

# **NENA Data Standards For Local Exchange Carriers, ALI Service Providers & 9-1-1 Jurisdictions**



NENA Data Standards for Local Exchange Carriers, ALI Service Providers & 9-1-1 Jurisdictions  
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National Emergency Number Association (NENA) Data Technical Committee

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**NENA  
TECHNICAL STANDARD DOCUMENT**

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NENA recognizes the following industry experts and their companies for their contributions in development of this document.

**Version 7, 09/17/2009**

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## 1. Executive Overview

### 1.1 Purpose and Scope of Document

This document sets forth NENA standards for all Service Providers (SPs) involved in providing dial tone to end users whether or not they are the 9-1-1 Database Management System Provider (DBMSP) or a SP in an Enhanced 9-1-1 area. It includes Database Maintenance, Quality measurements, INP, LNP and Number Pooling standards to be utilized for any 9-1-1 system that provides information for data display. It defines measurements that support meaningful computations to allow for a better understanding of database quality and timeliness of database updates.

This document defines the provisioning requirements for E9-1-1 data integrity, content, and call delivery regardless of Access Infrastructure Provider (formerly referred to as Dial Tone Provider). It is the goal of these standards to support current and future development consistent with the concept of “One Nation, One Number”. It is assumed that Federal, State or Local legislation will supersede these standards.

This document introduces the availability of NENA Database Administration software, which may be downloaded from the NENA web page at [www.nena.org](http://www.nena.org). There is no charge for this software which includes forms for MSAG Updates, E9-1-1 Inquires (ANI/ALI trouble resolution), and additional information. The software also allows the user to transmit the documents via various electronic methods. In addition this document defines standards for the data transmission of E9-1-1 updates by all SPs providing dial tone within the boundaries of an Enhanced 9-1-1 Jurisdiction. Utilization of these standards will provide for timely activation of emergency service databases and help to minimize costs incurred by providing accurate and consistent provisioning of ALI data. Throughout the creation of these standards, the goal was to set standards that would allow the shortest amount of time a record shall remain in an error condition. All entities must be aware of any time zone differences when discussing time frames such as one (1) business day.

### 1.2 Reason to Implement

How: Use of the standards will provide the basis for agreements between the 9-1-1 Jurisdictions, SPs and the 9-1-1 DBMSP.

When: Should be used at the time that arrangements are being made between the 9-1-1 Jurisdictions, SPs and the 9-1-1 DBMSP.

### **1.3 Reason to Implement**

Industry adoption of these standards will:

- Ensure timely and accurate ALI updates
- Ensure the consistent provision of ALI data
- Improve the overall quality of the databases
- Facilitate official standards/guidelines for database management
- Assist counties, vendors, Local Exchange Carriers and ALI SPs with establishment of quality goals and creation of a common set of quality measurements for 9-1-1 systems
- Ensure reliable 9-1-1 call delivery
- Improve communications and remove barriers across entities
- Standardize database maintenance processes
- Standardize database maintenance error codes/messages
- Standardize database maintenance forms
- Assist Local Exchange Carriers towards compliance with FCC order: CC Docket 95-116, complying with Local Number Portability.
- Assist Voice over Internet Protocol (VoIP) Providers towards compliance with FCC orders and federal/state regulations.

## **2 Introduction**

### **2.1 Operational Impacts Summary**

This document is written for DBMSPs, Access Infrastructure Providers (LECs, CLECs, Wireless Carriers, VoIP Providers, PS-911 customers, and any other future entity who may be required to provide address records for inclusion in an Enhanced 9-1-1 System), and Jurisdictions. It details standards for reporting and resolving ANI/ALI and NRF errors.

### **2.2 Security Impacts Summary**

Security is handled by the appropriate 9-1-1 Data Base Management System Provider and the appropriate 9-1-1 data providers as deemed by their internal IT security procedures and processes.

### **2.3 Document Terminology**

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

### **2.4 Reason for Issue/Reissue**

This standards document is met to convey 9-1-1 database industry standards for all 9-1-1 DBMSPs, SPs and 9-1-1 jurisdictional entities to assist in ensuring the accuracy and integrity of the 9-1-1 database. NENA reserves the right to modify this document. Upon revision, the reason(s) will be provided in the table below.

Version	Date	Reason For Changes
Original		Initial Document
2	March 2001	Addition of three (3) new Sections: <ul style="list-style-type: none"> <li>• Section 7 Government Entities Responsibilities</li> <li>• Section 19 Audits/Reconciliations</li> <li>• Section 24 Standards for Provision of 24 x 7 Telephone Company Contact Numbers to PSAP ALI screen</li> </ul>
3	March 2002	Revisions made to: <ul style="list-style-type: none"> <li>• Section 22 Standards for Local Number Portability to include General LNP Standards, Resolution of Failed Migrates, Resolution of Stranded Unlock Records, Wireline/Wireless Porting</li> </ul> The following Standard and associated Exhibits are new: <ul style="list-style-type: none"> <li>• Section 25 SP Going Out-Of-Business</li> <li>• Exhibit F Resolution of Failed Migrate Records</li> <li>• Exhibit G Resolution of Migrate Received - DBMS Record Does Not Exist</li> <li>• Exhibit H Resolution of Insert Received - DBMS Record Exists (Different CO ID)</li> <li>• Exhibit I Resolution of Stranded Unlock Records (Action)</li> </ul>
4	July 2002	Addition of three (3) new Sections: <ul style="list-style-type: none"> <li>• Section 12 Standard Error Codes</li> <li>• Section 18 Data Quality Measurements</li> </ul>
5	March 2004	Numerous modifications made and four (4) new Sections are being added: <ul style="list-style-type: none"> <li>• Section 26 Global Changes to NENA ID</li> <li>• Section 27 Unbundled Network Elements Platform (UNE-P)</li> <li>• Section 28 Determining Ownership of a Telephone Number</li> <li>• Section 29 Wireless No Record Found Reporting Process</li> </ul> New process flow charts have also been added to the

		Exhibits.
6	November 21, 2006	<p>Changed Dial Tone Provider to Access Infrastructure Provider</p> <ul style="list-style-type: none"> <li>•</li> <li>• Section 2.27 FX/DPA/OPX Standard</li> <li>• Section 2.28 VoIP Shell Record</li> <li>• Section 4.15 Jurisdictions access to DBMS</li> <li>• Section 5.2 NENA ID Responsibilities</li> <li>• Section 5.10 When an ALI record is required</li> <li>• Section 6.9 Fictitious Addresses</li> <li>• Section 7.1.6 PSAP Manager’s List of NENA Company IDs</li> <li>• Section 22 General LNP standards               <ul style="list-style-type: none"> <li>- The Unlock function code expires after 90 days, at which time the Unlocked TN record in the DBMS and ALI databases will be removed.</li> <li>- NPAC/LERG validation</li> <li>- Statistical reports identifying by NENA ID stranded unlocks more than 30 days old sent to the 911 database stakeholder</li> <li>- NPDI Standards modified to include VoIP</li> <li>- VoIP Testing Scenarios</li> </ul> </li> <li>• Exhibit F - J Flow charts revised</li> </ul>
7	September 17, 2009	<ul style="list-style-type: none"> <li>• Updated 1.3 to include VoIP service providers</li> <li>• Updated 2.13 to reflect updated template verbiage</li> <li>• Clarification of pilot/subline processing and what records are to be included in the ALI database (Sections 3.19 and 3.30)</li> <li>• Added 3.31 to agree with NENA 02-010 with regard to required formatting of “Customer Name” field</li> <li>• Clarification on use of USPS Publication 28 (Sections 5.16, 5.30, 6.5, 7.7)</li> <li>• Added referral to NENA 02-015 (Sections 7.3.3, 7.4)</li> <li>• Move Sections 10 and 28 to NENA 02-015, NENA Standards for Reporting ANI/ALI Discrepancies and No Records Found for Wireline, Wireless and VoIP</li> </ul>

		<p>Technologies. Related exhibits moved too.</p> <ul style="list-style-type: none"> <li>• Further definition of unlock/migrate (U/M) function of change codes (Section 21A.7). Exhibits removed.</li> <li>• Updated Section 21A.16 with second paragraph</li> <li>• Processing of expired unlock records (Section 21C.1)</li> <li>• Updated Section 27 with new links and instructions</li> <li>• Added additional references (Section 99)</li> </ul>
7.1	May 12, 2012	Correct link to Canadian postal addressing guidelines.

## 2.5 Recommendation for Additional Development Work

No additional standards development is needed.

## 2.6 Date Compliance

All systems that are associated with the 9-1-1 process shall be designed and engineered to ensure that no detrimental, or other noticeable impact of any kind, will occur as a result of a date/time change up to 30 years subsequent to the manufacture of the system. This shall include embedded application, computer based or any other type application. To ensure true compliance the manufacturer shall upon request provide verifiable test results to an industry acceptable test plan such as Telcordia GR-2945 or equivalent.

## 2.7 Anticipated Timeline

Deployment or implementation will take place as required.

## 2.8 Costs Factors

Some database management system and/or service order extract modifications may be required.

## 2.9 Future Path Plan Criteria for Technical Evaluation

In present and future applications of all technologies used for 9-1-1 call and data delivery, it is a requirement to maintain the same level or improve on the reliability and service characteristics inherent in present 9-1-1 system design.

New methods or solutions for current and future service needs and options should meet the criteria below. This inherently requires knowledge of current 9-1-1 system design factors and concepts, in order to evaluate new proposed methods or solutions against the Path Plan criteria.

Criteria to meet the Definition/Requirement:

1. Reliability/dependability as governed by NENA's technical standards and other generally accepted base characteristics of E9-1-1 service
2. Service parity for all potential 9-1-1 callers

3. Least complicated system design that results in fewest components to achieve needs (simplicity, maintainable)
4. Maximum probabilities for call and data delivery with least cost approach
5. Documented procedures, practices, and processes to ensure adequate implementation and ongoing maintenance for 9-1-1 systems

This basic technical policy is a guideline to focus technical development work on maintaining fundamental characteristics of E9-1-1 service by anyone providing equipment, software, or services.

## **2.10 Cost Recovery Considerations**

Normal business practices shall be assumed to be the cost recovery mechanism.

## **2.11 Additional Impacts (non cost related)**

Certain of the information or requirements contained in this NENA document are known to have monetary and procedural impacts, and others are not expected to have any impacts. At the date of publication of this document, some development work had begun by 9-1-1 service providers. Modifications may be required to DBMS software and internal procedures.

## **2.12 Intellectual Property Rights Policy**

### **General Policy Statement**

NENA takes no position regarding the validity or scope of any Intellectual Property Rights or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; nor does it represent that it has made any independent effort to identify any such rights.

NENA invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights that may cover technology that may be required to implement this standard.

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### **2.13 Acronyms/Abbreviations/Definitions**

See NENA 00-001 - NENA Master Glossary of 9-1-1 Terminology located on the NENA web site for a complete listing of terms used in NENA documents.

## **3 General Data Standards**

- 3.1 9-1-1 data for Local Exchange Carriers (LECs) must be integrated into existing Automatic Location Identification / Selective Routing (ALI/SR) systems.
- 3.2 NENA-02-010, NENA Formats and Protocols for Data Exchange, must be met for data exchange, format, content, and transmission protocol.
- 3.3 All telephone number records must be Master Street Address Guide (MSAG) valid and meet all components of the Measurements for Data Quality.
- 3.4 New services and features must not degrade the existing quality of the E9-1-1 System.
- 3.5 The LEC is responsible for directing 9-1-1 traffic from each of its end offices to the appropriate 9-1-1 selective router or PSAP as negotiated with the 9-1-1 SP.
- 3.6 All LECs are responsible for network management of their network components in compliance with the Network Reliability Council Recommendations.
- 3.7 All LECs must meet the network standard of the E9-1-1 SP for 9-1-1 call delivery.
- 3.8 The LEC's numbering plan follows the North American numbering standard.
- 3.9 Date Changes submitted by the LEC must be processed by the ALI SP's system following the Data Quality Measurements. "Processed" includes being capable of selective routing and PSAP display.
- 3.10 Any changes made to an MSAG i.e., ESN, Street, or Community name change, must be applied to all affected telephone number records within the ALI database.
- 3.11 When existing MSAGs are used to validate LEC telephone number records, the ALI SP shall negotiate the provision of a listing of valid street address information to the LEC.
- 3.12 Addresses not recognized by the local addressing authority must be negotiated between the LEC and the addressing authority for MSAG inclusion.
- 3.13 The NENA ID fields in the NENA-02-010, NENA Formats for Data Exchange, shall be used to identify the Access Infrastructure Provider and the Data Provider. Data in these fields shall be stored in the ALI database and be available for display at the PSAP. Display of this data

shall be controlled by each 9-1-1 district with consideration given to the capability of the PSAP equipment to display the data.

- 3.14 All SPs providing dial tone or ALI record source information providers must have a NENA registered Access Infrastructure Provider NENA ID or Data Provider NENA ID. DBMSPs must maintain a table containing all NENA IDs and all incoming records shall be validated to ensure that a valid Access Infrastructure Provider NENA ID and/or Data Provider NENA ID NENA are contained on each incoming record before any service order processing begins into the DBMS. Records without a registered ID shall be returned to the originator with an error code.
- 3.15 LEC data must be transferred to the ALI SP electronically, following the NENA-02-010, NENA Protocols for Data Exchange, with attention paid to network security to ensure data reliability.
- 3.16 It is the responsibility of the LEC to notify the ALI SP of new or additional NPA NXX assignments prior to the establishment of 9-1-1 data exchange.
- 3.17 It is preferable that the ALI SP in the area affected by an NPA split lead and coordinate the 9-1-1 conversion effort. The capability of the ALI SP shall dictate the method for converting the ALI database, which may require reloads of telephone number data and/or ALI database conversion. All LECs in the affected area must participate in the planning process to provide lists of their prefixes and agree upon dates for the conversion of their databases and subsequent update requests. The ALI SP shall notify the PSAPs as well as coordinate required changes within the E9-1-1 tandem switches.
- 3.18 It is required that all LECs allow caller information to be retrieved based upon the ANI generated by the switch as well as the ported number. This will depend upon the capabilities of the ALI SP's software and database where reverse lookups are permitted by regulatory entities.
- 3.19 When telephone number (TN) records are entered into the 911 database, each TN that can be presented as ANI to 911, (including ELIN, CPN, BTN) shall be entered as a separate TN record. The main telephone number (AKA pilot, billing TN) shall be included on the 9-1-1 record when applicable. Pilot to subline (AKA toll guide) relationship shall not be used in daily DBMS service order processing (aka Pilot Processing). Where legacy service order systems require, a DBMSP may allow pilot processing on a grandfathered basis.
- 3.20 9-1-1 data included for exchange or storage for ALI retrieval shall not include telephone numbers for non-generating dial tone classes of service.
- 3.21 The LEC responsible for establishing telephone service and billing records for the end user is also responsible for providing the ALI data to the ALI SP. Various methods may be

employed to update the ALI database and depend upon agreements between LECs and ALI DBMSPs, with attention paid to state legislative requirements.

- 3.22 Periodic reconciliation of the 9-1-1 database with the originator's database is required as specified in the Data Quality Measurements.
- 3.23 Confirmation of data transactions from the LEC to the ALI SP must be made available to the LEC. The confirmation must include the information from the populated fields of each specific transaction, the error code(s) if update was not successful, and statistical data of the total number of records received, processed, accepted and rejected.
- 3.24 The ALI SP may provide database extracts containing LEC telephone number data to PSAPs for inclusion in on-premise ALI databases.
- 3.25 The ALI SP shall restrict the usage of LEC data to emergency purposes as mandated by legislation. SP data shall not be provided to other entities without the written permission of that SP, unless legislation permits.
- 3.26 DBMSPs shall return errors to the Access Infrastructure Provider and/or the jurisdiction for resolution. For instructions on how to work these errors, refer to the DBMSPs web page or ask your contact for written documentation on how to interpret the errors. Errors are commonly referred to in three ways:
- Informational Error: This is an error that did not post and is waiting to reprocess for a specified period of time such as a "Failed migrate Retry."
  - Soft Error: This is an error that did post, but there is some minor discrepancy that needs to be investigated such as "SR/ESN Combo is Invalid" or "Loccom Flag is Set."
  - Hard Error: These are errors that did not post to ALI. SPs will see all errors with their Access Infrastructure Provider /Data Provider NENA ID, whichever is responsible for error correction. Addressing errors will be referred by the SP to the jurisdiction for resolution.
- 3.27 It is preferred that all of the 9-1-1 documentation listed below be transmitted electronically and retained for a minimum of three years unless state statute indicates otherwise.
- Addressing Authority Request to 9-1-1 Database Coordinator
  - MSAG Update Request (Paper or Electronic)
  - 911 Inquiry/ALI Discrepancy/NRF (Paper or Electronic)
  - Address Correction Request
  - Daily Error Corrections from Jurisdiction

- Service Order Input Files
- DBMS TN Record
- DBMS MSAG Record
- DBMS MSAGMail / 911NET / INFO911 Record

### 3.28 FX/DPA/OPX

- A. If the FX Service originates and terminates in the same county, the E911 ALI record is the standard record currently used in that county. MSAG validation of a standard address will occur.
- B. If the FX Service originates in one county, terminates in a different county, and is within the same router/tandem, The E911 ALI record is the standard record currently used for the terminating county. MSAG validation of the standard address for the terminating county will occur.
- C. If the FX Service originates and terminates in different counties and these counties are in different routers/tandems the following MSAG valid record shall be built:
- i) The house Number field will be “0”
  - ii) The Pre Directional will be blank
  - iii) The Street Name field will contain “FOREIGN EXCHANGE”
  - iv) The street suffix field will be blank
  - v) The post directional field will be blank
  - vi) The community name field will contain either “FX-SERVICE Jurisdiction Name of the PSAP or default PSAP serving the exchange.” NOTE: Some jurisdictions preface the PSAP name with “FX-SERVICE” and some do not.
  - vii) The ESN field as determined by the county. All FX Service is normally sent to a single location.
  - viii) The Location field should contain as much of the service address as the field will allow. This can currently be 10, 20, or 60 characters depending on the PSAP equipment. This includes all of the above modified fields.

This type of FX Service requires that 9-1-1 calls be answered by a live person, unless there is legislation that permits this type of FX service be answered by a recording.

- D. Current NENA standards for Type of Service , 1 FX in 911 serving area, 2 FX outside 911 serving area, 4 Non Published FX in 911 serving area, and 5 Non Published FX outside 911 serving area will apply to the records.
- E. Make address available with XML and use the ARA (also rings at) field.

F. The address(s) in the ARA field need(s) to contain the same address elements as the address of the main telephone number.

G. There is no limit to the number of ARA fields with XML.

H. ARA field does not need to be MSAG valid.

### 3.29 VoIP Shell Record

The recommendation for an MSAG VoIP Shell Record is:

HSE # field = **Blank to Blank** or **1 Low to 1 High**

(For areas that may have two ESNs for a community, the house number field would reflect 2 Low to 2 High for the second ESN.)

Street Name = **VOIP - PSAP NAME – SR CLLI**

(Adding the 4 character abbreviation of the SR CLLI is optional.)

Community Name = **Community Name**

ESN = **ESN**

The VoIP Shell Record will be established to allow a VPC provider to start populating their ESQK records into the 9-1-1 database. The MSAG Coordinator/Jurisdiction will follow existing normal MSAG update procedures located in NENA 02-011, Sections 7 and 10.

ESN changes will be made via the existing processes that are in place for MSAG changes located in NENA 02-011, Sections 7 and 10.

If the dynamic VoIP record is not sent to the PSAP during a 9-1-1 call, the shell record will be sent with the ESQK. This may indicate a possible problem with the dynamic V-E2 interface. This may/could indicate a problem at the VPC and/or the circuits between the VPC and ALI DB.

3.30 Any type of service that can dial 9-1-1 and present ANI must have a record in the traditional ALI database or be provided dynamically during 9-1-1 call processing.

Note: This does not authorize the Access Infrastructure Provider (end user's SP) to upload individual ALI records to the 9-1-1 DBMS for each TN of an entire range of DID numbers. In all cases, the appropriate applicable standards and practices pertaining to creating and maintaining PS-ALI/PS911 database records shall be followed.

- 3.31 Required format for an individual Customer Name (not business) is LASTNAME, FIRSTNAME and, optionally, a suffix which may be generation (Jr, III) and/or title (Phd, Esq, MD). Honorifics (Mr., Mrs, Ms.) should not be included as part of the name.
4. **Electronic Maintenance Document** (Exhibit D)
- 4.1 It is desirable that the NENA 9-1-1 Database Administration Forms software be used to replace existing 9-1-1 manual maintenance forms. This optional software includes forms for MSAG Updates, E9-1-1 ANI/ALI Trouble Resolution Inquiries, and additional information.  
*NOTE: It is not the intent of NENA to preempt any existing electronic communication that may exist today from your current Database Provider.*
- 4.2 9-1-1 DBMSPs, SPs and Jurisdictions may use the NENA 9-1-1 Database Administration Forms as a standard method for communicating ANI/ALI discrepancies, MSAG changes, and additional information.
- 4.3 These Electronic forms provide a consistent means to exchange 9-1-1 data between 9-1-1 DBMSPs, SPs, and Jurisdictions for the purpose of maintaining accurate customer records and MSAG entries.
- 4.4 These Electronic forms are a WINDOWS based application (Versions 3.1, 3.11, Win95', 2000, XP, or NT are supported). The user screen resembles 3 file tabs. The first 'tab' is a form to enter ANI/ALI Trouble Reports, the second 'tab' is a form to enter MSAG related data and the 3rd 'tab' is a blank page for entering additional information in free form text.
- 4.5 These forms can be saved in a file with the extension ".daf" (encrypted data file) or ".txt" (text file). This file may be encrypted for confidential transmission via Internet, modem or floppy disk.
- 4.6 The encrypted file may only be viewed using the NENA 9-1-1 Database Administration Forms software. If a hard copy is required, the records may be printed for filing and/or faxing.
- 4.7 Each record within a file has a system assigned control number and is date/time stamped to assist in tracking the progress of each record.
- 4.8 Each file produced by the software application may contain up to 50 sets of ANI/ALI Trouble Reports and/or MSAG records and/or Additional Information. Attached to each record are the name, address and contact information of the person originating the form and the last referral contact information.
- 4.9 The NENA 9-1-1 Database Administration Form may be obtained free of charge by accessing the NENA home page on the Internet ([www.nena.org](http://www.nena.org)) or may be ordered from NENA at a nominal processing charge.

- 4.10 The same considerations are to be given to electronic files as with current paper records; i.e.; retention, security, backups, archiving.
- 5. 9-1-1 Data Base Management System Provider Responsibilities (Exhibit A)**
- 5.1 All SPs providing dial tone or ALI record source information providers must have a NENA registered Access Infrastructure Provider NENA ID or Data Provider NENA ID. DBMSPs must maintain a table containing all NENA IDs and all incoming records shall be validated to ensure that a valid Access Infrastructure Provider NENA ID and/or Data Provider NENA ID NENA are contained on each incoming record before any service order processing begins into the DBMS. Records without a registered ID shall be returned to the originator with an error code.
- 5.2 9-1-1 DBMSPs must process each SP's update file(s) and provide positive electronic confirmation of the processing of 9-1-1 DBMS updates to all SPs within one (1) business day of receipt of the file from the SP. The confirmation shall include the entire TN record processed, date and time processed, number of records processed, number of records that erred, and the actual error records. This can be accomplished with any NENA data exchange format. As a long-term solution, SPs want confirmation of not only DBMS updates, but also confirmation of ALI and selective router updates being processed.
- 5.3 9-1-1 DBMSPs must not correct a SP's error records without that SPs written authorization.
- 5.4 9-1-1 DBMSPs must work Function of Change (FOC) errors with written authorization and return the remaining errors to the appropriate SP in an electronic format. FOC errors are:
- Record Already Exists, Insert Not Allowed
  - Record Does Not Exist for a Change
  - Record Does Not Exist for a Delete
  - Customer Code Does Not Match
  - Unlock Attempted on a Non-existent TN
  - Migrate Attempted on a Non-existent TN
- 5.5 9-1-1 DBMSPs shall be responsible for loading ALI systems. SPs shall not update ALI systems directly.
- 5.6 Where not restricted by law, it is desirable that 9-1-1 DBMSPs provide reverse ALI lookup capabilities during an emergency situation (see Section 17). Some types of service (multi-party lines, DID lines) do not generate ANI, which in turn will not request an ALI lookup. Manual query capability by the Jurisdiction may assist with dispatching emergency services.
- 5.7 When a telephone subscriber disconnects their telephone service, the number must be deleted from the 9-1-1 ALI and DBMS except when the telephone number is a soft dial tone number

- 5.8 DBMSPs shall provide restricted clerical access by NENA ID to all SPs. This will allow the SPs access to their TN and error records. Additionally, MSAG view only shall be allowed. It is desirable for SPs to correct errors and manage their TNs in the DBMS. This process does not circumvent the routine service order update process.
- 5.9 In order to maintain database accuracy and update timeliness, 9-1-1 DBMSPs must forward copies of all MSAG Update Requests, ANI/ALI Trouble Reports, Daily Error Files, No Record Found (NRF) reports within one (1) business day of receipt to all SPs. Additionally, all documents must be logged with date/time stamp.
- 5.10 The DBMSP shall first investigate the NRF to determine if the number is in the database. If the TN was in the DBMS at the time of the call, the DBMSP will investigate the reason that ALI was not displayed and report findings to the Jurisdiction.
- If the wireline number is not in the DBMS, the DBMSP will determine ownership of the telephone number and forward the NRF report to the SP within one business day of receipt from the jurisdiction.
- 5.11 All dial tone and data provider TN records must contain a unique NENA ID that is officially registered with NENA.
- 5.12 It is preferred that only MSAG valid records be updated to the ALI database. NRF conditions shall occur rather than the posting of non-MSAG valid data to the ALI database.
- 5.13 The DBMSP is required to treat all SPs records with parity according to FCC guidelines.
- 5.14 If the wireless callback number is delivered as ANI, the ALI query owner/routing provider needs to be able to distinguish whether the call is from a wireline or wireless phone, and shall indicate that in the class of service field on the display. If the pANI is sent as ANI, the display is not an issue, since only the information for the pANI will display.
- 5.15 The 9-1-1 jurisdiction's Database Coordinator shall have limited access to information contained in the 9-1-1 DBMS that is maintained by their Database Management System Provider. The 9-1-1 jurisdiction's Database Coordinator shall be able to obtain a user id and password to access the interface. This will provide the ability to view and/or print their TN and MSAG records as permitted by state or federal law. This interface shall be used solely for the purposes of DBMS/ALI database maintenance and quality control.
- 5.16 Entities implementing a 9-1-1 Data Base Management System, to include replacement of or major upgrades to legacy systems, shall consider implementation of a DBMS that best supports compliance with United States Post Office Publication 28, Appendix C1 (street suffix) and C2 (secondary units)/Canadian Addressing Guide.

- 5.17 All SPs providing dial tone or ALI record source information providers must have a NENA registered Access Infrastructure Provider NENA ID or Data Provider NENA ID. DBMSPs must maintain a table containing all NENA IDs and all incoming records shall be validated to ensure that a valid Access Infrastructure Provider NENA ID and/or Data Provider NENA ID NENA are contained on each incoming record before any service order processing begins into the DBMS. Records without a registered ID shall be returned to the originator with an error code.
- 5.18 It is the responsibility of the Company requesting a NENA Company ID to ensure the information is always accurate. Any changes must be submitted by using the Company Identifier Data Base Input Form and selecting “Update to Existing CID.” The Administrative Contact Person should verify their information on the NENA web page at least quarterly to ensure all data is accurate.
- 5.19 It is preferable that all SPs MSAG validate 9-1-1 daily updates.
- 5.20 If a SP is pre-scrubbing their records, they must work closely with the 9-1-1 DBMSP and the Jurisdiction in order to maintain a mirror image of the 9-1-1 DBMSP’s MSAG.
- 5.21 If a SP uses an abbreviation or a postal community name field in their service order system and this is the same data which is being provided to 9-1-1, it is the SPs responsibility to correct the spelling of the MSAG community name before sending the record to the 9-1-1 DBMSP. If SPs do not transmit MSAG valid data to DBMSPs, records will error and as such must be transmitted back to the SP for correction. This will cause a delay in updating the ALI database.
- 5.22 Exchange name validation is no longer valid with SP Local Number Portability; therefore, all records must be supplied with a valid MSAG community name. Valid MSAG community name (used to validate daily updates) is defined as the community name the Jurisdiction wants to see displayed for the purpose of dispatching emergency services. . NENA Versions 3, 4, and XML have two community name fields: MSAG community name and Postal community name.
- 5.23 If a SP is reselling services for another SP, the NENA ID on the record must be the ID of the Access Infrastructure Provider, not the billing company. If a Jurisdiction encounters any problems with dispatching, they shall require the 24-hour trouble number for the Access Infrastructure Provider.

Note: NENA V2.1, 3 and 4 (XML) allow for two NENA ID’s: Access Infrastructure Provider NENA ID and Data Provider NENA ID.

- 5.24 All SP's TN records must contain at a minimum a unique Access Infrastructure Provider NENA ID. The NENA ID must also be included on any TN listings or white page listings that may be sent to a Jurisdiction for their use with readdressing.
- 5.25 Each SP is responsible for ensuring their customer records are transmitted to the appropriate Database Management and/or Selective Routing System Provider within one (1) business day of when the service change occurs. This may entail sending the same updates to multiple providers if one company is providing selective routing and another company is providing ALI lookup.
- 5.26 Soft Dial Tone is a service provided at a wireline subscriber's location that has been disconnected and the SP chooses to leave the facilities in place to the location allowing service to be provisioned quickly for a new subscriber at that same location. This service provides dial tone with calling ability limited to the SP's business office and/or 9-1-1. When 9-1-1 is dialed from this type of soft dial tone service, the PSAP may not have the ability to call the subscriber back if the service does not allow incoming calls.

It is desirable that if a SP provides soft dial tone, an ALI record also be provided until a "live" customer assumes the service. If call back is unavailable, this must also be indicated in the ALI response message. It is further preferable that in the XML field, Special Attention Indicator (SAI), a value of "3" shall indicate soft dial tone, callback available; and a value of "4" shall indicate soft dial tone, callback NOT available. The customer name field shall not reflect the previous customer name when the customer has disconnected service. A suggested example is shown below:

Example of Soft Dial Tone ALI record: SOFT DIAL TONE -- NO CALLBACK

It is desirable that if a wireline SP supports suspended services including but not limited to vacation service and temporary denial for non-payment, the ALI record not be removed from the 9-1-1 database unless the subscriber's account is permanently disconnected. At that time, the dial tone provider may choose to place soft dial tone at the location. If that occurs, Section 5.8, SP Responsibilities, standards apply. When 9-1-1 is dialed from a line with any type of suspended services, the PSAP may not have the ability to call the subscriber back if the service does not allow incoming calls. Should this occur, a live or recorded intercept message may be heard. As the ALI record has not been removed, the existing customer information must be provided to the PSAP.

Any type of service that can dial 9-1-1 must have a record in the traditional ALI database or be provided dynamically during 9-1-1 call processing.

- 5.27 Carriers who supply Type 1 interconnection telephone numbers to wireless carriers shall ensure that those TNs are **NOT** included in the 911 DBMS.

- 5.28 Wireline NRF reports must be investigated and resolved within one business day of receipt. The investigation results (e.g. record entered in DBMS, line disconnected) must be communicated to the Jurisdiction and/or the DBMSP (verify process with DBMSP).
- 5.29 Wireless NRF reports shall be investigated by the SP as soon as possible and results of the investigation returned to the Jurisdiction within 5 business days of receipt.
- 5.30 Entities implementing dial tone or ALI record source information services, to include replacement of or major upgrades to legacy systems, shall consider implementation of a records information system that best supports compliance with United States Post Office Publication 28, Appendix C1 (street suffix) and C2 (secondary unit)/Canadian Addressing Guide
6. **NEW ENHANCED 9-1-1 CONVERSION STANDARDS** (Exhibits A, B and C)
- 6.1 At the time the 9-1-1 DBMSP enters into an E9-1-1 Contract or signs a Letter of Agreement with a Jurisdiction, the 9-1-1 DBMSP is responsible for notifying all SPs within that Jurisdiction's boundaries of the conversion to a new Enhanced 9-1-1 system. SPs include PS911 and wireless SPs. This will allow all Access Infrastructure Providers sufficient time to negotiate the appropriate contracts/agreements required for MSAG development and to prepare their customer records for E9-1-1. The 9-1-1 DBMSP and all SPs must jointly agree upon all customer timelines and commitments. 9-1-1 DBMSPs may not make commitments for SPs.
- 6.2 Within 30 days of Contract or Letter of Agreement signing, the 9-1-1 DBMSP shall host a meeting and/or conference call with all SPs, the United States Postal Service/Canada Post, and the Jurisdiction's address coordinator and/or address vendor to discuss conversion requirements and procedures.
- 6.3 The 9-1-1 DBMSP and each SP must provide their Street Address Guide (SAG), if available, at the time of the conversion meeting/call in order to develop an initial MSAG.
- 6.4 Actual telephone customer service records shall not be used to create an MSAG in order that all records validate to ALI. Actual telephone records may be used to create a preliminary SAG; however, the initial load of these TN records into the 9-1-1 DBMSP shall **NOT** occur until the final MSAG is approved by the Jurisdiction.
- 6.5 It is required that city style (911 Dispatch Lane, 911911 Highway 11), not a rural route and box, addressing be used for an addressing system. Refer to United States Postal Service Publication 28, Appendix C1 and C2, for street suffix and secondary unit designator abbreviation standards. Publication 28 is available through the National Address Information

Center in Memphis, TN, at 1-800-238-3150 or may be downloaded at:  
<http://pe.usps.gov/cpim/ftp/pubs/Pub28/pub28.pdf>. The Canadian Addressing Guide may be  
downloaded from the Canada Post / Postes Canada web site at URL :

English:

<https://www.canadapost.ca/tools/pg/manual/PGaddress-e.asp>

French:

<https://www.canadapost.ca/tools/pg/manual/PGaddress-f.asp>

- 6.6 It is required that the Jurisdiction coordinate address assignment with the United States Postal Service/Canada Post to ensure accurate and common addressing.
- 6.7 It is desirable that Jurisdictions, DBMSPs, and SPs have a 98% database accuracy (MSAG valid ALI records) prior to taking 'LIVE' Enhanced 9-1-1 calls.
- 6.8 During conversion each SP must work directly with the Jurisdiction to obtain MSAG valid addresses for their telephone service records.
- 6.9 Fictitious addresses or "NO ADDRESS," other than what is defined by NENA standards, shall not be used.
- 6.10 The Jurisdiction's authorized 9-1-1 Database Coordinator is the only entity allowed to approve changes to the MSAG. No 9-1-1 DBMSP or SP shall make MSAG changes without written authorization from the Jurisdiction except for internal telco type fields such as county code and exchange code.
- 6.11 It is preferable that the Jurisdiction work with the appropriate SP to gather each resident's name, telephone number, old address and new address in those areas being readdressed for Enhanced 9-1-1. The key inquiry field in most service order systems is the telephone number. Depending on State Legislation and/or Public Service Commission regulations, a telephone company may be able to assist the Jurisdiction during the initial conversion process by providing a customer listing.
- 6.12 Preliminary TN listings or White Page Listings that are provided by a SP to a Jurisdiction who is addressing must also contain the SP's NENA ID as a field in each record. This shall allow the Jurisdiction and/or their addressing vendor to return any address correction to the appropriate SP.

## **7. GOVERNMENT ENTITIES RESPONSIBILITIES**

(Refer to Exhibit A)

### 7.1 General

- 7.1.2 It is suggested that Jurisdictions acknowledge and make their management aware that with the implementation and maintenance of Enhanced 9-1-1, there must be a commitment in both staffing and response to the SPs and/or the DBMSP, whichever is applicable.
- 7.1.3 If a Jurisdiction has multiple PSAPs, cities, townships, etc who are responsible for their own addressing and error resolution, it is preferred that they flow their information to a single focal point in the Jurisdiction, normally referred to as a Jurisdiction 9-1-1 Coordinator or Jurisdiction 9-1-1 Database Coordinator.
- 7.1.4 It is a Jurisdiction's responsibility to notify all known SPs of the Jurisdiction's current contact name, telephone number, fax number, and mailing address. Refer to NENA 06-001, NENA Standards for Local SP Interconnection Information Sharing.
- 7.1.5 It is desirable that every attempt be made to return written inquiries from SPs within one (1) business day.
- 7.1.6 PSAP Managers are responsible for compiling a list of all NENA IDs in their 9-1-1 system's serving area for the PSAP Supervisors. This list must be verified quarterly, at a minimum, to ensure accuracy.
- 7.2 Conversion
- 7.2.1 Upon notification from the addressing authority that a readdressing or annexation project is being implemented, it is the Jurisdiction's responsibility to provide advance notification to all known SPs. The jurisdiction may negotiate with their DBMSP to provide this advance notification. The DBMSP is then responsible for notifying all SPs so they can prepare for the additional work volume.
- 7.2.2 The local addressing authority is responsible for notifying all property owners of their new address once agreement from the Postal Service and the Jurisdiction's 9-1-1 Database Coordinator has been received.
- 7.2.3 Once the post office has implemented the addressing by updating their Address Management System, the local addressing authority is responsible for providing all readdressing to the Jurisdiction's 9-1-1 Database Coordinator who in turn must supply the information to the appropriate SP(s). The local addressing authority is responsible for addressing (naming & numbering) within its boundaries and supplying the Jurisdiction 9-1-1 Database Coordinator with the final postal approved addressing. It is desirable that all readdressing be sorted by NENA ID, NPA/NXX, or some other locally determined method which shall allow the work to be sent to the correct SP. Refer to Section 2. General Data Standards in NENA 02-011 and NENA 06-001, NENA Standards for Local SP Interconnection Information Sharing.

NOTE: Postal Approval may not be required in all cases. For example,

a township or village where there are no mail carriers and all residents must pick up their mail at their post office box. Another example might be communication boxes along railroad tracks or major highways.

### 7.3 Maintenance

- 7.3.1 The Jurisdiction's 9-1-1 Database Coordinator is responsible for ensuring that postal approved addressing is distributed to the appropriate SPs. The Coordinator may perform this task or assign it to a local addressing authority.
- 7.3.2 Jurisdictions are responsible for the maintenance and content of their MSAG. As street changes or additions are made within the Jurisdiction's boundaries, the Jurisdiction's 9-1-1 Database Coordinator is responsible for completing an MSAG Update Request/Ledger and ensuring that all known SPs receive a copy within one (1) business day. Refer to Exhibit C for complete flow. The jurisdiction may negotiate with their DBMSP to provide copies of the MSAG Update Requests to other SPs. If this agreement is reached, the DBMSP is then responsible for forwarding a copy of all MSAG Update Requests within one (1) business day to all SPs.
- 7.3.3 As NRFs, misroutes, or erroneous ALI displays are noted at the PSAP, it is required that a 9-1-1 Inquiry Form be completed by the call taker and returned to the Jurisdiction's 9-1-1 Database Coordinator within one (1) business day. The 9-1-1 Database Coordinator is then responsible for reviewing, researching, and forwarding the inquiry to the DBMSP within one (1) business day. Refer to NENA 02-015.

NOTE: In some areas, where applicable, 9-1-1 Inquiry forms for erroneous ALI displays are routed directly to the entity providing the dial tone (Service Provider) based on the Access Infrastructure Provider NENA ID displayed at the time of the call.

- 7.4 The Jurisdiction is responsible for obtaining as much information as possible on the NRF and reporting the information within one business day to the SP. It is desirable that the Jurisdiction locate the SP for a Wireless Call by using the various systems available (NPAC, refer to NENA 02-015 and Section 27 of this document). Wireline NRF reports may be forwarded directly to the DBMSP.

The ANI on the NRF is absolutely necessary. The date and time of the call are critical and must be provided for any investigation to occur. Any other information obtained from the caller is helpful for investigation of the NRF.

- 7.5 DBMSP ELT Tables to Jurisdiction's ESN Listing

It is desirable that on a quarterly basis, Jurisdiction's obtain a copy of their ELT (English Language Translation) tables from the DBMSP to ensure the descriptions agree with their ESN listings.

- 7.6 It is preferred that the Jurisdiction MSAG be compared with the DBMSP MSAG at least twice a year.

If a Jurisdiction is also maintaining an MSAG on their internal systems it will be beneficial for the Jurisdiction to request a copy of their MSAG from the DBMSP at least twice a year and perform their own internal compare. If an accurate electronic audit is performed, the database coordinator need only review the discrepancies.

Performing this type of compare shall create benefits by reducing daily errors, NRFs, misroutes, processing 9-1-1 inquiry forms, and liability

Minimum Set of Fields for Audit: Prefix Directional, Street Name, Street Suffix, Post Directional, Low Range, High Range, MSAG community name, Postal community name, State, Odd/Even/Both, and ESN.

Output Files/Reports: Reports that reflect any discrepancies in any of the compared fields. The DBMSP must obtain concurrence from the Jurisdiction as to which entries need correcting. This can be accomplished by the Jurisdiction creating an MSAG Update Request to the DBMSP and all known SPs. (See section 7.3.2)

- 7.7 Local Addressing Authorities shall be the entity responsible for addressing and numbering systems. However, it is required that a system be selected that best supports the following:
- Clear identification of addresses for specific physical locations, without duplication of house numbers and street names within jurisdiction or postal areas.
  - Designed to handle future MSAG additions with minimal disruption to the addressing initially established.
  - Addressing shall be coordinated between municipalities, emergency service providers, and the United States Post Office/Canada Post.
  - The 9-1-1 jurisdiction determines the ALI displayed community name. If a postal community is not used, this must be closely coordinated with the DBMSP as there are several methods for accomplishing this:

- Use the English Language Translation tables (ELT) which defines responders (police, fire, ambulance) and add a community name that applies to each specific ESN.
- Dedicated 9-1-1 address in their service order systems.
- Service address field in service order system.
- Comply with United States Post Office Publication 28, Appendix C1 (street suffix) and C2 (secondary unit designators)/Canadian Addressing Guide (See Section 6.5).

Additional information may be found in NENA Publications:

- Addressing Systems, A Training Guide for 9-1-1
- E9-1-1 Database Guide (for street abbreviations, refer to United States Post Office Publication 28, Appendix C1 and C2/Canadian Addressing Guide – see section 6.5)

## **8. STANDARDS FOR ERROR RESOLUTION PROCESS**

8.1 9-1-1 DBMSPs shall work Function of Change (FOC) errors with written authorization and return the remaining errors to the appropriate SP in an electronic format. FOC errors are:

- Record Already Exists, Insert Not Allowed
- Record Does Not Exist for A Change
- Record Does Not Exist for A Delete
- Customer Code Does Not Match
- Unlock Attempted on a Non-existent TN
- Migrate Attempted on a Non-existent TN

8.2 Each SP is responsible for resolving their own errors by working directly with the Jurisdiction.

8.3 If an MSAG update is required to correct an error, the Jurisdiction must send an MSAG Update Form to their 9-1-1 DBMSP and ALL SPs.

NOTE: By using the NENA 9-1-1 Database Administration Forms software provided on the Internet, a Jurisdiction will be able to Email all SPs and the 9-1-1 DBMSP at one time. This will allow all parties requiring the information to receive it at the same time.

- 8.4 After receiving confirmation of the MSAG change from the 9-1-1 DBMSP, the appropriate SP(s) shall issue correcting service orders which will flow to the 9-1-1 Data Provider in the daily update process.
- 8.5 In an effort to maintain the integrity of the 9-1-1 databases and to provide accurate ALI bids, it is preferred that Jurisdictions resolve errors within one (1) business day of notification.
- 8.6 An error is defined as any telephone number record that does not pass all database management system edits including but not limited to invalid or missing fields, table edits, or MSAG validation as determined by the ALI provider's DBMS.

## **9. MSAG MODIFICATION PROCESS FLOW**

(Refer to Exhibit C)

- 9.1 The Jurisdiction's authorized 9-1-1 Database Coordinator is the only entity allowed to approve changes to the MSAG. It is required that no 9-1-1 DBMSP or SP make MSAG changes without written authorization from the Jurisdiction except for internal telco type fields such as county code and exchange code.
- 9.2 All SPs must obtain an initial complete MSAG via the negotiated medium (CD-ROM, file transfer, diskette, Email, paper) from the 9-1-1 DBMSP per the negotiated contracts. As Jurisdictions request changes to their MSAG, they shall forward a copy to all SPs unless arrangements have been made for the 9-1-1 DBMSP to forward a copy of the request to all SPs within one (1) business day. This is necessary to ensure all subscriber records contain MSAG valid addresses. Each SP must ensure their service order records are updated with an MSAG valid address.
- 9.3 When MSAG changes are made at the authorization of the jurisdiction, all affected TNs are updated. It is not the DBMSP's responsibility to provide a listing of affected TNs back to the SP. SPs are required to use the MSAGs to validate and identify their TNs impacted by the MSAG changes.
- 9.4 If a Jurisdiction is requesting an MSAG range deleted and there are TN records attached to the MSAG, it is required that the DBMSP print the associated TN's and return to the Jurisdiction 9-1-1 Database Coordinator prior to making any MSAG changes.
- 9.5 Refer to Exhibit C for Process Flow.
- 9.6 Structure-based MSAGs are not a NENA standard.

A structure-based MSAG is an MSAG consisting of a listing of all individual or shortened contiguous house numbers within a 9-1-1 service area, rather than a range of house numbers.

Example: Structures at 1, 2, 3, 4, and 8 would be listed on the structure-based MSAG as 1-1, 2-2, 3-3, 4-4, 8-8 or 1-4, 8-8; rather than a complete range of 1-8.

Due to geographic limitations (uninhabitable property, mountains, open spaces, lakes, etc.), it may be necessary to have range gaps. Example: 1-7, 100-499, 700-999 on the same street.

The streets and addresses are assigned selective routing codes or emergency service numbers (ESNs) to enable proper routing of 9-1-1 calls. This type of MSAG contains only house numbers for those locations with a physical structure and/or telephone instrument.

- 9.6A Building a structure-based MSAG does not improve or degrade data quality. Structure-based MSAGs may delay ALI updates and will require extensive manual intervention by both jurisdictions and DBMSPs.
- 9.6B GIS Mapping supports geo-coding and can be used to create a traditional range-based MSAG. However, a traditional range based MSAG cannot be used to create a spatially accurate GIS database needed for geo-coding and GIS Mapping.
- 9.6C A jurisdiction desiring to utilize an in-house structure-based MSAG does so of their own choice. It is the jurisdiction's responsibility to ensure that all structure addresses are included in the range-based MSAG. The jurisdiction's database manager shall routinely compare the in-house structure-based MSAG to the range-based MSAG to ensure that all low and high house numbers are included.
- 9.6D A jurisdiction utilizing an in-house structure-based MSAG may request a complete TN extract file and/or a daily service order update file from their DBMSP to compare with the jurisdiction's own in-house structure-based MSAG. It is desirable that the jurisdiction periodically request a copy of their MSAG from the DBMSP to ensure accuracy (NENA 02-011, Section 7.6, Government Entities Responsibilities).

## 10. NO RECORD FOUND REPORTS

THIS SECTION HAS BEEN MOVED TO NENA 02-015,  
NENA Standards for ANI/ALI Discrepancies and No Record Finds  
for Wireline, Wireless, and VoIP Technologies  
[https://www.nena.org/?page=ani\\_ali\\_discrepancy](https://www.nena.org/?page=ani_ali_discrepancy)

## 11. STANDARD ERROR CODES

<u>Group</u>	<u>Error Code</u>	<u>Description</u>	<u>MSAG/NON-MSAG</u>
<b>Data Errors</b>			
	100	Illegal Class of Service	NON-MSAG
	101	Illegal Type of Service	NON-MSAG
	102	Illegal Function Code	NON-MSAG
	103	Not MSAG Valid	MSAG
	104	House Number Not Valid [if DMS capable]	MSAG
	105	Street Name Not Valid [if DMS capable]	MSAG
	106	Directional Not Valid [if DMS capable]	MSAG
	107	Community Name Not Valid [if DMS capable]	MSAG
	108	Exchange Matching Failed	MSAG
	109	Illegal NENA ID (Section 2.14, 4.1, 5.1)	NON-MSAG
<b>Functional Errors</b>			<b>ALL NON-MSAG</b>
	200	Record Already Exists, Insert Not Allowed	
	201	Record Does Not Exist for A Change	
	202	Record Does Not Exist for A Delete	
	203	Customer Code Does Not Match	
	204	Unlock Attempted on a Non-existent TN	
	205	Migrate Attempted on a Non-existent TN	
<b>Portability Errors</b>			<b>LNP ERRORS</b>
	300	Unlock Attempted on an unlocked TN (different NENA ID)	
	301	Migrate Attempted on a Locked TN	
	302	Insert Attempted on a TN that is unlocked	
	303	Change Attempted on a TN that is unlocked	
	304	Delete Attempted on a TN that is unlocked	
	305	NENA ID's Do Not Match on a Change or Delete	
	306	NENA ID's Do Not Match on unlock	

## 12. STANDARD FUNCTION CODES

- 12.1 I - Insert telephone record.
- 12.2 C - Change telephone record requires NENA ID field to match.
- 12.3 D - Delete telephone record requires NENA ID field to match.

- 12.4 U - Unlock telephone record transaction sent by the Donor Company. This will make the telephone number available for the Recipient Company to overwrite the embedded telephone number record. The “U” function code requires a match on the NENA ID.
- 12.5 M - Migration transaction sent by the Recipient Company. This transaction requires an “unlocked” record in the 9-1-1 database and shall replace the customer information and the NENA ID on the "unlocked" record. The “M” function code does not require a match of NENA ID. If there is not a “U” record with the same telephone number in the 9-1-1 ALI database the “M” transaction must be treated as an error with a unique error code or a unique process.

**NOTE:** It is required that a complete record be sent.

- 12.6 E – Delete all error records associated with the corresponding calling telephone number that are in the DBMSP’s error file. No updates are made to the TN/ALI database when Function of Change (FOC) = E. Provides method for SPs to clean up any errors if no subsequent activity will be issued for the Calling Telephone Number.

### **13. METHOD OF COMMUNICATING**

- 13.1 It is required that SPs transmit initial loads, daily updates, error files, MSAG updates, complete MSAG’s, and 9-1-1 inquiries in a automated electronic format.
- 13.2 All TN records {9-1-1 DBMSP and SPs} must contain an entry in the NENA ID field that is officially registered with NENA.

### **14. NXX ADMINISTRATION**

DBMSPs shall be responsible for verifying LERG and assigning new NPA/NXX/Exchange/Selective Router data to their respective DBMS.

### **15. NPA SPLIT NOTIFICATION**

Most SPs have an internal procedure for working NPA splits. However, due to the critical nature of 9-1-1 service, it is required that each Local SP notify in writing the 9-1-1 DBMSP and the Jurisdiction when an NPA split is occurring. It is further requested that the following information be provided:

- \* OLD NPA
- \* NEW NPA
- \* NXX
- \* EXCHANGE NAME/RATE CENTER

- \* EXCHANGE (4 character abbr. in MSAG) [ALEC'S MAY NOT USE]
- \* DATE BILLING SYSTEM WILL START TRANSMITTING NEW NPA
- \* DATE OF ANI (SWITCH) CONVERSION
- \* DATE OF PERMISSIVE DIALING
- \* DATE OF MANDATORY DIALING

The following 9-1-1 databases may need to be updated:

- Automatic Location Identification (ALI)
- Selective Routers/Tandems
- PSAP Equipment

NPA splits must be a coordinated effort between the 9-1-1 DBMSPs and all SPs. When the 9-1-1 DBMSP has been notified of an NPA split it is required that they assume coordination responsibilities for updating all affected 9-1-1 databases under their control.

## **16. RETRIEVAL CONDITIONS for ALI Database Records**

9-1-1 jurisdictions may retrieve or otherwise have access to an ALI record under the following conditions:

1. An automatic retrieval and display may be made to a telecommunicator (i.e., Jurisdiction call taker or dispatcher) when that telecommunicator answers a 9-1-1 call. This provisioning meets the Electronic Communications Privacy Act of 1986 (ECPA) in that by placing a 9-1-1 call, the caller is granting permission for its telephone company to disclose the information to a government agency.
2. Where not restricted by law, a telecommunicator is authorized to manually retrieve a caller's ALI on the basis of the caller providing the caller's telephone number (ANI). This permission is granted because a call may arrive without the ANI or the caller may be calling from a neighbor's phone, for example, to report a fire at the caller's location, which is in a different fire district than the neighbor's location. This meets the ECPA requirement in that the caller is granting permission.
3. Where not restricted by law, a Jurisdiction's administrator may retrieve an ALI record to insert information received from the subscriber into the "Comments" field of the record. Because the subscriber is requesting the entry, permission is given, meeting the ECPA requirements. The Jurisdiction administrator is prohibited from disclosing this information to any other person.

The following information is shown as an explanation of the impact of ECPA (Electronic Communications Privacy Act).

Confidential Nature of the ALI Database -----

1. Legal basis for confidential nature:

While the ALI database is specifically created for use by a 9-1-1 jurisdiction, it contains confidential telephone company information that may not be disclosed except under conditions that meet the requirements of the Electronic Communications Privacy Act 1986 (ECPA), 18 USC [section symbol] 2701, et sequens. ECPA prohibits regulated telecommunications companies from disclosing to government agencies customer record information without either the customer's permission or a legal mandate. In particular, 18 USC [section symbol] 2703(c) provides regulated disclosure of "a record or other information pertaining to a subscriber to or customer of such service not including the contents of communications covered by subsection (a) or (b) of this section...." Subparagraph (c)(1)(B) permits disclosure to a governmental agency only with (i) subpoena, (ii) warrant, (iii) court order, or (iv) "consent of the subscriber or customer to such disclosure." The name, address and phone number of a customer constitute a "record or other information pertaining to a ...customer" as used in [section symbol] 2703(c).

2. Application of ECPA to ALI database

The key aspect of ECPA is "disclosure," whereby if the 9-1-1 Jurisdiction already has a subscriber's name, telephone number and address information via the published white pages of a telephone directory or other source, the confidentiality requirement listed above does not apply. Similarly, once a person has called 9-1-1 and previously confidential information is provided to the 9-1-1 district as a result of that call, the telephone company has no confidential requirement for that information regarding that governmental entity as it has been disclosed by the caller. The confidential requirement of the ALI database pertains to the non-listed telephone address, which the customer has requested that the telephone company neither publish in a directory nor disclose upon being asked for that information. Because that confidential information is a part of the ALI database, the ALI database itself must be handled as if it were completely confidential.

## 17. DATA QUALITY MEASUREMENTS

The following Data Quality Measurements are being issued with the knowledge that some SPs will require extensive development to their current data management platforms and possibly to their legacy service order and billing systems which may take several years to accomplish.

It is also understood these measurements will only be available to SPs and governmental agencies if all metrics can be captured electronically. This means that all SPs must be able to transmit daily updates, daily stats, daily errors, and daily MSAG entries via a mechanized transmission. Also, government agencies must input all E9-1-1 inquiries, MSAG modifications, or any other work request into an online system in order for all metrics to be captured. NENA does not support any SP being required to manually track the data quality measurements unless mutually agreed to by all parties (SP and PSAP).

Many NRFs may be caused by service order processing delays. Some SPs do not generate an update to E9-1-1 and other systems until a service order is completed and error free. The number of NRFs is increasing due to changing technologies (wireless, manual bids, VoIP, etc.). All NRF conditions shall be identified with a type code for the technology being used that produces the NRF telephone number.

At a minimum, all reports shall be available by the DBMSP at the following levels: ALI Provider NENA ID, Data SP NENA ID, State, County, and PSAP.

It is desirable that all supporting detail to the reports be retained for a minimum of a rolling three (3) month period.

NOTE: Currently, some DBMSPs return errors electronically to the originator and do not retain copies on their system. In order to generate the data quality measurements, DBMSPs must retain all errors for all SPs.

NOTE: Systems need to store additional times besides modification date; i.e., receipt in DBMS, date error cleared, in the following format:

YYYY:MM:DD	HH:MM:SS
2002:09:11	09:33:10

17.1 TOTAL # OF E9-1-1 INQUIRIES AS COMPARED TO TOTAL ALI QUERIES BY NENA ID.

SHORT-TERM SOLUTION: ALL E9-1-1 INQUIRIES / TOTAL ALI QUERIES.

Note: Total ALI queries currently include manual queries, wireless, transfers, screen refreshes, ANI failures, Incomplete ANI, ESCO Codes and Anonymous Calls.

LONG-TERM SOLUTION: ALL E9-1-1 INQUIRIES / TOTAL ALI QUERIES

EXCLUDING manual queries, wireless, transfers, screen refreshes, etc. The NENA CPE Committee has been asked to create a standard that all PSAP equipment generate a Query Type indicator.

Note: If a PSAP is served by an on-premise or stand-alone ALI database, it is the PSAP's responsibility to electronically input all requests in order for this measurement to be valuable. NRF statistics for PSAPs served by a centralized ALI system shall be mechanically retrieved from that system.

#### 17.1.1 % NO RECORD FOUNDS (NRFs)

Number of NRFs as compared to number of ALI queries.

How used: A SP may use to determine if audit or reload is required. Determine if there is a pattern of certain NXXs or thousands groups missing. May also indicate delays in updating ALI. (Misroutes, MSAG Discrepancies, ALI Discrepancies are not counted.)

Formula: 
$$\frac{\text{NRFs}}{\text{TOTAL ALI QUERIES}} = \% \text{ NRFs}$$

#### 17.1.2 % MISROUTED CALLS

Number of Misrouted calls as reported as compared to ALI queries. (NRFs, MSAG Discrepancies, ALI Discrepancies are not counted.)

Formula: 
$$\frac{\text{TOTAL MISROUTED CALLS}}{\text{TOTAL ALI QUERIES}} = \% \text{ MISROUTED CALLS}$$

#### 17.1.3 % MSAG DISCREPANCIES

Number of MSAG Discrepancies as reported as compared to ALI Queries. (NRFs, Misroutes, ALI Discrepancies are not counted.)

Formula: 
$$\frac{\text{MSAG DISCREPANCIES}}{\text{TOTAL ALI QUERIES}} = \% \text{ MSAG DISCREPANCIES}$$

#### 17.1.4 % ALI DISCREPANCIES

Number of Incorrect Address inquires as reported as compared to ALI queries (NRFs, Misroutes, MSAG Discrepancies are not counted.)

Formula: 
$$\frac{\text{INCORRECT ADDRESSES}}{\text{TOTAL ALI QUERIES}} = \% \text{ ALI DISCREPANCIES}$$

#### 17.2 % SUCCESSFUL ALI QUERIES

Total # of Successful ALI Queries as compared to Total ALI Queries. (Overall picture as to total health of the E9-1-1 data base.)

**SHORT-TERM SOLUTION:** Total ALI queries SHALL include manual queries, wireless, transfers, screen refreshes, etc.

**LONG-TERM SOLUTION:** Total ALI queries SHALL NOT include manual queries, wireless, transfers, screen refreshes, etc.

Formula: 
$$\frac{\text{TOTAL \# OF SUCCESSFUL ALI QUERIES}}{\text{TOTAL ALI QUERIES}} = \% \text{ SUCCESSFUL ALI QUERIES}$$

### 17.3 TOTAL POSTING TIMES (conception to grave -- Days/Hours/Minutes/Seconds)

It is recognized that some SPs may need to modify their systems to reflect: date, time, and user ID of ALL persons touching the request so that at any point in time a user will know where a request is or who delayed completion of the request. Suggested, but not inclusive, points of logging/status are: PSAP entry, Jurisdiction entry or approval, County Administrator entry or approval, Telco Receive and begin work, Referred, Withdrawn, Rejected, Completed.

It is required that all posting times be tracked so that delays in the process can be identified and that a particular individual entity can be made aware of the delay they are causing in the accuracy of the E9-1-1 database. It is therefore required that a layered approach be taken for these measurements.

For example: PSAP to County Coordinator  
County Coordinator to DBMSP  
DBMSP to SP  
SP to DBMSP  
DBMSP to County Coordinator  
County Coordinator to PSAP

17.3.1 Individual Entity and total posting time for E9-1-1 inquiries (ANI/ALI) from receipt to completion, county to SP to SP to SP to county, etc.

17.3.2 Individual Entity and total posting time for MSAG updates from receipt to completion, telco initiated and jurisdiction initiated.

Comments: Current approved standards indicate telcos have 1 business day to complete request. Jurisdictions have 5 business days to complete request as they usually have to work with another department within the county or city who is responsible for addressing, unless state regulations or local contracts are in force.

### 17.4 MONTHLY SUMMARY OF DAILY ERRORS (DBMS/DMS/TSS)

#### 17.4.1 % Service Order Accuracy (% SO Accuracy)

Total Number of Incoming Errors for the month from service order processing compared to total number of records processed for the month, per NENA ID, broken down by

MSAG Errors, Non-MSAG Errors (includes table and format errors), and LNP Errors.  
 NOTE: Informational only error codes are not to be included, but data shall include all records processed whether conversion or live.

Formula:

$$\frac{\text{Company's Total SO Records Processed} - \text{Company's Total SO Incoming Errors}}{\text{Company's Total SO Records Processed}} = \% \text{ SO Accuracy}$$

17.4.2 % Database Accuracy (% DB Accuracy)

Total Number of Unresolved Errors in the DBMS on the last day of the month as compared to total records in the DBMS on the last day of the month, per NENA ID. All error codes to be reported and broken down by MSAG Errors, Non-MSAG Errors, and LNP Errors. NOTE: This measurement is strictly a snapshot in time. Only count one error per individual telephone number. Data includes conversion activity.

Formula:

$$\frac{\text{Company's Total Records in DBMS}}{\text{Company's Total Records in DBMS} + \text{Company's Total Unresolved Errors}} = \% \text{ DB Accuracy}$$

17.4.3 Average Resolution Time

Average number of calendar days before error resolved, by MSAG Errors, Non-MSAG Errors, and LNP Errors, by specific error code, by NENA ID, by state -- including resellers. Report shall be run the 1<sup>st</sup> of the month and report the preceding month's statistics. This report measures average resolution time from the time the error is first detected until the time the error is resolved. NOTE: Data includes conversion activity.

**SAMPLE:**

NENA ID: ABCD		STATE: AK		(2 decimal places)	
Error Code	Qty Recd.	Qty Resolved	Qty Pending	Avg. Resolution Time	
MSAG Errors	505	25	480	10.15 days	
103					
104					
105					
NON-MSAG Errors	250	10	240	5.10 days	
100					
101					
102					
109					
LNP Errors	1646	1305	341	60.00 days	
300					
301					
302					



#### 17.4.4 Aging Report

Actual number of calendar days a record has been in error, by MSAG Errors, Non-MSAG Errors, and LNP Errors, by NENA ID, by state. . Report shall be run the 1<sup>st</sup> of the month and report the preceding month's statistics. NOTE: Data includes conversion activity.

#### **SAMPLE:**

NENA ID: ABCD STATE: AK

Error Total Errors 0-3 days 4-7 days 8-14 days 15-30 days 31-60 days 61-90 days 91-120 days 121-364 days +1year

MSAG Errors

103

104

105

NON-MSAG Errors

100

101

102

109

LNP Errors

300

301

302

#### 17.5 LNP MEASUREMENTS

17.5.1 How long does it take to get a number ported? The length of time between the time the TN was working in NPAC until the time the TN was updated to ALI.

17.5.1A Period of time TN working in NPAC to time unlock received in DBMS (tracks donor's responsiveness)

17.5.1B Period of time between TN being unlocked and migrate received in DBMS (tracks recipient's responsiveness)

17.5.2A Quantity of TNs unlocked with no migrates received - NPAC validated – Locked to new SP.

17.5.2B Quantity of migrates received not unlocked by old SP - NPAC validated – migrate processed.

17.5.3A Period of time between receipt of "U" to receipt of "M". This measures LNP processes

and the "M" is counted whether it updates the TN DB or creates an error. The error shall be measured by other Quality Measurements.

17.5.3B Period of time between receipt of "M" to receipt of "U". This measures LNP processes and the "U" is counted whether it updates the TN DB or creates an error. The error shall be measured by other Quality Measurements.

17.5.4 % of "M" records that work the first time because the "U" was already available. (implies no NPAC validation was required by the DBMSP)

$$\text{Formula: } \frac{\text{Total "M" Records} - \text{Total "M" Errors}}{\text{Total "M" Records}} = \% \text{ Successful Migrates}$$

## 18. DATA AUDITS / RECONCILIATIONS / COMPARES

This section will set standards for SPs and DBMSPs using electronic update processes pertinent to 9-1-1 database audits and the reconciliation processes to use to resolve any and all discrepancies. These processes require extensive coordination efforts relative to timing, data processing system resources, and sufficient work force to work the discrepancy reports. It is essential that prior to reconciliation between SPs conference calls be held to identify any and all special processes that are running on either side. Some examples of special processes are abbreviations, MSAG translations, moving directionals, etc. This document only defines which systems and/or databases are to be reconciled. Each SP must review their own internal processes to determine exact data flow and to ensure that all areas are audited appropriately. All extracts exchanged between SPs must be in one of the NENA Standard Data Exchange formats documented in NENA 02-010, Standards for Formats & Protocols for Data Exchange.

SPs must rethink their extract criteria, as the old processes of using NPA/NXX are no longer valid with Local Number Portability. Extracts must be pulled using exchange code, wire/rate center, state, county/tax district code, or some combination of these.

Prior to performing any audits or reconciliations, it is required that a complete review of the SPs' 9-1-1 extract logic be performed and the following questions answered. Is the extract doing everything it should? Am I receiving all 9-1-1 affecting orders? When new USOC/ISOC/service and equipment codes are created for new product/service offerings has it been determined whether 9-1-1 requires that service order activity or not? Ensure that initial load and daily service order extract programs are in sync and pulling the same data.

System reloads are not be performed in lieu of an audit.

All audit outputs and reports must be retained as required by local and/or state regulations.

**Audit Triggers:**

1. Excessive NRFs
2. Excessive Misroutes
3. Excessive address discrepancies
4. Software/Hardware Failures which may cause database corruption
5. Scheduled

Databases and/or systems that must be audited to ensure the accuracy of Enhanced 9-1-1 are listed below:

**18.1 Internal Customer Billing System to Central Office Switch Extract**

Performing this type of audit shall assist in ensuring that all lines, which are capable of dialing 9-1-1, are in the ALI database. Some SP's provide all TN's to the ALI database, while other SP's only provide those TN's that can actually dial out and connect with 9-1-1. For example, some SP's update ALI with DID and Remote Call Forwarding numbers and some do not. The goal is to ensure that the billing system reflects exactly what the switch is doing. Does this service have inward or outward calling capabilities? This type of audit not only helps with 9-1-1 accuracy, but also ensures billing and revenue accuracy.

Minimum Set of Fields for Audit

- 10-Digit Telephone Number
- 'Type of Service' field in the switch compared to appropriate billing service and equipment codes which identify inward and outward calling capabilities
- ILECs may obtain Rate Center from switch and compare to exchange code in billing system if used for 9-1-1 trunk default routing.
- CLECs may manually review RAX (Rate Area Exchange) assignment on each TN to ensure proper trunk default routing.

SPs may choose to expand this audit to check for billing items. When requesting the extract files from the billing system and the switch, only working telephone numbers are to be extracted.

Output Files/Reports:

- TNs working in switch and not the billing system
- TNs in billing system and not in switch
- Discrepancies in 'Type of Service' in switch, Rate Center, or inward or outward calling capability (1-way vs. 2-way)

## 18.2 SP to DBMSP MSAG Compares

It is required that prior to any ALI or TN reconciliations/audits being performed between SPs, an MSAG compare/audit be completed. If the DBMSP is reconciling their own records, there are several options available:

- a. Request the Jurisdiction's 9-1-1 Database Coordinator review the DBMSP MSAG for accuracy and completeness. The DBMSP may choose to use this review as an annual sign-off or approval of the Jurisdiction's MSAG.
- b. The DBMSP may also choose to use this review as a time to compare the DBMS MSAG to their internal SAG (Street Address Guide) system.

It is the SP's responsibility to ensure their SAG/MSAG agrees with the DBMSP MSAG and if it does not, it is the Jurisdiction's responsibility to mitigate the discrepancy (especially if the SP has worked with the Jurisdiction directly).

Minimum Set of Fields for Audit: Prefix Directional, Street Name, Street Suffix, Post Directional, Low Range, High Range, MSAG Community Name, Postal Community Name, State, Odd/Even/Both, ESN, Exchange and PSAP ID/County ID/TAR Code.

Output Files/Reports: Reports that reflect any discrepancies in any of the audited fields. The SP or DBMSP must obtain concurrence from the Jurisdiction as to which entries are correct.

## 18.3 Reseller Audit

It is desirable that all Resellers perform a periodic audit of their billing records against the Network Providers records.

## 18.4 Customer Record Information Systems (CRIS) (Service Order & Billing Systems or internal 9-1-1 DBMS) to 9-1-1 DBMSP (TN records)

It is required that all SP's compare their customer data against the 9-1-1 DBMS. This audit shall be performed using data housed in the system that directly feeds 9-1-1. The data could be extracted from a Service Order & Billing System, or ones own internal 9-1-1 DBMS. If ones own internal DBMS is used, an internal audit must be performed against that company's Service Order & Billing System and their internal DBMS system prior to performing any audits with the 9-1-1 DBMSP's DBMS.

This type of audit requires extensive coordination efforts between the DBMSP and SP. The party responsible for performing this audit must be agreed upon by all involved. These types of audits must be performed at the Access Infrastructure Provider NENA ID

level. Both parties must agree as to whether or not daily updates must be held while the audit is being completed or if they can flow as usual. Both parties need to ensure that any special processes which are being run; i.e., abbreviations, moving directionals, AKA's, PS-ALI tables, are discussed so that all parties are aware of these processes prior to the reconciliation being conducted.

Minimum Set of Fields for Audit: Customer Name, 10-digit Calling Telephone Number, 10-digit Main Telephone Number, House Number, House Number Suffix, Prefix Directional, Street Name, Street Suffix, Post Directional, Community Name, State, Location, NENA ID, Class of Service, DBMS Lock/Unlock Status, and Type of Service.

Note: Some companies may also compare the CRIS Tax Code to the DBMS County ID (if available) to ensure accuracy of county identification.

Output Files/Reports:

- All TN's that match in all audited fields shall NOT be written to output. The following comparisons assume that files are extracted by Access Infrastructure Provider NENA ID.
- All TN's on the billing file and not on the DBMS file shall be written to output as 'I' insert records. Assuming the NENA ID on the insert is for the NENA ID being audited, the insert file may be mechanically worked. Each individual TN on this report must be reviewed to ensure accuracy.
- This report will be the 'C' change records in a locked status. If the TN record is present on both files, but the information contained with the record does not match, the discrepancy shall be written to an output report that reflects one line with the billing system information and one line with the DBMS information. Each record on this report must be individually reviewed to ensure the correct information is updated to the 9-1-1 database.
- All TN's on the DBMS file that are unlocked, but are on the billing file shall be written to output as 'M' migrate records. When migrating these numbers within the DBMS, it is critical that the modification date be checked as well as NPAC to ensure the most current information is applied.
- All TN's on the DBMS file in a locked status and not on the billing file shall be written to output as 'D' delete records for investigation. When deleting these numbers from the DBMS, it is critical that the modification date be checked to ensure the most current information is applied. All deletes must be reviewed on an individual basis to ensure that working numbers are not being removed from the 9-1-1 database.

- All TN's on the DBMS file in an unlocked status and not on the billing file shall be written to output as 'D' delete records for investigation. NENA Standards suggest not removing 'unlocked' records. (See Section 22)

NOTE: This report will point out records where 'M' was not received because the DBMSP has changed.

- Additionally, a statistical report shall be provided by mutual agreement. Some of the items to be shown on the report shall be, but are not limited to, date/time of extract, total number of records compared, date/time processed, number of errors, type of errors, and number of discrepancies by field audited.

#### 18.5 Data Management System to one's own ALI database.

It is required that DBMSPs perform routine synchronization processes between DBMS and ALI databases. By doing this they are constantly ensuring the two databases are identical. This pertains only to wireline records.

ALI databases residing at the PSAP's property require extensive coordination efforts. Coordination must occur with internal DBMSP staff and the PSAP to ensure all parties understand what happens during the audit period.

Minimum Set of Fields for Audit: Customer Name, Calling Telephone Number, Main Telephone Number, House Number, House Number Suffix, Prefix Directional, Street Name, Street Suffix, Post Directional, Community Name, State, Location, ESN, NENA ID, Class of Service and Type of Service.

#### Output Files/Reports:

- All TNs that match in all audited fields shall NOT be written to output.
- All TNs on the DBMS file and not on the ALI file shall be written to output as 'I' insert records. Root cause analysis shall be used to determine why these records were not in the ALI database.
- If the telephone number record is present on both files, but any of the information contained within the record does not match, the discrepancy shall be written to an output report that reflects one line with the DBMS information and one line with the ALI information. This report will be your 'C' change records. This report must be reviewed manually to determine which database is correct and valid corrections must be applied through the DBMS.

- All TN's on the ALI file and not on the DBMS file shall be written to output as 'D' delete records. When deleting these numbers from the ALI database, it is critical that the modification date be checked to ensure the most current information is applied. This report shall be manually reviewed to ensure that no active working numbers are deleted. Any ESCO failure or test records that are found in the ALI database(s) are to be entered into the DBMS database with the appropriate Access Infrastructure Provider NENA ID.

Additionally, a statistical report shall be provided by mutual agreement. Some of the items to be shown on the report shall be, but are not limited to, date/time of extract, total number of records compared, date/time processed, number of errors, type of errors, and number of discrepancies by field audited.

#### 18.6 ALI Node to ALI Node, in redundant systems

This audit is basically the same as Section 19.4, DMS to ALI, if required. Some DBMSPs actually perform a three-way compare here. They audit the ALI Node to ALI Node and compare with the DBMS. Several management systems that directly feed ALI databases and tandems have routine synchronization jobs within the application. Therefore, unless a specific problem is detected, it is usually not necessary to perform this type of audit. However, if problems are detected, immediate investigation shall be conducted and the system and/or application support vendor shall be contacted to resolve all discrepancies.

#### 18.7 DBMS to Selective Router AND Selective Router to Selective Router

This type of audit requires that the Selective Router TNs and ESNs be in sync with the ALI databases. If the selective routing database is able to create an extract file, then an extract can be obtained from the DBMS and the two files compared to ensure that all TN/ESN information is correct. If no extract file can be obtained from the selective router and problems are detected, the router technicians must make the corrections in the Selective Router Database. If major routing problems are detected, a complete reload of the router from DBMS may be necessary. When redundant selective routers are in place it is critical that the two routers are in sync.

### 19. STANDARDS FOR INTERIM NUMBER PORTABILITY

- 19.1 In a geographic area where Interim Number Portability (INP) is used, when a customer wants to change his local SP and also wants to keep his telephone number, service is provided via a Remote Call Forwarding (RCF) arrangement. RCF allows the donor LEC to permanently forward the customer's telephone number to the telephone number assigned by the recipient

LEC. The customer can continue to use the telephone number he's familiar with, when in reality another telephone number is actually giving him dial tone.

The recipient LEC must send an insert (I) function code transaction record to the DBMS for the new telephone number they have assigned, because that is the telephone number that will now ANI. The recipient LEC must include in that transaction record the donor LEC telephone number that is being forwarded. That donor LEC number must be displayed at the PSAP with the label "ALT#". The recipient LEC must populate that forwarded donor LEC number in the NENA 02-010 Formats and Protocols for Data Exchange reserved field positions:

- Version 1 positions 227-236
- Version 2 positions 356-365
- Version 2.1 positions 377-386
- Version 3 Label, ALT

The DBMSP must attach the label "ALT#" for the ALI display.

- 19.2 The recipient LEC must send the actual ANI from their switch through the network, not the RCF number.
- 19.3 It is required that the donor LEC in an INP process send a disconnect (D) function code transaction record update to the DBMSP upon completion of implementation of INP to the recipient LEC.

## **20. INTERIM NUMBER PORTABILITY (INP) TO LOCAL NUMBER PORTABILITY (LNP) CONVERSION STANDARDS**

- 20.1 It is expected that cooperative efforts occur between LEC's to successfully manage the INP to LNP conversion process.
- 20.2 Each LEC providing portability must identify and maintain 9-1-1 LNP "points-of-contact" within their company. These contacts must be communicated to interconnecting carriers.
- 20.3 The recipient LEC must send an insert (I) function code transaction record to the DBMSP on the donor LEC's LNP ported number prior to the start of the INP to LNP conversion.
- 20.4 The recipient LEC must send a disconnect (D) function code transaction record to the DBMSP on the telephone number assigned by the recipient LEC after the INP to LNP conversion is completed. *(Caution: If the subscriber chooses to retain the telephone number assigned by the recipient LEC as a stand alone number, the recipient LEC must work to maintain the integrity of the ALI database by deleting reference to the INP number in the ALI record through issuing a change (C) function code transaction record instead of a disconnect*

(D) function code transaction.)

## 21. STANDARDS FOR LOCAL NUMBER PORTABILITY

### 21A. GENERAL LNP STANDARDS

- 21A.1 Allow any authorized company to send end user telephone number records to the appropriate DBMSP for any valid NPA-NXX that has access to 9-1-1.
- 21A.2 It is required that Stand Alone Databases providing 9-1-1 ALI data to areas where LNP is operational, must utilize the unlock and migrate update functions of change and other ALI/LNP data standards to provide consistency across database platforms and SP update processes.
- 21A.3 Adopt the use of the NENA ID on all transactions and include it on all embedded telephone number records in the 9-1-1 database. The telephone number and NENA ID relationship must remain the same until the record is unlocked and migrated or completely disconnected. For these standards to work, a SP providing both wireline and wireless services must have separate NENA IDs. For the purposes of this document fixed wireless service is recognized as wireline service.
- 21A.4 The DBMSP and the SP must work together to modify the embedded telephone numbers to include the 3-5 character NENA ID as referenced in the document “*NENA Company ID Registration Service*” available through the NENA National office.
- 21A.5 Where SP and data provider are the same, the SP identified by NPAC/LSMS/IVR validation, upon completion of porting, is responsible for accurate representation of their end user telephone number record in the 9-1-1 DBMS database. Where they differ; e.g. PS911 records, UNE & resold TNs, the data provider is responsible for the accuracy of the records. In some systems this may require additional record updates be sent to the DBMS system to correct end user records.
- 21A.6 In an LNP environment using the Location Routing Number (LRN) managed by a Number Portability Administration Center – Service Management System (NPAC-SMS), the recipient SP upon request to port a telephone number, notifies the donor SP using the industry standard Local Service Request (LSR) form. This allows for appropriate Function of Change code to be sent by the donor SP to the 911 database as defined by NPDI standard.
- 21A.7 Create two (2) additional function codes for *NENA-02-010, NENA Formats for Data Exchange* to assure data integrity:

U - The "U" function of change code is a time sensitive delete transaction. The sole purpose of the "U" function code is to allow for the temporary retention of the customer ALI record during the initial transition from one service provider using static ALI to another.

If an "M" function of change is not received prior to expiration the unlocked ALI record is removed from the DBMS/ALI. The unlocked ALI record expires as required in section 21C.

M -Inward (migration) function transaction record sent by the recipient SP. This transaction requires an "unlocked" record in the 9-1-1 database and must replace the customer information and the NENA ID on the "unlocked" record. The "M" function code does not require a match of NENA ID.

- 21A.8 It is required that the service orders be completed on the date (completion date) the porting activities occur. It is required that upon order completion, the unlock (U) function code transaction record be sent by the donor SP and the migrate (M) function code transaction record be sent by the recipient SP to the DBMSP. (Refer to NPDI standard.)
- 21A.9 The recipient SP must send a complete telephone number transaction record to migrate the end user's service, not just the telephone number and NENA ID.
- 21A.10 When the End User Move Indicator (EUMI) is "Yes" on the LSR, the affected SPs will provide the following information:
- a. The donor SP must provide a delete (D) function code transaction record
  - b. The recipient SP must provide an Insert (I) function code transaction record to the DBMS
- 21A.11 The following edits for the C and D function codes in the NENA-02-010, *NENA Formats for Data Exchange* for transactions are in addition to any existing edits:
- C - Create error conditions if NENA ID does not match between the embedded telephone number record in the 9-1-1 database and an update transaction record.
- D - Create error conditions if NENA ID does not match between the embedded telephone number record in the 9-1-1 database and the delete transaction record.
- 21A.12 It is expected that cooperative efforts occur between SPs to resolve all error conditions in a timely manner. Each SP must assure that all internal LNP processes have been completed and the telephone number is actually ported, prior to calling the other SP for assistance.
- 21A.13 Each SP providing portability must identify and maintain 9-1-1 LNP "points-of-contact" within their company. These contacts must be communicated to interconnecting carriers and DBMS providers.

21A.14 During porting, it is the responsibility of the recipient company to care for the final disposition of all the TN records being ported. If there are telephone numbers that have been ported that will no longer deliver ANI, then the recipient company must generate the migrate and the delete.

21A.15 Each affected SP shall identify what causes missing or delayed unlock (U) or migrate (M) function code transaction records to occur and resolve the record conditions within their company.

21A.16 When a donor SP is porting out a portion of numbers on a customer's account, and that portion includes the Pilot telephone number on an account, the donor SP must address the loss of the Pilot number and assure that only telephone numbers that are porting are unlocked.

When telephone number (TN) records are entered into the 911 database, each TN that can be presented as ANI to 911 shall be entered as a separate TN record. The main telephone number shall be included on the 9-1-1 record when applicable.

21A.17 Once a telephone number has been ported any subsequent moves, changes or disconnects shall be submitted using the standard function codes of Change or Delete. The only time porting function codes of unlock or migrate are utilized is when porting is actually in progress.

21A.18 Number Portability Administration Center (NPAC)/Local Exchange Routing Guide (LERG) Validation – a mechanized (preferred) or manual method for comparing DBMS Unlock & Migrate records against the NPAC DB, which drives actual switch porting activities, in order to determine the network owner of record of the ported or pooled TN. If the TN is not ported or pooled, query the LERG to determine the ownership of the NXX code. Note: Network owner is defined in the LERG by LRN or OCN associated with the TN; and in NPAC by the LRN associated with the TN.

## 21B. RESOLUTION OF FAILED MIGRATES

21B.1 E911 Database Providers shall compare “failed migrates” to the NPAC (or LSMS database) at a minimum of once each business day. When the NPAC is accessed and a condition of “Record Does Not Exist” is displayed for the TN being queried, then the TN is not pooled or ported. If the “record does not exist” in NPAC, the LERG shall also be checked on a daily basis to determine the identity of the Service Provider.  
(see NPAC/LERG validation definition in Section 22A.18, or in the Master Glossary.)

- a. If the NPAC SP owner is the company submitting the Migrate, the current E911 DBMS record shall be unlocked without donor company participation and the (M) migrate

record processed. Both the Donor Company and the Recipient Company are sent notification of the DBMS actions taken.

- b. If the NPAC SP owner is the company whose NENA ID is on the DBMS record, the (M) migrate record shall be placed in an error status and/or in a waiting file. During the mechanized migrate recycle period of 10 days, the NPAC database shall be referenced daily to determine if the record has been activated by the Recipient Company. If so, the record shall be unlocked and the (M) migrate record processed. If, at the end of ten (10) days, the NPAC database shows ownership remains with the company whose NENA ID is on the DBMS record, the (M) migrate record shall be deleted. Only the Company that sent the migrate record is sent notification of the actions taken.
- c. If the NPAC database shows the owner is neither the company submitting the Migrate nor the Donor Company, the (M) migrate record shall be placed in an error status and/or in a waiting file. During the mechanized migrate recycle period of 10 days, the NPAC database shall be referenced at a minimum once each business day to determine if the record has been activated by the company submitting the Migrate. If so, the (M) migrate record shall be processed as described in 22B.1.a. If, at the end of the ten (10) days, the NPAC database shows ownership remains with a SP that is not the company submitting the Migrate, the (M) migrate record shall be deleted. The company that sent the migrate record is sent notification of this activity.
- d. If the E911 DBMS receives a Migrate for a record that does not exist, the DBMSP shall NPAC validate the telephone number using the NPAC/LERG validation process reference in 22A.18:
  - If the submitting company is the owner of the TN according to NPAC/LERG validation, the DBMSP shall change the FOC from M to I, and process the record.
  - If the submitting company is not the NPAC/LERG owner, the DBMSP will validate the number daily for 10 days. If during the 10 day period, the submitting company becomes the NPAC/LERG owner of the TN, the DBMSP will process as above. If after 10 days, the submitting company is not the NPAC/LERG owner, the DBMSP will send a report that the Migrate has been deleted to the submitting company.
- e. The reports referenced above should be provided no less than weekly. The above actions shall in no way absolve the Donor Company of their responsibility for following normal procedures for submitting (U) unlock or (D) delete records.

**In Canada, the above standards do not apply.**

- 21B.2 If an (I) insert record is received by the E911 DBMS and a record already exists and is locked to a different SP, the 911 DBMSP shall compare the Insert to the NPAC DB (or LSMS DB) at a minimum of once each business day to determine if the record has been activated by the company submitting the Insert. When the NPAC is accessed and a condition of “Record Does Not Exist” is displayed for the TN being queried, then the TN is not pooled or ported. If the “record does not exist” in NPAC, the LERG shall also be

checked on a daily basis to determine the identity of the Service Provider.  
(See NPAC/LERG validation definition in Section 22A.18, or in the Master Glossary.)

- a. If the NPAC SP owner is the company submitting the Insert, the current record shall be unlocked without donor company participation, the Insert changed to a Migrate, and the Migrate record processed. Both the donor company and the recipient company shall be notified of the DBMS actions taken.
- b. If the NPAC SP owner is the same as the owner of the record in the 911 DBMS, the Insert record shall be placed in error status and/or in a waiting file. In a mechanized environment, each business day the DBMSP will reference the NPAC to determine if the telephone number has been activated by the company sending the Insert. If so, the record in the DBMS shall be unlocked, the Insert changed to a Migrate, and the Migrate record processed. If, at the end of the 10-day period, the NPAC SP ownership remains with the company whose NENA ID is on the record in the DBMS, the Insert record shall be deleted. The company who sent the insert record is sent notification of this activity.
- c. If the NPAC database shows the owner is neither the company submitting the Insert nor the company who NENA ID is on the record in the DBMS, the (I) Insert record shall be placed in an error status and/or in a waiting file. During the mechanized recycle period, the NPAC database shall be referenced at a minimum once each business day to determine if the record has been activated by the company submitting the Insert as described in 22B.2.a. If so, the (I) Insert record shall be processed as a Migrate. If, at the end of the ten (10) days, the NPAC database shows ownership remains with a SP that is not the company that submitted the Insert, the (I) Insert record shall be deleted. The company that sent the Insert record is sent notification of this activity. The NPAC identified SP is responsible for assuring the update information is correct for the telephone number in question.
- d. When an insert (I) is received by the DBMSP for a record that is in an unlocked condition, the DBMSP shall automatically change the FOC to Migrate and process the record. No validation of NPAC/LERG is necessary if the record in the database is unlocked.

21B.3 Until the DBMSP has implemented standards 22B.1 and 22B.2 the following standards must be complied with:

- a. The DBMSP shall make an exception report(s) available on a daily basis to the donor SP if their embedded telephone number records are in an unlocked state. The Donor SP is responsible to identify and refer these unlock exceptions to the Recipient SP to Migrate. If the Recipient SP does not issue Migrate records within 7 days, written notification

shall be sent to the Recipient SP with potential escalation to the appropriate regulatory authorities.

- b. The DBMSP shall reprocess all migrate (M) function code transaction records that did not successfully process because the record is still locked one time each business day for a minimum of three (3) additional business days. Migrate (M) function code transaction records needing to be reprocessed by the DBMS shall generate an informational error. If the final migrate (M) function code transaction update attempt fails, the transaction must be treated as an error. The NENA ID of the locked telephone number record in the DBMS shall be identified in the error record.
- c. It is preferable that the DBMSP change a record with a migrate (M) function code to an insert (I) function code when there is no existing telephone number record in the DBMS database.
- d. The recipient SP shall be responsible for successful resolution of all migrated (M) function code transaction records produced by their company which have not processed due to the unlock (U) function code transaction record not being generated by the donor LEC. It is desirable that written notification be sent to the donor SP with potential escalation to the appropriate jurisdictional/regulatory authorities.
- e. The DBMS administrator shall never re-lock a record previously unlocked by a donor SP. The donor SP can re-lock its own unlocked records, only if it is determined that the end-user is still a customer of the donor SP. If the donor SP relocks the embedded record, the migrate (M) function code transaction record shall be used.

## 21C. EXPIRED UNLOCK RECORDS

21C.1 The Unlock function code expires after 10 business days, at which time the Unlocked TN record in the DBMS and ALI databases will be removed.

21C.2 E911 Database SPs must compare all unlock records that have expired and been removed from their respective E911 databases to the NPAC (LSMS) / LERG databases. If the LSMS database is used, it must mirror the information found in the NPAC database. The SPID found in the NPAC database for each expired unlock record must be translated to the appropriate NENA ID with results as follows:

- a. The NPAC/LERG database shows the TN belongs to a SP that submits ALI updates, TN file is created of these records and sorted by the NENA ID. This file will be sent to the recipient company identified as the SP for the expired unlock record(s).

- b. No file is generated if the NPAC/LERG database shows the TN belongs to a SP that is not required to submit updates to the DBMS/ALI database (e.g. wireless, nomadic VoIP etc).
- c. Upon request from an authorized 911 database stakeholder, the DBMSP shall create a statistical report identifying the expired unlocks that have been deleted, broken down by recipient company's NENA ID (as identified via the above NPAC and LERG compare processes).

### 21C.3 VoIP Testing Scenarios

Wireline to VoIP using ALI (assuming that interconnection testing has been done)

- Verify that unlock and migrate processed correctly
- NENA Company ID and 24/7 number are correct in IVR and NENA Company ID database, respectively (should be VSP ID)

VoIP using ALI to wireline (assuming that interconnection testing has been done)

- Verify that unlock and migrate processed correctly; verify that the VOIP carrier sends an unlock instead of a delete.
- NENA Company ID and 24/7 number are correct in IVR and NENA Company ID database, respectively

Wireline to VoIP using VPC (assumes ESQK/VPC testing has been done)

- Verify that delete processed correctly; verify that the wireline company sends a delete.
- NENA Company ID and 24/7 number are correct in IVR and NENA Company ID database, respectively

VoIP using VPC to wireline (assuming that interconnection testing has been done)

- Verify that insert processed correctly.
- NENA Company ID and 24/7 number are correct in IVR and NENA Company ID database, respectively

Wireless to VoIP using ALI (assuming that interconnection testing has been done)

- Verify that insert processed correctly.
- NENA Company ID and 24/7 number are correct in IVR and NENA Company ID database, respectively

VoIP using ALI to wireless

- Verify that delete processed correctly; verify that VoIP company sends a delete.

- NENA Company ID and 24/7 number are correct in IVR and NENA Company ID database, respectively

Wireless to VoIP using VPC

- No DB activity
- NENA Company ID and 24/7 number are correct in IVR and NENA Company ID database, respectively

VoIP using VPC to wireless

- No DB activity
- NENA Company ID and 24/7 number are correct in IVR and NENA Company ID database, respectively

VoIP using ALI to VoIP using VPC (assuming ESQK testing has been completed)

- Verify that delete processed correctly; verify that VoIP company sends a delete.
- NENA Company ID and 24/7 number are correct in IVR and NENA Company ID database, respectively

VoIP using VPC to VoIP using VPC

- No DB activity
- NENA Company ID and 24/7 number are correct in IVR and NENA Company ID database, respectively

VoIP using VPC to VoIP using ALI

- Verify that insert processed correctly (verify that VoIP sent insert).
- NENA Company ID and 24/7 number are correct in IVR and NENA Company ID database, respectively

VoIP using ALI to VoIP using ALI

- Verify that unlock and migrate processed correctly
- NENA Company ID and 24/7 number are correct in IVR and NENA Company ID database, respectively

*Note – callback testing should have been done as part of interconnection testing; not required in these test plans unless it hasn't been done. If interconnection testing has not been done the following steps must be taken:*

- Schedule test with agencies prior to test date
- Ensure correct PSAP receives the 911 call

- Ensure correct information displays – *itemize what elements should be verified and what data they should contain, e.g. name, address, ELT for ESN. NENA Company ID should contain VSP ID.*
- Call back to the number is completed
- PSAP transfer works and correct data displays
- Ensure that ESQs point to correct ESN to route to the right PSAP

*Important – be sure that NENA Company ID returned from the V-E2 response is the VSP ID and that it is displayed correctly on the PSAP screen.*

## 21D. WIRELINE/WIRELESS PORTING

21D.1 Wireline to Wireless porting: The Donor Wireline SP must send delete (D) function code transaction records to the DBMSP to remove the wireline database record.

21D.2 Wireless to Wireline porting: The Recipient Wireline SP may send either migrate (M) function code transaction records or insert (I) function code transaction records or to the DBMSP to establish the E911 database record. If the migrate (M) function code is used, it is preferable that the DBMSP change a record with a migrate (M) function code to an insert (I) function code when there is no existing unlocked (U) telephone number record in the DBMS database to be migrated for the telephone number being ported.

### 21D.3 NPDI Standard

In the interest of Public Safety, the National Emergency Number Association (NENA) standard requires that when service is ported to another service provider, the Number Portability Direction Indicator (NPDI) field on the Local Service Request (LSR) be populated with one of the following OBF-sanctioned values:

A = No record update to the 911 database

- Wireless to Wireless
- VoIP using VPC Database to Wireless
- Wireless to VoIP using VPC Database
- VoIP using VPC Database to VoIP using VPC Database

B = “Insert” Function Code adding wireline TN record to 911 database

- Wireless **TO** Wireline
- VoIP using VPC Database to Wireline
- VoIP using VPC Database to VoIP using ALI Database
- Wireless to VoIP using ALI Database

C = “Delete” Function Code eliminating wireline TN record from 911 database

- Wireline **TO** Wireless
- Wireline to VoIP using VPC Database
- VoIP using ALI Database to VoIP using VPC Database
- VoIP using ALI Database to Wireless

D = “Unlock” & “Migrate” Function Code to identify the new Service Provider (SP) NENA ID in the 911 database

- Wireline **TO** Wireline
- Wireline to VoIP using ALI Database
- VoIP using ALI Database to Wireline
- VoIP using ALI Database to VoIP using ALI Database

It is recommended that all Service Providers include this requirement in their Interconnection Agreements with other Service Providers.

\*VPC database contains information for VoIP subscribers that describes current, valid civic addresses defined by MSAG. The address can be updated by the customer when using nomadic VoIP services, or can be inserted by a service provider selling fixed or nomadic VoIP service.

\*The ALI database is the traditional database containing the address of subscribers using wireline service.

21D.4 If the wireless callback number is delivered as ANI, the ALI query owner/routing provider needs to be able to distinguish whether the call is from a wireline or wireless phone, and shall indicate that in the class of service field on the display. If the pANI is sent as ANI, the display is not an issue, since only the information for the pANI will display.

## **22. STANDARDS FOR CONTAMINATED NUMBER POOLING**

22.1 If a decision is made to return an NPA/NXX number block to the number pool administrator, it is required that steps be taken to insure that the integrity of the 9-1-1 DBMS database is upheld.

22.2 It is required that the internal company service order to port the number back to its own switch does not generate any update to the DBMS database. The Telephone Number record in the DBMS database is required to remain exactly the same since the customer name, address, telephone number remains the same and the same NENA ID remains on the record. Therefore, it is required that LEC's be cautious to ensure that no update is sent to the DBMS unless otherwise advised.

## **23. 24 X 7 CONTACT NUMBER WITH THE ALI RESPONSE MESSAGE**

It is desirable that a 24x7 contact telephone number for the facility based SP be included in the ALI Response Message sent to the PSAP. The PSAP must call this 24x7 contact number for assistance with facility-based requests such as call interrupts and trap/traces. This section provides a standard for including the 24x7 contact telephone number under multiple conditions.

### **23.1 24 x 7 with ANI and ALI – Mechanized Version**

It is preferable that the ALI database provider include the Telephone Company 24x7 contact number within the ALI Response Message sent to the PSAP.

The data must be included in the ALI Response Message using the label SPN, for SP Number. The label must be immediately followed by a 10-character alphanumeric data field with one of three values:

- 10 digit Telephone Company 24x7 contact number
- NOT\_FOUND\_ where\_ represents a space
- UNAVAILABL

A field separator character must follow the 10-character data field. Refer to the ALI Response Message format for details of the tag data format.

A value of NOT FOUND shall be used to indicate that the NENA ID within the ALI database record was not found in the NENA ID table/database. It is desirable that the PSAP complete a PSAP inquiry to alert the ALI database provider that a NENA ID entry is missing from the NENA ID table/database and must be investigated. The ALI database provider is required to verify the NENA ID value against the latest NENA ID information found on the NENA web site. If the NENA ID is found on the NENA web site with a 24x7 contact number, the ALI database provider must refresh their internal table/database with the latest information from NENA. If the NENA ID is not found on the NENA web site, the ALI Database provider must identify and contact the appropriate person with that telephone company and request they obtain an official NENA ID and provide their 24x7 contact number.

In both cases, the ALI database provider is required to provide the PSAP with the appropriate action taken to close out the PSAP Inquiry.

A value of UNAVAILABL shall be used to indicate a system problem accessing the NENA ID table/database and the 24x7 contact number could not be determined. A PSAP Inquiry

must NOT be completed in this case. If UNAVAILABLE repeatedly appears in the ALI Response Messages, the PSAP must call the ALI database provider to report the problem. Values of NOT FOUND and UNAVAILABLE are preferable as a positive response and alert the PSAP of the reason the 24x7 contact information was not available. This is preferred over excluding the label SPN within the ALI Response Message, which would not alert the PSAP of possible data or system problems.

**Data Source:**

The ALI database provider must use the NENA ID table as their data source for the 24x7-telephone company contact number.

The NENA ID table may be downloaded from the NENA web site. File and record format specifications are included on the NENA web site.

Each row of the NENA ID table shall include a date stamp to indicate when a specific table entry was last updated. There shall also be a date stamp for the entire table. ALI database providers shall download the most current information from the NENA web site periodically as updates are made to the table.

As ALI Request Messages are processed by the ALI database provider, the NENA ID within the ALI database record must be used to search the NENA ID table for a match. If a match is found the corresponding 24x7 contact number shall be inserted in the ALI Response Message with the label SPN. If no match is found, label SPN shall be followed by NOT\_FOUND\_. If the search cannot be performed, label SPN shall be followed by UNAVAILABLE. It is preferable that either of these two conditions be logged by the ALI database provider and appear on a report for internal investigation.

The NENA ID table must be a reliable data source for the 24x7 contact telephone number. NENA shall validate the 24x7 contact information when a telephone company registers for a NENA ID and during the annual re-registration process.

It is desirable that the NENA Data Sharing Study Group also periodically audits and validates this information during the year. Telephone Companies shall be contacted if the 24x7 contact number is no longer valid. Appropriate updates shall be made to the NENA ID table on the NENA web site.

### 23.2 24x7 with ANI – No ALI – Mechanized Version

Handling E911 calls when the PSAP receives ANI but there is no record in the ALI database for the number.

When the PSAP CPE does the ALI Bid and there is not an ALI record in the DBMS, the ALI host computer shall then do a dip/query to a copy of the database file that supports Call Set

Up, which exists today because of LNP. It is the database each central office has to query before it can connect a call if the dialed number is from a NPA/NXX code that has any ported numbers. (Most Central Offices use a copy of the Call Set-Up database, updating as needed. Some Central offices use real time access to the Call Set-Up database. Negotiations with the DBMS will be needed when implementing this process.)

The two possible responses that would come back would be:

- The number is NOT ported – in which case a lookup shall then be done on a list of all NPA/NXX codes that are valid in the DBMS. Number Pooling shall require that the lookup be done at the 1K block level. This file shall contain the SP name and their 24x7 contact number, which could be returned to the PSAP instead of the traditional “Record Not Found” message.
- The number IS ported – The LRN (local routing number) shall be obtained from the Call Set Up Database – the LRN is unique to a specific switch of a specific SP. A query shall be done on the LRN with the SP and appropriate 24x7 contact number being returned. This information shall be displayed at the PSAP instead of the traditional “Record Not Found” message.

It shall be the responsibility of the SPs to know what numbers were being used as LRNs for their switches, and to create & update an ALI record for each LRN that shall contain the appropriate information.

The DBMS system administrator shall maintain a table of valid NPA/NXX codes. The table shall be defined at the thousands block level due to the impact of Telephone Number Pooling. Each table entry shall include the block owner’s Company Name and 24x7 contact number.

### 23.3 24x7 – ESCO (ANI Failure) – Mechanized Version

The PSAP receives an ESCO ANI (ANI Failure in lieu of ANI). The last three digits of the ESCO ANI are the unique ESCO code for the trunk group connecting the SP’s switch to the Selective Routing tandem.

- Each SP is required to create and maintain an ALI record in the database for the ESCO ANI number combinations for all of the ESCO codes associated with the trunk groups for their switches to the SR tandem. These ESCO ALI records shall identify the SP and the appropriate 24x7 number(s) for each of their switches.
- When the PSAP receives a call where an ANI failure occurred, the ALI dip shall be done using the ESCO ANI that is unique for the ESCO code assigned to the dedicated

trunk group connecting that switch to the SR tandem. The query shall result in displaying the ESCO ALI record containing the SP name and 24x7 contact number.

- It shall be the responsibility of the SPs to establish and maintain the ESCO ALI records for all of the ESCO ANI numbers for their ESCO codes and to assure current/accurate NENA ID and 24x7 contact number information is contained within these ESCO ALI records.

#### 23.4 24x7 with ANI/ALI; and ANI with No ALI - Manual Versions

Due to the cost structure for implementing the 24x7 with ANI/ALI and ANI with No ALI – a manual version is also suggested to obtain the 24x7 number for each SP who is implementing LNP.

Calls with ANI/ALI - Using the NENA web page obtain the 24x7 number and NENA ID for each of the SPs that are present in your PSAP territory and for any surrounding areas that you may be the default PSAP. When you receive a 911 call with ANI/ALI you shall have the NENA ID on your ALI screen, reference the NENA list for the appropriate 24x7 contact number for the SP.

Calls with no ALI – use the NeuStar IVR (formally known as Lockheed Martin IVR) – (to register with NeuStar for IVR access go to: [www.nationalpooling.com](http://www.nationalpooling.com), follow the law enforcement choices through the menus). Once you are registered you may access the IVR and enter the 10 digit phone number, if the number has been ported, the IVR identifies which local SP to call and also gives their 24x7 phone number.

If the number has not been ported refer to the above list you have created off of the NENA web site for the appropriate Incumbent SP for the area to assist in determining the appropriate carrier for the ANI.

(The above two processes (24.4) are excellent backups to the mechanized versions if there would be data link trouble and you would not be able to access the mechanized information.)

## 24. SERVICE PROVIDER GOING OUT-OF-BUSINESS

- 24.1 The E911 DBMS SP shall require written confirmation of the exact date the SP is going out of business.
- 24.2 The SP going out of business must continue to submit transactions to the E911 DBMS SP for transferring and keeping up-to-date customer information as long as the SP remains in service.

- 24.3 The SP going out of business must unlock all remaining 9-1-1 records effective with its termination of service to enable any new SP to migrate the existing 9-1-1 record if the customer ports a TN after wind-down of business.
- 24.4 In the event the SP going out of business does not unlock all remaining records effective with its termination date the E911 DBMS SP shall be authorized to unlock all current SP going out of business records, on the effective date of going out of business. The E911 Data Provider must send written confirmation to the SP going out of business contact that all records were unlocked on the effective date of going out of business.

## 25. GLOBAL CHANGES TO NENA ID

A global change to the Access Infrastructure Provider or Data Provider NENA ID shall be made in the ALI DBMS when one of the following conditions **is** met:

- Non-contaminated NPA/NXX code migration from one carrier to another by NANPA, and as verified in the LERG (all 10,000 TNs ) **OR**
- Non-contaminated NPA/NXX/X pooled block migration from one carrier to another by NANPA, and as verified in the LERG (all 1000 TNs) **OR**
- Entire NENA ID change (from xxxxx to yyyy), as specifically agreed to by all parties.

Note: The recipient company is responsible for the accuracy of the data, including aged errors and stranded unlocks, after the NENA ID is changed.

In addition it **is required** that:

- The new NENA ID must be a registered NENA ID.
- The new NPA/NXX/X must also be transferred to the new owner's SPID in NPAC. If there are multiple NENA IDs assigned to the same SPID, the automated code migration process must be negotiated between the new SP and the ALI DBMSP.
- The request must be sent electronically to the ALI DBMSP. The ALI DBMSP shall convert the records in the database based on the following elements of information:
  - Old NENA ID
  - Authorization of old NENA ID owner, if available
  - New NENA ID
  - Name of Company requesting change
  - Name of person requesting change
  - Title of person requesting change
  - Address
  - Phone Number
  - Email address

- Reason for change
- Description of work being requested
- Negotiated date change shall be executed

Note: For more information on NENA ID, please see NENA ID standard.  
It is required that the request be retained based on the NENA Data Retention Guidelines

## 26. Unbundled Network Elements Platform (UNE-P) – Refer to Exhibit E

Unbundled Basic Service Platform is a combination of unbundled port, unbundled shared transport, and unbundled loops. These platforms shall provide CLEC's with residential and business local exchange service capability. With these platforms, CLEC's shall be able to provide Residence, Business, Centranet, ISDN BRI/PRI, DID/DOD, and Coin services. In addition, by purchasing UNE-P, the CLEC has access to all of the vertical features and functions of the switch, such as caller ID and call waiting.

Unbundled Network Elements (also known as UNE) are a requirement mandated by the Telecommunications Act of 1996. They are the parts of the network that the ILECs are required to offer on an unbundled basis. Together, these parts make up a loop that connects to a DSLAM or a voice switch (or both). The loop allows non-facilities-based telecommunications providers to deliver service without laying network infrastructure (copper/fiber).

DSLAM(Digital Subscriber Line Access Module):  
Networking, hardware: (DSLAM, or Digital Subscriber Line Access Multiplexer) The generic term for the Central Office (CO) equipment where xDSL lines are terminated. The multiple DSL signals may be multiplexed onto a wideband channel such as ATM.

ATM (Asynchronous Transfer Mode) used for both LAN and WAN is a means of digital communications that is capable of very High speeds; suitable for transmission of images or voice or video as well as data;

The matrix below reflects which entity shall be providing daily updates to the 9-1-1 DBMSP:

UNE TYPE	Port Provider (Dial-tone)	Loop Provider	Provide ALI Update to DBMSP
UNE-Platform	ILEC	ILEC	ILEC
UNE-Local Loop	CLEC	ILEC	CLEC
UNE-Port	ILEC	CLEC	ILEC

UNE-Platform: ILEC provides central office and outside plant facilities (loop).

UNE-Local Loop: Dial tone is provided by the CLEC and outside plant facilities (loop) are provided by the ILEC.

UNE-Port: Dial tone is provided by the ILEC and outside plant facilities are provided by the CLEC. On UNE Port, contracts shall say ILEC is required to update 9-1-1 database, BUT CLEC is responsible for advising ILEC of any changes to the TN record within one business day. CLEC shall be liable/responsible for all data, including address provided. ILEC shall be responsible for transmitting the information provided by the CLEC. CLEC shall be responsible for accuracy.

The NENA ID and 800 trouble number used shall be the Access Infrastructure Provider's NENA ID. The Access Infrastructure Provider shall use their NENA ID or create a new unique one. It is understood that only the NENA ID owner can view the TN record in the 9-1-1 database.

## **27. DETERMINING OWNERSHIP OF A TELEPHONE NUMBER**

### INSTRUCTIONS FOR DETERMINING OWNERSHIP OF A PORTED TELEPHONE NUMBER AND TO OBTAINING A LOGIN ID TO NEUSTAR IVR:

- Go to: <http://www.npac.com/>
- At bottom of page click on "Law Enforcement/911 Registration" and complete the form.
- You will receive an email with your PIN, access number, and instructions.

Directions on how to use the IVR can be found at:

<http://www.npac.com/the-npac/access/law-enforcement-agencies-psaps>

### TO DETERMINE OWNERSHIP OF NON-PORTED TNS

- Go to: <http://www.nationalpooling.com>
- Select Reports
- Select Block Report
- Select a State
- Select an NPA
- Select Rate Center (use Select All)

You will receive a list of thousand group's owners. The "X" represents the 1000 block and there is also a column to indicate if the group is contaminated (not all same carrier TNs).

## 28. WIRELESS NO RECORD FOUND REPORTING PROCESS

THIS SECTION HAS BEEN MOVED TO NENA02-015,  
NENA Standards for ANI/ALI Discrepancies and No Record Finds  
for Wireline, Wireless, and VoIP Technologies  
[https://www.nena.org/?page=ani\\_ali\\_discrepancy](https://www.nena.org/?page=ani_ali_discrepancy)

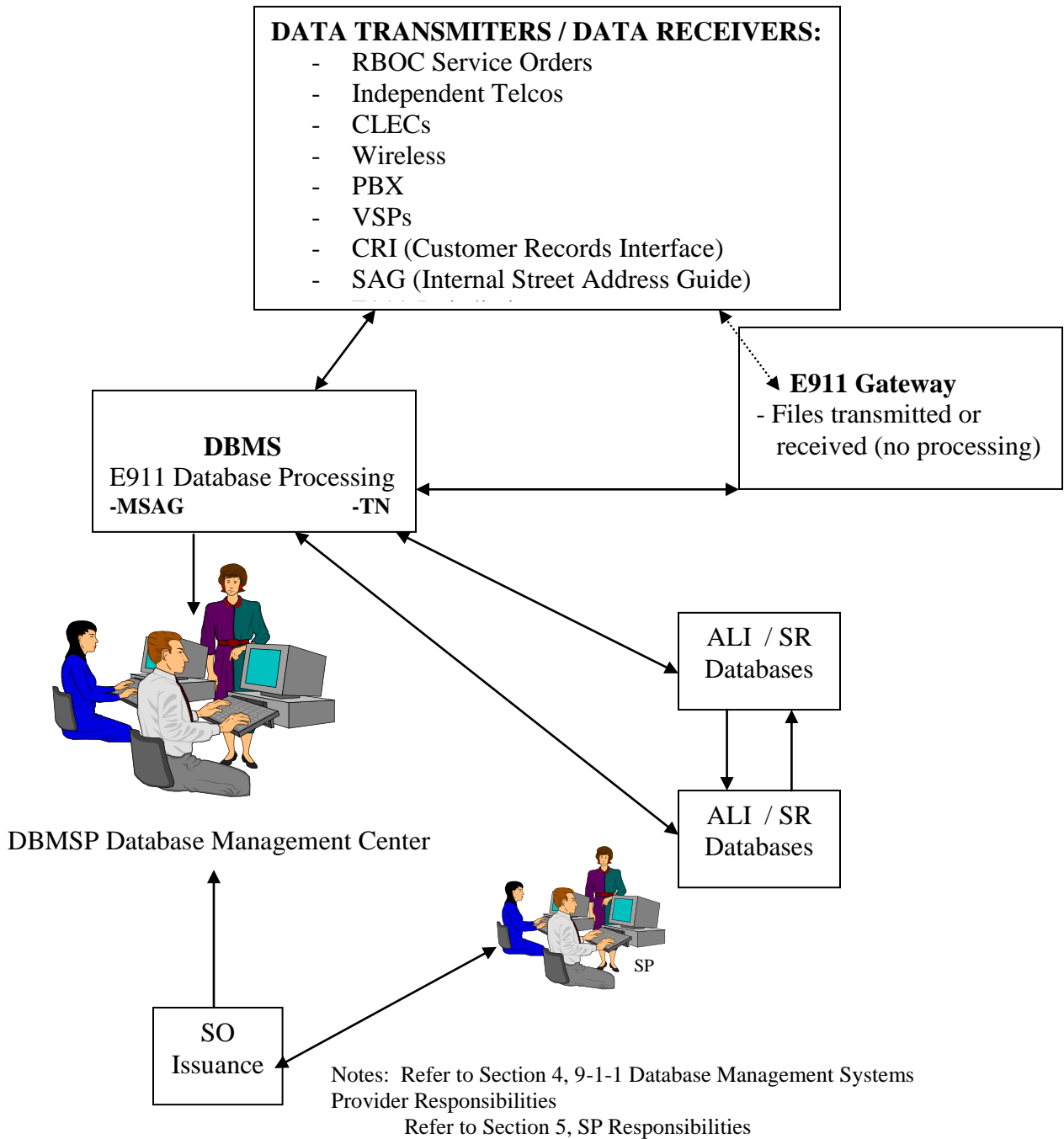
## 99. References

See related standards documents:

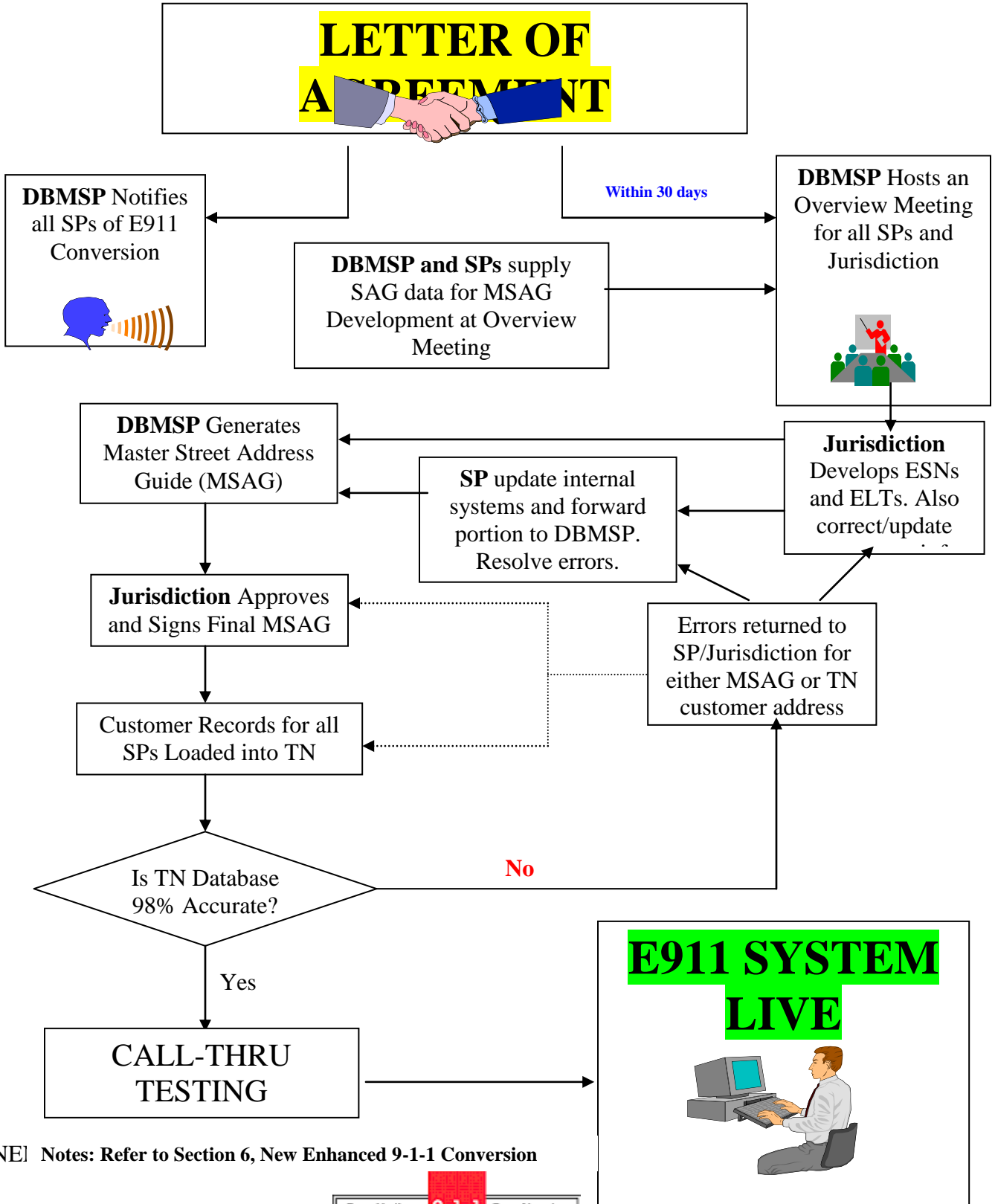
- **NENA 02-010**, NENA Formats and Protocols for Data Exchange
- **NENA 02-013**, NENA Data Standards for the Provisioning and Maintenance of MSAG Files to VDBs and ERDBs
- **NENA 02-014**, NENA GIS Data Collection and Maintenance Standards
- **NENA 02-015**, NENA Standards for Reporting ANI/ALI Discrepancies and No Records Found for Wireline, Wireless and VoIP Technologies
- **NENA 06-001**, NENA Standards for Local SP Interconnection Information Sharing.
- United States Postal Service, Postal Addressing Standards, Publication 28 may be downloaded from: <http://pe.usps.gov/cpim/ftp/pubs/Pub28/pub28.pdf>.
- The Canadian Addressing Guide may be downloaded from the Canada Post / Postes Canada web site at URL :  
English:  
<https://www.canadapost.ca/tools/pg/manual/PGaddress-e.asp>  
French:  
<https://www.canadapost.ca/tools/pg/manual/PGaddress-f.asp>
- NENA E9-1-1 Database Guide
- NENA Address Systems, A Training Guide for 9-1-1

**EXHIBIT A – E911 DATA FLOW**

**E911 Data Sources:** Double headed arrows represent 2-way flow of information

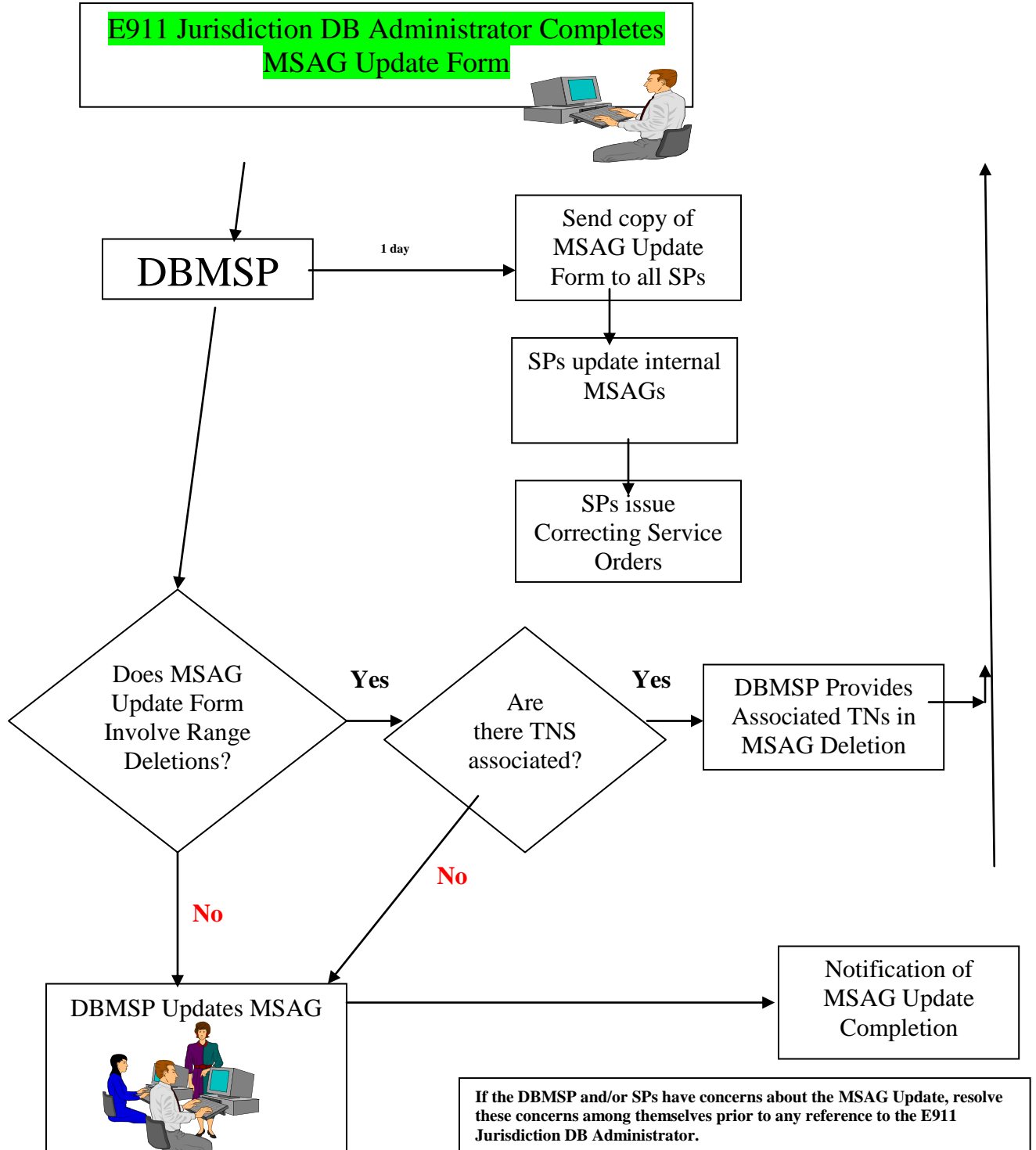


**EXHIBIT B – CONVERSION TO E911**



NEI Notes: Refer to Section 6, New Enhanced 9-1-1 Conversion

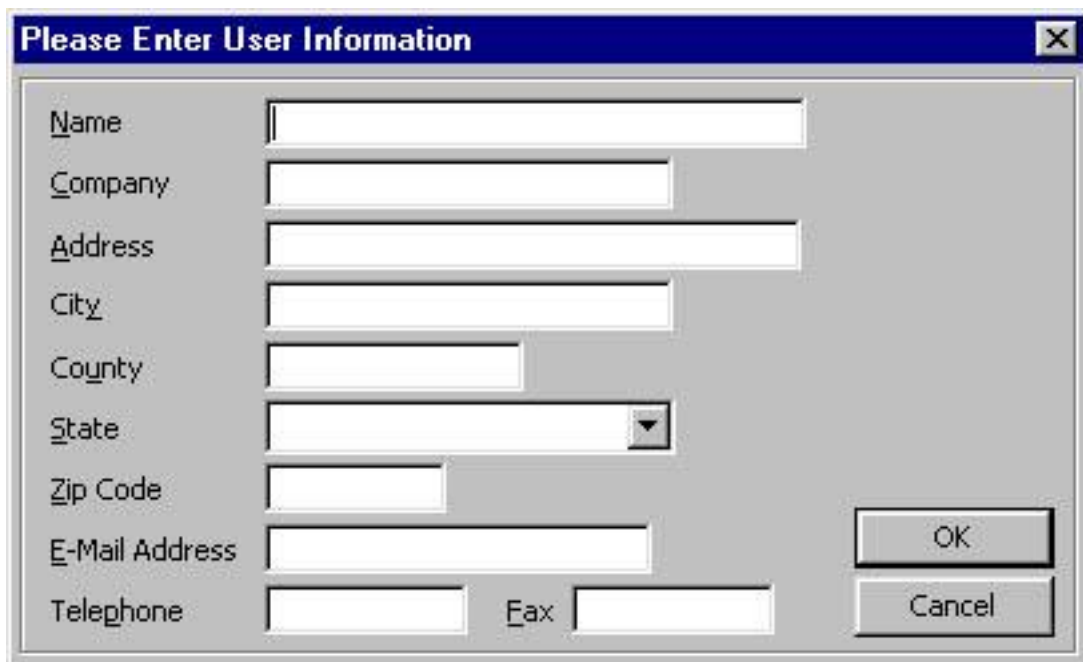
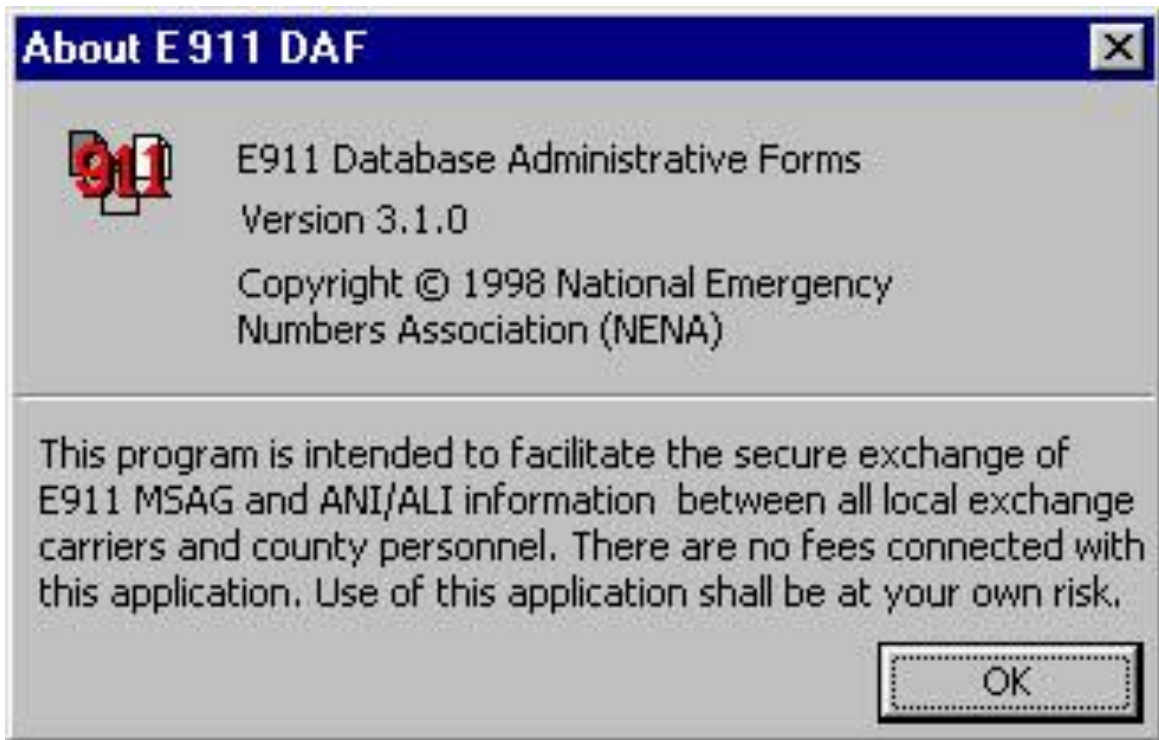
**EXHIBIT C – MSAG MODIFICATION PROCESS FLOW**



Notes: Refer to Section 7.3.2, Government Entities Responsibilities, Maintenance  
 Refer to Section 10, MSAG Modification Process Flow

**EXHIBIT D – 911 DATABASE ADMINISTRATION SOFTWARE**







Untitled - E911 Database Administration Forms

File Edit Tools Help

ANI / ALI Form MSAG Update Form Additional Information

Created 06/09/1998 16:19

Received

Corrected

Forwarded

Customer Name  ESN Number  Company ID Missing

House Number  County ID  No Record Found

Address  See Additional Info.  Mis Route

Location Info.  ANI Failure

Initial Call Company ID Answer PSAP True PSAP

**ALI Screen Display**

Telephone #

Customer Name

House Number

Address

MSAG Comm

Location Info.

ESN Number County ID State

**Correct Customer Data**

Telephone #

Customer Name

House Number

Address

MSAG Comm

Location Info.

ESN Number County ID State

Reason for Discrepancy

1 Record Control Number: DA.GTE.AA.001.01 06/09/1998 16:19

## ANI/ALI FORM

The screenshot shows a software application window titled "Untitled - E911 Database Administration Forms". The window has a menu bar with "File", "Edit", "Tools", and "Help". Below the menu bar is a toolbar with various icons. The main area of the window is divided into several sections:

- Navigation:** "ANI / ALI Form", "MSAG Update Form", and "Additional Information" tabs.
- Metadata:** "Created" (06/09/1998 16:20), "Received", "Corrected", and "Forwarded" fields.
- Update Options:** A group of checkboxes including "Street Name Change", "Exchange or TAR Code Change", "Range Change", "ESN Change", "Odd / Even / Both", "See Additional Information", and "MSAG Community Name".
- Identifiers:** "EXCH", "PSAP ID", and "County ID" fields.
- Address Ranges:** Two side-by-side sections for "Existing Address Range" and "New Address Range". Each section contains fields for "Function", "Prefix Directional", "Street Name", "Street Suffix", "Post Directional", "Low Range", "High Range", "Odd/Even/Both", "TAR Code", "MSAG Community", "Postal Community", "ESN Number", and "State".
- Status Bar:** "1 Record", "Control Number: DA.GTE.MS.001.01", and "06/09/1998 16:20".

## MSAG UPDATE FORM

Untitled - E911 Database Administration Forms

File Edit Tools Help

ANI / ALI Form MSAG Update Form Additional Information

Enter additional information or remarks below to be communicated to either the Service Provider or to the PSAP

1 Record 06/09/1998 16:21

## ADDITIONAL INFORMATION

**EXHIBIT E – CENTRAL OFFICE WITH CO-LOCATION**

