMC in a timely manner; and
- ***Primary Route Designation.*** The primary route designation for Washington's 911 traffic was to the Colorado ECMC rather than being shared between the Colorado and Florida centers. This lack of traffic balancing between the two centers magnified the impact of the outage that centered on functionality in the Colorado ECMC.

[10] See Appendix B for staff data request RS-11
[11] Emphasis added.

Each deficiency is discussed in detail below.

Call Threshold Management

At the time of the outage, none of the PSAPs in Washington had completed a transition to NG911 equipment that utilizes Internet Protocol to transmit traffic. Because this transition had not been completed, processing 911 calls from Washington required CenturyLink's 911 vendor to use a threshold counter key called a Primary Trunk Member (PTM)[12] to assign a unique identifier to each Washington call entering its 911 database system. CenturyLink's 911 vendor initially set the PTM call threshold to process a maximum of 40 million 911 calls for all of the states (including Washington) served by its 911 network. Once the 40 millionth 911 call was received on April 9, 2014, no additional 911 calls could be completed through the Colorado ECMC and the processing of 911 calls relying on the PTM was automatically halted.

Because CenturyLink's 911 vendor specifically designed a system with a threshold of 40 million, it and CenturyLink bore responsibility for managing the threshold counter to ensure that call volumes would not reach the arbitrary limit of 40 million calls. Had CenturyLink's 911 vendor actively monitored call volumes and the levels recorded by the threshold counter, the counter would have been reset to "0" or the threshold would have been increased to ensure continued call processing.

A staff data request[13] asked CenturyLink's 911 vendor for the… "date the threshold counter was reset." The vendor responded:

> "Undetermined whether the counter was reset at any point. However, all indications suggest that the counter may not have been reset to a lower number prior to April 2014."

Staff met with CenturyLink and its 911 vendor in Seattle on Sept. 23, 2014. During that meeting staff reviewed details of the threshold counter issue again with company personnel and the vendor's representative stated that there was an error in the software that prevented the threshold counters from being reset. From information provided, the counter apparently did not automatically reset as each software update was installed over time. Had the counter been reset to a lower number or increased to accommodate a higher number of calls, as was done subsequent to the statewide 911 outage, the statewide 911 system failure would have been averted. Given that the limit was increased to more than 1 billion calls subsequent to the statewide 911 outage, it appears that it is not a complicated task to expand the threshold counter limit. It appears that the vendor did not actively monitor call levels, the software intended to reset the counter did not function as intended, and the vendor did not increase the call limit until after the outage.

Alarm Management

Staff's investigation discovered that CenturyLink's 911 vendor established an alarm to notify its

[12] Definition: Primary Trunk Member (PTM) reserves a telephone circuit used to transport 911 information back to the PSAP. The "key" is the threshold counter number that is assigned in the software assures that only a single 911 call at any one time can be assigned to the PTM.

[13] See Attachment C for staff data request and CenturyLink response for RS-70-a.

network operating center employees when the threshold counter reached 40 million. Staff determined that while the processing system would issue an alarm once the 40 million-call level was reached, the alarm was not specific and did not properly indicate the severity of the issue. Therefore, even though an alarm was triggered in the Colorado ECMC as the statewide 911 outage commenced, the alarm did not provide clear information to enable ECMC personnel to signal a level of severity that necessitated an immediate response.

Staff asked[14] CenturyLink's 911 vendor, "Why did a threshold counter error go unnoticed by Intrado personnel before the system failed or immediately after the counter failed?" [15] The vendor responded:

> "The alarm for threshold counter error was not specific, and not at the appropriate severity. Since the incident, an enhanced alarming system has been implemented with a specific, identifiable alarm for when the threshold is reached."

CenturyLink reported that its 911 vendor classified alarms as **Critical, Major, Minor, and Warning**. Staff asked which alarm category was given to the threshold counter before the 911 outage. [16] CenturyLink responded on behalf of its 911 vendor as follows:

> "Before the 9-1-1 outage, the system did provide alarms; but these were generic in nature and did not specifically flag the threshold counter condition. Today, the threshold counter is set to use alarms in *each of the four categories for this condition."*[17]

Lack of Automatic Call Rerouting

The telecommunications industry relies heavily on call monitoring and systems that automatically reroute calls in the event pieces or segments of a network fail.

In response staff's question,"What were the causes of the system failure and please identify each cause separately," CenturyLink's 911 vendor stated:

> *"The system is geographically redundant and is designed to failover between core processing sites. This situation occurred at a point in the application logic that was not designed to perform any automated corrective actions.* The situation at the Englewood ECMC did not affect the processing at CenturyLink's 911 vendor's Miami ECMC.; it initiated manual failover of all call processing to the Miami, Florida ECMC when the issue was diagnosed.
>
> "From the answer provided by the vendor, its clear that the system is *designed* to 'failover' (i.e., reroute to the Florida ECMC) and perform "automated corrective action"; However, because of the nature of the outage, the network failed to act as designed and calls were not automatically rerouted between the Colorado and Florida ECMCs.When

[14] See Appendix D for staff data request and CenturyLink response to RS-49-d.
[15] Threshold counter key is the Primary Trunk Member identifier for NG911 systems.
[16] See Appendix E for staff data request and CenturyLink response to RS-69-c.
[17] Emphasis added.

rerouting finally was initiated, some six hours after the beginning of the outage, it was done using a manual process."[18]

Primary Route Designation

As noted previously, CenturyLink's 911 vendor has two ECMCs, one in Colorado and one in Florida. However, rather than balancing Washington's 911 traffic between the two centers to minimize potential 911 call processing problems, the primary route selected for Washington's traffic was the Colorado ECMC. Staff believes that if Washington's 911 calls had been split between the two centers, the outage in the Colorado location would not have affected every 911 call initiated by Washington customers. Instead, the outage would have affected roughly half of the state's 911 calls.

State Network Requirements

RCW 80.36.080 requires telecommunications companies to provide service "in a prompt, efficient manner and the facilities, instrumentalities and equipment furnished be safe, kept in good condition and repair, and its appliances, instrumentalities and service shall be modern, adequate, sufficient, and efficient." Commission rules require companies to make reasonable provisions to minimize the effects of major outages and prioritize outages affecting PSAPs and emergency response agencies to be restored as soon as possible. Both the law and the commission's rules appear to anticipate that outages may occur through no fault of the companies, e.g., cables cut by contractors or damaged by storm damage, etc. Therefore, companies are expected to use "best efforts" to repair the damage.

Staff's investigation applied the "modern, adequate, sufficient, and efficient" standard of the law by reviewing common practices in the telecommunications industry. The critical nature of 911 service requires the network to be protected by both the 911 provider and the Military Department. To protect networks from equipment failure, CenturyLink's 911 provider provides multiple routes and two ECMCs to ensure the 911 system continues in the event of an equipment failure. The Military Department and the county PSAPs also have procedures in place when equipment fails, such as backup PSAPs and multiple circuits from the PSAP to the ESInet.

Major Outage Requirements

Staff reviewed CenturyLink's recovery effort to ascertain whether the company complied with the commission's Major Outage rules. WAC 480-120-412 requires companies to make reasonable provisions to minimize the effects of major outages, including those caused by force majeure, and inform and train pertinent employees to prevent or minimize interruption or impairment of service.

Staff's investigation determined that CenturyLink employees did not adequately communicate internally with its 911 vendor or externally with PSAPs to inform 911 authorities in Washington state of the severity and location of the statewide 911 outage. Staff concludes that the company did not comply with the Major Outages rule.

Findings

[18] Emphasis added.

The 911 system is a vital part of Washington's emergency and public safety service to the residents of Washington. On April 9, 2014, Washington experienced a statewide outage of its 911 system, lasting approximately six hours, denying emergency service to at least 5,840 911 callers.

CenturyLink is required by Washington statute to provide service that is safe, modern, adequate, sufficient, and efficient. As a result of its investigation, staff concludes that CenturyLink and its 911 vendor did not meet the standards required for providing safe and efficient 911 service. The outage was caused April 9 by a call threshold counter that had been set to receive up to but no more than 40 million 911 calls that were non-NG911 in origin, i.e., calls from PSAPs that had not yet made the transition to IP-compatible equipment. On April 9, 2014, the threshold of 40 million calls was met and the system ceased processing additional 911 calls that originated in Washington. Staff has determined four major deficiencies on the part of CenturyLink's 911 vendor contributed to the outage.

- CenturyLink's 911 vendor's system relied on a call threshold counter that was limited to processing an arbitrary cumulative total of 40 million 911 calls and the threshold counter was not properly managed to ensure that the limit would not be exceeded;
- Automatic rerouting capabilities did not function as designed and Washington's 911 calls were not rerouted from the Colorado ECMC to the Florida ECMC in a timely manner;
- CenturyLink's 911 vendor did not properly manage network alarms designed to signal system issues or outages; and
- The primary route designation for Washington's 911 traffic was to the Colorado ECMC rather being shared between Colorado and Florida centers. This lack of traffic balancing between the two center magnified the impact of the outage that centered on functionality in the Colorado ECMC.

INVESTIGATION: COMMUNICATION DURING THE OUTAGE

As part of this investigation, commission Consumer Protection staff reviewed the company's business practices related to communication, responsiveness, and the impacts of failed calls to 911.

External Communication during the Outage

In response to a data request regarding external communication efforts by the company, CenturyLink submitted a six-page document entitled, "911 WA Media Outreach Summary" (media summary) that shows the first media contact was a telephone call to KOMO TV News on April 10, at 1:45 a.m. The media summary included multiple media contacts for a separate Oregon 911 outage.

Social Media Posts

Facebook

In response to staff's data request, CenturyLink reported that it posted the following to its Facebook page at 2:30 a.m., April 10:

> "CenturyLink technicians in Washington state are working to repair service disruptions impacting local and long distance services, including 911 service in some communities. If there is an emergency, residents are encouraged to use a wireless phone to call for help or to drive to their nearest fire station or medical facility. We apologize for any inconvenience this creates for our customers and will provide updates as more information becomes available."

Staff's review of CenturyLink's Facebook page documents that the company actually posted a message at 3 a.m., on April 10. At that time, CenturyLink knew, or should have known, that wireless telephones were also affected by the outage and not an option for people to use in the event of an emergency. The posted notice failed to provide alternate telephone numbers for the public to call in an emergency.

CenturyLink reported that it made the following Facebook post at 5 a.m., April 10:

> "CenturyLink technicians continue working to restore 911 service in some areas of Washington following a technical issue which occurred overnight. While 911 service in some communities is now working, CenturyLink will continue to work on this issue until all services are restored."

At 5:05 a.m., on April 10, KING 5 TV News provided a complete list of alternate numbers to call in an emergency on its own Facebook page and subsequently shared it on CenturyLink's Facebook page as well.

Staff located no further postings related to the outage posted on CenturyLink's Facebook page.

Twitter

CenturyLink posted the following messages to Twitter on April 10:

> 2:30 a.m. – "CenturyLink is working to repair local and 911 services in parts of Washington state. Stay tuned for updates."
>
> 3:32 a.m. – "CenturyLink is working to repair local and 911 services in parts of Washington state. Stay tuned for updates."
>
> 4:07 a.m. – "CenturyLink has restored local services, including 911 service, in Oregon. Restoration work continues in Washington."
>
> 5:44 a.m. – "CenturyLink technicians are working to restore impacted 911 services in several counties in WA state. Some services are now restored."
>
> 7 a.m. – "While some 911 services are not working in Washington, CenturyLink continues to work on this issue until all services are restored."

The times CenturyLink provided in RS-3.3 for Facebook and Twitter posts do not coincide with the times noted on the Media Summary.

WAC 480-120-412(5) provides that, in the event of a major outage, "all companies must implement procedures to disseminate information to the public, public officials, and news media. All companies must provide a statement about the major outage that includes the time, the cause, the general location and approximate number of affected access lines, and the anticipated duration."

CenturyLink did not meet the requirement of WAC 480-120-412(5) until April 14, 2014, four days after cessation of the 911 outage, when the company released the following statement to media:[19]

> "On April 10, CenturyLink experienced a 911 outage in Washington. The outage was not caused by any failures or malfunctions of CenturyLink's network and was not related to any OpenSSL issues such as Heartbleed. The outage was due to a technical error in a third-party vendor's call route, which prevented the system from properly processing calls. CenturyLink and its vendor partner have taken steps to implement an improved monitoring process and have addressed the router issue. Our 911 system has been returned to normal operations and we are confident these steps have address this issue.
>
> "Approximately 770 911 calls were completed and 4,500 failed between 12:36 a.m. PST and 6:26 a.m., when 911 service was fully restored. This occurred across 127 public safety answering points (PSAPs) in Washington; other PSAPs successfully rerouted calls.
>
> "'CenturyLink's top priority is customer safety and reliable communications,' Brian Stading, Northwest Region President said. 'We are working closely with our vendor partner to fully to understand this outage. At this time, we are confident that the 911 system is fully operational and stable.'"

[19] See Appendix F for staff data request and CenturyLink response to RS 3.5, approved media statements.

Communication with Commission Staff

WAC 480-120-412(2), Major Outages, provides that, "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."

CenturyLink's first notification to the commission about the 911 outage was at 6:24 a.m. on April 10, 2014, with what the company titled a *Public Utilities Company Outage Report* (outage report) sent to the commission's telecom-outage email address.[20] The outage report noted that the start time was 4:45 a.m. on April 10 and the reason for the outage notification was listed as multiple PSAPs reporting no 911 service. CenturyLink reported that the location of the outage was "Castle Rock, WA."

CenturyLink followed up with another outage report to the commission's telecom outage email address at 8:27 a.m. on April 10.[21] The reason for the outage report was noted as "All Washington offices could not deliver 911 calls to the PSAPs." The location of the outage was all of Washington state. This outage report was sent after the 911 outage had been resolved.

The commission's Assistant Director for Telecommunications contacted CenturyLink's Washington vice president by telephone at approximately 8:30 a.m. on April 10 to ask about the Castle Rock outage. The CenturyLink representative stated to staff that the technician issuing the outage report did not know how to fill out the form to indicate the outage was statewide, so instead entered Castle Rock as the outage location. The CenturyLink representative confirmed that the 911 outage was statewide. This was the first direct contact between CenturyLink and the commission.

WAC 480-120-439(5) requires "any company experiencing a major outage that lasts more than forty-eight hours must provide a major outage report to the commission within ten business days of the major outage."

The report must include a description of the major outage and a statement that includes the time, the cause, the location and number of affected access lines, and the duration of the interruption or impairment. The report must include a description of preventative actions to be taken to avoid future outages.

CenturyLink submitted its Major Outage Report to the commission on April 24, 2014,[22]and technically met this requirement of WAC 480-120-439. The report did not provide an accurate count of failed calls in Washington, but did report what was known at the time. In addition to the failed calls reported, CenturyLink reported that approximately 770 calls to 911 were completed.

Communication with PSAPs

[20] See Appendix G for a copy of CenturyLink's outage report, dated April 10, 2014, at 6:24 a.m.
[21] See Appendix H for a copy of CenturyLink's outage report, dated April 10, 2014, at 8:27 a.m.
[22] See Appendix I for a copy of CenturyLink's April 24, 2014 Major Outage Report.

CenturyLink's response to commission staff's data request (noted below) shows that the company's 911 repair center began receiving trouble reports from PSAPs and notified CenturyLink's 911 vendor at 12:58 a.m. PDT:

> "Upon receiving trouble reports from PSAPSs, the CTL 9-1-1 Repair Center notified Intrado at 00:58 AM PDT. We began calling PSAPs in the area, while also fielding a flood of calls. Here is a partial account of the PSAPs we spoke with, or attempted to reach via test call.
>
> - 00:40 PDT Norcom – Katie with PSAP called in trouble
> - 00:58 PDT Clark County called us reporting their 911 was down
> - 00:59 PDT Cowlitz test calls failed but see below (01:36)
> - 00:59 PDT Clark County test calls failed
> - 01:36 PDT Cowlitz got a ckts busy, but call to 503-331-0023 completed & talked to dispatcher
> - 01:56 PDT Spokane county ECC test calls fast busy but reached PSAP, Veronica on 509-225-5855
> - 01:58 PDT Seattle PD test calls getting fast busy
> - 02:10 PDT Skagit County, Lewis County & Jefferson County – all test calls got fast busy
> - 2:24 PDT Rivercom PD test call good only Wireless is down (per note)
> - 02:39 PDT Okanogan talked Christy at PSAP
> - 02:47 PDT Grays Harbor & Franklin County test calls get fast busy
> - 03:40 PDT Whitcom (sic) Moscow test calls getting fast busy
> - 03:45 PDT Fife PD test calls getting fast busy
> - 03:47 PDT Columbia County spoke to dispatcher Diane
> - 04:50 PDT Franklin County spoke to PSAP who said wireline still down
> - 05:08 PDT Pend Oreille ticket called in by Jake at PSAP, test call getting fast busy
>
> "In parallel, the WA Service Manager, Kathy Miller, was in contact with Marlys Davis, King County, at 2 AM PDT, and Marlys indicated she had posted outage information to a private "Yahoo" website that all of the WA PSAP Coordinators use for updates & information. Additionally, Kathy spoke with Andy Leneweaver, with the Washington State E911 Coordinator's Office, ~3:50 PDT – Andy created a bridge and sent an email to the distribution of PSAP Coordinators to join – Kathy worked between our NEMC bridge and the WA PSAP bridge to provide updates as well."

Staff reviewed CenturyLink's documentation of PSAP contacts. Most of the contacts were a result of the PSAP contacting CenturyLink. CenturyLink contacted only two PSAPs using alternate 10-digit numbers.

The Military Department provided staff with a report on Oct. 8, 2014, entitled, "April 9-10, 2014, 911 Outage Statewide Information." The report is a compilation of responses from PSAPs, which were asked the following questions by Military Department staff on April 10, 2014: 1) How did you find out about the outage? 2) Were there serious problems or issues? and 3) Were there lingering problems? Following is a synopsis of the responses about how PSAPs learned of the outage:

	County	How did you learn of the 911 outage
1	Adams	Notified by Spokane Co. Sheriff's Office
2	Benton	Notified by WSP
3	Chelan (RiverCOM)	Notified by Thurston County call center
4	Clallam	Notified by Jefferson County dispatch
5	Clark	Noticed low call volume – contacted CL*
6	Columbia	Notified by State E911 Office
7	Cowlitz	Notified by Clark County dispatch
8	Douglas	See Chelan (RiverCOM) for information
9	Ferry	Notified by Steven's County 911
10	Franklin	Notified by WSP
11	Garfield	Unknown
12	Grant	Notified by RiverCOM
13	Grays Harbor	Notified by Thurston and Lewis Counties
14	Island	Notified by Skagit County
15	Jefferson	Notified by a former employee
16	King (Redmond PD)	Notified by NORCOM
17	King (Port of Seattle)	Notified by Seattle Police Department
18	King (Bothell Police)	Notified by PSAP talk group
19	King (WSPBellevue)	Notified by WSP District 1 (Tacoma)
20	King (Enumclaw PD)	Notified by E911
21	King Co.Sheriff	Unknown
22	King (Issaquah PD)	Notified by Redmond PD
23	NORCOM	Notified by citizen – contacted CL
24	Seattle PD	Notified by two citizens
25	Valley COM Center	Notified by relay service from Canada
26	Univ. of Washington	Notified by Seattle Police broadcast
27	Kitsap	Notified by aid personnel – contacted CL
28	Kittitas	Notified by WSP
29	Lewis	Notified by Cowlitz
30	Lincoln	Notified by Stevens County
31	Mason	Notified by Thurston County (TCOMM)
32	Okanogan	Notified by RiverCOM
33	Pacific	Notified by Wahkiakum
34	Pend Oreille	Notified by Stevens County
35	Pierce	Pierce noticed low call volume
36	Puyallup Comm Center	Notified by South Sound 911(SS911)
37	Tacoma WSP	Notified by SS911
38	Pierce Fire and Rescue	Notified by SS911
39	San Juan	Notified by local hospital
40	Skagit	Notified by citizen
41	Skamania	Unknown

	County	How did you learn of the 911 outage
42	Snohomish SNOCOM	Notified by SNOPAC
43	Snohomish (SNOPAC)	Notified by Officers
44	Spokane	Notified by citizen
45	Thurston	Notified by Lewis County
46	Wahkiakum	Notified by Cowlitz
47	Walla Walla	Unknown
48	Whatcom	Notified locally
49	Whitman	Notified by WSP
50	WSP	Notified by WSP District 2
51	Yakima	Notified by WSP

* Clark County contacted CenturyLink to report an outage. CenturyLink responded that everything seemed to be fine. Clark County then contacted CenturyLink's 911 vendor directly.

In a June 3, 2014, letter to the FCC, the director of the Pacific County Sheriff's Office wrote:[23]

> "…CenturyLink and their contractor, Intrado, had no internal indication of an outage. Pacific County specifically contacted the CenturyLink Network Operations Center (NOC) which, after a 20 to 25 minute hold time, was unable to provide specific information about the issue(s). It is unknown how many Washington State E9-1-1 Centers called into the CenturyLink NOC by the time Pacific County reported however, by the time Pacific County reported, telecommunicators from Pacific County were aware of many (over six) counties that had also been affected. The number of counties reporting to the CenturyLink NOC should have triggered a significant alarm of some type."

In a July 2, 2014, letter to the FCC, the Thurston County 9-1-1 Communications (TCOMM911) executive director wrote:[24]

> "The outage notification procedure/process was not initiated by CenturyLink or Intrado as it should have been. Outage notifications flowed from PSAP to PSAP, from PSAP to State E911 Office and from PSAP to CenturyLink to Intrado."

Staff found that the PSAPs were not properly notified about the outage and were essentially left to their own devices to get the word out within the public safety community about the 911 outages. King County notified CenturyLink that it had posted outage information on a private Yahoo site the PSAP coordinators use for updates and information. Staff at the Military Department created an open telecommunication conference call bridge and sent an email to the PSAPs notifying them that the bridge was open. The bridge allowed the PSAPs to call in to report and receive outage updates.

[23] See Appendix J for a copy of June 3, 2014 letter to the FCC from the Director of Pacific County Sheriff's Office.
[24] See Appendix K for a copy of July 2, 2014 letter to the FCC from TCOMM911 Executive Director.

Staff was not able to find a single documented report that CenturyLink first notified a PSAP of the outage. King County noted in the 911 Statewide Outage Information report that the North East King County Regional Public Safety Communication Agency (NORCOM) received a call from a citizen at 12:25 a.m., saying it had called 911 six times before getting through to NORCOM. NORCOM immediately contacted CenturyLink, which advised it was not aware of a problem. NORCOM subsequently received another call from a citizen reporting the same problem. CenturyLink then opened a trouble ticket at 12:45 a.m.

Communications Plan
In response to a staff data request, CenturyLink submitted a confidential communications plan entitled, "Local Outage Procedures – Market Development Managers & Corporate Communications" (communications plan), which describes guidelines for personnel designated to speak with the media, information to be collected, and guidelines for external messaging. The document describes generic procedures that are not specific to Washington state or to this outage. Moreover, it is the same communications plan submitted to the commission by CenturyLink in response to the San Juan Islands data and service outage that occurred Nov. 5, 2013.

Staff's data request also asked if CenturyLink has a plan for communicating with stakeholders during future outages. CenturyLink submitted an undated, confidential document, entitled, "MDM Disaster Recovery Plan Checklist," which the company says reflects additional planning based on experience gained through the San Juan outage. Staff finds the undated checklist is also not specific to Washington.

Commission-Referred Consumer Complaints and Inquiries
Commission consumer protection staff did not receive any complaints related to the outage. Nineteen people requested to be notified of a future public hearing.

Public Safety and Homeland Security Bureau – Federal Communications Commission
On May 16, 2014, the FCC's Public Safety and Homeland Security Bureau released a Public Notice seeking comment on the effects of the outage. In response to the notice, the FCC received comments from King County E911, the Military Department, and the Pierce County Sheriff's Office expressing concern over the lack of communication by CenturyLink during the outage and immediately after the event.

Findings
Commission rules require that telecommunications companies take steps to minimize the effects of service failures, including the failures affecting 911 service, and report on them. WAC 480-120-412(2) requires telecommunication companies to notify the commission and any PSAP when a company receives notice of or detects a major outage as soon as possible. As reflected in the table on page 22, 51 PSAPs reported they did not learn of the 911 outage by CenturyLink. Staff finds 51 violations of WAC 480-120-412(2).

INVESTIGATION: FAILED CALLS TO EMERGENCY 911 SERVICES

CenturyLink reported to staff that the outage began at 11:54 p.m., PDT on April 9, and ended at 6:06 a.m., PDT on April 10, 2014. The total outage duration was six hours and 12 minutes. On May 30, 2014, in response to staff's data request, CenturyLink reported that 4,324 calls to 911 failed in Washington state. Staff's review of the data found the first reported failed call to 911 was documented at 12:50 a.m., on April 10, yet the outage was documented to have started at 11:54 p.m. on April 9. Staff contacted CenturyLink on Aug. 14, and asked if all the failed calls had been captured in the report. CenturyLink stated it would contact its 911 vendor to verify the number of failed calls in Washington.

On Aug. 19, CenturyLink responded to staff by email that CenturyLink's 911 vendor was going to "re-look" at data regarding failed calls and other information sources to reconcile the report.[25] CenturyLink submitted a supplemental response on Sept. 3, with an expanded list of failed calls to 911 by Washington residents. The number increased to 5,840.

Hundreds, and possibly thousands, of Washington state residents attempted to call 911 multiple times. Staff did not have adequate data from CenturyLink to determine an exact count of how many unique callers made multiple attempts to reach 911. Based on the failed-call data submitted by CenturyLink, staff determined that individual callers to 911 during the outage attempted to reach 911 between two and 65 times. CenturyLink customers were denied the most basic telecommunication service, which is an ability to dial 911 and have that call routed directly to public safety resources, as provided for in WAC 480-120-450(1).

Failed Calls – Impact to the Public's Safety

All 6.9 million residents of Washington state were potentially impacted by the April 9 and 10, 2014, statewide 911 outage because they lost the ability to access 911 in the event of an emergency. Following are a few of the publicized or PSAP-reported events that occurred during the outage:

> **Cowlitz Co. PSAP:** Reported an assault victim tried to call 911 from a wireless telephone after being assaulted by multiple subjects outside a tavern. He was not able to get through.
>
> **King Co. Valley COM Center**: Reported a person attempted to call 911 from a wireless telephone to report a vehicle crash. When the caller could not get through to 911, he went to a pay phone. The call was transferred through a relay service, which then connected the call to 911 dispatch.
>
> **Kitsap Co. PSAP:** Reported an aid car witnessed a motor vehicle collision. The collision victims reported they had tried to call 911 but were unable to get through. Kitsap Co. PSAP noted they documented the call at 12:19 a.m., and notified CenturyLink.

[25] See Attachment L for a copy of email from CenturyLink, dated Aug. 19, 2014.

Kitsap Co. PSAP: Reported Harrison Hospital called Kitsap's 10-digit number to report an overdose patient had attempted and failed to reach 911. The overdose call was reported as serious.

Mason Co. PSAP – A patient with chest pain called 911 but was not able to get through. The patient called the hospital, which in turn contacted the PSAP who dispatched Advanced Life Support. The medical issue was reported as serious.

Puyallup COM Center: Reported that at 1:39 a.m., a woman flagged down a police officer to report domestic violence. The woman reported to the officer that she was unable to get through to 911.

Snohomish Co. (SNOPAC): The PSAP received a call from Lifeline Medical Alert with a report that an individual had passed away at a private residence. Lifeline stated that the reporting party was unsuccessful in his attempts to call 911, so he activated the deceased's Lifeline Medical Alert.

Snohomish Co.: A *Daily Mail* article reported an intruder entered a woman's home in the early hours of April 10 and she made 37 attempts to reach 911. When the caller could not get through to 911, she used the Internet to locate a 10-digit law enforcement number to call. By the time the caller reached 911, the intruder had left her residence.[26]

Spokane: The *Spokesman Review* newspaper reported in the early morning hours on April 10, a propane tank in a truck with an overhead camper exploded in the Hillyard area of Spokane.[27] According to the news article, the blast shattered six windows of a nearby residence and the resident was hit in the face by the glass of a broken window. The explosion shook windows of homes as far as six blocks away. Debris was thrown onto rooftops and melted tar. Emergency services reported they did receive a 911 call and the fire department responded. Witnesses at the scene stated that they were not able to reach 911.

Whitman Co. PSAP: The PSAP reported that it was unaware of the outage when they received a call about a heart attack patient who called the fire department directly because he could not get through to 911.

Failed Calls – Callback Numbers

As the PSAPs became aware that 911 calls were not getting through, they began contacting various service providers for the callback numbers of the failed calls, which is their typical process. Because of the large volume of failed calls and in order to minimize the number of requests for numbers of failed calls from multiple PSAPs, King County requested the Military Department assist by coordinating between the PSAPs and service providers.

[26] See Appendix M for copy of article related to a woman's failed 911 calls who had an intruder enter her home.
[27] See Appendix N for a copy of *The Spokesman Review* article related to truck explosion.

On April 16, six days after the 911 outage, CenturyLink, on its own initiative, provided the Military Department with a list of failed calls. The failed calls list identified landline callers by the automatic number identification (ANI), or in other words, the actual telephone number. Wireless callers were identified on the failed calls list by an automatically assigned pseudo automatic number identification (pANI). This is important flaw, because without the actual telephone numbers of wireless callers, the PSAPs could not conduct welfare checks on the Washington residents whose calls to 911 failed, creating another layer of serious risk to public safety.

As an example, a Sprint wireless customer attempted to call 911 a total of 37 times in the early hours of April 10. Staff contacted this wireless customer and was provided the actual wireless telephone number used to call 911. Staff searched the telephone numbers on the failed calls list and could not locate this particular telephone number. Because a different pANI was assigned every time this Sprint customer attempted to reach 911, each of the 37 calls appeared as a different telephone number.

On April 16, the Military Department forwarded the pANIs from the CenturyLink list of failed calls to the appropriate service providers, and requested the actual callback numbers. The request for pANIs from service-provider, Cricket, was sent on April 17. The responses from the service providers follows:

- Sprint refused to provide ANIs without a court order;
- T-Mobile responded April 17;
- US Cellular (through CenturyLink's 911 vendor) responded April 17;
- ATT responded April 18;
- Cricket responded April 23; and
- Verizon responded April 23.

Staff found that there is no statewide PSAP policy that addresses how or when callbacks on failed calls should be made; each PSAP develops its own guidelines. Many PSAPs do attempt to obtain the callback numbers to perform welfare checks on missed calls, as demonstrated by Thurston 911 Communications' (TCOMM911), which responded to an FCC inquiry into the circumstances of the 911 outage (PS Docket 14-72) as follows:

> "TCOMM 911 went to great lengths to determine how many 911 calls were made and not answered during the outage. Any dropped call or missed call known to the center required a call back and contact to determine if there was still an emergency response need. PSAPs rely on the carriers to to provide the data necessary to perform the follow up after a system-wide 911 outage. Delivery of actionable data to the PSAPs was not timely by any carrier. The first actionable data to the PSAPs was not timely by any carrier. The first actionable data was received over 10 days following the event, and one carrier, Sprint, refused to provide any data on the failed calls for follow-up."

The earliest date the PSAPs received ANIs for wireless callers was April 17, seven days from April 10, the date the majority of call attempts to 911 failed. Due to the time lapse between the time of the failed call to 911 and the time the PSAPs had a callback number, many PSAPs chose not to make callbacks. In a telephone conversation on Sept. 30, 2014, Spokane County's operations manager told staff: "The decision was made not to callback failed calls because there was too much of a time lapse between the outage and receiving the data."

Sprint had 671 failed calls by wireless customers, but refused to release the ANIs to the Military Department or to the PSAPs. As part of this investigation, on July 31, 2014, staff requested Sprint provide the ANIs. On Aug. 6, 2014, Sprint refused the request via an email to staff:

> "As discussed, now that it has been some time since the apparent 911 call attempts and there is no demonstrated reason to consider these exigent circumstances, Sprint has concerns with providing telephone numbers assigned to our subscribers absent a valid, written legal request, such as a subpoena or court order. Another possible approach would be to seek affirmative consent from each of the subscribers identified in your spreadsheet, but logistically, that might be a difficult and time-consuming effort and may ultimately yield only a partial result. We would also expect any information provided to you to be accorded confidential treatment and therefore it would need to fall under an exception to your state's applicable FOIA laws."

The above statement is notable because Sprint suggested contacting each of the customers on the list of 671 failed calls to obtain individual consent; however, that is exactly the problem. There was no way to contact the subscribers because the telephone numbers are pseudo-numbers. There was also no way to determine by the pANIs how many of the 671 calls were actually multiple attempts by a unique user to reach 911. The PSAPs could not make welfare checks on callers because they were not provided the actual telephone numbers.

On Sept. 11, 2014, one known caller to 911 during the outage authorized Sprint to release all call information to staff. Sprint released the information on Sept. 19, 2014.

Staff finds that the delays or inability of the PSAPs to receive critical callback information put the public at serious risk. Staff finds there is a gap in the process for PSAPs to receive critical callback numbers in a timely way, if at all. Staff is not aware of any requirement for CenturyLink or any service provider to provide the callback numbers. Due the inability of the PSAPs to make timely checks on failed 911 calls, it is not possible to further gauge the impact to the public.

Findings

The full impact of this outage failure will never be known. However, the safety of Washington residents was severely threatened and loss of life could have occurred as a result of this statewide 911 outage. CenturyLink did not provide its customers the most basic telecommunication service, which is an ability to dial 911 and have that call routed directly to public safety resources, as provided for in WAC 480-120-450(1). Staff finds 5,840 violations of WAC 480-120-450(1).

INVESTIGATION: RESPONSES TO DATA REQUESTS

On April 30, 2014, staff requested the following information related to the statewide 911 outage in Washington. Requests for data from the commission's Consumer Protection Section are designated with a "CP" identifier:

CP1. The number of affected customers, identified by customer type (commercial or residential), and CenturyLink services affected.
CP2. A chronology of all internal communications related to the outages, including summaries of phone calls and copies of any emails or other written correspondence.
CP3. A chronology of all communications with stakeholders related to the outages (such as commission staff, other federal, state, county, and local governments), including summaries of phone calls and copies of any emails or other written correspondence.
CP4. A chronology of service restoral by location, number of customers, and service type.
CP5. At the time of the outage, did CenturyLink have a communication plan in place? If so, please provide a copy.
CP6. Does CenturyLink have a plan for communicating with stakeholders during future outages? If so, please provide a copy.
CP7. Please provide a summary of any credits for the outages that were/will be provided.

Staff requested CenturyLink respond to the data request no later than May 14, 2014. CenturyLink did not respond by the requested date. Staff contacted CenturyLink on May 15, and granted an extension for the response through May 30, 2014.

RCW 80.04.380 requires regulated companies to comply with every requirement or direction made by the commission. Following is a summary of CenturyLink's responses to the data requests

CP1: CenturyLink did not respond to the request for a count of all customers affected by the outage, nor were the customers identified as residential or commercial. In a July 17 telephone conversation, staff requested CenturyLink respond fully to the data request. CenturyLink submitted a supplemental response on July 24. CenturyLink's original response to Item CP1 violated RCW 80.04.380 because it was incomplete. A modified response was submitted on July 24, 2014, 54 days after the May 30, 2014, due date, which constitutes 54 violations of RCW 80.04.380.

CP2 and CP3: CenturyLink objected to these requests as overbroad and unduly burdensome; however, staff accepted a response made to RS-3 and the associated attachments.

CP4: CenturyLink did not fully respond to this request. Staff requested a chronology of service restoral by location, number of customers, and service type. CenturyLink's response provided only the outage start and end times and duration of the event. The response did not reference restoral times by location, number of customers and service type. CenturyLink's incomplete response to Item CP4 violates RCW 80.04.380. Staff finds one violation of RCW 80.04.380.

CP5 and CP6: Responses were timely.

CP7: CenturyLink responded that the issue of credits was under review and would supplement this response as decisions are made and more information becomes available. As of the date of this investigation, staff has still not received supplemental information related to this request.

Findings

Staff finds 55 violations of RCW 80.04.380. CenturyLink is notified that it must timely and fully respond to staff's data requests, or request an extension prior to the due date. Staff considers this technical assistance and future violations may result in enforcement action.

RECOMMENDATIONS

Staff's investigation finds that CenturyLink's 911 system failed due to a foreseeable and preventable technical error and related deficiencies. As a result, the residents of Washington state lost access to 911 service and could not call for emergency assistance using 911 for more than six hours. Staff believes that the severity of the outage and the risk it posed to the public warrants a significant penalty.

Staff typically recommends a "per violation" penalty against a regulated company where the violations result in serious consumer harm; for repeat violations of a rule after the company receives technical assistance; or for intentional violations of commission laws or rules.While staff could recommend penalties of up to $1,000 per violation, we believe to do so in this instance would be unduly punitive.

Per the *Enforcement Policy of the Washington Utilities and Transportation Commission* (Docket A-120061), commission staff considered the following factors to determine the recommended penalty amount:

1. **How serious or harmful the violation is to the public.**
   The statewide 911 outage that occurred April 9 and 10, 2014, stretched over a six hour period. In commission staff's experience, the event was unprecedented in both its scope and duration. Every person in Washington was affected because the ability for anyone to access 911 was almost non-existent. As well, the average person does not know the 10-digit number needed to reach first responder if 911 is not available. Not being able to reach help by calling 911 is a serious and potentially fatal event. In the case of this particular outage, the potential impact was mitigated only by the fact that no major natural or human-caused disasters or incidents occurred during the timeframe of the outage.

   It will likely never be known the true extent of the harm to the public. Thousands of callers reached out for help and did not receive it. CenturyLink failed to ensure that the 911 system was fully operational and all possible backup systems were operational.

2. **Whether the violation is intentional.**
   Although the outage itself was unintentional, the evidence supports a finding that it was foreseeable and preventable. CenturyLink failed to ensure that its vendor successfully configured its system to ensure all 911 calls were routed as required. The fact that the call counter reached an arbitrary limit of 40 million calls should have been known well in advance and procedures should have been in place to increase the call capacity as necessary. When the calls to 911 were not being routed an alarm activated, notifying technicians of the error. The alert message was not understood by employees and they were unaware of the significance of this failure.

   Staff also believes the evidence supports a finding that while CenturyLink's poor communication with commission staff, WMS, PSAPs, and its customers may have been unintentional, it was avoidable. The company knew, or should have known, that such an outage was inevitable and therefore should have had procedures in place for notifying

regulators and other stakeholders about the nature and extent of the outage.

This is the second time in little more than one year that staff has found CenturyLink's external communications lacking. Staff's investigation found that this was also a key failure by the company during its 10-day 2013 service outage in San Juan County.

3. **Whether the company self-reported the violation.**
CenturyLink's first notification to the commission about the 911 outage was at 6:24 a.m., on April 10, 2014, through an outage report sent to the commission's telecom outage email address. The outage report noted that the outage start time was 4:45 a.m., on April 10 and the reason for the outage notification was listed as multiple PSAPs reporting no 911 service. CenturyLink reported the location of the outage was Castle Rock, WA. This message was received 18 minutes after the outage had been resolved.

CenturyLink followed up with another outage report to the commission's telecom outage email address at 8:27 a.m., on April 10. The reason for the outage report was noted as "All Washington offices could not deliver 911 calls to the PSAPs." The location of the outage was all of Washington state.

Commission staff contacted CenturyLink by telephone at approximately 8:30 a.m., on April 10, to ask about the scope of the outage. This was the first direct contact between CenturyLink and the commission.

4. **Whether the company was cooperative and responsive.**
The company was cooperative and generally responsive throughout the investigation although some of the data request responses were incomplete and staff had to resubmit requests for data.

5. **The number of violations and the number of customers affected.**
Every Washington resident was affected by this outage, whether or not he or she was a customer of CenturyLink. Staff found 5,840 attempted calls to 911 failed during the outage. Without the actual telephone number of every caller, it is impossible to know how many different callers attempted to call 911 during the outage. Many of the calls were made by the same person; however, each and every call was critical whether the caller attempted to call one time or more.

6. **The likelihood of recurrence.**
Unfortunately, another 911 outage is possible. Staff believes that CenturyLink has taken this outage seriously and has outlined procedural changes to reduce the possibility of a future widespread system outage. This outage was a result of poorly designed infrastructure that did not have adequate alert messages for company vendor staff to recognize the 911 calls were not being routed.

The company's inability to communicate effectively about a serious outage to its customers, the PSAPs, and the public is likely to recur without changes in procedures.

7. **The company's past performance regarding compliance, violations and penalties.**
   In August 2008, staff reviewed 212 commission-referred consumer complaints filed against Qwest (now CenturyLink) between Jan. 1 and June 30, 2008, to determine Qwest's compliance with rules and laws enforced by the commission. Staff found that Qwest violated 11 consumer protection laws and rules. Staff provided Qwest with a copy of the investigation report and met with company representatives to discuss the findings and provide technical assistance.

   Staff performed a follow-up investigation in March 2010, using 102 consumer complaints filed against Qwest between March 1 and June 30, 2009. Despite the company's assurance of future compliance and the ongoing technical assistance provided through the commission's consumer complaint process, staff found violations of 10 statues and rules. Staff recommended the commission issue a formal complaint against Qwest for 69 violations of laws and rules enforced by the commission, and recommended a penalty of $69,000.

   In March 2014, staff performed a subsequent investigation reviewing 144 consumer complaints filed against Qwest and CenturyLink from Sept. 1, 2011, to Aug. 31, 2012. Staff found several repeat violations, and recommended the commission issue a formal complaint against the company and impose penalties of up to $313,000.

   In August 2014, staff released its investigative report on CenturyLink's November 2013 voice and data outage in the San Juan Islands. Staff recommended the commission order more than $170,000 in penalties.

8. **The company's existing compliance program.**
   Staff is not aware of any existing compliance program.

9. **The size of the company.**
   The company reported total intrastate operating revenues of $475,609,089 in 2013**.**

Penalty Recommendation

Staff recommends the commission issue a formal complaint against CenturyLink and assess a penalty of up to $2,932,750 for 11,731 violations of commission laws and rules, as follows:

- Up to $250 for each of 5,840 violations of RCW 80.36.080 for system errors resulting in a failure of of calls to route to 911, as required, for a potential penalty of $1,460,000.
- Up to $250 for each of 5,840 violations of WAC 480-120-450(1) for failed calls to 911, for a potential penalty of $1,460,000.
- Up to $100 for each of 51 violations of WAC 480-120-412(2) for failing to promptly notify PSAPs of a major outage, for a potential penalty of $12,750.

Technical Recommendations

Staff recommends the commission require CenturyLink implement the following safeguards to assure reliability, availability, and survivability of the network in order to prevent future 911 outages:

- Distribute Washington primary PSAP functionality and 911 traffic more equally between the Colorado and Florida ECMCs to reduce risk of another statewide outage. In consultation with staff, establish a deadline for completion of this recommendation and submit quarterly status reports until completed.
- Provide a detailed corrective action report of work implemented during and after the April 2014, outage and present those findings to the commission at an Open Meeting in 2015. In consultation with staff establish completion dates for each staff recommendation.
- Submit quarterly status reports until all recommendations have been completed.
- Report to commission staff all 911 emergency system network outages in every state the company provides such services within 24 hours of the outage. CenturyLink will also provide staff a copy of the report sent to regulatory authority describing the cause of the outage and actions taken to restore 911 service in that state.
- Until all Washington PSAP's have completed the transition to NG911[28], CenturyLink will provide the following information to the commission:
  - Quarterly reports on the PSAP Trunk Member (PTM) threshold counter that includes the maximum number of messages the counter can process, the frequency of how many times the counter is manually reviewed (e.g., daily, weekly, monthly) and the counters value at the end of each quarter.
  - Quarterly corrective action progress reports.
  - Quarterly IP transition status reports.
  - Annual status reports that describe in detail any major enhancements, audits and results[29] to all components of the state 911 network and also submit annual audits pertaining to network design.[30]

Staff acknowledges that no amount of penalties and reports will guarantee absolutely that another 911 outage will be prevented but believes the penalties will provide a proper incentive to CenturyLink to carry out its public safety responsibilities and ensure appropriate monitoring of its vendors involved with any component of Washington's 911 system. The recommended reporting requirements would provide the commission with periodic information to proactively review actions and changes CenturyLink undertakes to the state's 911 system. Additionally, Staff

[28] Since the April outage, eight PSAPs have converted to NG911, three additional PSAPs will convert in 2015, and the remaining PSAPs are scheduled to convert in 2016 or later.

[29] Specifically, Staff recommends that CenturyLink be required to provide Staff with FCC Communications Security Reliability and Interoperability Council (CSRIC) Best Practice Network Diversity Audit results.

[30] "Network Operators and Public Safety should periodically audit the physical and logical diversity called for by network design of their network segment(s) and take appropriate measures as needed" in Washington state. (Reference CSRIC II Working Group 6: Best Practice Implementation's Final Report). http://www.fcc.gov/encyclopedia/communications-security-reliability-and-interoperability-council-ii CSRIC Best Practice number 9-9-0532 as a recommended means to improve network reliability. In addition, the FCC recently adopted a certification process in its 911 Reliability Report and Order that will require "Covered 911 Service Providers" like CenturyLink to conduct physical diversity audits of their "Critical 911 Circuits" on an annual basis.

recommends that CenturyLink closely review this report and the violations cited herein, which constitute technical assistance. Future violations will result in additional enforcement action.

APPENDIX A

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Public Safety and Homeland Security	)	PS Docket No. 14-72
Bureau Inquiry into Circumstances	)	
of Major 911 Outage Centered in	)	
Washington State on April 9-10, 2014	)	

REPLY COMMENTS OF THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

The Washington Utilities and Transportation Commission ("WUTC")[1] submits the following reply comments in response to the Federal Communications Commission's ("Commission") Public Notice seeking comment in the matter of the circumstances of a major 911 outage centered in the state of Washington on April 9 and 10, 2014.[2]

On April 10, 2014, between approximately midnight and 8:00 a.m., the CenturyLink Emergency Services Internet Protocol Network in the state of Washington[3] experienced a complex outage caused by a technical error in a call router, which prevented the system from properly processing calls. During the outage period, approximately 770 calls to 911 were delivered to the Public Safety Answering Points (PSAPs) and approximately 4,500 calls to 911 failed in the state of Washington.

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[1] The WUTC has authority to "participate in proceedings before federal administrative agencies in which there is at issue the authority, rates or practices for transportation or utility services affecting the interests of the State of Washington, its businesses and general public." Wash. Rev. Code § 80.01.075.

[2] *Public Safety and Homeland Security Bureau Inquiry Into Circumstances of Major 911 Outage Centered in Washington State on April 9-10, 2014*, PS Docket No 14-72, Public Notice, DA 14-676 (rel. May 16, 2014).

[3] In March 2012, 911 service in the state transitioned from a legacy 911 system to the CenturyLink Emergency Services Internet Protocol Network ("ESINet") product.

APPENDIX A (continued)

The WUTC has jurisdiction over the rates, services, facilities, and practices of telecommunications companies operating within the state of Washington.[4] CenturyLink provides facilities for 911 services throughout the state. Although the WUTC has deregulated many of CenturyLink's services in Washington because they are competitive in nature, 911 services are not treated as competitive and remain in CenturyLink's tariff.[5] The WUTC accordingly reviews tariffs that CenturyLink files with the WUTC for service over dedicated 911 facilities and regulates the service CenturyLink provides under those tariffs. In addition to reviewing the tariffs offering 911 services, the WUTC regulates service quality,[6] requires reporting during major outages,[7] regulates the E-911 obligations of local exchange companies,[8] and mandates compliance with network performance standards that include specific requirements for E-911 facilities.[9] When the WUTC finds that a telecommunications company has violated laws or rules enforced by the WUTC, the WUTC may take enforcement action, including assessing penalties.[10]

The WUTC also plays a role in the funding of emergency services. State law requires telecommunications carriers to collect an E-911 excise tax from their customers to fund emergency services.[11] Under this law, the WUTC is tasked with setting annually the E-911 excise tax level.[12]

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[4] Wash. Rev. Code § 80.01.040.

[5] *In the Matter of the Petition of the CenturyLink Companies – Qwest Corporation; CenturyTel of Washington;* CenturyTel *of Inter Island; CenturyTel of Cowiche; and United Telephone Company of the Northwest, to be Regulated Under an Alternative Form of Regulation Pursuant to RCW 80.36.135*, WUTC Docket UT-130477, Order 04, Final Order Approving Settlement Agreements and Establishing Alternative Form of Regulation (Jan. 9, 2014), ¶¶ 44 & 83.

[6] *E.g.*, Wash. Rev. Code § 480-120-439.

[7] Wash. Admin. Code § 480-120-412.

[8] Wash. Admin. Code § 480-120-450.

[9] Wash. Admin. Code § 480-120-401.

[10] *E.g.*, Wash. Rev. Code § 80.04.380 and Wash. Rev. Code § 80.04.405.

[11] Wash. Rev. Code § 82.14B.030.

[12] The current E-911 excise tax is twenty-five cents per month per line. *In the Matter of Determining the Enhanced 911 Excise Tax*, WUTC Docket UT-131629, Order 01, Order Determining the State Enhanced 911 Excise Tax (Oct. 10, 2013).

APPENDIX A (continued)

On April 10, 2014, the WUTC opened an investigation into the April E-911 outage in Washington.[13] The WUTC investigation encompasses the cause of the outage, CenturyLink's emergency preparedness and response, restoration efforts, and communication with the public in the state of Washington. In the course of its investigation, WUTC staff has been working closely with the staff of the Washington State Military Department ("Military Department") and the Commission staff assigned to the Commission Inquiry.

CenturyLink filed comments on June 16, 2014, in this Commission proceeding. At this time, because those comments contain factual assertions that are at issue in the WUTC investigation the WUTC cannot reply to them. We intend to address them in our ongoing proceeding, which we expect to complete in August, 2014. At that time, the WUTC will make its findings available to the Commission and the public. The WUTC appreciates the attention the Commission is giving to this important matter. The WUTC intends to continue to work closely with Commission staff and the Military Department to address the critical issues of reliability and resiliency, network operations, and governance issues of Washington State's next-generation 911 network.

Respectfully submitted this 26th day of June 2014,

Steven V. King
Executive Director and Secretary
Washington Utilities and Transportation Commission
1300 S. Evergreen Park Dr. S.W.
P.O. Box 47250
Olympia, WA 98504-7250

APPENDIX B

Docket UT-140597
CenturyLink's Responses to Data Requests 1-53
May 30, 2014

RS-11. What was the cause(s) of the system failure on April 10, 2014 related to 911 services provided by CenturyLink and/or Company vendors in Washington? A. Please identify the cause(s) separately for CenturyLink or third party vendor (Parties).

Response: The cause of the failure was related to services provided by Intrado.

Incident Synopsis: Intrado's PSAP Trunk Member (PTM) threshold counter in the Englewood, Colorado Emergency Call Management Complex (ECMC) exceeded its administered threshold, resulting in the system's inability to assign trunks for PSAP CAMA call delivery via the Englewood ECMC.

Incident Root Cause: Intrado's PTM threshold counter in the Englewood, Colorado ECMC exceeded its administered threshold. Under normal operations for calls to PSAP CAMA destinations, this counter is incremented when a PSAP CAMA trunk is assigned for call delivery and is used as a unique identifier within the geographically distributed databases. When the threshold counter reached capacity, no additional database entries to reserve a PSAP CAMA trunk could be created, resulting in the inability to assign a trunk for call delivery.

The system is geographically redundant and is designed to failover between core processing sites. This situation occurred at a point in the application logic that was not designed to perform any automated corrective actions. The situation at the Englewood ECMC did not affect the processing at Intrado's Miami ECMC. Intrado initiated manual failover of all call processing to Miami, Florida ECMC when the issue was diagnosed.

Respondent: Intrado

APPENDIX C

UT-140597
RESPONSES TO UTC DATA REQUESTS 70-80
September 12, 2014

70. Was the Englewood, Colorado ECMC threshold counter upgraded or reset at any point prior to April 9th or 10th, 2014? If the answer is yes, please provide the following:

a. The date the threshold counter was reset.
b. The reason the counter was reset on that date.
c. What was the numerical value on the counter before and after it was reset?

Intrado Response:
Undetermined whether or when the counter value was reset. The upgrade scripts that modify the counter did not log the existing value or how the value was modified.

a. Undetermined whether the counter was reset at any point. However, all indications suggest that the counter may not have been reset to a lower number prior to April 2014.

b. The database upgrade script that resets the database PTM counter is run for every system upgrade but may not have affected the counter value. The counter value range was extended 1000 fold on April 10, 2014, as a corrective action to the incident. The range is now at 20 billion and is actively monitored to ensure that it is not approaching a critical value.

c. Undetermined. It does not appear that the counter was reset to a lower number based upon the design of the scripts.

APPENDIX D

Docket UT-140597
CenturyLink's Responses to Data Requests 1-53
May 30, 2014

RS-49. Please explain the following for Intrado's 911 data base monitoring alarm system:

a. How the alarms are prioritized in terms of importance?

Response: Alarms are categorized from Minor to Critical, with 4 levels of categorization based on severity of the alarm.

b. How do Intrado employees monitor the alarms?

Response: Intrado's NOC monitors the alarms in real-time through a direct interface to Intrado's monitoring and alarming system.

c. When do Intrado employees notify CenturyLink personnel of system alarms?

Response: In accordance with our contract provisions Intrado's NOC notifies CenturyLink NOC personnel of a system alarm when it is identified as impacting CenturyLink 9-1-1 services; or when a CenturyLink investigation is required, as in a transport issue within the CenturyLink network.

d. Why did a threshold counter error go unnoticed by Intrado personnel before the system failed or immediately after the counter failed?

Response: The alarm for threshold counter error was not specific, and not at the appropriate severity. Since the incident, an enhanced alarming system has been implemented with a specific, identifiable alarm for when the threshold is reached.

Respondent: Intrado

APPENDIX E

Docket UT-140597
Data Request CenturyLink Next Generation 911 System Outage
August 11, 2014

RS-69

In response to staff's data request RS-49, Intrado states that the company categorizes its alarms from Minor to Critical with 4 levels of categorization based on the severity of the alarm. Please answer the following:

a. Please provide the name of each level of categorization of the alarm.
RESPONSE:
Alarms are categorized based on 4 levels of severity: Critical, Major, Minor, and Warning.

Respondent: Intrado

b. Please describe the criteria the company uses to ascertain the category of the alarms.

RESPONSE:
The criteria that Intrado uses to ascertain the category of the alarms is:
- **Critical** – A condition exists that requires immediate attention and likely mitigation
- **Major** – A condition in which temporary system impact may exist. System is fully functional. Important information that requires action on all partial system impacts
- **Minor** – Alarm that is informational about the system. System is fully functional. A condition that reflects important information about non-critical elements or conditions within the solution.
- **Warning** – Informational message about a particular element within the system. System is fully functional.

Respondent: Intrado

c. What alarm category was given to the "threshold counter" before the 911 outage and what alarm category is assigned the present "threshold counter" today?

RESPONSE: A response to this request is still being prepared and will be provided as soon as it is complete.

Respondent: Intrado

SUPPLEMENTAL RESPONSE (8/11/14)

Before the 9-1-1 outage, the system did provide alarms; but these were generic in nature and did not specifically flag the threshold counter condition. Today, the threshold counter is set to use alarms in each of the four categories for this condition.

- We have established a Warning alarm to inform and alert the team should the counter reach a particular initial threshold.
- A Minor alarm has been established as a proactive alert in the event the counter should reach a threshold requiring proactive action.
- A Major alarm has been established for use when a threshold has been reached and action is necessary to prevent system impact.
- A Critical alarm has been established to immediately notify the support team and NOC that remediation is required and mitigation is essential.

Respondent: Intrado

APPENDIX F
RESPONSE TO RS-3
3.5

Statement Released 4/10

CenturyLink Statement: CenturyLink and Intrado, our vendor partner, are working together and are confident that the 9-1-1 system is fully operational, stable and working as designed.

Intrado provides 9-1-1 services to CenturyLink through its fully redundant 9-1-1 system. The service disruption was due to an isolated issue in Intrado's system that impaired call routing, which prevented the system from properly processing calls and launching their system's redundancy.

Intrado has done three things to ensure the same 9-1-1 outage will not occur:

1. Resolved a software issue that prevented the proper processing of the 9-1-1 calls
2. Added additional alarms and raised the visibility of the alarms within the operations control center and
3. Enhanced processes to ensure similar software issues do not occur

CenturyLink and Intrado place customer safety and reliable communications as top priorities and will continue to work together to ensure effective 9-1-1 communications.

Intrado plans to share with the Seattle AP reporter: The outage was due to an isolated issue in our system that impaired call routing.

Statements Released 4/14

CenturyLink Statement: Wash. – CenturyLink, Inc. (NYSE: CTL) On April 10, CenturyLink experienced a 911 outage in Washington. The outage was not caused by any failures or malfunctions of CenturyLink's network and was not related to any OpenSSL issues such as Heartbleed. The outage was due to a technical error in a third-party vendor's call router, which prevented the system from properly processing calls. CenturyLink and its vendor partner have taken steps to implement an enhanced monitoring process and have addressed the router issue. Our 911 system has been returned to normal operations and we are confident these steps have addressed this issue.

Approximately 770 911 calls were completed and 4,500 failed between 12:36 a.m. PST and 6:26 a.m., when 911 service was fully restored. This occurred across 127 public safety answering points (PSAPs) in Washington; other PSAPs successfully rerouted calls.

"CenturyLink's top priority is customer safety and reliable communications," Brian Stading, Northwest Region President said. "We are working closely with our vendor partner to fully to understand this outage. At this time, we are confident that the 911 system is fully operational and stable."

Intrado: "Intrado has partnered with CenturyLink in the State of Washington for nearly 20 years to provide 9-1-1 services. Public and personal safety are at the heart of Intrado's business, and we take any service disruption very seriously. This service disruption was caused by an isolated system issue that was resolved on Thursday. The system is stable and continues to process 9-1-1 calls normally."

Many Thanks,

Meg Andrews
Marketing & Media Relations- Puget Sound Region
Voice: 206.733.5124 | Email: meg.andrews@centurylink.com | Follow: @centurylinkSEA

APPENDIX G

From: Regulatory.NEMC@CenturyLink.com
Sent: Thursday, April 10, 2014 6:24 AM
To: UTC DL Telecom-Outage
Subject: PUC_WA.041014.003_I

PUC Report

Report Number	WA.041014.003
Impacted Company	CenturyLink
Date and Time	10-APR-2014 04:45:00
TIMEZONE	PDT
For Questions Contact	Mark Reynolds 206 345 1568
Reason for Outage Notification	Multiple PSAPs reporting no 911 service.
Cause of Outage	
Location of Outage	CASTLE ROCK/WA
Exchange Name / Wire Center	CSRKWA01DS0
Expected Duration	10-APR-2014 09:00:00
Actual Duration	
Number of Customers/ Cable pair impacted	5000
Services Affected	911
Agencies Notified	
Significant Update	
Resolution	

--Disclaimer--

APPENDIX H

From: Regulatory.NEMC@CenturyLink.com [mailto:Regulatory.NEMC@CenturyLink.com]
Sent: Thursday, April 10, 2014 8:27 AM
To: UTC DL Telecom-Outage
Subject: PUC_WA.041014.003_Final

CenturyLink™
Stronger Connected™

PUC Report

Report Number	WA.041014.003
Impacted Company	CenturyLink
Date and Time	10-APR-2014 00:30:00
TIMEZONE	PDT
For Questions Contact	Mark Reynolds 206 345 1568
Reason for Outage Notification	All washington offices could not deliver 911 calls to the PSAP's
Cause of Outage	UNDER INVESTIGATION
Location of Outage	WASHINGTON STATE
Exchange Name / Wire Center	All
Expected Duration	10-APR-2014 09:00:00
Actual Duration	0005:56:00
Number of Customers/ Cable pair impacted	1355723
Services Affected	911
Agencies Notified	
Significant Update	
Resolution	Restored by vendor, RFO Under investigation

--Disclaimer--

APPENDIX I

CenturyLink
1600 7th Avenue, Room 1506
Seattle, Washington 98191
(206) 345-1568
Facsimile (206) 343-4040

Mark S. Reynolds
Northwest Region Vice President
Public Policy

Via E-mail and
Overnight Delivery

April 24, 2014

Mr. Steven V. King, Executive Director and Secretary
Washington Utilities & Transportation Commission
1300 S. Evergreen Park Drive SW
P.O. Box 47250
Olympia, WA 98504-7250

Re: Docket No. UT-140597
Major Outage Report - 04/10/2014 Next Generation 911 System Outage

Dear Mr. King,

The following information is being provided in response to CenturyLink's requirement to file a major outage report according to Washington Administrative Code (WAC) 480-120-439:

Overview

Between 11:45 p.m. (PST) on April 9th and 6:06 a.m. on April 10th, the Washington NG 911 system experienced an outage that was caused by a technical error in an Intrado call router which prevented the system from properly processing calls. During the outage period, approximately 770 911 calls completed and 4,500 failed. The outage occurred across 127 Public Safety Answering Points (PSAPs) in Washington; other PSAPs successfully rerouted calls. CenturyLink and Intrado have taken steps to implement an enhanced monitoring process and have addressed the router issue. At this point, CenturyLink's NG 911 system has returned to normal operations.

Specific Outage Information

1) **Date & Time Impact Started**: April 9, 2014 at 11:54 p.m. (PST)

APPENDIX I (continued)

2) **Date & Time Impact Stopped**: April 10, 2014 at 6:06 a.m. (PST)

3) **Duration of Impact**: Approximately 6 hours and 12 minutes

4) **Incident Synopsis:** Intrado's PSAP Trunk Member (PTM) threshold counter in the Englewood, Colorado Emergency Call Management Complex (ECMC) exceeded its administered threshold, resulting in the system's inability to assign trunks for PSAP CAMA call delivery via the Englewood ECMC.

5) **Incident Impacts:** During the time of impact, all calls routed through Intrado's Englewood ECMC to PSAP CAMA destinations were impacted, and callers experienced either Fast Busy or Ring No Answer. 4,452 CenturyLink calls in the states of Washington, Minnesota and North Carolina were impacted.

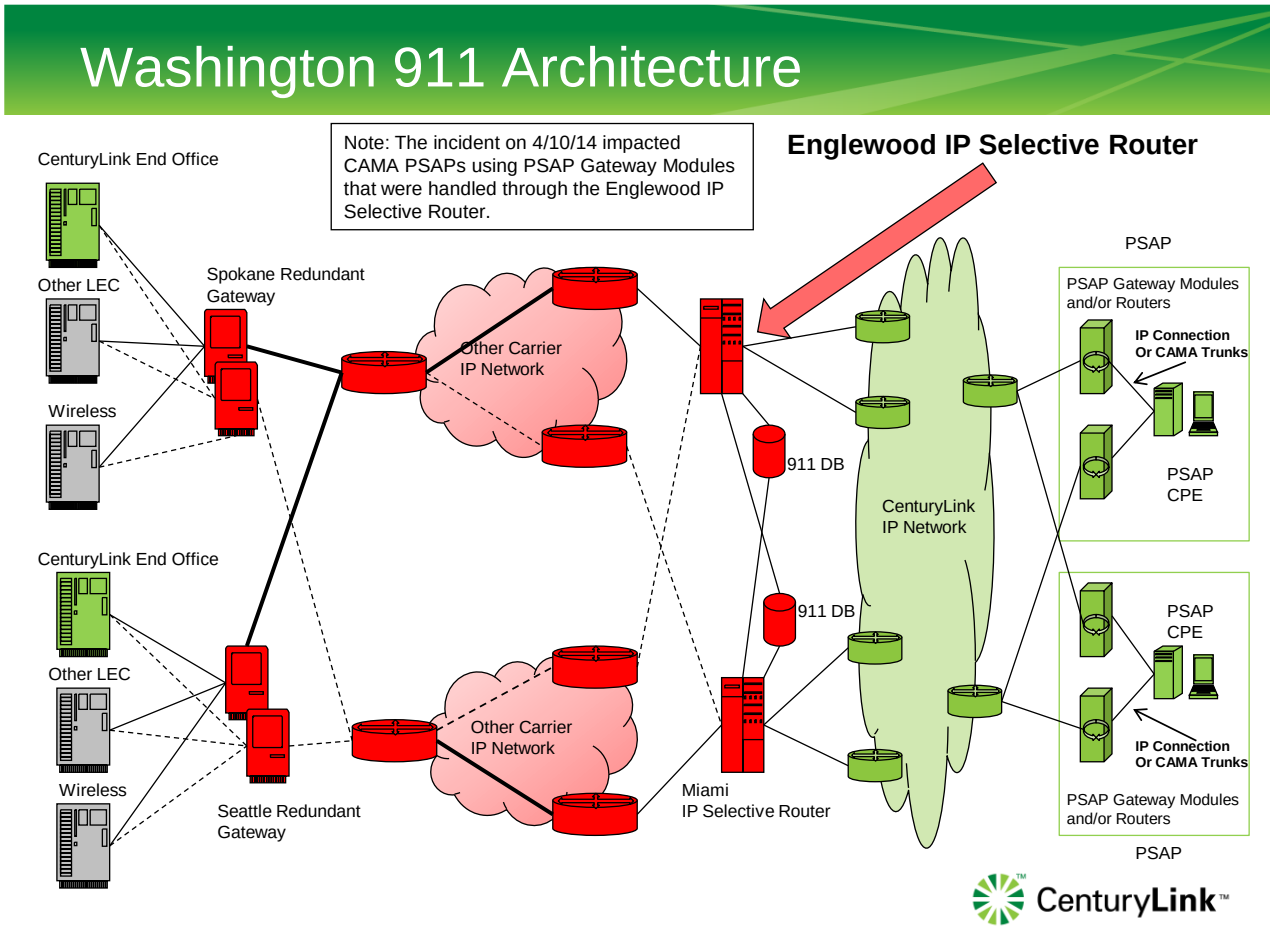
6) **Incident Root Cause:** Intrado's PTM threshold counter in the Englewood, Colorado ECMC exceeded its administered threshold. Under normal operations for calls to PSAP CAMA destinations, this counter is incremented when a PSAP CAMA trunk is assigned for call delivery and is used as a unique identifier within the geographically distributed databases.
    a. When the threshold counter reached capacity, no additional database entries to reserve a PSAP CAMA trunk could be created, resulting in the inability to assign a trunk for call delivery.
    b. The system is geographically redundant and is designed to failover between core processing sites. This situation occurred at a point in the application logic that was not designed to perform any automated corrective actions. The situation at the Englewood ECMC did not affect the processing at Intrado's Miami ECMC. Intrado initiated manual failover of all call processing to Miami, Florida ECMC when the issue was diagnosed.

7) Intrado Corrective Action(s):
    a. The PTM threshold has been increased for both ECMCs so that it is not theoretically possible to exhaust the threshold ranges.
    b. An enhanced alarming system has been implemented with a specific, identifiable alarm for when the PTM threshold is reached.
    c. Periodic manual checks of the counter are being performed.
    d. Intrado technical teams are actively engaged in an A9-1-1 architecture review.

8) Intrado/CenturyLink Joint Follow up Action(s):
    a. Network Operations Center (NOC) to NOC partnership session to work through NOC to NOC challenges and establish or clarify process changes.
    b. Joint review of ingress trunking configuration to distribution between ECMC Processing sites.

APPENDIX I (continued)

9) Diagram of the Washington Next Generation 911 network



10) Approved Media Statements & Talking Points

a. **<u>April 11, 2014 at 8:32 a.m. (PST):</u>**
CenturyLink experienced a service interruption in Washington and Oregon today. At this time, 911 services have been restored throughout both states.

The outages in WA and OR were isolated incidents:

- *In Oregon, the outage was caused by a maintenance issue that impacted approximately 16,000 people in Lincoln, Tillamook and Yamhill counties and was resolved by 3:25AM PST.*
- *At this time, the Washington outage is still being investigated for the root cause. CenturyLink services were restored at 6:45AM PST.*

CenturyLink continues to work with the 911 centers to ensure that all issues have been resolved.

b. **<u>April 11, 2014 at 12:47 p.m. (PST):</u>**
WA.041014.003 Customer Talking Points:

- *On 4/10/14 at 1:01 a.m. (PST), CenturyLink experienced a 911 service interruption in various states due to a vendor caused failure.*
- *CenturyLink services were restored at 6:26 a.m. (PST).*
- *The vendor is in the process of investigating the root cause.*
- *CenturyLink continues to work with the vendor to ensure that all issues have been resolved.*
- *Once the vendor completes their root cause analysis, CenturyLink will provide a formal reason for outage.*

c. April 14, 2014 at 4:42 p.m. (PST):

On April 10, CenturyLink experienced a 911 outage in Washington. The outage was not caused by any failures or malfunctions of CenturyLink's network and was not related to any OpenSSL issues such as Heartbleed. The outage was due to a technical error in a third-party vendor's call router, which prevented the system from properly processing calls. CenturyLink and its vendor partner have taken steps to implement an enhanced monitoring process and have addressed the router issue. Our 911 system has been returned to normal operations and we are confident these steps have addressed this issue.

Approximately 770 911 calls were completed and 4,500 failed between 12:36 a.m. PST and 6:26 a.m., when 911 service was fully restored. This occurred across 127 public safety answering points (PSAPs) in Washington; other PSAPs successfully rerouted calls.

"CenturyLink's top priority is customer safety and reliable communications," Brian Stading, Northwest Region President said. "We are working closely with our vendor partner to fully to understand this outage. At this time, we are confident that the 911 system is fully operational and stable."

***d.* April 15, 2014 at 7:16p.m. (PST):**

CenturyLink and Intrado, our vendor partner, are working together and are confident that the 9-1-1 system is fully operational, stable and working as designed.
Intrado provides 9-1-1 services to CenturyLink through its fully redundant 9-1-1 system. The service disruption was due to an isolated issue in Intrado's system that impaired call routing, which prevented the system from properly processing calls and launching their system's redundancy.

Intrado has done three things to ensure the same 9-1-1 outage will not occur:

1. *Resolved a software issue that prevented the proper processing of the 9-1-1 calls*
2. *Added additional alarms and raised the visibility of the alarms within the operations control center and*
3. *Enhanced processes to ensure similar software issues do not occur*

CenturyLink and Intrado place customer safety and reliable communications as top priorities and will continue to work together to ensure effective 9-1-1 communications.

If you have any questions regarding this report, please don't hesitate to call me.

Sincerely,

Mark S. Reynolds

APPENDIX J

PACIFIC COUNTY SHERIFF'S OFFICE
Sheriff Scott L. Johnson

Todd Fosse, *Undersheriff*
Stephanie Frits, *911 & Emergency Management Director*
Pat Matlock, *Chief Criminal Deputy*
Denise Rowlett, *Chief Deputy*

June 3, 2014

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554

RE: Comments Regarding the Washington State E9-1-1 Outage of April 10, 2014

Dear Ms. Dortch,

On the morning of Thursday, April 10, 2014 Pacific County Communications and other E9-1-1 centers in Washington State discovered that 911 lines were no longer functional largely by notification from the residential citizens who had been attempting contact. Further, as E9-1-1 centers in Washington State work closely together on a daily basis, additional contact and notification of the outage was initiated by telecommunicators dialing E9-1-1 center to E91-1-1 center via business lines. Testing of each area of responsibility ensued and it was quickly determined that the outage impact was statewide with the exception of two counties (Skamania County and Garfield County). Pacific County Communications immediately attempted to notify the network provider, CenturyLink, Network Operations Center.

The paragraph above is a simple summary of one portion of the eight hour E9-1-1 outage that demonstrates two serious concerns. The first was that CenturyLink and their contractor, Intrado, had no internal indication of an outage. Pacific County specifically contacted the CenturyLink Network Operations Center (NOC) which, after a 20 to 25 minute hold time, was unable to provide specific information about the issue(s). It is unknown how many Washington State E9-1-1 Centers called into the CenturyLink NOC by the time Pacific County reported however, by the time Pacific County reported, telecommunicators from Pacific County were aware of many (over six) counties that had also been affected. The number of counties reporting to the CenturyLink NOC should have triggered a significant alarm of some type. CenturyLink has subsequently stated that a call to the state service representative would have escalated the issue. This is not a workable solution, as one person cannot adequately manage communication with 60+ communications centers in the heat of the crisis. Washington State E9-1-1 Centers do not allow our telecommunicators to handle calls from 60+ individuals in crisis, all at the same time, nor do we expect CenturyLink to be able to adequately do so – either at the NOC or with the state service manager.

The problem that created the outage was identified, but pointed out clearly that true redundancy did not exist in the network as promised. The provision of true (not virtual) redundancy will be the best solution to the problem and will serve to negate the potential of future outages.

P.O. Box 27 · 300 Memorial Drive, South Bend, WA 98586 | Phone 360-875-9395 | Fax 360-875-9393
Pacific County is an Equal Opportunity Employer and Provider

APPENDIX J (continued)

Following the resolution of the immediate problem, Washington State counties requested that service providers (wireline and wireless) provide lists of callers who attempted to dial 9-1-1 during the time of the outage and were unsuccessful in contacting 9-1-1. This information was delivered piecemeal and in some cases as much as ten days after the fact, or not at all. This level of service is unacceptable and applies to all providers of E9-1-1 telecommunications service.

Since the outage, E911 Directors and Coordinators from all Washington State counties (including those not impacted) have been working in concert with CenturyLink and Intrado. CenturyLink and Intrado have determined the cause of the outage and explained the issue in detail. The cause of the outage is important, and a short-term fix has been implemented with long term changes being planned. In retrospect however, the cause of the outage is no longer the primary concern, but the issues of awareness, notification, and follow-up continue.

Pacific County Communications urges the FCC to consider the following in terms of the providers and contractors responsible for E9-1-1 service:

1. E9-1-1 failure awareness
2. E9-1-1 failure escalation criteria
3. E91-1- failure notice to served centers/areas
4. Redundancy in network provision
5. No single point of failure
6. Short turn-around of information requested following an outage
7. Follow-up to those who attempted to dial 9-1-1

Being among the first first responders, Pacific County Communications is seriously concerned and committed to reaching a final resolution regarding the cause of the outage, and to establish enhanced working relationships with the providers of the E9-1-1 network. Communication with the vendor, the state, and with other Washington State E9-1-1 centers will continue until such time as all questions are answered and/or resolved. The primary interest is in ensuring the E9-1-1 network is fully redundant with no single point of failure.

Sincerely,

Scott L. Johnson
SHERIFF

Stephanie Fritts
Director

APPENDIX K

TCOMM911
9-1-1
POLICE • FIRE • MEDICAL
Your Emergency — Our Priority

THURSTON 9-1-1 COMMUNICATIONS

2703 Pacific Avenue SE, Suite A
Olympia, WA 98501
Bus (360) 704-2730
Fax (360) 704/2723

July 2, 2014

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

RE: Inquiry into Circumstances of Major 911 Outage Centered in Washington State on April 9-10, 2014, *PS Docket No. 14-72*

Ms. Dortch:

On April 10, 2014 at approximately 01:00 in the morning the 911 system in Washington State was incapacitated. Thurston 9-1-1 Communications (TCOMM911 serving for Thurston County including the State Capitol) offers the following comments for the Commission's consideration in this matter:

1. The outage notification procedure/process was not initiated by CenturyLink or Intrado as it should have been. Outage notifications flowed from PSAP to PSAP, from PSAP to State E911 Office and from PSAP to CenturyLink and Intrado.
2. The network/database failure type did not generate a warning of significant value to require an immediate response from the Network Operations Center (NOC). The alert associated with causative factor for this near state-wide outage was a low-level warning, which in retrospect was not sufficient given the level of importance of the event to public safety.
3. Failover systems that manage the ESInet routing at CenturyLink and Intrado at the Colorado selective router failed to work as designed, negating the long time assurances by CenturyLink that this essential services network had NO single points of failure.

   TCOMM911 was able to route local 911 calls from the local CO via POTS lines which restored service by effectively routing Basic 9-1-1 outside of the MPLS ESInet. Even

when there was direct communication between local PSAPs and the NOC there was a refusal by Intrado to manually enable the failover procedure.

4. TCOMM911 went to great lengths to determine how many 911 calls were made and not answered during the outage. Any dropped call or missed call known to the center required a call back and contact to determine if there was still an emergency response need. PSAPs rely on the carriers to provide the data necessary to perform the follow up after a system-wide 911 outage. Delivery of actionable data to the PSAPs was not timely by any carrier. The first actionable data was received over 10 days following the event, and one carrier, Sprint, refused to provide any data on failed calls for follow up.

Summary

The 911 system has been in operation since 1970 in Washington State and there has never been a 911 system outage of this magnitude before. This event has heightened awareness at all levels in the system particularly as the nation's PSAPs are migrating to Next Generation 9-1-1 systems. Efforts underway by the vendors, the FCC, and State Utility regulators must result in system improvements so public safety is not compromised as it was in this outage.

Sincerely,

James Quackenbush

TCOMM911 Executive Director

APPENDIX L

Paul, Susie (UTC)

From: Anderl, Lisa <Lisa.Anderl@CenturyLink.com>
Sent: Tuesday, August 19, 2014 11:11 AM
To: Paul, Susie (UTC)
Subject: timestamp questions

Hi Susie - we've heard from Intrado that they are going to re-look at the data in the failed calls report and other records to reconcile the questions around whether the time stamps are correct, or if additional data should be included in the report. They say this effort will take some time, and I don't expect information until next week. Just wanted to keep you apprised. They are aware of the importance of this and are dedicating resources to it.

Let me know if you have other questions in the meantime.

Lisa

APPENDIX M

Mail Online

'I grabbed a knife... and went toward him': SEVEN HOUR 911 outage forces mother to face off with home intruder

- 911 services in Washington state cut off for seven hours last week
- Mother tried calling 37 times when man attempted to force his way in
- Alicia Cappola ended up threatening intruder with a knife
- Outage in Washington state blamed on a maintenance issue

By Sara Malm

Published: 08:21 EST, 16 April 2014 | Updated: 08:33 EST, 16 April 2014

A young mother has told of how she was forced to defend herself with a knife when a man tried to enter her home during a seven hour outage of 911 phone services in Washington State.

Alicia Cappola of Everett, Washington, was woken up by a man banging aggressively on her front door in the early hours of Thursday last week.

Worried about her two young twins asleep in the other room, she phoned 911, but despite trying 37 times she was unable to get thought to emergency services.

Ms Cappola kept trying 911, but explains that it continued to ring busy during the ten minutes the man was stood on her doorstep, attempting to get in.

She says she made 37 calls about the intruder breaking into her home, but in the end was forced to drive him away herself with a knife.

'I thought I had done something wrong because 911 is never busy and you know, tried it a couple more times,' she told Huffington Post.

'He stopped banging on the door after about ten minutes and ripped a screen off a window on my front porch and unfortunately the window was unlocked.

'Then he came through the window I grabbed a knife in my kitchen and went toward him and told him to get out.'

Attacked: Alicia Cappola of Everett, Washington, tried calling 911 more than 35 time, to alert police about the man trying to break into her home, but was forced to threaten the midnight intruder with a kitchen knife until he left

The seven hour outage of 911 phone services in Washington state was blamed on a maintenance issue (stock image)

The man, who according to Ms Cappola appeared to be under the influence of drugs and/or alcohol, left after she was able to convince him that this was not his home.

She was later able to get through to 911 services and police arrived around 3am – over an hour after the man began his attempt to get through her door.

CenturyLink says the seven-hour outage in Washington state 911 service early Thursday was caused by a technical error by a third-party vendor.

In a statement Friday, the company said the vendor worked with CenturyLink to resolve the issue 'as quickly as possible.'

The company said a similar, shorter 911 outage about the same time in Oregon affected about 16,000 phone customers in Lincoln, Tillamook and Yamhill counties.

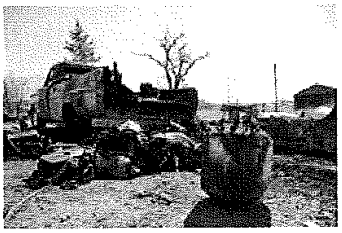
CenturyLink says that was caused by a maintenance issue.

THE SPOKESMAN-REVIEW April 10, 2014

Early-morning explosion rocks Hillyard

Jody Lawrence-Turner
The Spokesman-Review

Tags: explosion Hillyard truck fire

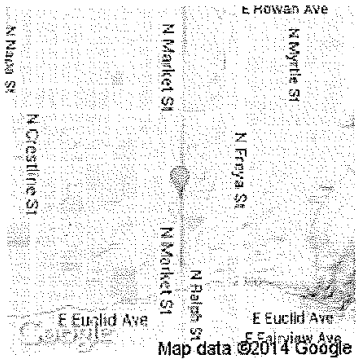


A propane tank sits outside a burned-out pickup truck after an explosion, April, 10, 2014, in northeast Spokane, Wash. The early-morning blast rocked the neighborhood and broke windows at the corner of Ferrell and Broad.

Bert Halquist heard firecracker-like pops outside his Hillyard window early Thursday, then started to doze back off.

The "concussion" explosion that followed, shattering six windows in his home, brought him to his feet.

A truck with an over-the-cab camper exploded about 12:45 a.m. The blast shook windows from as far as six blocks away and shot a fireball 20 feet high, witnesses said. Fire crews quickly put out the blaze.



Fire investigators arrived at the scene near the intersection of Freya Street and Broad Avenue around 8 a.m. The cause remains unknown.

Halquist noticed the truck on Broad about 5 a.m. Wednesday, but said he hadn't seen it before. He never saw the driver.

"I didn't know if it was a vagrant or what," he said. "If someone needed a place to sleep, I wasn't going to bother them."

Less than 24 hours later, "I saw light coming through the window... I was hit in the face with a piece of glass from one of the broken windows."

Debris flew as far as 100 feet, Halquist said. Spokane Fire Department firefighters told him not to touch any of it, but did not put up crime scene tape around the area, he said.

"The fire and explosion damage spread for a good 10-15 feet around the truck, with smoking trash everywhere," said Dan Gayle, a Spokesman-Review employee who lives six blocks away. "Firefighters extinguished flaming pieces of wood that were found on the roof of the nearby house, melting into the tar."

Hours later, witnesses said, police responded to the scene and arrested a man found digging through the truck's leftover debris.

A spokeswoman for Spokane County said that 911 received the emergency call for service and passed it along to Spokane fire and police departments and that the delay in police response reported by witnesses was not due to a region-wide 911 outage early today.

In a statement, 911 officials said they received a call regarding the camper fire at 12:46 a.m.

"The request for service was answered by 911 and processed and there was no impact or connection to the 911 outage," the statement said.

Gayle said witnesses at the scene said they had attempted to call 911, but could not get through.