

## Synopsis of Events Related to the Storm on June 29, 2012 Fairfax County Department of Information Technology

DIT response to the derecho storm was in assessing and responding to any interruptions or other impacts to core countywide government IT services and infrastructure in the areas of:

- Data Center including servers, batch processes and all 600 county business applications supported including email and FOCUS.
- 9-1-1 phone switch and 9-1-1 VZ circuits.
- County government phone systems and Verizon circuits.
- Public Safety and Public Service radio systems.
- Data communications network which include the county operated I-Net and Verizon circuits.
- Website, Internet access, and other e-Gov channels (IVR).

In addition, DIT GIS and MPSTOC site tech staff supported the EOC activation during all active hours with tech support for the EOC technology, and for developing GIS maps, and e-Gov Web staff worked with OPA to update the public website with emergency information. DIT calculated about 684 hours in direct support of the event, for about \$47,000.

**Data Center:** The Data Center in the Government Center survived the minimum power interruption with the UPS and generator activating as designed. As a result, no systems housed were without power. DIT staff responded to the Government Center to check all servers and data systems, which were found to be working normally. The Sheriff's Jail management had a server down that was located in Massey caused by the power interruption in Massey. DIT staff responded and restored the server by 7 p.m. Saturday, June 30. Technical staff were deployed to various County facilities to provide PC and related support. Staff dispatched to Burke Center Community Library in support of the libraries heat shelter activation Sunday, July 1, in order to restore public Internet capabilities. Six technology staff were deployed either on-site and/or on-call at the EOC during the incident starting Saturday, June 30, assisting DIT incident deployment, and the regular DIT MPSTOC staff supporting EOC operations for A/V and OEM systems.

**Network:** DIT staff managed the recovery of I-Net network sites throughout the period. The seven core hub sites never went down as they are hardened with UPS and generator systems. Of the total 420 county I-NET sites, the recover progressed from 34 sites being down Sunday, 9 on Wednesday, July 4, to zero on Thursday, July 5, all but two due to power outages. Two sites (Fire Station #1 and Twin Lakes Golf Course) suffered damage fiber damage. Cox responded and corrected the fiber problems within the County's service level agreement for repair (this is a temporary fix; Cox will schedule a permanent fix later). The DIT Data Communications on-call staff responded to the Government Center in the wake of the storm Friday night at approximately 11:30 p.m. DIT had the capability to monitor the network remotely. It was immediately determined that the Government Center (GC) and Massey Building, including the jail, remained up. Subsequently, there were trouble calls for Massey, which persisted intermittently throughout the event. Next priority was for Public Safety sites, with Fire Stations 1, 8, 13, 19 and 23 reporting troubles. By 4 p.m. Saturday, all but Fire Station 1 (FS01) were resolved by the I-Net

team. There was a delay in Cox being able to start its work on Fire Station 1 as Dominion Virginia Power needed to correct the power problem on the poles prior to Cox servicing the fiber. After the initial response on Friday, June 29, Matt Dowd and the I-Net team worked from 6 a.m. until about 11 p.m. each day from June 30 through July 5 with regular updates of the 34 sites impacted by the storm until all resolved. The team included eight staff and contractors (*see attachment*). Note: The I-Net served the County and Schools well during this event. The County has never experienced a systemwide outage of its I-Net since it went live circa 2004, and no sites down except for a few cases where the fiber was cut. Since 2010 with the new Computer Aided Dispatch System, Police and Fire stations are connected to the DPSC 9-1-1 Center via the County's I-Net.

**Telephony:** The telephony outages proved to be probably the most challenging of the technical areas to restore. Because of the Verizon 9-1-1 three NoVA central switching offices (CO) and circuit trunks outage, in addition to checking the County 9-1-1 telephone systems at MPSTOC, DIT support tested the backup numbers at Pine Ridge backup center. The Verizon CO offices and circuits outage had a wide-ranging , multiple day interruption of the County's ability to make land-line and wireless calls, which at numerous sites would either not work, or would behave very intermittently, such as calls being able to go out from County systems, but incoming calls not always functioning. Calls also could not be made to the IVR, rendering the IVR apps not accessible. DIT staff spent considerable time getting the outages reported to the appropriate organization in Verizon, always keeping in mind high priority public safety and first responders. DIT staff response started Saturday, June 30, when our monitoring equipment reported sites were losing power and staff began testing critical phone numbers and discovered that calls were not getting through to either Massey or Government Center campuses. The main Avaya telephone system had power, the two main hub locations are the at the Government Center and Massey complex, but had no service from Verizon, thus no ability for calls in or out of the County. Many non-Avaya supported sites were also without power and Verizon service. Staff began entering service trouble reports into the Verizon customer portal to also include all Police, Fire and Human Services locations, and dispatching staff to key locations to include BOS offices. By Monday, July 2, the Verizon portal was closed, and staff began a constant process of calling service representatives. DIT also spoke with the Verizon VP responsible for "repairs," who offered no answers but sent a broiler plate message via email as his response. In progression, there were 49 major sites down Sunday, July 1, 15 sites Tuesday, July 3 and 1 site still with a partial outage as of Friday, July 6. Some small sites still have outstanding issues as of Friday, July 6, 2012 (See attached chronology). Eight DIT telecom staff and two contractors worked the event June 30 through July 6.

Note: Although DIT, DSPC and CEX have had several previous executive meetings with Verizon over the past several years due to prior 9-1-1 service interruption incidents, although a commitment was made, Verizon executives did not proactively contact the county in support of this incident. Also, to note that in response to the prior incident whereby the Verizon 9-1-1 CO in Fairfax City failed cause by water leakage on their circuit panels in the CO, the County DIT and DPSC staff visited the main Verizon 9-1-1 switching hub in New Jersey, whereby Verizon indicated that in the event of a failure of one of their sites in Virginia, the New Jersey site is configured to route those calls. It was evident in the derecho that this did now work as promised.

**Radio Services (800 Mhz Public Safety and Public Services radio system):** Voice radio communications continued to operate during the outage, the critical infrastructure used by Public

Safety, DPWES and other agencies for responder communications. This County-managed asset was again the last line of defense after telephone and cellphone company infrastructures failed. A few sites had specific problems due to power outage, but fixes were addressed relatively quickly because of the levels of redundancy and overlap that the County built into the radio systems. Workarounds were implemented, along with cooperation with other jurisdictions that have interoperability with Fairfax County. Some of the details:

- At 11:30 p.m. on Friday, June 29, the commercial power failed in the Fairfax Station (Butts Corner) area of the County and the generator at the site failed to start. The on-call Radio Engineer immediately responded to the site and quickly restarted the generator bringing the site back up.
- The Verizon copper circuits that connect MPSTOC to the Bailey's Corner radio site and the Beacon Hill radio site were lost, but the special Verizon network (SONET) inter-connecting all the County radio tower sites stayed up the entire time. The copper circuits were restored on Sunday, July 1. As these two sites are part of the radio system expansion, countywide outdoor coverage was not compromised.
- There was loss of indoor coverage in the Bailey's Corner area and in the area surrounding Fort Hunt Road. We were able to utilize neighboring jurisdictions' radio systems for indoor coverage in these areas.
- Two radio channels which were PSAP to PSAP (9-1-1 Center) backup channels were lost because of telephone circuits going down. These are not used for emergency on-scene communications or inter-county communications. They were restored on Monday, July 2.
- The statewide interoperability radio system patch for low-band radios to the County's 800 MHz system was lost which was a minor problem. This circuit was restored on Monday.
- The dispatch consoles at the Courthouse and the Jail were lost when the power went out in the Massey Building. Once power was restored to the Massey Building the consoles came back up. Within the next year, we will be rerouting these circuits to go directly to the Courts and Jail and bypass the Massey Building.

Radio Services deployed to MPSTOC for over 14 hours working with the UFOD and PLC to resolve any communications issues. Radio services staff worked approximately 27 hours of overtime for this event.

**GIS:** DIT provided GIS mapping services throughout the derecho incident supporting the EOC activation. Six GIS staff provided 24/7 onsite staffing at the EOC Saturday, June 30, and Sunday, July 1, with two to three staff per day; 5 a.m. to 6 p.m. in the EOC on Monday, July 2. Support continued Tuesday, Wednesday and Thursday with both additional work assignments and on-call staffing status for EOC on-site as needed. Approximately 100 work hours logged. Geospatial analysis and 16 major maps were provided as needed, a sampling included:

- Fairfax County, County facilities and Town of Vienna boil water advisory maps.
- Falls Church water service area.
- Maps of people with special medical needs and maps of special medical needs in the water boil area.
- Dominion Virginia Power outage compilation maps.
- Mapped County facilities by location and number of employees at each site.
- Map requested of public facilities and their status late in day. Will be completed later.

- Power outages by Battalion Areas with Fireboxes for public outreach by OEM/FRD operations.

The map products produced for the EOC derecho recovery event are stored in WebEOC and the GIS Library.

### **Attachment to DIT Summary Derecho Event**

#### **DIT After-Action Report: Network**

The I-Net backbone consists of seven hub sites serving 420+ County Government and County School sites.

- None of the seven hub sites ever went down. All hub sites are hardened with generators and UPS, supported by COX Communications under the franchise agreement.
- Only two sites (Fire Station #1 McLean and Twins Lakes Golf Course) suffered fiber damage. COX responded and corrected fiber issues within the SLA window for each site. Fire Station #1 was back online by 1:35 a.m. Sunday, July 1.
- The only delay COX had restoring service to FS01 was related to Dominion Virginia Power needing to correct power issues on the poles prior to allowing COX to service their fiber. This is a safety issue and protocol was followed correctly.
- Number of I-Net sites out each day for County Government sites: (FCPS would need to provide details on their sites, but none of the FCPS outages were related to I-Net infrastructure).
- Saturday, June 30: Priority – Public Safety
- Exact number not documented, focus was on Public Safety sites.
- No Police stations were down.
- PSTOC and Pine Ridge alternate sites were up.
- FS01, 08, 13, 19 and 23 were down. All sites with the exception of FS01 were power related.
- Staff was dispatched to Fire Stations and all but FS01 were back online by 4 p.m. Saturday.
- FS01 was determined to be an I-Net fiber issue. COX communications was dispatched and repairs were completed by 1:35 a.m. Sunday.
- After this time no major Public Safety sites were down.

Summary of I-Net sites out of 420 total sites reported with outages by day:

Sunday, July 1:	34
Monday, July 2:	27
Tuesday, July 3:	18
Wednesday, July 4:	9
Thursday, July 5:	7 in a.m.; all resolved by evening.

County sites down by Name and Day:

July 1, Sunday Morning:

1. Great Falls Library
2. Colvin Run Park
3. Reston Library
4. Riverbend Park Visitors Center
5. Parks Area 6 Maintenance Shop

6. Spring Hill Recreation Center
7. Sully Historic Site
8. E.C. Lawrence Park (Walney Rd.)
9. Twin Lakes Golf Course
10. Crossroads CSB A&D treatment site
11. Hollin Hall Community Center
12. Mt. Vernon Mental Health (Gartlan Center)
13. Hidden Pond Nature Center
14. Burke Lake Park Administration
15. Burke Lake Golf Course
16. ASAP Office
17. James Lee Community Center
18. David Pinn Community Center
19. Human Services Falls Church Office (6245 Leesburg Pike)
20. Woodburn Mental Health
21. Youth Services (CSB Falls Church 107 Park Place)
22. George Mason Library
23. Woodrow Wilson Library
24. Park Authority Facility Maintenance HQ (Hummer Rd.)
25. Hidden Pond Nature Center
26. Audrey Moore Recreation Center
27. Parks Wakefield Turf Shop
28. Parks Hunter House
29. Dolly Madison Library
30. Mclean Teen Center
31. Pimmit Hills Senior Center
32. McLean Community Center
33. Lewinsville Senior Center
34. Bailey Affordable Health – NON I-Net

July 2, Monday Morning:

1. Great Falls Library
2. Colvin Run Park
3. Reston Library
4. Riverbend Park Visitors Center
5. Parks Area 6 maintenance shop
6. Spring Hill Recreation Center
7. Sully Historic Site
8. E.C. Lawrence Park (Walney Rd.)
9. Twin Lakes Golf Course
10. Crossroads CSB A&D treatment site
11. Hollin Hall Community Center
12. Hidden Pond Nature Center
13. Burke Lake Park Administration
14. Burke Lake Golf Course
15. James Lee Community Center
16. David Pinn Community Center
17. Human Services Falls Church Office (6245 Leesburg Pike)

18. George Mason Library
19. Woodrow Wilson Library
20. Audrey Moore Recreation Center
21. Parks Wakefield Turf Shop
22. Parks Hunter House
23. Dolly Madison Library
24. Pimmit Hills Senior Center
25. McLean Community Center
26. Lewinsville Senior Center
27. Bailey Affordable Health – NON I-Net

July 3, Tuesday Morning:

1. Great Falls Library
2. Colvin Run Park
3. Riverbend Park Visitors Center
4. Parks Area 6 maintenance shop
5. Spring Hill Recreation Center
6. Sully Historic Site
7. E.C. Lawrence Park (Walney Rd.)
8. Twin Lakes Golf Course
9. Crossroads CSB A&D treatment site
10. Hollin Hall Community Center
11. Hidden Pond Nature Center
12. David Pinn Community Center
13. Woodrow Wilson Library
14. Parks Hunter House
15. Dolly Madison Library
16. McLean Community Center
17. Lewinsville Senior Center
18. Bailey Affordable Health – NON I-Net

July 4, Wednesday Morning:

1. Riverbend Park Visitors Center
2. Sully Historic Site
3. E.C. Lawrence Park (Walney Rd.)
4. Twin Lakes Golf Course
5. Hidden Pond Nature Center
6. David Pinn Community Center
7. Woodrow Wilson Library
8. Parks Hunter House
9. Bailey Affordable Health – NON I-Net

July 5, Thursday Morning:

1. Riverbend Park Visitors Center
2. Sully Historic Site
3. E.C. Lawrence Park (Walney Rd.)
4. Twin Lakes Golf Course

5. Hidden Pond Nature Center
6. Parks Hunter House
7. Bailey Affordable Health – NON I-Net

July 5 Thursday afternoon 3 p.m. ALL SITES UP

### **Attachment to DIT Summary Derecho Event DIT After-Action Report: Telecommunications**

**Saturday, June 30:** DIT began seeing Solar Winds (network monitoring system) reports of many sites losing power and began to test some critical numbers and discovered that calls were not going through to either Massey or Government Center campuses. Also Telecom received reports that there were issues with 9-1-1 service.

Bob Woolwine was dispatched to the McConnell PSTOC and worked with DPSC staff and Verizon 9-1-1 on issues. He also went with several call takers to Pine Ridge (back up 9-1-1 site) to test incoming trunks and see if calls could be answered from that location. Although there were some calls coming through into Pine Ridge, it was eventually decided by DPSC that the call takers remain at MPSTOC.

Lisa Dowd and Jerome Craig arrived at the Government Center and began fielding calls from sites that were open and calling all major sites to determine which locations had power and phone service. Began contacting and entering service issues to Verizon so they were aware of which sites were down. At this point most major sites (Police, Fire, Government Center, Massey, Human Services, etc.) had telephone issues, either complete loss of service or partial loss of service.

Avaya contract staff monitored incoming alarms and dispatched to sites to determine status if power was up for the County Avaya switching equipment (PBX) but service from Verizon was not available.

**Sunday, July 1:** Staff were deployed on-site and working remotely throughout the day and into the evening, working with county site contacts, monitoring Dominion Virginia Power's outage maps, viewing Solar Winds reports to determine outages, working with Verizon all day and evening to report and escalate troubles, and reporting to OEM and DIT leadership about the status of service and problems.

County staff: Bob Woolwine and Lisa Dowd.

Avaya contract staff: Newell McCaw and Andrew Washington

**Monday, July 2, and Tuesday, July 3:** All Telecommunications staff members involved in contacting sites, determining outages and reporting to the appropriate section of Verizon. Staff also made sites visits to all Board of Supervisors offices and other major sites where power status could not be determined. Telecom staff worked with IVR staff to reroute calls for all Courts because the T-1 circuits between Government Center and Massey were down. Also reported status as problems were either resolved or remained open to OEM and DIT leadership.

County staff: Lisa Dowd, Marlena Pinkston, Delnee Carr, Tom Walker, Scott Gregory, Bob Woolwine, Steve Wells.

Avaya contract staff: Newell McCaw and Andrew Washington.

**Wednesday, July 4:** Lisa Dowd monitoring and working with Verizon techs and upper management on outstanding problems and continued reports to OEM and DIT leadership. Scott Gregory worked on-call responding to new troubles as they arose.

**Thursday, July 5:** Lisa Dowd monitoring and working with Verizon techs and upper management on outstanding problems and reporting to OEM and DIT Leadership. Scott Gregory dispatched to a few sites where power/telephony service was in question. Avaya contract staff continuing to monitor sites and alarms and respond to sites as needed.

**Friday, July 6:** Lisa Dowd still working with Verizon on one major circuit outage at South County Human Services and working with Verizon to ensure it gets repaired today. Avaya contract staff continuing to monitor sites and alarms and respond to sites as needed.

**II. Staffing and people and work hours estimate:**

Saturday, June 30	3 County staff, 2 Avaya contract staff
Sunday, July 1	2 County staff, 2 Avaya contract staff
Monday, July 2	7 County staff, 2 Avaya contract staff
Tuesday, July 3	4 County staff, 2 Avaya contract staff
Wednesday, July 4	2 County staff
Thursday, July 5	2 County staff, 2 Avaya contract staff

Comp, on-call comp or call-back comp work total for all County staff: 41 hours estimated  
Regular hours Monday, Tuesday, Thursday and Friday for staff listed: 156 hours estimated.

**III. Work tasks supporting Derecho Recovery:**

Primary work tasks performed for high-priority public safety entities and first responders (OEM/EOC, MPSTOC, Police, Fire and Rescue, Sheriff, Police District Stations, FRD Stations, etc.):

Bob Woolwine on-site at MPSTOC and Pine Ridge working with Police, Fire and DPSC staff on 9-1-1 call processing issues as well as direct line circuits to all Police and Fire stations. Lisa Dowd and Jerome Craig working to get non-9-1-1 related Public Safety issues reported to the appropriate people within Verizon.

Primary work tasks performed for the rest of the County:

Called all major County sites to determine if they had working phone service; also traveled to numerous sites to verify power and/or working phone service. Worked with Verizon techs and management to get troubles reported, prioritized and escalated as needed.

Summary metrics or relevant statistics for the number of County facilities, number of phones, circuits or network connections supported:

- Saturday, June 30 – 9-1-1, all other Public Safety sites, Government Center Campus, Massey Campus, all major Human Services sites, all Libraries, all BOS offices and many RECenters also having issues processing incoming and outbound calls – Verizon issue.
- Sunday, July 1 (PM) – 49 major sites still down.
- Monday, July 22 (AM) – 16 major sites back in service, 33 still out of service.
- Tuesday, July 3 (AM) – 17 sites out of service.
- Tuesday, July 3 (PM) – 15 sites out of service.
- Wednesday, July 4 (AM) – 11 sites out of service.
- Thursday, July 5 (AM) – 7 sites out of service.
- Friday, July 6 (AM) – 1 site has a partial outage (South County).

**IV. Issues requiring follow-up:**

- UPS at Massey is problematic. FMD needs to have the batteries replaced. In this process if the Massey loses power, there will be a brief time when equipment goes down, before the generator kicks in. All telephony sites connected to the Massey core equipment (approximately 38 sites) will also briefly go offline while they are re-registering in stand-alone mode. Once power is restored, they will be down briefly again while they re-register to the core.
- UPS at the South County Building was damaged during the storm and needs to be replaced. Telecomm staff has ordered a new unit and it should be on-site July 9. Until it is replaced there is no battery backup for the core network or telephony equipment at this site.
- Several small sites are still experiencing minor outages due to the storm. We are working with the sites and Verizon to get their service restored once power has been restored.

**Attachment to DIT Summary Derecho Event**

**DIT After-Action Report: Radio Services**

**I. Initial response Friday, June 29:**

Radio Services Center engineering staff received a SCADA notification at 1130 p.m. that the generator at Butts Corner failed to start. On-call engineer immediately self-dispatched to Butts Corner to resolve problem.

Radio Services Center shop supervisor and lead technician conducted a site survey of the Jermantown facility on Saturday morning, June 30.

Second radio engineer came in to assist on-call engineer to conduct site surveys of all radio sites on Saturday, June 30.

Third radio engineer came in on Sunday, July 1, to complete the Jermantown site survey and to restore critical radio equipment as power was restored to Jermantown Garage.

**II. Staffing and people and work hours estimate:**

Five radios services center personnel deployed:

Richard Slusher	14 hours on Saturday, June 30
Harjit Chawla	6 hours on Saturday, June 30
Adam Eldert	2 hours on Saturday, June 30
John Curilla	2 hours on Saturday, June 30
Charlie Locke	3 hours on Sunday, July 1

Estimate total work hours for the recovery: 27 work hours for staff on-site.

### **III. Work tasks supporting Derecho Recovery:**

Primary work tasks performed for high priority Public Safety entities and first responders (OEM/EOC, MPSTOC, Police, Fire and Rescue, Sheriff, Police District Stations, FRD Stations, etc.):

Restored power to Butts Corner radio site. Liaison with Verizon and County staff to restore telephone circuits lost during the storm. Worked closely with DPSC staff to analyze which circuits were adversely affected and what action was needed to restore these circuits. Supported EOC operations.

#### **Primary work tasks performed for the rest of the County:**

Restored critical Public Safety and Public Service radio infrastructure. Kept a close watch on all RF (radio frequency) infrastructure throughout the weekend to ensure that the radio systems remained operational.

#### **Summary radio system response:**

- Butts Corner Radio site – restored in one hour of notification June 29.
- Beacon Hill and Bailey’s Corner radio sites – restored on Sunday, July 1 (T1 issue)
- Restored SIRS (state plug) VFIRE21 and VFIRE23 on Monday, July 2, telephone line issues.
- All Public Safety and Public Service trunking system infrastructure except as noted above worked flawlessly. Nine of the 12 sites were operating on generator power for a majority of the weekend.
- Two sites, Butts Corner and Great Falls, remained on generator power until July 3.

#### **Overall:**

The Public Safety and Public Service radio systems operated very effectively and efficiently during this major storm. We lost on RF site for approximately one hour, and lost two other sites for a few days. But, due to coverage design and redundancy, the Public Safety users were always able to communicate throughout the County using their radio equipment.

FMD generator staff responded very quickly and did a fantastic job of keeping the radio system on the air.

Also, Motorola and their contractor, Wireless Communications provided invaluable support during this event. They had people working throughout the County ensuring that the radio systems stayed up.