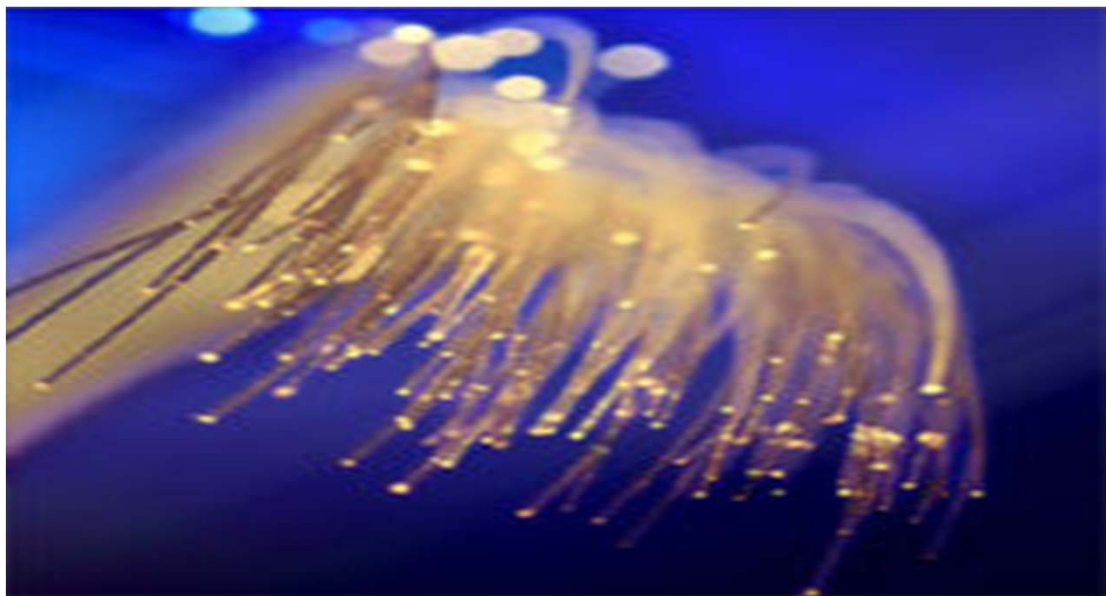


Analysis of Network Outage Reports for NRSC Meeting



*Cybersecurity and
Communications
Reliability Division –
Public Safety & Homeland
Security Bureau*

John Healy

December 2011

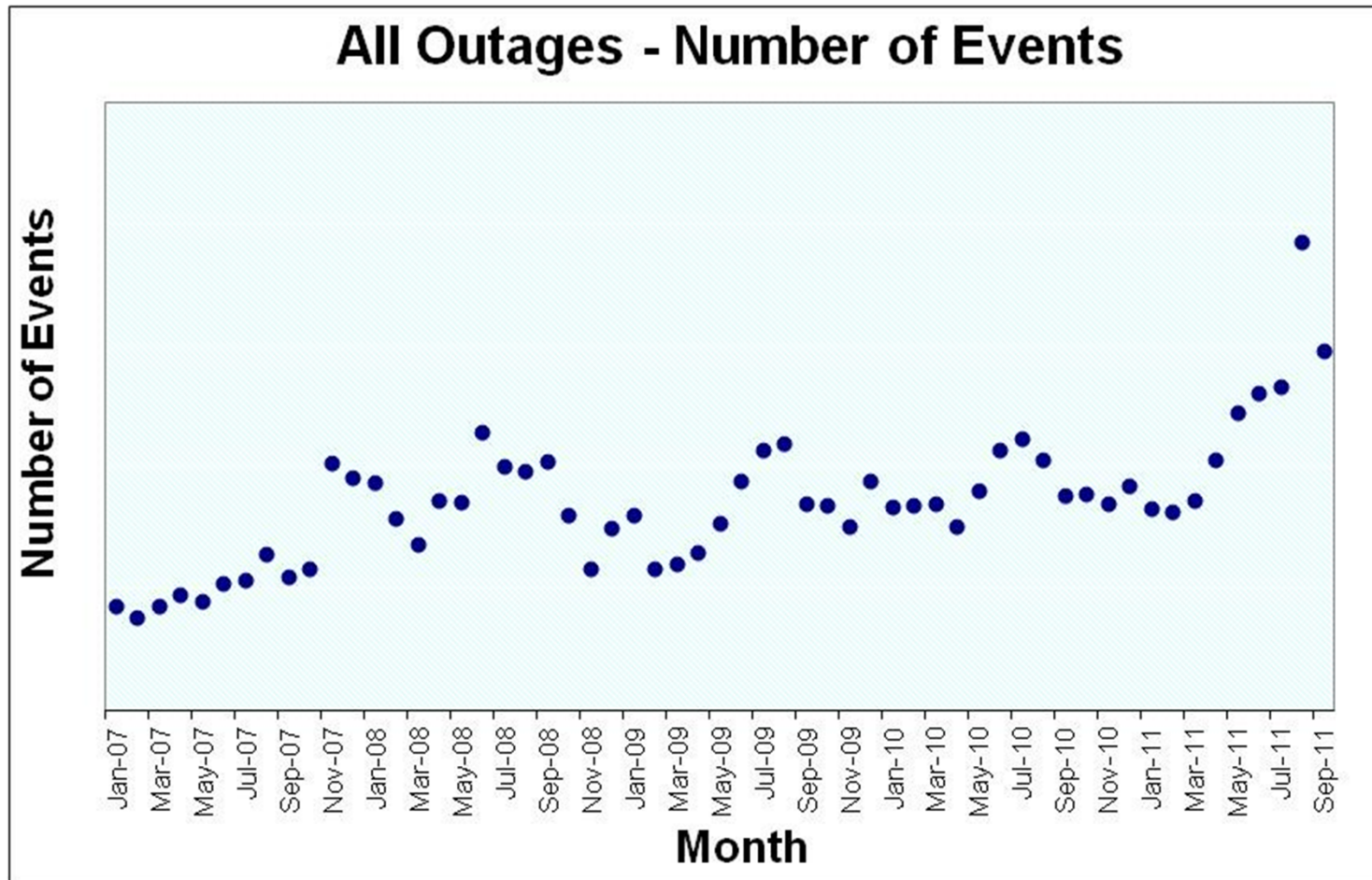




Overview of Presentation

- Network Reliability Status
- Improvements to NORs
- NRSC Activities

Frequency of Outages by Month



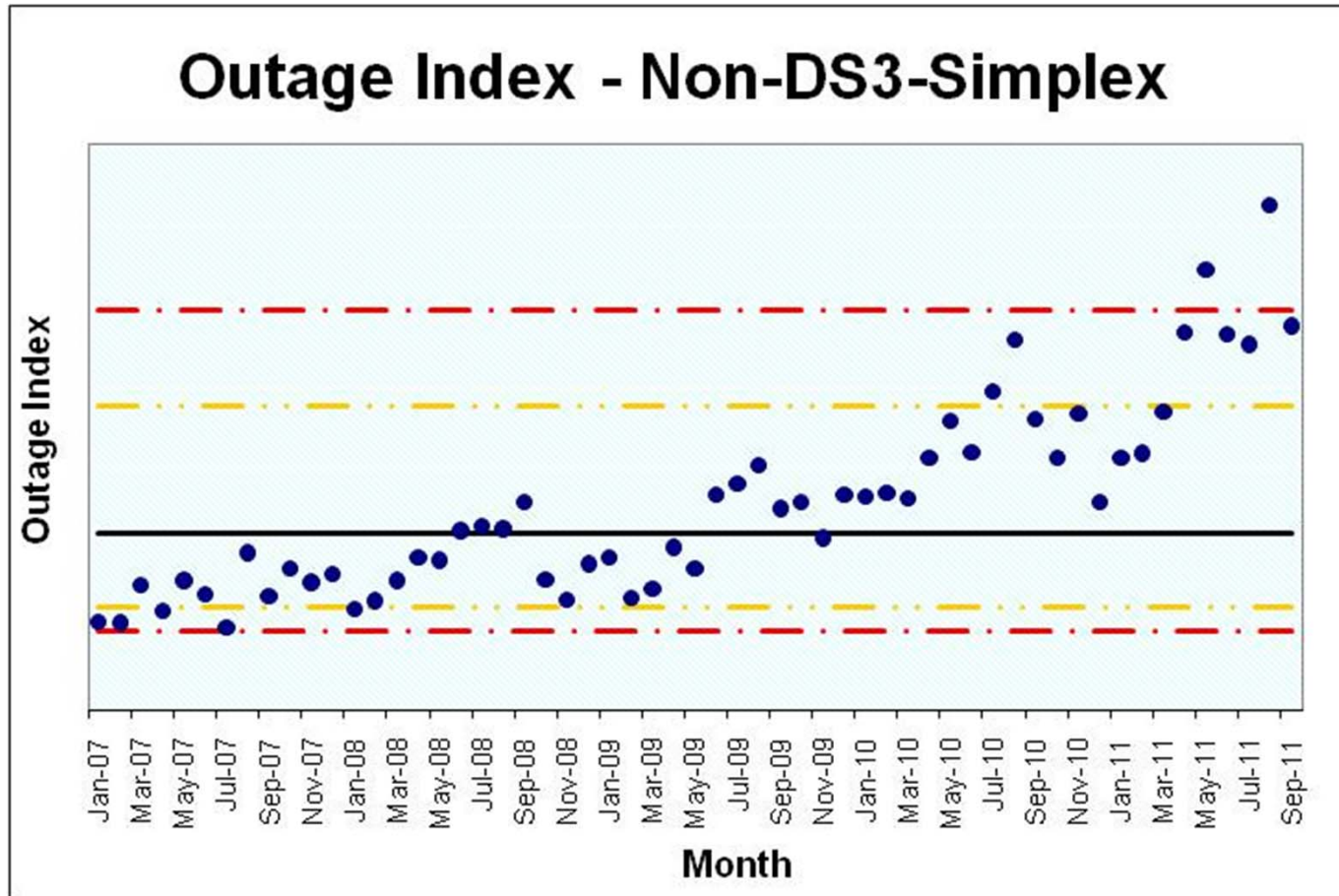
Standards for Outage Frequencies



- Took average of January 2009 through December 2009 as the standard

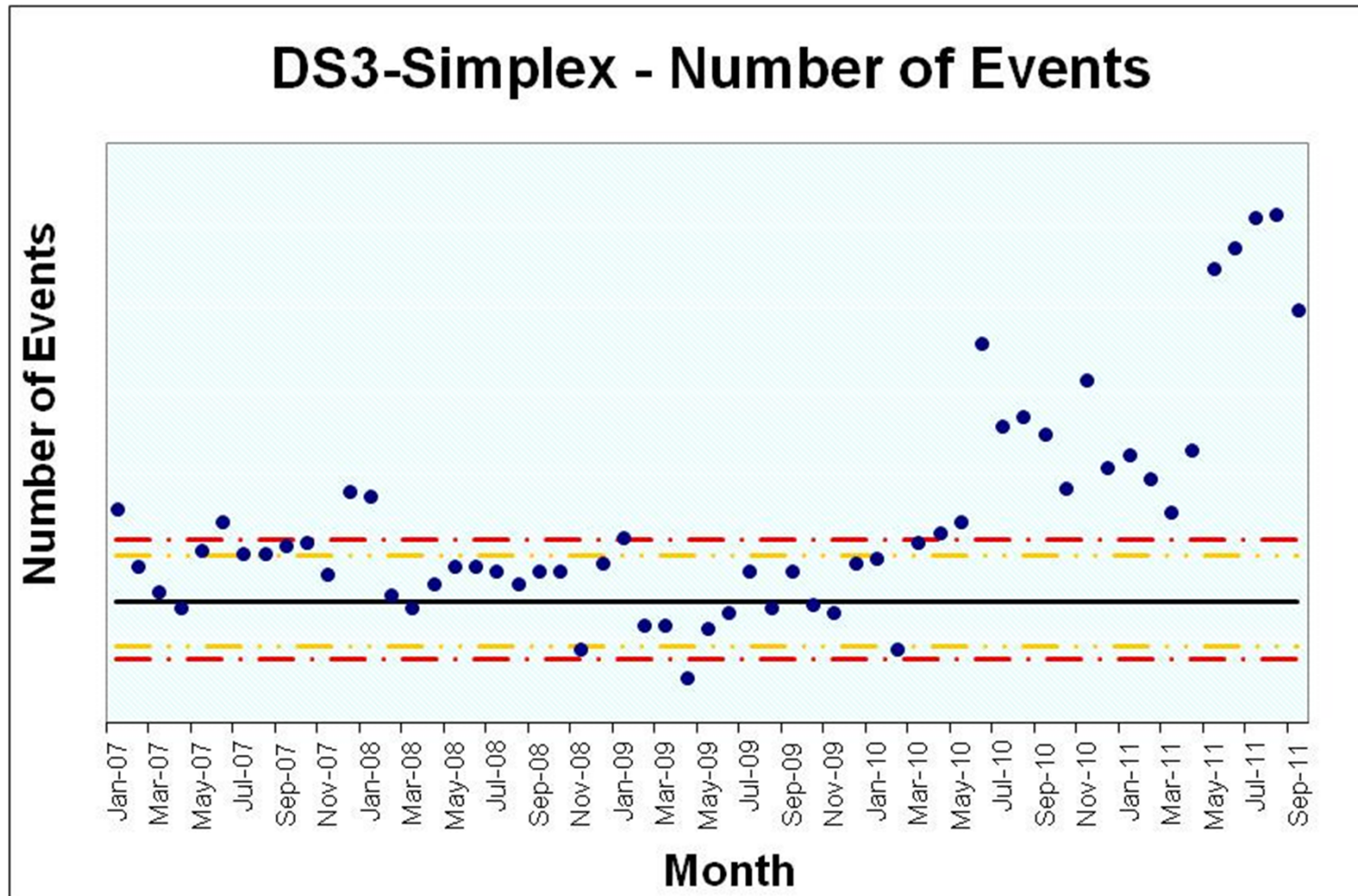


Outage Index – For All Outages Except DS3-Simplex

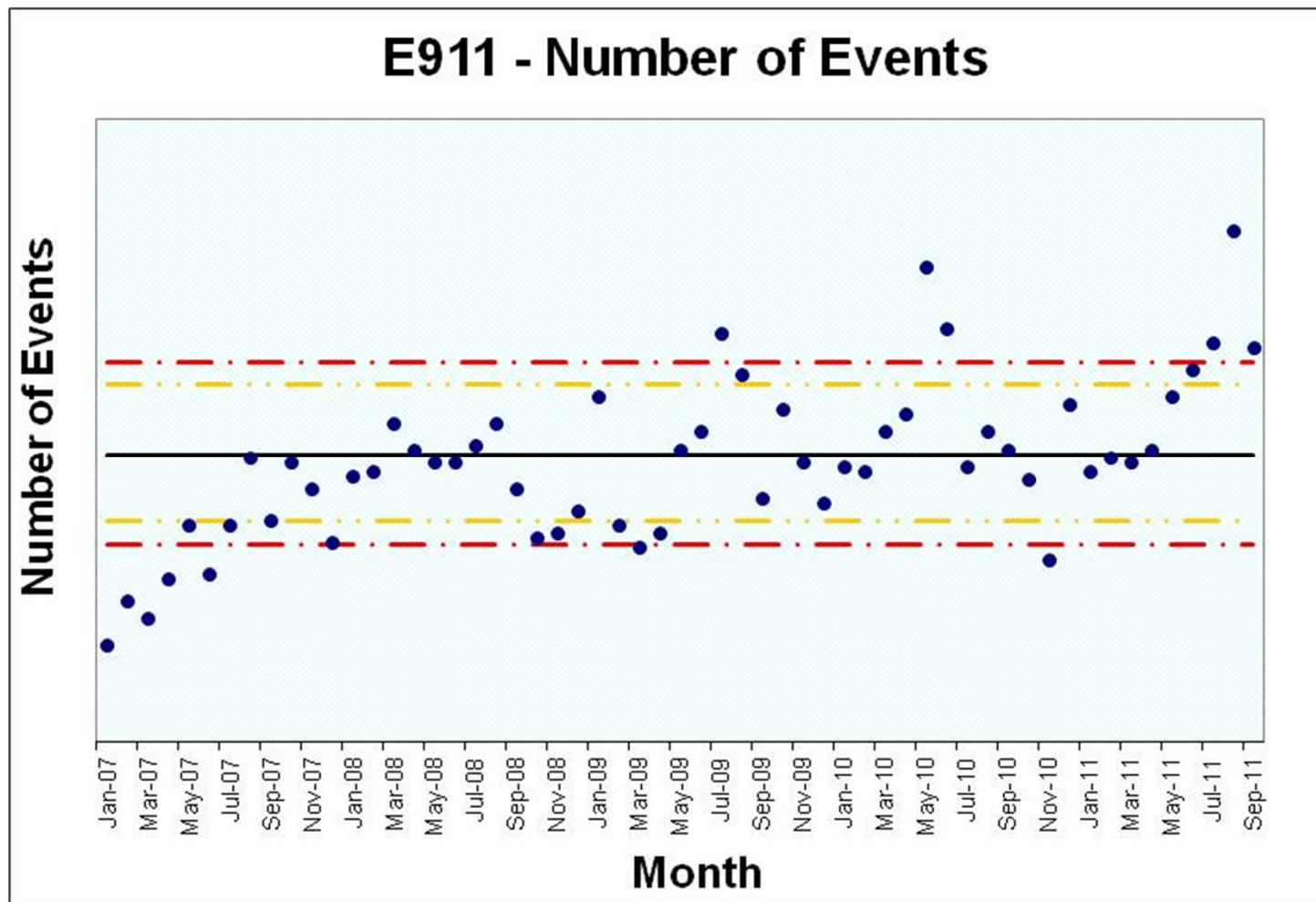


See PRQC-2006-019 for a description of the method used to calculate the outage index.

DS3-Simplex

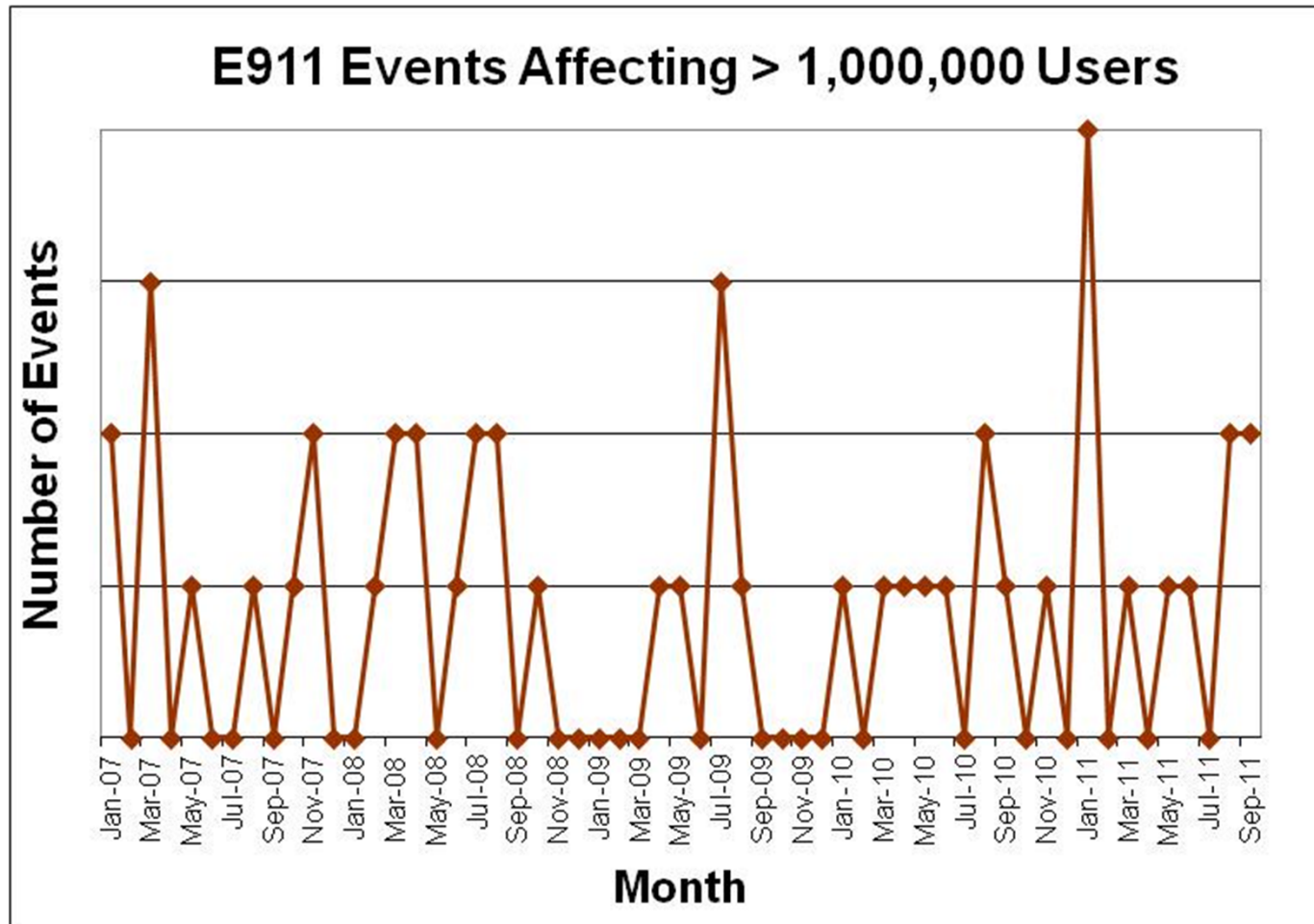


E911

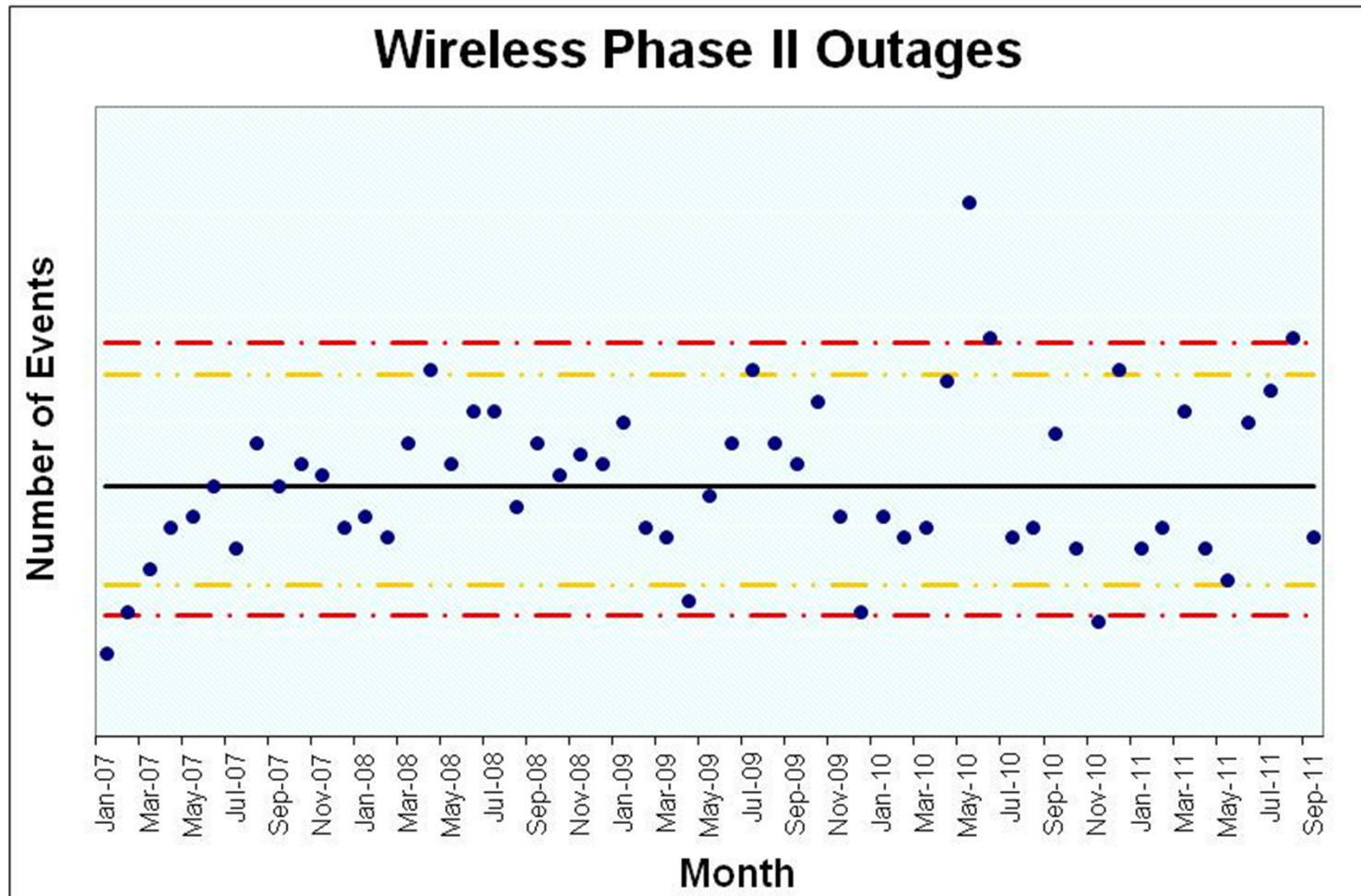




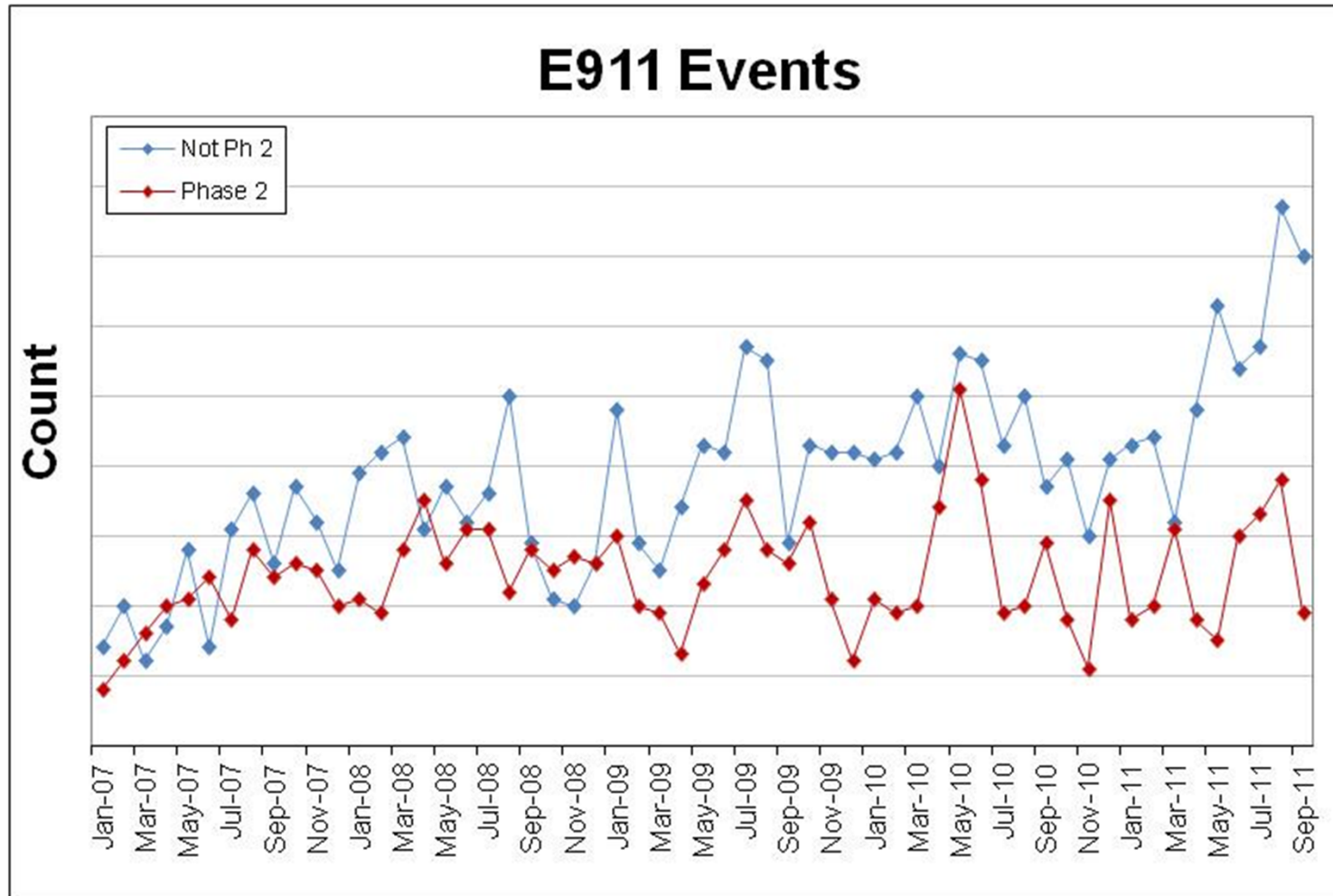
Very Large E911 Outages



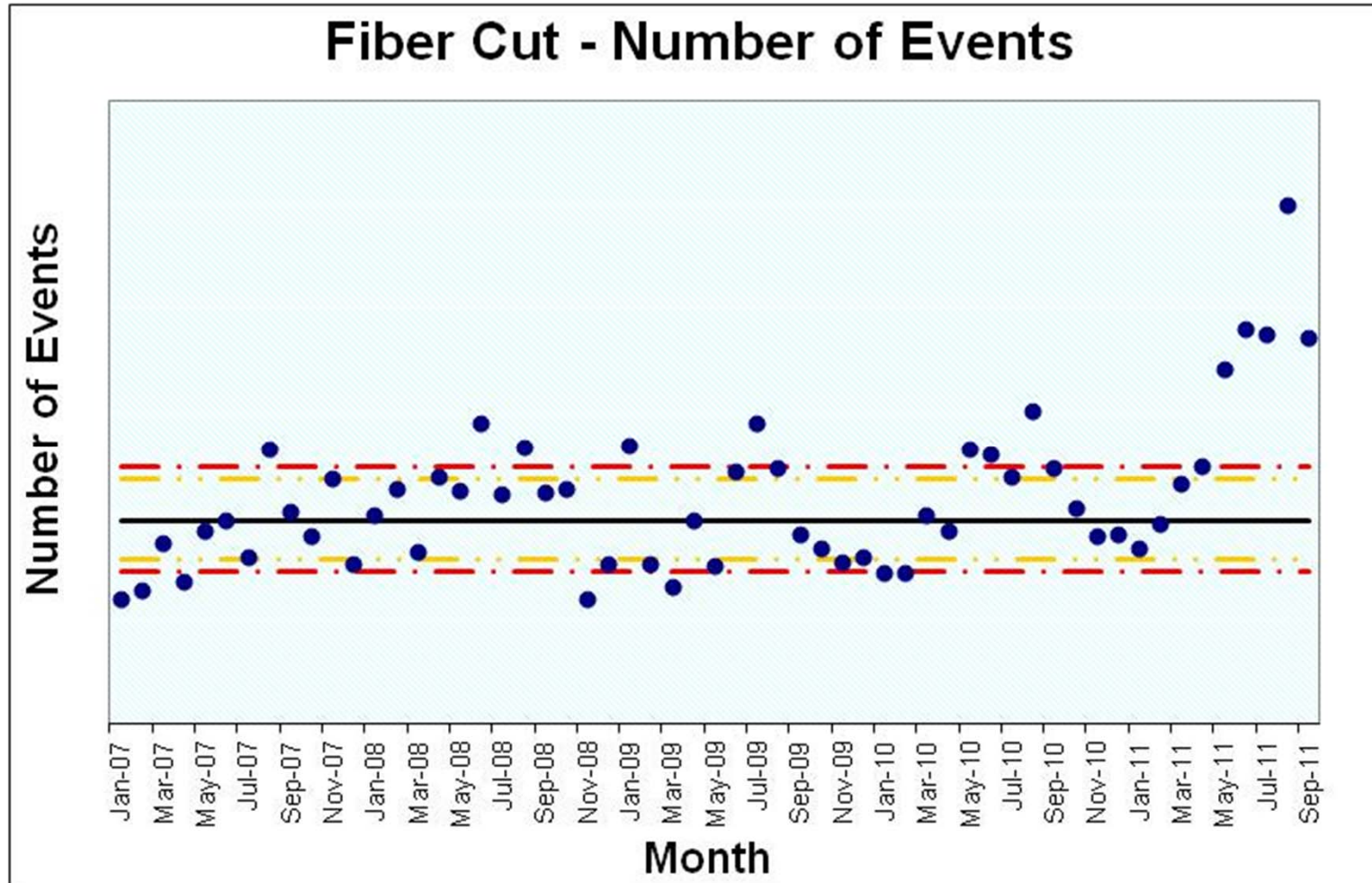
E911 – Phase 2 Events



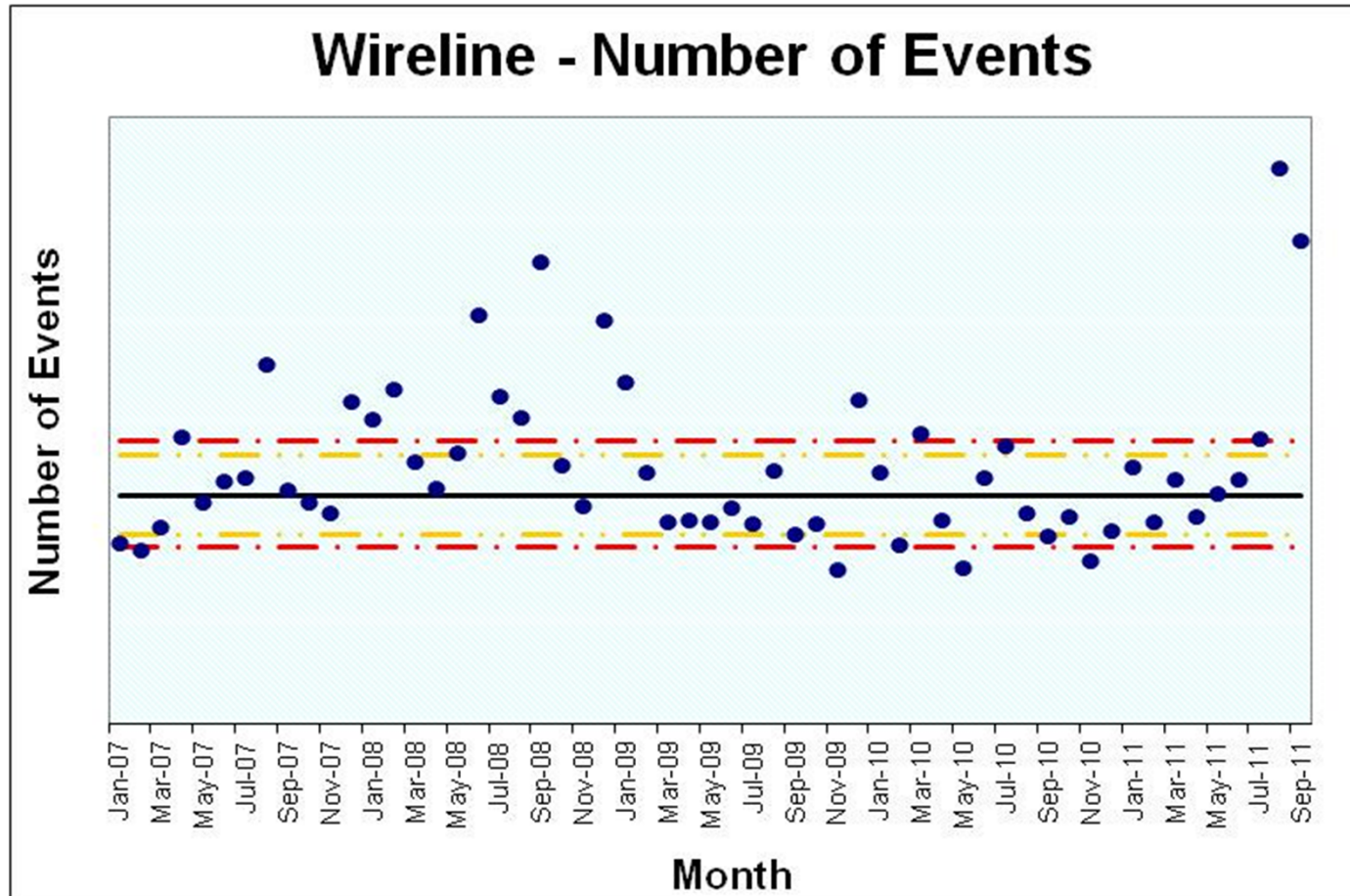
Phase 2 vs. All Other E911 Outages



Fiber Cut

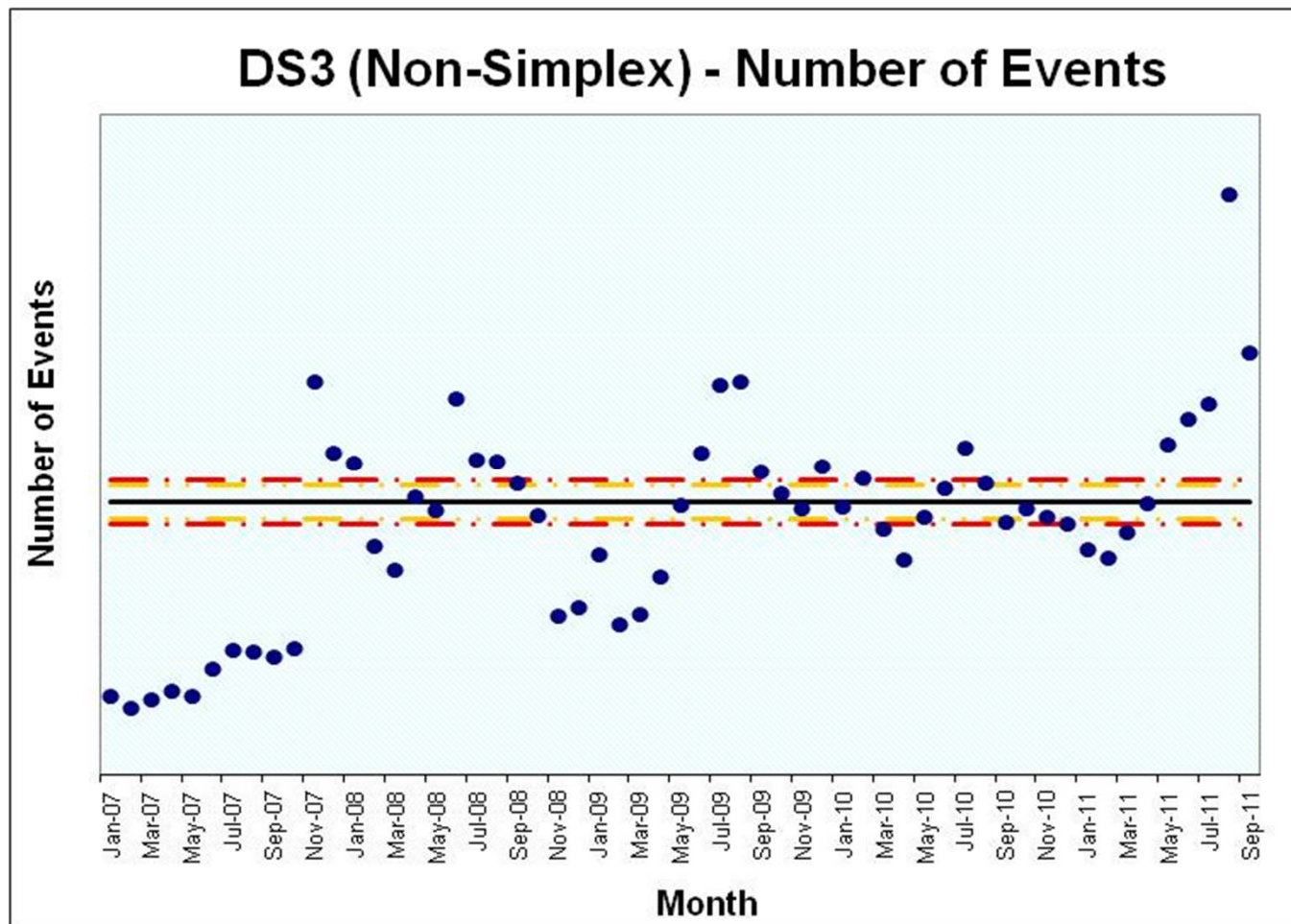


Wireline



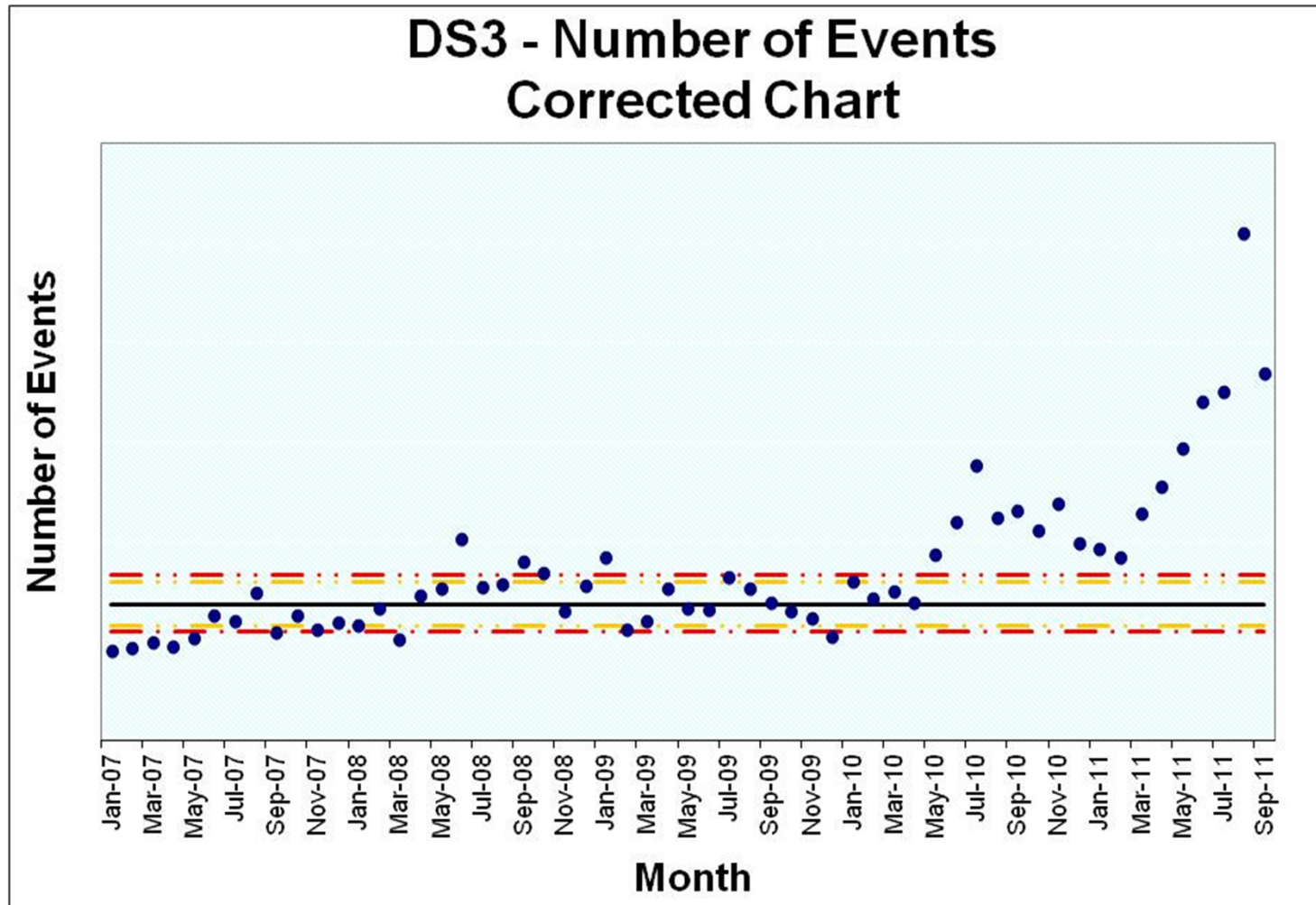
Wireline outages are all outages for which the Reason Reportable was at least 900,000 wireline user-minutes.

DS3 (Non-Simplex) Events



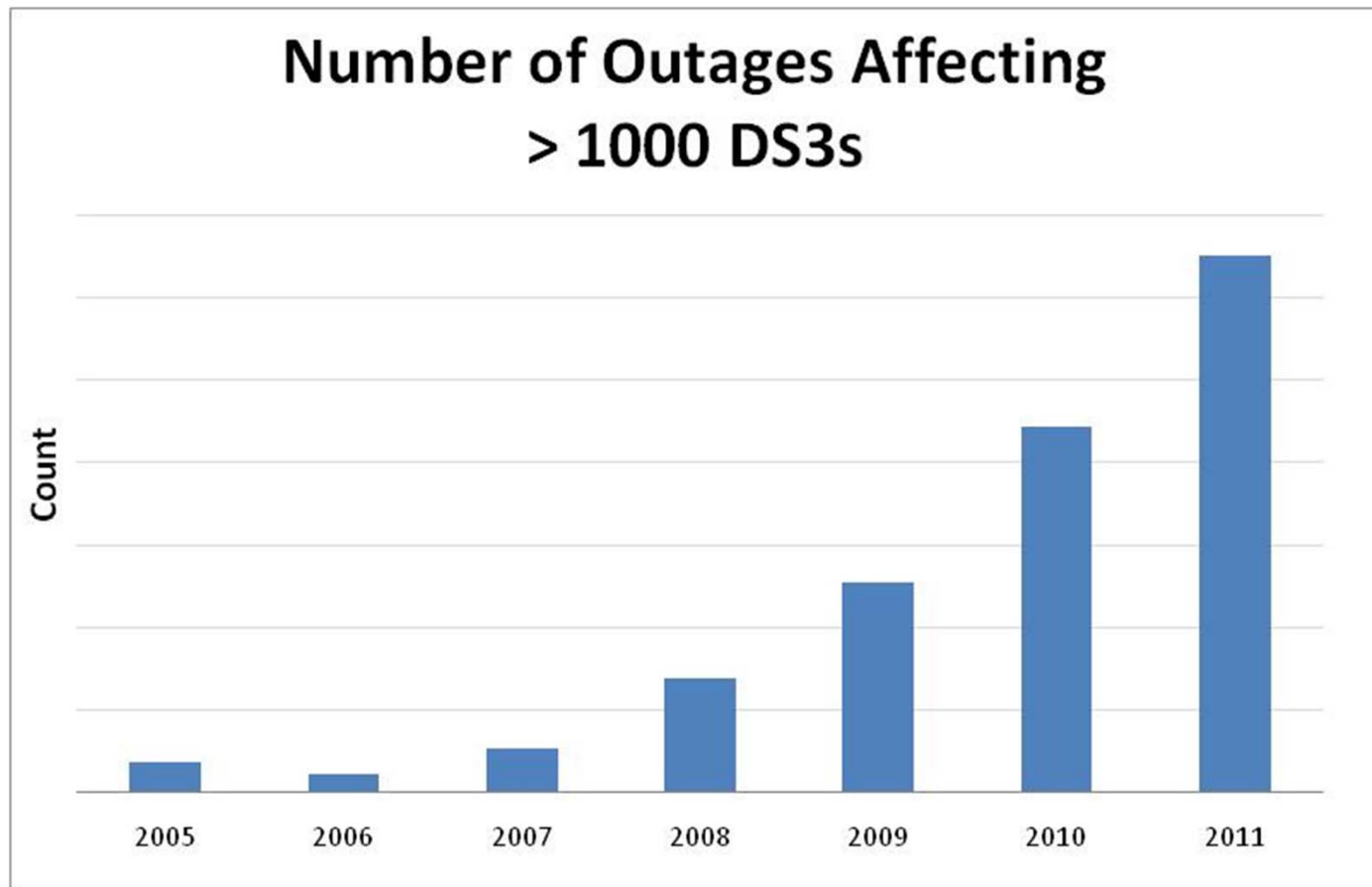


DS3 (Non-Simplex) Events





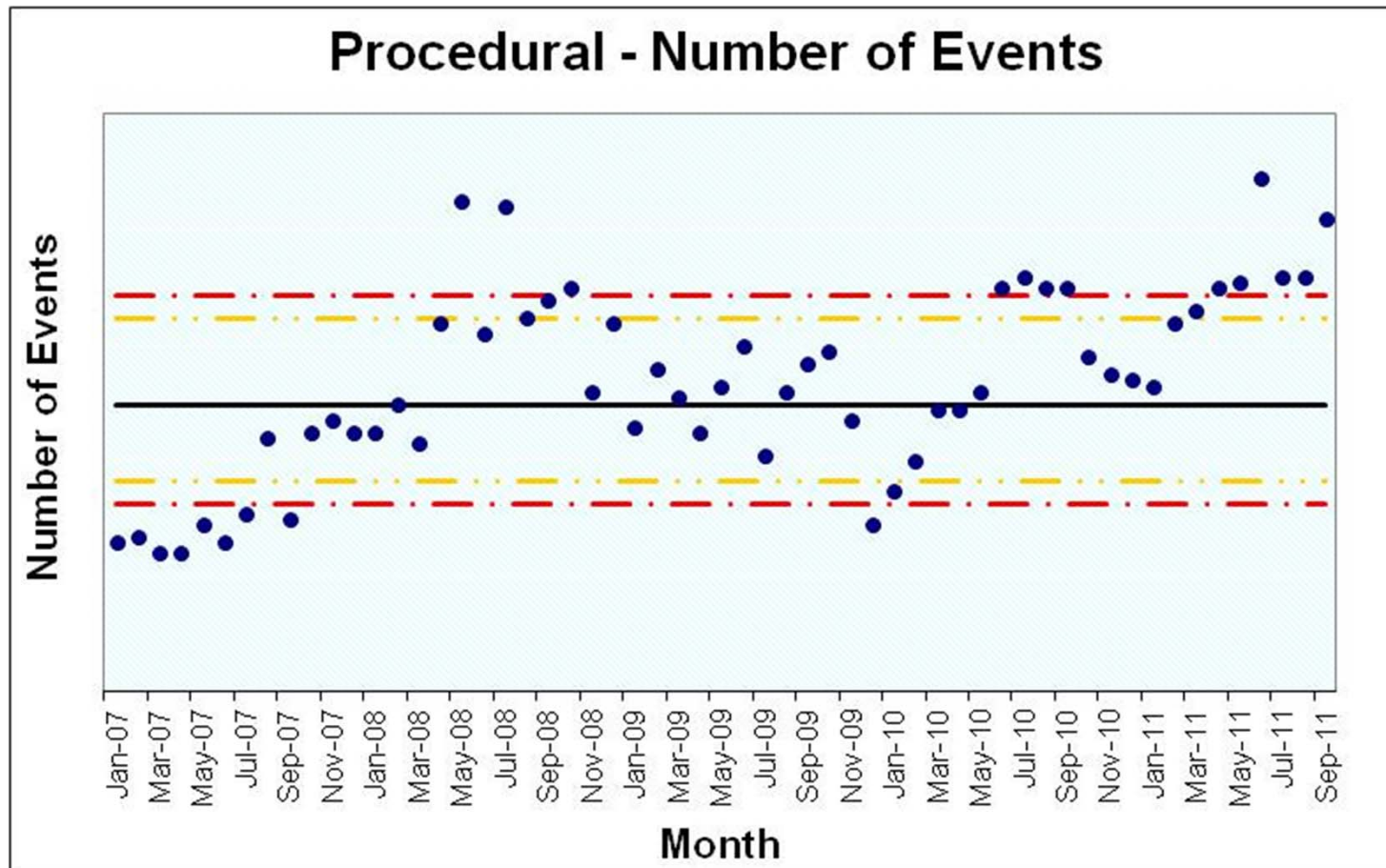
Big DS3 Outages



For 2011, the number of outages for January to September was multiplied by 1.33

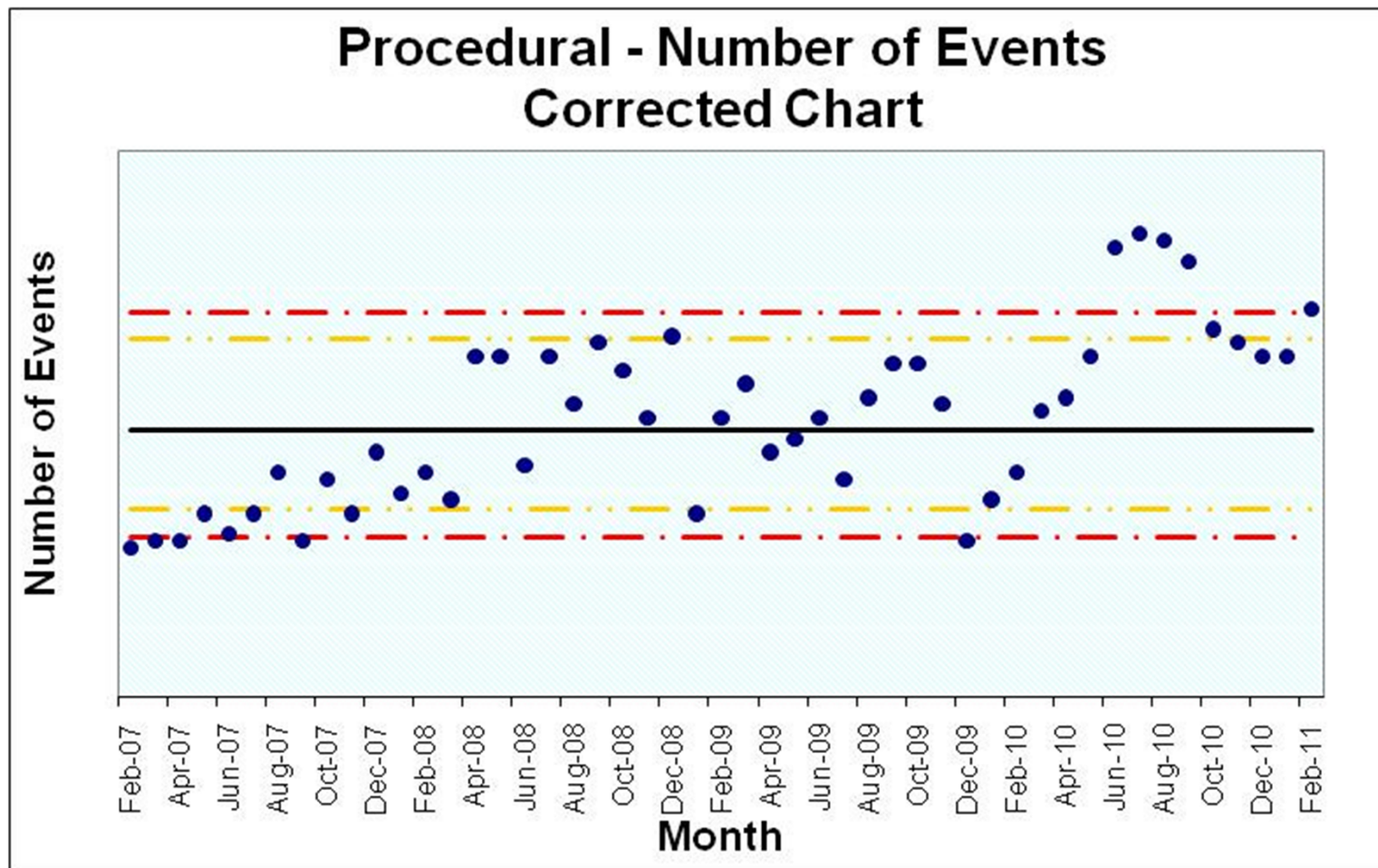


Procedural Events

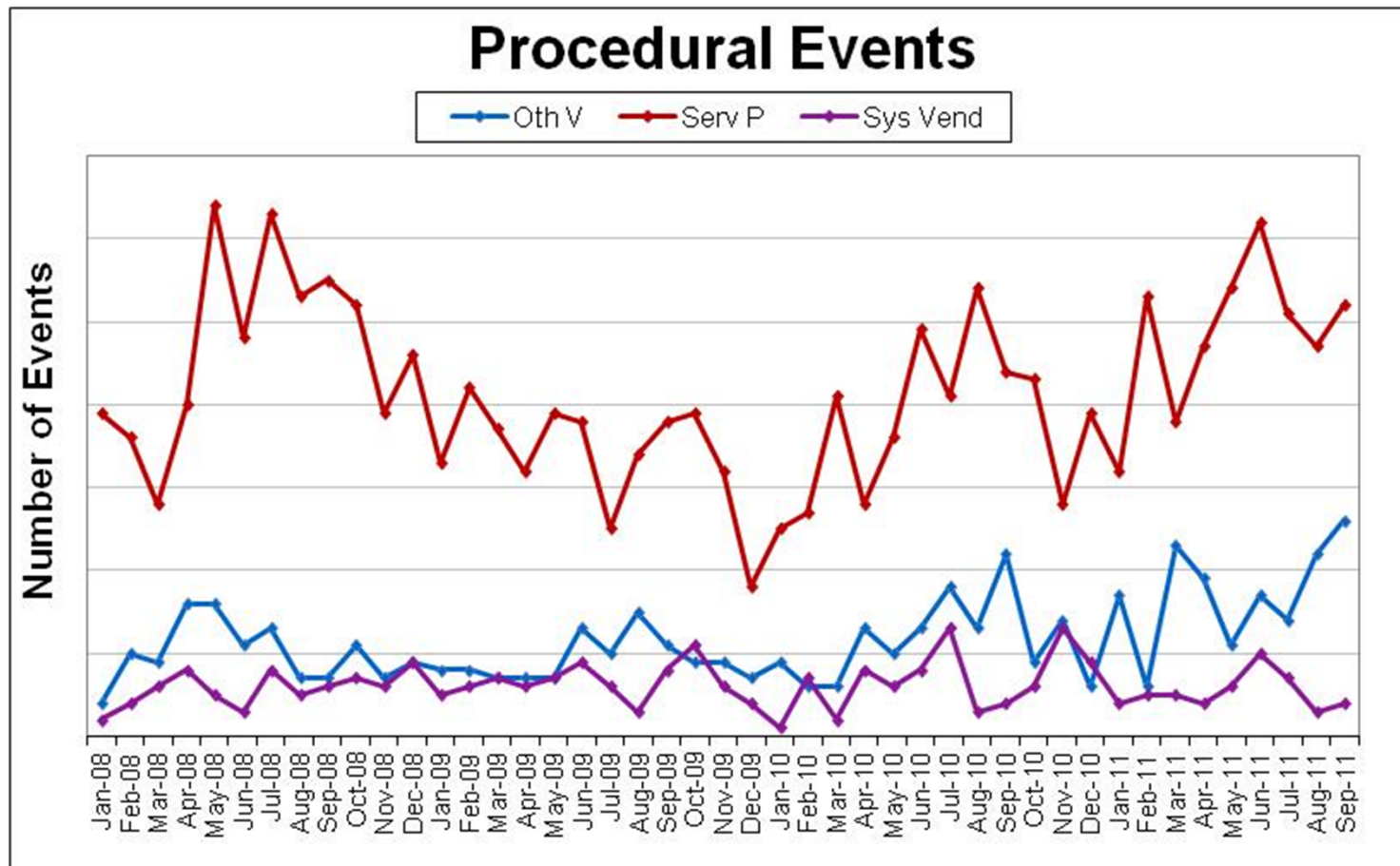


Procedural events are ones which have a procedural root cause.

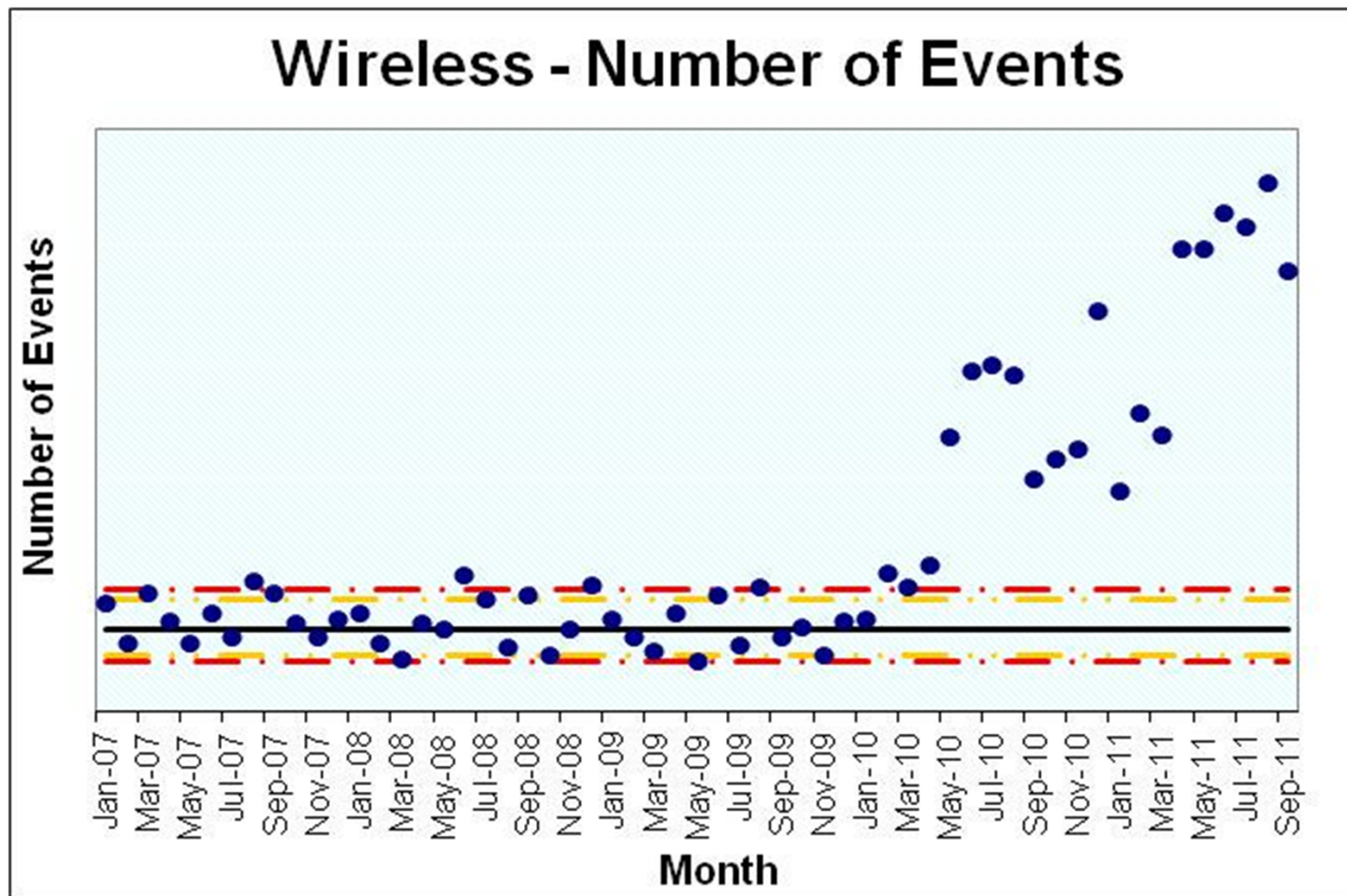
Procedural Events



Procedural Events by Source

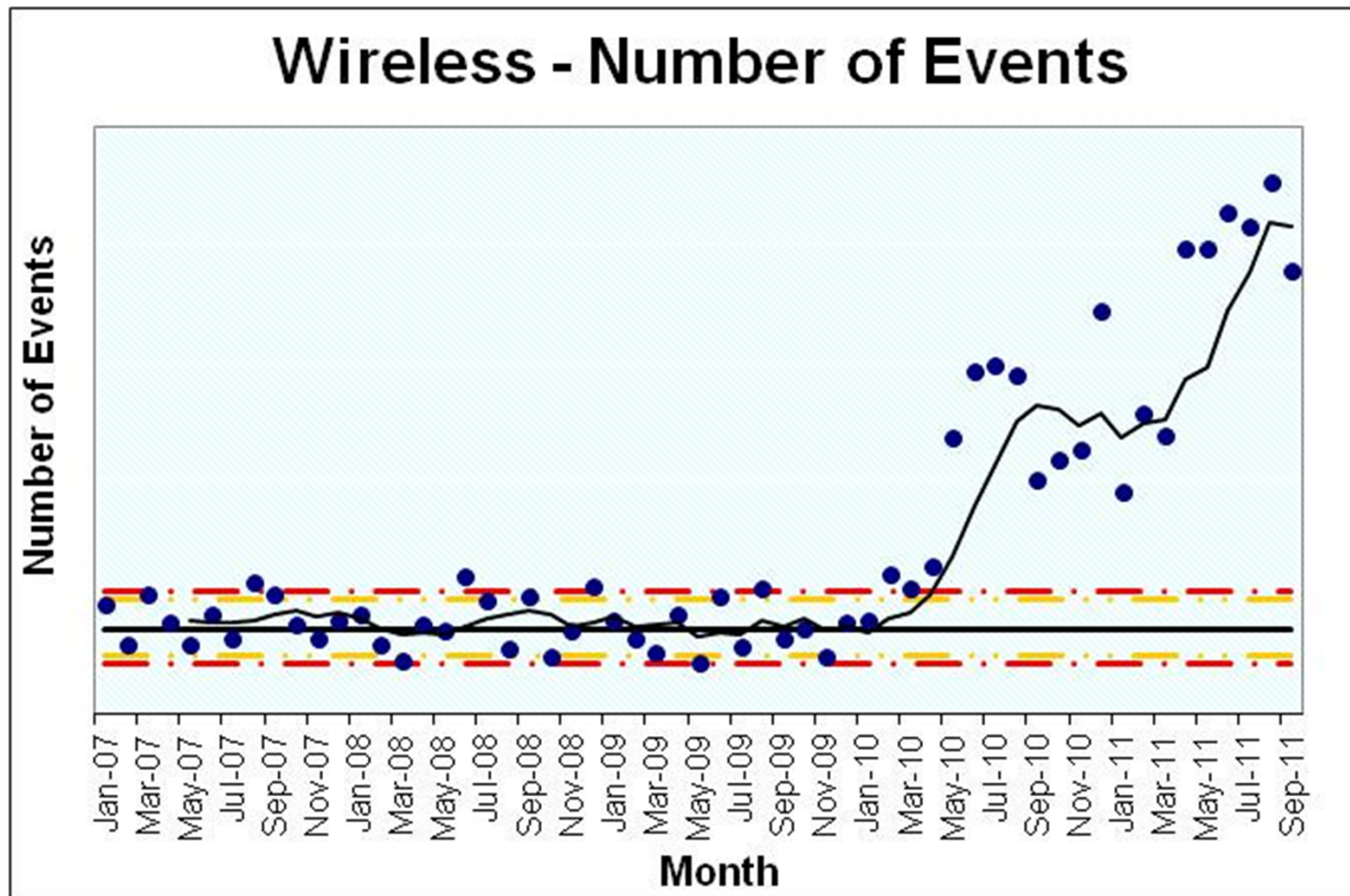


Wireless

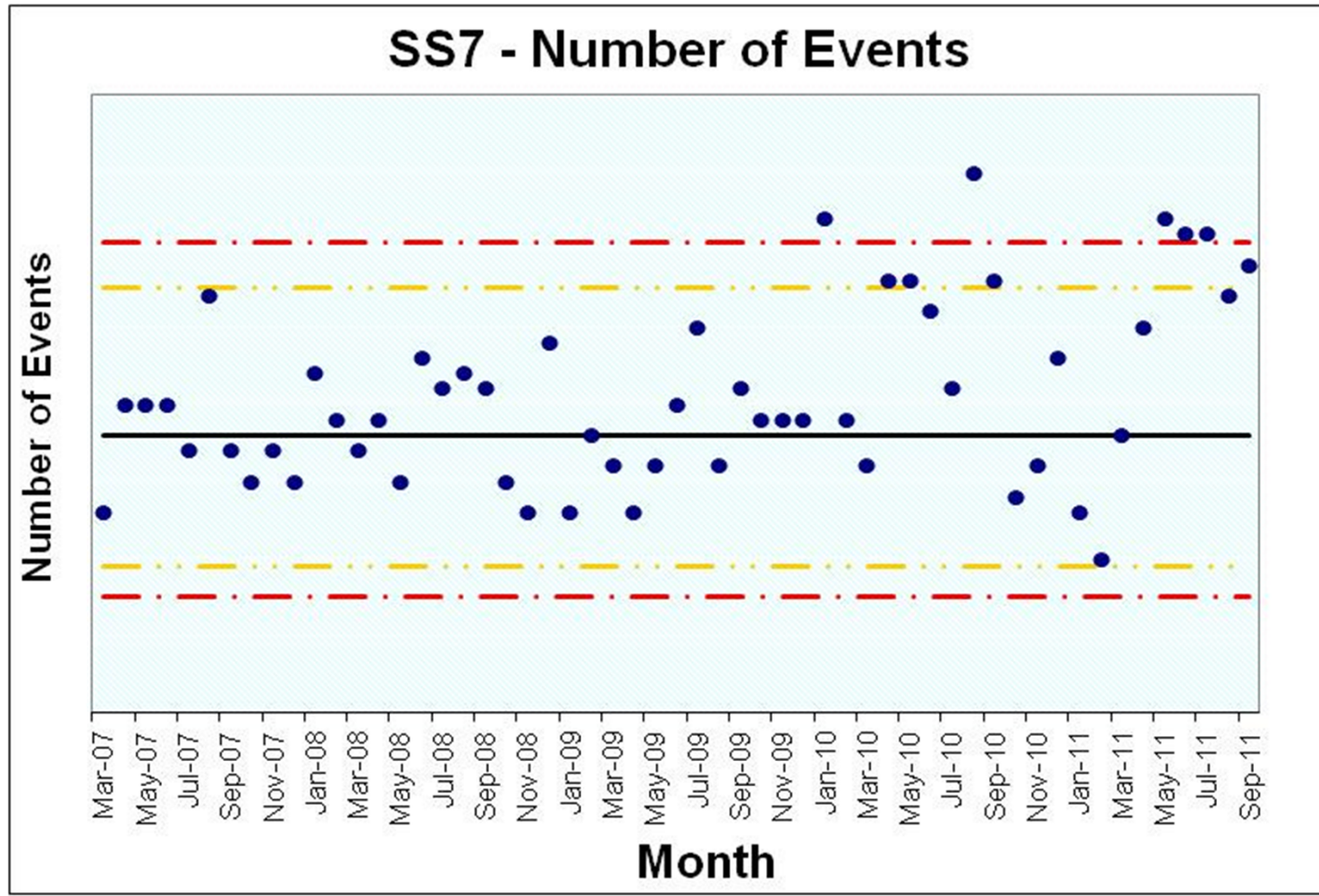




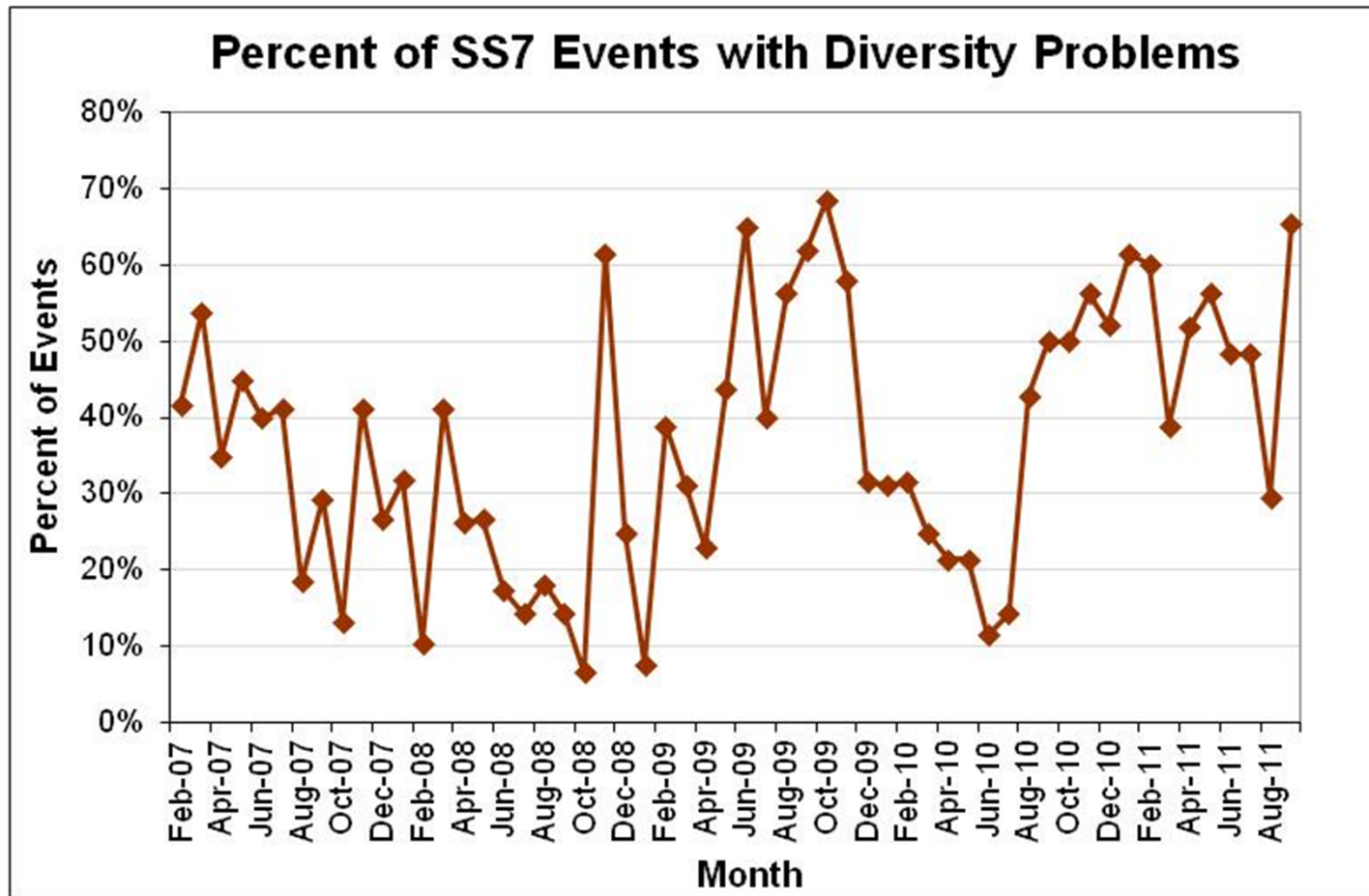
Wireless with Trend Line



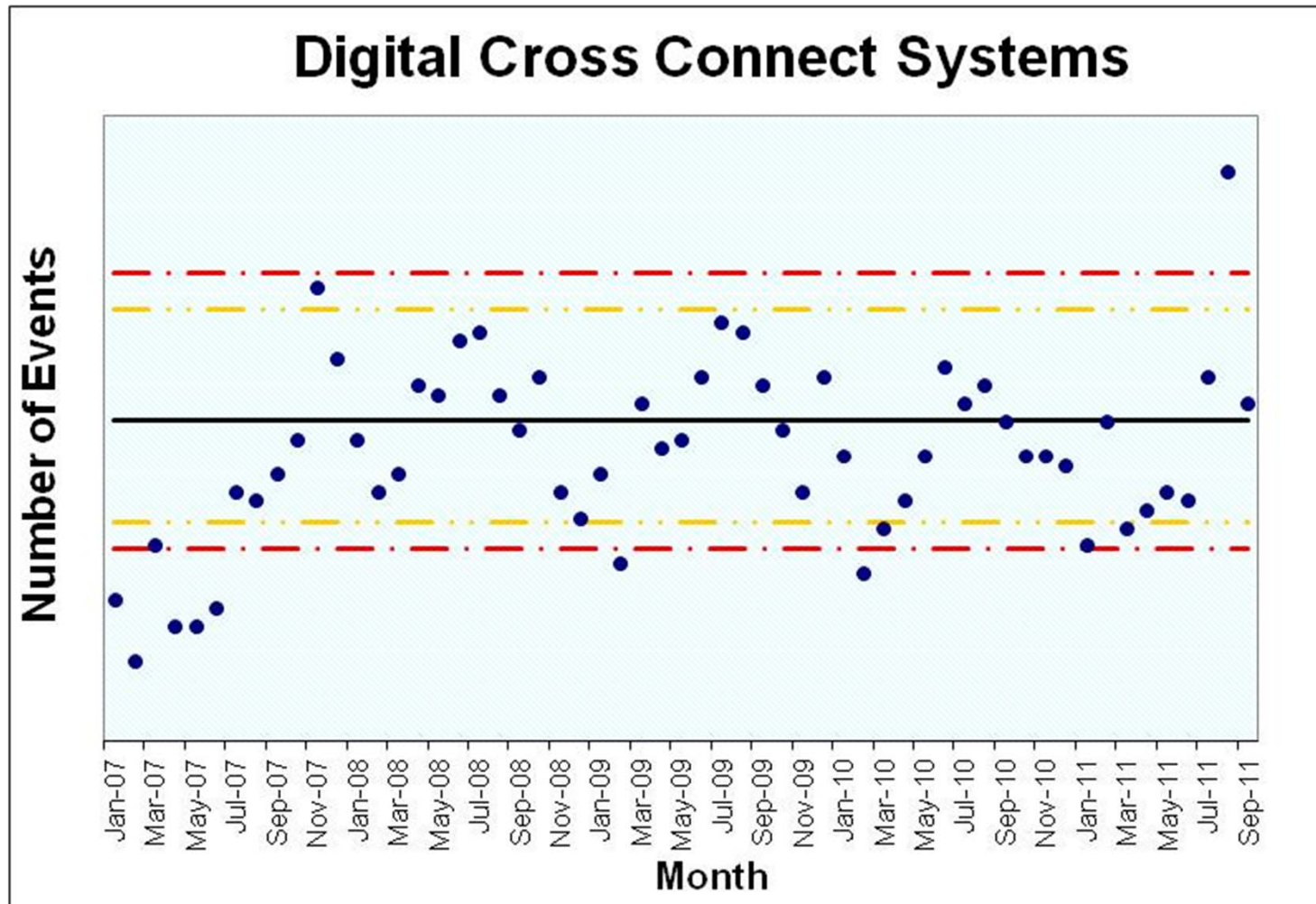
SS7



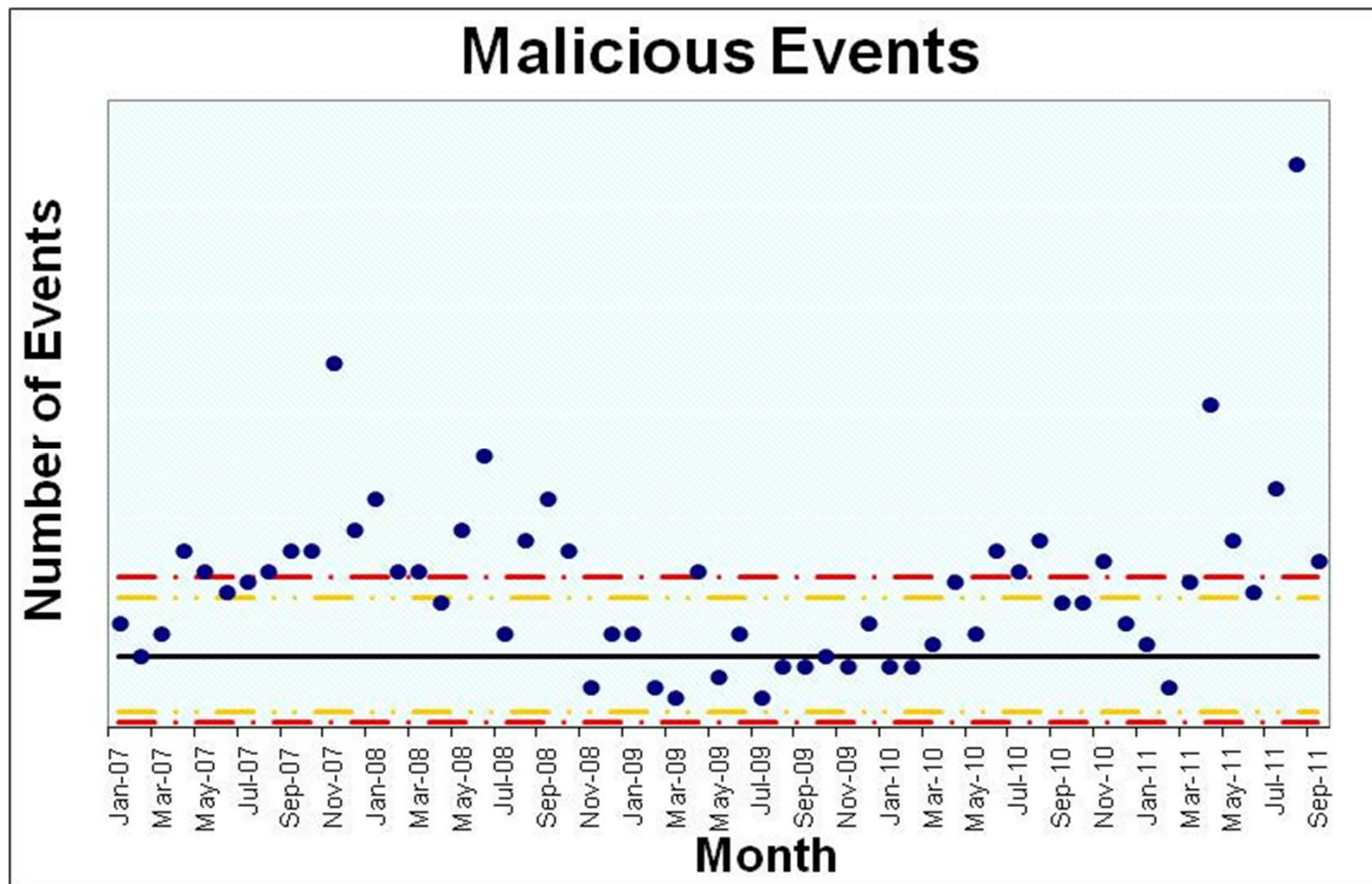
SS7 and Diversity



Digital Cross Connect Systems



Malicious Events

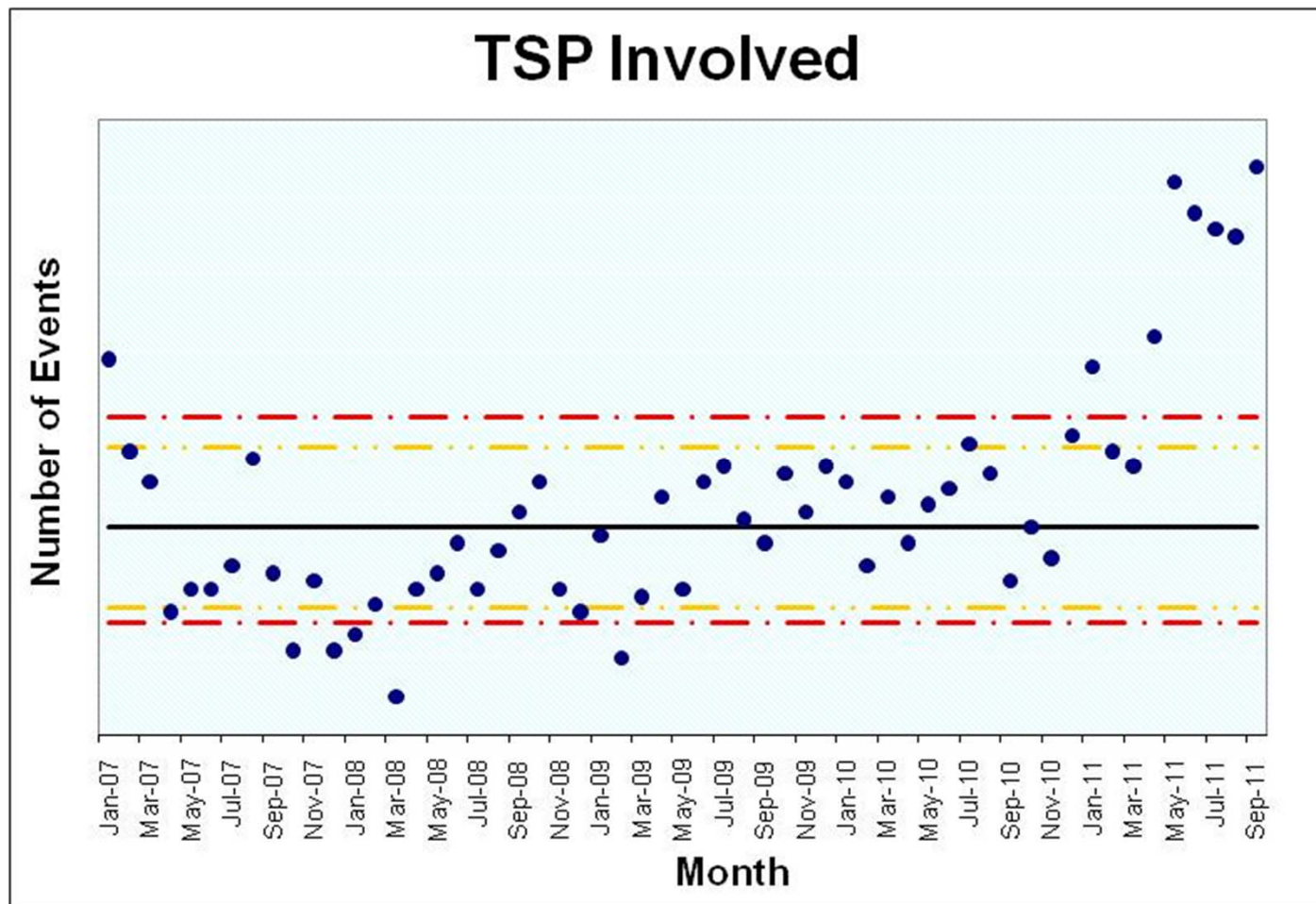


Malicious Activity



- 533 outage reports where malicious activity was indicated (188 in 2007, 188 in 2008, 83 in 2009, 138 in 2010, and 181 in of 2011)
- No outages seemed to be related to terrorist activities.
- About 59% of the reports (59) mentioned vandalism in 2010 and 40% (72) mention vandalism in 2011.
- About 7.6% of the reports (8) mentioned gun or shots in 2010 and 4% (6) in 2011.

Telecommunications Service Priority

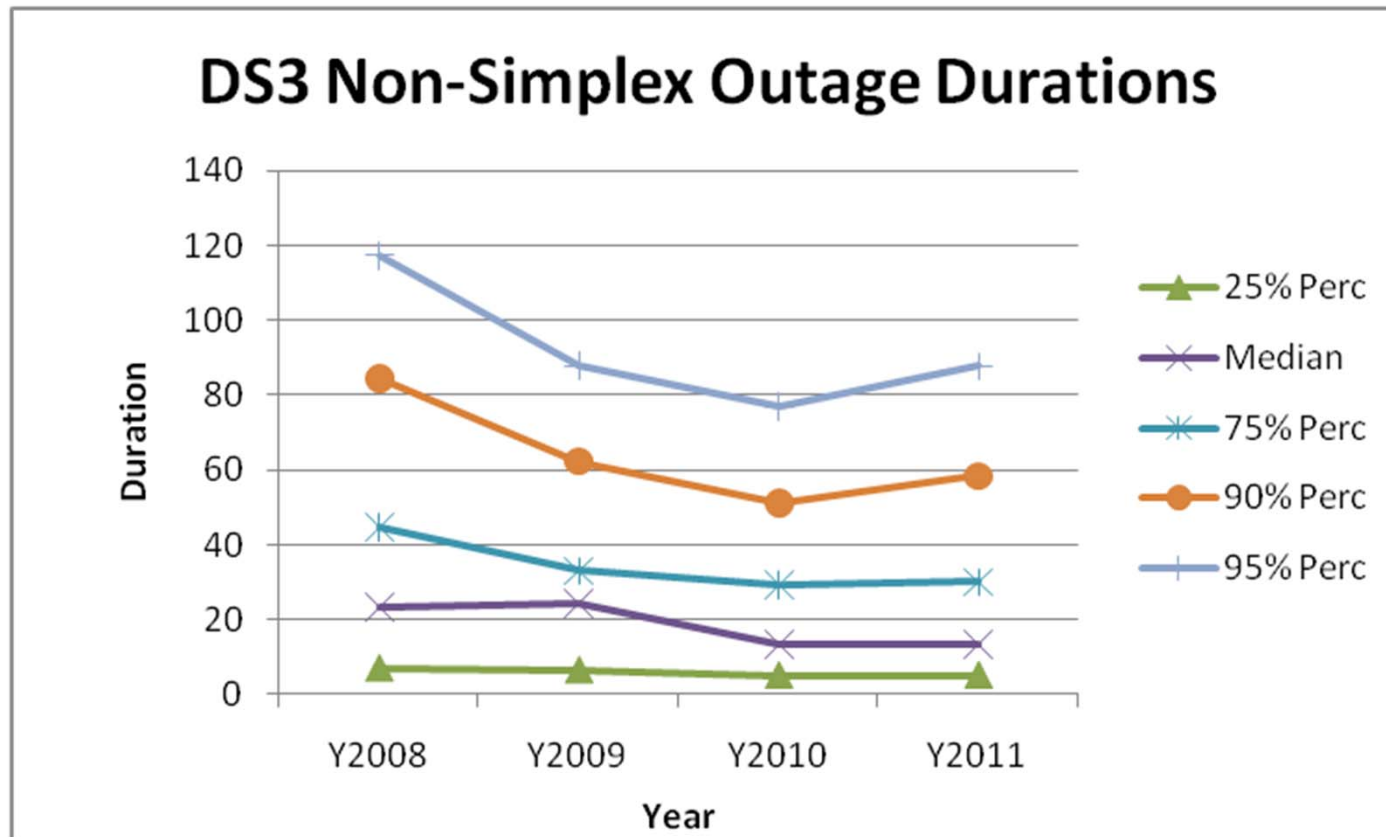


Telecommunications Service Priority

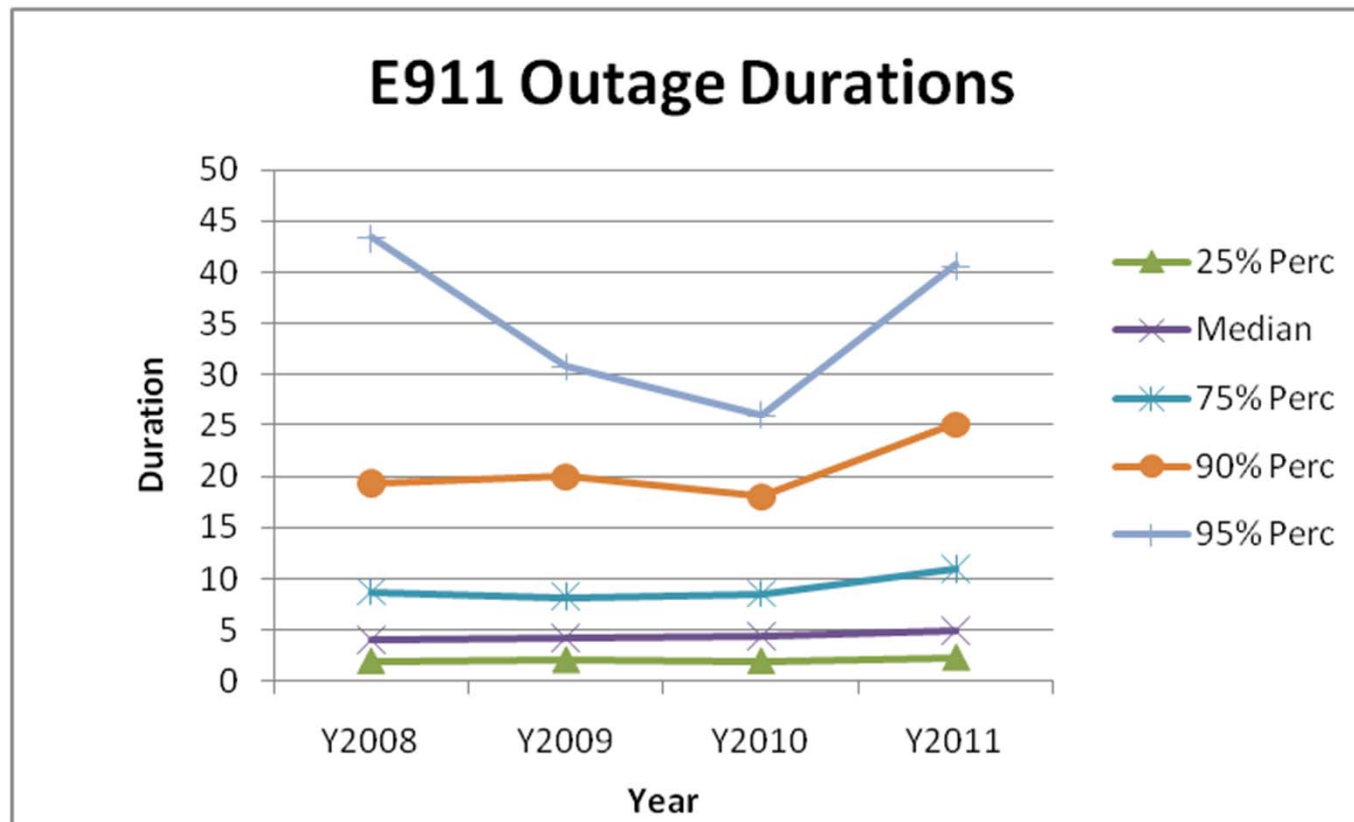


- About 25 outages per month in 2007 check TSP
- About 18.5 outages per month in 2008 check TSP
- About 27 outages per month in 2009 check TSP
- About 29 outages per month in 2010 check TSP
- About 57 outages per month in 2011 check TSP.

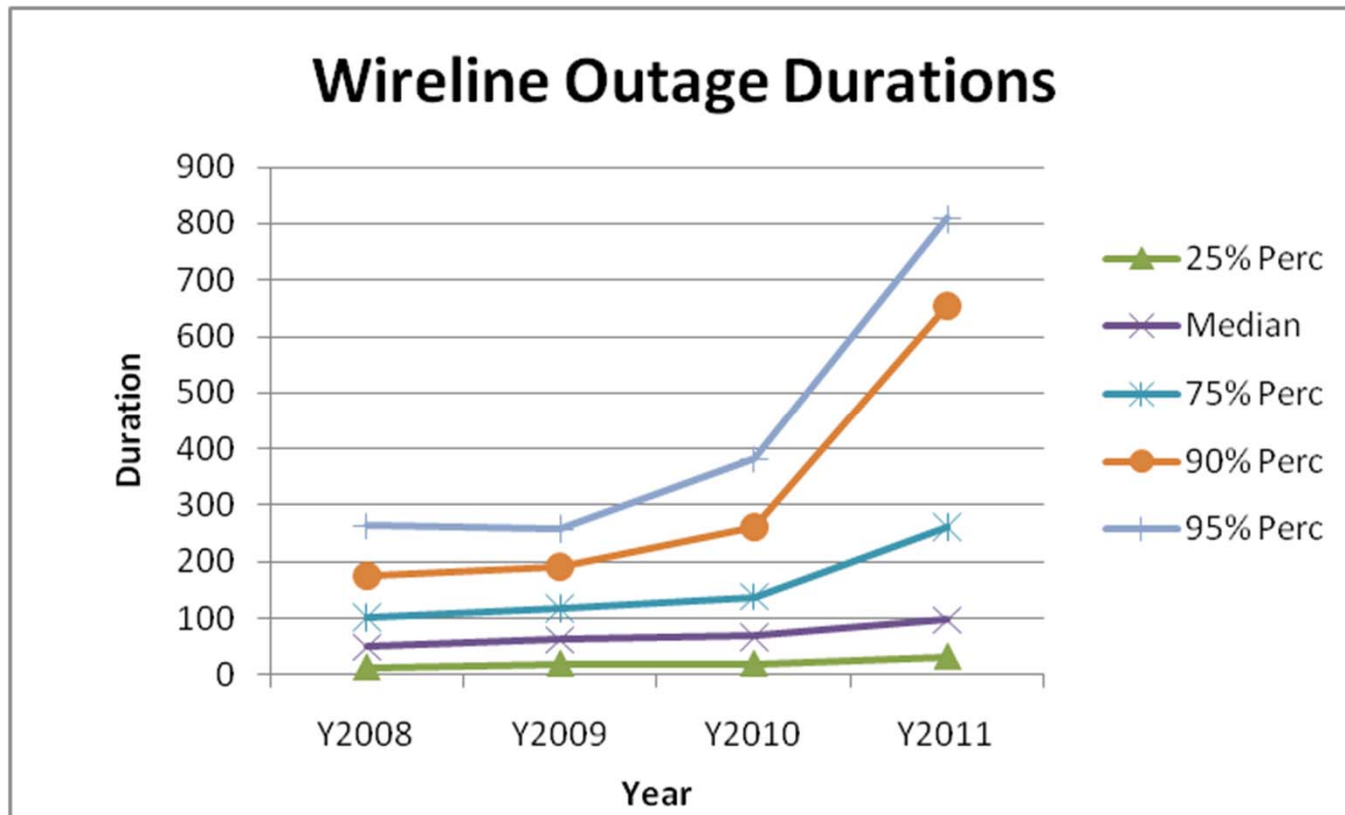
Duration Trends: DS3 Non-Simplex



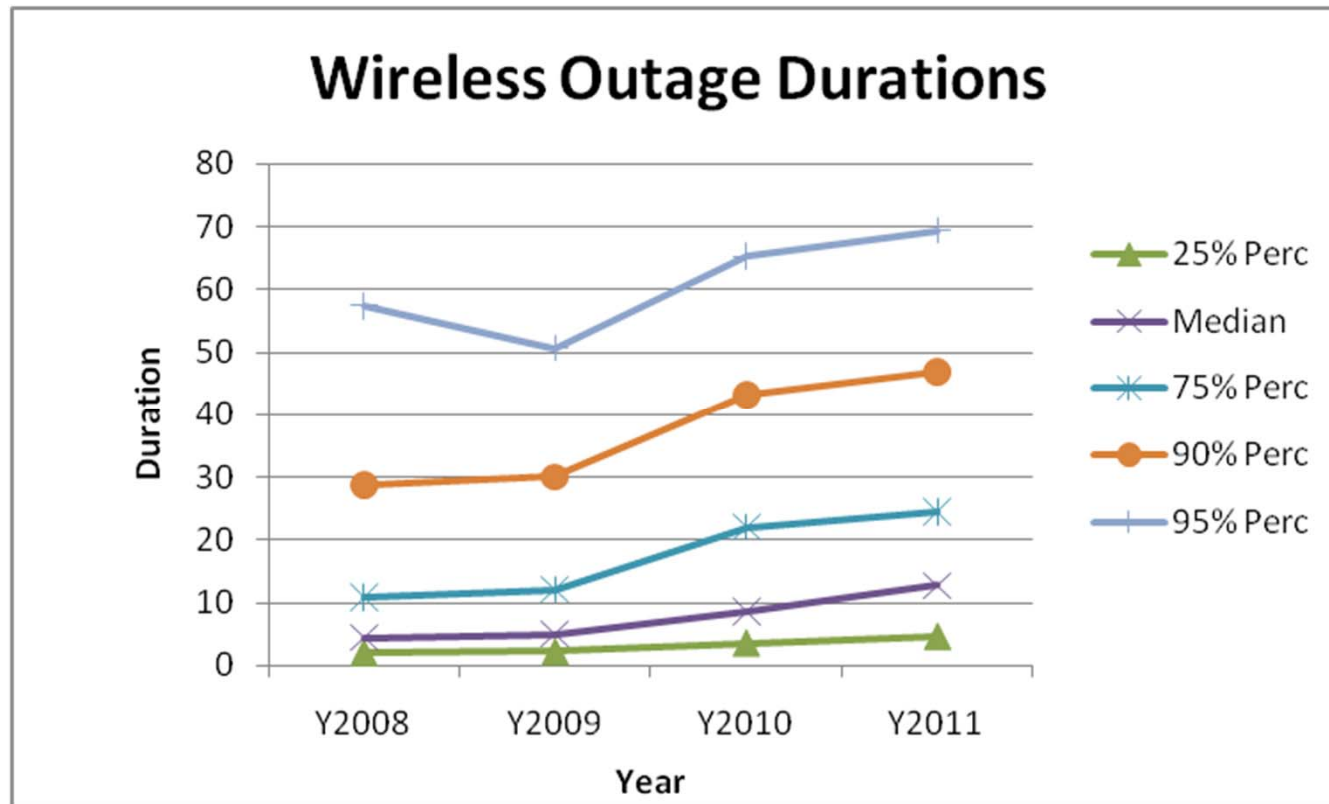
Duration Trends: E911



Duration Trends: Wireline



Duration Trends: Wireless



Test for Trend in Event Duration



Non-DS3-Simplex Outages Data from 2009 thru 2011

Rank Correlation of
duration with date is .048
and is significant

**Conclusion: Non DS3-
Simplex Outages are
longer from 1/10 to 9/11**

DS3-Simplex Events Only Data from 2009 thru 2011

Rank Correlation of
duration with date is .029
and is not significant

**Conclusion: DS3-Simplex
Events have similar
durations from 1/10 to
9/11**

Changes to NORS



Added the capability of getting all versions of an outage report

Comments and suggestions are greatly appreciated

NRSC Activities



- Wireless Team
- Procedural Team
- Best Practices Team
- Outage Reporting Advisory Team
 - Improvements to the NORS System
 - Improvements to the template
 - Recommended ways to communicate information
 - Improvements to NORS/DIRS manuals