

NENA Resource, Hazard and Vulnerability Analysis Information Document

Abstract: This document is intended as a guide for PSAP staff and 9-1-1 Authorities to review and mitigate, as required, the potential hazards that may affect your systems, which may adversely impact the PSAPs ability to serve their communities.



NENA Hazard and Vulnerability Analysis Information Document

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1 Executive Overview

This document is provided to assist Public Safety Answering Points (PSAPs) and 9-1-1 Authorities with the development of a risk mitigation plan that includes Resource Analysis, the first step in completing Hazard and Vulnerability Analyses. These analyses are essentially audits that provide planning tools to identify, prevent, prepare for, respond to and recover from incidents that have the potential to adversely affect the PSAPs ability to perform its critical functions. Every PSAP is unique and this document should be used as a starting point in disaster planning.

Purpose and Scope of Document

This document is intended as a guide for PSAP staff and 9-1-1 Authorities to review and mitigate, as required, the potential hazards that may affect your systems, which may adversely impact the PSAPs ability to serve their communities. This document is not intended as a template, but as a guide to identify your resources and conduct a hazard and vulnerability analysis.

Reason to Implement

PSAPs are critical for the safety and security of the public. The potential for manmade, accidental and/or natural occurrences to prevent a PSAP from receiving, processing, dispatching and monitoring incidents places the public and first responders in danger. It is therefore incumbent on PSAP administrators to prepare for such occurrences.

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Reason for Issue/Reissue

NENA reserves the right to modify this document. Upon revision, the reason(s) will be provided in the table below.

Doc #	Approval Date	Reason For Issue/Reissue
NENA 53-501 & 53-502	03/27/2007	Initial Documents
NENA-INF-019.2-2016	09/10/2016	These documents were combined, updated and reissued by NENA to ensure content was current with industry changes and advancements made since the original issue date.
NENA-INF-019.3-2022	April 2022	Editorial edits to move to current template and update links.



2 Components of a Hazard and Vulnerability Analysis

The following indicate the applicable elements that are associated with:

- Legacy environment: The PSAP can't process calls received via i3 defined call interfaces (IP-based calls)
- Transitional environment: The PSAP would have implemented an i3 component, such as a legacy SR gateway.
- NG 9-1-1 environment: The PSAP has fully migrated and is operating in an all IP environment.

2.1 COMMUNICATION NETWORKS	Legacy	Transitional	NG
<p>2.1.1 Customer isolation from Central Office or equivalent network element</p> <p>Customer is not able to complete a phone call to 9-1-1 due to a failure of the path from the customer to their serving Central Office due to:</p> <ul style="list-style-type: none"> • Landline and or, cell tower • Equivalent network element, such as an IP-based Call Server or the internet 	X	X	X
<p>2.1.2 Central Office, Remote or Call Server Failure</p> <p>Calls cannot be completed due to a failure at the Central Office or the IP-based Call Server (a.k.a. "soft switch") to pass them to the next appropriate destination in the call path.</p> <ul style="list-style-type: none"> • Emergency Service Routing Protocol (ESRP) the path serving the Central office fails 	X	X	X X



<p>2.1.3 Enhanced 9-1-1 Control Office (aka: 9-1-1 Tandem or Selective Router) or equivalent network element Call cannot be completed because of a failure of the 9-1-1 tandem, selective router or other 9-1-1 specific network element such as an ESInet.</p>	X	X	X
<p>2.1.4 ANI/ALI Failure or appropriate location information A 9-1-1 call is completed to a PSAP, but without ANI and/or ALI. In the event the ANI/ALI is not provided on a 9-1-1 call including when location data was not available in an ESInet handled call. In any of these cases the PSAP that receives the call would be a designated default PSAP, and may not be the one who would have received the call if ANI or location data had been available.</p>	X	X	X
<p>2.1.5 Contingency 10-Digit phone failure Failure of the PSAP's PSTN-based (Public Switched Telephone Network) or other contingency 10-digit phones</p>	X	X	X
<p>2.1.6 Wireless 9-1-1 failures Calls to 9-1-1 from wireless customers cannot be completed due to failure of wireless Core network, network congestion, cell site isolation, MSC (Mobile Switching Center) or 9-1-1 tandem/NG9-1-1 Core access.</p>	X	X	X
<p>2.1.7 9-1-1 Alternate – Routing Calls for one PSAP are not transferring to the alternate 9-1-1 PSAP when requested (automatically or manually)</p>	X	X	X
<p>2.1.8 9-1-1 Default Routing 9-1-1 calls received without valid ANI are routed based on incoming trunk group or default translation.</p>	X	X	X
<p>2.1.9 Phone Network Security</p>	X	X	X



Level of cybersecurity in the PSAP authority phone network to prevent TDoS (Telephony Denial of Service) attacks.			
<p>2.1.10 Status of priority for communication service and restoration during an emergency Priority Communications Service, Telecommunications Service Priority (TSP), Government Emergency Telecommunications Service (GETS) and Wireless Priority Service (WPS) These services provide priority access and call routing to authorized users.</p>	X	X	X
<p>2.1.11 Network/Transport Diversity Consult with your 9-1-1 network service provider(s) that you have physical diversity on 9-1-1 dedicated lines and trunks. Diversity should be audited on a regular basis, at least annually.</p>	X	X	X
<p>2.1.12 Network/Transport Redundancy Consult with your 9-1-1 network service provider that you have route redundancy on 9-1-1 trunks and switches.</p>	X	X	X
<p>2.1.13 Network Resiliency Consult with your 9-1-1 service provider and identify an agreed upon acceptable level of service (service level agreement), as well as a demarcation point, in compliance with applicable local, state and federal regulations.</p>		X	X
<p>2.1.14 Cloud Based Call/Session Routing Consult with your 9-1-1 service provider to ensure the routing requirements are met. Distinct service level agreements should be identified for each individual call/session routing requirement.</p>		X	X



PSAP Call Handling Equipment/Telephony Equipment	Legacy	Transitional	NG
2.2.1 Automatic Call Distributor (ACD) ACD does not direct calls or directs calls to unanswerable queue. Calls are not routed to the intended recipient as implemented	X	X	X
2.2.2 Answering Point Failure Calls cannot be answered due to failure of position answering equipment or access to that position. Failure could be network based, or call handling equipment and apparatus based.	X	X	X
2.2.3 No audible ring tone or visual indication	X	X	X
2.2.4 Voice quality issues [these may be network issues]	X	X	X
2.2.5 Call transfer internally/externally (voice)	X	X	X
2.2.6 Call transfer internally/externally (text, video, data and media)	X	X	X
2.2.7 ANI/ALI controller issue [these have different aspects in NG9-1-1]	X	X	
2.2.8 Call Logging and instant replay equipment (voice) It is recommended that maintained recordings be protected by either recordings stored on networks, be backed up to an off-site location or if being stored on site that recordings be kept in flame/heat proof containers.	X	X	X



2.2.9 Call/Session detail records associated equipment and applications (text, video, data and media) (Recording recommendations same as above)	X	X	X
2.2.10 Information Management System (Recording recommendations same as above)	X	X	X
2.2.11 Dispatch information to field Emergency Responders	X	X	X
2.2.12 Master Clock	X	X	X
2.2.13 GIS tools and functions	X	X	X
2.2.14 Policy Routing Rules Policy routing function defines where calls are diverted if the target PSAP is unreachable.		X	X

2.3 External Power Supply and Physical Plant

Circuit drawings, diagrams or quick-reference sheets should be available with details about equipment power sources. For example: Work station 1 - Outlet 25 - Panel B - Breaker 10. This information could significantly reduce the time required to trouble-shoot and restore power. Electrical outlets that provide power from a UPS should be orange in color, or at a minimum, marked in such a way that they are readily identifiable as UPS outlets with a corresponding number of identifier.

Additionally, information should be provided regarding safety and when to disconnect power to specific outlets, panels or other systems, e.g., smoke emanating from a specific device.

2.3.1 Street/Grid Electricity

Ideally there should be two diverse power paths, from two different grids, coming into the facility.

2.3.2 External Gas Supply

Where earthquakes are anticipated supply valves should be evaluated for appropriate automatic shutoff devices. The potential for utilization of alternate fuel sources should be evaluated



2.3.3 Backup/Internal Power

UPS Integrity/ Maintenance/Load Capacity/Battery Condition and Maintenance

Generator maintenance and load should be tested bi-monthly. Fuel type availability and storage (diesel/natural gas), as well as redundant plans for delivery of fuels during periods of local disasters.

2.3.4 Back-up Power Supply

UPS/Generator Systems.

Identify critical components connected to UPS and Generator. Ensure all critical systems or "tools" are supported seamlessly by the back-up power supply with no loss of power (e.g., access to NCIC, NECMC, etc.) [NFPA 1221, Standard for the Installation, Maintenance and Use of Emergency Communications Systems].

Power system control panels, or auxiliary panels, should be located where they can be monitored by on-duty personnel from their normal workstation(s).

2.4 Facility Environmental Concerns

2.4.1 Heating, Ventilation and Air Conditioning

Both staff comfort and as a means of entry into PSAP. HVAC should be monitored, alarmed and reported. [NFPA 1221 Standard for installation, maintenance and use of emergency communications systems section 4.4]

HVAC Issues: mold, filtration systems, HVAC failures and operations in an inhospitable environment

- Internal Environmental Issues

- Fire extinguishing system discharge

- Hazards associated with fumes produced from construction, painting, cleaning etc.

- Gas/Smoke/Fire Hazards

2.4.1.1 Backup Power/UPS & Generator Impact

UPS Battery off Gassing, outside factors. Air Filtration on back-up power. Fuel supply

2.4.2 Water and Sewage Infrastructure

2.4.2.1 Water Supply and Alternatives

Water supply integrity into PSAP, critical considerations water backup/flooding: PSAP Operations Area; leakage in critical areas (9-1-1 center, phone/demarc rooms; server/radio rooms). Power considerations to pump water prevent flooding.

2.4.2.1.1 Water/Sewage System Failure/Backup/Health Risks

When equipment is in contact with water/sewage there is an increased risk of electrocution when connected to a power source. Contact with sewage may expose employees to gases, bacteria, pathogens and other infectious hazards.

2.4.3 Equipment Reinforcement

Ensure servers, monitors and any other equipment that is vulnerable to falling is secured. This vulnerability maybe increased during earthquakes, tornadoes or other damages to the structural integrity of the facility.

2.4.4 Smoke/Fire detection and response

What level of smoke/fire detection is available? Does detection equipment meet the requirements of NFPA 1221: Standard for the installation, maintenance, and use of emergency services communications systems?

2.4.5 Facility Security

Security into and within the facility includes at the minimum:

- The ability to remotely secure areas or provide access to them.
- Keys, badging, levels of permissions to gain access to specific areas of the facility.
- Door control security systems should have redundant UPS power to assure ongoing controlled access capability if primary power backup systems fail.
- Surveillance video and recording in high security areas.
- Vendor control and procedures to monitor visitor and employee access.

2.4.6 Grounding

Is the facility and communications system properly grounded? Include, telephone equipment, communication towers, radio equipment, servers, modems, etc.

Grounding a power entrance, telephone demarc or coaxial cable entrance to a ground rod or other single 'earthing' point may be insufficient for most PSAPs.

PSAP equipment should be connected to a common ground with cables and connectors of sufficient size and installed in such a manner as to reduce the threat of lightning damage, stray current faults and noise. Older buildings, or buildings that have been expanded or improved, may have grounding systems that are isolated from each other, which could result in a difference of potential within the facility. This phenomenon can increase the risk of lightning damage.

PSAP Authorities should refer to industry standards and guidelines, and vendors to ensure their facilities are adequately grounded in accordance with accepted standards, especially in areas with frequent lightning.

2.4.7 Facility Integrity

Is the facility able to remain operational during disaster situation? What measures are in place to help preserve building integrity?

Secure Windows/Hurricane Shutters

Correctly Rated Structural Integrity for Building (NFPA Standards for communication centers)

Hazards on Premise

2.5 External Network Connectivity

PSAP Authorities should identify their voice, data and media network designs, providers and mission critical applications supported. PSAP authorities need to identify what redundancies or alternate plans you have in place. Who provides each of the connections? What are their service level agreements should there be an outage? Emergency contact list audits should be included in operational procedures to be verified semi-annually and before any anticipated major event.

2.6 Radio Communication

2.6.1 Network Failure

What degradation will occur with radio system failure? How is the radio network protected?

2.6.2 Terrestrial Link Failure

Does the radio system rely on terrestrial link and what are the impacts of link failure?

2.6.3 Tower Failure

Will a failure at a tower cause system-wide failure? If towers are connected via microwave is the system reversible? How is tower failure identified? Inherent tower hazards clearly marked? Do towers meet the same level of site security as the PSAP? What environmental impacts could impact the integrity of the tower operation?

2.6.4 Interference

Are plans in place to quickly identify and correct radio interference issues?

2.6.5 Redundancy

Plan should be in place to identify different levels of redundancy.

2.6.6 Resiliency

Plan should be in place to identify, monitor and validate resiliency.

2.6.7 Radio Console

What impact is expected if radio consoles are lost? Plans should include information regarding console receive and transmit failures. Is the staff familiar with how to operate equipment and what to do in the event of a partial and complete failure? What are the alternate plans for radio channel recording?

2.6.8 Portable Radios

Are you able to transmit/receive from portable radios at all operational locations? Do you test them? Is staff familiar with how to operate equipment? Do you have an up dated channel/talk group lineup? Do you have a SOP to ensure they are charged and ready to deploy?

2.7 Mission Critical Dispatch Applications

CAD, Mapping, Voice, Data, Text and Video Recording, Alert/Notification Systems, State/Federal databases. Is access to dispatch applications secure from planned and inadvertent tampering? Are these applications run by a service provider or housed locally? Are these applications securely accessible locally and remotely from all potential operational locations?

2.7.1 Application Interface (i.e., AVL, ALI, Paging)

These are any over the top (OTT) or third-party applications that interface with your systems, such as CAD to mobile applications, Text to 9-1-1 application, etc.

2.7.2 Internal/External Emergency Mass Notification/Alerting

Consider the availability and access to all notification/alerting systems, understand capabilities and limitations for internal and external uses. Use the most appropriate notification system available for the situation. Be aware of the vendor's contingency planning if their systems are impacted by an event or disaster. Notification/Alerting applications need to be readily accessible by the authorized PSAP staff from any location. Emergency mass notification/alerting processes should be part of the PSAP Authority emergency communication plan.

Establish corporate connections in your region to utilize billboards/electronic messaging for emergency notification. For example: A large retail company emergency management program includes changing their electronic messaging boards during an emergency at the request of public safety.

2.7.3 Social Media

Social media processes such as accepting calls for service from the public via social media should be part of the PSAP Authority emergency communication plan. PSAP Authorities utilizing social media should forecast appropriate staffing and operational needs to monitor and manage social media tools during a major event. Identify in advance who will be authorized to provide public notifications on your agency's social media platforms. Ensure access to those platforms is supported by back-up, power, applications, full functionality, compatibility and connectivity.

2.8 Human Resource

Analysis should be performed regarding staffing issues and the expected impact on service.

2.8.1 Staffing

Telecommunicator and administrative staff are sufficient to provide critical services.

2.8.2 Education and Training

Staff is trained to meet all local, state and federal standards.

2.8.3 Support Personnel

Sufficient support personnel are available to maintain operational readiness

2.8.4 Administrative

Adequate funding is available to maintain operations and adequately plan for continued operations.

2.8.5 Personnel Safety

Plan to deal with an internal threat to employees, such as a person that may gain access to the PSAP with legitimate means (ex: disgruntled, suspended or former employee).

2.8.6 Lockdown/Shelter In Place

Plan to deal with external situations when it's not possible or safe for employees to leave the site, as well as for new staff to come in to work (i.e., snowstorm, civil unrest outside the facility, other weather-related events).

Adequate comfort and sanitary supplies should be on-hand to support the maximum anticipated lockdown/shelter in place situations. Plans may include pre-arranged and practiced utilization of volunteer assistance to facilitate staff travel or staff family assistance.

2.8.7 Evacuation

Plan for when it is appropriate for a PSAP to evacuate Pre-plan transportation to evacuate employees, tracking and staffing for single seat PSAPs.

2.9 Support Documentation and Mutual Aid

2.9.1 Administrative Operational Agreements

PSAP authorities should validate on a regular basis administrative and operational agreements with other authorities in accordance to NENA Mutual Aid document or other applicable guidelines.

2.9.2 System and Operational Documentation

Include a list of applicable administrative, functional and operational documents required to function in a contingency environment. These documents should be current and readily accessible at the contingency location. The list should include but is not limited to system architecture, operating manuals, system security plans, risk assessments, MOUs, MOA, SLAs, testing procedures and results, system interdependencies, asset inventory, contacts and escalation list, hardware inventory, software inventory, backup procedures, configuration guidelines, alternate site status and inventory, and standard operating procedures. REF: [CSRC Computer Security Resource Center, National Institute of Standards and Technology. <http://www.CSRC.NIST.gov>]

3 Conducting a Hazard and Vulnerability Analysis

PSAP Authorities when executing a hazard and risk assessment for continuity of operations should consider a range of factors, such as type of hazard (event), frequency of the hazard, the magnitude of the hazard, the probability of warning time, severity of the hazard and any special characteristics or planning considerations. Exhibit "A" *Risk Index Worksheet* can be used by PSAP Authorities to conduct a high-level risk assessment. PSAP Authorities complete the worksheet listing every type of hazard their organization has or may encounter; weather, environmental, man-made, and technological. PSAP Authorities should consider how those hazards will impact the components listed in Section 3 *Components of a Hazard and Vulnerability Analysis* as part of their analysis. After all of the hazards are listed, PSAP Authorities need to determine the "Risk Priority" of the hazard. The Risk Priority could be factored based on the frequency, magnitude and severity of the hazard (event). The hazards (events) with a High-Risk Priority should be investigated by the PSAP Authority to mitigate the factors that makes the PSAP authority vulnerable. Exhibit B *Hazard Checklist* and Exhibit C *Hazard Profile Worksheet* can be used to further assess and identify PSAP vulnerabilities for specific hazards.

4 Mitigating Hazards and Vulnerabilities

The quality of PSAP Authority preparedness is based on the extent of the hazard analysis and correlated disaster and contingency plan for each hazard. As the environment of the PSAP changes technology reassessments must be made to identify potential new hazards, vulnerabilities and mitigation strategies. Preparedness plans should include an analysis of recovery strategies including personnel debriefing and assistance. PSAP Authorities can refer to *NENA INF-017.2-2015 Communications Center/PSAP Disaster and Contingency Plans Model Recommendation* and *INF-020.2-2016 NENA PSAP Survivability Information Document* for options to mitigate hazards to reduce vulnerability and increase PSAP survivability.

5 Impacts, Considerations, Abbreviations, Terms, and Definitions

5.1 Operations Impacts Summary

This document will assist PSAP Authorities in identifying potential areas of vulnerabilities to their operations. Operational impacts will vary; this may include equipment downtime, the need for additional staffing when conducting maintenance or tests on support systems, associated processes and evaluating contingency plans.

APCO/NENA ANS 1.102.1-2010, Public Safety Answering Point (PSAP) Service Capability Criteria Rating Scale: The self-evaluation assessment tool is 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. NENA & APCO encourage PSAP Managers and their Governing Authorities to use available assessment tools as they undertake to identify resources and plan for mitigation of hazards.

5.2 Technical Impacts Summary

The technical impact will vary greatly dependent upon the size and complexity of the emergency call center. At a minimum the Communication Service Provider (referred to in the past as the "Telephone Company or Telephone Service Provider"), 9-1-1 System Service Provider (911SSP), radio, IT personnel, Computer-Aided-Dispatch vendor and any other service provider or vendor unique to your agency should be consulted to review your resources, identify your vulnerabilities and develop mitigation plans.

In addition to this document, APCO/NENA ANS 1.102.1-2010, Public Safety Answering Point (PSAP) Service Capability Criteria Rating Scale, assists 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.

5.3 Security Impacts Summary

PSAPs should consider physical and cyber security impacts on technical, functional and operational issues to meet current NENA standards and best practices when conducting their resource analysis and hazard and vulnerability planning. PSAPs should take into consideration any internal, local, state and federal, standards, guidelines, recommendations and/or legal requirements.

5.4 Recommendation for Additional Development Work

This document is intended to be used as a guide to assist with disaster planning. Current and future Standards regarding access, network, equipment, infrastructure and capability should be used to assist with disaster planning. In particular, the National Fire Protection Association (NFPA) Standard 1221 and the NENA Communications Center/PSAP Disaster and Contingency Plans Model Recommendations should be utilized.

5.5 Anticipated Timeline

The anticipated timeline will vary depending on the size and complexity of the operational and technical requirements to review your resources and mitigate your hazards and vulnerabilities.

5.6 Cost Factors

PSAPs that require or desire to adequately prepare for disaster will incur expenses. These expenses will be unique to each PSAP based on their current resources and planning goals. Administrators are urged to look beyond the cost of planning and prevention to the potential cost of system failure.

5.7 Cost Recovery Considerations

Cost Recovery will vary greatly depending on the jurisdiction of the Communication Center/PSAP. Administrators are encouraged to review their cost recovery legislation and apply for all available grants and/or funding.

5.8 Additional Impacts (non-cost related)

The information contained in this NENA document is known to have several impacts, based on the analysis of the authoring group. The primary impacts include:

- a. Identifying hazard and performing risk analysis of all systems, interfaces and equipment
- b. Implementing mitigation plans may impact SOPs, staffing, physical resources, etc.
- c. Implementing guidelines and/or practices mentioned in this document may necessitate drafting of new or modified MOU's or Interagency Agreements
- d. Impacts to Staff training and drills
- e. Impacts to Routine testing of equipment

- f. Implementing mitigation plans may necessitate a review of After Action Reports
- g. Implementing mitigation plans may necessitate establishment of, or modifications to SOPs to provide for regular reviews of the risk/disaster/contingency plan, including implementation of changes to risk/disaster/contingency plans as required

5.9 Abbreviations, Terms and Definitions

See NENA-ADM-000, NENA Master Glossary of 9-1-1 Terminology, located on the [NENA web site](#) for a complete listing of terms used in NENA documents. All acronyms used in this document are listed below, along with any new or updated terms and definitions.

Term or Abbreviation (Expansion)	Definition / Description
<i>ACD</i> (<i>Automatic Call Distribution</i>)	Equipment that automatically distributes incoming calls to available PSAP attendants in the order the calls are received, or queues calls until an attendant becomes available.
<i>ALI</i> (<i>Automatic Location Identification</i>)	The automatic display at the PSAP of the caller's telephone number, the address/location of the telephone and supplementary emergency services information of the location from which a call originates.
<i>ANI</i> (<i>Automatic Number Identification</i>)	Telephone number associated with the access line from which a call originates.
<i>ATIS</i> (<i>Alliance for Telecommunications Industry Solutions</i>)	A U.S.-based organization that is committed to rapidly developing and promoting technical and operations standards for the communications and related information technologies industry worldwide using a pragmatic, flexible and open approach. Please refer to: www.atis.org
<i>NFPA</i> (<i>National Fire Protection Association</i>)	A global, nonprofit organization devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards. The association delivers information and knowledge through consensus codes and standards, research, training, education, outreach and advocacy; and by partnering with others who share an interest in furthering the NFPA mission. http://www.nfpa.org/
<i>PSAP</i> (<i>Public Safety Answering Point</i>)	Public Safety Answering Point (PSAP): An entity responsible for receiving 9-1-1 calls and processing

	those calls according to a specific operational policy.
UPS (<i>Uninterruptible Power Supply</i>)	A device that provides battery backup when the electrical power fails or drops to an unacceptable voltage level. Small UPS systems provide power for a few minutes; enough to power down the computer in an orderly manner, while larger systems have enough battery for several hours.
CAD (<i>Computer Aided Dispatch</i>)	A computer-based system, which aids PSAP telecommunicators by automating selected dispatching and record keeping activities.
AVL (<i>Automatic Vehicle Location</i>)	A means for determining the geographic location of a vehicle and transmitting this information to a point where it can be used.

6 Recommended Reading and References

- [1] NENA Master Glossary of 9 1 1 Terminology, [NENA-ADM-000](#)
- [2] [National Fire Protection Association- NFPA](#)
- [3] NFPA 1221 Standard for the installation, maintenance, and use of emergency services communication systems (**This Standard has been combined into a new consolidated Standard, NFPA 1225, Standard for Emergency Services Communications, which also includes NFPA 1061. For further information on the current edition of this consolidated Standard, go to [NFPA 1225.](#)**)
- [4] National Fire Alarm Code, [NFPA 72-44](#), Chapter 6, Protected Premises Fire Alarm Systems National Fire Protection Association, Standard 1221, Installation, Maintenance, and Use of Emergency Services Communications Systems.
- [5] Alexander, David, Principles of Emergency Planning and Management, Oxford University Press 2002
- [6] NENA Communications Center/PSAP Disaster and Contingency Plans Model, [NENA INF-017.3-2018](#)
- [7] NENA Inter-Agency Agreements Model Recommendations Information Document, [NENA-INF-012.3-2020](#)
- [8] NENA Mutual Aid Standard/Model Recommendation, [NENA-STA-009.2-2015](#)
- [9] NENA-APCO Public Safety Answering Point (PSAP) Service Capability Criteria Rating Scale, [NENA-APCO ANS 1.102-3-2020](#)
- [10] NENA PSAP Survivability Information Document, [NENA-INF-020.2-2017 \(originally 53-503\)](#)
- [11] NENA Emergency Services IP Design Information Document (includes SLA details), [NENA-INF-016.2-2018](#)



- [12] NENA Potential Point of Demarcation in NG911 Network Information Document, [NENA-INF-003.1-2013](#)
- [13] NENA NG9-1-1 Policy Routing Rules Operations Guide, [NENA-INF-011.2-2020](#)
- [14] NENA Next Generation 9-1-1 Security Audit Checklist Information Document, [NENA 75-502](#)
- [15] [IACP Social Media](#)
- [16] NENA Standard for Social Media Emergency Requests, [NENA-STA-044.1-202Y](#) (DRAFT)
- [17] [APCO ANS 1.112.2-2020](#) Best Practices for the use of Social Media in Public Safety
- [18] CSRC Computer Security Resource Center, National Institute of Standards and Technology. <http://www.CSRC.NIST.gov>
- [19] State Office of Emergency Services & Emergency Operation Plan
- [20] [The Communications Security, Reliability and Interoperability Council's \(CSRIC\)](#)
- [21] [FEMA](#)
- [22] [FEMA-Integrated Public Alert & Warning System](#)



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NENA Board of Directors Approval Date: 09/10/2016

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Exhibit A Risk Index Worksheet

RISK INDEX WORKSHEET						
<i>Hazard</i>	<i>Frequency</i>	<i>Magnitude</i>	<i>Warning Time</i>	<i>Severity</i>	<i>Special Characteristics and Planning</i>	<i>Risk Priority*</i>
	<input type="checkbox"/> Highly likely <input type="checkbox"/> Likely <input type="checkbox"/> Possible <input type="checkbox"/> Unlikely	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible	<input type="checkbox"/> Minimal <input type="checkbox"/> 6-12 hours <input type="checkbox"/> 12-24 hours <input type="checkbox"/> 24+ hours	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible		
	<input type="checkbox"/> Highly likely <input type="checkbox"/> Likely <input type="checkbox"/> Possible <input type="checkbox"/> Unlikely	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible	<input type="checkbox"/> Minimal <input type="checkbox"/> 6-12 hours <input type="checkbox"/> 12-24 hours <input type="checkbox"/> 24+ hours	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible		
	<input type="checkbox"/> Highly likely <input type="checkbox"/> Likely <input type="checkbox"/> Possible <input type="checkbox"/> Unlikely	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible	<input type="checkbox"/> Minimal <input type="checkbox"/> 6-12 hours <input type="checkbox"/> 12-24 hours <input type="checkbox"/> 24+ hours	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible		
	<input type="checkbox"/> Highly likely <input type="checkbox"/> Likely <input type="checkbox"/> Possible <input type="checkbox"/> Unlikely	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible	<input type="checkbox"/> Minimal <input type="checkbox"/> 6-12 hours <input type="checkbox"/> 12-24 hours <input type="checkbox"/> 24+ hours	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible		
	<input type="checkbox"/> Highly likely <input type="checkbox"/> Likely <input type="checkbox"/> Possible <input type="checkbox"/> Unlikely	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible	<input type="checkbox"/> Minimal <input type="checkbox"/> 6-12 hours <input type="checkbox"/> 12-24 hours <input type="checkbox"/> 24+ hours	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible		
	<input type="checkbox"/> Highly likely <input type="checkbox"/> Likely <input type="checkbox"/> Possible <input type="checkbox"/> Unlikely	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible	<input type="checkbox"/> Minimal <input type="checkbox"/> 6-12 hours <input type="checkbox"/> 12-24 hours <input type="checkbox"/> 24+ hours	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible		
	<input type="checkbox"/> Highly likely <input type="checkbox"/> Likely <input type="checkbox"/> Possible <input type="checkbox"/> Unlikely	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible	<input type="checkbox"/> Minimal <input type="checkbox"/> 6-12 hours <input type="checkbox"/> 12-24 hours <input type="checkbox"/> 24+ hours	<input type="checkbox"/> Catastrophic <input type="checkbox"/> Critical <input type="checkbox"/> Limited <input type="checkbox"/> Negligible		

* High, Medium, Low



Exhibit B Hazard Checklist

Hazard:

Brief description of scenario:

Location:

Characterization

natural technological human secondary complex

Probability of occurrence

calculable hypothesized unknown independent of past events dependent of past events

Frequency

regular (e.g. seasonal) some regularity random

Pattern of impact

sudden catastrophe rapid build-up (<24h) slow build-up

Duration

seconds minutes hours days weeks months years

Area of Impact

widespread local site specific

Short-term predictability (forecast capability)

Location predictable variable but generally known unpredictable

Timing highly predictable very predictable somewhat predictable highly unpredictable

Warning capability

very high high moderate low very low

Controllability (can physical process be stopped?)

definitely probably possibly no

General assessments

Vulnerability very high high moderate low very low
Risk levels very high high moderate low very low

Preparedness levels

very effective effective unknown ineffective lacking

Structural and semi-structural preparedness

very effective effective unknown ineffective lacking

Infrastructure preparedness

very effective effective unknown ineffective lacking

Probable future impact levels

very effective effective unknown ineffective lacking

Staff awareness of hazard

very effective effective unknown ineffective lacking

Support for mitigation and preparedness measures

very effective effective unknown ineffective lacking

General assessment of mitigation situation for this hazard

very effective effective unknown ineffective lacking



Exhibit C Hazard Profile Worksheet

HAZARD PROFILE WORKSHEET	
HAZARD:	
POTENTIAL MAGNITUDE (Percentage of the facility that may be affected): <ul style="list-style-type: none"><input type="radio"/> Catastrophic: More than 50 %<input type="radio"/> Critical: 25 to 50%<input type="radio"/> Limited: 10 to 25%<input type="radio"/> Negligible: Less than 10%	
FREQUENCY OF OCCURRENCE: <ul style="list-style-type: none"><input type="radio"/> Highly likely: Near 100% probability in next year.<input type="radio"/> Likely: Between 10 and 100% probability in next year, or at least one chance in next 10 years.<input type="radio"/> Possible: Between 1 and 10% probability in next year, or at least one chance in next 100 years.<input type="radio"/> Unlikely: Less than 1% probability in next 100 years.	PATTERN:
AREAS LIKELY TO BE AFFECTED:	
PROBABLE DURATION:	
POTENTIAL SPEED OF ONSET (Probable amount of warning time): <ul style="list-style-type: none"><input type="radio"/> Minimal (or no) warning<input type="radio"/> 6 to 12 hours warning<input type="radio"/> 12 to 24 hours warning<input type="radio"/> More than 24 hours warning	
EXISTING WARNING MECHANISMS:	
COMPLETE VULNERABILITY ANALYSIS: <ul style="list-style-type: none"><input type="radio"/> Yes<input type="radio"/> No	

Exhibit D Risk Assessment Worksheet

Area	Essential Facilities at Risk	
	Staff/Citizens at Risk	
	Infrastructure	
	Property at Risk	
	Expected Extent of Damage	% of Property
	<input type="radio"/> Severe	
	<input type="radio"/> Substantial	
	<input type="radio"/> Minor	
	<input type="radio"/> None	



