

## **D. Test Results: Network Surveillance Support Evaluation (PPR19)**

### **1.0 Description**

The Network Surveillance Support Evaluation consisted of an analysis of the processes and operational elements associated with Verizon Pennsylvania (Verizon PA) surveillance and outage notification procedures. The evaluation involved a detailed examination of the processes followed by the Verizon PA Network Services Assurance Center (NSAC) and the Network Operations Center (NOC) in monitoring Verizon networks for Retail and CLEC operations. An evaluation of the network elements, systems, and coverage of the NSAC and the NOC was also performed.

### **2.0 Methodology**

The test methodology of the Network Surveillance Support Evaluation involved: (i) direct observation of the NSAC and NOC as it adheres to processes outlined in the CLEC Handbook, Volume III; (ii) an examination of the outage notification documentation; and (iii) an examination of coverage of the network to confirm degree of compliance with service level agreements for CLEC operations.

#### **2.1 Business Process Description**

Verizon PA defines the network elements evaluated in this test as follows:

- ◆ Interoffice Facilities (IOF) – A high capacity digital transmission path that is dedicated for the use of the ordering CLEC for the transport of local, toll, and/or access traffic between central offices. The CLEC can purchase IOFs in DS1 through DS3 transport capacities.
- ◆ IOF Dedicated Trunk Port – A termination on a Verizon PA switch (i.e., tandem or end office) dedicated to the use of the ordering CLEC for transport of local, toll, and/or access traffic between the Verizon PA unbundled switch and the CLEC’s collocation or other suitable arrangement. The trunk port includes the associated signaling and transport options.
- ◆ Advanced Intelligent Network (AIN) – A network architecture that includes three basic call processing elements: Service Control Points (SCP), Service Switching Points (SSP), and Signal Transfer Points (STPs). An AIN SCP is a database that executes service application logic in response to queries sent to it by an SSP equipped with AIN functionality. SSPs are digital phone switches that may query an SCP for customer specific instructions on how to process a call (routing, blocking, etc.). STPs are packet switches that shuttle messages between an SSP and SCP or between SSP and SSP. All three communicate via out-of-band signaling using the Signaling System 7 protocol.

- ◆ Signal System 7 (SS7) – A means by which network elements exchange information over an out-of-band channel called an SS7 link. There are two distinct protocols used. The first is Integrated Services Digital Network User Part (ISUP). ISUP messaging allows an SSP to communicate with another SSP through an STP. Examples of information exchange include trunk reservation, trunk setup, and call tear-down requests. The second SS7 protocol is Transaction Capabilities Application Part (TCAP). SSPs may need additional information on how to route or treat a specific call request. This data may be found in an SCP. TCAP messaging allows an SSP to communicate with an SCP (or an SCP with another SCP) through an STP. Examples of information exchange include Local Number Portability data such as Location Routing Numbers and Line Information Database addresses.

The Verizon PA NSAC and NOC monitor and maintain the Verizon PA network, focusing on network integrity, reliability, availability, and quality of the network. Verizon PA monitors outages that are the result of abnormal events that affect the service capability of the Verizon PA network. Verizon PA defines abnormal events as unusual events, conditions, or situations that affect, or might be expected to affect, telephone company personnel, telephone service, equipment, or other property.

Verizon PA technicians monitor and analyze the Pennsylvania network and outages through the use of the systems listed below:

- ◆ Network Traffic Manager (NTM) – NTM gives 30-second to 5-minute updates which provide the NSAC with traffic data on trunk groups, switch volumes, and congestion in the network. This system allows the re-routing of traffic, the insertion of call gaps, or other types of controls that are used in the network.
- ◆ Network Traffic Patterns/“Panther” (NTP) – This shows call irregularity messages directly from the switch and provides information on mass calling events, network congestion, or trunk group problems. There are no network controls administered through this system. Panther provides additional/more-detailed data on trunk groups.
- ◆ Signaling Traffic Management (STM) – This provides the NSAC with any problems concerning SS7 links. Information is provided in real time.
- ◆ Network Monitoring and Analysis (NMA) – This provides the NSAC with transport trouble information. If NMA generates an alarm on a transport facility, selecting the alarm on the NMA system’s GUI will provide additional detail as to the exact type, level of trouble, and identification of the effected transport facility.

- ◆ Network Fault Management (NFM) – This tool provides awareness screens to give information on switch and facility alarms. These alarms are color coded according to severity. Additionally, this is the only alarm that will give an audible signal (SS7 problem isolation). Environmental alarms are viewed through NFM.

## 2.2 Scenarios

Scenarios were not applicable to this test.

## 2.3 Test Targets & Measures

The test targets are the network surveillance and outage notification processes and sub-processes. Processes, sub-processes, evaluation measures, and associated test cross-reference numbers are summarized in Table 19-1 which follows. The last column, “Test Cross-Reference,” indicates where the particular measures are addressed in Section 3.1 “Results & Analysis.”

**Table 19-1: Test Target Cross-Reference**

Process	Sub-Process	Evaluation Measure	Test Cross-Reference
Network Surveillance	IOF Surveillance	Existence, Reliability	PPR-19-1, PPR-19-2
Network Surveillance	AIN Interconnect Surveillance	Existence, Reliability	PPR-19-3, PPR-19-4, PPR-19-7
Network Surveillance	SS7 Interconnect Surveillance	Existence, Reliability	PPR-19-5, PPR-19-6, PPR-19-7
Outage Notification	Process Documentation	Accuracy, Completeness	PPR-19-8
Outage Notification	Notification Procedures	Timeliness, Accuracy, Completeness	PPR-19-9, PPR-19-10, PPR-19-11

## 2.4 Data Sources

The data collected for this test relied on interviews and reviews of documents supplied by Verizon PA. Interviews were conducted with Verizon PA managers and employees with direct responsibility and knowledge of targeted processes.

The data collected for the test are summarized in Table 19-2 below.

**Table 19-2: Data Sources for Network Surveillance Support Evaluation**

Document	File Name	Location in Workpapers	Source
PA NOC Interview Report (March 23, 1999)	NOC_IntervSummary_3_23_99 (verification).doc	PPR-19-A-1	KPMG Consulting
PA NSAC Interview Report (May 20, 1999)	NSAC_IntervSummary_5_20_99.doc	PPR-19-A-2	KPMG Consulting
Verizon Response to PA NSAC Interview Report (May 20, 1999)	VZN_Response_to_5_20_99.rtf	PPR-19-A-3	Verizon South
PA NSAC Interview Report (January 12, 2000)	PA NSAC Interview_011220001.doc	PPR-19-A-4	KPMG Consulting
PA NSAC Interview Report (September 18, 2000)	NSAC_IntervSummary_8_18_00.doc	PPR-19-A-5	KPMG Consulting
Verizon Response to PA NSAC Interview Report (September 18, 2000)	Verizon Response_to_9_18_00.doc	PPR-19-A-6	Verizon South
Verizon CLEC Handbook, Volume III, Section 8.3	Hard Copy	PPR-19-A-7	Verizon South
Verizon CLEC Handbook, Volume III, Section 8.4.6 & Section 8.4.7	Hard Copy	PPR-19-A-8	Verizon South
Verizon Service Quality Assurance System (SQAS) overview	Hard Copy	PPR-19-A-9	Verizon South
Guide to Inputting Verizon Lotus Notes Abnormal Events (Verizon document 002-200-004) Issue B (September 1999)	Hard Copy	PPR-19-A-10	Verizon South

Document	File Name	Location in Workpapers	Source
NYNEX Abnormal Events Procedures (Nynex Document 002-500-930) Issue F (July 1995)	Hard Copy	PPR-19-A-11	Verizon South
NYNEX Emergency Operating Procedures (June 1996)	Hard Copy	PPR-19-A-12	Verizon South
Verizon Abnormal Event Reporting Guidelines (Verizon Document 002-200-001) (Date Issued April 26, 1999)	Hard Copy	PPR-19-A-13	Verizon South
Verizon Reportable Abnormal Conditions (Verizon Document 002-100-800) Issue C (October 1998)	Hard Copy	PPR-19-A-14	Verizon South
FCC Guidelines “Notification of Service Outage” CFR, Title 47, Volume 3, Part 63, Section 63.100	Hard Copy	PPR-19-A-15	Federal Communications Commission
Network Operations Failure Procedure (December 20, 1999)	Hard Copy	PPR-19-A-16	Verizon South

#### 2.4.1 Data Generation/Volumes

This test did not rely on data generation or volume testing.

#### 2.5 Evaluation Methods

The evaluation measures were established by the Test Manager to provide a framework and a basis for the evaluation. The evaluation criteria cover the measures set forth in the Master Test Plan. Interviews and document reviews were used to assist KPMG Consulting’s assessments. The responses from the interview questions were furnished to Verizon PA employees participating in the test to verify the accuracy of the information recorded. The interview

responses and Verizon PA documentation formed the collection of data evaluated in this test. The data was then analyzed in reference to the evaluation measures established for the test.

2.6 *Analysis Methods*

The Network Surveillance Support Evaluation included a checklist of evaluation criteria developed by the Test Manager during the initial phase of the Verizon Pennsylvania OSS Evaluation. These evaluation criteria provided the framework of norms, standards, and guidelines for the Network Surveillance Support Evaluation.

The data collected were analyzed employing the evaluation criteria referenced above.

3.0 *Results Summary*

This section identifies the evaluation criteria and test results.

3.1 *Results & Analysis*

The results of this test are presented in Table 19-3 below.

**Table 19-3: PPR19 Evaluation Criteria and Results**

Test Cross-Reference	Evaluation Criteria	Result	Comments
<b>Network Surveillance:</b>			
PPR-19-1	IOF surveillance exists and is functional.	Satisfied	Interoffice Facilities such as trunk groups and transport are monitored through the use of the Network Traffic Management (NTM), Network Monitoring & Analysis (NMA), and Network Fault Management (NFM) systems.  NTM will indicate problems to the Network Service Assurance Center (NSAC).  NFM provides the NSAC with visible, color coded alarms regarding the jeopardy of IOFs.  Similarly, NMA provides visible notification of transport status. When jeopardy thresholds are reached, NMA will automatically generate a ticket into the Work Force Administration (WFA) system.

Test Cross-Reference	Evaluation Criteria	Result	Comments
PPR-19-2	IOF events are logged, categorized, and tracked.	Satisfied	Abnormal events affecting IOFs are logged, categorized, and tracked in the abnormal events database. Additionally, when tickets for IOF events are built into the WFA system, either automatically by NMA or manually by Verizon PA personnel, they are categorized and tracked according to the level of severity (service level affecting) and tracked as a trouble ticket.
PPR-19-3	AIN interconnection surveillance exists and is functional.	Satisfied	Surveillance of advanced intelligent network (AIN) connectivity is provided by the Network Monitoring & Analysis (NMA) and the Network Fault Management (NFM) systems. NMA provides visible notification of transport status. When jeopardy thresholds are reached, NMA will generate a ticket into the Work Force Administration (WFA) system. NFM provides the NSAC with visible, color coded alarms regarding the jeopardy of advanced intelligent network connectivity.
PPR-19-4	AIN interconnection events are logged, categorized, and tracked.	Satisfied	Abnormal events affecting advanced intelligent network connectivity (AIN) are logged, categorized, and tracked in the Verizon PA NSAC's Abnormal Events Database. Additionally, when tickets for AIN events are built into the WFA system, either automatically by NMA or manually by Verizon PA personnel, they are categorized and tracked according to the level of severity (service level affecting) and tracked as a trouble ticket.
PPR-19-5	SS7 interconnection surveillance exists and is functional.	Satisfied	The Signaling Traffic Management (STM) system displays SS7 traffic information in real time to the Network Service Assurance Center. STM information is constantly updated and presented to Verizon PA personnel in a heads-up display. The Network Fault Management (NFM) system generates awareness screens to alert Verizon personnel to SS7 problems. NFM SS7 problem

Test Cross-Reference	Evaluation Criteria	Result	Comments
			isolation produces an audible alarm which must be reacted to in order to silence.
PPR-19-6	SS7 interconnection events are logged, categorized, and tracked.	Satisfied	SS7 alarms generated by the STM and NFM systems are reviewed and confirmed by NSAC personnel. If trouble is authenticated, a trouble ticket is generated and the “abnormal event” procedures are followed. Abnormal events affecting SS7 links are logged, categorized, and tracked in the abnormal events database. Additionally, when tickets for SS7 events are built into the WFA system, they are categorized and tracked according to the level of severity (service level affecting) and tracked as a trouble ticket.
PPR-19-7	NOC switch trouble events are logged, categorized, and tracked.	Satisfied	Verizon PA follows established procedures for resolving and tracking switch trouble events. Switch Equipment Technicians and the NOC Info system, in conjunction with NSAC’s NMA system, maintain a categorized records of switch events and their progress to resolution.
<b>Outage Notification:</b>			
PPR-19-8	Verizon has a documented policy and procedure for notification during an event.	Satisfied	<p>The CLEC Handbook, Volume III, Section 8.3.7 describes network outages that affect service as “abnormal events.”</p> <p>Verizon PA stipulates that it has the ability to notify CLECs of critical network failures via email. The process for establishing notification is defined as follows:</p> <p>“Upon request by a CLEC through the Verizon PA Account Manager assigned to that CLEC, Verizon PA will notify the CLEC of certain events in the Verizon PA network that may be service affecting. Notification of reportable events is sent to CLECs simultaneously with the internal Verizon PA event notification. The usual Verizon PA practice is for the notification process to begin within 30 minutes after the Verizon PA Work</p>

Test Cross-Reference	Evaluation Criteria	Result	Comments
			<p>Center has determined that a reportable event has occurred.”</p> <p>In addition, Verizon PA maintains the “Reportable Abnormal Conditions” job aid which specifically outlines reporting responsibilities, reportable conditions, and when to notify Verizon PA organizations. This coincides with the CLEC requested notification process as specified in CLEC Handbook, Volume III, Section 8.3.7.</p> <p>The “Network Operations Network Failure Procedure” outlines specific notification requirements for the Network Operations Center in their Tier I surveillance role.</p>
PPR-19-9	Intervals exist for notifying affected CLECs of outages.	Satisfied	<p>The CLEC Handbook, Volume III, Section 8.3.7 stipulates that the usual Verizon PA practice is for the notification process to begin within 30 minutes after the Verizon PA Work Center has determined that a reportable event has occurred.</p> <p>Specific timing and severity triggers for notification of abnormal events/outages are contained in the “Reportable Abnormal Conditions” job aid.</p>
PPR-19-10	Procedures exist for timely, accurate, and operationally complete outage notification.	Satisfied	<p>Abnormal outage notification time triggers are provided to the CLECs in the CLEC Handbook, Volume III, Section 8.3.7. Abnormal outage notification procedures, as defined in the “Reportable Abnormal Conditions” job aid, provide specific timeline information, as well as who and when to contact other Verizon PA organizations.</p> <p>Abnormal outage notification follows Federal Communications Guidelines as set forth in the Code of Federal Regulations, Title 47, Volume 3, Part 63, Section 63.100, “Notification of Service Outage.”</p>

Test Cross-Reference	Evaluation Criteria	Result	Comments
PPR-19-11	Procedures exist for timely, accurate, and operationally complete switch event notification.	Satisfied	<p>Abnormal event notification time triggers are provided to the CLECs in the CLEC Handbook, Volume III, Section 8.3.7. Abnormal event notification procedures, as defined in the “Reportable Abnormal Conditions” job aid, provide specific timeline information, as well as who and when to contact other Verizon PA organizations.</p> <p>Abnormal event notification follows Federal Communications Commission Guidelines as set forth in the Code of Federal Regulations, Title 47, Volume 3, Part 63, Section 63.100, “Notification of Service Outage.”</p>