APCO International

The Association of Public-Safety Communications Officials - International

Public Safety Answering Point (PSAP) Service Capability Criteria Rating Scale

APCO / NENA ANS 1.102.1-2008

Approved American National Standard

ANSI

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Acronyms and Abbreviations*

For the purposes of this ANS, the following definitions of acronyms apply:

ADA	Americans with Disabilities Act
AHJ	Authority Having Jurisdiction
ANI/ALI	Automatic Number Identification/Automatic Location Identification
ANS	American National Standard
ANSI	American National Standard Institute
APCO	Association of Public-Safety Communications Officials
BP	Best Practice
CAD	Computer Aided Dispatch
CBN	Call Back Number
COOP	Continuity of Operations Plan
CPE	Customer Premise Equipment
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
GETS	Government Emergency Telecommunications Service
GIS	Geographic Information Systems
HSPD	Homeland Security Presidential Directive
LSO	Local Serving Office
MOU	Memorandum of Understanding
NENA	National Emergency Number Association
NFPA	National Fire Protection Association
NLSI	National Lighting Safety Institute
NRIC	Network Reliability and Interoperability Council
PSAP	Public Safety Answering Point
PSTN	Public Switched Telephone Network
SOG	Standard Operating Guidelines
SOP	Standard Operating Procedure
TDD-TTY	Telephone Device for the Deaf - Teletypewriter (Text Telephone)
UPS	Uninterruptible Power Supply
WPS	Wireless Priority Service
WSP	Wireless Service Provider

*The Acronyms and Abbreviations are informative and not a part of the ANS

1 Executive Overview

APCO and NENA have jointly developed this document to assist PSAP Managers and their Governing Authorities to identify their current level of service capability. A self-evaluation assessment tool is provided to facilitate an objective review of the current capabilities of the PSAP against models representing the best level of preparedness, survivability and sustainability amidst a wide range of natural and man-made events.

The assessment tool is also intended to provide the basis for discussion with funding bodies (Federal, State, County, Municipal, etc.) concerning the PSAP status in regard to their current technological position, and readiness or effectiveness to survive certain risks associated with local vulnerabilities.

Using the assessment tool, PSAP Managers and Administrators will have the ability to assess the validity and completeness of the public safety communications portion of agency "Continuity of Operations Plans (COOP)" against objective criteria. This evaluation is necessary to demonstrate a meaningful effort to anticipate and be prepared for sustained emergency communications services amidst disaster.

PSAP Managers and Administrators also have the opportunity to identify PSAP capabilities that are desired, yet missing, or less than fully developed. This provides both practitioners and public policy executives with an implementation path that has clear logic. Priorities may be assigned to close the gaps in service capability that are documented during the assessment.

This tool may also be adapted for use as a "self-evaluation" tool, or as a tool that is utilized by a qualified outside organization on behalf of the PSAP or the Authority Having Jurisdiction (AHJ), such as an APCO-NENA program to conduct such evaluations for the PSAPs in a neutral environment, or any qualified entity chosen by the PSAP.

The initial focus of the PSAP Service Capability Rating Scale is in the area of PSAP Survivability. When developing the evaluation matrix, a number of items were identified as being essential when considering PSAP survivability, with other items relating to day-to-day operations and anticipated future items. This document will provide the Survivability items, while subsequent revisions will include day-to-day and future items.

2 Introduction

2.1 Purpose and Scope of Document

APCO and NENA have jointly developed this document to assist PSAP Managers and their Governing Authorities to identify their current level of service capability. An assessment tool is provided to facilitate an objective review of the current capabilities of the PSAP against models representing the best level of preparedness, survivability and sustainability amidst a wide range of natural and man-made events. The self-evaluation assessment tool is also intended to provide the basis for discussion with funding bodies (Federal, State, County, Municipal, etc.) concerning the PSAP status in regard to their current technological position, and readiness or effectiveness to survive certain risks associated with local vulnerabilities.

2.2 Reason to Implement

PSAP Managers and Administrators will have the ability to assess the validity and completeness of the public safety communications portion of agency "Continuity of Operations Plans (COOP)" against objective criteria. This evaluation is necessary to demonstrate a meaningful effort to anticipate and be prepared for sustained emergency communications services amidst disaster.

PSAP Managers and Administrators also have the opportunity to identify PSAP capabilities that are desired, yet missing, or less than fully developed. This provides both practitioners and public policy executives with an implementation path that has clear logic. Priorities may be assigned to close the gaps in service capability that are documented during the assessment.

This tool may also be adapted for use as a "self-evaluation" tool, or as a tool that is utilized by a qualified outside organization on behalf of the PSAP or the Authority Having Jurisdiction (AHJ), such as an APCO-NENA program to conduct such evaluations for the PSAPs in a neutral environment, or any qualified entity chosen by the PSAP.

2.3 Document Terminology

The term "shall" is used throughout this document to indicate required parameters and to differentiate from those parameters that are recommendations. The term "should" is used throughout this document to identify recommendations.

3 APCO/NENA ANS 1.102.1-2008

3.1 Overview

The initial focus of the PSAP Service Capability Rating Scale is PSAP Survivability. When developing the evaluation matrix, a number of items were identified as being essential when considering PSAP survivability (categorized as "S"), with other items relating to day-to-day operations ("D") and anticipated future ("F") items. This document will provide the Survivability items, while subsequent revisions will include day-to-day and future items.

For each item, an example of a specific level of service is defined, either as "Standard", which reflects the minimum criteria for PSAPs in the category; "Advanced", which represents a higher level of service; or "Superior", which represents the best example of service within the item. Each graduated rating assumes compliance with the prior level.

3.2 Survivability Category Items

IMPORTANT: The following items have been identified as necessary for PSAP Survivability, and therefore fall into the "S" category. The criteria for a "Standard" rating for PSAPs on these "S" items are listed in this section. See the Matrix (Section 5 - Exhibit) for a description of the "Advanced" and "Superior" criteria applicable to each item.

3.2.1 Receipt of E9-1-1 calls using static ALI functionality. [S1]

PSAP has Customer Premise Equipment to enable the receipt of "Enhanced 9-1-1" calls with associated data (CBN & caller location information) from callers in the PSAP's jurisdiction. This includes traditional wireline, static VoIP, and wireless Phase 1 types of calls.

PSAP is also Phase 1 wireless capable for at least one WSP in the jurisdiction, or has made a valid formal request for Phase 1 wireless service with the WSPs doing business in their jurisdiction.

3.2.2 Reserved for future use

3.2.3 Receipt of E9-1-1 calls using dynamic ALI functionality. [S3]

PSAP has CPE to enable the receipt of "Enhanced 9-1-1" calls with associated data via dynamic ALI updates (CBN & caller location information). This includes nomadic VoIP and wireless Phase 2 types of calls.

PSAP is also Phase 2 wireless capable 5, for at least one WSP in the jurisdiction, or has made a valid formal request for Phase 2 wireless service with the WSPs doing business in their jurisdiction. (Related NRIC BP 7-7-3218 and 7-7-3219)

3.2.4 Computer Aided Dispatch (CAD). [S4]

The PSAP provides their telecommunicators with software to assist in initiating calls for service, dispatching, and maintaining the status of responding resources in the field.

3.2.5 GIS mapping tool. [S5]

The PSAP has the ability to automatically accept, display and plot caller location data on an electronic map display. The process either exists or is in planning for effective updating.

3.2.6 Access to the Public Switched Telephone Network (PSTN). [S6]

PSAP has access to PSTN through typical local service provisioning.

3.2.7 ADA compliance. [S7]

TDD-TTY and special needs community access available at each PSAP position; semiannual training provided as required by the Americans with Disabilities Act and Department of Justice requirements.

3.2.8 Emergency Communications Plans are in place for risks associated with local vulnerabilities. [S8]

These plans should provide at least basic levels of service (as defined by the AHJ) for up to 3 days until more permanent changes or repairs can be made. PSAPs should determine, or have knowledge of, all hazards identified during a threat assessment, with special attention given to “at risk” events. For example, a PSAP in a hurricane-prone area should have comprehensive emergency communications plans that assure survivability and sustainability of at least basic levels of service in the event of a hurricane. All PSAPs risk disruption of service caused by natural and man-made events.

3.2.8 (Continued from previous page)

This criterion could be met by establishing mutual aid agreements with neighboring PSAPs to receive and handle calls during this time.

This item also supports agency Continuity of Operations Planning (COOP). (See also Homeland Security Presidential Directive 8[1] and NFPA 1600)
(Related NRIC BP 7-7-3211)

3.2.9 Coordination of Emergency Communication Plans and Collaboration with all necessary partners. [S9]

Such plans should be developed in collaboration with all partners [i.e. PSAP Operations, E9-1-1 Service Provider, Authority Having Jurisdiction (AHJ) (a.k.a. 9-1-1 Governing Authority), associated Public Utilities, and other applicable entities]. All entities should have a copy of their applicable section(s).
(Related NRIC BP 7-7-0577, 7-7-0579, 7-7-0599, 7-7-1011, and 7-7-1037)

3.2.10 Schedule and conduct drills to exercise Emergency Communication Plans. [S10]

A drill and exercise program is in place to evaluate contingency/continuity of operations plans. Each plan or planning item should be exercised at least annually. An after action and correction process is in place to evaluate and improve the planning process. (Related NRIC BP 7-7-0579)

3.2.11 Trunking/Transport Path Management. [S11a through e]

3.2.11.1 Diversity. [S11a]

Trunking diversity and redundancy shall be included in PSAP's operational/ design documents. (Related NRIC BP 7-5-0569 Option 2, BP 7-7-0579, BP 7-7-0566, 7-7-0573, 7-7-0580, and 7-7-3210) Minimum level of diversity for the E9-1-1 transport path is from the Selective Router (SR) to the Local Serving Office (LSO) (including trunks/lines and supporting hardware and electronics. These items shall be audited on an annual basis.

[1] Section 23 of the Homeland Security Presidential Directive provides that the Secretary, in conjunction with other Federal Departments and agencies, State and local governments, and non-governmental organizations, shall develop a comprehensive plan to provide accurate and timely information to public citizens, first responders, units of government, the private sector, and other interested parties and mechanisms for coordination at all levels of government.

3.2.11.2 Status Monitoring of the network elements. [S11b]
Network paths are monitored and alarmed 24x7 by the network element providers. (Related NRIC BP 7-7-0574)

3.2.11.3 Status Monitoring of PSAP CPE. [S11c]
PSAP CPE is alarmed 24x7 for automatic trouble reporting/alerting.

3.2.11.4 SOPs. [S11d]
Standard Operating Procedures explain what to do when an alarm is activated and assign responsibility. (Related NRIC BP 7-7-0568)

3.2.11.5 Training. [S11e]
Trunking/Transport path management is addressed in PSAP training document. Example: this would include having training material to allow PSAP management to identify when one of the diverse transport paths has been interrupted.

3.2.12 Selective Router redundancy. [S12]
Not required for Standard rating. (See matrix for Advanced and Superior.) (See NRIC BP 7-7-0571 and 7-7-3220)

3.2.13 Standard Operating Procedures (SOP) [S13a and S13b]

3.2.13.1 Continuity of Operations Planning (COOP) supported by SOPs. [S13a]
There are readily available SOPs for daily operations, and PSAP personnel are aware of them. There is an up-to-date, documented process for notifying people of changes

3.2.13.2 SOPs support staff by providing procedural guidance. [S13b]
Public Safety communications procedural guidance is available via published documents; such as, SOPs, SOGs and protocols. These should cover such categories as Personnel, Operations, Technical Support, Security, Maintenance, Procurement and COOP.

3.2.14 Redundancy of mission critical systems and subsystems. [S14]

MOUs exist to sustain COOP in the event of a mission critical system/subsystem failure. These systems and subsystems include, but are not limited to, telephones, radio systems, ANI/ALI controllers, recording equipment, and power sources. Appropriate SOPs exist to support this criterion.[2] (See NRIC BP 7-7-0575)

3.2.15 Level of service provided from alternate facility. [S15]

The PSAP can receive 9-1-1 calls as voice calls and dispatch them. (See NRIC BP 7-7-0568)

3.2.16 Staffing as applied to critical incident situations. [S16]

Adequate staffing to maintain service levels, at or above AHJ minimum during normal 9-1-1 call volume. In the absence of any other defining criteria[3], adequate staffing in this context means that 90% of the incoming E9-1-1 calls are answered in 10 seconds or less[4]. Methods to achieve these levels during critical incident situations could include mutual aid agreements with neighboring PSAPs to receive and handle calls; or diverting non-emergency calls and non-active event radio traffic during crisis event level operations. SOP exists authorizing such adjustments.

3.2.17 Access to Technical Support for all Mission Critical systems. [S17]

The fundamental requirement here is that qualified technical support is available 24/7.

3.2.17.1 Remote Diagnostics. [S17a]

Technical support via remote diagnostic capability is available 24/7, and should begin resolution of the problem within the time specified in any applicable contract.
(See NRIC BP 7-7-0513)

[2] Mission critical equipment should meet or exceed NENA or equivalent standards where applicable (NFPA, APCO P-25, etc).
[3] NFPA 1221, Section 7.4.1 may be one source of "other defining criteria" that an AHJ may choose to meet this specific objective. In summary, NFPA 1221, 7.4 requires that 95% of alarms to be answered in 15 seconds and 99% of alarms to be answered in 40 seconds. The authors of this document suggest the AHJ consult with their local legal counsel if they are unsure which standard or standards apply.
[4] Per NENA 56-005 Section 3.1 Standard for answering 9-1-1 Calls - Ninety percent (90%) of all 9-1-1 calls arriving at the Public Safety Answering Point (PSAP) shall be answered within ten (10) seconds during the busy hour (the hour each day with the greatest call volume, as defined in the NENA Master Glossary 00-001). Ninety-five (95%) of all 9-1-1 calls should be answered within twenty (20) seconds.

3.2.17.2 On-Site Response [S17b]

On-site technical support is available 24/7, and, when required, technical support should be on-site to begin resolution of the problem within the time specified in any applicable contract.

3.2.17.3 Availability of a crash kit. [S17c]

The crash kit can to be on-site within 2 hours.

3.2.18 Staff and Family Security Plan. [S18]

Staff is placed on standby and may be required to report as needs arise, as specified locally.

3.2.19 PSAP Site Selection and Construction Considerations[5]. [S19]

Secured building locations. Building location and architecture should minimize potential threats from natural and human sources. PSAP placement takes meteorological and seismic threats into account. PSAP location is not located along a known fault line, and is not susceptible to flooding, tornados, hurricane winds, frequent lightning strikes, mudslides, etc.
(See NFPA 1221 and NENA 56-506, PSAP Site Selection Criteria OID)

3.2.20 Data backup plan. [S20]

The reliance upon CAD databases to facilitate call processing, manage resources and events has created a need for such mission critical data to be immediately available at the designated back-up location. A hard copy of critical call processing, dispatch and support resources are available at the designated back up site for use in the event of a delay of availability of electronic resources.

3.2.21 Alternate power source established at primary facility. [S21]

Primary facility has the ability to operate via UPS devices (individual or facility-level) during commercial power loss until alternate power activates.

3.2.21.1 Primary facility has the ability to operate via UPS devices (individual or facility-level) during commercial power loss until alternate power activates.

[5]Details on these items can be found in the NENA Communications Center/PSAP Disaster and Contingency Plans Model Recommendation, Document 53-001 (June 7, 2005), and some of them are also included in NRIC Best Practices for E9-1-1 services. For additional information on PSAP site selection criteria in general, see NFPA 1221, and NENA 56-506: PSAP Site Selection Criteria OID.

3.2.21.2 Alternate Power Source (appropriately sized generator placed in a safe and accessible location) is readily available to operate immediately to serve the primary facility, with documented SOP and training for starting procedures.

3.2.21.3 The Authority Having Jurisdiction (AHJ) has plans and sources identified to provide sustained refueling as necessary.

3.2.21.4 Regular testing of Alternate Power Source is conducted per local SOP and Manufacturer Guidelines, with documentation of test results available.

3.2.22 Telecommunications Service Priority (TSP) for wireline restoration and provisioning. [S22]

The Authority Having Jurisdiction (AHJ) has been assigned formal TSP status. Assignment records are audited against current service records annually.
(See NRIC BP 7-7-0488)

3.2.23 Wireless Priority Service (WPS) access in emergency circumstances. [S23]

The Authority Having Jurisdiction (AHJ) has been assigned formal WPS status. WPS test calls made quarterly from all WPS assigned handsets.

3.2.24 Government Emergency Telecommunications Service (GETS) access in emergency circumstances. [S24]

The Authority Having Jurisdiction (AHJ) has been assigned formal GETS status. GETS Test calls made by all card holders on a Quarterly basis.
(See related NRIC Best Practices BP 7-7-1063, 7-7-5127 and 7-7-5128)

3.2.25 Remote access to call forwarding for administrative lines. [S25]

As available from the Local Exchange Carrier or telecommunications service provider, the PSAP has the capability to set call forwarding on administrative lines remotely. The PSAP SOP defines the process for such action. Phone numbers and other contact information referenced in any specific SOP shall be verified minimally annually, or as notice of change takes place.

3.2.26 Remote access to rerouting E9-1-1 trunks and lines. [S26]

As available from the Local Exchange Carrier or telecommunications service provider, the PSAP has the capability to set rerouting on E9-1-1 trunks and lines remotely. The PSAP SOP defines the process for such action. Phone numbers and other contact information referenced in any specific SOP shall be verified minimally annually, or as notice of change takes place.

3.2.27 Grounding/Lightning Protection. [S 27]

PSAP shall employ industry recognized lightning and grounding practices, such as those defined in the most recent version of the National Electric Code (NEC) sections 250, 280 and 285 or equivalent, and any applicable local laws or ordinances that exceed NEC requirements, as amended. Special attention should be given to ensuring that the contractor provides a "single ground point" for PSAP area to protect staff.

Conformance with such standards provides a reasonable level of protection from lightning induced failures associated with tower strikes, building strikes, incoming facility strikes, etc. In all cases, any new or modified equipment shall be installed in accordance with these best practices and so certified to the PSAP.

4 References

Americans with Disabilities Act (ADA), Title II, 28 C.F.R. Part 35.

Bush, George W. (2003). Homeland Security Presidential Directive/HSPD-8, National Preparedness. Washington, D.C.: The White House.

Department of Transportation Federal Aviation Administration (2005). Lightning and Surge Protection, Grounding, Bonding and Shielding Requirements for Facilities and Electronic Equipment. (FAA-STD-019)

Federal Communications Commission (1996). Report and Order and Further Notice of Proposed Rulemaking, CC Docket Number 94-102, RM-8143, Adopted June 12, 1996, Issued July 26, 1996.

IEEE (2006). Recommended Practice for Powering and Grounding Electronic Equipment. (IEEE Std 1100 – 2005)

National Fire Protection Association (2008). National Electric Code 70 – Chapter 2: Wiring and Protection; Article 250: Grounding and Bonding; Article 280: Surge Arrestors over 1kV; Article 285: Surge Protective Devices (SPDs), 1kV or less. (NFPA NEC 70)

National Fire Protection Association (2008). Standard for the Installation of Lightning Protection Systems. (NFPA 780)

National Fire Protection Association (2007). Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems. (NFPA 1221)

National Fire Protection Association (2007). Standard on Disaster/Emergency Management and Business Continuity Program. (NFPA 1600)

National Emergency Number Association (2005). NENA Communications Center/PSAP Disaster and Contingency Plans Model Recommendation Document 53-001.

National Emergency Number Association (2007). NENA Hazard and Vulnerability Analysis 53-501

National Emergency Number Association (2007). NENA Resource Analysis 53-502

National Emergency Number Association (2007). NENA PSAP Survivability Operations Information Document 53-503.

National Emergency Number Association (2007). NENA Public Safety Answering Point Site Selection Criteria Operations Information Document 56-506.

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Network Reliability & Interoperability Council. Best Practices, retrieved March 4, 2008 from https://www.fcc.gov/nors/outage/bestpractice/ProcessBestPractice.cfm

Powers, L. Robert and Schmid, David (1993). Network Reliability Council E-911 Focus Group Report on 9-1-1 Service Delivery Reliability.

U.S. Department of Homeland Security, *Lessons Learned Information Sharing (LLIS.gov)* is the national network of Lessons Learned and Best Practices for emergency response providers and homeland security officials.

End of APCO / NENA ANS 1.102.1-2008

5 Exhibit – Capability Criteria Matrix

(Each graduated rating assumes compliance with the prior rating criteria)

Legend for CAT: S = related to survivability, D = day-to-day operations, F- future oriented items

CAT	Item	Standard Criteria	Advanced Criteria	Superior Criteria
S 1	Receipt of E9-1-1 calls using static ALI functionality	PSAP has CPE to enable the receipt of "Enhanced 9-1-1" calls with associated data (CBN & caller location information) from callers in the PSAP's jurisdiction. This includes traditional wireline, static VoIP, and wireless Phase 1 types of calls. PSAP is also Phase 1 wireless capable[6] for at least one WSP in the jurisdiction, or has made a valid formal request for Phase 1 wireless service with the WSPs doing business in their jurisdiction.	ANI & ALI data is interfaced to CAD and electronic mapping. ANI is 10-digits from the SR. (no NPD digit)	Using a GIS mapping tool
S 2	Reserved for future use			

6 Wireless capability can be achieved by either being Phase 1 or 2 capable, or by having written agreements with some other PSAP to receive such calls, and has written documentation supporting this arrangement. This could be the case where a PSAP doesn't receive enough wireless calls to justify the costs associated with being Phase 1 or 2 capable, so they have another PSAP answering calls for them.

CAT	Item	Standard Criteria	Advanced Criteria	Superior Criteria
S 3	Receipt of E9-1-1 calls using dynamic ALI functionality NRIC BP 7-7-3218 NRIC BP 7-7-3219	PSAP has CPE to enable the receipt of "Enhanced 9-1-1" calls with associated data via dynamic ALI updates (CBN & caller location information) This includes nomadic VoIP and wireless Phase 2 types of calls. PSAP is also Phase 2 wireless capable 6, for at least one WSP in the jurisdiction, or has made a valid formal request for Phase 2 wireless service with the WSPs doing business in their jurisdiction.	Capable of receiving the 10-digit CBN via the SR, or within the callpath, and graphically displays the caller's estimated location via GIS (as opposed to a cell sector location)	Providing wireless Ph2 service for **all** carriers serving the jurisdiction,
S 4	CAD	The PSAP provides their telecommunicators with software to assist in initiating calls for service, dispatching, and maintaining the status of responding resources in the field.	PSAP provides additional software which provides capability to process information associated with incoming calls, including the maps display of the caller's reported location. PSAP has the ability to access historical information from management system	PSAP has capability to transmit call information directly to responders, alternate PSAPs, etc. PSAP has the ability to provide data and interoperability electronically with other agencies and communications centers
S 5	GIS mapping tool	The PSAP has the ability to automatically accept, display and plot caller location data on an electronic map display.	911 mapping display the location of current calls and other resources. Updated quarterly and software upgrades.	Has a fully integrated GIS management system that supports 911 call routing (MSAG management), CAD, as well as call handling. Updated daily. Fully supported, multi-layered, GIS system. Integrated and common database/implications
S6	Access to PSTN	PSAP has access to PSTN through typical local service provisioning.	PSAP has PSTN connectivity from redundant network sources.	PSAP has PSTN connectivity incorporated into their Mobile Command Units or Alternate PSAP locations.

CAT	Item	Standard Criteria	Advanced Criteria	Superior Criteria
S 7	ADA compliance	TDD/TTY, special needs community access at each PSAP position with semiannual training	Standard Plus integrated into CTI, with a public outreach program	Advanced Plus conducting testing at regular intervals with the aid of actual end-user callers who need this type of service
S 8	Emergency Communication Plans in place for risks associated with local vulnerabilities[7] (This item also supports agency Continuity Of Operations Planning) See also HSPD 8, footnote 1 above, and NFPA 1600. NRIC BP 7-7-3211	Documented plans in place to survive risks associated with local vulnerabilities and provide at least basic levels of service for a brief period of time such as up to 3 days until more permanent changes or repairs could be made. For example, a PSAP in a hurricane-prone area should have comprehensive emergency communication plans in place to ensure (at least) basic level service survivability and sustainability in the event of a hurricane. All PSAPs share the risk from man-made events resulting in disruption of emergency services. This criterion could be met by establishing mutual aid agreements with neighboring PSAPs to receive and handle calls during this time. This item also supports agency Continuity of Operations Planning (COOP). (See also Homeland Security Presidential Directive 8 and NFPA 1600).	Meets Standard requirements plus has the ability to survive risks associated with local vulnerabilities and provide routine levels of service for moderately longer periods of time, such as 4 -7 days, before needing to hand-off all call receipt and handling responsibilities to some other PSAP.	Meets Advanced requirements plus has the ability to survive risks associated with local vulnerabilities and sustain routine and surge capacity levels of service for extended periods of time, such as could be needed to effect repairs to the PSAP and supporting infrastructure.

[7] PSAPs should determine or have knowledge of all hazards identified during a threat assessment, with special attention given to risks associated with local vulnerabilities. A PSAP in a hurricane prone area should have comprehensive emergency communication plans in place to ensure at least basic level service survivability and sustainability in the event of a hurricane. All PSAPs share the risk from man made events resulting in disruption of emergency services.

CAT	Item	Standard Criteria	Advanced Criteria	Superior Criteria
S 9	Coordination and Collaboration of Emergency Communication Plans with all necessary partners NRIC BP 7-7-0579 NRIC BP 7-7-0577 NRIC BP 7-7-0599 NRIC BP 7-7-1037 NRIC BP 7-7-1011 (other NRIC BPs apply too)	Having such plans in place, and in the hands of all partners (i.e. PSAP Operations, E911SSP, Authority Having Jurisdiction (AHJ), associated Public Utilities, and other applicable entities)	Having regular scheduled meetings to ensure that all partners share current expectations and make necessary revisions	Testing the plans through exercises at predetermined intervals with all partners to ensure they will result in the desired outcomes

CAT	Item	Standard Criteria	Advanced Criteria	Superior Criteria
S 10	Schedule and conduct drills to exercise emergency communication plans NRIC BP 7-7-0579	A drill and exercise program is in place to evaluate contingency/continuity of operations plans. Each plan or planning item should be exercised at least annually. An after action and correction process is in place to evaluate and improve the planning process.	Drills and exercises are scheduled to assure all appropriate staff and support agencies/personnel have the opportunity to practice contingency/continuity of operations plans at least annually. (e.g. a PSAP with four shifts will perform all annual drills/exercises at least four times)	Drills and exercises are held at random, unannounced times including after hours to evaluate contingency/continuity of operations plans in worst case scenarios.
S 11a	Trunking/Transport Path Management • Diversity[8] Additional references of interest may include: NRIC BP 7-5-0569 Option 2. NRIC BP 7-5-0570 NRIC BP 7-7-0566 NRIC BP 7-7-0573 NRIC BP 7-7-0580 NRIC BP 7-7-3210	• Trunking diversity and redundancy shall be included in the PSAP's operational/design documents. • **Diversity**: Selective Router (SR) to Local Serving Office (LSO) is the minimum level of diversity for the E9-1-1 transport path (aka: trunks or lines, and supporting hardware & electronics). (Audited on an annual basis.)	**Diversity**: Meets Standard requirements plus have local loop diversity from the LSO to the PSAP where economically feasible. This requires that the total number of trunks or lines be diverse including those entering and within the PSAP. Example; if the PSAP requires 10 trunks or lines to attain a P.01 grade of service, local loop diversity would be achieved by having 5 in one transport path and 5 in another.[9] (Audited on an annual basis.)	**Diversity**: Meets Standard & Advanced requirement plus has full redundancy as well as at least one level of diversity. Example; if the PSAP requires 10 trunks or lines to attain a P.01 GOS, fully redundant local loop diversity would be achieved by having 10 in each diverse transport path. (Audited on an annual basis.)

8 NENA Technical Information Document 03-501 on Network Quality Assurance, Section 3.2 addresses E9-1-1 Network Diversity in the following manner; "When discussing diversity in a network, two concepts shall be considered – diverse routing and diverse facilities (or transport). Diverse routing implies diverse facilities but the opposite may not be true. Both shall be implemented to completely eliminate single points of failure". See NENA 03-501 for more information.

9 Consideration of economically feasible should be noted. Smaller PSAPs are very unlikely to be able to afford local loop diversity. Wireless may be a viable option.

CAT	Item	Standard Criteria	Advanced Criteria	Superior Criteria
S 11b	Trunking/Transport Path Management **Status Monitoring of the network elements** NRIC BP 7-7-0574	Paths are monitored & alarmed 7x24 by the network element providers	Monitoring capabilities include some level of remote diagnostics via the network element providers	Monitoring capabilities include some level of remote repair functions via the network element providers PSAP has real-time access to the monitoring being done by the network element providers
S 11c	Trunking/Transport Path Management **Status Monitoring of PSAP CPE:**	PSAP CPE is alarmed 7x24 for automatic trouble reporting/alerting	Monitoring capabilities include some level of remote diagnostics via the PSAP CPE provider	Monitoring capabilities include some level of remote repair functions via the PSAP CPE provider
S 11d	Trunking/Transport Path Management **SOPs:** NRIC BP 7-7-0568	SOPs explain what do when the alarm is activated, and assign responsibility.	SOPs explain how and when to manually invoke alternate trunking/transport paths	SOPs detail how and when alternate trunking/transport paths will be automatically invoked.
S 11e	Trunking/Transport Path Management **Training**:	Trunking/Transport path management is addressed in PSAP training document. Example: This would include having training material to allow PSAP management to identify when one of the diverse transport paths has been interrupted.	Not applicable	Not applicable
S 12	Selective Router Redundancy: [10] NRIC BP 7-7-0571 NRIC BP 7-7-3220	None required to be rated Standard	Redundant SRs are used to assure that more than approx 50%, but less than 100% of the normal load would remain in service in the event one of the SRs were to be unavailable for use. (Commonly called load sharing redundancy)	Redundant SRs are used to assure that 100% of the normal load would remain in service in the event one of the SRs were to be unavailable for use (Commonly called fully redundant)

10 If the redundant and diverse facilities are not part of normal day-to-day call delivery they should be exercised on a regularly scheduled basis.

CAT	Item	Standard Criteria	Advanced Criteria	Superior Criteria
S 13a	Continuity of Operations Planning (COOP) supported by SOPs	There are readily available SOPs for daily operations, and PSAP personnel are aware of them. There is an up-to-date, documented process for notifying people of changes	SOPs for emergency communication planning to support the need to invoke restoration plans. There is a scheduled documented process in place for at a min. annual review of all documented SOPs	SOPs are available on line for all center personnel and are updated in a timely fashion, by a designated administrator. COOP and supporting documents are readily available for retrieval and transport or remote access.
S 13b	SOPs support staff by providing procedural guidance	Public Safety communications procedural guidance is available via published documents; such as, SOPs, SOGs and protocols. These should cover such categories as Personnel, Operations, Technical Support, Security, Maintenance, Procurement and COOP.	Public Safety communications procedural guidance is available via (internally) published and documented SOPs/protocols for Non-routine or exceptional categories	SOPs align with CALEA (or equivalent standard setting organizations) requirements and are certifiable. There are timely drills/exercises/other evaluative processes to ensure the relevance and viability of the SOPs.
S 14	Redundancy of mission critical systems, subsystems such as (but not limited to); • Telephones • Radio systems • ANI/ALI controllers • Recording equipment • Power sources NRIC BP 7-7-0575	For mission critical systems, subsystems written MOUs exist to sustain COOP in the event of a mission critical system, subsystem failure. Appropriate SOPs exist to support the above criteria	Mission critical systems, subsystems are redundant to the extent that they provide reduced yet acceptable levels of service, but without requiring any outside/external MOU support Appropriate SOPs exist to support the above criteria	Mission critical systems, subsystems are redundant to the extent that they provide full service, but without requiring any outside/external MOU support Appropriate SOPs exist to support the above criteria

CAT	Item	Standard Criteria	Advanced Criteria	Superior Criteria
S 15	Level of service provided from Alternate Facility NRIC BP 7-7-0568	The PSAP can receive 9-1-1 calls as voice calls and dispatch them.	The PSAP provides the same level of E 9-1-1 service as the primary site, but may do so at a diminished capacity. Alternate facility captures call and CAD data, and it is available to the primary site when it is back in service.	The PSAP provides a comparable standard of service as the primary site.
S 16	Staffing as applied to critical incident situations [11]	Adequate staffing to maintain service levels, at or above AHJ minimum during normal 9-1-1 call volume. In the absence of any other defining criteria , adequate staffing in this context means that 90% of the incoming E9-1-1 calls are answered in 10 seconds or less . Methods to achieve these levels during critical incident situations could include mutual aid agreements with neighboring PSAPs to receive and handle calls; or diverting non-emergency calls and non-active event radio traffic during crisis event level operations. SOP exists authorizing such adjustments.	With up to a 10% increase in normal call volume, the PSAP has adequate staff and maintain service levels to meet a 90/10 benchmark and to have adequate Supervisory support on hand. SOP to support such action exists and documented training in same is available.	With a increase greater than 10% in normal call volume, the PSAP has adequate staff and maintain service levels to meet a 90/10 benchmark Adequate Supervisory support, including training and technical services staff positions are readily available to call takers/dispatchers. SOP to support such action exists and documented training in same is available. Adequate regard for rest, refreshment and family support is documented via SOP, internal memorandum, etc.

11 Adequate staffing levels is a local management prerogative;, however tools for calculating the best estimate of actual staffing needs are available. APCO & NENA both support the use of the best and most current professional advice on staffing needs, levels and retention efforts.

CAT	Item	Standard Criteria	Advanced Criteria	Superior Criteria
S 17a	Access to Technical Support for all Mission Critical systems - Remote Diagnostics NRIC BP 7-7-0513	Technical Support via remote diagnostic capability is available 24/7. Technical Support should begin resolution of the problem within the time specified in any applicable contract.	Technical Support should begin remote diagnostic resolution of the problem within 2 hours.	Technical Support should begin remote diagnostic resolution of the problem within 1 hour.
S 17b	Access to Technical Support for all Mission Critical systems - On-Site Response. NRIC BP 7-7-0513	On-site technical support is available 24/7. When required, technical support should be on-site to begin resolution of the problem within the time specified in any applicable contract.	When required, technical support should be on-site to begin resolution of the problem within 4 hours.	When required, technical Support should be on-site to begin resolution of the problem within 2 hours.
S 17c	Access to Technical Support for all Mission Critical systems - Availability of a crash kit[12] 7/24	The crash kit can be on-site within 2 hours.	The crash kit can be on-site within 1 hour.	The crash kit is available on-site 24/7.

[12] The term crash kit as used here is meant to describe a collection of spare hardware typically expected to be necessary to support mission critical systems.

CAT	Item	Standard Criteria	Advanced Criteria	Superior Criteria
S 18	Staff and Family Security Plan	Staff required to be ready to report (as specified locally) during any major event; staff have adequate access rights and credentials	Authority has properly planned, arranged adequate food, supplies, rest areas and support for staff required to extend shifts during major event	Same as Advanced and Authority has arranged shelter plans for family of staff, including prompt access and sustained resources
S 19	PSAP Site Selection & Construction Considerations [13] Building location and architecture should minimize potential threats from natural and human sources. NRIC BP 7-7-0512	PSAP placement takes meteorological and seismic threats into account. PSAP location is not located along a known fault line, and is not susceptible to flooding, tornados, hurricane winds, frequent lightning strikes, mudslides, etc.	PSAP placement takes human threats into account. PSAP location is not under or next to elevated roadways, electrical substations, natural gas or oil pipelines, rail lines or runways; reasonably protected from out-of-control vehicles; reasonably protected from casual vandalism.	PSAP and related outdoor structures are built to withstand earthquakes according to state or local code. PSAP is positioned within a secure perimeter to minimize physical access to the structure.
S 20	Data backup plan [13]	The reliance upon CAD databases to facilitate call processing, manage resources and events has created a need for such mission critical data to be immediately available at the designated back-up location. A hard copy of critical call processing, dispatch and support resources are available at the designated back up site for use in the event of a delay of availability of electronic resources.	Critical data is transportable to any backup location (not pre-designated) within four hours	Critical data is stored in a manner that allows it to be available to any authorized PSAP or other entity that would be acting as a backup in an emergency/disaster situation. This is likely a shared network drive or equivalent.

13 Details on these items can be found in the NENA Communications Center/PSAP Disaster and Contingency Plans Model Recommendation Document 53-001 (June 7, 2005), and some of them are also included in NRIC Best Practices for E9-1-1 services. For additional information on PSAP site selection criteria in general, see NFPA 1221, and NENA 56-506: PSAP Site Selection Criteria OID.

CAT	Item	Standard Criteria	Advanced Criteria	Superior Criteria
S 21	Alternate Power Source with sustainable fuel options/sources	• Primary facility has the ability to operate via UPS devices (individual or facility level) during periods lost of commercial power, until alternate power becomes available. • Alternate Power Source (appropriately sized generator placed in a safe and accessible location) is readily available to operate immediately to serve the primary facility, with documented SOP and training for starting procedures. • The AHJ has plans and sources identified to provide sustained refueling as necessary. • Regular testing of Alternate Power Source is conducted per local SOP and Manufacturer Guidelines, with documentation of test results available	• Alternate Power Source at primary and remote critical facility sites such as distributed radio control locations • Generator Status Monitor Panel installed inside PSAP • Documented training of understanding of such panel alerts and remedial actions • Load capacity allows maintenance of routine functionality at the primary and remote facilities • Documented MOU with local power provider for priority restoration • Automatic Transfer Switch with Manual Starting Options while primary facility is served by UPS devices • Sustained refueling contracts include priority service in disaster situations with audits to ensure the supplier has the capability for delivery even in the event of loss of power to the suppliers facility.	• Primary facility has a secondary alternate power supply if the primary alternate generator fails. • Alternate generator is capable of maintaining all mission critical functionality • This level is as all others, inclusive of lower levels objectives • A test of backup power under load is performed according to NFPA 1221 Chapter 11-Testing
S 22	Telecommunication Service Priority (TSP) for wireline restoration and provisioning [13] NRIC BP 7-7-0488	The AHJ has been assigned formal TSP status. Assignment records are audited against current service records annually.	Has been assigned formal TSP status. Has written Procedures in place to utilize these tools when necessary	Includes the use of TSP tools in routine practice drills.
S 23	WPS access in emergency circumstances	The AHJ has been assigned formal WPS status. WPS test calls made quarterly from all WPS assigned handsets.	The AHJ has written Procedures in place to utilize WPS when necessary. Handsets assigned WPS access are acquired from two or more carriers.	Includes the use of WPS in routine practice drills.

CAT	Item	Standard Criteria	Advanced Criteria	Superior Criteria
S 24	GETS cards for access in emergency circumstances [13] NRIC BP 7-7-1063 NRIC BP 7-7-5127 NRIC BP 7-7-5128	The AHJ has been assigned formal GETS status. GETS Test calls made by all card holders on a Quarterly basis	The AHJ has written Procedures in place to utilize GETS when necessary.	Includes the use of GETS in routine practice drills.
S 25	Remote access to call forwarding for admin lines [13]	As available from LEC, PSAP has capability to set call forwarding on admin lines remotely. SOP defines and explains the process for such action. Phone numbers and other contact information referenced in any specific SOP shall be verified minimally annually, or as notice of change takes place.	PSAP has documented the demonstration of such capability during regularly scheduled staff training Phone numbers and other contact information in protocol are verified semi-annually, or as notice of change takes place.	PSAP has documented the capability during regularly scheduled exercises or actual events Phone numbers and other contact information in protocol are verified quarterly, or as notice of change takes place.
S 26	Remote access to rerouting for E911 trunks and lines	As available from LEC, PSAP has capability to establish rerouting of E911 trunks/line remotely. Phone numbers and other contact information referenced in any specific SOP shall be verified minimally annually or as notice of change takes place.	PSAP has documented the demonstration of such capability during regularly scheduled staff training Phone numbers and other contact information in protocol are verified semi-annually, or as notice of change takes place.	PSAP has documented the capability during regularly scheduled exercises or actual events Phone numbers and other contact information in protocol are verified quarterly, or as notice of change takes place.

CAT	Item	Standard Criteria	Advanced Criteria	Superior Criteria
S 27	Grounding/Lightning Protection	PSAP shall employ industry recognized lightning and grounding practices, such as those defined in the most recent version of the National Electric Code (NEC) sections 250, 280 and 285 or equivalent, and any applicable local laws or ordinances that exceed NEC requirements, as amended. Conformance with such standards provides a reasonable level of protection from lightning induced failures associated with tower strikes, building strikes incoming facility strikes, etc. Special attention should be given to ensuring that the contractor provides a "single ground point" for PSAP area to protect staff. In all cases, any new or modified equipment shall be installed in accordance with these best practices and so certified to the PSAP.	The PSAP meets the requirements of NFPA-780 or equivalent, and the associated re-inspection cycles, performed by a qualified inspector.	The PSAP meets the requirements of the most recent version of FAA-019 or equivalent, or IEEE 1100 or equivalent, and the associated re-inspection cycles, performed by a qualified inspector.

Return to Section 3.2

6 Appendix – A (Informative material and not a part of the candidate ANS)

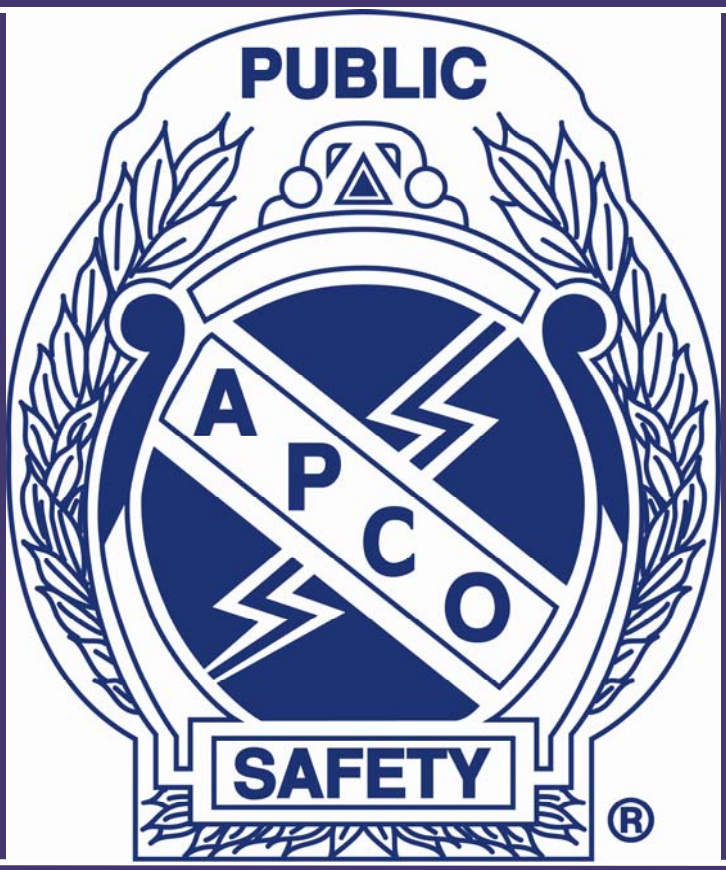
NRIC Best Practices used as additional reference material in this document:

BP Number	Descriptive Text
BP 7-5-0569 Option 2	Option 2: Wireless Network as Backup for 911 Dedicated Trunks - Similar to the PSTN backup for completing 911 calls when the primary transport facility is interrupted, wireless networks may provide more diversity than the PSTN alternative.
BP 7-7-0488	Network Operators and Service Providers should ensure that critical wireless circuits (e.g., high priority cells, SS7 circuits, 911 circuits) are registered with Telecom Service Priority (TSP).
BP 7-7-0513	Network Operators and Service Providers should maintain a 24 hours by 7 days contact list of other providers and operators for service restoration of inter-connected networks. Where appropriate, this information should shared with Public Safety Service and Support providers.
BP 7-7-0566	Network Operators and Service Providers should consider placing and maintaining 911 circuits over diverse interoffice transport facilities (e.g., geographically diverse facility routes, automatically invoked standby routing, diverse digital cross-connect system services, self-healing fiber ring topologies, or any combination thereof).
BP 7-7-0568	Network Operators and PSAPs should establish a routing plan so that in the case of a lost connection from the selective router to the PSAP, 911 calls are routed to an alternate answering point (e.g., alternate PSAP, appropriate telephone line).
BP 7-7-0571	Network Operators should consider deploying dual active 911 selective router architectures to enable circuits from the caller's serving end office to be split between two selective routers in order to eliminate single points of failure (SPOF). Diversity should also be considered on interoffice transport facilities connecting each 911 selective router to the PSAP serving end office.
BP 7-7-0573	Network Operators, Service Providers and Public Safety Authorities, should consider providing local loop diversity to the PSAP including the use of alternate technologies, (e.g., wireless, broadband). PSAPs should consider the availability of diverse local loop connections in the site selection for new PSAP facilities.
BP 7-7-0574	Network Operators and Service Providers should remotely monitor and manage the 911 network components using network management controls, where available, to quickly restore 911 service and provide priority repair during network failure events.
BP 7-7-0575	Network Operators and Service Providers should deploy Diverse Automatic Location Identification systems used in Public Safety (e.g., Automatic Location Identification and Mobile Positioning Center systems) in a redundant, geographically diverse fashion (i.e. two identical ALI/MPC data base systems with mirrored data located in geographically diverse locations).
BP 7-7-0577	Network Operators, Service Providers and Public Safety Agencies responsible for PSAP operations should jointly and periodically test and verify that critical components (e.g., automatic re-routes, PSAP Make Busy keys) included in contingency plans work as

	designed.
BP 7-7-0579	Network Operators, Service Providers, and 911 administrators, and public safety agencies should routinely team to develop, implement, periodically test, evaluate and update as needed plans for 911 disruption contingencies (e.g., share information about network and system security and reliability where appropriate).
BP 7-7-0580	Network Operators and Public Safety Authorities should apply redundancy and diversity (e.g., concepts set forth in Best Practices 0566, 0573), where feasible, to other network links considered vital to a community's ability to respond to emergencies. An order for these links would be placed by the Public Safety Authority. Security practices and concepts should be applied to the critical systems supporting Link Redundancy and Diversity.
BP 7-7-0599	Network Operators and Service Providers should conduct exercises periodically to test a network's operational readiness through planned drills or simulated exercises. The exercise should be as authentic as practical. Scripts should be prepared in advance and team members should play their roles as realistically as possible.
BP 7-7-1011	Network Operators, Service Providers, Equipment Suppliers and Public Safety Authorities should establish alternative methods of communication for critical personnel.
BP 7-7-1037	Network Operators, Service Providers, Equipment Suppliers and Public Safety Authorities should use a disaster recovery support model that provides a clear escalation path to executive levels, both internally and to business partners.
BP 7-7-1063	Network Operators and Service Providers should set Initial Address Messages (IAMs) to congestion priority in accordance with applicable ANSI standards. This will ensure government emergency calls (e.g., 911, GETS) receive proper priority during national emergency situations. Implementation in all networks should be in accordance with ANSI T1.111.
BP 7-7-3210	Emergency Operations Centers and PSAPs should consider obtaining connections to provide video (for viewing local weather and news information and monitoring distribution of information over EAS), and utilize that connection to provide diverse access to the Internet and telecommunications.
BP 7-7-3211	Network Operators and Service Providers should develop and maintain operations plans that address network reliability issues. Network Operators and Service Providers should proactively include Public Safety authorities when developing network reliability plans in support of 911 services.
BP 7-7-3218	Training on Obtaining E9-1-1 Phase II Data: PSAPs should provide Training to educate PSAP personnel as to the process to obtain E9-1-1 Phase II data.
BP 7-7-3219	Training on E9-1-1 Phase II ALI Display: PSAPs should provide training to educate PSAP personnel as to the proper meaning and interpretation of the E9-1-1 Phase II display parameters.
BP 7-7-3220	E9-1-1 Selective Router Database (SRDB) Diversity: Network Operators and Service Providers that operate E9-1-1 Selective Router

	Databases (SRDBs) should deploy SRDBs with redundancy and geographic diversity.
BP 7-7-5127	Network Operators, Service Providers, Equipment Suppliers and Public Safety Authorities should provide a Government Emergency Telecommunications Service (GETS) card to essential staff critical to disaster recovery efforts and should consider utilizing Wireless Priority Service (WPS) for essential staff. Appropriate training and testing in the use of GETS & WPS should occur on a regular basis (i.e. in conjunction with testing of the corporate disaster recovery plan).
BP 7-7-5128	Network Operators, Service Providers, Equipment Suppliers and Public Safety Authorities should maintain accurate records for Government Emergency Telecommunications Service (GETS) cards and Wireless Priority Service (WPS) phone assignments as staff changes occur.

Notes



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