Exh. RM-1TC
Docket UT-190209
Witness: RANDOM MILLS

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant, v.** **QWEST CORPORATION d/b/a CENTURYLINK QC,** **Respondent.**	**DOCKET UT-190209**

PREFILED RESPONSE TESTIMONY OF

RANDOM MILLS
CENTURYLINK

JANUARY 9, 2020

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I. INTRODUCTION

Q. Please state your name and job title.

A. Random Mills, Senior Voice Engineer

Q. By whom are you employed?

A. I am currently employed by Intrado Life & Safety, Inc. (fka West Safety Services, Inc.) ("Intrado") and have been an employee of Intrado since January 11th of 2016.

Q. Have you ever testified before the Washington Utilities and Transportation Commission (WUTC or Commission) or any other regulatory or administrative body?

A. I have not previously testified before the WUTC. However, I participated in the July 29, 2019 Settlement Conference with the WUTC staff, Public Counsel and CenturyLink to review and discuss this incident.

II. SCOPE AND PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to respond to some of the allegations in the complaint and in Staff's investigation report and testimony. Specifically, I will describe the nature of the 911 interruption, the cause of the interruption, and the circumstances the Commission should consider in determining whether to find violations or assess penalties.

III. DISCUSSION

Q. Please describe your work experience and current responsibilities at Intrado.

A. I have worked in the telecommunications industry for over 20 years; the last four years at Intrado. My current responsibilities at Intrado are to engineer new product lines for deployment on our 911 network, turn-up new 911 customers and interconnections, maintain circuits and equipment in the 911 call path (including replacing and upgrading equipment), and provide contracted support services to third-parties for 911 call issues.

Q. Please describe your familiarity with the 911 interruption that occurred on July 12, 2017.

A. I was personally involved in the maintenance event that led to this partial 911 interruption. I was the technician at Intrado that immediately noticed the incident and started reverting the changes back to resolve the 911 interruption. I also personally worked with our switch vendor to find a solution to the issue. Additionally, I participated in drafting the Reason for Outage (RFO) document provided to CenturyLink.

Q. Please generally describe the 911 interruption.

A. The 911 service interruption on July 12, 2017 occurred during a maintenance window that was part of a bigger project to upgrade Intrado's redundant emergency voice switches in Englewood, Colorado and Miami, Florida from [redacted] switches to [redacted] Servers [redacted]. My team implemented the switch upgrade project from late 2016 to late 2017 after a year of planning time. Voice traffic

was selectively migrated in segments during the project according to a detailed project plan. On the day of the interruption, Intrado was in the process of migrating a portion of the Washington 911 traffic to the new switch in Englewood, Colorado. Part of this migration process involved exporting the database with all trunk group information from our legacy switch to our new switch, which includes Ingress Trunk Group (ITG) flag information. During the insertion phase of the database transfer, a machine error resulted in ITG flags not uploading correctly to the provisioning database for the new Englewood switch for a small portion of the migrating trunk groups. The ITG flag is responsible for informing the Intrado Emergency Call Management Center (ECMC) where the 911 call originated and what default PSAP is associated with the connected trunk group. Without the ITG tag, the ECMC in Englewood, Colorado rejected certain 911 calls from affected trunk groups during the interruption on July 12, 2017 because the ECMC did not have the necessary routing information for delivery to the appropriate PSAPs. The affected 911 calls were returned to the originating service providers (OSPs) with a cause code 34, which translates to "no circuits available." At that point, the OSPs should have attempted to redirect the call to Intrado's alternate switch and ECMC in Miami, which was processing calls without issue during the 911 interruption. Our records indicate that over a thousand calls successfully re-routed to the Miami ECMC during the interruption.

Q. On page 4 of Exhibit RM-2C you note that all calls, including the 222 failed attempts, reached the selective router. Can you expand on that?

A. Yes, the 222 failed 911 call attempts did in fact reach the selective router. As mentioned above, the affected calls during the interruption on July 12, 2017 reached the ECMC.

Q. How do you know that?

A. We know this because the ECMC's call impact report shows that the affected 911 calls reached the ECMC in Englewood, Colorado for processing but were returned to the OSPs with a cause code 34 due to missing ITG tags. Had the calls failed to reach the ECMC, there would be no record of call setup at the Englewood switch and we would not have returned the affected calls to the OSPs with a cause code 34.

Q. Why is that important?

A. I understand from reading the complaint and investigation report that Staff claims CenturyLink violated a Commission rule requiring each LEC to deliver 911 calls to the selective router. The rule would be violated if calls did not reach the selective router, but the rule does not address a situation where the calls fail after reaching the selective router. As a simple matter of fact, all affected calls reached the selective router during the 911 interruption.

Q. You stated that the interruption occurred as a part of a maintenance event associated with a network upgrade project. Can you give us a little bit more detail on that?

A. As mentioned, the maintenance event leading to the 911 interruption on July 12, 2017 was part of a multi-stage, national implementation to upgrade Intrado's emergency switches over the course of a year-long period. This project was consistent with Intrado's goal to provide modern, adequate, sufficient and efficient 911 services and equipment to its customer CenturyLink by keeping Intrado's switching facilities in good condition and repair. Intrado implemented the switch upgrade project in a methodical fashion with voice traffic migrating to the new switch in incremental stages to minimize and isolate potential network impact. [redacted]

Prior to the migration of Washington traffic on July 12, 2017, we did not experience any service interruptions over the course of approximately eight months of migration work. Because of the large quantity of 911 calls in Washington, we intentionally planned the

Washington migration at the end of our project timeline after full development of our method of procedure. After the interruption on July 12, 2017, we did not experience any other issues during the switch migration project in Washington.

Q. How did this upgrade enhance the functioning of the 911 network?

A. The legacy [redacted] switches at Intrado were aging, end-of-life hardware with no future support available, whereas the new [redacted] switches are modern, fully supported hardware with more feature functionality and inherent resiliency. The [redacted] switches enhanced the reliability and resiliency of CenturyLink's 911 service via Intrado's 911 network. Additionally, the upgrade was a network necessity as the legacy [redacted] switches were end-of-life and needed to be replaced to ensure continued and prompt support and repair.

Q. Would it be accurate to say that this project was in furtherance of the goal of providing Washington consumers with modern, adequate, sufficient and efficient services?

A. Yes.

Q. How so?

A. The switch upgrade was designed to keep 911 switching facilities in good condition and repair, and provide the most technologically advanced method of delivering service.

Q. What if you had not performed the upgrade? Would the outage have occurred?

A. No, the service interruption occurred as a result of the switch upgrade project. However, I believe the switch upgrade was critical for 911 network reliability and carriers should not be discouraged from such upgrades by unreasonable regulatory enforcement and penalties. Had Intrado instead decided to maintain its legacy [redacted] switches, there would have been no ongoing manufacturer support for this dated and end-of-life equipment. Consequently, any issues with the [redacted] switches after end-of-life would have resulted in a significantly longer time of repair and outage restoration, which presents an indefensible threat of harm to public safety.

Q. You state that a machine error occurred. Can you please describe what a machine error is and state why Intrado and CenturyLink originally reported this as human error?

A. I believe human error was reported initially by mistake. As mentioned above, during the database import process, a machine error in our trunk provisioning server resulted in ITG flags not uploading correctly to the provisioning database for the new Englewood switch on a small portion of the migrating trunk groups. This loss of ITG flags resulted due to unforeseeable configuration errors on the provisioning server that maintains the trunk provisioning database. After discovery, we immediately corrected the issue and the migration proceeded without further 911 interruption.

Q. Was the upgrade project performed all at once or in phases?

A. As mentioned, the upgrade was a year-long project that Intrado rolled out in phases across the country.

Q. When did the Washington portion of the upgrade start?

A. It started in July 2017, near the end of our nationwide project.

Q. What precautions did Intrado take to ensure that a database error would not occur?

A. As mentioned [redacted] Traffic was selectively migrated in small segments during short, off-hour maintenance windows in the middle of the night in order to minimize and isolate potential network issues. As a result, the interruption was both relatively short in duration and scope, with prompt root cause identification and only a small number migrated trunks affected by the incident. I believe it is important to note that 911 service in Washington was never "hard down" during this partial interruption, meaning 911 calls continued to process during the incident. Intrado's alternate switch in Miami was also fully operational and capable of receiving re-routed calls by OSPs during the interruption, and did in fact successfully receive over a thousand such re-routed calls.

Additionally, we applied two-stage data validation prior to all traffic migration, which included a check of all trunk data from the legacy [redacted] switch and a check of all data

after database conversion. We also deployed network alarms during the switch project, which worked as designed by identifying the lack of ITG tags for the affected 911 calls during the interruption on July 12, 2017. After the outage, we added a third validation step of a final check of the trunk provisioning data after import into the new database.

Q. Did other similar errors occur over the course of the upgrade project?

A. No. Intrado is not aware of any other similar errors that occurred either before or after the interruption on July 12, 2017.

Q. Was this machine error a foreseeable event?

A. No. As mentioned, the interruption occurred due to the loss of ITG tags during the insertion phase of the database transfer from the legacy switch to the new switch. Up until the interruption, the project had progressed for approximately eight months across the country without incident. Based on all available information and experience, Intrado had no way to know that the provisioning server would fail to transmit all ITG tag data during the Washington migration on July 12, 2017.

Q. How did Intrado and CenturyLink respond to the service interruption?

A. As mentioned, our call failure alarms worked as designed and identified the lack of ITG tags on certain trunk groups during the interruption. Intrado responded promptly and internal fault management protocols were triggered. Intrado engaged in direct communication with CenturyLink – each company has a network operations center (NOC) and NOC-to-NOC communication was set up immediately. Intrado then forced a

busy condition on the affected trunks, which in turn forced 911 calls to automatically alternate route to our switch in Miami.

Q. Did Intrado or CenturyLink report this outage to the WUTC?

A. I believe that Mr. Grate addresses reporting from CenturyLink's perspective. As the vendor to CenturyLink in Washington, Intrado does not report incidents/outages to the Commission.

Q. Was additional corrective action taken after the fact of the service interruption?

A. Yes. As mentioned, after the service interruption, Intrado added a third validation check to the database migration process requiring our technicians to manually inspect all trunk group data after transfer completion by the provisioning server. Additionally, we implemented a policy of pre-notification of all maintenance events to CenturyLink regardless of severity level or disruption potential. We also upgraded the physical resources of our provisioning server and restricted user access to reduce the potential for unforeseen resource absorption.

Q. Staff contends that there is a likelihood of recurrence of this type of an outage. What is your reaction to that?

A. I disagree with that contention. The switch migration project was completed in late 2017, so there is no risk of reoccurrence. As mentioned, Intrado did not experience any similar incidents before or after the interruption on July 12, 2017. It also is my understanding

that Comtech is now the 911 provider in Washington, so there is no risk of another CenturyLink/Intrado incident due to a similar maintenance event.

Q. Do you think penalties are warranted in this circumstance?

A. No. I believe Intrado performed the switch upgrade project in a highly methodical and responsible manner. This work was in furtherance of the goal of providing Washington consumers with modern, adequate, sufficient and efficient services. Assessing penalties here will discourage carriers from maintaining and improving their networks.

One of Intrado's main goals as a 911-focused company is to maintain network reliability with modern equipment and to promptly replace all end-of-life equipment to ensure continued support. The repercussions of leaving aging equipment in place can drastically increase the probability and impact of a 911 service outage, which is why Intrado engaged in year-long project to upgrade our redundant emergency switches at great company time and expense.

In this particular case, the interruption on July 12, 2017 was caused by an unforeseeable machine error. Intrado applied pre-validation steps to the traffic migration, including an audit of the ITG tags. The pre-validation steps did not reveal any errors in the database export and transfer. As discussed, this was a very thorough upgrade process that Intrado planned and implemented over a two-year period (a year of planning and a year of implementing). I believe our detailed planning and mitigation measures, including

selective and segmented migration [redacted] and after-hours work over short periods of time, greatly reduced the impact and duration of this partial interruption. Also, our network and fault management process worked as designed. Our call alarms identified the deficient ITG tags and we promptly engaged our fault management process, including NOC-to-NOC communication with CenturyLink. After discovering the interruption, we forced a busy condition on the affected trunks, which in turn forced 911 calls to alternate route to our switch in Miami.

In addition, during the service interruption, we correctly returned the affected calls to the OSPs with the appropriate cause code 34. At that point, the OSPs were responsible for advance routing their end users 911 calls to our redundant switch in Miami, which was fully functional during the incident. Although certain carriers advance routed their calls as expected, others decided to retry their trunk groups to the affected Englewood switch. Intrado has no control over OSP carrier switch configuration or logic.

Intrado also implemented immediate remedial measures after the interruption to prevent recurrence. As mentioned, Intrado did not experience any similar incidents before or after the interruption on July 12, 2017. The switch migration project was completed in late 2017, so there is no risk of reoccurrence.

In sum, the circumstances of this service interruption demonstrate penalties are unwarranted.

Q. Does this conclude your testimony?

A. Yes.