

NENA

Next Generation

9-1-1 Data Management Requirements



NENA Next Generation 9-1-1 Data Management Requirements

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Table of Contents

1	EXECUTIVE OVERVIEW	5
2	INTRODUCTION.....	5
2.1	OPERATIONS IMPACTS SUMMARY.....	5
2.2	TECHNICAL IMPACTS SUMMARY.....	5
2.3	SECURITY IMPACTS SUMMARY	5
2.4	DOCUMENT TERMINOLOGY	6
2.5	REASON FOR ISSUE/REISSUE.....	6
2.6	RECOMMENDATION FOR ADDITIONAL DEVELOPMENT WORK	6
2.7	ANTICIPATED TIMELINE.....	6
2.8	COST FACTORS	6
2.9	COST RECOVERY CONSIDERATIONS	7
2.10	ADDITIONAL IMPACTS (NON-COST RELATED).....	7
2.11	INTELLECTUAL PROPERTY RIGHTS POLICY.....	7
2.12	ACRONYMS/ABBREVIATIONS, TERMS AND DEFINITIONS	7
3	DISCREPANCY REPORTS.....	11
3.1	MINIMUM CONTENT REQUIREMENTS FOR DISCREPANCY REPORT.....	13
3.2	LIS	14
3.3	SI.....	15
3.4	ECRF/LVF.....	15
3.5	ESRP	16
3.6	PRF	17
3.7	LNG	17
3.8	LSRG	18
3.9	PSAP.....	20
3.10	FOREST GUIDE.....	21
3.11	GENERAL	22
4	PERFORMANCE STATISTICS REPORT (PSR).....	23
4.1	LIS	24
4.2	LVF.....	25
4.3	ESRP.....	25
4.4	ECRF.....	26
4.5	BCF.....	27
4.6	PROVISIONING PERFORMANCE REPORT RELATED TO GIS DATA.....	27
4.7	DISCREPANCY REPORT STATISTICS	28
5	RECOMMENDED READING AND REFERENCES.....	28
6	PREVIOUS ACKNOWLEDGMENTS.....	28

1 Executive Overview

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:

COMPONENT	DESCRIPTION
Discrepancy Report Requirements	The process by which a problem is reported and the requirements for resolving the issue.
Performance Statistic Report Requirements	Describes the current performance of NG9-1-1 elements. Example: Reporting the percentage of discrepancies in a database

2 Introduction

2.1 Operations Impacts Summary

9-1-1 Authorities and more generally, the operation of 9-1-1 services will be affected by the new reporting standard guidelines. NG9-1-1 introduces new functions and databases that require issue reporting by, and resolution from, involved stakeholders such as CSP and 9-1-1 Authorities. This document and the standard guidelines set within intend to minimize the impacts to existing processes while providing options for report review.

2.2 Technical Impacts Summary

Communication Service Providers may need to adjust their existing processes, procedures, and services to meet the new discrepancy reports associated with NG9-1-1 systems. This document has attempted to minimize effects on the existing systems by taking into account turnaround time and information flow defined in NENA 02-011-v7.1 NENA Data Standards for Local Exchange Carriers, ALI Service Providers & 9-1-1 Jurisdictions. The format of batch or individual reports should preferably be user friendly for the local 9-1-1 Authority and other providers.

2.3 Security Impacts Summary

No additional security impacts above what is defined in NENA STA-010 - Detailed Functional and Interface Standards for the NENA i3 Solution documentation.

2.4 Document Terminology

The terms "shall", "must", "mandatory", and "required" are used throughout this document to indicate normative requirements and to differentiate from those parameters that are recommendations. Recommendations are identified by the words "should", "may", "desirable" or "preferable".

2.5 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 Changes
NENA-REQ-002.1-2016	03/10/2016	Initial Document

2.6 Recommendation for Additional Development Work

Additional sections will be added in future versions to complete the NG9-1-1 Data Management Requirements document. Recommended sections include the following:

- Auditing Requirements of NG9-1-1 Functional Elements
- Discrepancy and Performance Reports as functional elements are further defined or changed in NENA Standards documents
- Further research pertaining to the description of the coverage area discussed within section 3.8 Forest Guide Operator to Contributing Emergency Call Routing Function (ECRF) Node Operator on provisioning coverage data
- Discrepancy report information for deployment of public facing Location Validation Function (LVF)
- Discrepancy resolution descriptions for individual Discrepancy Reports including further specifications on the Date/Time stamp

2.7 Anticipated Timeline

The timeline related to system integration of function(s) related to specific Discrepancy and Performance Statistics Reports will vary depending on the implementation of NG9-1-1 systems.

2.8 Cost Factors

The vendor may incur additional cost for development work to support report guidelines.

The CSP may incur additional costs for format conversion and training based on new reports and functions.

The local 9-1-1 Authorities may incur additional costs for training personnel on new discrepancy review procedures. Additional personnel may be needed based on the local transition processes for review and resolution of discrepancy reports.

Other additional costs may occur that have not yet been identified.

2.9 Cost Recovery Considerations

There are no specific cost recovery considerations for implementation of reports. Any cost recovery or other sources of funds for a NG9-1-1 system should be included in the implementation process.

2.10 Additional Impacts (non-cost related)

The report requirements are built on the Discrepancy Report web services defined in NENA STA-010 - Detailed Functional and Interface Standards for the NENA i3 Solution. No additional impacts are known at this time.

2.11 Intellectual Property Rights Policy

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2.12 Acronyms/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.

Abbreviations, Terms and Definitions	Definition / Description	**New (N) / Update (U)
<i>BCF (Border Control Function)</i>	Provides a secure entry into the ESInet for emergency calls presented to the network. The BCF incorporates firewall,	

	admission control, and may include anchoring of session and media as well as other security mechanisms to prevent deliberate or malicious attacks on PSAPs or other entities connected to the ESInet.	
<i>CSP (Communication Service Provider)</i>	This term is used generically to refer to any and all providers of telecommunications services that may be used to generate a 9-1-1 call, and who would interconnect in any fashion to the 9-1-1 network. CSPs include wireline ILECs and CLECs, Wireless Service Providers, VoIP Service Providers, operators of large PBXs and any other entity providing telecommunications services.	
<i>DR (Discrepancy Report)</i>	A Discrepancy Report (DR) notifies agencies and services when issues arise in the system. The discrepancy reporting audience is an individual or a function that, when using the data, determines a problem has occurred.	N
<i>ECRF (Emergency Call Routing Function)</i>	A functional element in an ESInet which is a LoST protocol server where location information (either civic address or geo-coordinates) and a Service URN serve as input to a mapping function that returns a URI used to route an emergency call toward the appropriate PSAP for the caller's location or towards a responder agency.	
<i>ESRP (Emergency Services Routing Proxy)</i>	An i3 functional element which is a SIP proxy server that selects the next hop routing within the ESInet based on location and policy. There is an ESRP on the edge of the ESInet. There is usually an ESRP at the entrance to an NG9-1-1 PSAP. There may be one or more intermediate ESRPs between them.	
<i>FG (Forest Guide)</i>	A Forest Guide has knowledge of the coverage region of trees for a particular top-level service.	N
<i>FGO (Forest Guide Operator)</i>	The organization selected by the FG Sponsoring Entity to deploy and operate a national Forest Guide	N
<i>GIS (Geographic Information Systems)</i>	A system for capturing, storing, displaying, analyzing and managing data and associated attributes which are spatially referenced.	
<i>LDB (Location Database)</i>	The Location Database (LDB) server retains all of the current information, functionality, and interfaces of today's ALI and can utilize the new protocols required in an NG9-1-1 deployment.	N
<i>LIS (Location Information Server)</i>	A Location Information Server (LIS) is a functional element that provides locations of endpoints. A LIS can provide Location-by-Reference, or Location-by-Value, and, if the latter, in geo or civic forms. A LIS can be queried by an	

	<p>endpoint for its own location, or by another entity for the location of an endpoint. In either case, the LIS receives a unique identifier that represents the endpoint, for example an IP address, circuit-ID or MAC address, and returns the location (value or reference) associated with that identifier. The LIS is also the entity that provides the dereferencing service, exchanging a location reference for a location value.</p>	
<i>LNG (Legacy Network Gateway)</i>	<p>A signaling and media interconnection point between callers in legacy wireline/wireless originating networks and the i3 architecture, so that i3 PSAPs are able to receive emergency calls from such legacy networks.</p>	
<i>Location by Value</i>	<p>In the context of location information to support IP based emergency services: A PIDF-LO containing the location of an IP end-point that can be attributed to a specific point in time.</p>	
<i>LPG (Legacy PSAP Gateway)</i>	<p>An NG9-1-1 Functional Element which provides an interface between an ESInet and an un-upgraded PSAP.</p>	
<i>LSRG (Legacy Selective Router Gateway)</i>	<p>The LSRG provides an interface between a 9-1-1 Selective Router and an ESInet, enabling calls to be routed and/or transferred between Legacy and NG networks. A tool for the transition process from Legacy 9-1-1 to NG9-1-1.</p>	
<i>LVF (Location Validation Function)</i>	<p>A functional element in an NGCS that is a LoST protocol server where civic location information is validated against the authoritative GIS database information. A civic address is considered valid if it can be located within the database uniquely, is suitable to provide an accurate route for an emergency call and adequate and specific enough to direct responders to the right location.</p>	
<i>MCS (MSAG Conversion Service)</i>	<p>A web service providing conversion between PIDF-LO and MSAG data.</p>	N
<i>NENA (National Emergency Number Association)</i>	<p>As The Voice of 9-1-1™, NENA is on the forefront of all emergency communications issues. The association serves its members and the greater public safety community as the only professional organization solely focused on 9-1-1 policy, technology, operations, and education issues. With more than 10,000 members in 48 chapters across the United States and around the globe, NENA promotes the implementation and awareness of 9-1-1, as well as international three-digit emergency communications systems. NENA works with 9-1-1 professionals nationwide, public policy leaders, emergency services and telecommunications</p>	U

	<p>industry partners, like-minded public safety associations, and other stakeholder groups to develop and carry out critical programs and initiatives, to facilitate the creation of an IP-based Next Generation 9-1-1 system, and to establish industry leading standards, training, and certifications. Through the association’s efforts to provide effective and efficient public safety solutions, NENA strives to protect human life, preserve property, and maintain the security of our communities.</p>	
<p><i>NG9-1-1 (Next Generation 9-1-1)</i></p>	<p>NG9-1-1 is an Internet Protocol (IP)-based system comprised of managed Emergency Services IP networks (ESInets), functional elements (applications), and databases that replicate traditional E9-1-1 features and functions and provides additional capabilities. NG9-1-1 is designed to provide access to emergency services from all connected communications sources, and provide multimedia data capabilities for Public Safety Answering Points (PSAPs) and other emergency service organizations. http://c.ymcdn.com/sites/www.nena.org/resource/resmgr/ng9-1-1_project/whatisng911.pdf NOTE: It is recognized that there will be a multi-year transition to NG9-1-1 beginning as early as 2010. See the NENA list of FAQs related to NG9-1-1 for more details.</p>	
<p><i>PIDF-LO (Presence Information Data Format – Location Object)</i></p>	<p>Provides a flexible and versatile means to represent location information in a SIP header using an XML schema.</p>	
<p><i>PRF (Policy Routing Function)</i></p>	<p>That functional component of an Emergency Services Routing Proxy that determines the next hop in the SIP signaling path using the policy of the nominal next element determined by querying the ECRF with the location of the caller. A database function that analyzes and applies ESInet or PSAP state elements to route calls, based on policy information associated with the next-hop.</p>	
<p><i>PSAP (Public Safety Answering Point)</i></p>	<p>Public Safety Answering Point (PSAP): An entity responsible for receiving 9-1-1 calls and processing those calls according to a specific operational policy.</p>	
<p><i>PSR (Performance Statistics Report)</i></p>	<p>Reports are provided to conduct trend analysis to verify that NG9-1-1 components are operating as expected. Metrics to be reported include timeliness, accuracy and error volume. The information captured in the Performance Report may be delivered to the end user as individual documents or a</p>	<p>N</p>

	combined document reporting several sections of information.	
<i>QA/QC (Quality Assurance/Quality Control)</i>	A combination of quality assurance, the process or set of processes used to measure and assure the quality of a product; and quality control, the process of meeting products and services to public safety standards.	N
<i>Resolve</i>	The requested party will effect changes needed to bring the issue to a close.	N
<i>Respond</i>	The requested party will acknowledge that they will investigate the issue to determine the root cause and possible resolution	N
<i>SI (Spatial Interface)</i>	A standardized interface between the GIS and the functional elements that consume GIS data, such as the ECRF/LVF.	
<i>URI (Uniform Resource Identifier)</i>	A predictable formatting of text used to identify a resource on a network (usually the Internet) OR A string of characters that must follow prescribed syntaxes such as URL, URN... Note Version 1.1 of the XML namespaces recommendation uses IRIs (Internationalized Resource Identifiers) instead of URIs. However, because version 1.1 is not yet a full recommendation [February, 2003] and because the IRI RFC is not yet complete, this document continues to refer to URIs instead of IRIs.	
<i>XML (eXtensible Markup Language)</i>	An internet specification for web documents that enables tags to be used that provide functionality beyond that in Hyper Text Markup Language (HTML). Its reference is its ability to allow information of indeterminate length to be transmitted to a PSAP call taker or dispatcher versus the current restriction that requires information to fit the parameters of pre-defined fields.	

3 Discrepancy Reports

When working with databases, errors or discrepancies may occur. The Discrepancy Report (DR) function is meant to notify agencies and services when issues arise in the system. The discrepancy reporting audience is an individual or function that, when using the data, determines a problem has occurred. Where possible, note or identify potential duplicate errors or discrepancies before a discrepancy report is submitted. The following table outlines discrepancy reports that could occur within the system or process.

Discrepancy Report Listing
Location Information Server (LIS)
1. Communication Service Providers (CSP) provisioning records to LIS
2. LIS validating records against the Location Validation Function (LVF)
Spatial Interface (SI)
1. SI Operator to 9-1-1 Authority on provisioning Geographic Information Systems (GIS) data
Emergency Call Routing Function/ Location Validation Function/ (ECRF/LVF)
1. ECRF/LVF Operator to SI Operator on GIS data provisioning
2. ECRF/LVF Operator to Discrepancy Report (DR) Subscribers on GIS gaps and overlaps
Emergency Services Routing Proxy (ESRP)
1. Emergency Services Routing Proxy (ESRP) to 9-1-1 Authority(s) or owner of problem routing policy(s).
2. ESRP on Access and/or Originating Network Provider with default route
3. ESRP to a Border Control Function (BCF) Operator
Policy Routing Function (PRF)
1. PRF to owner of routing policies
Legacy Network Gateway (LNG)
1. LNG Operator to CSP
2. LNG Operator to provider of the PIDF-LO
3. LNG Operator to CSP on dropped call
Legacy Selective Router Gateway (LSRG)
1. LSRG Operator to CSP
2. LSRG Operator to provider of the PIDF-LO
3. LSRG Operator to CSP on dropped call
4. LSRG Operator to 9-1-1 Authority/Transfer Entity

5. LSRG Operator to 9-1-1 Authority on Non-MSAG valid location
Public Safety Answering Point (PSAP)
1. PSAP/Entity to 9-1-1 Authority on misroute to their PSAP/Entity
2. PSAP/9-1-1 Authority to the GIS Provider when issues found in the map display
3. PSAP/9-1-1 Authority to a LIS or CSP
4. PSAP to a BCF Owner
Forest Guide (FG)
1. Forest Guide Operator to Contributing ECRF Node Operator on provisioning coverage data
General
1. Entity to Entity due to authentication issues
2. Data User to Data Owner due to rights management
3. Failure to dereference a location from a LIS

Table 1

The criteria to measure the start and end of turnaround times will be further defined in the Data Management standards document.

The workgroup realized the Location Database (LDB) and LIS are two different functional elements but within this document the term LIS is used to describe LIS and LDB.

Discrepancies may be resolved or responded to. Some discrepancies will be responded to rather than resolved, due to special circumstances where an immediate resolution may not be feasible.

The following nomenclature is used in specifying requirements:

TOPIC XXXX-YYYY Where:

TOPIC denotes a functional area (e.g. GENERAL)

XXXX represents the top level (parent) Requirement

YYYY represents the secondary level requirement. Child elements clarify or expand a parent requirement (e.g. XXXX-0100 or XXXX-0101 etc.)

3.1 Minimum Content Requirements for Discrepancy Report

- Time Stamp of Discrepancy Submittal
- Discrepancy Report ID
- Discrepancy reporting agency domain name
- Discrepancy reporting agent user ID
- Discrepancy reporting agency contact info

- Service or Instance in which the discrepancy exists
- Additional notes/comments
- Discrepancy Service or Database specifics

Additional Info

- Query that generated the discrepancy
- Full response of the query that generated the discrepancy (Message ID, Result Code, etc.)
- What the reporting agency thinks is wrong
- What the reporting agency thinks is the correct response, if available

3.2 LIS

LIS-DR 0100-0000 Communication Service Providers (CSP) provisioning records to Location Information Server (LIS)

This applies to LIS location by value only. A discrepancy report is produced by the LIS when a record from a CSP is not accepted into the LIS database. When the CSP and LIS Operator are the same entity, the discrepancy report may be internal within the CSP system. Resolving an error will require an action to correct the issue and re-submission into the LIS.

LIS-DR 0100-0100 LIS shall report data information such as a format error using CSP-provided error description (excluding LVF errors)

LIS-DR 0100-0200 Turnaround time for LIS to produce the report shall be near real time

LIS-DR 0100-0300 Turnaround time for CSP to resolve Discrepancy Report shall be one business day

LIS-DR 0200-0000 LIS validating records against the LVF

The LIS Operator submits location record(s) to the LVF. The location records are validated against the LVF. If any discrepancies are identified in the location records, the resulting discrepancy report is returned to the LIS Operator.

LIS-DR 0200-0100 LIS shall report location data elements that are valid, invalid, or unchecked to a Communications Service Provider (CSP) and optionally to 9-1-1 Authority

LIS-DR 0200-0200 Turnaround time to produce a Discrepancy Report shall be less than 24 hours.

LIS-DR 0200-0300 Turnaround time to resolve a Discrepancy Report by the CSP shall be one business day or refer to the 9-1-1 Authority. The CSP should perform its due diligence prior to referring the DR to the 9-1-1 Authority.

LIS-DR 0200-0400 Turnaround time for 9-1-1 Authority to resolve Discrepancy Report shall be three business days.

3.3 SI

SI-DR 0100-0000 SI Operator to 9-1-1 Authority on provisioning GIS data

The 9-1-1 Authority may enable a SI to coalesce local GIS data into a regional or state database. The SI provisions the coalesced dataset to the Emergency Call Routing Function/Location Validation Function (ECRF/LVF) Operator based on SI functionality as stated in NENA STA-010 - Detailed Functional and Interface Standards for the NENA i3 Solution.

SI-DR 0100-0100 SI shall report to 9-1-1 Authority on GIS data quality control checks.

Some issues that could be reported back to the 9-1-1 Authority from the SI are:

- Invalid geometry
- Gap/overlap
- Duplicate attribute as defined by the SI system
- Mandatory field(s) missing or mismatched data types
- Address range issues on centerline
- General provisioning failure to SI or ECRF/LVF
- Malformed Uniform Resource Identifier (URI)

NOTE: It is expected that 9-1-1 Authorities will perform Quality Assurance/Quality Control (QA/QC) processes listed above prior to provisioning the data into the SI thus minimizing the errors and resolution timeframe for the provisioning process.

SI-DR 0100-0200 Turnaround time for SI to produce a Discrepancy Report shall be near real time.

SI-DR 0100-0300 Turnaround time for 9-1-1 Authority to resolve a Discrepancy Report shall be three business days.

3.4 ECRF/LVF

ECRF/LVF-DR 0100-0000 ECRF and LVF Operator to SI Operator on GIS data provisioning

ECRF/LVF-DR 0100-0100 ECRF and LVF Operator shall report general failures to SI Operator on failures when provisioning due to GIS data quality control checks.

Some issues that could be reported back to the 9-1-1 Authority from the SI are:

- Incorrect eXtensible Markup Language (XML) schema, or malformed XML in a Web Feature Service (WFS) transaction message
- Unexpected GIS layer or attributes
- Invalid or missing geometry for a feature
- Unauthorized provisioning source

ECRF/LVF-DR 0100-0200 Turnaround time for ECRF and LVF Operator to produce a Discrepancy Report to SI Operator shall be as near real time as possible without impacting the time it takes to route an incoming 911 call/request for service.

ECRF/LVF-DR 0100-0300 Turnaround time for SI Operator to resolve discrepancy shall be one business day

ECRF/LVF-DR 0200-0000 ECRF and LVF Operator to Discrepancy Report Subscribers on GIS Gaps and Overlaps

The GIS data is provisioned to the ECRF and LVF from a SI. As the ECRF and LVF Operator receive data from any SI, the QA/QC procedures are applied.

ECRF/LVF-DR 0200-0100 ECRF and LVF Operator shall publish GIS data quality error reports to a subscription-based service near real time. Discrepancy Report web service (DR Web Service) as defined in NENA STA-010- Detailed Functional and Interface Standards for the NENA i3 Solution.

ECRF/LVF-DR 0200-0200 DR Web Service shall notify DR subscribers (SI Operators and 9-1-1 Authorities) of GIS data quality issues near real time

ECRF/LVF-DR 0200-0300 Turnaround time for 9-1-1 Authority(s) to resolve GIS data quality error reports shall be three business days.

3.5 ESRP

ESRP-DR 0100-0000 Emergency Services Routing Proxy (ESRP) to 9-1-1 Authority(s) or owner of problem routing policy(s).

A route is created to a PSAP that the ESRP does not recognize or conflicts with one or more existing policies.

ESRP-DR 0100-0100 ESRP Operator shall report conflict in existing policies, missing or invalid data elements to 9-1-1 Authority(s) or owner of routing policy(s).

ESRP-DR 0100-0200 Turnaround time for ESRP Operator to produce the discrepancy report(s) shall be near real time.

ESRP-DR 0100-0300 Turnaround time for 9-1-1 Authority(s) or owner of routing policy(s) to resolve a discrepancy report shall be one business day.

ESRP-DR 0200-0000 ESRP on Access and/or Originating Network Provider with default route.

Any ingress conditions preventing the call from being routed to the appropriate PSAP. ESRP-DR 0200-0100 ESRP Operator shall report when a default route is engaged and why (if available) to authority having jurisdiction.

ESRP-DR 0200-0200 Turnaround time for ESRP to produce the report shall be near real time.

ESRP-DR 0200-0300 Turnaround time for Access and/or Originating Network Provider to respond to discrepancy report shall be one business day.

ESRP-DR 0300-0000 ESRP to a BCF Operator

The ESRP submits a DR on the BCF Operator for invalid, unusual, inconsistent, or improper incoming data.

Some issues that could be reported back to the BCF are:

- Invalid forwarding of an emergency call/session to an ESRP
- Reporting of unusual incoming IP packets that the ESRP determines should be blocked to protect the intended receiving user or network
- Quality of Service (QoS) inconsistencies to the PSAP
- Invalid or improper Call Detail Recording (The BCF also serves as the media session controller, which plays a part in delivery of multi-media content to the PSAP and the call detail recording function).
- Baudot tones (TTY) to real time text transcoding errors

ESRP-DR 0300-0100 ESRP shall report invalid, unusual, inconsistent or improper incoming data to the BCF.

ESRP-DR 0300-0200 Turnaround time for ESRP to produce the report shall be near real time.

ESRP-DR 0300-0300 Turnaround time for BCF Operator to resolve or refer discrepancy shall be one business day.

3.6 PRF

PRF-DR 0100-0000 PRF to owner of routing policies

The PRF may not be capable of routing a call due to routing rule formatting, conflicts, syntax, creation of a loop between PSAPs, etc. This is an integrity check as policies are defined on the Policy Store.

PRF-DR 0100-0100 Policy Routing Store Operator shall produce a report on the routing policy(s) that produce invalid routing conditions to 9-1-1 Authority(s)/Owner of routing policies

PRF-DR 0100-0200 Turnaround time for the Policy Routing Store Operator to produce the report shall be near real time.

PRF-DR 0100-0300 Turnaround time for 9-1-1 Authority(s)/ Owner of routing policies to resolve discrepancy report shall be near real time.

3.7 LNG

LNG-DR 0100-0000 LNG Operator to CSP

A call comes into the system with no ANI.

LNG-DR 0100-0100 LNG Operator shall produce a report on incoming call(s) with no ANI to the CSP.

LNG-DR 0100-0200 Turnaround time for the LNG Operator to produce the report shall be near real time.

LNG-DR 0100-0300 Turnaround time for CSP to respond to discrepancy report shall be near real time.

LNG-DR 0200-0000 LNG Operator to provider of PIDF-LO

Query went from LNG to the provider of the PIDF-LO and received a malformed response or no response.

LNG-DR 0200-0100 LNG Operator shall produce a report on instance(s) receiving a malformed response or no response.

LNG-DR 0200-0200 Turnaround time for the LNG Operator to produce the report shall be near real time.

LNG-DR 0200-0300 Turnaround time for provider of the PIDF-LO to respond to discrepancy report shall be one business day.

LNG-DR 0300-0000 LNG Operator to CSP on dropped call

Notification to CSP that a call was dropped or terminated without appropriate signaling.

LNG-DR 0300-0100 LNG Operator shall produce a report on instance(s) receiving malformed response or no response.

LNG-DR 0300-0200 Turnaround time for the LNG Operator to produce the report shall be near real time.

LNG-DR 0300-0300 Turnaround time for CSP to respond to discrepancy report shall be one business day.

3.8 LSRG

LSRG-DR 0100-0000 LNG Operator to CSP

A call comes into the system with no ANI

LSRG-DR 0100-0100 LSRG Operator shall produce a report on incoming call(s) with no ANI to the CSP.

LSRG-DR 0100-0200 Turnaround time for the LSRG Operator to produce the report shall be near real time.

LSRG-DR 0100-0300 Turnaround time for CSP to respond to discrepancy report shall be near real time.

LSRG -DR 0200-0000 LSRG Operator to provider of PIDF-LO

Query went from LSRG to the provider of the PIDF-LO and received a malformed response or no response.

LSRG-DR 0200-0100 LSRG Operator shall produce a report on instance(s) receiving a malformed response or no response.

LSRG-DR 0200-0200 Turnaround time for the LSRG Operator to produce the report shall be near real time.

LSRG-DR 0200-0300 Turnaround time for provider of the PIDF-LO to respond to discrepancy report shall be one business day.

LSRG -DR 0300-0000 LSRG Operator to CSP on dropped call
Notification to CSP that a call was dropped or terminated without appropriate signaling.

LSRG-DR 0300-0100 LSRG Operator shall produce a report on instance(s) receiving no or malformed response.

LSRG-DR 0300-0200 Turnaround time for the LSRG Operator to produce the report shall be near real time.

LSRG-DR 0300-0300 Turnaround time for CSP to respond to discrepancy report shall be one business day.

LSRG -DR 0400-0000 LSRG Operator to 9-1-1 Authority/Transfer Entity
LSRG creates a discrepancy report on a failed transfer. Notification of the transfer failure will be to the entity originating the transfer and the 9-1-1 Authority.

LSRG -DR 0400-0100 LSRG Operator shall produce a report on instance(s) of a failed transfer.

LSRG -DR 0400-0200 Turnaround time for the LSRG Operator to produce the report shall be near real time.

LSRG -DR 0400-0300 Turnaround time for 9-1-1 Authority to respond to the discrepancy report shall be one business day.

LSRG-DR 0500-0000 LSRG Operator to 9-1-1 Authority on Non-MSAG valid location

LSRG Operator queries the MCS (MSAG Conversion Service), and doesn't receive an MSAG valid response. The location may be LVF valid, but not MSAG valid. This applies to calls being transferred from an ESInet to a legacy network.

LSRG -DR 0500-0100 LSRG Operator shall produce a report on instance(s) of a failed location MCS validation to the 9-1-1 Authority

LSRG -DR 0500-0200 Turnaround time for the LSRG Operator to produce the report shall be near real time.

LSRG -DR 0500-0300 Turnaround time for 9-1-1 Authority to respond to the discrepancy report shall be one business day.

3.9 PSAP

PSAP-DR 0100-0000 PSAP/Entity to 9-1-1 Authority on misroute to their PSAP/Entity

PSAP/Entity receives a misrouted call and sends discrepancy report to 9-1-1 Authority for investigation and resolution.

1. Location information received with the call is incorrect. Refer to PSAP-DR 0300-0000.
2. Location information received with the call is correct (verified by call taker) and initial or transferred call routed to incorrect PSAP/Entity. The 9-1-1 Authority reviews the discrepancy report to determine cause and correction method. Possible causes for the misroute:
 - a. GIS-related (GIS data incorrect)
 - b. Policy control issue
 - c. ESRP issue

PSAP-DR 0100-0100 PSAP/Entity shall report when a misroute call is received to their 9-1-1 Authority.

PSAP-DR 0100-0200 Turnaround time for PSAP/Entity to produce the report shall be one business day.

PSAP-DR 0100-0300 Turnaround time for 9-1-1 Authority to resolve discrepancy report shall be one business day.

PSAP-DR 0200-0000 PSAP/9-1-1 Authority to the GIS Provider when issues found in the map display

Call taker views inaccuracies in the GIS data used in the PSAP's map display.

PSAP-DR 0200-0100 PSAP/9-1-1 Authority shall produce a discrepancy report through the local PSAP error reporting process to GIS Provider (local or outside source) when GIS discrepancies are observed.

PSAP-DR 0200-0200 Turnaround time for PSAP/9-1-1 Authority to produce the discrepancy report shall be one business day.

PSAP-DR 0200-0300 Turnaround time for GIS Provider (local or outside source) to resolve discrepancy report shall be as soon as practical depending on criticality, as determined by PSAP/911 Authority, of reported error (s).

PSAP-DR 0300-0000 PSAP/9-1-1 Authority to a LIS or CSP

Call taker determines civic location information provided with the call is inaccurate. Applies to calls that route and display registered location using a LVF valid civic address.*

*Does not apply to wireless, VOIP, or VPC call locations

PSAP-DR 0300-0100 PSAP/9-1-1 Authority shall report inaccurate civic location information delivered with a 9-1-1 call to the LIS or CSP.

PSAP-DR 0300-0200 Turnaround time for PSAP/9-1-1 Authority to produce report shall be two business days.

PSAP-DR 0300-0300 Turnaround time for LIS or CSP to resolve discrepancy shall be one business day.

PSAP-DR 0400-0000 PSAP to a BCF

The PSAP submits a DR on the BCF for invalid, unusual, inconsistent, or improper incoming data.

Some issues that could be reported back to the BCF are:

- Invalid forwarding of an emergency call/session to an ESRP
- Reporting of unusual incoming IP packets that the ESRP or PSAP determine should be blocked to protect the intended receiving user or network
- Quality of Service (QoS) inconsistencies to the PSAP
- Invalid or improper Call Detail Recording (The BCF also serves as the media session controller, which plays a part in delivery of multi-media content to the PSAP and the call detail recording function).
- Baudot tones (TTY) to real time text transcoding errors

PSAP-DR 0400-0100 PSAP shall report invalid, unusual, inconsistent or improper incoming data to the BCF.

PSAP-DR 0400-0200 Turnaround time for PSAP to produce the report shall be near real time.

PSAP-DR 0400-0300 Turnaround time for BCF to respond to discrepancy shall be one business day.

3.10 Forest Guide

FG-DR 0100-0000 Forest Guide Operator to Contributing ECRF Node Operator on provisioning coverage data

The Contributing ECRF Node Operator will need to replicate both geographic extent and civic representations of its coverage area to a national Forest Guide (FG). This data will be transmitted to the FG using the LoST-Sync protocol per IETF RFC 6739¹.

Some issues that could be reported back to the Contributing ECRF Node Operator from the FG are:

- Invalid geometry
- Gap/overlap
- Duplicate attribute

¹ See IETF RFC 6739, Section 4.2 and 5.2. <http://datatracker.ietf.org/doc/rfc6739/>

- Mandatory field(s) missing or mismatched data types
- General provisioning failure to FG
- Malformed URI
- Lost-Sync protocol errors² (badRequest, forbidden, internalError, serverTimeout, and notDeleted).

FG-DR 0100-0100 Forest Guide Operator (FGO) shall report discrepancies in GIS data from quality control checks to the contributing ECRF Node Operator.

FG-DR 0100-0200 Turnaround time for FGO to produce the report shall be near real time.

FG-DR 0100-0300 Turnaround time for contributing ECRF Node Operator providing the GIS data to resolve or refer to downstream contributing ECRF Node Operator shall be one business day.

FG-DR 0100-0400 Turnaround for resolution from referral shall be three business days.

3.11 General

GEN-DR 0100-0000 Entity to Entity due to authentication issues

Entity (such as an intelligent device) attempts to establish a communication link to another entity. Link fails due to possible out of date or invalid certification, no account or configuration error as some examples.

GEN-DR 0100-0100 Source entity shall report authentication failure to administrator of the destination entity.

GEN-DR 0100-0200 Turnaround time for source entity to produce the report shall be near real time.

GEN-DR 0100-0300 Turnaround time for Administrator of the destination entity to resolve issue or work with source entity for resolution shall be near real time but no longer than 24 hours

GEN-DR 0200-0000 Data User to Data Owner due to rights management

Example: PSAP requesting information such as building blueprint or contact information about a location, not available due to Rights Management.

Example: The network a device is connected to requests information to complete call routing. SIP header may contain a location object used for querying a data source for obtaining actual location information. The system does not allow device access to the location information.

GEN-DR 0200-0100 Data user shall report data access failure to administrator of data.

GEN-DR 0200-0200 Turnaround time for data user to produce the report shall be near real time.

GEN-DR 0200-0300 Turnaround time for Administrator of data to resolve issue or work with data user for resolution shall be near real time but no longer than 24 hours.

GEN-DR 0300-0000 Failure to dereference a location from a LIS

Similar to the No Record Found (NRF) situation in the legacy system

Points of dereference:

1. PSAP controller or call taker workstation may need to dereference a device location
2. ESRP
3. Legacy PSAP Gateway (LPG)

GEN-DR 0300-0100 ESInet functional element shall produce a report containing information related to the event to the CSP and 9-1-1 Authority

GEN-DR 0300-0200 Turnaround time for ESInet functional element to produce the report shall be two business days

GEN-DR 0300-0300 Turnaround time for CSP and 9-1-1 Authority to respond to a discrepancy report shall be one business day.

4 Performance Statistics Report (PSR)

Performance Statistics Report (PSR) Performance reporting is required to verify that NG9-1-1 components are operating as expected. Statistics to be reported include timeliness, accuracy and error volume. Reports are provided to conduct trend analysis. The information captured in the Performance Report Requirements may be delivered to the end user as individual documents or a combined document reporting several sections of information. The following table outlines performance reports that shall be produced within the system or process

Performance Statistic Report Listing
1. Location Information Service (LIS) Performance Statistics Report
2. Location Validation Function (LVF) Performance Statistics Report
3. Emergency Services Routing Proxy (ESRP) Performance Statistics Report
4. Emergency Call Routing Function (ECRF) Performance Statistics Report
5. Border Control Function (BCF) Performance Statistics Report

6. GIS Data Provisioning Performance Statistics Report
7. Discrepancy Report Statistics

Table 2

4.1 LIS

LIS-PSR 0100-0000 Performance Statistics Report

A statistical report summarizing the LIS transaction volume of successes and failures for provisioning and call processing.

The statistics in this report could be used for a variety of purposes including: overall operational management/oversight of the LIS performance, capacity monitoring/planning, troubleshooting data delivery issues, management of service level agreements, data quality assurance, service provider oversight/management, etc. Other uses are anticipated as use of the LIS becomes integral to data delivery.

LIS-PSR 0100-0100 LIS Operator shall produce a report containing transaction volume showing success and failure rate of provisioning and call processing functions for 9-1-1 Authority and other authorized entities

LIS-PSR 0100-0200 Minimum content for report should include

- Reporting party's contact information
- Reporting time period
- Validation Statistics for Provisioning
 - Total number of updates attempted
 - Total number of updates that pass validation
 - Total number of discrepancies
- Call Processing Statistics
 - Total number of queries
 - Total number of responses handled
- Summary of discrepancies by error description and Access Network Operator Statistics for location validation
 - Total number of individual record transactions attempted during reporting time period
 - Total number of successful individual record transactions
 - Total number of failed individual record transactions (e.g. no record found)

- Summary of failed individual record transactions by error description
- Total number of dereference attempts
- Total number of dereference failures by error description

LIS-PSR 0100-0300 Report available daily with an on-demand option for 9-1-1 Authority and other authorized entities

4.2 LVF

LVF-PSR 0100-0000 Performance Statistics Report

A statistical report summarizing the volume and accuracy of transactions occurring between the LIS and LVF. The report assists in defining the performance of the LVF. The statistics in this report could be used for a variety of purposes including: overall operational management/oversight of the LVF performance, management of service level agreements, data quality assurance, etc. Other uses are anticipated as use of the LVF becomes integral to data provisioning and call delivery.

LVF-PSR 0100-0100 LVF Operator shall produce a report containing volume and accuracy of LVF transactions between the LIS and location validation and routing databases for the 9-1-1 Authority and LIS Operator.

LVF-PSR 0100-0200 Minimum content of report should include:

- Reporting party's contact information
- Reporting time period
- Validation statistics: Statistic 1 is a quantity of LVF responses where all attributes are found to be valid. Statistic 2 is a quantity of LVF responses with at least one attribute to be found invalid. Specific attribute errors are identified in the Discrepancy Report section of this document
- Total number of transactions during reporting time period
- Average response times of LVF queries
- Percentage of response time within some interval (for example 90% of the time)

LVF-PSR 0100-0300 Report available daily with an on-demand option for 9-1-1 Authority and LIS Operator(s).

4.3 ESRP

ESRP-PSR 0100-0000 Performance Statistics Report

A statistical report summarizing the success and error type codes of the ESRP routing processes and ECRF queries.

ESRP-PSR 0100-0100 ESRP Operator shall produce a report for 9-1-1 Authority and Originating Network Provider

ESRP-PSR 0100-0200 Minimum content of report should include:

- Reporting party's contact information
- Reporting time period
- Performance statistics
 - Number of successes
 - Error type code, including default, alternate, and contingency routing
 - Volume of Discrepancies reported
 - Summary of Discrepancy types
 - Date of Discrepancy

ESRP-PSR0100-0300 Report available monthly at a minimum or as requested for 9-1-1 Authority and/or Originating Network Provider.

4.4 ECRF

ECRF-PSR 0100-0000 Performance Statistics Report

A statistical report summarizing the number of ECRF queries and query responses.

ECRF-PSR 0100-0100 ECRF Operator shall produce one or more reports to 9-1-1 Authority(s) or authorized entities.

ECRF-PSR 0100-0200 Minimum content of the report should include:

- Reporting party's contact information
- Reporting time period
- Performance statistics
 - Total number of queries received by ECRF
 - Total number of queries by type
 - <findService>
 - <getServiceBoundary>
 - <listServicesByLocation>
 - <listServices>
 - Total number of Warning and Error* messages received from ECRF
 - Number of each Warning and Error* messages returned for each query type
 - Breakdown of ECRF response times by query type for iterative queries
 - For response time oriented statistics: Average (mean)
 - % of transactions between 130-145% of the Average (approximately one standard deviation from average)
 - % of transactions greater than 145% of the Average (approximately two standard deviations from average)
 - Breakdown of ECRF response times by query type for recursive queries
 - For response time oriented statistics: Average (mean)
 - % of transactions between 130-145% of the Average (approximately one standard deviation from average)

- % of transactions greater than 145% of the Average (approximately two standard deviations from average)

* Warning and Error messages as defined in IETF RFC5222³.

ECRF-PSR 0100-0300 Report available monthly at a minimum or as requested for 9-1-1 Authority and/or authorized entities.

4.5 BCF

BCF-PSR 0100-0000 Performance Statistics Report

A statistical report summarizing the volume of ingress and egress traffic running through the BCF.

BCF-PSR 0100-0100 BCF Operator shall produce a report to the 9-1-1 Authority and/or other authorized entities.

BCF-PSR 0100-0200 Minimum content of the report should include:

- Reporting party's contact information
- Reporting time period
- Performance statistics
 - Volume of ingress and egress
 - Volume of blocked traffic by blockage issue
 - Volume of BadActorRequest received
 - Volume of BadActorRequest honored (policy applied to the sourceId)
 - Volume of CallSuspicion submitted per score

BCF-PSR 0100-0300 Report available monthly at a minimum or as requested for 9-1-1 Authority and/or authorized entities.

4.6 Provisioning Performance Report related to GIS Data

GIS-PSR 0100-000 Data Provisioning Performance Statistics Report

Any functional element receiving GIS data shall provide a statistical report of its GIS transactions.

GIS-PSR 0100-0100 Functional Element Operator (e.g. LVF, ECRF), receiving GIS data for provisioning, shall produce a report to the 9-1-1 Authority and/or authorized entity.

GIS-PSR 0100-0200 Minimum content of the report should include:

- Reporting party's contact information
- Reporting time period
- Number of GIS data transactions received
- Number of successful transactions
- Number of provisioning errors by type/code

³ See IETF RFC 5222, Section 13. <http://datatracker.ietf.org/doc/rfc5222/>

GIS-PSR 0100-0300 Report available monthly at a minimum and/or as requested for 9-1-1 Authority and/or authorized entities.

4.7 Discrepancy Report Statistics

DR-PSR 0100-0000 Performance Statistics Report

Any element that receives or produces a discrepancy report shall provide a summary report that captures quantity received, created, and resolution timeline. Breakdown of discrepancy reports resolved within or exceeding recommended timeframe as noted in Discrepancy Report documentation.

DR-PSR 0100-0100 Entity responsible for any element that produces or receives a discrepancy report shall produce a report to the 9-1-1 Authority and/or authorized entity.

DR-PSR 0100-0200 Minimum content of the report should include:

- Reporting party's contact information
- Reporting time period
- Performance statistics broken down by reports produced or received by entity
 - Discrepancy Report Produced
 - Quantity produced
 - Grouped by type of discrepancy report
 - Grouped by entity reported to
 - Discrepancy Report Received
 - Quantity of Discrepancy Reports resolved within recommended timeframe
 - Quantity of Discrepancy Reports resolved beyond recommended timeframe
 - Quantity of Discrepancy Reports unresolved
 - Grouped by type of discrepancy report

DR-PSR 0100-0300 Report available monthly at a minimum or as requested for 9-1-1 Authority and/or authorized entities

5 Recommended Reading and References

- [NENA-STA-010](#) (originally NENA 08-003) - Detailed Functional and Interface Standards for the NENA i3 Solution
- [NENA-INF-008](#) (originally 77-501) – Transition Plan Considerations Information Document
- NENA [02-011](#)-v7.1 NENA Data Standards for Local Exchange Carriers, ALI Service Providers & 9-1-1 Jurisdictions

6 Previous Acknowledgments

None – new document