



MEMORANDUM

To: Mr. Quinn Ness, Bureau Chief, Public Safety Communications Bureau,
State of Montana, Department of Administration

From: Scott A. Strom, Project Manager, Federal Engineering, Inc. (**FE**)

Date: April 10, 2019

Re: Montana Statewide 9-1-1 Plan Project – NG9-1-1 Uniform Standards
Document

Document Purpose

This document serves as the Next Generation 9-1-1 (NG9-1-1) Uniform Standards Document deliverable as described in the approved proposal for the State of Montana Statewide 9-1-1 Plan project.

Introduction

The purpose of the NG9-1-1 Uniform Standards Document is to establish a set of current Standards and Information documents to be used in design and transition to a state-wide NG9-1-1 system. Based on a review of the Montana Legislation and our industry knowledge of NG9-1-1 standards, FE will recommend standards to the State of Montana for ESInet, network security, GIS data, call delivery, and call processing.

1. Methodology

A thorough comparison of the current NG9-1-1 standards germane to the implementation of NG9-1-1 was completed. The vast majority of these NG9-1-1 standards and information documents are being shepherded by the National Emergency Number Association (NENA) Working Groups¹ and in some cases in collaboration with the Association of Public-Safety Communications Officials (APCO) International Standards Development Committee (SDC).² Hyperlinks to actual documents are shown in Section 3 below.

¹ <https://www.nena.org/page/NDGCommitteeList>;

² <https://www.apcointl.org/standards/>



Refer to *Appendix “A” – Montana NG9-1-1 Uniform Standards Review Spreadsheet* for a detailed listing of the review. The spreadsheet:

- **Column A** – Assigns a unique **Item** number to each standard;
- **Column B** – Shows the **Document Number** of the standard;
- **Column C** – Shows the **Document Name** of the standard;
- **Column D** – Shows the **Approval Date** of the standard or whether it is under review or is still being developed; and
- **Column E** – Shows which **Working Group** or agency is responsible for the development of the standard.

2. Disclaimer

The world of NG9-1-1 is in a constant state of change. It must therefore be assumed that current standards pertaining to the new 9-1-1 technology will be evolving, and the requirement to publish updated standards will be ongoing.

All existing standards were reviewed, and the most current version of the standard are logged in the body of the spreadsheet. Previous versions of a standard, if applicable, are shown in the **Document Number** column.

3. Summary of NG9-1-1 Standards

3.1 NG9-1-1 Transition

NENA 08-751 - NENA i3 Technical Requirements Document - This "NENA i3 Technical Requirements Document" is intended to specify the requirements the i3 (Long Term Definition) Standard should meet. This document is issued to guide the development of the i3 Standard.

https://www.nena.org/page/i3_Requirements_LTD

NENA-INF-006.1-2014 - NG9-1-1 Planning Guidelines Information Document - The purpose and scope of this document is to provide guidance to help 9-1-1 Authorities create a smooth, timely and efficient transition plan to accomplish implementation of NG9-1-1.

<https://www.nena.org/page/ng911planning>

NENA-INF-008.2-2013 (originally 77-501) - NG9-1-1 Transition Plan Considerations Information Document - The public safety community has recognized the need to evolve legacy emergency services networks to next generation concepts which may facilitate



new capabilities and services. As such there are numerous industry associations and Standard Development Organizations (SDOs) that are defining architectures and protocols for these next generation networks. The public safety community desires to take advantage of this work and address the challenge it represents to emergency communications. To this end, work is progressing in other NENA committees to define the specific emergency services architectures and protocols involved. The transition of emergency services addressed by this document relies upon this collective work.

https://www.nena.org/page/NG911_TransitionPlan

3.2 NG9-1-1 Data Structures

NENA-STA-010.2-2016 (originally 08-003) - NENA Detailed Functional and Interface Standards for the NENA i3 Solution (update in progress) - This specification builds upon prior NENA publications including i3 requirements and architecture documents. Familiarity with the concepts, terminology and functional elements described in these documents is a prerequisite. While the requirements and architecture documents describe high level concepts, the present document describes only the detailed functional and external interfaces to those functional elements. If there are discrepancies between the requirements or architecture documents and this document, this document takes precedence. This document provides a baseline to other NG9-1-1 related specifications.

https://www.nena.org/page/i3_Stage3

NENA-STA-004.1.1-2014 - NENA Next Generation 9-1-1 (NG9-1-1) United States Civic Location Data Exchange Format (CLDXF) Standard - This document defines the civic location data elements that will be used to support the NENA compliant Next Generation systems, databases, call routing, call handling, and related processes. The CLDXF document was developed to:

1. Provide a definitive set of core civic location data elements that support emergency call routing and dispatch.
2. Map a profile between Presence Information Data Format-Location Object (PIDF-LO) and those same NENA core civic location data elements.
3. Map those civic location data elements to the corresponding Federal Geographic Data Committee, United States Thoroughfare, Landmark, and Postal Address Data Standard, Document Number FGDC-STD-016-2011 set of data elements, which was sponsored by the Urban and Regional Information Systems Association (URISA) and the National Emergency Number Association (NENA).



4. Provide illustrative examples of address parsing.

<https://www.nena.org/page/NG911CLDXF>

NENA-STA-015.10-2018 (originally 02-010) - NENA Standard Data Formats for E9-1-1 Data Exchange & GIS Mapping - This document sets forth NENA standard formats for Automatic Location Identification (ALI) data exchange between Service Providers and Data Base Management System Providers, a Geographic Information System (GIS) data model, and formats for data exchange between the ALI Database and PSAP Controller equipment.

<https://www.nena.org/general/custom.asp?page=DataFormats>

NENA-STA-006.1-2018 - NENA Standard for NG9-1-1 GIS Data Model - This document defines the Geographic Information Systems (GIS) Data Model, which supports the NENA Next Generation 9-1-1 (NG9-1-1) Core Services (NGCS) of location validation and routing, both geospatial call routing or to the appropriate agency for dispatch. This model also defines several GIS data layers used in local Public Safety Answering Point (PSAP) and response agency mapping applications for handling and responding to 9-1-1 calls.

<https://www.nena.org/page/NG911GISDataModel>

APCO / NENA 2.105.1-2017 - NENA/APCO NG9-1-1 Emergency Incident Data Document (EIDD) – The Emergency Incident Data Document (EIDD) provides a standardized, industry-neutral National Information Exchange Model (NIEM) conformant (XML-based) specifications for exchanging emergency incident information to agencies and regions that implement NG9-1-1 and Internet Protocol (IP) based emergency communications systems. Emergency incident information exchanges supported by the EIDD include exchanges between disparate manufacturers' systems located within one or more public safety agencies and with other incident stakeholders.

<https://www.nena.org/page/EIDD>

3.3 Data Management

NENA-STA-003.1.1-2014 - NENA Standard for NG9-1-1 Policy Routing Rules - An important feature of NG9-1-1 is the ability of the system to adapt to outages, excessive call volumes, emergencies and normal scheduled PSAP outages. The Policy Routing Function (PRF) described in 08-003 is the function that handles the diversion of calls. To support the PRF, Policy Routing Rules (PRRs) must be developed. These PRRs define to where calls are diverted if the target PSAP is unreachable. This Working Group's charter was to define a template to guide the development of these PRRs. To that end, the committee developed templates to facilitate the PRRs that a 9-1-1 Authority must



develop for any new NG9-1-1 System. The minimum set of rules developed must address all call diversion capabilities present in the current E9-1-1 system. A 9-1-1 Authority may choose to implement additional and/or enhanced PRRs to divert calls in a manner that takes advantage of capabilities available in a NG9-1-1 system that are not available in E9-1-1 systems.

<https://www.nena.org/page/NG911RoutingRules>

NENA-INF-011.1-2014 - NENA NG9-1-1 Policy Routing Rules Operations Guide -

This document is provided to assist 9-1-1 Governing Authorities in using Policy Routing Rules (PRRs) during the full life cycle of a NG9-1-1 System. The document provides considerations and recommendations to 9-1-1 Governing Authorities implementing NG9-1-1 systems during the Request For Information (RFI) and Request For Proposals (RFP) used to select a vendor, through the implementation phase where PRRs are initially established, to the steady-state operations of a NG9-1-1 System where PRRs are refreshed and refined. Using the information in this document the reader will be able to take full advantage of the power of PRRs defined in the NG9-1-1 Standards referenced. This document is intended for staff of 9-1-1 Governing Authorities and PSAPs with a baseline understanding of NG9-1-1. Reading the reference documents listed in Section 4 is helpful but is not a requirement to use this document.

https://www.nena.org/page/PRR_OptnsGuide

NENA 71-502 - An Overview of Policy Rules for Call Routing and Handling in NG9-1-1 Information Document -

This document is an overview of what policy rules are, how policy is defined, and the ways that they may be used. Policy rules influence the delivery of calls to a PSAP and, how these calls are handled based on call taker skill sets and other criteria. Policy Rules are defined and implemented by the governing 9-1-1 Authority.

https://www.nena.org/page/NG911_Policy_Rules

NENA-REQ-002.1-2016 - NENA Next Generation 9-1-1 Data Management Requirements -

This document defines discrepancy report and the performance reports associated with processes within the Next Generation 9-1-1 (NG9-1-1) system. The intent of the document is to provide 9-1-1 Authorities, vendors, Communication Service Providers (CSP), and other interested parties with guidelines for communicating issues or status of various elements within the system. The components of the document are Discrepancy Report Requirements and Performance Statistic Report Requirements.

<https://www.nena.org/page/NGDataMgmt>



NENA 02-014 - NENA GIS Data Collection and Maintenance Standards - This document is the NENA recommended standard for GIS data collection and GIS data maintenance. This document is meant to provide PSAP management, vendors, and other interested parties necessary guidelines for collecting and maintaining GIS data. Collection and maintenance of GIS data is most reliably accomplished by qualified, trained individuals or vendors that have received formal GIS training and instruction. This standard also provides information on data collection to meet accuracy requirements for wireless and Voice over Internet Protocol (VoIP) 9-1-1 technologies that use x, y, z coordinates to provide location of the 9-1-1 caller.

<https://www.nena.org/page/gisdatacollection>

NENA-INF-014.1-2015 - NENA Information Document for Development of Site/Structure Address Point GIS Data for 9-1-1 - This document is an informational tool chest, not a listing of instructions and requirements. The reader will find a great deal of practical information on address point placement methodologies, based on real world experience. Reading the entire document will provide the greatest understanding of address point placement options and be the most beneficial to the reader.

<https://www.nena.org/page/SSAP>

NENA-STA-005.1.1-2017 - NENA Standards for the Provisioning and Maintenance of GIS data to ECRF and LVFs - This document defines operational processes and procedures necessary to support the i3 Emergency Call Routing Function (ECRF) and Location Validation Function (LVF). Additionally, this document identifies ECRF/LVF performance and implementation considerations for 9-1-1 Authorities' consideration.

<https://www.nena.org/page/ProvGISECRFLVF>

NENA-INF-71-501 – NENA Information Document for Synchronizing GIS with MSAG & ALI – This document is meant to provide PSAP management, vendors, and other interested parties necessary guidelines for synchronizing GIS data with existing 9-1-1 databases. The synchronization process of the GIS data is most reliably accomplished by qualified, trained individuals or vendors that have received formal GIS training and instruction.

https://www.nena.org/page/synch_gis_msag_ali



3.4 Agency Systems

NENA-STA-026.5-2016 (originally NENA 04-002) - NENA PSAP Master Clock Standard - This Standard is a guide for designers and manufacturers of PSAP equipment. It identifies engineering and technical requirements to be met before the NENA membership shall consider purchase of such equipment; it may also be of value to purchasers, maintainers and users of such equipment.

https://www.nena.org/page/PSAP_Master_Clock

NENA/APCO-REQ-001.1.2-2018 - NENA/APCO Next Generation 9-1-1 Public Safety Answering Point Requirements - This technical requirements document introduces requirements for a NG9-1-1 Public Safety Answering Point (PSAP) that is capable of receiving IP-based signaling and media for delivery of emergency calls conformant to the latest version of the NENA i3 Architecture document. An emergency call enters the i3 PSAP using Session Initiation Protocol signaling. NG9-1-1 encourages the creation of many new coordination and information access services to enrich collaborative interactions between all agencies involved in processing emergency service requests. This document is issued as NENA/APCO recommended requirements for functions and interfaces between an i3 PSAP and NG9-1-1 Core Services, and among Functional Elements associated with the i3 PSAP. This document is primarily intended to drive the development of more standards that meet the technical requirements specified herein. Unless otherwise indicated, the requirements in this document do not apply to products and services unless and until matching specifications are published in applicable standards.

https://www.nena.org/page/NG911_PSAP_REQ

NENA-STA-019.1-2018 - NG9-1-1 Call Processing Metrics Standard - Call processing metrics are measurements between events in the call processing chain used to drive reporting, analysis, and real-time monitoring. The intent of this document is to define normalized NG9-1-1 call processing metrics for computing useful statistics so that independent implementations can derive the same comparable measurements. This is ANSI Accredited NENA Standard.

https://www.nena.org/page/NG_CallProcMetrics

3.5 Interconnection & Security

NENA-INF-016.2-2018 (originally NENA 08-506) - NENA Emergency Services IP Network Design for NG9-1-1 Information Document - This document is intended to provide information that will assist in the development of requirements necessary to



design ESNets that meet industry standards and best practices related to the NG9-1-1 systems that will depend on them for services. Readers are encouraged to review and refer to this document during preparations for procuring, building and implementing an ESNet and to use it as an informative resource.

https://www.nena.org/page/IP_Network_NG911

NENA 75-502 - Next Generation 9-1-1 Security (NG-SEC) Audit Checklist Information Document - This Information Document is a companion to NENA 75-001 - NENA Security for Next-Generation 9-1-1 Standard (NG-SEC) Standard. To effectively use this document the user should have a clear understanding of the concepts and procedures described therein. This checklist provides a summary of the requirements and recommendations detailed in the NG-SEC standard and provide the educated user a method to document a NG-SEC Audit.

<https://www.nena.org/page/NGSecurityChecklist>

NENA 75-001 - Security for Next-Generation 9-1-1 (NG-SEC) - The purpose of this document is to establish the minimal guidelines and requirements for the protection of NG9-1-1 assets or elements within a changing business environment. This document:

- Identifies the basic requirements, standards, procedures, or practices to provide the minimum levels of security applicable to NG9-1-1 Entities.
- Provides a basis for auditing and assessing levels of security and risk to NG9-1-1 Entities, assets or elements, and exception approval / risk acceptance process in the case of non-compliance to these guidelines.

https://www.nena.org/page/NG911_Security

NENA-INF-015.1-2016 – NENA NG9-1-1 Security (NG-SEC) Information Document - This information document is a companion to NENA STA-010. This document provides detail of the mechanisms and best practices relative to security of the i3 system. This document describes procedures and best practices on how to deploy security for the system.

https://www.nena.org/page/NG911_Security_INF

3.6 Miscellaneous

CSRIC Best Practices - The Communications Security, Reliability and Interoperability Council's (CSRIC) mission is to provide recommendations to the FCC to ensure, among other things, optimal security and reliability of communications systems, including



telecommunications, media, and public safety.³ CSRIC's members focus on a range of public safety and homeland security-related communications matters, including: (1) the reliability and security of communications systems and infrastructure, particularly mobile systems; (2) 9-1-1, Enhanced 9-1-1 (E9-1-1), and Next Generation 9-1-1 (NG9-1-1); and (3) emergency alerting.

<http://transition.fcc.gov/pshs/advisory/csric>

4. Concluding Comments

This information lays the groundwork for the next steps in the research and development of the NG9-1-1 Technology Requirements Document and Statewide ESInet Design and Implementation Plan.

³ <https://www.fcc.gov/about-fcc/advisory-committees/communications-security-reliability-and-interoperability-1>;



Appendix A - Montana NG9-1-1 Uniform Standards Review Spreadsheet

Montana NG9-1-1 Uniform Standards Review Spreadsheet

ITEM	DOCUMENT NUMBER	DOCUMENT NAME	APPROVED	DEVELOPMENT WORKING GROUP
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NEXT GENERATION 9-1-1 (NG9-1-1)

1	NENA 08-751	NENA i3 Technical Requirements Document	9/28/2006	Interconnection & Security
2	NENA-INF-006.1-2014	NG9-1-1 Planning Guidelines Information Document	1/8/2014	NG Project Lead Team
3	NENA-INF-008.2-2013 (originally 77-501)	NG9-1-1 Transition Plan Considerations Information Document	11/20/2013	NG Transition Planning

DATA STRUCTURES

4	NENA STA-010.2-2016 (originally 08-003)	Detailed Functional and Interface Standards for the NENA i3 Solution	9/17/2009 (update in Progress)	Data Structures
5	NENA-STA-004.1-2014	NENA Next Generation United States Civic Location Data Exchange Format (CLDXF)	3/23/2014	Data Structures
6	NENA-STA-015.10-2018 (originally 02-010)	NENA Standard Data Formats for E9-1-1 Data Exchange & GIS Mapping	8/12/2018	Data Structures
7	NENA-STA-006.1-2018	NENA Standard for NG9-1-1 GIS Data Model	7/16/2018	Data Structures
8	APCO/NENA 2.105.1-2017	NENA/APCO NG9-1-1 Emergency Incident Data Document (EIDD)	PENDING	Joint APCO/NENA Working Group



DATA MANAGEMENT

9	NENA-STA-003.1.1-2014	NENA Standard for NG9-1-1 Policy Routing Rules	12/1/2014	Data Management
10	NENA-INF-011.1-2014	NENA NG9-1-1 Policy Routing Rules Operations Guide	10/6/2014	Data Management
11	NENA 71-502	An Overview of Policy Rules for Call Routing and Handling in NG9-1-1 Information Document	12/14/2011	Data Management
12	NENA-REQ-002.1-2016	NENA Next Generation 9-1-1 Data Management Requirements	3/10/2016	Data Management
13	NENA 02-014	NENA GIS Data Collection and Maintenance Standards	7/17/2007 (update in progress)	Data Management
14	NENA-INF-014.1-2015	NENA Information Document for Development of Site/Structure Address Point GIS Data for 9-1-1	9/18/2015	Data Management
15	NENA-STA-005.1.1-2017	NENA Standards for the Provisioning and Maintenance of GIS data to ECRF and LVFs	02/16/2017	Data Management
16	NENA-INF-71-501	Synchronizing Geographic Information System Databases with MSAG & ALI Information Document	9/8/2009	Data Management

AGENCY SYSTEMS

17	NENA-STA-026.5-2016 (originally NENA 04-002)	NENA PSAP Master Clock Standard	12/21/2016	Agency Systems
18	NENA/APCO-REQ-001.1.2-2018	NENA/APCO Next Generation 9-1-1 Public Safety Answering Point Requirements	4/5/2018	Agency Systems
19	NENA-STA-019.1-2018	NG9-1-1 Call Processing Metrics Standard	2018/07/02	Agency Systems



INTERCONNECTION & SECURITY

20	NENA-INF-016.2-2018 (originally NENA 08-506)	Emergency Services IP Network Design for NG9-1-1 Information Document (Update in Progress)	12/14/2011	Interconnection & Security
21	NENA 75-502	Next Generation 9-1-1 Security (NG-SEC) Audit Checklist Information Document	12/14/2011	Interconnection & Security
22	NENA 75-001	Security for Next-Generation 9-1-1 (NG-SEC)	2/6/2010	Interconnection & Security
23	NENA-INF-015.1-2016	NG9-1-1 Security Information Document	12/08/2016	Interconnection & Security

MISCELLANEOUS

24	CSRIC Best Practices	http://transition.fcc.gov/pshs/advisory/csric	ONGOING	FCC
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