

**April 2, 2019**

**Regular Meeting**

**Item # 7a**

**Board of Supervisors**

**Discussion of Phone,**

**Internet, and Power**

**Outage**

**(March 22-23)**



## Root Cause Analysis Mono County 911

Prepared by: Commercial Customer Support Center

Ticket Number: 2482228, MSI 404840  
Start Date/Time: 3/23/19 3:23 PM  
End Date/Time: 3/24/19 7:04 PM

The purpose of this document is to identify the root cause and key learning from an incident and use this information to significantly reduce or prevent the likelihood of a future occurrence.

### **Incident Description:**

This incident started with multiple trouble tickets to the Commercial Customer Support Center reporting voice, data or 911 service outages and were assigned to a technician for investigation.

Due to the scope and urgency of this outage the Network Operations and Incident Management Teams were immediately contacted. A crisis bridge with all necessary teams and immediate dispatch was put in place.

The field confirmed a fiber cut and started at the Helendale, CA Central Office to isolate it. A field technician did a physical inspection of the route but saw no obvious break. At this point they had 11 miles of open fiber and no reroute options available as cross connects could not be move without visibility to the break.

Construction crews and splicers had been standing by and began digging at the splice box as this cable is all direct buried and there were no above ground obvious signs of damage.

After exposing 900' of cable there was still no sign of the damage and the Advance IP Data Team confirmed there was no data reroute path available. Crews continued to expose fiber until they found the break and at approximately 1:19 PM EST 3/24 they had completed one end of the splice. Final location, splicing and testing was completed at 7:04 PM EST on 3/24.

### **Root Cause:**

The root cause was fiber damage burnt by power.

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**Final Remarks or Recommendations:**

Details of this incident have been provided to senior management for review of practices and procedures and initiate any needed changes or disciplinary actions as appropriate.

**Contributing factors to outage duration:**

- No external damage and all fiber was buried requiring extensive digging.
- Initial readings showed, 11 open fiber miles from Helendale to Boron and 22.7 fiber miles from Boron CA to Helendale.
- Original dig by hand was located at along Highway 395 4 miles North of Shadow Mountain Road
- Backhoe work was delayed waiting for location data of gas lines for safety concerns.

**Of Note:**

- There was a highway construction crew also working in the area at the junction of Highway 395 and 58.

**Diversity:**

Frontier's SS7 and 911 trunks are diversified over a radio system; however, at some point those links were patched over to only the fiber path - causing a diversity violation.

Because such a diversity violation escapes the visibility of our systems, restoration time was delayed.

We have reiterated the requirement to our Operations Team that any radio maintenance that requires creating a single-threaded scenario must include a temporary update to all records so restoring diversity post-maintenance will not be overlooked.

Also, our Transport Team has done their due diligence to make sure all records are correct and that our systems reflect the proper equipment and circuit inventories to raise diversity awareness.

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Information given in this document is referenced based on the timeline of events noted in Frontier's trouble ticketing system. All times listed are Eastern Standard Time.

Frontier continually reviews its overall processes for improvements to lower down times and minimize impact to our customers.

Periodic equipment malfunctions caused by normal use are addressed as trouble reports are received. Our routine maintenance helps mitigate service-impacting events but cannot prevent them altogether. As trouble reports are isolated to wiring or equipment, steps are taken to repair or replace as determined necessary.

**MONO COUNTY**  
**SHERIFF**  
*A Commitment to Community Safety and Service*



**Ingrid Braun**  
Sheriff-Coroner

**MONO COUNTY SHERIFF'S OFFICE**

**Phillip West**  
Undersheriff

**March 23/24, 2019 9-1-1 Outage**  
**Summary from Cal-OES**

Time Outage Started: 3/23/19 11:47 PST  
Time Outage Reported to CA 9-1-1 Branch: 3/23/19 12:30 PST  
Time Outage Cleared: 3/24/19 16:40 PST  
Total Outage Time: 28 hours 53 minutes

**Jurisdictions Affected:**

Bishop PD, Mono County SO, Inyo County SO, and Bishop CHP suffered a total SS7 isolation.

Ridgecrest PD, California City PD were able to forward their 9-1-1 calls to Kern County SO. Because they are in AT&T territory, they were only partially affected.

**Reason for Outage:** Damaged fiber. A 100-foot section of underground damaged fiber near Adelanto caused a total SS7 isolation.

- All telephone companies, wireless carriers, and VoIP phone providers use SS7 to transmit data.
- Depending on whether or not those companies have alternate lines available, this isolation would prevent their phone calls from getting through to the PSAP.
- Frontiers network allowed for Inyo County SO to continue to use their admin lines.
- Mono County SO was unable to do the same, due to inaccessibility of the switch, per Frontier.
- Crews searched through the night and had several difficulties locating the damaged fiber. At different points they had to bring in construction crews to dig out concrete, they ran into unmarked gas lines, etc. The majority of the effort spent during the outage was in finding the damaged cable.

Wireless 9-1-1 Calls Impacted: yes  
Wireline 9-1-1 Calls Impacted: yes  
Frontier telephone landlines affected: 17,378  
AT&T telephone landlines affected: 894

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