



BERTHA W. HENRY, County Administrator

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## MEMORANDUM

**DATE:** May 4, 2018

**TO:** Mayor and Board of County Commissioners

**FROM:** Bertha Henry, County Administrator

**SUBJECT:** Post Incident Assessment Report on Abnormal Call Processing

As you are aware, at approximately 11:50AM on April 27, 2018, the 911 phone system entered into an unstable state, causing incoming calls to experience abnormal call processing. This issue affected the three Regional Consolidated Dispatch Public Safety Answering Points (PSAPs). County staff and the 911 system services provider, West Safety Services, immediately began working on the issue, and it was revealed that calls received were going into an "abandoned" call state. The system was able to accept 911 calls. However, the system was unable to deliver the calls to 911 call takers for inbound call processing, ultimately leading to 911 callers hanging up. After hanging up, the system registered the incoming 911 calls as abandoned calls, and dispatch personnel made attempts to call back every abandoned call. The system was restored by 12:53PM.

This issue had no impact on the County radio system or the County computer aided dispatch (CAD) system. These systems continued to operate normally.

I, along with County staff, met with the Vice President of Delivery Operations of West Safety Services Corporation on May 2, 2018 regarding the incident. In this meeting, West Safety Services provided a full assessment of the incident which includes root cause analysis, corrective actions, and countermeasures to prevent this incident from occurring again. A Post Incident Review is attached. The corrective actions taken include installation of a corrective software patch that was installed on our system on May 3<sup>rd</sup> as well as instituting procedures and re-training of local and remote West Safety Services' technical staff to ensure immediate service restoration actions are taken upon detection of such failures. For example, switchover to the redundant system, while root cause analysis is being performed, thereby reducing downtime.

If you require additional information, please contact me or Brett Bayag at 954-357-8565.

Attachment

cc: Alphonso Jefferson, Jr., Assistant County Administrator  
Brett Bayag, Acting Director, Office of Regional Communications  
Broward County Consolidated Communications Committee



# Post Incident Review – Broward County Regional System

West Safety Services  
May 4th, 2018  
Company Confidential

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**Helpdesk Ticket #:** 199918  
**Opened:** 4/27/2018 12:01 PM (Eastern)  
**Location:** Broward Regional System  
**Channel:** Direct  
**Impact:** Severity 1 - Inbound Calls Not Presenting  
**Event Start:** 4/27/2018 11:50 AM  
**Event End:** 4/27/2018 12:52 PM

**Event Summary:**

- At approximately 11:50 AM issues with inbound call presentation begin.
- 11:59 AM - West Safety Services Help Desk was contacted by Broward Central with the trouble description "all lines are down - unable to make or receive Admin or 911 calls"; trouble ticket #199917 was generated as a Severity 1 issue.
- West Safety Services Help Desk immediately begins investigation in real-time as a Severity 1 event.
- 12:01 PM – West Safety Services Help Desk was contacted by Broward North with the trouble description "Coral Springs is attempting to transfer calls to Broward North and the calls are not going through"; trouble ticket #199918 was generated.
- 12:05 PM – The local West Safety Services Supervisor who was contacted directly by Broward County, also generates ticket #199919 with the description "All regional sites are down. North, South and Central regional. All 911 calls going to abandoned calls field".
- During the event, calls would enter the VIPER system but would not present to call answering positions. When the calling party hung up, the inbound call would appear as an abandoned call available for callback as outgoing lines were not impacted.
- The West Safety Services Help Desk worked with the local West On-site Technicians at the Broward North and Central Regional sites. Initial focus from the on-site team was to perform fault isolation diagnostics between the VIPER CPE and the AT&T telephony network.
- At approximately 12:21 PM ticket #199918 is escalated to the West Level 3 support team.
- 12:50 PM – The West Safety Services L3 team performed corrective action on active VIPER VoIP Server Software by remotely failing over a service which was in a "deadlocked" state.
- 12:52 PM –Agents begin logging back into Power 911 ACD queues.
- 12:52:54 PM – VIPER record indicate 911 calls are again being presented and answered by Agents.

**Root Cause Summary:**

- A component on the VIPER VoIP Server which is specifically responsible for ACD call distribution entered into an unexpected deadlock state. This process deadlock impacted the delivery of ACD calls to the Primary VIPER node.
- The Secondary VIPER Node which was not impacted during the event.

- The trigger of this deadlock state was a random software event, not initiated by a hardware issue, configuration, or user action.
- Although the potential for this ACD process deadlock is present in all versions of VIPER ACD, West has not encountered this condition in any other field production environments or in any prior lab testing.
- Note: The Broward County Regional VIPER system is utilizing an ACD configuration which is best practice for larger PSAPs in order to assure faster call response times, and optimized efficiency in higher call volume environments. The Broward County Non-Regional VIPER system is however configured for shared line appearance at all PSAPs thus not susceptible to an ACD deadlock condition.
- Note: The Broward County Regional VIPER system is configured with multiple redundant, fault tolerant, VoIP servers. Currently the VIPER system monitors itself for loss of heartbeat, hardware failure, loss of power, loss of network connectivity, or a failure on any of the core telephony process on the active VoIP server. In addition the VIPER system monitors its own health by constantly simulating calls to the active VoIP server to ensure calls are being accepted. In the event that any of the aforementioned criteria is not met, an auto recovery or failover to the standby VoIP server, or Secondary VIPER node will automatically occur. As the process deadlock state which occurred on 04.27.18 did not affect calls entering into the VIPER system an automatic failover to the standby VoIP server did not occur.

### Call Impact Summary:

- Based on the Abandon Call Summary report for Broward Regional sites generated on 4/27/2018 at 1:34:51 PM, the following statistics are based on status at the time the report was generated – reflecting the event between 11:50:00 AM and 12:51:00 PM.
- There were a grand total of 288 calls which entered into the VIPER system between 11:50:00 AM and 12:51:00 on 04.27.18 which eventually entered into an abandoned state.
- Of these 288 abandoned calls, there were 202 unique callers (additional 86 calls consisted of duplicate callers)
- There were 26 instances of call records with No ANI (no call back number available.) West is working with the local Telco (AT&T) in order to isolate the cause of these calls with no ANI – investigation is still in progress.
- Of those 26 instances of calls with no ANI, 13 records were identified potentially unique with the additional 13 appearing to be related to an flapping issue on a single trunk (investigating with local Telco).
- West sees no evidence that these instances of calls with no ANI were in any way related to the 04.27.18 event as we have identified multiple instances of calls entering the system with no ANI before and after the event.

### Corrective Actions:

- West Safety Services Help Desk and local on-site Technicians are actively monitoring the Broward County Regional VIPER system 24x7, and reporting system health check statuses to both West Sr Management and Broward County ORCAT team every 30 minutes.

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- 04.29.18 - West Engineering team identified the source of the issue and has developed an intermediate patch to protect against the potential ACD deadlock condition.
  - 05.03.18 - The Broward County Regional VIPER system was successfully patched as part of coordinated CMR event.
  - The West Help Desk and local on-site Technicians will continue active monitoring on the Broward County Regional VIPER system 24x7, with hourly health check statuses through 05.06.18.
  - The software correction applied to the Broward County Regional system will be made generally available as part of packaged software release at a future date.
  - West's R&D team will also begin development of more robust, enhanced system monitoring process which will identify, detect, alarm, and auto-recover from any type of potential process deadlock states regardless of the trigger.

### **Operational Postmortem:**

- The West Help Desk will create a reference guide for the entire support team to more effectively identify deadlock conditions.
- Both the West Help Desk and on-site Technicians will be trained on use of the reference guide to ensure proper steps are followed to prioritize & accelerate service restoral.