North American Numbering Council (NANC)

Functional Requirements Specification

Number Portability Administration Center (NPAC) Service Management System (SMS)

Version 1.10~~9~~

July 8~~May 13~~, 1998

Related Publications

NPAC SMS Interoperable Interface Specification (IIS), Version 1.109, July 8May 13, 1998.

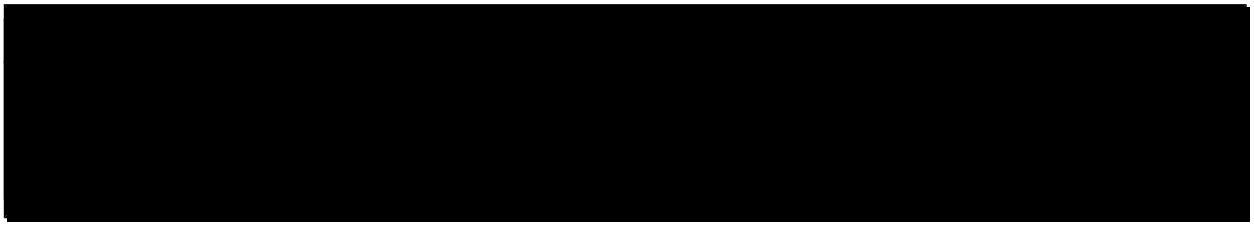
Illinois Commerce Commission Number Portability Administration Center and Service Management System Request for Proposal (ICC NPAC/SMS RFP), February 6, 1996.

Generic Requirements for SCP Application and GTT Function for Number Portability, ICC LNP Workshop SCP Generic Requirements Subcommittee.

Generic Switching and Signaling Requirements for Number Portability, version 1.03, ICC LNP Workshop Switch Generic Requirements Subcommittee, September 4, 1996.

Report on Local Number Portability, Industry Numbering Committee (INC).

FCC 96-286 First Report And Order, CC Docket No. 95-116, July 2, 1996.



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0. Preface

This section describes the organization and typographical conventions used within the document.

0.1 Document Structure

This document is organized into sections as defined below:

Preface	This section describes the document structure, conventions, and references used to develop this document.
Section 1	Introduction - This section introduces the project and describes its scope and objectives, constraints, associated assumptions, and related references.
Section 2	Business Process Flows - This section provides the high level processing flows for the NPAC SMS.
Section 3	NPAC Data Administration - This section provides the high level functional requirements related to the NPAC SMS data relationships.
Section 4	Service Provider Data Administration - This section contains the functional requirements for managing service provider information on the NPAC SMS.
Section 5	Subscription Administration - This section contains the functional requirements associated with managing service provider subscriptions for ported numbers on the NPAC SMS.
Section 6	NPAC SMS Interfaces - This section contains the functional requirements associated with the NPAC SMS external interfaces.
Section 7	Security - This section contains the functional requirements for the NPAC SMS system security.
Section 8	Audit Administration - This section contains the functional requirements for NPAC SMS audit administration.
Section 9	Reports - This section contains the functional requirements for NPAC SMS reporting capabilities.
Section 10	Performance and Reliability - This section contains the functional requirements for NPAC SMS system performance and reliability.
Section 11	Billing - This section contains the functional requirements for NPAC SMS usage recording for usage billing.
Appendix A	This section contains the flow diagrams depicting the NPAC SMS process flows.

Appendix B Glossary - This section provides a description of all acronyms and terms used in this document.

Appendix C System Tunables - This section provides a list of all system tunables and their default values.

0.2 Document Version History

NANC Version 1.0, released on 04/07/97, contains changes from the ICC Subcommittee FRS Version 1.1.5.

NANC Version 1.1, released on 05/08/97, contains changes from the NANC FRS Version 1.0.

NANC Version 1.2, released on 05/25/97, contains changes from the NANC FRS Version 1.1.

NANC Version 1.3, released on 07/09/97, contains changes from the NANC FRS Version 1.2.

NANC Version 1.4, released on 08/08/97, contains changes from the NANC FRS Version 1.3.

NANC Version 1.5, released on 09/09/97, contains changes from the NANC FRS Version 1.4.

NANC Version 1.6, released on 11/12/97, contains changes from the NANC FRS Version 1.5.

NANC Version 1.7, released on 12/12/97, contains changes from the NANC FRS Version 1.6.

NANC Version 1.8, released on 2/11/98, contains changes from the NANC FRS Version 1.7.

NANC Version 1.9, released on 5/13/98, contains changes from the NANC FRS Version 1.8.

~~**NANC Version 1.9, released on 5/13/98, contains the following changes from the NANC FRS Version 1.8:**~~

- ~~**Change Order** NANC 194 – Retry Tunables without Requirements in FRS~~

NANC Version 1.10, released on 7/8/98, contains the following changes from the NANC FRS Version 1.9:

- **Change Order** NANC 209 – Documentation of NPA Split Query Behavior
- **Change Order** NANC 211 – Flow Modification for Failed SP List Updates

0.3 Abbreviations and Notations

To uniquely identify requirements, this document follows a naming convention where the first character is always a letter denoting whether the item is an assumption (A), a constraint (C) or a requirement (R).

In order to identify all NPAC SMS functional requirements this document incorporates information from three sources: the Illinois NPAC SMS RFP, Lockheed Martin's response to the RFP and requirements definition activities performed with the Illinois Number Portability SMS Subcommittee.

Illinois number of requirements has been adopted for the initial release of the NANC document. In Illinois as requirements were deleted the requirement number and an indication of its deletion were left in the document for tracking purposes. NANC has chosen to leave these deleted requirements in this document for the initial release of the document. Further explanation of the numbering scheme follows.

If the second character is the letter "N", the item is a requirement, assumption or a constraint that was stated in the narrative portion of the RFP and not assigned a number. The number following this character identifies the item's section in the RFP/requirements document.

If the second character is the letter "X", the item is a requirement, assumption or a constraint that was added upon award, and **not** in the RFP. These items represent clarifications or enhancements to the RFP. The number following this character identifies the item's section in the RFP/requirements document.

If the second character is the letter "R", the item is a requirement, assumption or a constraint that was identified during requirements analysis and verification activities subsequent to award. These items represent clarifications or enhancements to the RFP. The number following this character identifies the item's section in the RFP/requirements document.

The following labels are used to identify assumptions, constraints, and requirements within the document. Each label begins with the letter A, C, or R followed either by a number or letter illustrated below:

A-<nnn>	Is a label for each assumption in the document. Assumptions are conditions that are expected to be true during the design and implementation phases of the project. This is an assumption that was a numbered assumption in the RFP.
AN-<nnn>	This is an assumption that was contained in the narrative text in the RFP.
AP-<nnn>	This is an assumption that was added upon award.
AR-<nnn>	This is an assumption that was identified as a new assumption for the system, during post-award meetings with the Illinois LCC.
C-<nnn>	Is a label for each constraint within the document. Constraints are conditions that restrict the design and implementation scope of the project. This is a constraint that was a numbered constraint in the RFP.
CN-<nnn>	This is a constraint that was contained in the narrative text in the RFP.
CP-<nnn>	This is a constraint that was added upon award.
CR-<nnn>	This is a constraint that was identified as a new constraint for the system, during post-award meetings with the Illinois LCC.
R-<nnn>	Is a label for each requirement in the document. Requirements define the functionality expected of the design and implementation. This is a requirement that was a numbered requirement in the RFP.
RN-<nnn>	This is a requirement that was contained in the narrative text in the RFP.

RX-<nnn>	This is a requirement that was added upon award.
RR-<nnn>	This is a requirement that was identified as a new requirement for the system, during post-award meetings with the Illinois LCC.

Table 0-1 Notation Key

0.4 Document Language

Specific language is used in the document to denote whether a statement is informative or required. The following words have these connotations when used to describe actions or items:

shall	The use of the term "shall" in this document is intended to precede a required statement. Compliance with "shall" must be demonstrated during design review and system acceptance testing.
is, will, should	Use of the terms "is," "will," or "should" in this document is intended to identify guidance or preference. Statements annotated in this manner are to be treated as informative or preference, but not required. Statements following the words "is," "will," or "should" are not a mandatory deliverable for the final system.

Table 0-2 Language Key

1. Introduction

This document defines the functional requirements of the Number Portability Administration Center Service Management System (NPAC SMS) enabling Service Provider Portability.

This introduction gives readers a brief overview of NPAC SMS functionality. It is intended to prepare you for the detailed sections that follow. If you need more information on any particular area, please consult the applicable detailed sections in the remainder of this document or the *NPAC SMS Interoperable Interface Specification*.

This introduction is also meant to convey the basic course of events that give the best understanding of the system. Alternate courses of events (variants of the basic course or error paths) are described in the detailed sections later in this document and in the *NPAC SMS Interoperable Interface Specification*.

1.1 NPAC SMS Platform Overview

The Number Portability Administration Center Service Management System (NPAC SMS) is a hardware and software platform which contains the database of information required to effect the porting of telephone numbers. In general, the NPAC SMS can receive customer information from both the old and new Service Providers (including the new Location Routing Number), validates the information received, and downloads the new routing information when an "activate" message is received indicating that the customer has been physically connected to the new Service Provider's network. The NPAC SMS also contains a record of all ported numbers and a history file of all transactions relating to the porting of a number. The NPAC SMS shall also provide audit functionality and the ability to transmit LNP routing information to Service Providers to maintain synchronization of Service Provider's network elements that support LNP.

1.2 NPAC SMS Functional Overview

1.2.1 Provisioning Service Functionality

The new Service Provider will obtain authorization to port the customer and notify the old Service Provider according to processes internal to the Service Providers. Both the old and new Service Providers can send a notification to the NPAC SMS from their Service Order Administration Systems (SOA). When the NPAC SMS receives the notification(s), it will perform certain validation checks, and attempt to match the notification received from the new Service Provider with a concurring notification that may be sent from the old Service Provider. Assuming the notifications are valid, the two Service Providers will complete any physical changes required. When the new Service Provider due date is reached, the new Service Provider can send an activation notice to the NPAC SMS. The NPAC SMS will broadcast the update out in real time to each local SMS. Upon receiving the update from the NPAC SMS, all Service Providers will update their networks. The NPAC SMS will record any transmission failures and take the appropriate action.

In the case where either the old or new Service Providers did not send a notification to the NPAC SMS, the NPAC SMS will notify the Service Provider from which it did not receive a notification that it is expecting a notification.

If it then receives the missing notification and the notifications indicate agreement among the Service Providers, the process proceeds as normal. If it still does not receive a notification and if it is the old Service Provider that failed to respond, the NPAC SMS will log the failure to respond and allow the new Service Provider to proceed with activation when the new Service Provider due date is reached. If it was the new Service Provider that failed to respond, the NPAC will log the failure to respond, cancel the notification, and notify both Service Providers of the cancellation. If there is disagreement among the Service Providers as to who will be providing service for the telephone number, the conflict resolution procedures will be implemented (see Section). Processes for obtaining authorization from the customer to port a number are defined by the Service Providers. The NPAC is not involved in obtaining or verifying customer approval to port a TN.

1.2.2 Disconnect Service Functionality

When a ported number is being disconnected, the customer and Service Provider will agree on a date. The current Service Provider will send an update indicating the disconnect to the NPAC SMS. The NPAC SMS will broadcast the update to all Service Providers based on the disconnect effective date and remove the telephone number from its database of ported numbers. Upon receiving the update, all Service Providers will remove the telephone number from their LNP databases. The NPAC SMS will log the update in history. Calls to the telephone number will be routed as a non-ported number.

1.2.3 Repair Service Functionality

A problem will be detected either by a Service Provider or by a customer contacting a Service Provider.

There will be audit capabilities in the NPAC SMS to aid in isolating problems. If an inaccuracy is found, the NPAC SMS will supply the correct data to any local SMS requesting updates.

1.2.4 Conflict Resolution Functionality

If Service Providers disagree on who will serve a particular line number, the NPAC SMS will place the request in the "conflict" state and notify both Service Providers of the conflict status and the Status Change Cause Code. The Service Providers will determine who will serve the customer via internal processes. When a resolution is reached, the NPAC will be notified and will remove the request from the "conflict" state by the new Service Provider. The new Service Provider can cancel the Subscription Version.

1.2.5 Disaster Recovery and Backup Functionality

If there is unplanned downtime, the NPAC will assess how long the primary machine will be down. The NPAC will notify all of the Service Providers of the situation and planned action by electronic notification and telephone calls to the Service Providers' contact numbers. The Service Providers will attempt to switch to the backup NPAC.

1.2.6 Order Cancellation Functionality

If a Create Subscription has been sent by only the new Service Provider, the new Service Provider may send a message to the NPAC SMS to cancel the Subscription Version. If a Create Subscription has been sent by only the old Service Provider, the old Service Provider may send a message to the NPAC SMS to cancel the Subscription Version. If both Service Providers have sent a Create Subscription, either may send a message to the NPAC SMS to

cancel the Subscription Version. If both Service Providers concur with the cancellation, the NPAC SMS will set the Subscription Version to canceled and notify both Service Providers that the Subscription Version has been canceled. If cancellation concurrence is not provided by the new Service Provider the Subscription Version is placed in conflict by the NPAC SMS. If cancellation concurrence is not provided by the old Service Provider, the Subscription Version is set to cancel by the NPAC SMS.

1.2.7 Audit Request Functionality

An audit function will be necessary for troubleshooting customer problems and also as a maintenance process to ensure Subscription Version data integrity across the entire LNP network. Audits will be concerned with the process of comparing the NPAC SMS view of the LNP network's Subscription Version data with one or more of the Service Provider's views of its network. In the case of "on demand" audits, audits may be initiated by any Service Provider who has reason to believe a problem may exist in another Service Provider's network. These audits are executed via queries to the appropriate Service Provider's network, and corrected via downloads to those same networks.

In addition, Local Service Providers will be responsible for comparing database extracts of Subscription data written to an FTP site by the NPAC SMS with their own versions of the same Subscription data.

In a third scenario, the NPAC SMS will select a random sample of active Subscription Versions from its own database, then compare those samples to the representation of that same data in the various Local SMS databases. All three of the methods outlined above are designed to help ensure data integrity across the LNP network.

1.2.8 Report Request Functionality

The NPAC SMS supports report generation for pre-defined and ad-hoc reports. The report generation function creates output report files according to specified format definitions, and distributes reports to output devices as requested. The report distribution service supports distribution to electronic files local/remote printers, e-mail and FAX machines.

1.2.9 Data Management Functionality

The NPAC SMS will support functionality to manage network, Service Provider, and Subscription Version data.

1.2.9.1 NPAC Network Data

The NPAC SMS contains data which defines the configuration of the LNP service and network. This includes such data as: participating Service Providers, NPA-NXXs that are portable, and LRNs associated with each Service Provider.

1.2.9.2 Service Provider Data

The Service Provider data indicates who the LNP Service Providers are and includes location, contact name, security, routing, and network interface information.

1.2.9.3 Subscription Version Data

The subscription data indicates how local number portability should operate to meet subscribers' needs.

1.2.10 NPA-NXX Split Processing

For an impending NPA split, there is no communication between each SOA and the NPAC via an electronic interface (SOA, LSMS, or NPAC Administrative Interface) other than providing the NPAC with the new network data (LRNs and NPA-NXXs), if applicable. The NPAC inputs via the NPAC Administrative Interface the information for the NPA split (the current NPA, the new NPA, and the affected NXXs) plus the beginning and end date of the permissive dialing period. This function of the NPAC Administrative Interface is only available to NPAC Operations personnel. A process will be documented in the M&P document that will define how the NPAC is notified of an impending split. This process should be similar to how the Service Providers are notified of a split today.

NOTE: Split information input will not be allowed if there are any partially failed or sending subscription versions associated with the old NPA-NXXs.

The NPAC modifies all of the subscription versions associated with the split to associate the new TN with the subscription version to support the permissive dialing period. No updates or information is sent over the SOA interface or LSMS interface to indicate that a split is occurring.

During the permissive dialing period the NPAC will accept messages with either old or new NPA but broadcasts/downloads with the new NPA only. In addition, all notifications and responses to the SOA system will contain the new NPA only during the permissive dialing period regardless of whether the SOA system is using the old or new NPA in its requests to the NPAC SMS. If a delete request is received, it is broadcast with the new NPA. The subscription version ID that the NPAC SMS is aware of for the TN is used in the messages.

NOTE: The subscription version ID does not change during a split.

The NPAC will update its subscription version records when permissive dialing ends to the new NPA. Existing records to the old NPA will be modified so that the NPA is set to the new NPA and the field that held the new NPA during the permissive dialing period is deleted. Any records involved in the split will have any references to the old NPA removed. There are no old or new versions created. An NPA split causes a shift of the data, not creation of a new entity. By definition, NPAC SMS will change identity information for the TN when the NPA is changed. This type of a change would require use of the version ID to find the TN and should not be problematic because the NPAC uses the version ID, not the TN to track subscriptions relative to logs and audit data.

It is incumbent on the LSMS's to recognize that a request for data that is log-related may show TN information that was in effect when the log entry was made (if it was copied into the log, most entries are made by reference to subscription version ID, so this should not be problematic). In essence, the NPAC SMS is performing a modification when doing an NPA split that is a special case because:

1. It is a change to what users consider identity information.
2. The modification occurs over the permissive dialing period.
3. NPAC SMS will recognize both identifiers during the permissive period.
4. NPAC SMS will recognize only the new NPA "shortly" after the end of the permissive period (on the day after the end date, NPAC SMS will perform the operation soon after midnight GMT time).

Based on information from the LERG, the service providers will update their networks/LSMS to accommodate the permissive dialing period and will update the data in their networks/LSMS after permissive dialing ends. There is no communication from the NPAC to cause these updates to occur. No assumptions are made about what the LSMS does during the permissive period to track the NPA-NXX split for a subscription version.

After permissive dialing ends, the service providers can remove any old network data that is no longer valid due to the split (LRNs, NPA-NXXs), if any, via an electronic interface (SOA, LSMS, or NPAC Administrative Interface).

1.3 Background

An industry task force was formed in Illinois in April 1995, pursuant to the Illinois Commerce Commission (ICC) Order on Customers First Plan (Docket 94-0096 dated April 7, 1995), to develop a permanent number portability solution for Illinois. During the year, this task force has made significant progress in defining and resolving the issues related to implementing number portability.

1.4 Objective

The target date for LRN implementation is second quarter 1997.

The objective of this document is to uniquely identify the baseline end-user, functional requirements that define the LNP SMS supporting number portability.

1.5 Assumptions

A1-1 Proportional Billing

The Service Providers will be billed in proportion to their usage of the services provided by the NPAC SMS.

AR1-1 Service Provider ID

All NPAC Customers will obtain a unique Service Provider ID from a proper source.

A1-2 Resource Accounting

The resource accounting measurements will not cause degradation in the performance of the basic functions of the NPAC SMS.

AR3-1 Greenwich Mean Time

Specific time of day references in the Functional Requirements Specification are assumed to be in Greenwich Mean Time (GMT).

AN3-4.1 NPA Split Information Source

The service provider responsible for the NPA split communicates NPA Split information to the NPAC.

AR4-1.1 Service Provider ID

All NPAC Customers will obtain a unique Service Provider ID from a proper source.

AR5-1 Active Status

"Active" status refers to Subscription Versions with either an Active or Disconnect Pending status.

AR5-2 Conflict Resolution Tunable due date value

The time used for the conflict restriction tunable calculation relies on the time value specified in the New Service Provider due date.

AR6-1 Range Activations

A range activate will contain an average of 20 TNs.

AR6-2 Percent of Range Activations

20% of all downloads as specified in R6-28.1, R6-28.2, R6-29.1 and R6-29.2 will be processed via range activations.

A8-1 Service Provider Audits Issued Immediately

NPAC SMS will process audit requests from service providers immediately.

AR10-1 Scheduled Downtime

NPAC initiated downtime as defined in R10-5 does not include downtime needed for software release updates initiated by or collectively agreed to by the Service Providers.

A10-1

DELETE

A10-2

DELETE

A10-3

DELETE

A11-2 Accounting Measurements Will Not Degrade the Basic System Performance

The resource accounting measurements will not cause degradation in the performance of the basic functions of the NPAC.

1.6 Constraints

The following constraints shall be adhered to during the development of the software associated with the requirements within this document.

C1-1 Real Time Call Processing

The NPAC SMS is not involved in real time call processing.

C1-2 Service Provider Activity Tracking

The NPAC SMS is not involved in facilitating or tracking Service Provider-to-Service Provider activities.

CN1-1 Service Provider Portability

Initially, only wireline Service Provider portability will be implemented.

CN2-1.1.1 Interactions between Service Providers are beyond the scope of the NPAC SMS

Processes for obtaining authorization from the customer to port a number are defined by the Service Providers. The NPAC is not involved in obtaining or verifying customer authorization. Details of steps in those processes do not involve the NPAC or NPAC SMS, and are beyond the scope of the NPAC SMS functionality.

CN2-1.3.1. Service provider network change activities are beyond the scope of the NPAC SMS

Details of steps in the processes that do not involve the NPAC or NPAC SMS, such as physical changes performed in the Service Provider's networks, are beyond the scope of the NPAC SMS functionality.

CN2-1.4.1 Service provider's internal activities are beyond the scope of this document

Details of steps in the processes that do not involve the NPAC or NPAC SMS, such as physical changes performed in the Service Provider's networks are beyond the scope of this document.

CN2.1.5.1. Service Provider's Network Change Validation Activities Are Beyond The Scope Of The NPAC SMS

Network testing performed by the Service Providers, such as testing of call processing and testing of Service Provider network elements, is beyond the scope of the NPAC SMS.

CN2-1.6.1 Service provider's internal activities are beyond the scope of this document

Details of steps in the processes that do not involve the NPAC or NPAC SMS, such as updates to data performed in the Service Providers network elements are beyond the scope of this document.

CN2-3.3.1 Service provider's repair activities are beyond the scope of the NPAC SMS

Details of steps in the repair processes that do not involve the NPAC or NPAC SMS, such as the customer's notification of problems, the Service Provider's analysis/troubleshooting activities and the Service Provider's repair activities are beyond the scope of the NPAC SMS functionality.

CN2.4.2.1. Service provider's conflict resolution activities are beyond the scope of the SMS NPAC

Details of steps in the processes that do not involve the NPAC or NPAC SMS, such as conflict resolution escalation and arbitration activities are beyond the scope of this document.

CN2-6.1.1 Interactions between Service Providers are beyond the scope of this document

Processes for obtaining authorization from the customer to port a number are defined by the Service Providers. The NPAC is not involved in obtaining or verifying customer authorization. Details of steps in those processes do not involve the NPAC or NPAC SMS, and are beyond the scope of this document.

2. Business Process Flows

The following process flows indicate how the NPAC SMS is used by the Service Providers in business processes associated with number portability. Specific requirements generated by the process flows are included in the appropriate sections later in the document.

The process flows supported by the NPAC SMS are:

- Service Provisioning
- Service Disconnection
- Service Repair
- Conflict and Conflict Resolution
- Disaster Recovery and Backup
- Service Order Cancellation
- Audit Requests
- Report Requests
- Data Administration Requests

2.1 Provision Service Process

This process flow defines the provisioning flow in which a customer ports a telephone number to a new Service Provider. The service provisioning flow activities are shown in Appendix 0, Error: Reference source not found, on page 3Error: Reference source not found.

2.1.1 Service provider-to-service provider activities

The new Service Provider will notify the old Service Provider according to processes internal to the Service Providers.

CN2-1.1.1 Interactions between Service Providers are beyond the scope of the NPAC SMS

Processes for obtaining authorization from the customer to port a number are defined by the Service Providers. The NPAC is not involved in obtaining or verifying customer authorization. Details of steps in those processes do not involve the NPAC or NPAC SMS, and are beyond the scope of the NPAC SMS functionality.

2.1.2 Subscription version creation process

The Subscription Version creation flow activities are shown in Appendix 0, Error: Reference source not found, on page 4Error: Reference source not found.

2.1.2.1 Create Subscription Version

When a number is ported, both the old and new Service Providers can send a notification to the NPAC SMS. The NPAC validates the data for each notification and attempts to match the notification with a concurring notification from the other Service Provider. If a notification is missing from either provider after a tunable time period, the NPAC sends a request for the missing notification. If the data provided with the notification is valid, the NPAC SMS creates a pending Subscription Version and awaits the concurring notification. If the data is invalid, the NPAC SMS reports a specific error to the sender of the data and discards the request.

2.1.2.2 Request missing/late notification

If concurring notification or explicit non-concurrence from the *old* Service Provider is not received, the process flows to process 2.1.3, as illustrated in Appendix 0, Error: Reference source not found, on page 3Error: Reference source not found. If concurring notification or explicit non-concurrence from the *new* Service Provider is not received, the process flows to 2.6 (Cancel).

2.1.2.3 Final Concurrence Notification to Old Service Provider

The NPAC will send a final concurrence notification to the Old Service Provider who did not send a concurring notification.

2.1.3 Service providers perform physical changes

The two Service Providers involved in the number port will coordinate and perform the physical changes to their respective networks.

CN2-1.3.1. Service provider network change activities are beyond the scope of the NPAC SMS

Details of steps in the processes that do not involve the NPAC or NPAC SMS, such as physical changes performed in the Service Provider's networks, are beyond the scope of the NPAC SMS functionality.

2.1.4 NPAC SMS "activate and data download" process

The NPAC network data broadcast download flow is shown in Appendix 0, Flow 2.1.4 NPAC SMS Activate and Data Download Process, on page 5.

2.1.4.1 New Service Provider sends activation to NPAC SMS

The new Service Provider sends an activate notification to the NPAC SMS. If the current date is greater than or equal to the new Service Provider due date, the flow continues. Otherwise, broadcast of the activation is rejected.

2.1.4.2 NPAC SMS broadcasts network data to appropriate Service Providers

Upon receipt of the activation notification, the NPAC SMS broadcasts the network update data in real time to the appropriate Service Providers' Local SMSs.

2.1.4.3 Failure - notify NPAC

If the NPAC SMS does not receive positive acknowledgment of the broadcast from all Service Providers, the NPAC SMS will rebroadcast the network data download to the Service Providers that did not acknowledge the original broadcast. The NPAC SMS will perform the rebroadcast a tunable number of times within a tunable time frame.

2.1.4.4 Initiate repair procedures

If the tunable rebroadcast parameters have been exceeded, the NPAC staff will initiate repair processes with the appropriate Service Providers. The NPAC SMS will send the list of Service Providers associated with each failed or partial failure subscription version to the old and new Service Providers.

2.1.5 Service providers perform network updates

Upon receiving the network data download broadcast from the NPAC SMS, all Service Providers' local SMSs will confirm the receipt of the download broadcast, and update their network elements. The Service Providers may also test their network changes.

CN2-1.5.1. Service Provider's Network Change Validation Activities Are Beyond The Scope Of The NPAC SMS

Network testing performed by the Service Providers, such as testing of call processing and testing of Service Provider network elements, is beyond the scope of the NPAC SMS.

2.2 Disconnect Process

This process flow defines the activities associated with the discontinuance of service for a ported number. The NPAC Disconnect Service flow is shown in Appendix 0, Flow 2.2 NPAC SMS Disconnect Process, on page 6.

2.2.1 Customer notification, Service Provider initial disconnect service order activities

When a ported number is being disconnected, the customer and Service Provider will agree on a date. The Service Provider will send a notification to the NPAC SMS indicating the date of the physical disconnect of the number and, optionally, the date that the disconnect information is to be broadcast to all Local SMSs (the 'effective release date').

2.2.2 NPAC waits for effective release date

The NPAC SMS will send delete actions containing the disconnect information based on the effective release date specified by the Service Provider. If no effective release date is specified on the disconnect request, the NPAC SMS processes the request immediately.

2.2.3 NPAC donor notification

The NPAC SMS will broadcast the effective release date and disconnect date to the donor SOA.

2.2.4 NPAC performs broadcast download of disconnect data

The NPAC SMS will broadcast the disconnect information to all Service Providers. If the broadcast is not acknowledged, the disconnect information will be resent a tunable number of times within a tunable time frame. If the tunable parameters for the collection of responses have been exceeded, the NPAC staff will initiate repair processes with the appropriate Service Providers (Flow 2.3), and send a list of failed Service Providers to the current Service Provider.

2.3 Repair Service Process

This process flow defines the activities performed when a problem is detected either by the NPAC SMS, a Service Provider, or by a customer who contacts a Service Provider. The repair service flow is shown in Appendix 0, Flow 2.3 NPAC SMS Repair Process, on page 7.

2.3.1-A Service provider receives problem notification from customer

2.3.1-B Service provider receives problem notification from another Service Provider

2.3.1-C Service provider receives problem notification from NPAC SMS

2.3.2 Service provider analyzes the problem

If NPAC SMS intervention is needed to resolve the problem, up to three repair actions may be required before repairs can be initiated.

2.3.2-A Subscription data query required

If a Subscription data query is required to initiate the repair, a query is launched to the Local Service Providers.

2.3.2-B Subscription data audit required

If a Subscription data audit is required before the repair can be initiated, an audit is initiated with the local Service Providers.

2.3.2-C Network synchronization required

If network synchronization is required, the process flows to 2.3.5, Request broadcast of subscription data.

2.3.3 Service provider performs repairs

There will be audit capabilities in the NPAC SMS to aid in isolating problems.

CN2-3.3.1 Service provider's repair activities are beyond the scope of the NPAC SMS

Details of steps in the repair processes that do not involve the NPAC or NPAC SMS, such as the customer's notification of problems, the Service Provider's analysis/troubleshooting activities and the Service Provider's repair activities are beyond the scope of the NPAC SMS functionality.

2.3.4 Request broadcast of subscription data

There will be audit capabilities in the NPAC SMS to aid in isolating problems. A Service Provider may request a download of subscription data to assist in the repair process, if necessary.

2.3.5 Broadcast repaired subscription data

If inaccurate routing data is found, the NPAC SMS will broadcast the correct subscription data to any involved Service Provider's networks to correct inaccuracies.

2.4 Conflict Process

This process flow defines the activities performed when Service Providers disagree on who will serve a particular customer. The conflict flow is shown in Appendix 0, Flow 2.4.1 Conflict Process, on page 8.

2.4.1 Subscription version in conflict

A Subscription Version may be put into a conflict state either by the old Service Provider (assuming certain conditions are true), or as a result of a failure to acknowledge a Subscription Version in Cancel-Pending state by the new Service Provider (see Figure A-9 in Appendix 0). Subscription Versions set to either conflict or cancel initiate the creation of an entry in the Subscription Cause Code field identifying the cause of the status change.

2.4.1.1 Cancel-Pending Acknowledgment missing from new Service Provider

If the new Service Provider has not yet acknowledged a Subscription Version in Cancel-Pending state, the Subscription Version is put into Conflict, and the Cause Code is updated accordingly.

2.4.1.2 Old Service Provider requests conflict status

If the old Service Provider requests that a Subscription Version be put in conflict, it must be the first time the request has been made (a request to put a Subscription Version in conflict can only be made once by the old Service Provider), and the request must be received in the NPAC a tunable number of hours prior to 12:00 A.M. of the new Service Provider due date. If either one of these conditions has not been satisfied by the old Service Provider, the Subscription Version cannot be put into conflict.

2.4.1.3 Change of status upon problem notification

Subscription version's conflict status "on" is achieved when a Service Provider notifies NPAC SMS personnel of a disagreement between the new and old Service Providers as to whether or not a TN may be ported. The old Service Provider can only place a "pending" Subscription Version in "conflict" one time.

2.4.1.4 Change of status upon Old Service Provider non-concurrence

A Subscription Version creation with authorization set to "False" from the Old Service Provider causes the NPAC SMS to place the Subscription Version in conflict during the "Create Version" process (2.1.2).

2.4.1.5 Change of status upon New Service Provider non-concurrence

Non-concurrence from the New Service Provider causes the NPAC SMS to cancel the Subscription Version during the "Create Version" process (2.1.2).

2.4.2 New Service Provider coordinates conflict resolution activities

The New and Old Service Providers use internal and inter-company processes to resolve the conflict. If the conflict is resolved, the new Service Provider sets the Subscription Version status to pending. If the conflict is not resolved with the tunable maximum number of days, the NPAC SMS cancels the Subscription Version, and sets the Cause Code for the Subscription Version.

2.4.2.1 Cancel pending notification

The new Service Provider may also cancel the Subscription Version, effectively taking it out of the conflict state. If the Subscription Version was previously in a cancel-pending state **AND** the Service Provider requesting the cancellation did **NOT** provide concurrence for that cancellation request, then that request will be accepted and the Subscription Version will be placed in cancel-pending. Otherwise, the request will be rejected.

CN2.4.2.1. Service provider's conflict resolution activities are beyond the scope of the SMS NPAC

Details of steps in the processes that do not involve the NPAC or NPAC SMS, such as conflict resolution escalation and arbitration activities are beyond the scope of this document.

2.4.3 Subscription version cancellation

If the Subscription Version status has been set to conflict "on" for 30 days [tunable parameter] and no resolution has occurred, the NPAC SMS will cancel the Subscription Version, set the Cause Code for the Subscription Version, and notify both the old and new Service Providers of the cancellation.

2.4.4 Conflict resolved

When both Service Providers agree to resolve the conflict, the new Service Provider will send a request to the NPAC SMS to change the Subscription Version status to pending.

2.5 Disaster Recovery and Backup Process

This process flow defines the backup and restore activities performed by the NPAC and the Service Providers. The disaster recovery flow is shown in Appendix 0, Flow 2.5 NPAC SMS Disaster Recovery Process, on page 9.

2.5.1 NPAC personnel determine downtime requirement

If there is planned downtime for the NPAC SMS, the NPAC SMS will send an electronic notification to the Service Providers' SOAs that includes information on when the downtime will start, how long it will be, and if they will be required to switch to the backup or disaster recovery machine. Downtime is considered planned when the NPAC can provide notification to the Service Providers at least 24 hours in advance.

If there is unplanned downtime, the NPAC will assess how long the primary machine will be down. The NPAC will notify all of the Service Providers by electronic notification and telephone calls to the Service Providers' contact numbers. The notification will describe the situation and the planned action. The Service Providers will attempt to switch to the backup NPAC.

2.5.2 NPAC notifies Service Providers of switch to backup NPAC and start of cutover quiet period

The NPAC Service Providers will switch to the backup or disaster recovery machine as indicated in the notification.

2.5.3 Service providers connect to backup NPAC

The Service Providers must use an alternate connection route to the backup NPAC and establish associations with the backup NPAC application.

2.5.4 Backup NPAC notifies Service Providers of application availability and end of cutover quiet period

When the backup NPAC application and database are on-line, processes will proceed as normal. The backup NPAC application will be at the same version level as the primary NPAC application. The NPAC SMS database will also contain the same routing information as the primary database.

2.5.5 Service providers conduct business using backup NPAC

The Service Provider should continue to process as normal when connected to the backup NPAC. If a Service Provider does use internal processes to request updates to SCPs while waiting to be able to send them to the backup machine, the Service Provider will still resend the updates when the backup NPAC can begin processing them in order to ensure that every Service Provider and the NPAC SMS receive the update.

2.5.6 Backup NPAC notifies Service Providers of switch to primary NPAC and start of cutover quiet period

When the primary machine is brought back up, the backup NPAC will advise the Service Providers of the timing of their switch back to the primary machine. At this time the backup NPAC will stop taking updates.

2.5.7 Service providers reconnect to primary NPAC

The Service Providers re-establish associations with the primary NPAC application using their normal connections.

2.5.8 Primary NPAC notifies Service Providers of availability and end of cutover quiet period

When the primary NPAC is available, NPAC personnel will notify Service Providers of the end of the cutover quiet period.

2.6 Service Order Cancellation Process

This flow defines the process performed when a Service Provider cancels a service order. The service order cancellation flow is shown in Appendix 0, Flow 2.6 Cancellation Process, on page 10.

2.6.1 Service Provider issues service order cancellation

From the time both Service Providers have sent a valid notification of a new Subscription Version to the time the Subscription Version is activated, either Service Provider may send a message to the NPAC SMS to cancel the

Subscription Version. If this occurs, the NPAC SMS will notify both Service Providers that the Subscription Version is in a cancel-pending state.

2.6.2 Service provider cancels an un-concurred Subscription Version

If a Service Provider issues a cancel on a Subscription Version that was created by that Service Provider and not concurred to by the other Service Provider involved in that port, or if the Subscription Version was initiated, then subsequently canceled by the NPAC, the Subscription Version will be canceled immediately and a notification will be sent to both Service Providers.

2.6.3 NPAC requests missing acknowledgment from Service Provider

When notified that a Subscription Version has been set to cancel-pending, both Service Providers must concur by returning a cancel-pending acknowledgment to the NPAC SMS within 18 hours [tunable parameter]. If the NPAC does not receive acknowledgment in the allowable time from one of the Service Providers, a request is sent to that Service Provider for a cancel-pending-acknowledgment. If the missing cancel-pending-acknowledgment is not received within a tunable time frame, the Subscription Version status is set to "conflict" if it is the new Service Provider that failed to acknowledge, but is set to cancel if the old Service Provider failed to acknowledge. In either case, the Cause Code is then set for the Subscription Version, and both Service Providers are then notified of the Subscription Version status change.

2.6.4 NPAC cancels the Subscription Version and notifies both Service Providers

When acknowledgment is received from both Service Providers, within the allowed time frame the NPAC SMS will set the Subscription Version to canceled in its database, update the Cause Code for the Subscription Version, and notify both Service Providers that the Subscription Version has been canceled. All canceled Subscription Versions are purged from the NPAC database after a tunable period.

2.7 Audit Request Process

This process flow defines the activities performed by the NPAC when Service Providers request audits of LNP data. The audit request flow is shown in Appendix 0, Flow 2.7 Audit Process, on page 11.

2.7.1 Service provider requests audit

Any Service Provider can request an audit of another Service Provider's LSMS.

2.7.2 NPAC SMS issues queries to appropriate Service Providers

Upon receipt of an audit request, the NPAC SMS queries the appropriate Service Provider's Local SMS databases.

2.7.3 NPAC SMS compares Subscription Version data

The NPAC SMS compares its own Subscription Version data to the data it finds in the targeted Local SMS Subscription Version databases.

2.7.4 NPAC SMS updates appropriate Local SMS databases

The NPAC SMS updates Subscription Version information in the appropriate Local SMS databases.

2.7.5 NPAC SMS sends report of audit discrepancies to requesting SOA

2.7.6 NPAC SMS sends report of audit results to requesting SOA

2.8 Report Request Process

This process flow defines the activities performed by the NPAC when the Service Providers request report generation and delivery. The report request flow is shown in Appendix 0, Flow 2.8 Report Process, on page 12.

2.8.1 Service provider requests report

2.8.2 NPAC SMS generates report

2.8.3 Report delivered via NPAC Administrative or SOA Low-Tech Interface, Email, electronic file, fax, printer

2.9 Data Administration Requests

This section defines the activities performed by the NPAC when Service Providers make a manual request for data administration.

2.9.1 Service provider requests administration of data by NPAC personnel

Service provider personnel are able to contact NPAC personnel to request data administration activities.

2.9.2 NPAC SMS personnel confirms user's privileges

Before NPAC personnel fulfill the data administration request, they will confirm the user's privileges and validate the request.

2.9.3 NPAC SMS personnel inputs user's request

Upon validation of the request, NPAC personnel will input the request.

2.9.4 NPAC SMS performs user's request

The NPAC SMS processes the request.

2.9.5 NPAC SMS personnel logs request denial if user's privileges are not validated

If the user's privileges are not confirmed, or the request cannot be validated, the NPAC personnel log the activity and end the process.

3. NPAC Data Administration

3.1 Overview

The NPAC SMS manages the ported TN information associated with Service Provider portability for the LNP service. This section describes the high level requirements associated with managing ported telephone numbers from an operations perspective. Figure 3 -1 illustrates the logical data model associated with the data elements for the NPAC SMS, and the relationship between NPAC Customer data and other data tracked or created by the system.

AR3-1 Greenwich Mean Time

Specific time of day references in the Functional Requirements Specification are assumed to be in Greenwich Mean Time (GMT).

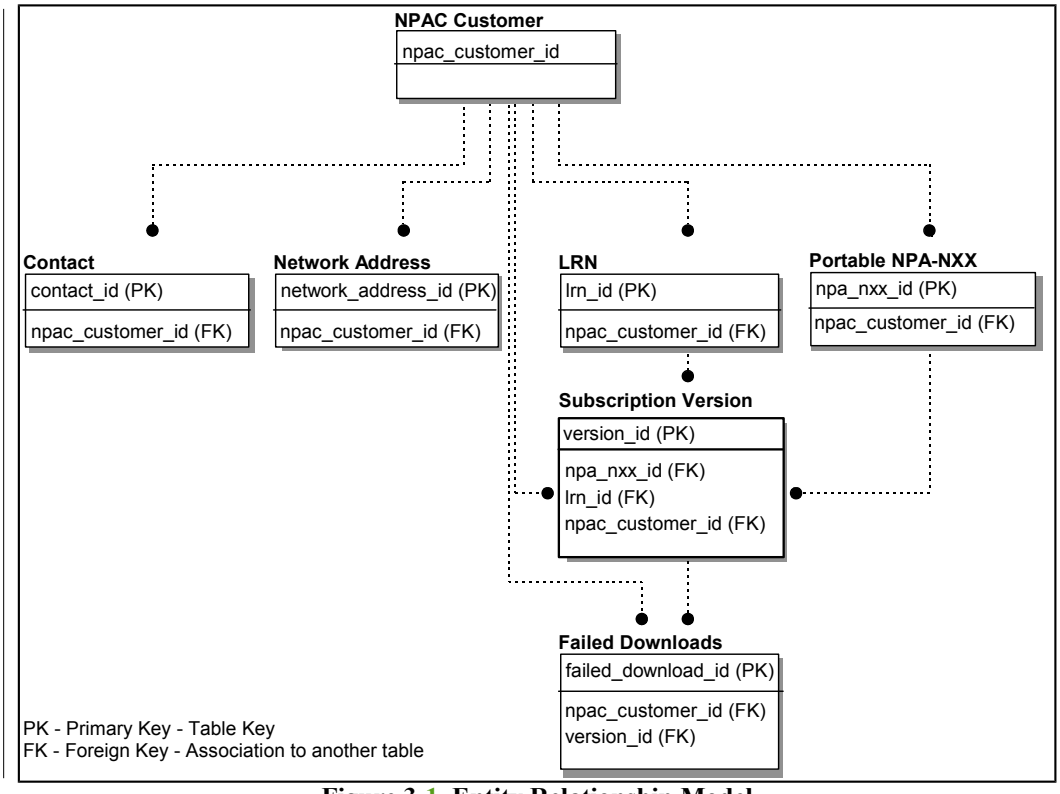


Figure 3-1 Entity Relationship Model

3.1.1 Data Type Legend

The following table describes the data types used in the data models.

DATA TYPE LEGEND	
Data Type	**Description**
Address	Network Address: raw binary data stored as unformatted bytes.
B	Boolean (True or False) indicator.
C	Character or Alphanumeric strings.
E	Enumeration.
M	Bit Mask comprised of one or more bytes.
N	Numeric data (up to 32 bit integer, numeric data that can be arithmetically manipulated).
N(x)	Character string of "x" digits only.
T	Timestamp: month, day, year, hour, minute, and seconds.
TN	Telephone Number: 3-digit NPA, 3-digit NXX, 4-digit Station Number.

Table 3-3 Data Type Legend

3.1.2 NPAC Customer Data

NPAC Customer Data contains information about NPAC customers participating in the LNP service. The data items that need to be administered by NPAC Customer Data Management are represented in Table 3 -4, Table 3 -5, and Table 3 -6.

NOTE: A check in the "Required" column means that this attribute must exist in the record before the record is considered useable.

NPAC CUSTOMER DATA MODEL			
Attribute Name	**Type (Size)**	**Required**	**Description**
NPAC Customer ID	C (4)	√	An alphanumeric code which uniquely identifies an NPAC Customer.
NPAC Customer Name	C (40)	√	A unique NPAC Customer Name.
NPAC Customer Allowable Functions	M	√	Each bit in the mask represents a boolean

NPAC CUSTOMER DATA MODEL			
Attribute Name	**Type (Size)**	**Required**	**Description**
			indicator for the following functional options: • SOA Management • SOA Network Data Management • LSMS Network Data Management • LSMS Data Download • LSMS Queries/Audits

Table 3-4 NPAC Customer Data Model

NPAC CUSTOMER CONTACT DATA MODEL			
Attribute Name	**Type (Size)**	**Required**	**Description**
NPAC Customer Contact ID	N	√	A unique sequential number assigned upon creation of the Contact record.
NPAC Customer ID	C (4)	√	An alphanumeric code which uniquely identifies an NPAC Customer.
Contact Type	C (2)	√	The type of NPAC Customer Contact Organization. Valid values are: • BI - Billing • CF - Conflict Resolution Interface • LI - Local SMS Interface • NC - NPAC Customer • NF - Network and Communications Facilities Interface • OP - Operations • RE - Repair Center Contact Organization • SE - Security • SI - SOA System Interface • UA - User Administration • WI - Web Interface
Contact	C (40)	√	Name of NPAC Customer Contact Organization.
Contact Address Line 1	C (40)	√	Contact Organization address Line 1.

NPAC CUSTOMER CONTACT DATA MODEL			
Attribute Name	**Type (Size)**	**Required**	**Description**
Contact Address Line 2	C (40)	√	Contact Organization address Line 2.
Contact City	C (20)	√	Contact Organization city.
Contact State	C (2)	√	Contact Organization state.
Contact Zip	C (9)	√	Contact Organization zip code or postal code.
Contact Country	C (20)	√	Contact Organization country.
Contact Province	C (2)		Contact Organization province.
Contact Phone	TN	√	Contact Organization phone number.
Contact Fax	TN		Contact Organization Fax phone number.
Contact Pager	TN		Contact Organization Pager phone number.
Contact Pager PIN	C (10)		Contact Organization Pager Personal Identification Number (PIN).
Contact Email	C (60)		Contact Organization E-mail address.

Table 3-5 NPAC Customer Contact Data Model

NPAC CUSTOMER NETWORK ADDRESS DATA MODEL			
Attribute Name	**Type (Size)**	**Required**	**Description**
NPAC Customer Network Address ID	N	√	A unique sequential number assigned upon creation of the Network Address record.
NPAC Customer ID	C (4)	√	An alphanumeric code which uniquely identifies an NPAC Customer.
Network Address Type	C (1)	√	Type of Network Address. Valid values are: • S - SOA interface • L - Local SMS interface
NSAP Address	Address (20)	√	OSI Network Service Access Point Address
TSAP Address	Address (4)	√	OSI Transport Service Access Point Address.
SSAP Address	Address (4)	√	OSI Session Service Access Point Address.
PSAP Address	Address (4)	√	OSI Presentation Service Access Point Address.

NPAC CUSTOMER NETWORK ADDRESS DATA MODEL			
Attribute Name	**Type (Size)**	**Required**	**Description**
Internet Address	Address (12)		Internet address of the Service Provider Web interface.

Table 3-6 NPAC Customer Network Address Data Model

3.1.3 Subscription Version Data

Subscription Version Data consists of information about the ported TNs. The data items that need to be administered by Subscription Version Data Management functions are identified in Table 3 -7Table 3 -7:

SUBSCRIPTION VERSION DATA MODEL			
Attribute Name	**Type (Size)**	**Required**	**Description**
Version ID	N	√	A unique sequential number assigned upon creation of the Subscription Version.
LRN	TN	√	The LRN is an identifier for the switch on which portable NPA-NXXs reside.
Old Service Provider ID	C (4)	√	Old Service Provider ID.
New Service Provider ID	C (4)	√	New Service Provider ID.
TN	TN	√	Subscription Version telephone number.
Local Number Portability Type	E	√	Number Portability Type. Valid enumerated values are: • LSSP - Local Service Provider Portability (0) • LISP - Local Intra-Service Provider Portability (1)

SUBSCRIPTION VERSION DATA MODEL			
Attribute Name	**Type (Size)**	**Required**	**Description**
Status	E	√	Status of the Subscription Version. The default value is P for Pending. Valid enumerated values are: • X - Conflict (0) • A - Active (1) • P - Pending (2) • S - Sending (3) • F - Failed (4) • PF - Partial Failure (5) • DP - Disconnect Pending (6) • O - Old (7) • C - Canceled (8) • CP - Cancel Pending (9)
CLASS DPC	N (9)	√	DPC for 10-digit GTT for CLASS features.
CLASS SSN	N (3)	√	CLASS SSN for the Subscription Version.
LIDB DPC	N (9)	√	DPC for 10-digit GTT for LIDB features.
LIDB SSN	N (3)	√	LIDB SSN for the Subscription Version.
CNAM DPC	N (9)	√	DPC for 10-digit GTT for CNAM features.
CNAM SSN	N (3)	√	CNAM SSN for the Subscription Version.
ISVM DPC	N (9)	√	DPC for 10-digit GTT for ISVM features.
ISVM SSN	N (3)	√	ISVM SSN for the Subscription Version.
New Service Provider Due Date	T	√	The due date planned by the new Service Provider for Subscription Version Transfer.
Old Service Provider Due Date	T	√	The due date planned by the old Service Provider for Subscription Version Transfer.
Old Service Provider Authorization	B		A boolean indicator set by the old Service Provider to indicate authorization or denial of Transfer of Service for the Subscription Version to the new Service Provider.
New Service Provider Create Time Stamp	T		The date and time that the New Service Provider authorized Transfer of Service of the Subscription Version.

SUBSCRIPTION VERSION DATA MODEL			
Attribute Name	**Type (Size)**	**Required**	**Description**
Old Service Provider Authorization Time Stamp	T		The date and time that the old Service Provider authorized Transfer of Service for the Subscription Version.
Activation Request Time Stamp	T		The date and time that the Subscription Version activation request was made by the new Service Provider.
Activation Broadcast Date	T		The date and time that broadcasting began to all local SMS systems for the activation of the Subscription Version.
Activation Broadcast Complete Time Stamp	T		The date and time that at least one Local SMS system successfully acknowledged the broadcast or the retries were exhausted for the activate.
Disconnect Request Time Stamp	T		The date and time that the Subscription Version disconnect request was made by the local Service Provider.
Disconnect Broadcast Time Stamp	T		The date and time that broadcasting began to all local SMS systems for the disconnect of the Subscription Version.
Disconnect Broadcast Complete Time Stamp	T		The date and time that at least one Local SMS system successfully acknowledged the broadcast or the retries were exhausted for the disconnect.
Effective Release Date	T		The date that the Subscription Version is to be deleted from all Local SMS systems.
Customer Disconnect Date	T		The date that the Customer's service was disconnected.
Pre-Cancellation Status	E		Status of the Subscription Version prior to cancellation. Valid enumerated values are: • X - Conflict (0) • P - Pending (2) • DP - Disconnect Pending (6)
Old Service Provider Cancellation Time Stamp	T		The date and time that the Old Service Provider acknowledged that the Subscription Version be canceled.
New Service Provider Cancellation Time Stamp	T		The date and time that the New Service Provider acknowledged that the Subscription Version be canceled.
Cancellation Time Stamp	T		The date and time that the Subscription Version became canceled.
Old Time Stamp	T		The date and time that the Subscription Version became old.
Conflict Time Stamp	T		The date and time that the Subscription Version was last placed in conflict.
Conflict Resolution Time Stamp	T		The date and time that the resolution of a Subscription Version in conflict is acknowledged.

SUBSCRIPTION VERSION DATA MODEL			
Attribute Name	**Type (Size)**	**Required**	**Description**
Create Time Stamp	T	√	The date and time that this Subscription Version record was created.
Modified Time Stamp	T	√	The date and time that this Subscription Version record was last modified. The default value is the Create Time Stamp.
Porting to Original	B	√	A boolean that indicates whether the Subscription Version created is to be ported back to the original Service Provider. The default value is False.
End User Location Value	N (12)		For future use.
End User Location Value Type	N (2)		For future use.
Modify Request Timestamp	T		The date and time that the Subscription Version Modify request was made.
Modify Broadcast Timestamp	T		The date and time that broadcasting began to all local SMS systems for the modification of the Subscription Version.
Modify Broadcast Complete Timestamp	T		The date and time that all local SMS systems successfully acknowledged or the retries were exhausted for the modification of the Subscription Version
Billing ID	C (4)		For future use. The default value is the Facilities Based Service Provider ID.
Status Change Cause Code	N (2)		Used to specify reason for conflict when old Service Provider Authorization is set to False, or to indicate NPAC SMS initiated cancellation. Valid values are: 0 - No value 1 - NPAC SMS Automatic Cancellation 50 - LSR Not Received 51 - FOC Not Issued 52 - Due Date Mismatch 53 - Vacant Number Port 54 - General Conflict - NPAC SMS Automatic Conflict from Cancellation

Table 3-7 Subscription Version Data Model

3.1.4 Network Data

The network data represents the attributes associated with network topology and routing data with respect to local number portability. This information is used by the respective network elements to route ported numbers to the new

termination points. The data items that need to be administered by Network Data Administration functions are identified in Table 3 -8, Table 3 -9, and Table 3 -10:

PORTABLE NPA-NXX DATA MODEL			
Attribute Name	**Type (Size)**	**Required**	**Description**
NPA-NXX Id	N	√	A unique sequential number assigned upon creation of the NPA-NXX record.
NPA-NXX	C (6)	√	The NPA-NXX open for porting.
NPAC Customer ID	C (4)		An alphanumeric code which uniquely identifies an NPAC customer.
NPA-NXX Effective Date	T	√	The date that the NPA-NXX is available for LNP in the NPAC Customer networks.
Split new NPA	C (6)		The new NPA-NXX for an NPA split.
Split Activation Date	T		The date that the new NPA-NXX becomes available for use in an NPA split. This date represents the beginning of the permissive dialing period.
Split Disconnect Date	T		The data that the old NPA-NXX becomes unavailable for use in an NPA split. This date represents the end of the permissive dialing period.
NPA-NXX has been Ported	B	√	A boolean that indicates if any TN within this NPA-NXX has been ported. The default value is false, indicating that no TN within this NPA-NXX has yet been ported.

Table 3-8 Portable NPA-NXX Data Model

LRN DATA MODEL			
Attribute Name	**Type (Size)**	**Required**	**Description**
LRN ID	N	√	A unique sequential number assigned upon creation of the LRN record.
LRN	TN	√	The LRN is the unique identifier for the switch on which the portable NPA-NXXs reside.
NPAC Customer ID	C (4)	√	An alphanumeric code which uniquely identifies an NPAC Customer.

Table 3-9 LRN Data Model

LSMS FILTERED NPA-NXX DATA MODEL			
Attribute Name	**Type (Size)**	**Required**	**Description**
LSMS Filter NPA-NXX ID	N	√	A unique sequential number assigned upon creation of the LSMS Filtered NPA-NXX record.
NPAC Customer ID	C (4)	√	An alphanumeric code that uniquely identifies the LSMS NPAC Customer who is filtering subscription version broadcasts.
NPA-NXX	C (6)	√	The NPA-NXX for which the LSMS is filtering subscription version broadcasts.
Creation Timestamp	T	√	Date the filtered NPA-NXX was created.

Table 3-10 LSMS Filtered NPA-NXX Data Model

3.2 NPAC Personnel Functionality

The following requirements describe the functionality required by the NPAC SMS to support the daily operation of the Regional LNP SMS support staff. These requirements define the high level functionality required by the system with the specifics of each requirement defined in more detail in sections and .

R3-1

DELETE

R3-2

DELETE

R3-3 Create NPA-NXX data for a Service Provider

NPAC SMS shall allow NPAC personnel to create a new LNP NPA-NXX for a Service Provider.

R3-4.1

(Duplicate - refer to R4-1)

R3-4.2

(Duplicate - refer to R4-3)

R3-5

(Duplicate - refer to R4-2)

R3-6.1 Administer mass changes for NPA splits, LRN changes, LIDB changes, CLASS, ISVM and CNAM

NPAC SMS shall allow NPAC personnel to perform NPA splits, LRN, LIDB, CLASS, ISVM and CNAM mass changes that affect multiple Subscription Versions, with version statuses of active, pending, conflict, cancel pending, deferred disconnect or failed.

R3-6.2 Mass Update Filter Usage

NPAC SMS shall, for a mass update request, only send updates for subscription versions that are not filtered on the Local SMS.

R3-7.1 Administer mass changes for one or more Subscription Versions

NPAC SMS shall allow NPAC personnel to select Subscription Versions which match a user defined TN and specify a mass update action to be applied against all Subscription Versions selected (except for Subscription Versions with a status of old, partial failure, sending, or canceled).

R3-7.2 Administer mass changes for one or more Subscription Versions for a TN range

NPAC SMS shall allow NPAC personnel to select Subscription Versions which match a TN range, and specify a mass update action to be applied against all Subscription Versions selected (except for Subscription Versions with a status of old, partial failure, sending, or canceled).

3.3 System Functionality

R3-8 Off-line batch updates for Local SMS Disaster Recovery

NPAC SMS shall support an off-line batch download (via 4mm DAT tape and FTP file download) to mass update Local SMSs with Subscription Versions and Service Provider Network data.

The contents of the batch download are:

- Subscriber data:
  - Version ID
  - TN
  - LRN
  - New Current Service Provider ID
  - Activation Request Timestamp
  - Version Status
  - CLASS DPC
  - CLASS SSN
  - LIDB DPC
  - LIDB SSN
  - ISVM DPC
  - ISVM SSN
  - CNAM DPC
  - CNAM SSN
  - End User Location - Value
  - End User Location - Type

  - Billing ID
  - LNP Type
  - Download Reason
  - Network data:
  - NPAC Customer ID
  - NPAC Customer name
- NPA-NXX-Download Data:
  - NPA-NXX ID
  - NPA-NXX Value
  - NPAC Customer ID
  - Effective TimeStamp
  - Download Reason
- LRN-Download Data:
  - LRN ID
  - LRN Value
  - Download Reason

R3-9 NPAC SMS download of network data to the Local SMS

NPAC SMS shall be able to communicate creation or deletion of NPA-NXX data and LRN data for a Service Provider to Local SMSs.

The contents of the network download are:

- Network data:
  - NPAC Customer ID
  - NPAC Customer Name
- NPA-NXX-Download Data:
  - NPA-NXX ID
  - NPA-NXX Value
  - Effective TimeStamp
  - Download Reason
- LRN-Download Data:
  - LRN ID
  - LRN Value
  - Download Reason

R3-10 NPAC SMS notification of NPA-NXX availability to the Service Providers

NPAC SMS shall inform all Service Providers about the availability of the NPA-NXXs for porting via the NPAC SMS to Local SMS interface or the Web bulletin board. The NPA-NXX data fields sent via the NPAC SMS to Local SMS interface are:

- NPAC Customer ID
- NPAC Customer Name
- NPA-NXX ID
- NPA -NXX Value
- Effective Date
- Download Reason

The NPA-NXX data fields sent to the WEB bulletin board are:

- NPAC Customer ID
- NPAC Customer Name
- NPA-NXX Value

- Effective Date

R3-11 NPAC SMS notification of LRNs and Service Provider data by Service Provider

NPAC SMS shall inform all Service Providers about a new Service Provider and the associated LRNs. NPAC SMS shall post the new Service Providers and/or new LRNs on the Web bulletin board.

The Service Provider data fields sent to the WEB bulletin board are:

- NPAC Customer ID
- NPAC Customer Name
- NPAC Customer Type
- Contact Type
- Contact Name
- Contact Address 1
- Contact Address 2
- Contact City
- Contact State
- Contact Zip
- Contact Province
- Contact Country
- Contact Phone
- Contact Fax
- Contact Pager
- Contact Pager PIN
- Contact Email

The LRN data fields sent to the WEB bulletin board are:

- NPAC Customer ID
- NPAC Customer Name
- LRN Value

R3-12

(Duplicate - refer to R5-18)

R3-13 NPAC SMS mass change update capability to the Local SMS

NPAC SMS shall have the capability to identify all Subscription Versions affected by mass changes, (such as NPA splits), and automatically carry out the required updates to modified data in the Local SMSs.

3.4 Additional Requirements

RX3-1.1.1 Service Provider NPA-NXX Data Addition

NPAC SMS shall allow Service Providers to add their NPA-NXX data via the NPAC SMS to Local SMS interface or the SOA to NPAC SMS interface.

RX3-1.1.2 Service Provider NPA-NXX Data Effective Date Validation

NPAC SMS shall allow Service Providers to add their NPA-NXX data with an effective date that is set to a past, present, or future date.

RX3-1.2 Service Provider LRN Data Addition

NPAC SMS shall allow Service Providers to add their LRN data via the NPAC SMS to Local SMS interface or the SOA to NPAC SMS interface.

RX3-2

DELETE

RX3-3.1 Service Provider NPA-NXX Data Deletion

NPAC SMS shall allow Service Providers to delete their NPA- NXX data via the NPAC SMS to Local SMS interface or the SOA to NPAC SMS interface provided the changes do not cause any updates to the Subscription Versions.

RX3-3.2 Service Provider LRN Data Deletion

NPAC SMS shall allow Service Providers to delete their LRN data via the NPAC SMS to Local SMS interface or the SOA to NPAC SMS interface provided the changes do not cause any updates to the Subscription Versions.

3.5 Requirements Defined in Post-Award Activities

RN3-1 NPA Split Permissive Dialing

NPAC SMS shall support a permissive dialing period, during which dialing of both NPAs is allowed during NPA splits.

RN3-2 NPA split

NPAC SMS shall accept both the old and new NPAs during the permissive dialing period, but will only respond and download with the new NPA-NXX, except for query requests that span NPAs.

RN3-3 NPA Split Permissive Dialing Cleanup

NPAC SMS shall perform an update to remove NPAC SMS mapping of the old NPA-NXX(s) to the new NPA-NXX(s) for Subscription Versions associated with an NPA split after the expiration date of the permissive dialing period.

AN3-4.1 NPA Split Information Source

The service provider responsible for the NPA split communicates NPA Split information to the NPAC.

RN3-4.1 NPA Split – NPA-NXX existence prior to the NPA Split

NPAC SMS shall verify that the new and the old NPA-NXX(s) involved in an NPA Split exist when NPAC personnel enter the split information.

Note: New NPA-NXX(s) will be opened via normal processing prior to the NPA Split.

RN3-4.2 NPA Split - NPA-NXX existence prior to the NPA Split - Error

NPAC SMS shall report an error to NPAC personnel and reject the NPA Split upon determining that the new or old NPA-NXX(s) involved in an NPA Split do not exist when the NPA Split information is entered.

RN3-4.3 NPA Split – NPA-NXX Effective Date Validation

NPAC SMS shall verify that the new NPA-NXX(s) involved in an NPA Split has an effective date equal to the start date of permissive dialing when NPAC personnel enter the NPA Split information.

RN3-4.4 NPA Split – NPA-NXX Effective Date Validation – Error

NPAC SMS shall report an error to NPAC personnel and reject the NPA Split upon determining that a new NPA-NXX involved in an NPA split has an effective date not equal to the start date of permissive dialing.

RN3-4.5 NPA Split – NPA-NXX involved in one NPA Split Validation

NPAC SMS shall verify that the new NPA-NXX(s) involved in an NPA Split are not currently involved in another NPA Split when NPAC personnel enter the NPA split information.

RN3-4.6 NPA Split – NPA-NXX involved in one NPA Split Validation

NPAC SMS shall report an error to NPAC personnel and reject the NPA Split upon determining that a new NPA-NXX involved in an NPA Split is currently involved in another NPA Split.

RN3-4.7 NPA Split – No Active Subscription Versions in the new NPA-NXX

NPA SMS shall verify that there only exist pending, old, conflict, canceled, or cancel pending Subscription Versions in the new NPA-NXX involved in an NPA Split upon entering split information.

RN3-4.8 NPA Split – No Active Subscription Versions in the new NPA-NXX – Error

NPA SMS shall report an error and reject the NPA Split upon determining that there are Subscription Versions with a status other than pending, old, conflict, canceled, or cancel pending in the new NPA-NXX involved in an NPA Split.

RN3-4.9 NPA Split - Prevention of NPA-NXX Deletion

NPAC SMS shall prevent an old or new NPA-NXX involved in an NPA split from being deleted from the network data during permissive dialing.

RN3-4.10 NPA Split - Retention of NPA-NXX(s) involved in an NPA Split

NPAC SMS shall leave the old NPA-NXX(s) involved in a split as valid NPA-NXX(s).

Note: Old NPA-NXX(s) may be deleted via normal processing after the end of permissive dialing.

RN3-4.11 NPA Split - No modification of LRN data

NPAC SMS shall leave the LRN information in Subscription Versions involved in the split unchanged during NPA split processing.

Note: The LRN data if necessary will be changed via mass update.

RN3-4.12 NPA Split – Exception Processing for Subscription Versions that exist in the New and Old NPA-NXX

NPAC SMS shall upon finding a subscription version that exists in the new NPA-NXX that currently exists in the old NPA-NXX during NPA split processing shall do the following and continue processing:

- log an error
- the Subscription Version in the new NPA-NXX will be moved to old if active or to canceled if it is in any pending state.
- the Subscription Version in the old NPA-NXX will be modified to the new NPA-NXX.

RN3-4.13 NPA Split - No Modification of Filter Data

NPAC SMS shall leave filters for NPA-NXX(s) involved in an NPA split unchanged.

Note: Service Providers are responsible for setting filters appropriately.

RN3-4.14 NPA Split – Audit Processing

NPAC SMS shall query the LSMS systems for the new NPA-NXX(s) when an audit is run during the NPA split permissive dialing period.

Note: It is the responsibility of the LSMS to recognize and return the new NPA-NXX in the subscription versions returned.

RN3-4.15 NPA Split – Entering of Split Data

The NPAC SMS shall require the following data for entry of NPA Split information into the NPAC:

- the Service Provider Id
- the old and new NPA
- the affected NXX(s)
- the start date of the permissive dialing period

- the end date of the permissive dialing period

RN3-4.16 NPA Split – Modification of End Date of Permissive Dialing Date

NPAC SMS shall allow the modification of the end of permissive dialing during permissive dialing provided the date is not less than the current date.

RN3-4.17 NPA Split – Removal of NPA-NXX during Permissive Dialing

NPAC SMS shall allow the removal of an NPA-NXX during permissive dialing from the NPA Split information as an NPA-NXX involved in the NPA Split.

RN3-4.18 NPA Split – Removal of NPA-NXX during Permissive Dialing – Subscription Version Processing

NPAC SMS shall upon removal of an NPA-NXX during permissive dialing modify the TN of any subscription versions involved in a split existing in the new NPA-NXX to the old NPA-NXX. This processing includes subscription versions that did not previously exist prior to the NPA Split.

RN3-4.19 NPA Split – Addition of NPA-NXX before or during Permissive Dialing

NPAC SMS shall allow the addition of an NPA-NXX to an NPA Split after the split data is entered. Additional NPA-NXX(s) may be handled by entering a new NPA split into the NPAC SMS.

RN3-4.20 NPA Split – Removal of NPA Split Information prior to NPA Split

NPAC SMS shall allow the removal of pending NPA Split information prior to the start of the permissive dialing period.

RN3-4.21 NPA Split – Removal of NPA Split Information after Permissive Dialing Period End Date

NPAC SMS shall log and remove NPA Split Information from the NPAC SMS at the end of the permissive dialing period.

RN3-4.22 NPA Split – No Broadcast of Subscription Version Modification

NPAC SMS shall broadcast no information to the SOA(s) or LSMS(s) about the creation, modification, or deletion of Subscription Versions due to NPA Split processing on the NPAC SMS.

Note: The LSMS and SOA systems are responsible for creating, deleting, or modify subscription versions due to an NPA Split.

RN3-4.23 NPA Split – Retention of Subscription Version Id

NPAC SMS shall retain the Subscription Version Id of the Subscription Versions involved in an NPA Split.

RN3-4.24 NPA Split - Update of Subscription Versions at the Beginning of Permissive Dialing

NPAC SMS shall update all Subscription Versions with a status other than old or canceled with the new NPA at the beginning of the Permissive Dialing Period.

RN3-4.25 NPA Split - Old NPA-NXX involved in one NPA Split Validation

NPAC SMS shall verify that the old NPA-NXX(s) involved in an NPA Split are not currently involved in another NPA Split when NPAC personnel enter the NPA split information.

RN3-4.26 NPA Split - Old NPA-NXX involved in one NPA Split Validation - Error

NPAC SMS shall report an error to NPAC personnel and reject the NPA Split upon determining that an old NPA-NXX involved in an NPA Split is currently involved in another NPA Split.

RN3-4.27 NPA Split - Validation of the Permissive Dialing Period

NPAC SMS shall verify that the end date of permissive dialing is greater than the start date except in cases were there is no permissive dialing period.

RN3-4.28 NPA Split - Old NPA-NXX and New NPA-NXX Ownership Validation

NPAC SMS shall verify that the owner of the old NPA-NXX matches the owner of the new NPA-NXX for each NXX in a NPA split.

RN3-4.29 NPA Split - Old NPA-NXX and New NPA-NXX Ownership Validation - Error

NPAC SMS shall report an error to NPAC personnel and reject the NPA Split upon determining that the owner of the old NPA-NXX does not match the owner of the new NPA-NXX for each NXX in a NPA split.

RN3-4.30 NPA Split - Creation of a Subscription Version during the Permissive Dialing Period

NPAC SMS shall change the old NPA-NXX to the new NPA-NXX when a Subscription Version is created with the old NPA-NXX during the permissive dialing period.

RN3-4.31 NPA Split Current and Pending NPA Split Report

NPAC SMS shall support a Current and Pending NPA Split Report for NPA Splits before or during their permissive dialing period that contains all split data entered as defined in requirement 15.

RN3-4.32 NPA Split - NPA Split History Report

NPAC SMS shall support a NPA Split History Report for completed NPA Splits that contains all split data entered as defined in requirement 15.

RN3-4.33 NPA Split – Start Time

NPAC SMS shall complete any needed NPA Split Processing or activities by 00:01 CST on the start date of permissive dialing.

RN3-4.34 NPA Split – End Time

NPAC SMS shall end NPA Split permissive dialing at 23:59 CST on the end date of permissive dialing except in cases where there is no permissive dialing period.

RN3-4.35 NPA Split – No Permissive Dialing Period

NPAC SMS shall complete NPA Split Processing in less than 1 minute for NPA Splits that do not have a permissive dialing period on the day of the NPA Split. For example, the start of the permissive dialing period would be at 00:01 CST and would end on or before 00:02 CST.

RR3-1 Service Provider Download Indicator

NPAC SMS shall provide a mechanism for the Service Provider to indicate whether or not they want NPA-NXX data and LRN data downloaded to their Local SMS via the NPAC SMS to Local SMS Interface.

RR3-2 Service Provider Download Indicator Default

NPAC SMS shall download NPA-NXX data and LRN data via the NPAC SMS to Local SMS Interface if the indicator is **ON**.

R3-14 Bulk Database Extracts

NPAC SMS shall periodically perform NPAC SMS database extracts of active Subscription Versions on an NPA-NXX basis to an ASCII file.

R3-15 FTP Site for Database Extracts

NPAC SMS shall store database extract files at the NPAC SMS FTP site for Local SMS file retrieval.

R3-16 Database Extract File Creation

NPAC SMS shall allow NPAC personnel to specify database extract file creation on a weekly, monthly, or quarterly basis.

R3-17 Scope of Database Extract File Creation

NPAC SMS shall allow NPAC personnel to specify an NPA-NXX for database extract file creation.

RR3-3 NPAC SMS Input Restrictions

NPAC SMS shall prevent the entry of pipe characters (|) as part of text strings.

RR3-4 Create LRN data for a Service Provider

NPAC SMS shall allow NPAC personnel to create a new LRN for a service provider.

3.6 Requirements Defined in Change Orders

RR3-5 Create Filtered NPA-NXX for a Local SMS

NPAC SMS shall allow a Service Provider to create a filtered NPA-NXX for a given Local SMS, via the NPAC SMS to Local SMS interface and the SOA to NPAC SMS interface, which results in the SMS broadcasting subscriptions with the filtered NPA-NXX to the Local SMS.

RR3-6 Delete Filtered NPA-NXX for a Local SMS

NPAC SMS shall allow a Service Provider to delete a filtered NPA-NXX for a given Local SMS, via the NPAC SMS to Local SMS interface and the SOA to NPAC SMS interface, which results in the SMS **NOT** broadcasting subscriptions with the filtered NPA-NXX to the given Local SMS.

RR3-7 Query Filtered NPA-NXXs for a Local SMS

NPAC SMS shall allow a Service Provider to query filtered NPA-NXXs for a given Local SMS via the NPAC SMS to Local SMS interface and the SOA to NPAC SMS interface.

RR3-8 Query Filtered NPA-NXXs - NPA-NXX Not Provided

NPAC SMS shall return to the requesting Service Provider all filtered NPA-NXXs for a given Local SMS when the NPA-NXX is **NOT** input upon a Filter NPA-NXX Query via the NPAC SMS to Local SMS interface and the SOA to NPAC SMS interface.

RR3-9 Query Filtered NPA-NXXs - NPA-NXX Provided

NPAC SMS shall return to the requesting Service Provider a single NPA-NXX for a given Local SMS when the NPA-NXX is input upon a filtered NPA-NXX Query via the NPAC SMS to Local SMS interface and the SOA to NPAC SMS interface.

RR3-10 Business Hours and Days

NPAC SMS shall support definition and processing of business hours and days for operations involving business time calculation.

RR3-11 Business Day Definition

NPAC SMS business days shall be Monday through Friday excluding NPAC operations-defined holidays.

RR3-12.1 Business Day Duration - Tunable Parameter

NPAC SMS shall provide a Business Day Duration tunable parameter, which is defined as the number of hours from the tunable business day start time.

RR3-12.2 Business Day Duration - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Business Day Duration tunable parameter.

RR3-12.3 Business Day Duration - Tunable Parameter Default

NPAC SMS shall default the Business Day Duration tunable parameter to 12 hours.

RR3-13.1 Business Day Start Time - Tunable Parameter

NPAC SMS shall provide a Business Day Start Time tunable parameter, which is defined as the start of the business day in Central Standard Time.

RR3-13.2 Business Day Start Time - Tunable Parameter Modification

NPAC SMS shall default the Business Day Start Time tunable parameter to the value specified by the contracting region.

RR3-13.3 Business Day Start Time - Tunable Parameter Default

NPAC SMS shall default the Business Day Start Time tunable parameter to 7:00 AM, Central Standard Time.

RR3-14 Business Holidays

NPAC SMS shall allow NPAC operations personnel to add/delete business holidays.

4. Service Provider Data Administration

4.1 Service Provider Data Administration and Management

Service Provider Data Administration functions allow NPAC personnel to receive and record data needed to identify authorized LNP Service Providers. The Service Provider data indicates who the LNP Service Providers are and includes location, contact name, security, routing, and network interface information.

Service Provider Administration supports functionality to manage Service Provider data. There can be only one instance of Service Provider data for a specific LNP Service Provider.

AR1-1 Service Provider ID

All NPAC Customers will obtain a unique Service Provider ID from a proper source.

4.1.1 User Functionality

R4-1 Create Service Providers

The NPAC SMS shall allow NPAC Personnel to add a Service Provider.

R4-2 Modify Service Providers

NPAC SMS shall allow modification of Service Provider data via the NPAC SMS to Local SMS interface or the SOA to NPAC SMS interface. Service Providers can only modify their own data.

R4-3 Delete Service Providers

NPAC SMS shall allow NPAC personnel to delete a Service Provider.

R4-4 View of Service Provider Data

NPAC SMS shall allow NPAC personnel to view Service Provider data.

R4-5.1 View List of Service Provider Subscriptions

NPAC SMS shall allow NPAC personnel to view a list of Subscription Versions associated with the Service Provider.

R4-5.2 Authorized Service Providers View Their Own Data

NPAC SMS shall allow authorized Service Provider personnel to view their own Service Provider data via the SOA to NPAC SMS interface, the NPAC SMS to Local SMS interface, and the NPAC SOA Low-tech Interface.

RX4-2 Authorized Service Providers Modify Their Own Data

NPAC SMS shall allow authorized Service Provider personnel to modify their own Service Provider data.

RR4-4.1 Broadcast NPAC Customer Names

NPAC SMS shall broadcast all additions, modifications, and deletions of NPAC Customer names via the NPAC SMS to Local SMS interface.

4.1.2 System Functionality

This section describes NPAC SMS functionality required to support the NPAC personnel requests described in the above section. The following specifies user requests and lists the NPAC SMS functionality needed to support those requests.

4.1.2.1 Service Provider Data Creation

NPAC personnel can request that Service Provider data be created in the NPAC SMS. The functionality described below enables a new instance of Service Provider data for a Service Provider to be created, provided that no other Service Provider data exists for the Service Provider.

R4-6 New Service Provider ID

NPAC SMS shall require the following to be entered to identify the Service Provider, when NPAC personnel are creating a new Service Provider:

Service Provider ID - the alphanumeric identifier of the Service Provider. This ID must be unique.

R4-7.1 Examine for Duplicate Service Provider ID

NPAC SMS shall check to see if there is an existing Service Provider with the same Service Provider ID.

R4-7.2 Error notification of Duplicate Service Provider

NPAC SMS shall inform the user that the Service Provider data already exists for the Service Provider, if it does exist, and that the new Service Provider data cannot be created.

R4-8 Service Provider Data Elements

NPAC SMS shall require the following data if there is no existing Service Provider data:

1. Service Provider name, address, phone number, and contact organization.

2. NPAC customer type.

3. Service Provider allowable functions.

4. Service Provider Network Address of NPAC SMS to Local SMS interface.

5. Service Provider Network Address of NPAC SMS to SOA interface.

6. Service Provider Security Contact. Contact data is security data when Contact Type is “SE.”

7. Service Provider Repair contact name and phone number. The default Service Provider Repair Contact and phone number shall be the same as the Service Provider contact and phone number, if the Service Provider Repair Contact information is left blank.

8. Service Provider billing name, address, phone number, and billing contact for NPAC SMS billing. The default for the Service Provider Billing data shall be the same as the Service Provider data, if the Service Provider Billing information is left blank.

9. Service Provider Download Indicator

10. Service Provider Maximum Query

The following data is optional:

- Service Provider Contact Type: SOA Contact, Local SMS, Web, Network Communications, Conflict Resolution, Operations, and User Administration Contact Address Information.

R4-9 Service Provider data validation

NPAC SMS shall validate that all required Service Provider data has been received, after the Service Provider data has been collected.

R4-10 Notification of successful add for new Service Provider

NPAC SMS shall notify NPAC personnel upon successful creation of the new Service Provider.

R4-11 Failure notification of Service Provider creation

NPAC SMS shall issue an appropriate error message upon unsuccessful creation of the new Service Provider.

4.1.2.2 Service Provider Data Modification

NPAC personnel and the SOA to NPAC SMS interface and the NPAC to Local SMS interface can request that Service Provider data be modified in the NPAC SMS. The functionality described below enables the user to modify data for the Service Provider.

R4-12

(Duplicate - refer to R4-2)

R4-13 Service Provider Key selection for modifying Service Provider data

NPAC SMS shall require one of the following data items to identify the Service Provider data to be modified:

Service Provider ID
or
Service Provider Name

The Service Provider ID is required over the SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface.

R4-14 Error notification of invalid Service Provider ID or Name during Modify

NPAC SMS shall issue an appropriate error message to the user if the Service Provider data to be modified does **not** exist.

R4-15.1 Modify restrictions on Service Provider data - Service Providers

NPAC SMS shall allow Service Provider data to be modified or added to the Service Provider data with the exception of the data listed in Table 3 -4.

R4-15.2 Modify restrictions on Service Provider data - NPAC Operations Personnel

NPAC SMS shall allow NPAC Operations personnel to modify the data in Table 3 -4, with the exception of the NPAC Customer ID.

R4-16 Re-validation of Service Provider data after Modify

NPAC SMS shall revalidate that all required Service Provider data is present when a user attempts to submit modified Service Provider data.

R4-17 Modify Validation Error Message

NPAC SMS shall issue an appropriate error message to the user if the Service Provider data fails validation on a modify.

R4-18.1

DELETE

R4-18.2

DELETE

R4-18.3

DELETE

4.1.2.3 Delete Service Provider Data

NPAC personnel can request that the Service Provider data be deleted. Deleted Service Provider data will be written to a history file. The functionality described below enables a user to delete data for the Service Provider.

R4-19

(Duplicate - refer to R4-3)

R4-20 Service Provider key for delete

NPAC SMS shall require the Service Provider ID and/or Service Provider name from the user to identify the Service Provider data to be deleted.

R4-21 Error Message for Delete key search

NPAC SMS shall generate an error message and send it to the request originator, if the Service Provider data does not exist, or if is has already been deleted and exists only in a history file. NPAC SMS will not proceed further with the deletion request.

R4-22.1 No Subscription Versions during Service Provider Delete

NPAC SMS shall perform the deletion of the Service Provider data, notify the user that the deletion request was successful, if there are no affected Subscription Versions, and write the Service Provider data to a history file.

R4-22.2 Subscription during Service Provider Delete

NPAC SMS shall notify the user that the request to delete the Service Provider data cannot be completed until the affected individual Subscription Versions are modified, if affected Subscription Versions are found.

R4-22.3 Service Provider subscription restrictions during Network Data Delete.

NPAC SMS shall determine if there are any Subscription Versions being affected by the NPA-NXX and/or LRN data being deleted.

4.1.3 Service Provider Queries

The query functionality discussed in this section will give users the ability to view Service Provider and Subscription data. A user may not be able to modify a particular data item because they do not have the proper security permissions, therefore the data is made available via NPAC SMS for read-only purposes.

4.1.3.1 User Functionality

R4-23

(Duplicate - refer to R4-5.2)

R4-24.1 Display of Service Provider ID and related subscription data

NPAC SMS shall allow NPAC personnel to view all Subscription Versions associated with a Service Provider ID and/or Service Provider Name.

R4-24.2 Display of LRN and related subscription data

NPAC SMS shall allow NPAC personnel to view all Subscription Versions associated with an LRN.

R4-24.3 Display of NPA-NXX and related subscription data

NPAC SMS shall allow NPAC personnel to view all Subscription Versions associated with an NPA-NXX.

4.1.3.2 System Functionality

The following specifies NPAC SMS functionality needed to support the user requests described above.

4.1.3.2.1 Service Provider Query

R4-25 Service Provider as Key for queries

NPAC SMS shall require the Service Provider ID and/or the Service Provider Name for queries regarding Service Provider data.

R4-26.1 Error message for unknown Service Provider during a query

NPAC SMS shall provide the request originator with a message indicating that there was no data in the NPAC SMS that matched the search keys for a Service Provider query, if no match was found.

R4-26.2 Results returned to Service Provider during a query

NPAC SMS shall return all Service Provider data associated with the Service Provider ID and/or Service Provider Name, as listed in Tables 3-1, 3-2, and 3-3, if the Service Provider data matches the query criteria. Service Providers are only allowed to query their own data.

R4-27 Service Provider Query Types

NPAC SMS shall receive the Service Provider ID, a request to view subscription data, and optionally the subscription data status types to be returned (e.g., active only, active or pending) for queries regarding subscription data for a specific Service Provider.

R4-28 Service Provider Information Message during query

NPAC SMS shall provide the request originator with a message indicating that there was no data in NPAC SMS that matched the search keys, if NPAC SMS does not have subscription data as specified by the request originator.

4.1.3.2.2 Subscription List Query

R4-29 Service Provider subscription query options

NPAC SMS shall receive the attributes to be searched on for queries regarding Subscription Versions associated with the Service Provider. Allowable attributes are the following data elements from Table 3 -7 Subscription Version Data Model:

- Subscription Version ID
- Subscription Version Status
- Local Number Portability Type
- Ported Telephone Number
- Old facilities-based Service Provider Due Date
- New facilities-based Service Provider Due Date
- New facilities-based Service Provider ID
- Authorization from old facilities-based Service Provider
- Local Routing Number (LRN)
- Class DPC
- Class SSN
- LIDB DPC
- LIDB SSN
- CNAM DPC
- CNAM SSN
- ISVM DPC
- ISVM SSN
- Billing Service Provider ID
- End User Location Value
- End User Location Type
- Customer Disconnect Date
- Effective Release Date
- Disconnect Broadcast Complete Time Stamp
- Conflict Time Stamp
- Activation Time Stamp
- Cancellation Time Stamp (Status Modified to Cancel Time Stamp)
- New Service Provider Creation Time Stamp
- Old Service Provider Authorization Time Stamp
- Pre-cancellation Status
- Old Service Provider Cancellation Time Stamp
- New Service Provider Cancellation Time Stamp
- Old Time Stamp (Status Modified to Old Time Stamp)
- New Service Provider Conflict Resolution Time Stamp
- Create Time Stamp
- Modify Time Stamp
- Porting To Original
- Status Change Cause Code

R4-30.1 Service Provider subscription query

NPAC SMS shall return all active Subscription Versions associated with the Service Provider which satisfy the selection criteria, up to a tunable parameter number of Subscription Versions for queries initiated via the NPAC SMS to Local SMS interface.

R4-30.2 NPAC SMS shall return all Subscription Versions

NPAC SMS shall return all Subscription Versions regardless of Subscription Version status for queries initiated via the NPAC SOA Low-tech Interface.

R4-30.3

DELETE

R4-30.4

DELETE

R4-30.5

DELETE

R4-30.6 Count of subscription information during a query

NPAC SMS shall return an “out of range” error and the count of subscription records returned by a query, if more than a tunable parameter number of Subscription Versions are found.

R4-30.7

DELETE

R4-30.8 Error Message for Service Provider subscription query

NPAC SMS shall provide the request originator with a message indicating that there was no data in NPAC SMS that matched the search keys, if NPAC SMS does not have Subscription Versions as specified by the request originator.

4.2 Additional Requirements

RN4-1 Service Provider Network Data Addition/Deletion

NPAC SMS shall allow Service Providers to add/delete the NPA-NXX and/or LRN data via the NPAC SMS to Local SMS interface and SOA to NPAC SMS interface provided the changes do not cause mass updates to the Subscription Versions.

RR4-1 Removal of Service Provider with Respect to LRNs

NPAC SMS shall allow removal of a Service Provider by NPAC personnel only if all associated LRNs are removed, and no Subscription Versions are associated with the LRN.

RR4-2 Removal of Service Provider with Respect to NPA-NXXs

NPAC SMS shall allow removal of a Service Provider by NPAC personnel only if all associated NPA-NXXs are removed, and no Subscription Versions are associated with the NPA-NXX.

RR4-3 Removal of NPA-NXX

NPAC SMS shall allow removal of an NPA-NXX by NPAC personnel only if no Subscription Versions, except Old or Canceled Subscription Versions, are associated with the NPA-NXX.

RR4-4.2 Removal of LRN

NPAC SMS shall allow removal of an LRN by NPAC personnel only if no Subscription Versions, except Old or Canceled Subscription Versions, are associated with the LRN.

RR4-5 Duplicate NPA-NXX Validation

NPAC SMS shall validate upon request to add an NPA-NXX for a service provider, that the NPA-NXX does not exist for any service provider in the region.

RR4-6 Duplicate NPA-NXX Validation – Error Processing

NPAC SMS shall upon finding that an NPA-NXX already exists for a service provider in a region, reject a request to add an NPA-NXX for a service provider and report an error to the user.

RR4-7 Duplicate LRN Validation

NPAC SMS shall validate upon request to add an LRN for a service provider, that the LRN does not exist for any service provider in the region.

RR4-8 Duplicate LRN Validation – Error Processing

NPAC SMS shall upon finding that an LRN already exists for a service provider in a region, reject a request to add an LRN for a service provider and report an error to the user.

5. Subscription Management

5.1 Subscription Version Management

Subscription Management functions allow NPAC personnel and SOA to NPAC SMS interface users to specify data needed for ported numbers. The subscription data indicates how local number portability should operate to meet subscribers' needs. These functions will be accessible to authorized service providers via an interface (i.e., the SOA to NPAC SMS interface) from their operations systems to the NPAC SMS and will also be accessible to (and performed by) NPAC personnel.

Subscription Management supports functionality to manage multiple versions of subscription data. See Section **, *5.1.1 Subscription Version Management***, for more details on the different states of a version.

RN5-1 Subscription Version Status - Only One Per Subscription

NPAC SMS shall allow only one pending, cancel pending, conflict, disconnect pending, failed or partial failure Subscription Version per subscription.

RN5-2 Subscription Version Status - Only One Active Version

NPAC SMS shall allow only one active Subscription Version per subscription.

RN5-3 Subscription Version Status - Multiple Old/Canceled

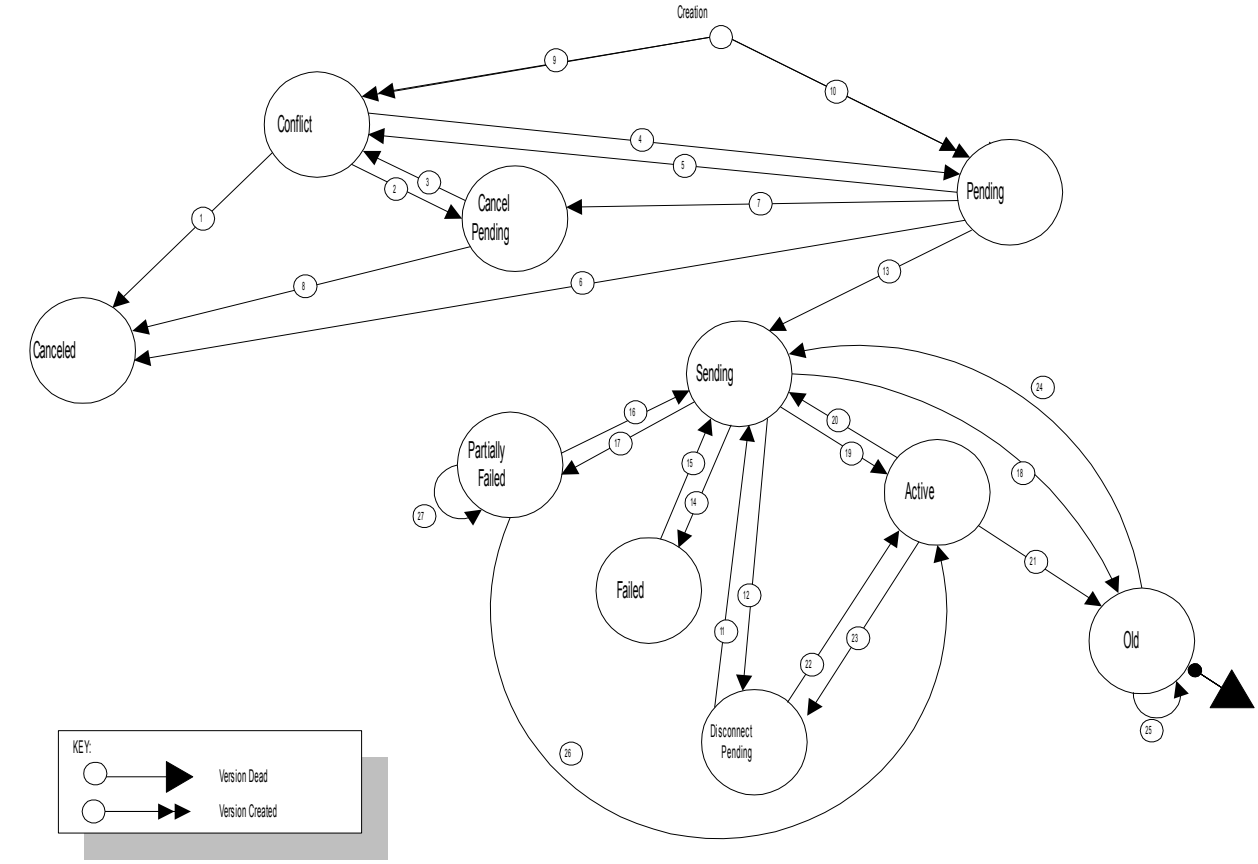
NPAC SMS shall allow multiple old and/or canceled Subscription Versions per subscription.

5.1.1 Subscription Version Management

Subscription Version management provides functionality to manage multiple time-sensitive views of subscription data. This section addresses version management for LNP and the user and system functionality needed for subscription administration. In this context a version may be defined as time-sensitive subscription data.

At any given time, a Subscription Version in the SMS can have one of several statuses (e.g., active, old) and may change status depending on results of different SMS processes (e.g., modification, activation). This section describes the different statuses that a version can have and the SMS processes that can change the status. This section also discusses functionality and data that is needed for Subscription Management.

5.1.1.1 Version Status


Creation
Conflict
Pending
Cancel Pending
Canceled
Sending
Partially Failed
Active
Failed
Old
Disconnect Pending
KEY:
Version Dead
Version Created

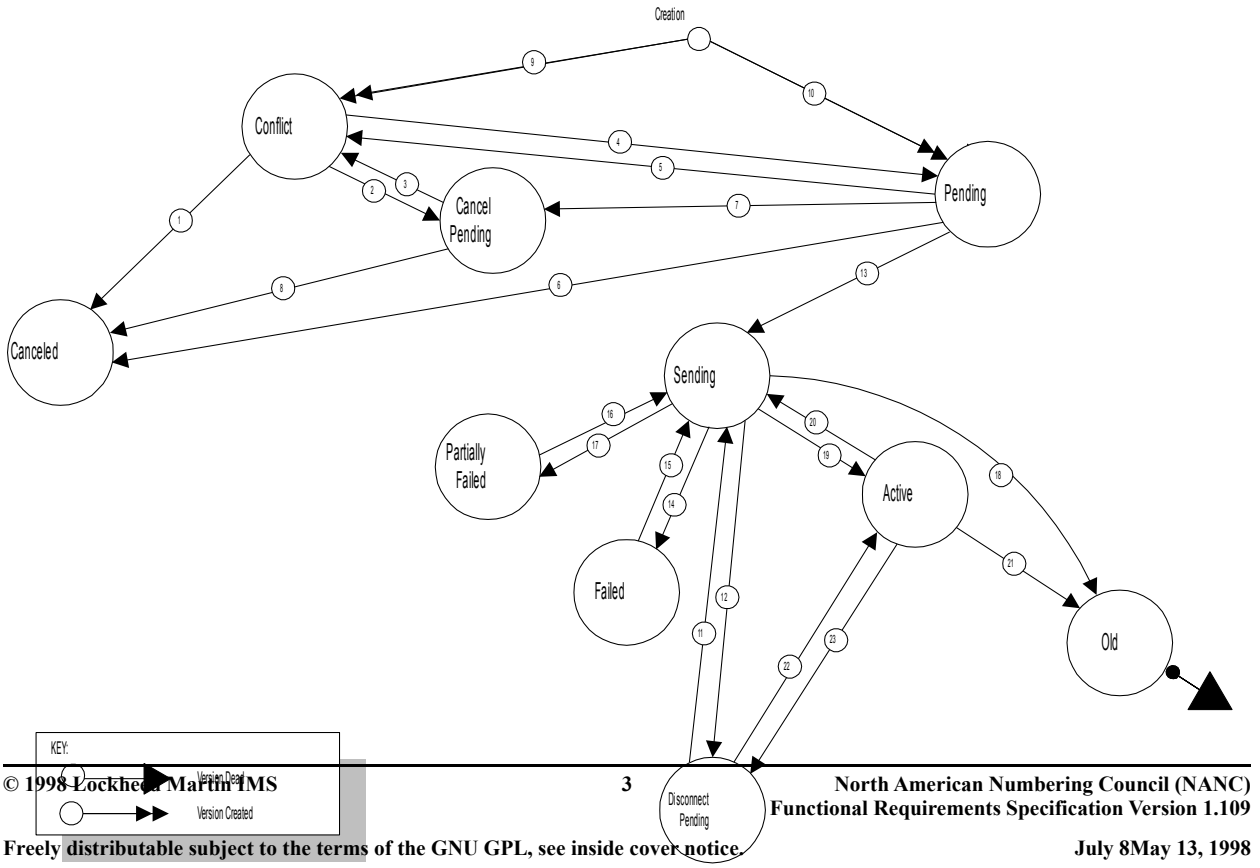

Creation
Conflict
Pending
Cancel Pending
Canceled
Sending
Partially Failed
Active
Failed
Old
Disconnect Pending
KEY:
Version Dead
Version Created

Figure 5-2 Version Status Interaction Diagram

Version Status Interaction Descriptions

#	Interaction Name	Type	Description
1	Conflict to Cancel	NPAC SMS Internal	NPAC SMS automatically sets a Subscription Version in conflict directly to canceled after it has been in conflict for a tunable number of calendar days.
		SOA to NPAC SMS Interface or NPAC SOA Low-tech or Administrative Interface	The old Service Provider User (or NPAC personnel acting on behalf of the Service Provider) sends a cancellation request for a Subscription Version created by that Service Provider with a status of conflict that has not been concurred by the other new Service Provider.
2	Conflict to Cancel Pending	NPAC SOA Low-tech or Administrative Interface	User cancels a Subscription Version in conflict or cancels a Subscription Version that was created by or concurred to by both Service Providers.
		SOA to NPAC SMS Interface	User sends a cancellation request for a Subscription Version that was created by or concurred to by both Service Providers.
3	Cancel Pending to Conflict	NPAC SOA Low-tech or Administrative Interface	User sets a Subscription Version with a status of cancel pending to conflict.
		NPAC SMS Internal	NPAC SMS automatically sets a Subscription Version with a status of cancel pending to conflict if cancel pending acknowledgment has not been received from the new Service Provider within a tunable timeframe.
4	Conflict to Pending	NPAC Administrative Interface – NPAC Personnel and SOA to NPAC SMS Interface or NPAC SOA Low-tech Interface – Old Service Provider	User removes a Subscription Version from conflict.
		SOA to NPAC SMS Interface or NPAC SOA Low-tech Interface - New Service Provider	New Service Provider User removes a Subscription Version from conflict. This action can only occur if a tunable number of hours have elapsed since the Subscription Version was placed in conflict.

Version Status Interaction Descriptions

#	Interaction Name	Type	Description
5	Pending to Conflict	NPAC Administrative Interface – NPAC Personnel	1. User sets a Subscription Version with a status of pending to conflict. 2. User creates a Subscription Version for an existing pending Subscription Version for the old Service Provider and does not provide authorization for the transfer of service.
		SOA to NPAC SMS Interface or NPAC SOA Low-tech Interface – Old Service Provider	Old Service Provider sends a Subscription Version creation or modification request for a Subscription Version with a status of pending, which revokes the old Service Provider's authorization for transfer of service. This action can only be taken once, and must be taken a tunable number of hours prior to the new Service Provider due date.
6	Pending to Cancel	NPAC Administrative Interface – NPAC Personnel	User cancels a Subscription Version with a status of pending that has not been concurred by both service providers.
		SOA to NPAC SMS Interface or NPAC SOA Low-tech Interface	**Service Provider** User sends a cancellation request for a Subscription Version created by that Service Provider with a status of pending that has not been concurred by the other Service Provider.
		NPAC SMS Internal	1. NPAC SMS automatically sets a pending Subscription Version to cancel after authorization for the transfer of service has not been received from the new Service Provider within a tunable timeframe. 2. NPAC SMS automatically sets a pending Subscription Version to cancel if an activation request is not received a tunable amount of time after new Service Provider due date.
7	Pending to Cancel Pending	NPAC Administrative Interface - NPAC Personnel	User cancels a Subscription Version with a status of pending that has been created/concurred by both Service Providers.
		SOA to NPAC SMS Interface or NPAC SOA Low-tech Interface	**Service Provider** User sends a cancellation request for a Subscription Version with a status of pending that has been concurred by the other Service Provider.

Version Status Interaction Descriptions

#	Interaction Name	Type	Description
8	Cancel Pending to Cancel	NPAC SMS Internal	NPAC SMS automatically sets a cancel pending Subscription Version to canceled after receiving cancel pending acknowledgment from the concurring Service Provider, or the final cancellation concurrence window has expired without cancel concurrence from the old Service Provider.
9	Creation - Set to Conflict	NPAC Administrative Interface – NPAC Personnel	User creates a Subscription Version for the old Service Provider and does not provide authorization for the transfer of service.
		SOA to NPAC SMS Interface and NPAC SOA Low-tech Interface – Old Service Provider	User sends an old Service Provider Subscription Version creation request and does not provide authorization for the transfer of service.
10	Creation - Set to Pending	NPAC Administrative Interface – NPAC Personnel	User creates a Subscription Version for either the new or old Service Provider. If the create is for the old Service Provider and authorization for the transfer of service is not provided, refer to *# 9, Creation - Set to Conflict, NPAC SOA Low-tech Interface*.
		SOA to NPAC SMS Interface and NPAC SOA Low-tech Interface	User sends a Subscription Version creation request for either the new or old Service Provider. If the create is for the old Service Provider, and authorization for the transfer of service is not provided, refer to *# 9, Creation - Set to Conflict, SOA to NPAC SMS LOW-TECH INTERFACE.*
11	Disconnect Pending to Sending	NPAC SMS Internal	NPAC SMS automatically sets a deferred disconnect pending Subscription Version to sending after the effective release date is reached.
12	Sending to Disconnect Pending	NPAC SMS Internal	NPAC SMS automatically sets a Subscription Version from sending to disconnect pending when the broadcast of the disconnect pending fails completely.
13	Pending to Sending	NPAC Administrative Interface - NPAC Personnel	User activates a pending Subscription Version for a Subscription Version with a new Service Provider due date less than or equal to today.
		SOA to NPAC SMS Interface and NPAC SOA Low-tech Interface - New Service Provider	New Service Provider User sends an activation message for a pending Subscription Version for a Subscription Version with a new Service Provider due date less than or equal to today.

Version Status Interaction Descriptions

#	Interaction Name	Type	Description
14	Sending to Failed	NPAC SMS Internal	NPAC SMS automatically sets a Subscription Version from sending to failed after all Local SMSs fail Subscription Version activation after the tunable retry period expires.
15	Failed to Sending	NPAC Administrative Interface – NPAC Personnel	User re-sends a failed Subscription Version.
16	Partially Failed to Sending	NPAC Administrative Interface – NPAC Personnel	User re-sends a partial failure Subscription Version.
17	Sending to Partially Failed	NPAC SMS Internal	NPAC SMS automatically sets a Subscription Version from sending to partial failure after one or more, but not all, of the Local SMSs fail the Subscription Version activation after the tunable retry period expires.
18	Sending to Old	NPAC SMS Internal	NPAC SMS automatically sets a sending Subscription Version to old after a disconnect or "porting to original" port to all Local SMSs successfully completes. Disconnects that fail on one or more, but not all, Local SMSs will also be set to old.
19	Sending to Active	NPAC SMS Internal	1. NPAC SMS automatically sets a sending Subscription Version to active after the Subscription Version activation is successful in all of the Local SMSs. 2. NPAC SMS automatically sets a sending Subscription Version to active after the Subscription Version modification is successfully broadcast to any of the Local SMSs. 3. NPAC SMS automatically sets a sending Subscription Version to active after a failure to all Local SMSs on a disconnect.
20	Active to Sending	NPAC Administrative Interface – NPAC Personnel	User disconnects an active Subscription Version and does not supply an effective release date, or User modifies an active Subscription Version.
		SOA to NPAC SMS Interface to NPAC SOA Low-tech Interface - Current Service Provider	User sends a disconnect request for an active Subscription Version and does not supply an effective release date, or User modifies an active Subscription Version.

Version Status Interaction Descriptions

#	Interaction Name	Type	Description
21	Active to Old	NPAC SMS Internal	NPAC SMS automatically sets the currently active Subscription Version to old once a currently active subscription version is superseded by a pending subscription version, due to the fact that the current version is set to old when an activate occurs. The new pending version is set to sending and then to active, partially failed, or old. On a disconnect the sending state occurs before the old.
22	Disconnect Pending to Active	NPAC Administrative Interface – NPAC Personnel	User cancels a Subscription Version with a disconnect pending status.
		SOA to NPAC SMS Interface and NPAC SOA Low-tech Interface – New Service Provider	User sends a cancellation request for a disconnect pending Subscription Version.
23	Active to Disconnect Pending	NPAC Administrative Interface - NPAC Personnel	User disconnects an active Subscription Version and supplies a future effective release date.
		SOA to NPAC SMS Interface and NPAC SOA Low-tech Interface- Current Service Provider	User sends a disconnect request for an active Subscription Version and supplies a future effective release date.
24	Old to Sending	NPA Operations Interface – NPAC Personnel	User re-sends a partial failure or failure port-to-original Subscription Version.
25	Old to Old	NPAC SMS Internal	NPAC SMS automatically sets a Subscription Version from old to old after one or more previously failed Local SMSs successfully disconnect a Subscription Version, as a result of an audit or LSMS resync. The Failed_SP_List is updated to reflect the updates to the previously failed SPs.
26	Partially Failed to Active	NPAC SMS Internal	NPAC SMS automatically sets a Subscription Version from partial failure to active after all previously failed Local SMSs successfully activate a Subscription Version, as a result of an audit or LSMS resync. The Failed_SP_List is updated to reflect the updates to the previously failed SPs.

Version Status Interaction Descriptions

#	Interaction Name	Type	Description
27	Partially Failed to Partially Failed	NPAC SMS Internal	NPAC SMS automatically sets a Subscription Version from partial failure to partial failure after one or more, but not all previously failed Local SMSs successfully activate a Subscription Version, as a result of an audit or LSMS resync. The Failed_SP_List is updated to reflect the updates to the previously failed SPs.

Table 5-11 Version Status Interaction Descriptions

R5-1.1 Subscription Version Statuses

NPAC SMS Subscription Version instances shall at any given time have one of the following statuses:

- Active - Version is currently active in the network.

NOTE: There may be another pre- active version in the system that will eventually supersede this version. Examples: 1) Pending version for the active subscription exists 2) Sending version for the active subscription exists.

- Canceled - A pending, conflict, or disconnect pending version was canceled prior to activation in the network.
- Cancel Pending - Version is awaiting cancellation acknowledgment from the concurring Service Providers, at which time the version will be set to canceled.
- Conflict - Version is in conflict (i.e., a dispute exists between the two Service Providers), awaiting resolution.
- Disconnect Pending - Version is awaiting the effective release date, at which time the version will be set to sending and the disconnect request will be sent to all Local SMSs.
- Failed - Version failed activation in ALL of the Local SMSs in the network.
- Old - Version was previously active in the network and either was superseded by another active version or was disconnected.
- Partial Failure - Version failed activation in one or more, but not all, Local SMSs in the network.
- Pending - Version is either pending activation (approval had been received from both Service Providers) or pending creation/approval from one or the other Service Provider.
- Sending - Version is currently being sent to all of the Local SMSs in the network.

R5-1.2

(Duplicate - refer to R5-20.3)

(Duplicate - refer to R5-30.2)

(Duplicate - refer to R5-53)

(Duplicate - refer to R5-54)

(Moved - refer to R5-54.2)

R5-2.1 Old Subscription Retention - Tunable Parameter

NPAC SMS shall provide an Old Subscription Retention tunable parameter which is defined as the length of time that old Subscription Versions shall be retained and accessible through a query request.

R5-2.2 Old Subscription Retention - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Old Subscription Retention tunable.

R5-2.3 Old Subscription Retention - Tunable Parameter Default

NPAC SMS shall default the Old Subscription Retention tunable parameter to 18 calendar months.

R5-3.1 Cancel-Pending Subscription Retention - Tunable Parameter

NPAC SMS shall provide a Cancel-Pending Subscription Retention tunable parameter which is defined as the length of time that canceled Subscription Versions with a pre-cancellation status of pending shall be retained and accessible through a query request.

R5-3.2 Cancel-Pending Subscription Retention - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Cancel-Pending Subscription Retention tunable parameter.

R5-3.3 Cancel-Pending Subscription Retention - Tunable Parameter Default

NPAC SMS shall default the Cancel-Pending Subscription Retention tunable parameter to 90 calendar days.

R5-3.4 Cancel-Conflict Subscription Retention - Tunable Parameter

NPAC SMS shall provide a Cancel-Conflict Subscription Retention tunable parameter which is defined as the length of time that canceled Subscription Versions with a pre-cancellation status of conflict shall be retained and accessible through a query request.

R5-3.5 Cancel-Conflict Subscription Retention - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Cancel-Conflict Subscription Retention tunable parameter.

R5-3.6 Cancel-Conflict Subscription Retention - Tunable Parameter Default

NPAC SMS shall default the Cancel-Conflict Subscription Retention tunable parameter to 30 calendar days.

R5-3.7

DELETE

R5-3.8

DELETE

R5-3.9

DELETE

RR5-1.1 Pending Subscription Retention - Tunable Parameter

NPAC SMS shall provide a Pending Subscription Retention tunable parameter, which is defined as the length of time that a pending Subscription Version shall remain in the system prior to cancellation.

RR5-1.2 Pending Subscription Retention - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Pending Subscription Retention tunable parameter.

RR5-1.3 Pending Subscription Retention - Tunable Parameter Default

NPAC SMS shall default the Pending Subscription Retention tunable parameter to 90 calendar days.

RR5-1.4 Pending Subscription Retention - Tunable Parameter Expiration

NPAC SMS shall cancel a Subscription Version by setting the subscription version to cancel after a pending Subscription Version has existed in the system for a Pending Subscription Retention number of calendar days subsequent to new Service Provider Due Date.

R5-4

(Duplicate - Refer to RN5-1)

R5-5 Subscription Versions Creation for TN Ranges

NPAC SMS shall create individual Subscription Versions when a Subscription Version creation request is received for a TN range.

R5-6 Subscription Administration Transaction Logging

NPAC SMS shall log all subscription administration transactions. The log entries shall include:

- Activity Type: create, modify, activate, query, all status types, and all acknowledgments.
- Service Provider ID
- Initial Version Status
- New Version Status (if applicable)
- User ID and/or Login
- Local Number Portability Type
- Date
- Time
- Ported Telephone Number
- Status Flag - successful or failed
- Subscription Version ID (when assigned)

5.1.2 Subscription Administration Requirements

5.1.2.1 User Functionality

Authorized users can invoke the following functionality in the NPAC SMS to administer subscription data:

R5-7 Creating a Subscription Version

NPAC SMS shall allow NPAC personnel and the SOA to NPAC SMS interface to create a Subscription Version.

R5-8.1 Modifying a Subscription Version

NPAC SMS shall allow NPAC personnel and the SOA to NPAC SMS interface to modify a Subscription Version.

R5-8.2

(Duplicate - refer to R5-25)

R5-9 Activating a Subscription version

NPAC SMS shall allow NPAC personnel and the SOA to NPAC SMS interface to activate a Subscription Version.

RN5-9

DELETE

R5-10.1 Setting a Subscription Version to Conflict

NPAC SMS shall allow NPAC personnel to set a Subscription Version to conflict.

R5-10.2 Subscription Version Conflict Status Rule

NPAC SMS shall prohibit a Subscription Version in conflict from being activated.

R5-11 Disconnecting a Subscription Version

NPAC SMS shall allow NPAC personnel and the SOA to NPAC SMS interface to disconnect a Subscription Version.

R5-12 Canceling a Subscription Version

NPAC SMS shall allow NPAC personnel and the SOA to NPAC SMS interface to cancel a Subscription Version.

R5-13 Querying a Subscription Version

NPAC SMS shall allow NPAC personnel, Local SMS/ SOA to NPAC SMS interface to query for a Subscription Version.

5.1.2.2 System Functionality

This section describes NPAC SMS functionality required to support NPAC personnel and SOA to NPAC SMS interface user requests defined in the above section.

Additionally, NPAC SMS functionality will perform operations which are not invoked by a direct user request. Some examples of this are: monitor a Subscription Version to determine whether the old and the new facilities-based Service Providers have authorized the transfer of service for a ported number, issue appropriate notifications to Service Providers, and change the status of a Subscription Version based on tunable parameters.

5.1.2.2.1 Subscription Version Creation

This section provides the requirements for the Subscription Version Create functionality, which is executed upon the user requesting to create a Subscription Version.

RR5-3 Create Subscription Version - Notify NPA-NXX First Usage

NPAC SMS shall notify all accepting Local SMSs and SOAs of the NPA-NXX, effective date, and owning Service Provider when an NPA-NXX is being ported for the first time immediately after creation validation of a Subscription Version.

5.1.2.2.1.1 Subscription Version Creation - Inter-Service Provider Ports

This section provides the Subscription Version Creation requirements for performing an Inter-Service Provider port of a TN. There are two types of Inter-Service Provider ports: A port of a TN to a new Service Provider from the Old, or a "porting to original" port. A "porting to original" port implies that all porting data will be removed from the Local SMSs and the TN will revert to the default routing, which ultimately results in the TN returning to the original "donor" Service Provider.

The primary differences in functionality between these two types of Inter-Service Provider ports is that for a "porting to original" port, the routing data is not supplied and upon activation, a delete request is broadcast to the Local SMSs instead of a create request.

Both port types of Inter-Service Provider ports require authorization for the transfer of service from the new Service Provider.

R5-14 Create Subscription Version - Old Service Provider Input Data

NPAC SMS shall accept the following data from the NPAC personnel or old Service Provider upon Subscription Version creation for an Inter-Service Provider port:

- Local Number Portability Type -Port Type.
- Ported Telephone Number(s) - this entry can be a single TN or a continuous range of TNs that identifies a subscription or a group of Subscription Versions that share the same attributes.
- Due Date - date on which transfer of service from old facilities-based Service Provider to new facilities-based Service Provider is initially planned to occur.
- New facilities-based Service Provider ID - the identifier of the new facilities-based Service Provider.
- Old facilities-based Service Provider ID - the identifier of the old facilities-based Service Provider.
- Authorization from old facilities-based Service Provider - indication that the transfer of service is authorized by the ported-from Service Provider.
- Status Change Cause Code - indication of reason for denial of authorized by the Old Service Provider.

R5-15.1 Create "Inter-Service Provider Port" Subscription Version - New Service Provider Input Data

NPAC SMS shall require the following data from NPAC personnel or the new Service Provider upon Subscription Version creation for an Inter-Service Provider port when **NOT** "porting to original":

- Local Number Portability Type - Port Type. This field must be set to "LSPP" for Inter-Service Provider ports.
- Ported Telephone Number(s) - this entry can be a single TN or a continuous range of TNs that identifies a subscription or a group of Subscription Versions that share the same attributes.
- Due Date - date on which transfer of service from old facilities-based Service Provider to new facilities-based Service Provider is initially planned to occur.
- New Facilities-based Service Provider ID - the identifier of the new facilities-based Service Provider.
- Old Facilities-based Service Provider ID - the identifier of the old facilities-based Service Provider.
- Location Routing Number (LRN) - the identifier of the ported-to switch.
- Class DPC
- Class SSN
- LIDB DPC
- LIDB SSN
- CNAM DPC
- CNAM SSN
- ISVM DPC
- ISVM SSN
- Porting to Original - flag indicating whether or not this is a "porting to original" port. This flag must be set to "FALSE" for this type of Inter-Service Provider port.

R5-15.2 Create "porting to original" Subscription Version - New Service Provider Input Data

NPAC SMS shall require the following data from NPAC personnel or the new Service Provider upon Subscription Version creation for an Inter-Service Provider "porting to original" port:

- Local Number Portability Type - Port Type. This field must be set to "LSPP" for "porting to original" ports.
- Ported Telephone Number(s) - this entry can be a single TN or a continuous range of TNs that identifies a subscription or a group of Subscription Versions that share the same attributes.
- Due Date - date on which transfer of service from old facilities-based Service Provider to new facilities-based Service Provider is initially planned to occur.
- New Facilities-based Service Provider ID - the identifier of the new facilities-based Service Provider.
- Old Facilities-based Service Provider ID - the identifier of the old facilities-based Service Provider.
- Porting to original - flag indicating whether or not this is a "porting to original" port. This flag must be set to "TRUE" for "porting to original" port.

R5-16 Create Subscription Version - New Service Provider Optional input data

NPAC SMS shall accept the following optional fields from NPAC personnel or the new Service Provider upon Subscription Version creation for an Inter-Service Provider port:

- Billing Service Provider ID
- End-User Location - Value
- End-User Location - Type

R5-17.1

(Duplicate - Refer to R5-18.7 and R5-20.1)

R5-17.2

(Duplicate - Refer to R5-18.8 and R5-20.1)

R5-18.1 Create Subscription Version - Field-level Data Validation

NPAC SMS shall perform field-level data validations to ensure that the value formats for the following input data, if supplied, is valid according to the formats specified in Table 3-5 upon Subscription Version creation for an Inter-Service Provider port:

- LNP Type
- Ported TN(s)
- Old Service Provider Due Date
- New Service Provider Due Date
- Old Service Provider ID
- New Service Provider ID
- Authorization from old facilities-based Service Provider
- Status Change Cause Code
- LRN
- Class DPC
- Class SSN
- LIDB DPC
- LIDB SSN
- CNAM DPC
- CNAM SSN
- ISVM DPC
- ISVM SSN
- Porting to Original
- Billing Service Provider ID
- End-User Location - Value
- End-User Location - Type

R5-18.2 Create Subscription Version - Due Date Consistency Validation

NPAC SMS shall verify the old and new Service Provider due dates are the same upon initial Subscription Version creation for an Inter-Service Provider port.

R5-18.3 Create Subscription Version - Due Date Validation

NPAC SMS shall verify that the due date is the current or a future date upon Subscription Version creation for an Inter-Service Provider port.

R5-18.4 Create Subscription Version - Ported TN NPA-NXX Validation

NPAC SMS shall verify that the NPA-NXX to be ported exists as an NPA-NXX in the NPAC SMS system upon Subscription Version creation for an Inter-Service Provider port.

R5-18.5 Create Subscription Version - Service Provider ID Validation

NPAC SMS shall verify that the old and new Service Provider IDs exist in the NPAC SMS system upon Subscription Version creation for an Inter-Service Provider port.

R5-18.6 Create Subscription Version - LRN Validation

NPAC SMS shall verify that an input LRN is associated with the new Service Provider in the NPAC SMS system upon Subscription Version creation for an Inter-Service Provider port.

R5-18.7 Create Subscription Version - Originating Service Provider Validation

NPAC SMS shall verify that the originating user is identified as the new or old Service Provider on the incoming Subscription Version upon Subscription Version creation for an Inter-Service Provider port.

R5-18.8 Create Subscription Version - Duplicate Authorization Validation

NPAC SMS shall verify that authorization for transfer of service for a given Service Provider does not already exist when a Service Provider creates a Subscription Version for an Inter-Service Provider port.

R5-18.9 Create Subscription Version - Service Provider ID Validation

NPAC SMS shall verify that the incoming New and Old Service Provider IDs match the IDs in the current pending version, if one exists, upon Subscription Version creation for an Inter-Service Provider port.

R5-18.10 Create Subscription Version - Status Change Cause Code Validation

NPAC SMS shall require and only allow the Status Change Cause Code to be set when the Old Service Provider authorization is set to false.

R5-19.1 Create Subscription Version - Old Service Provider ID Validation

NPAC SMS shall verify that the old Service Provider ID on the version being created is equal to the new Service Provider ID on the active Subscription Version, if an active version exists upon Subscription Version creation for an Inter-Service Provider port.

R5-19.2 Create Subscription Version - Old Service Provider ID Validation - No Active Subscription Version

NPAC SMS shall validate that the old Service Provider in the create message is the Service Provider to which the TN's NPA-NXX is assigned (as stored in the NPAC SMS service provider data tables) if there is currently no active Subscription Version for the TN in the NPAC SMS.

R5-20.1 Create Subscription Version - Validation Failure Notification

NPAC SMS shall send an appropriate error message to the originating NPAC personnel or SOA to NPAC SMS interface user if any of the validations fail upon Subscription Version creation for an Inter-Service Provider port.

R5-20.2 Create Subscription Version - Validation Failure - No Update

NPAC SMS shall not apply the incoming data to an existing subscription if any of the validations fail upon Subscription Version creation for an Inter-Service Provider port.

R5-20.3 Create Subscription Version - Validation Failure - No Create

NPAC SMS shall not create a new Subscription Version, if a version does not exist, if any of the validations fail upon Subscription Version creation for an Inter-Service Provider port.

R5-20.4 Create Subscription Version - Validation Success - Update Existing

NPAC SMS shall apply the incoming data to an existing Subscription Version if all validations pass upon Subscription Version creation for an Inter-Service Provider or port.

R5-20.5 Create Subscription Version - Validation Success - Create New

NPAC SMS shall create a new Subscription Version, if a version does not already exist, if all validations pass at the time of Subscription Version creation for an Inter-Service Provider port.

R5-21.1 Initial Concurrence Window - Tunable Parameter

NPAC SMS shall provide an Initial Concurrence Window tunable parameter which is defined as the number of business hours subsequent to the time the Subscription Version was initially created by which both Service Providers can authorize transfer of service if this is an Inter-Service Provider port.

R5-21.2 Initial Concurrence Window - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Initial Concurrence Window date tunable parameter.

R5-21.3 Initial Concurrence Window - Tunable Parameter Default

NPAC SMS shall default the Initial Concurrence Window date tunable parameter to 9 business hours.

R5-21.4

(Duplicate - Refer to R5-21.1)

R5-21.5

(Duplicate - Refer to R5-21.1)

R5-21.6 Create Subscription Version - Set to Pending

NPAC SMS shall set a Subscription Version to pending upon successful subscription creation and the Old Service Provider has authorized transfer of service if this is an Old Service Provider create request for an Inter-Service Provider port.

R5-21.7 Create Subscription Version - Notify User Success

NPAC SMS shall notify the old and new Service Providers when a Subscription Version is set to pending upon successful subscription creation for an Inter-Service Provider port.

RR5-2.1 Create Subscription Version - Set to Conflict

NPAC SMS shall set a Subscription Version directly to conflict and set the cause code, if the Subscription Version passed validations, but this is a create request from the Old Service Provider and the Old Service Provider did not authorize transfer of service for an Inter-Service Provider port and specified a cause code.

RR5-2.2 Create Subscription Version - Set Conflict Timestamp

NPAC SMS shall set the conflict timestamp to the current time when a Subscription Version is set to conflict at the time of subscription version creation for an Inter-Service Provider port.

RR5-2.3 Create Subscription Version - Conflict Notification

NPAC SMS shall notify the Old and New Service Provider when a Subscription Version is set to conflict at the time of Subscription Version creation for an Inter-Service Provider or port.

RR5-2.4 Cause Code in Conflict Notification - Creation

NPAC SMS shall include the cause code in the conflict notification to the Old and New Service Provider when the Old Service Provider did not authorize transfer of service for an Inter-Service Provider port on creation.

R5-22 Create Subscription Version - Initial Concurrence Window Tunable Parameter Expiration

NPAC SMS shall send a notification to the Service Provider (old or new) who has not yet authorized the transfer of service, when the Initial Concurrence Window **tunable parameter** for a pending Subscription Version has expired.

R5-23.1 Final Concurrence Window - Tunable Parameter

NPAC SMS shall provide a Final Concurrence Window tunable parameter which is defined as the number of business hours after the concurrence request is sent by the NPAC SMS by which time both Service Providers can authorize transfer of subscription service for an Inter-Service Provider port.

R5-23.2 Final Concurrence Window Tunable - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Final Concurrence Window tunable parameter.

R5-23.3 Final Concurrence Window Tunable - Tunable Parameter Default

NPAC SMS shall default the Final Concurrence Window tunable parameter to 9 business hours.

R5-23.4 New Service Provider Fails to Authorize Transfer of Service

NPAC SMS shall set the Subscription Version status to cancel when the Final Concurrence Window tunable parameter expires and a new Service Provider has not sent authorization for the transfer of service.

R5-23.5 Activation without Old Service Provider Authorization

NPAC SMS shall allow a pending Subscription Version to be activated without an old Service Provider authorization for transfer of service.

R5-23.6 Activation without Old Service Provider Authorization - Time restriction

NPAC SMS shall allow activation without Old Service Provider concurrence only after the final concurrence window timer has expired.

RR5-43 Activation with Old Service Provider Authorization

DELETE

5.1.2.2.1.2 Subscription Version Creation - Intra-Service Provider Port

This section provides the Subscription Version Creation requirements for performing an Intra-Service Provider port of a TN. An Intra-Service Provider port of a TN is when a TN is ported to a new location within the current Service Provider network (i.e., the routing data is modified, but the Service Provider remains the same). A "port to original" port for an Intra-Service Provider port should be handled by a requesting user via submission of a Disconnect request to the NPAC SMS.

RR5-4 Create "Intra-Service Provider Port" Subscription Version - Current Service Provider Input Data

NPAC SMS shall require the following data from the NPAC personnel or the Current (New) Service Provider at the time of Subscription Version Creation for an Intra-Service Provider port:

- LNP Type - port type This field must be set to "LISP for Intra-Service Provider support.
- Ported Telephone Number(s) - this entry can be a single TN or a continuous range of TNs that identifies a subscription or group of Subscription Versions that share the same attributes.
- Due Date - date on which Intra-Service Provider port is planned to occur.
- New facilities-based Service Provider ID - current Service Provider within which the Intra-Service Provider port will occur.
- Old facilities-based Service Provider ID - current Service Provider within which the Intra-Service Provider port will occur.
- Location Routing Number (LRN) - identifier of the ported-to switch
- Class DPC
- Class SSN
- LIDB DPC
- LIDB SSN
- CNAM DPC
- CNAM SSN
- ISVM DPC
- ISVM SSN

RR5-5 Create "Intra-Service Provider Port" Subscription Version - Current Service Provider Optional Input Data

NPAC SMS shall accept the following optional fields from the NPAC personnel or the Current Service Provider upon a Subscription Version Creation for an Intra-Service Provider port:

- Billing Service Provider ID
- End-User Location - Value
- End-User Location - Type

RR5-6.1 Create "Intra-Service Provider Port" Subscription Version - Field-level Data Validation

NPAC SMS shall perform field-level data validations to ensure that the value formats for the following input data, if supplied, is valid according to the formats specified in Table 3-4 upon Subscription Version creation for an Intra-Service Provider port:

- LNP Type
- Ported TN(s)
- Current Service Provider Due Date
- Old Service Provider ID
- New Service Provider ID
- LRN
- Class DPC
- Class SSN
- LIDB DPC
- LIDB SSN
- CNAM DPC
- CNAM SSN
- ISVM DPC
- ISVM SSN
- Billing Service Provider ID
- End-User Location - Value
- End-User Location - Type

RR5-6.2 Create "Intra-Service Provider Port" Subscription Version - New and Old Service Provider ID Match

NPAC SMS shall validate that the new and old Service Provider IDs are identical to the ID of the requesting user at the time of Subscription Version creation for an Intra-Service Provider port.

RR5-6.3 Create "Intra-Service Provider Port" Subscription Version - Due Date Validation

NPAC SMS shall verify that the input due date is the current or a future due date upon Subscription Version creation for an Intra-Service Provider port.

RR5-6.4 Create "Intra-Service Provider Port" Subscription Version - Ported TN NPA-NXX Validation

NPAC SMS shall verify that the NPA-NXX for the TN to be ported exists as an NPA-NXX in the NPAC SMS system upon Subscription Version creation for an Intra-Service Provider port.

RR5-6.5 Create "Intra-Service Provider Port" Subscription Version - LRN Validation

NPAC SMS shall verify that the LRN is associated with the new Service Provider in the NPAC SMS system upon Subscription Version creation for an Intra-Service Provider port.

RR5-6.6 Create "Intra-Service Provider Port" Subscription Version - Duplicate Authorization Validation

NPAC SMS shall verify that the authorization for transfer of service for a given Service Provider does not already exist when a Service Provider creates a Subscription Version for an Intra-Service Provider port.

RR5-6.7 Create "Intra-Service Provider Port" Subscription Version - Old Service Provider ID Validation

NPAC SMS shall verify that the old Service Provider ID on the version being created is equal to the new Service Provider ID on the active Subscription Version, if an active version exists, upon Subscription Version creation for an Intra-Service Provider port.

RR5-6.8 Create "Intra-Service Provider Port" Subscription Version - No Active Version

NPAC SMS shall allow an Intra-Service Provider port to occur for a telephone number not associated with a current active version.

RR5-6.9 Create "Intra-Service Provider Port" Subscription Version - Old Service Provider ID Validation - No Active Subscription Version

NPAC SMS shall validate that the old Service Provider in the create message is the Service Provider to which the TN's MPA-NXX is assigned (as stored in the NPAC SMS service provider data tables) if there is currently no active Subscription Version for the TN in the NPAC SMS.

RR5-7.1 Create "Intra-Service Provider Port" Subscription Version - Validation Failure Notification

NPAC SMS shall send an appropriate error message to the originating NPAC personnel or SOA to NPAC SMS Interface if any of the validations fail at the time of Subscription Version creation for an Intra-Service Provider port.

RR5-7.2 Create "Intra-Service Provider Port" Subscription version - Validation Failure - No Create

NPAC SMS shall not create a new Subscription Version if any of the validations fail at the time of Subscription Version creation for an Intra-Service Provider port.

RR5-8 Create "Intra-Service Provider Port" Subscription version - Set to Pending

NPAC SMS shall set a Subscription Version to pending upon successful creation of a Subscription Version for an Intra-Service Provider port.

RR5-9 Create "Intra-Service Provider Port" Subscription version - Notify User of Creation

NPAC SMS shall notify the current Service Provider when a Subscription Version is set to pending upon a successful creation of a Subscription Version for an Intra-Service Provider port.

5.1.2.2.2 Subscription Version Modification

This section provides the requirements for the Subscription Version Modification functionality, which is executed upon the user requesting modify Subscription Version.

5.1.2.2.2.1 Modification of a Pending or Conflict Subscription Version

R5-24.1

(Duplicate - refer to R5-27 and R5-28)

R5-24.2

(Duplicate - refer to R5-27 and R5-28)

R5-24.3

(Duplicate - refer to R5-27 and R5-28)

R5-25 Modify Subscription Version - Invalid Version Status Notification

NPAC SMS shall return an error to the originating NPAC personnel or SOA to NPAC SMS interface user if the version status is sending, failed, partial failure, canceled, cancel pending, old or disconnect pending upon Subscription Version modification.

R5-26 Modify Subscription Version - Version Identification

NPAC SMS shall receive the following data from the originating NPAC personnel or SOA to NPAC SMS interface user to identify a pending or conflict Subscription Version to be modified:

Ported Telephone Number (or a specified range of numbers) and status

or

Subscription Version ID

R5-27.1 Modify Subscription Version - New Service Provider Data Values

NPAC SMS shall allow the following data to be modified in a pending or conflict Subscription Version for an Inter-Service Provider or Intra-Service Provider port by the new/current Service Provider or NPAC personnel:

- Location Routing Number (LRN) - the identifier of the ported to switch.
- Due Date - date on which transfer of service from old facilities-based Service Provider to new facilities-based Service Provider is planned to occur.
- Class DPC
- Class SSN
- LIDB DPC
- LIDB SSN
- CNAM DPC
- CNAM SSN
- ISVM DPC
- ISVM SSN

R5-27.2 Modify “porting to original” Subscription Version - New Service Provider Data Values

NPAC SMS shall allow the following data to be modified in a pending, or conflict Subscription Version for a “porting to original” port by the new Service Provider or NPAC personnel:

- Due Date - New Service Provider date on which “port to original” is planned to occur.

R5-27.3 Modify Subscription Version - Old Service Provider Data Values

NPAC SMS shall allow the following data to be modified in a pending or conflict Subscription Version for an Inter-Service Provider port by the old Service Provider or NPAC personnel:

- Due Date - date on which transfer of service from old facilities-based Service Provider to new Service Provider is planned to occur.
- Old Service Provider Authorization
- Status Change Cause Code

R5-27.4 Old Service Provider authorization Flag Modification to False

NPAC SMS shall allow the old Service Provider to modify the old Service Provider authorization flag to false and set the cause code. As a result the NPAC SMS will set the Subscription Version status to conflict provided the version has not previously been set into conflict by the Old Service Provider for reasons other than cancellation.

R5-27.5 Old Service Provider Conflict Restriction

(Duplicate - refer to RR5-42.1)

R5-28 Modify Subscription Version - New Service Provider Optional input data.

NPAC SMS shall accept the following optional fields from the NPAC personnel or the new Service Provider upon modification of a pending or conflict Subscription version:

- Billing Service Provider ID
- End-User Location - Value
- End-User Location - Type

R5-29.1 Modify Subscription Version - Field-level Data Validation

NPAC SMS shall perform field-level data validations to ensure that the value formats for the following input data, if supplied, is valid according to the formats specified in Table 3-4 upon Subscription Version modification.

- LNP Type
- Ported TN(s)
- Old Service Provider Due Date
- New Service Provider Due Date
- Old Service Provider Authorization
- Status Change Cause Code
- Old Service Provider ID
- New Service Provider ID
- LRN
- Class DPC
- Class SSN
- LIDB DPC
- LIDB SSN
- CNAM DPC
- CNAM SSN
- ISVM DPC
- ISVM SSN
- Billing Service Provider ID
- End-User Location - Value
- End-User Location - Type

R5-29.2 Modify Subscription Version - Due Date Validation

NPAC SMS shall verify that an input due date is the current or future date upon Subscription Version modification.

R5-29.3 Modify Subscription Version - LRN Validation

NPAC SMS shall verify that an input LRN is associated with the new Service Provider in the NPAC SMS system upon Subscription Version modification.

R5-29.4 Modify Subscription Version - Originating Service Provider Validation

NPAC SMS shall verify that the originating user is identified as the new or old Service Provider on the current Subscription Version, if one exists, upon Subscription Version modification.

R5-29.5 Modify Subscription Version - Status Change Cause Code Validation

NPAC SMS shall require and only allow the Status Change Cause Code to be set when the Old Service Provider authorization is set to false.

R5-30.1 Modify Subscription Version - Validation Failure Notification

NPAC SMS shall send an error message to the originating user if the modified pending or conflict Subscription Version fails validations.

R5-30.2 Modify Subscription Version - Validation Error Processing

NPAC SMS shall leave the original version intact upon validation failure of a modified pending or conflict Subscription Version.

R5-31.1

DELETE

R5-31.2

DELETE

R5-31.3 Modify Subscription Version - Successful Modification Notification

NPAC SMS shall send an appropriate message to the old and new Service Providers upon successful modification of a Subscription Version.

R5-32

(Duplicate - refer to R5-31.3)

RR5-10.1 Modify Subscription Version - Set Conflict Timestamp

NPAC SMS shall set the conflict timestamp to the current time when a Subscription Version is set to conflict upon Subscription Version modification.

RR5-10.2 Modify Subscription Version - Conflict Notification

NPAC SMS shall notify the Old and New Service Provider when a Subscription Version is set to conflict upon Subscription Version modification.

RR5-10.3 Modify Subscription Version - Cause Code in Notification

NPAC SMS shall include the cause code for conflict in the conflict notification to the Old and New Service Provider when a Subscription Version is set to conflict upon Subscription Version modification.

RR5-10.4

DELETE

RR5-10.5

DELETE

5.1.2.2.2.2 Modification of an Active Subscription Version

R5-33

(Duplicate - refer to R5-35 and R5-36)

AR5-1 Active Status

"Active" status refers to Subscription Versions with either an Active or Disconnect Pending status.

RR5-11 Modify Active Subscription Version - Service Provider Owned

NPAC SMS shall allow only NPAC personnel and the current Service Provider to modify their own active Subscription Versions.

R5-34

DELETE

R5-35 Modify Active Subscription Version - Version Identification

NPAC SMS shall require the following data from NPAC personnel or SOA to NPAC SMS interface users to identify the active Subscription Version to be modified:

Ported Telephone Numbers (or a specified range of numbers) and status of Active

or

Subscription Version ID

R5-36 Modify Active Subscription Version - Input Data

NPAC SMS shall allow the following data to be modified for an active Subscription Version:

- Location Routing Number (LRN) - the identifier of the ported to switch
- Class DPC
- Class SSN
- LIDB DPC
- LIDB SSN
- CNAM DPC
- CNAM SSN
- ISVM DPC
- ISVM SSN

R5-37 Active Subscription Version - New Service Provider Optional input data.

NPAC SMS shall accept the following optional fields from the new Service Provider or NPAC personnel for an active Subscription Version to be modified:

- Billing Service Provider ID
- End-User Location - Value
- End-User Location - Type

R5-38.1 Modify Active Subscription Version - Field-level Data Validation

NPAC SMS shall perform field-level data validations to ensure that the value formats for the following input data, if supplied, is valid according to the formats specified in Table 3-4 upon Subscription Version modification of an active version:

- LRN
- Class DPC
- Class SSN
- LIDB DPC
- LIDB SSN
- CNAM DPC
- CNAM SSN
- ISVM DPC
- ISVM SSN
- Billing Service Provider ID
- End-User Location - Value
- End-User Location - Type

R5-38.2 Modify Active Subscription Version - LRN Validation

NPAC SMS shall verify that an input LRN is associated with the new Service Provider in the NPAC SMS system upon Subscription Version modification of an active version.

R5-39.1 Modify Active Subscription Version - Validation Failure Notification

NPAC SMS shall send an appropriate error message to the originating user if the modified active Subscription Version fails validations.

R5-39.2 Modify Active Subscription Version - Validation Error Processing

NPAC SMS shall leave the original version intact upon validation failure of a modified active Subscription Version.

R5-40.1 Modify Active Subscription Version - Broadcast Date/Time Stamp

NPAC SMS shall record the current date and time as the broadcast date and time stamp upon initiation of broadcasting of the modified active Subscription Version.

R5-40.2

(Duplicate - refer to R5-34)

R5-40.3 Modify Active Subscription Version - Modification Success User Notification

NPAC SMS shall notify the originating user indicating successful modification of an active Subscription Version.

R5-40.4 Modify Active Subscription Version - Broadcast complete Time Stamp

NPAC SMS shall record the current date and time as the Broadcast Complete Date and Time Stamp, after one Local SMS has successfully acknowledged modifying the new Subscription Version.

R5-41 Activation Of A Modified Subscription Version

NPAC SMS shall proceed with the broadcast modified active subscription process upon successful modification of an active Subscription Version.

RR5-41.1 Broadcast Modified Active Subscription - Local SMS Identification

NPAC SMS shall determine which Local SMSs to send the Subscription Version to by identifying all Local SMSs that are accepting Subscription version data downloads for the given NPA-NXX.

RR5-41.2 Broadcast Modified Active Subscription - Send to Local SMSs

NPAC SMS shall send the modified Subscription version via the NPAC SMS to Local SMS Interface to the Local SMSs

RR5-41.3 Broadcast Modified Active Subscription - Set to Sending

NPAC SMS shall set the Subscription Version status to sending upon sending the Subscription version to the Local SMSs.

RR5-41.4 Modify Active Subscription Version - Return Status

NPAC SMS shall upon completion of the broadcast (failed or successful) return the status of the modified active subscription to it's previous state.

RR5-41.5 Modify Active Subscription Activation Retry Attempts - Tunable Parameter

NPAC SMS shall use the Subscription Activation Retry Attempts tunable parameter which defines the number of times a new Subscription Version will be sent to a Local SMS which has not acknowledged receipt of the modify request.

RR5-41.6 Modify Active Subscription Activation Retry Interval - Tunable Parameter

NPAC SMS shall use the Subscription Activation Retry Interval tunable parameter, which defines the delay between sending new Subscription Versions to a Local SMS that has not acknowledged receipt of the modify request.

RR5-41.7 Modify Active Subscription Version Failure Retry

NPAC SMS shall resend the modified Subscription Version a Subscription Activation Retry Attempts tunable parameter number of times to a Local SMS that has not acknowledged the receipt of the modification request once the Subscription Activation Retry Interval tunable parameter expires.

RR5-41.8 Modify Active Subscription Version Failure - Status Sending

NPAC SMS shall retain the status for the Subscription Version being modified as sending until the earlier of the Subscription Version retry period has expired for all Local SMSs, or until all Local SMSs have acknowledged the activation**.**

RR5-41.9 Modify Active Subscription Version Failure - Local SMS Identification

NPAC SMS shall notify the NPAC SMS Administrator of all Local SMSs where a modify has failed, once each Local SMS has successfully responded or failed to respond during the activation retry period.

RR5-41.10 Subscription Version Activation - Resend to Failed Local SMSs

NPAC SMS shall provide NPAC SMS personnel with the functionality to re-send modify active Subscription Version requests to all failed Local SMSs.

RR5-41.11 Modify Active Subscription Version - Failed Local SMS Notification Current Service Provider

NPAC SMS shall send a list to the Current Service Provider of all Local SMSs that failed activation when a Subscription Version modify active fails.

5.1.2.2.3 Subscription Version Conflict

This section provides the requirements for the functionality to place a Subscription Version in to conflict and remove it from conflict.

NOTE: An old Service Provider can place a subscription version in conflict by setting the authorization flag to "False", as noted in requirement R5-27.4

5.1.2.2.3.1 Placing a Subscription Version in Conflict

R5-42 Conflict Subscription Version - Version Identification

NPAC SMS shall require the following data from NPAC personnel to identify the Subscription Version to be placed in conflict:

Ported Telephone Number

or

Subscription Version ID

R5-43.1 Conflict Subscription Version - Invalid Status Notification

NPAC SMS shall send an error message to the NPAC personnel or old Service Provider if the version status is not pending or cancel pending upon attempting to set the Subscription Version to conflict.

R5-43.2 Conflict Subscription Version - No Cause Code Notification

NPAC SMS shall send an error message to the SOA if the cause code is not specified upon setting the Subscription Version to conflict.

RN5-11

(Duplicate - Refer to R5-42 and R5-43)

RR5-42.1 Conflict Subscription Version - Old Service Provider Number Restriction

NPAC SMS shall only allow a subscription version to be placed into conflict by the Old Service provider one time.

RR5-42.2 Conflict Subscription Version - Conflict Restriction Window

NPAC SMS shall provide a Conflict Restriction Tunable which is defined as the time on the business day prior to the New Service Provider due date that a pending Subscription Version **can no longer** be placed into conflict state by the old Service Provider.

AR5-2 Conflict Restriction Window Tunable due date value

The date used for the Conflict Restriction Window Tunable calculation relies on the date value specified in the New Service Provider due date.

RR5-42.3 Conflict Subscription Version - Conflict Restriction Window Tunable

NPAC SMS shall allow the NPAC SMS Administrator to modify the Conflict Restriction Window Tunable parameter.

RR5-42.4 Conflict Subscription Version - Conflict Restriction Window Tunable Default

NPAC SMS shall default the Conflict Restriction Window Tunable parameter to 12 noon.

R5-44.1 Conflict Subscription Version - Set Status to Conflict

NPAC SMS shall, upon placing a Subscription Version into conflict, set the version status to conflict.

R5-44.2 Conflict Subscription Version - Set Conflict Date and Time

NPAC SMS shall, upon placing a Subscription Version into conflict, record the current date and time as the conflict date and time stamp.

R5-44.3 Conflict Subscription Version - Successful Completion Message

NPAC SMS shall issue an appropriate message to the originating user and the Old and New Service Providers indicating successful completion of the process to place a subscription in conflict.

R5-45.1 Conflict Expiration Window - Tunable Parameter

NPAC SMS shall provide a Conflict Expiration Window tunable parameter which is defined as a number of calendar days a Subscription Version will remain in conflict prior to cancellation.

R5-45.2 Conflict Expiration Window - Tunable Parameter Default

NPAC SMS shall default the Conflict Expiration Window tunable parameter to 30 calendar days.

R5-45.3 Conflict Expiration Window - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administration to modify the Conflict Expiration Window tunable parameter.

R5-45.4 Conflict Subscription Version - Set to Cancel

NPAC SMS shall set the status of the Subscription Version to cancel after a Subscription Version has been in conflict for a Conflict Expiration Window tunable parameter number of calendar days.

R5-45.5 Conflict Subscription Version - Set Cancellation Date Timestamp

NPAC SMS shall set a Subscription Version cancellation date timestamp to the current time upon setting a conflict Subscription Version to cancel.

R5-45.6 Conflict Subscription Version - Inform Service Providers of Cancel Status

NPAC SMS shall notify both Service Providers after a Subscription Version status is set to cancel from conflict.

5.1.2.2.3.2 Removing a Subscription Version from Conflict

R5-46 Conflict Resolution Subscription Version - Version Identification

NPAC SMS shall require the following data from the NPAC personnel user, new, or old Service Provider to identify the Subscription Version to be set from conflict to pending:

Ported Telephone Number

or

Subscription Version ID

R5-47 Conflict Resolution Subscription Version - Invalid Status Notification

NPAC SMS shall send an error message to the originating user if the Subscription Version status is not in conflict upon attempting to set the Subscription Version to pending.

R5-48

DELETE

R5-49.1

DELETE

R5-49.2

DELETE

R5-50.1 Conflict Resolution Subscription Version - Set Status

NPAC SMS shall set the version status to pending if the Subscription Version is in conflict upon a request from NPAC personnel, new, or old service providers to set a Subscription Version to pending.

R5-50.2 Conflict Resolution Subscription Version - Status Message

NPAC SMS shall send an appropriate message to the originating user indicating successful completion of the process to set a subscription to pending.

RR5-12.1 Conflict Resolution Subscription Version - Inform Both Service Providers of Pending Status

NPAC SMS shall inform both Service Providers when the status of a Subscription Version is set to pending for an Inter-Service Provider port.

RR5-12.2

DELETE

RR5-12.3 Conflict Resolution New Service Provider Restriction Tunable Parameter

NPAC SMS shall provide a Conflict Resolution New Service Provider Restriction tunable parameter which is defined as a number of business hours after the subscription version is put into conflict that the NPAC SMS will prevent it from being removed from conflict by the New Service Provider.

RR5-12.4 Conflict Resolution New Service Provider Restriction - Tunable Parameter Default

NPAC SMS shall default the Conflict Resolution New Service Provider Restriction tunable parameter to 6 business hours.

RR5-12.5 Conflict Resolution New Service Provider Restriction Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administration to modify the Conflict Resolution New Service Provider Restriction tunable parameter.

RR5-13.1

DELETE

RR5-13.2

DELETE

RR5-14 Conflict Resolution Acknowledgment - Update Conflict Resolution Date and Time Stamp

NPAC SMS shall update the conflict resolution date and time stamp with the current date and time and set the old Service Provider Authorization flag to true when conflict is resolved.

RR5-15.1

DELETE

RR5-15.2

DELETE

RR5-16.1

DELETE

RR5-16.2

DELETE

RR5-17.1

DELETE

RR5-17.2

DELETE

RR5-17.3

DELETE

RR5-17.4

DELETE

RR5-18.1

DELETE

RR5-18.2

DELETE

RR5-18.3

DELETE

RR5-19

DELETE

RR5-20

DELETE

5.1.2.2.4 Subscription Version Activation

This section provides the requirements for the Subscription Version Activation functionality, which is executed upon the NPAC personnel or SOA to NPAC SMS interface user requesting to activate a Subscription Version. Requirements related to activation are contained in requirement R5-23.

R5-51.1 Activate Subscription Version - Version Identification

NPAC SMS shall require the following data from the NPAC personnel or new service provider to identify the Subscription Version to be activated:

Ported Telephone Number
or
Subscription Version ID

R5-51.2 Activate Subscription Version - Broadcast Complete Date and Time Stamp

NPAC SMS shall record the current date and time as the Activation Broadcast Complete Date and Time Stamp, as soon as one Local SMS has successfully acknowledged activating the new Subscription Version.

RR5-21 Activate "porting to original" Subscription Version

NPAC SMS shall proceed with the "immediate" disconnect processing when a "porting to original" Subscription Version is activated.

RR5-22 Activate Subscription Version - Set Activation Received Timestamp

NPAC SMS shall set the Activation Received timestamp to the current date and time upon receiving a Subscription Version activation request.

R5-52 Activate Subscription Version - Invalid Status Notification

NPAC SMS shall send an error message to the originating user if the version status is not pending upon Subscription Version activation.

R5-53.1 Activate Subscription Version - Validation

NPAC SMS shall verify that a Subscription Version is in a valid pending state by checking that a new Service Provider time stamp exists and that the effective date of the NPA-NXX has been reached.

R5-53.2 Activate Subscription Version Validation Error Message

NPAC SMS shall send an error message to the originating user if the Subscription validation fails.

R5-53.3 Activate Subscription Version - Validate Due Date

NPAC SMS shall verify that a pending Subscription Version is eligible for activation by ensuring that the new Service Provider due date is less than or equal to the current date.

R5-54.1

DELETE

R5-54.2

DELETE

R5-55 Activate Subscription Version - Local SMS Identification

NPAC SMS shall determine which Local SMSs to send the Subscription Version to by identifying all Local SMS that are accepting Subscription Version data downloads for the given NPA-NXX.

R5-56

(Duplicate - refer to R5-57.1)

R5-57.1 Activate Subscription Version - Send to Local SMSs

NPAC SMS shall send the activated Subscription Version for an activated Inter or Intra-Service Provider port via the NPAC SMS to Local SMS Interface to the Local SMSs.

R5-57.2 Activate Subscription Version - Set to Sending

NPAC SMS shall set the subscription status to sending upon sending the activated Subscription Version to the Local SMSs.

R5-57.3 Activate Subscription Version - Date and Time Stamp

NPAC SMS shall record the current date and time as the broadcast date and time stamp upon initiating sending the activated subscription to the Local SMSs.

R5-58.1 Local SMS Activation message logging

NPAC SMS shall log the activation responses resulting from the activation requests sent to the Local SMSs.

R5-58.2 Local SMS Activation Log Retention Period - Tunable Parameter

NPAC SMS shall provide a Local SMS Activation Log Retention Period tunable parameter which is defined as the number of calendar days Local SMS activation responses will remain in the log.

R5-58.3 Local SMS Activation Log Retention Period - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Local SMS Activation Log Retention Period tunable parameter.

R5-58.4 Local SMS Activation Log Retention Period - Tunable Parameter Default

NPAC SMS shall default the Local SMS Activation Log Retention Period tunable parameter to 90 calendar days.

R5-58.5 Local SMS Activation Message Log - Viewing

NPAC SMS shall allow NPAC personnel to view the Local SMS Activation Message log.

R5-59.1 Activate Subscription Version - Set Status of Current to Active

NPAC SMS shall, upon receiving successful activation acknowledgment from all involved Local SMSs, set the sending Subscription Version status to active.

R5-59.2 Activate Subscription Version - Set Status of Previous to Old

NPAC SMS shall upon receiving successful activation acknowledgment from any involved Local SMSs, set the previous active Subscription Version status to old.

R5-60.1 Subscription Activation Retry Attempts - Tunable Parameter

NPAC SMS shall provide a Subscription Activation Retry Attempts tunable parameter which defines the number of times a new Subscription Version will be sent to a Local SMS which has not acknowledged receipt of the activation request.

R5-60.2 Subscription Activation Retry Interval - Tunable Parameter

NPAC SMS shall provide a Subscription Activation Retry Interval tunable parameter, which defines the delay between sending new Subscription Versions to a Local SMS that has not acknowledged receipt of the activation request.

R5-60.3 Subscription Activation Retry Attempts - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Subscription Activation Retry Attempts tunable parameter.

R5-60.4 Subscription Activation Retry Interval - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Subscription Activation Retry Interval tunable parameter.

R5-60.5 Subscription Activation Retry Attempts - Tunable Parameter Default

NPAC SMS shall default the Subscription Activation Retry Attempts tunable parameter to 3 times.

R5-60.6 Subscription Activation Retry Interval - Tunable Parameter Default

NPAC SMS shall default the Subscription Activation Retry Interval tunable parameter to 2 minutes.

R5-60.7 Subscription Version Activation Failure Retry

NPAC SMS shall resend the activated Subscription Version a Subscription Activation Retry Attempts tunable parameter number of times to a Local SMS that has not acknowledged the receipt of the activation request once the Subscription Activation Retry Interval tunable parameter expires.

R5-60.8 Subscription Version Activation Failure - After Retries

NPAC SMS shall consider the Subscription Version activation for a given Local SMS failed once the applicable Activation Retry tunable parameter number of retries has been exhausted for that Local SMS.

R5-60.9 Subscription Version Activation Failure - Status Sending

NPAC SMS shall retain the status for the Subscription Version being activated as sending until the Subscription Version retry period expires for all Local SMSs, or until all Local SMSs have acknowledged the activation.

R5-60.10 Subscription Version Activation Failure - Local SMS Identification

NPAC SMS shall notify the NPAC SMS Administrator of all Local SMSs where new activation failed, once each Local SMS has successfully responded or failed to respond during the activation retry period.

R5-60.11 Subscription Version Activation Failure - Set Status to Partial Failure

NPAC SMS shall set the Subscription Version status to partial failure if the activation resulting from an subscription version activation request failed in one or more, but not all, of the Local SMSs.

R5-60.12 Subscription Version Partial Activation Failure - Set Status of Previous to Old

NPAC SMS shall set the status of a previous active version to old when a Subscription Version activation succeeds for at least one of the Local SMSs.

R5-61.1 Subscription Version Activation - Set Status to Failure

NPAC SMS shall set the status of the Subscription Version to failed if the Subscription Version fails activation resulting from an subscription version activation request in all the Local SMSs to which it was sent.

R5-61.2 Subscription Version Activation Subscription Version - Failure Notification

NPAC SMS shall notify the NPAC System Administrator when a Subscription Version fails activation at all of the Local SMSs.

R5-61.3 Subscription Version Activation - Resend to Failed Local SMSs

NPAC SMS shall provide NPAC SMS personnel with the functionality to re-send activate Subscription Version requests to all failed Local SMSs.

RR5-22.1 Subscription Version Activation - Failed Local SMS Notification - Both Service Providers

NPAC SMS shall send a list to the Old and New Service Providers of all Local SMSs that failed activation when a Subscription Version is set to failed or partial failure subsequent to Subscription Version activation for an Inter-Service Provider port.

RR5-22.2 Subscription Version Activation - Failed Local SMS Notification - Current Service Provider

NPAC SMS shall send a list to the current Service Provider of all Local SMSs that failed activation when a Subscription Version is set to failed or partial failure subsequent to Subscription Version activation for an Intra-Service Provider port.

5.1.2.2.5 Subscription Version Disconnect

This section provides the requirements for the Subscription Version Disconnect functionality, which is executed upon the NPAC personnel or SOA to NPAC SMS interface user requesting to have a Subscription Version disconnected.

R5-62 Disconnect Subscription Version - Version Identification

NPAC SMS shall receive the following data from the NPAC personnel or current Service Provider to identify an active Subscription Version to be disconnected:

Ported Telephone Numbers (or a specified range of numbers)
or
Subscription Version ID

RR5-23.1 Disconnect Subscription Version - Required Input Data

NPAC SMS shall require the following input data upon a Subscription Version disconnect:

- Customer Disconnect Date - Date upon which the customer's service is disconnected.

RR5-23.2 Disconnect Subscription Version - Optional Input Data

NPAC SMS shall accept the following optional input data upon a Subscription Version disconnect:

- Effective Release Date - Future date upon which the disconnect should be broadcast to all Local SMSs.

RR5-23.3 Old Service Provider Final Concurrence Timer Expiration Notification

NPAC SMS shall upon expiration of the Final Concurrence Timer send a notification to the old service provider via the SOA to NPAC SMS interface to inform them of the timer expiration.

RN5-10 Disconnect Subscription Version - Invocation by Current Service Provider

NPAC SMS shall allow only NPAC personnel or the Current Service Provider to invoke the functionality to disconnect a Subscription Version.

R5-63 Disconnect Subscription Version - Invalid Status Notification

NPAC SMS shall send an appropriate error message to the originating user that the Subscription Version is not active in the network and cannot be disconnected or set to disconnect pending if there is no Subscription Version with a status of active.

R5-64.1 Disconnect Subscription Version - Cancel Other Version Notification

NPAC SMS shall notify the originating user that the active Subscription Version cannot be disconnected if a version of that subscription version with a status other than canceled or old exists.

R5-64.2

DELETE

R5-64.3

DELETE

R5-64.4

DELETE

R5-64.5

DELETE

R5-64.6

DELETE

R5-64.7

DELETE

RR5-24 Disconnect Subscription Version -Set to Disconnect Pending

NPAC SMS shall set the status of a Subscription Version to disconnect pending upon a Subscription Version disconnect request when an effective release date is specified.

RR5-25.1 Disconnect Subscription Version - Disconnect Pending Status Notification

NPAC SMS shall inform the current Service Provider when the status of a Subscription Version is set to Disconnect Pending.

RR5-25.2 Disconnect Subscription Version - Customer Disconnect Date Notification

NPAC SMS shall notify the new Service Provider (donor) of the Subscription Version Customer Disconnect Date and Effective Release Date immediately prior to broadcasting a Subscription Version disconnect.

R5-65.1 Disconnect Subscription Version -Immediate Broadcast

NPAC SMS shall immediately proceed with the broadcasting of the disconnect after the Customer Disconnect Date notification is sent if no Effective Release Date was specified with the request.

R5-65.2 Disconnect Subscription Version - Deferred Broadcast

NPAC SMS shall proceed with the broadcasting of the disconnect when the specified Effective Release Date is reached if an Effective Release Date was specified with the request.

R5-65.3

DELETE

R5-65.4 Disconnect Subscription Version - Broadcast Interface Message to Local SMSs

NPAC SMS shall broadcast the disconnect Subscription Version message to the Local SMSs that are accepting Subscription Version data downloads for the given NPA-NXX via the NPAC SMS to Local SMS Interface.

R5-65.5 Disconnect Subscription Version - Disconnect Broadcast Date and Time Stamp

NPAC SMS shall record the current date and time as the disconnect broadcast date and time stamp upon sending of disconnect messages to the Local SMSs.

R5-65.6 Disconnect Subscription Version - Set to Sending

NPAC SMS shall set a Subscription Version status to sending upon sending the disconnect messages to the Local SMSs.

R5-66.1

DELETE

R5-66.2 Disconnect Subscription Version Complete - Set Disconnect Broadcast Complete Date

NPAC SMS shall set the Disconnect Broadcast Complete timestamp to the current date in the previously active, now old, Subscription Version upon a successful disconnect from one Local SMS.

R5-66.3 Disconnect Subscription Version Complete - Set Disconnect to Old

NPAC SMS shall set the sending disconnect Subscription Version to old upon a successful disconnect in all Local SMSs.

R5-67.1 Disconnect Subscription Version - Set Status to Active

NPAC SMS shall set the status of the disconnect Subscription Version to active if the disconnect fails in all the Local SMSs to which it was sent.

R5-67.2 Disconnect Pending Subscription Version - Failure Notification

NPAC SMS shall notify the NPAC SMS System Administrator when a disconnect Subscription Version fails in all of the Local SMSs.

R5-67.3 Disconnect Subscription Version - Resend Disconnect Requests to All Local SMSs

NPAC SMS shall provide authorized NPAC SMS personnel with the functionality to resend all failed disconnect requests to the Local SMSs.

R5-68.1 Disconnect Subscription Version - Subscription Disconnect Retry Attempts - Tunable Parameter

NPAC SMS shall allow the NPAC SMS Administrator to modify the Subscription Disconnect Retry Attempts tunable parameter, which is defined as the number of times the NPAC SMS will resend a disconnect message to an unresponsive Local SMS.

R5-68.2 Disconnect Pending Subscription Version - Subscription Disconnect Retry Attempts - Tunable Parameter Default

NPAC SMS shall default the Subscription Disconnect Retry Attempts tunable parameter to 3 times.

R5-68.3 Disconnect Subscription Version - Subscription Disconnect Retry Interval - Tunable Parameter

NPAC SMS shall allow the NPAC SMS Administrator to modify the Subscription Disconnect Retry Interval tunable parameter, which is defined as the amount of time that shall elapse between disconnect retries.

R5-68.4 Disconnect Subscription Version - Subscription Disconnect Retry Interval - Tunable Parameter Default

NPAC SMS shall default the Subscription Disconnect Retry Interval tunable parameter to 2 minutes.

R5-68.5 Disconnect Subscription Version - Retry Processing

NPAC SMS shall resend a Subscription Version disconnect message a Subscription Disconnect Retry Attempts tunable parameter number of times to a Local SMS that has not acknowledged the receipt of a disconnect once the Subscription Disconnect Retry Interval tunable parameter expires.

R5-68.6 Disconnect Subscription Version - Sending Status during Retries

NPAC SMS shall retain the status for the Subscription Version being disconnected as sending until the Subscription Disconnect Retry Attempts tunable parameter period expires for all Local SMSs, or until all Local SMSs have acknowledged the disconnect.

R5-68.7 Disconnect Subscription Version - Retry Failed

NPAC SMS shall consider the disconnect Subscription Version request to have failed at a specific Local SMS after the Subscription Disconnect Retry Attempts tunable parameter count for the specific Local SMS has been exhausted.

R5-68.8 Disconnect Subscription Version - Failure Notification after Retries Complete

NPAC SMS shall send a list of the Local SMSs where the disconnect request failed to the NPAC SMS System Administrator after every local SMS has either succeeded or failed with the disconnect.

R5-68.9 Disconnect Subscription Version - Set to Old

NPAC SMS shall set the disconnect Subscription Version status to old if the disconnect request failed at one or more, but not all, of the Local SMSs.

R5-68.10 Disconnect Subscription Version - Resend Disconnect Requests to Failed Local SMSs

NPAC SMS shall provide authorized NPAC SMS personnel with the functionality to resend disconnect requests to all Local SMSs that failed to register the disconnect request.

5.1.2.2.6 Subscription Version Cancellation

This section provides the requirements for the Subscription Version Cancellation functionality, which is executed upon the NPAC personnel or SOA to NPAC SMS interface user requesting to cancel a Subscription Version.

RR5-26.1 Cancel Subscription Version - Inform Both Service Providers of Cancel Pending Status

NPAC SMS shall inform both old and new Service Providers when the status of a Subscription Version is set to cancel pending for an Inter-Service Provider port.

RR5-26.2

DELETE

R5-69 Cancel Subscription Version - Version Identification

NPAC SMS shall receive the following data from the NPAC personnel to identify a Subscription Version to be canceled:

Ported Telephone Number (or a specified range of numbers)

or

Subscription Version ID

R5-70 Cancel Subscription Version - Invalid Status Notification

NPAC SMS shall send an appropriate error message to the originating user if the status is not pending, conflict, or disconnect pending.

RR5-27 Cancel Subscription Version - Validate Service Provider

NPAC SMS shall send an appropriate error message to the originating user if the originating user is neither the New nor the Old Service Provider in the existing Subscription Version upon Subscription Version cancellation.

R5-71.1 Cancel Subscription Version - Set to Canceled.

(Superseded - refer to RR5-28)

R5-71.2 Cancel Subscription Version - Set Cancellation Date and Time Stamp

NPAC SMS shall set the Subscription Version cancellation date and time to current upon setting the Subscription Version status to canceled.

R5-71.3 Cancel Subscription Version- Set to Cancel Old Service Provider only

NPAC SMS shall set the subscription version status to cancel upon receiving a cancellation from the old Service Provider if the New Service Provider has not sent a subscription version create.

R5-71.4 Cancel Subscription Version- Set to Cancel New Service Provider only

NPAC SMS shall set the subscription version status to cancel upon receiving a cancellation from the New Service Provider if the Old Service Provider has not sent an subscription version create.

R5-71.5 Cancel Subscription version- Error on Cancellation

NPAC SMS shall return an error if a Service Provider sends a cancellation for a subscription version that has not been created by that Service Provider.

R5-71.6 Cancel Subscription Version- Set Pending subscription version to Cancel Pending Status Inter-Service Provider port

NPAC SMS shall set the subscription version status to Cancel Pending upon receiving a cancellation from either the Old or New Service Provider for a subscription version with a pending status (both Service Providers have done a create) for an Inter-Service Provider or Port to original port.

R5-71.7

DELETE

R5-71.8 Cancel Subscription Version- Set Conflict Subscription to Cancel New Service Provider only

NPAC SMS shall set the subscription version status to cancel upon receiving a cancellation from the new Service Provider on a subscription in conflict that was previously in cancel pending and for which only the old service provider has sent a cancellation acknowledgment.

R5-71.9 Cancel Subscription Version - Rejection of Old Service Provider Conflict Cancellation

NPAC SMS shall return an error to the Old Service Provider if they attempt to cancel a Subscription Version that is in conflict due to lack of New Service Provider cancellation concurrence on a subscription version that was previously in cancel pending state.

R5-71.10 Cancel Subscription Version- Set Disconnect Pending subscription version to Active

NPAC SMS shall set the subscription version status to Active upon receiving a cancellation for a subscription version with a status of disconnect pending.

R5-71.11 Cancel Subscription Version- Set to Cancel Status - Intra-Service Provider port

NPAC SMS shall set the subscription version status to cancel upon receiving a cancellation from the current Service Provider for an Intra-Service Provider port.

RR5-28.1 Cancel Subscription Version - Set to Cancel After Service Provider Acknowledge

NPAC SMS shall set the Subscription Version status to cancel upon receiving cancellation pending acknowledgment from the Service Provider that did not initiate the cancellation for an Inter-Service Provider port.

RR5-28.2

DELETE

RR5-29.1 Cancel Subscription Version - Inform Both Service Providers of Cancel Status

NPAC SMS shall notify both old and new Service Providers after a Subscription Version's status is set to canceled for an Inter-Service Provider port.

RR5-29.2 Cancel Subscription Version - Inform Current Service Provider of Cancel Status

NPAC SMS shall notify the current Service Provider after a Subscription Version's status is set to canceled for an Intra-Service Provider port.

RR5-30 Cancel Subscription Version Acknowledgment - Update Old Service Provider Date and Time Stamp

NPAC SMS shall update the old Service Provider cancellation date and time stamp with the current date and time when the cancellation acknowledgment is received from the old Service Provider.

RR5-31 Cancel Subscription Version Acknowledgment - Update New Service Provider Date and Time Stamp

NPAC SMS shall update the new Service Provider cancellation date and time stamp with the current date and time when the cancellation acknowledgment is received from the new Service Provider.

RR5-32.1 Cancellation-Initial Concurrence Window - Tunable Parameter

NPAC SMS shall provide a Cancellation-Initial Concurrence Window tunable parameter, which is defined as the number of business hours after the version is set to Cancel Pending by which the non-originating Service Provider is expected to acknowledge the pending cancellation.

RR5-32.2 Cancellation-Initial Concurrence Window - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Cancellation-Initial Concurrence Window tunable parameter.

RR5-32.3 Cancellation-Initial Concurrence Window - Tunable Parameter Default

NPAC SMS shall default the Cancellation-Initial Concurrence Window tunable parameter to 9 business hours.

RR5-33.1 Cancellation-Final Concurrence Window - Tunable Parameter

NPAC SMS shall provide a Cancellation-Final Concurrence Window tunable parameter which is defined as the number of business hours after the second cancel pending notification is sent by which both Service Providers are expected to acknowledge the pending cancellation.

RR5-33.2 Cancellation-Final Concurrence Window Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Cancellation-Final Concurrence Window tunable parameter.

RR5-33.3 Cancellation-Final Concurrence Window - Tunable Parameter Default

NPAC SMS shall default the Cancellation-Final Concurrence Window tunable parameter to 9 business hours.

RR5-34 Cancellation-Initial Concurrence Window - Tunable Parameter Expiration

NPAC SMS shall send a notification to the Service Provider (new or old) who has not yet acknowledged the cancel pending status when the Cancellation-Initial Concurrence Window tunable parameter expires.

RR5-35.1 Cancellation-Final Concurrence Window - Tunable Parameter Expiration New Service Provider

NPAC SMS shall set the Subscription Version status to conflict when the NPAC SMS has not received the cancellation acknowledgment from the new Service Provider and the Cancellation-Final Concurrence Window tunable parameter has expired.

RR5-35.2 Cancellation-Final Concurrence Window - Tunable Parameter Expiration Old Service Provider

NPAC SMS shall set the Subscription Version status to cancel and set the cause code to “NPAC SMS automatic cancellation” when the NPAC SMS has not received the cancellation acknowledgment from the Old Service Provider and the Cancellation-Final Concurrence Window tunable parameter has expired.

RR5-36 Cancel Subscription Version - Inform Service Providers of Conflict Status

NPAC SMS shall notify the old and new Service Providers upon setting a Subscription Version to conflict.

5.1.2.2.7 Subscription Version Resend

This section provides the requirements for the Subscription Version resend functionality, which is executed upon the NPAC personnel requesting to resend a Subscription Version.

RR5-38.1 Resend Subscription Version - Identify Subscription Version

NPAC SMS shall receive the following data from NPAC personnel to identify a failed or partial failure version to be resent:

Ported Telephone Number
or
Subscription Version ID

RR5-38.2 Resend Subscription Version - Input Data

NPAC SMS shall require the following input data from NPAC personnel upon a Subscription Version resend:

- List of "failed" Local SMSs to resend to.

RR5-38.3 Resend Subscription Version - Error Message

NPAC SMS shall send an error message to the originating user upon Subscription Version resend if the version does not have a list of failed LSMSs associated with the subscription's last operation..

RR5-38.4 Resend Subscription Version - Activation Request

NPAC SMS shall resend a Subscription Version activation request, if either the Subscription Version previously failed activation or an active Subscription Version previously failed modification, to the designated list of failed Local SMSs via the NPAC SMS to Local SMS Interface upon a Subscription Version resend request.

RR5-38.5 Resend Subscription Version - Disconnect Request

NPAC SMS shall resend a Subscription Version disconnect request, if the Subscription Version failed disconnect, to the designated list of failed Local SMSs upon a Subscription Version resend request.

RR5-38.6 Resend Subscription Version - Failed or Partial Failure

NPAC SMS shall set a failed or partial failure Subscription Version to sending subsequent to resending to the Local SMSs.

RR5-38.7 Resend Subscription Version - Standard Activation Processing

NPAC SMS shall proceed with the standard activation processing subsequent to resending a Subscription Version activation request to the Local SMSs.

RR5-38.8 Resend Subscription Version - Standard Disconnect Processing

NPAC SMS shall proceed with the standard disconnect processing subsequent to resending a Subscription Version disconnect request to the Local SMSs.

5.1.3 Subscription Queries

This section provides the requirements for the Subscription Version Query functionality, which is executed upon the user requesting a query of a Subscription Version (R5-13).

5.1.3.1 User Functionality

R5-72 Query Subscription Version - Request

NPAC SMS shall allow NPAC personnel, SOA to NPAC SMS interface users, and NPAC SMS to Local SMS interface users to query data maintained by the NPAC SMS for a Subscription and all its Versions.

5.1.3.2 System Functionality

The following requirements specify the NPAC SMS query functionality defined above.

R5-73 Query Subscription Version - Version Identification

NPAC SMS shall receive the following data to identify a Subscription Version to be queried:

Ported Telephone Numbers and status (optional)
or
Subscription Version ID

R5-74.1 Query Subscription Version - Status Supplied

NPAC SMS shall only retrieve Subscription Versions with a specific status when the user supplies a specific Subscription Version status as part of the query criteria.

R5-74.2 Query Subscription Version - Return All Subscription Versions for Ported TN

NPAC SMS shall return all Subscription Versions associated with a ported TN that the requester is eligible to view if the originating user has not provided a Subscription Version status as part of the query criteria.

R5-74.3 Query Subscription Version - Output Data

NPAC SMS shall return the following output data for a Subscription Version query request initiated by NPAC personnel or a SOA to NPAC SMS interface user:

- Subscription Version ID
- Subscription Version Status
- Local Number Portability Type
- Ported Telephone Number

- Old facilities-based Service Provider Due Date
- New facilities-based Service Provider Due Date
- New facilities-based Service Provider ID
- Old facilities-based Service Provider ID
- Authorization from old facilities-based Service Provider
- Status Change Cause Code
- Location Routing Number (LRN)
- Class DPC
- Class SSN
- LIDB DPC
- LIDB SSN
- CNAM DPC
- CNAM SSN
- ISVM DPC
- ISVM SSN
- Billing Service Provider ID
- End-User Location Value
- End User Location Type
- Customer Disconnect Date
- Effective Release Date
- Disconnect Broadcast Complete Time Stamp
- Conflict Time Stamp
- Activation Time Stamp
- Cancellation Time Stamp (Status Modified to Canceled Time Stamp)
- New Service Provider Creation Time Stamp
- Old Service Provider Authorization Time Stamp
- Pre-cancellation Status
- Old Service Provider Cancellation Time Stamp
- New Service Provider Cancellation Time Stamp
- Old Time Stamp (Status Modified to Old Time Stamp)
- New Service Provider Conflict Resolution Time Stamp
- Create Time Stamp
- Modified Time Stamp
- Porting to Original
- List of all Local SMSs that failed activation, modification, or disconnect.

R5-74.4 Query Subscription Version - Output Data

NPAC SMS shall return the following output data for a Subscription Version query request initiated over the NPAC SMS to Local SMS interface:

- Subscription Version ID
- Ported Telephone Number
- Location Routing Number (LRN)
- New facilities-based Service Provider ID
- Activation Time Stamp
- Customer Disconnect Date
- Class DPC
- Class SSN
- LIDB DPC
- LIDB SSN
- CNAM DPC
- CNAM SSN

- ISVM DPC
- ISVM SSN
- End-User Location Value
- End-User Location Type
- Billing Service Provider ID
- Local Number Portability Type

R5-75 Query Subscription Version -No Data Found

NPAC SMS shall send the originating user an appropriate message indicating that there was no data found if no Subscription Versions were found for a query.

RN5-4 Query Subscription Version - Retrieve Data, Modification Not Allowed

NPAC SMS shall allow NPAC personnel or SOA to NPAC SMS interface users to retrieve subscription data that they cannot modify.

RN5-5 Query Subscription Version - Retrieve Data Based on Single Ported TN Only

NPAC SMS shall allow authorized NPAC personnel, SOA to NPAC SMS interface users, or NPAC SMS to Local SMS interface users to submit query requests for Subscription Version data based on a single ported TN only.

RN5-6 Query Subscription Version - View for Any Ported TN

NPAC SMS shall allow old and new Service Providers or NPAC personnel to view a Subscription Version for any ported TN.

RR5-39 Query Subscription Version - View Old or Active Only

NPAC SMS shall allow NPAC Customers who are neither the old nor the new Service Provider to view only those Subscription Versions for a ported TN with a status of active or old .

RR5-40 Query Subscription Version - Online Records Only

NPAC SMS shall only allow Subscription Version queries of online subscription Versions that have not been archived.

6. NPAC SMS Interfaces

Two CMIP-based, mechanized interfaces to the NPAC SMS were defined in the Illinois NPAC RSMS RFP. One interface supports the Service Provider's Service Order Administration (SOA) systems. This interface is referred to as the SOA to NPAC SMS interface. The second interface supports the Service Providers Local Service Management System (LSMS). This interface is referred to as the NPAC SMS to LSMS interface. Both of the interfaces support two-way communications.

6.1 SOA to NPAC SMS Interface

R6-1

DELETE

R6-2.1

DELETE

R6-2.2

DELETE

R6-3

DELETE

R6-4.1

DELETE

R6-4.2

DELETE

R6-4.3

DELETE

R6-5.1

DELETE

R6-17.1

DELETE

R6-17.2

DELETE

R6-17.3

DELETE

R6-18.1

DELETE

R6-18.2

DELETE

R6-18.3

DELETE

R6-19

DELETE

R6-20.1

DELETE

R6-20.2

DELETE

6-20.3

DELETE

R6-21

DELETE

6.3 Interface Transactions

The CMIP protocol provides for six types of transactions over the interface (Reference: ISO 9595 and 9596). They are:

- Create
- Delete
- Set
- Get
- M-Action
- Event Report

R6-22 Manager-agent relationship of interface transactions

NPAC SMS Interoperable Interface shall be designed in terms of CMIP transactions in a manager-agent relationship.

6.4 Interface and Protocol Requirements

While it is expected that dedicated links will be used for the interfaces, switched connections should also be supported. Reliability and availability of the links will be essential and high capacity performance will be needed.

R6-23 Open interfaces

The SOA to NPAC SMS Interface and the NPAC SMS to Local SMS Interface shall be open, non-proprietary interfaces and will not become the property of any entity.

6.4.1 Protocol Requirements

R6-24 Interface protocol stack

Both of the NPAC SMS interfaces, as defined above, shall be implemented via the following protocol stack:

INTERFACE PROTOCOL STACK	
Application	CMISE, ACSE, ROSE
Presentation	ANSI T1.224
Session:	ANSI T1.224
Transport:	TCP, RFC1006
Network:	IP
Link	PPP, MAC, Frame Relay, ATM (IEEE 802.3)

INTERFACE PROTOCOL STACK	
Physical	DS1, DS-0 x n , V.34

Table 6-12 Interface Protocol Stack

R6-25 Multiple application associations

NPAC SMS shall support multiple application associations per Service Provider.

6.4.2 Interface Performance Requirements

R6-26 Interface availability

Both the SOA to NPAC SMS and the NPAC SMS to Local SMS interfaces shall be available on a 24 by 7 basis, consistent with other availability requirements in this specification.

R6-27 Interface reliability

A 99.9 % reliability rate shall be maintained for both the SOA to NPAC SMS and NPAC SMS to Local SMS interfaces.

AR6-1 Range Activations

A range activate will contain an average of 20 TNs.

AR6-2 Percent of Range Activations

20% of all downloads as specified in R6-28.1, R6-28.2, R6-29.1 and R6-29.2 will be processed via range activations.

R6-28.1 SOA to NPAC SMS interface transaction rates - sustained

A transaction rate of 2 CMIP transactions (sustained) per second shall be supported by each SOA to NPAC SMS interface association.

R6-28.2 SOA to NPAC SMS interface transaction rates - peak

NPAC SMS shall support a rate of 5.2 CMIP operations per second (peak) over a single SOA to NPAC SMS interface association.

R6-29.1 NPAC SMS to Local SMS interface transaction rates

A transaction rate of 25 TN downloads per second shall be supported by each NPAC SMS to Local SMS interface.

R6-29.2 NPAC SMS to Local SMS interface transaction rates - sustainable

NPAC SMS shall, given a transaction rate of 25 TN downloads per second and the assumptions concerning range activations expressed above, support a rate of 5.2 CMIP operations per second (sustainable for 5 minutes) over each NPAC SMS to Local SMS interface association.

6.4.3 Interface Performance Requirements

R6-30.1 Interface specification

The interoperable interface model defining both the NPAC to Local SMS and the SOA to NPAC SMS shall be specified in terms of ISO 10165-4, "Guideline for the Definition of Managed Objects (GDMO)".

R6-30.2 Interface specification identification

The interface specification shall be referred to as the "NPAC SMS Interoperable Interface Specification" (NPAC SMS IIS).

R6-30.3

DELETE

R6-31

DELETE

R6-32

DELETE

R6-33

DELETE

R6-34

DELETE

R6-35 NPAC SMS Interoperable Interface Specification extensibility

The interface specified shall be capable of extension to account for evolution of the interface requirements.

RR6-1 Acknowledgment of a Cancel Pending for a Subscription Version

NPAC SMS shall acknowledge receiving a cancel pending request for a Subscription Version via the SOA to NPAC SMS Interface.

RR6-2 Acknowledgment of a Conflict Resolution for a Subscription Version

NPAC SMS shall acknowledge receiving a conflict resolution request for a Subscription Version via the SOA to NPAC SMS Interface.

RR6-3 Deferred Disconnect of a Subscription Version

NPAC SMS shall allow a specific Subscription Version to be placed into a deferred disconnect status by having the effective date in the future via the SOA to NPAC SMS Interface.

RR6-4 Cancel Request Notification

NPAC SMS shall notify a Service Provider of a request for a Subscription Version status to be changed to cancel via the SOA to NPAC SMS Interface.

RR6-5 Conflict Resolution Request Notification

NPAC SMS shall notify a Service Provider of a request for a Subscription Version status to be changed to conflict resolution via the SOA to NPAC SMS Interface.

RR6-6

(Duplicate - refer to R10-10.1)

RR6-7

(Duplicate - refer to R10-10.1)

6.4.4 Request Restraints

RR6-8 Tunable Parameter Number of Aggregated Download Records

NPAC SMS shall allow NPAC System Administrators to specify a tunable parameter value for the maximum number of download records.

RR6-9 Download Time Tunable Parameter to Restricted Time Range

NPAC SMS shall allow NPAC System Administrators to specify a tunable parameter value for the maximum time range for a download.

RR6-10

DELETE

RR6-11

(Duplicate - refer to RX6-2.5)

RR6-12

DELETE (moved to RX6-2.6)

RR6-13 Queries Constrained by NPA-NXX

NPAC SMS shall constrain all queries on the NPAC SMS to Local SMS Interface to one NPA-NXX plus additional filter criteria.

RR6-14 Subscription Version Resynchronization Filter Usage

NPAC SMS shall, for a Subscription Version Resynchronization request, over the NPAC SMS to Local SMS Interface, only send subscription version that are not filtered on the Local SMS.

6.5 NPAC SOA Low-tech Interface

The NPAC SOA Low-tech Interface supports the request functionality of the SOA to NPAC SMS interface.

RX6-2.1 NPAC SOA Low-tech Interface

NPAC SMS shall provide an NPAC SOA Low-tech Interface.

RX6-2.2 SOA to NPAC SMS Create Subscription Versions administration requests via an NPAC SOA Low-tech Interface

NPAC SMS shall support Create Subscription Version requests via a secure, NPAC SOA Low-tech Interface.

RX6-2.3 SOA to NPAC SMS Cancel Subscription Versions administration requests via an NPAC SOA Low-tech Interface

NPAC SMS shall support Cancel Subscription Version requests via a secure, NPAC SOA Low-tech Interface.

RX6-2.4 SOA to NPAC SMS Modify Subscription Versions administration requests via an NPAC SOA Low-tech Interface

NPAC SMS shall support Modify Subscription Version requests via a secure, NPAC SOA Low-tech Interface.

RX6-2.5 SOA to NPAC SMS Query Subscription Versions administration requests via an NPAC SOA Low-tech Interface

NPAC SMS shall support query of Subscription Versions via a secure, NPAC SOA Low-tech Interface.

RX6-2.6 SOA to NPAC SMS Activate Subscription Versions administration requests via an NPAC SOA Low-tech Interface

NPAC SMS shall support Activation of Subscription Versions via a secure, NPAC SOA Low-tech Interface.

RX6-2.7 SOA to NPAC SMS Disconnect Subscription Versions administration requests via an NPAC SOA Low-tech Interface

NPAC SMS shall allow NPAC personnel and users of the SOA to NPAC SMS interface to request disconnection of a Subscription Version via a secure, NPAC SOA Low-tech Interface.

RX6-3 SOA to NPAC SMS audit requests

NPAC SMS shall support SOA to NPAC SMS audit requests for all, part or one Service Provider via the NPAC SOA Low-tech Interface.

RX6-3.1

DELETE

RX6-4 NPAC SMS Notification Handling

NPAC SMS shall support, via a secure NPAC SOA Low-tech Interface, a method to view and locally capture notifications that have occurred for the service provider upon request.

6.6 CMIP Request Retry Requirements

RR6-15 SOA Retry Attempts - Tunable Parameter

NPAC SMS shall provide a SOA Retry Attempts tunable parameter which defines the number of times a message will be sent to a SOA which has not acknowledged receipt of the message.

RR6-16 SOA Retry Interval - Tunable Parameter

NPAC SMS shall provide a SOA Retry Interval tunable parameter, which defines the delay between sending a message to a SOA that has not acknowledged receipt of the message.

RR6-17 SOA Retry Attempts - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the SOA Retry Attempts tunable parameter.

RR6-18 SOA Retry Interval - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the SOA Retry Interval tunable parameter.

RR6-19 SOA Retry Attempts - Tunable Parameter Default

NPAC SMS shall default the SOA Retry Attempts tunable parameter to 3 times.

RR6-20 SOA Retry Interval - Tunable Parameter Default

NPAC SMS shall default the SOA Retry Interval tunable parameter to 2 minutes.

RR6-21 SOA Activation Failure Retry

NPAC SMS shall resend the message a SOA Retry Attempts tunable parameter number of times to a SOA that has not acknowledged the receipt of the message once the SOA Retry Interval tunable parameter expires.

RR6-22 LSMS Retry Attempts - Tunable Parameter

NPAC SMS shall provide an LSMS Retry Attempts tunable parameter which defines the number of times a message will be sent to a Local SMS which has not acknowledged receipt of the message.

RR6-23 LSMS Retry Interval - Tunable Parameter

NPAC SMS shall provide an LSMS Retry Interval tunable parameter, which defines the delay between sending a message to a Local SMS that has not acknowledged receipt of the message.

RR6-24 LSMS Retry Attempts - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the LSMS Retry Attempts tunable parameter.

RR6-25 LSMS Retry Interval - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the LSMS Retry Interval tunable parameter.

RR6-26 LSMS Retry Attempts - Tunable Parameter Default

NPAC SMS shall default the LSMS Retry Attempts tunable parameter to 3 times.

RR6-27 LSMS Retry Interval - Tunable Parameter Default

NPAC SMS shall default the LSMS Retry Interval tunable parameter to 2 minutes.

RR6-28 LSMS Activation Failure Retry

NPAC SMS shall resend the message an LSMS Retry Attempts tunable parameter number of times to a Local SMS that has not acknowledged the receipt of the message once the LSMS Retry Interval tunable parameter expires.

7. Security

7.1 Overview

In addition to the general security requirements based on the user interface paradigm in Section through , there are requirements for the security on an OSI application to application interface (such as the one specified in Section , 6. NPAC SMS Interfaces, for the SMS to SMS and SMS to SOA interfaces).

7.2 Identification

The NPAC will accept only authorized NPAC customers through interface connections, and among NPAC customers, the NPAC will make appropriate limitations on their actions (for example, letting only old or new Service Providers view a pending record). The NPAC will only accept authorized customer user IDs. However, the NPAC will make no distinction among an NPAC customer's employees; the NPAC customer and their systems must control individual NPAC customer employee actions.

A user identification is a unique, auditable representation of the user's identity within the system. The NPAC SMS requires all system users, both individuals and remote machines, to be uniquely identified to support individual accountability over the NPAC Administrative and NPAC SOA Low-tech Interfaces.

R7-1 Unique User Identification Codes - Individuals

NPAC SMS shall require unique user identification codes (userids) to identify all NPAC and Service Provider personnel.

R7-2 Assigned Userid Identification

NPAC SMS shall require NPAC and Service Provider personnel to identify themselves with their assigned userId before performing any actions.

R7-3 Current Active User List Maintenance

NPAC SMS shall maintain internally the identity of all NPAC and Service Provider personnel logged on to the NPAC SMS.

R7-4 User Invoked Processes

NPAC SMS shall have for every process running an associated userId of the invoking user (or the userId associated with the invoking process).

7.3 Authentication

The identity of all NPAC SMS system users, both individuals and remote machines, must be verified or authenticated to enter the system, and to access restricted data or transactions over the NPAC Administrative and NPAC SOA Low-Tech Interfaces.

R7-10 User Authentication

NPAC SMS shall authenticate the identity of all NPAC and Service Provider users of the NPAC Administrative and NPAC SOA Low-tech Interfaces prior to their initially gaining access to NPAC SMS.

R7-11

(Duplicate - refer to R7-10)

R7-12 Authentication Data Protection

NPAC SMS shall protect all internal storage of authentication data so that it can only be accessed by an NPAC Security Administrator user.

7.3.1 Password Requirements

R7-13 Passwords - Non-shared

NPAC SMS shall require a single password entry for each userId.

R7-14 Passwords - Userid Unique

NPAC SMS shall allow a user to define a password that is already associated with another userId.

R7-15 Passwords - One-Way Encrypted

NPAC SMS shall store passwords in a one-way encrypted form.

R7-16 Passwords, Encrypted - Privileged Users Access Control

NPAC SMS shall only allow access to encrypted passwords by authorized users.

R7-17

(Duplicate - refer to R7-15)

R7-18 Passwords, Entry - Automatic Clear Text Suppression

NPAC SMS shall automatically suppress or fully blot out the clear-text representation of the password on the data entry device.

R7-19 Passwords - Network Transmission Clear Text Suppression

NPAC SMS shall ensure that passwords sent over public or external shared data networks are encrypted.

R7-20 Passwords - Non-Null

NPAC SMS shall require non-null passwords.

R7-21 Passwords - User-Changeable

NPAC SMS shall provide a mechanism to allow passwords to be user-changeable. This mechanism shall require re-authentication of the user identity.

R7-22 Passwords - Reset Capability

The NPAC SMS shall have a mechanism to reset passwords.

R7-23.1 Passwords - Aging Enforcement

NPAC SMS shall enforce password aging.

R7-23.2 Password Aging Default

NPAC SMS shall default the system password aging to 90 days.

R7-24.1 Passwords - Expiration Notification

NPAC SMS shall notify users a NPAC-specifiable period of time prior to their password expiring. The system supplied default shall be seven days.

R7-24.2 Passwords - Expiration Notification Default

NPAC SMS shall default the password expiration notification time period to seven days

R7-24.3 Passwords - Require User to Enter New Password

NPAC SMS shall require any user whose password has expired to enter a new password before allowing that user access to the system.

R7-25.1 Passwords - Non-Reusable

NPAC SMS shall ensure that a password can not be reused by the same individual for specifiable period of time.

R7-25.2 Password Reuse Default

NPAC SMS shall default the time period in which a password can not be reused to six months.

R7-26.1 Passwords - Minimum Structure Standard #1

Passwords shall contain a combination of at least six case-sensitive alphanumeric characters including at least one alphabetic and one numeric or punctuation character.

R7-26.2 Passwords - Associated Userid

NPAC SMS shall ensure that passwords do not contain the associated userId.

R7-27.1 Password Generator

NPAC SMS shall provide a password generator.

R7-27.2 Passwords, System Generated - Attack Resistant

NPAC SMS shall ensure that generated passwords are "reasonably" resistant to brute-force password guessing attacks.

R7-27.3 Passwords, System Generated - Random

NPAC SMS shall ensure that the generated sequence of passwords have the property of randomness.

7.4 Access Control

Access to the NPAC SMS and other resources will be limited to those users that have been authorized for that specific access right.

7.4.1 System Access

R7-28.1 System Access - Individuals

NPAC SMS shall allow access to authorized individual users.

R7-28.2 System Access - Remote Machines

NPAC SMS shall allow access to authorized remote systems.

R7-29.1 System Access, User Information - Entry

NPAC SMS shall provide a facility for the initial entry of authorized user and associated authentication information.

R7-29.2 System Access, User Information - Modification

NPAC SMS shall provide a facility for the modification of authorized user and associated authentication information.

R7-30

(Duplicate - refer to R7-10)

R7-31 System Access, Login - Trusted Communication

NPAC SMS's login procedure shall be able to be reliably initiated by the user, i.e., a trusted communications path should exist between NPAC SMS and the user during the login procedure.

R7-32.1 System Access - Disconnect User

NPAC SMS shall disconnect end users after a period of non-use.

R7-32.2 Non-use Disconnect Tunable Parameter

NPAC SMS shall default the Non-use Disconnect tunable parameter to 60 minutes.

R7-33.1 System Access - User Authentication Failure

NPAC SMS shall exit and end the session if the user authentication procedure is incorrectly performed a specifiable number of times.

R7-33.2 Incorrect Login Exit Default

NPAC SMS shall default the number of allowable incorrect login attempts to 3.

R7-34 System Access, User Authentication Failure - Notification

NPAC SMS shall provide a mechanism to immediately notify the NPAC SMS system administrator when the threshold in R7-33.1 is exceeded.

R7-35.1 System Access - Login Process I/O Port Restart

NPAC SMS shall restart the login process when the threshold in R7-33.1 has been exceeded and a specified interval of time has passed.

R7-35.2 Login Process Restart Default

NPAC SMS shall default the time interval to restart the login process to 60 seconds.

R7-36 System Access, User Authentication Failure - Userid Non-Suspension

NPAC SMS shall not suspend the userId upon exceeding the threshold in R7-33.1.

R7-37 System Access, User Authentication Procedure - Entry

NPAC SMS shall perform the entire user authentication procedure even if the userId that was entered was not valid.

R7-38 System Access, User Authentication Procedure Entry - Error Feedback

NPAC SMS shall only provide error feedback of "invalid".

R7-39 System Access, User Authentication Procedure Entry - Time Parameters

NPAC SMS shall provide a mechanism to restrict user login based on time-of-day, day-of-week, calendar date.

R7-40.1 System Access, User Authentication Procedure Entry - Method

NPAC SMS shall provide a mechanism to restrict user login based on method of entry.

R7-40.2 System Access, User Authentication Procedure Entry - Location

NPAC SMS shall provide a mechanism to restrict user login based on user system location.

R7-41 System Access, User Authentication Procedure Entry - Dial-Up Limitations

NPAC SMS shall provide a mechanism to limit the users authorized to access the system via dial-up facilities.

R7-42.1 System Access - Network Basis

NPAC SMS shall provide a mechanism to limit system entry for privileged NPAC SMS users on a specifiable network access.

R7-42.2 System Access - Per-Port Basis

NPAC SMS shall provide a mechanism to limit system entry for privileged NPAC SMS users on a specifiable per-port basis.

R7-43.1 System Access, Network Authentication

NPAC SMS shall provide a strong authentication mechanism for network access.

R7-43.2 Internet Access

NPAC SMS shall use authentication of public encryption keys for users accessing the NPAC SMS over the Internet.

R7-43.3 Dial-in Access

NPAC SMS shall use smart cards to authenticate users accessing the NPAC SMS via dial-up.

R7-44 System Access - Secure Logoff Procedures

NPAC SMS shall provide a mechanism to end the session through secure logoff procedures.

R7-45

(Duplicate - refer to R7-47)

R7-46 System Access, Unauthorized Use Message - Specifiable

NPAC SMS shall ensure that the message is NPAC SMS-specifiable to meet their own requirements, and any applicable laws.

R7-47.1 System Access, Unauthorized Use Message - Specifiable

NPAC SMS shall be able to display an advisory warning message of up to 20 lines in length prior to login.

R7-47.2 Advisory Warning Message Default

NPAC SMS shall default the pre-login advisory warning message to the following:

NOTICE: This is a private computer system.
Unauthorized access or use may lead to prosecution.

R7-48.1 System Access - User's Last Successful Access

NPAC SMS shall display the date and time of the user's last successful system access upon successful login.

R7-48.2 System Access - User's Unsuccessful Access Attempts

NPAC SMS shall display the number of unsuccessful attempts by that userId to access the system, since the last successful access by that userId upon successful login.

R7-49.1 System Access, Security Administration - Authorize Users

NPAC SMS shall only allow the NPAC Security Administrator to authorize users.

R7-49.2 System Access, Security Administration - Revoke Users

NPAC SMS shall only allow the NPAC Security Administrator to revoke users.

R7-50.1 System Access, Security Administration -Adding Users

NPAC SMS shall provide security documentation that defines and describes procedures for adding users.

R7-50.2 System Access, Security Administration -Deleting Users

NPAC SMS shall provide security documentation that defines and describes procedures for deleting users.

7.4.2 Resource Access

R7-51 Data Access for Authorized Users

NPAC SMS shall allow only authorized users to access the data that is part of or controlled by the SMS system.

R7-52 Service Provider Data Protected

NPAC SMS shall protect service provider data from access by unauthorized users.

R7-53.1 Authorized User Access to Software

NPAC SMS shall ensure that only NPAC system administrators can access the software files that constitutes the NPAC SMS.

R7-53.2 Authorized User Access to Transactions

NPAC SMS shall ensure that only authorized users can access the transactions that constitute the NPAC SMS.

R7-53.3 Authorized User Access to Data

NPAC SMS shall ensure that only authorized NPAC Administrative and NPAC SOA Low-tech Interfaces users can access the data generated by the transactions that constitutes the SMS.

R7-54.1 Access Control of Executable Software

NPAC SMS shall ensure that the executable and loadable software is access controlled for overwrite and update, as well as execution rights.

R7-55 Access Control of Resources

NPAC SMS shall ensure that control of access to resources is based on authenticated user identification.

R7-56 Use of Encryption

NPAC SMS shall ensure that userId and password is used as a primary access control for direct login and system ID is used for primary access control to the SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface.

R7-57 Resource Access to Users

NPAC SMS shall ensure that for software resources controlled by NPAC SMS, it must be possible to grant access rights to a single user or a group of users.

R7-58 Resource Access Denied to Users

NPAC SMS shall ensure that for software resources controlled by NPAC SMS, it must be possible to deny access rights to a single user or a group of users.

R7-59

(Duplicate - refer to R7-53.3)

R7-60 Only NPAC Personnel Can Modify User Access

NPAC SMS shall allow only NPAC personnel to modify access rights to a resource.

R7-61 Removal of User Access Rights

NPAC SMS shall provide a mechanism to remove access rights to all software resources for a user or a group of users.

R7-62.1

(Duplicate - refer to R7-12)

R7-62.2

(Duplicate - refer to R7-12)

7.5 Data and System Integrity

R7-63 Identify Originator of System Resources

NPAC SMS shall identify the originator of any accessible system resources.

R7-64 Identify Originator of Information Received Across Communication Channels

NPAC SMS shall be able to identify the originator of any information received across communication channels.

R7-65.1 Monitor System Resources

NPAC SMS NMS shall use SNMP to monitor the system resources.

R7-65.2 Detect Error Conditions

NPAC SMS NMS shall use SNMP to detect error conditions.

R7-65.3 Detect Communication Errors

NPAC SMS NMS shall use SNMP to detect communication errors.

R7-65.4 Detect Link Outages

NPAC SMS NMS shall use SNMP to detect link outages.

R7-66.1 Rule Checking on Update

NPAC SMS shall ensure proper rule checking on data update.

R7-66.2 Handling of Duplicate Inputs

NPAC SMS shall handle duplicate/multiple inputs.

R7-66.3 Check Return Status

NPAC SMS shall check return status.

R7-66.4 Validate Inputs

NPAC SMS shall validate inputs for reasonable values.

R7-66.5 Transaction Serialization

NPAC SMS shall ensure proper serialization of update transactions.

R7-67 Database Integrity Checking

NPAC SMS shall include database integrity checking utilities for the NPAC SMS database.

7.6 Audit

7.6.1 Audit Log Generation

R7-68.1 Security Audit Log for After the Fact Investigation

NPAC SMS shall generate a security audit log that contains information sufficient for after the fact investigation of loss or impropriety for appropriate response, including pursuit of legal remedies.

R7-68.2 Security Audit Data Availability

NPAC SMS shall ensure that the security audit data is available on-line for a minimum of 90 days.

R7-68.3 Security Audit Data Archived

NPAC SMS shall archive the security audit data off-line for a minimum of two years.

R7-69 User Identification Retained

NPAC SMS shall ensure that the user-identification associated with any NPAC SMS request or activity is maintained, so that the initiating user can be traceable.

R7-70 Protection of Security Audit Log Access

NPAC SMS shall protect the security audit log from unauthorized access.

R7-71.1

DELETE

R7-71.2 NPAC Personnel Delete Security Audit Log

NPAC SMS shall ensure that only authorized NPAC personnel can archive and delete any or all of the security audit log(s) as part of the archival process.

R7-72 Security Audit Control Protected

NPAC SMS shall ensure that the security audit control mechanisms are protected from unauthorized access.

R7-73.1 Log Invalid User Authentication Attempts

NPAC SMS shall write a record to the security audit log for each invalid user authentication attempt.

R7-73.2 Log NPAC SMS End User Logins

NPAC SMS shall write a record to the security audit log for logins of NPAC users.

R7-73.3 Log NPAC Personnel Activities

NPAC SMS shall write a record to the security audit log for security controlled activities of NPAC users.

R7-73.4 Log Unauthorized Data Access

NPAC SMS shall write a record to the security audit log for unauthorized data access attempts.

R7-73.5 Log Unauthorized Transaction Access

NPAC SMS shall write a record to the security audit log for unauthorized NPAC SMS transaction functionality access attempts.

R7-74 No Disable of Security Auditing

NPAC SMS shall ensure that NPAC audit capability cannot be disabled.

R7-75 Security Audit Record Contents

NPAC SMS shall ensure that for each recorded event, the audit log contains the following:

- Date and time of the event
- User identification including relevant connection information
- Type of event
- Name of resources accessed or function performed
- Success or failure of the event

R7-76.1 Recorded Login Attempts

NPAC SMS shall record actual or attempted logins in audit logs after an NPAC-tunable parameter threshold of consecutive login failures.

7.6.2 Reporting and Intrusion Detection

R7-77.1 Exception Reports on Data Items

NPAC SMS shall provide post-collection audit analysis tools that can produce exception reports on items relating to system intrusions.

R7-77.2 Exception Reports on Users

NPAC SMS shall provide post-collection audit analysis tools that can produce exception reports on users relating to system intrusions.

R7-77.3 Exception Reports on Communication Failures

NPAC SMS shall provide post-collection audit analysis tools that can produce exception reports on communication failures relating to system intrusions.

R7-77.4 Summary Reports on Data Items

NPAC SMS shall provide post-collection audit analysis tools that can produce summary reports on data items relating to system intrusions.

R7-77.5 Summary Reports on Users

NPAC SMS shall provide post-collection audit analysis tools that can produce summary reports on users relating to system intrusions.

R7-77.6 Summary Reports on Communication Failures

NPAC SMS shall provide post-collection audit analysis tools that can produce summary reports on communication failures relating to system intrusions.

R7-77.7 Detailed Reports on Data Items

NPAC SMS shall provide post-collection audit analysis tools that can produce detailed reports on data items relating to system intrusions.

R7-77.8 Detailed Reports on Users

NPAC SMS shall provide post-collection audit analysis tools that can produce detailed reports on users relating to system intrusions.

R7-77.9 Detailed Reports on Communication Failures

NPAC SMS shall provide post-collection audit analysis tools that can produce detailed reports on communication failures relating to system intrusions.

R7-78 Review User Actions

NPAC SMS shall provide a capability to review a summary of the actions of any one or more users, including other NPAC users, based on individual user identity.

R7-79.1 Monitor Network Address

NPAC SMS shall provide tools for the NPAC to monitor the message passing activities to and from a specific network address as they occur.

R7-80.1 Real-time Security Monitor

NPAC SMS NMS shall provide a real-time mechanism to monitor the occurrence or accumulation of security auditable events. Where possible, NPAC SMS shall determine and execute the least disruptive action to terminate the event.

R7-80.2 Security Event Notification

NPAC SMS NMS shall notify the NPAC personnel immediately when security event thresholds are exceeded through the SNMP agent.

7.7 Continuity of Service

R7-81 System Made Unavailable by Service Provider

NPAC SMS shall ensure that no service provider action, either deliberate or accidental, should cause the system to be unavailable to other users.

R7-82 Detect Service Degrading Conditions

NPAC SMS shall report conditions that would degrade service below a pre-specified minimum, including high memory, CPU, network traffic, and disk space utilization.

R7-83 System Recovery After Failure

NPAC SMS shall provide procedures or mechanisms to allow recovery after a system failure without a security compromise.

R7-84.1 Software Backup Procedures

NPAC SMS shall have documented procedures for software backup.

R7-84.2 Data Backup Procedures

NPAC SMS shall have documented procedures for data backup.

R7-84.3 Software Restoration Procedures

NPAC SMS shall have documented procedures for software restoration.

R7-84.4 Data Restoration Procedures

NPAC SMS shall have documented procedures for data restoration.

R7-85.1 Software Version Number

NPAC SMS shall record the exact revision number of the latest software installed.

R7-85.2 Software Version Number

NPAC SMS shall display for viewing the exact revision number of the latest software via a Web bulletin board, and also through the NPA Administrative and NPAC SOA Low-tech Interfaces upon completion of the user login sequence.

7.8 Software Vendor

R7-86 Software Development Methodology

NPAC SMS shall be developed using a corporate policy governing the development of software.

R7-87 Bypass of Security

NPAC SMS shall **not** support any mode of entry into NPAC SMS for maintenance, support, or operations that would violate or bypass any security procedures.

R7-88 Documented Entry

NPAC SMS shall document any mode of entry into the SMS for maintenance, support, or operations.

7.9 OSI Security Environment

7.9.1 Threats

Attacks against the NPAC SMS may be perpetrated in order to achieve any of the following:

- Denial of service to a customer by placing wrong translation information in the SMS
- Denial of service to a customer by preventing a valid message from reaching the SMS
- Disrupting a carrier's operations by having numerous spurious calls (to users who are not clients of that carrier) directed to that carrier

- Switching customers to various carriers without their consent
- Disrupting the functioning of the NPAC SMS by swamping it with spurious messages

7.9.2 Security Services

R7-89 Authentication

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall support Authentication (at association setup).

R7-90 Data Origin Authentication

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall support data origin authentication for each incoming message.

R7-91.1 Detection of Message Replay

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall support detection of replay.

R7-91.2 Deletion of a Message

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall support detection of message deletion.

R7-91.3 Modification of a Message

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall support detection of message modification.

R7-91.4 Delay of a Message

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall support detection of message delay.

R7-92 Non-repudiation of Origin

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall support non-repudiation of origin.

R7-93 Access Control

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall allow only authorized parties (i.e., carriers serving a given customer) to cause changes in the NPAC SMS database.

7.9.3 Security Mechanisms

This section outlines the requirements to specify security mechanisms.

7.9.3.1 Encryption

R7-94.1 Public Key Crypto System (PKCS)

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall use a public key crypto system (PKCS) to provide digital signatures. Since there is no requirement for confidentiality service there is no need for any additional encryption algorithms.

R7-94.2 Digital Signature Algorithms

NPAC SMS shall support one of the digital signature algorithms listed in the OIW Stable Implementation Agreement, Part 12, 1995.

R7-95 RSA Encryption Modulus Size

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall require the size of the modulus of each key to be at least 600 bits for RSA encryption.

7.9.3.2 Authentication

R7-96 Digital Signature Algorithm

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall apply the digital signature algorithm to the fields specified below without any separators between those fields or any other additional characters.

- The unique identity of the sender
- The Generalized Time, corresponding to the issuance of the message
- A sequence number
- A key identifier
- Key list ID

R7-97 Authenticator Contents

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall provide authentication consisting of the following:

- The unique identity of the sender
- The Generalized Time, corresponding to the issuance of the message
- A sequence number
- A key identifier
- The digital signature of the sender's identity, Generalized Time and sequence number listed above
- Key list ID

R7-98 Authenticator in Access Control Field

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall convey the authenticator in the CMIP access control field.

7.9.3.3 Data Origin Authentication

R7-99.1 Subsequent Messages Contain Access Control Field

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall ensure that every subsequent CMIP message that contains the access control field carries the authenticator.

R7-99.2 Separate Counter for Association Sequence Numbers

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall verify that each party maintains a separate sequence number counter for each association it uses to send messages.

R7-99.3 Increment Sequence Numbers

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall verify that every time the authenticator is used the value of the sequence number will be incremented by one.

7.9.3.4 Integrity and Non-repudiation

R7-100.1 Security Field

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall ensure that all the notifications defined for the number portability application contain a security field.

R7-100.2 Security Field Syntax

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall ensure that the syntax of the security field used for the notification corresponds to the authenticator.

R7-101.1

DELETE

R7-101.2

(Duplicate - refer to R7-91.1)

R7-101.3

(Duplicate - refer to R7-91.2)

R7-101.4

(Duplicate - refer to R7-91.3)

R7-101.5

(Duplicate - refer to R7-91.4)

R7-102 Notifications in Confirmed Mode

NPAC SMS shall ensure that all the notifications are sent in the confirmed mode.

R7-103

MISSING in RFP

7.9.3.5 Access Control

R7-104 Responsible for Access Control

NPAC SMS shall be responsible for access control on the SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface.

R7-105.1

(Duplicate - refer to R7-97 and R7-98)

R7-105.2 Generalized Time

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall ensure that external messages received have a generalized time in the access control information within 5 minutes of the NPAC SMS system clock.

7.9.3.6 Audit Trail

R7-106 Log Contents

SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface shall keep a log of all of the following:

- Incoming messages that result in the setup or termination of associations
- All invalid messages (invalid signature, sequence number out of order, Generalized Time out of scope, sender not authorized for the implied request)
- All incoming messages that may cause changes to the NPAC SMS database

7.9.3.7 Key Exchange

R7-107.1 Lists of Keys

NPAC SMS shall ensure that during a security key exchange, each party provide the other with a list of keys.

R7-107.2 Keys in Electronic Form

NPAC SMS shall provide the list of keys in a secure electronic form.

R7-107.3 Paper copy of MD5 Hashes of the Keys

The originator of the list of keys shall also provide the receiver with signed (in ink) paper copy of the MD5 hashes of the keys in the list.

R7-107.4 Key List Exchange

NPAC SMS shall support exchange of the list of keys in person or remotely.

R7-107.5 Remote Key List Exchange

NPAC SMS shall convey the lists via two different channels, diskette sent via certified mail, and a file sent via Email or FTP using encryption mechanisms if the keys are exchanged remotely.

R7-108.1 Remote Reception Acknowledgment

NPAC SMS shall support the Service Providers' acknowledgment via 2 secure electronic forms, Email or FTP using encryption mechanisms.

R7-108.2 Acknowledgment Contents

NPAC SMS shall support the acknowledgment consisting of the MD5 hash of each one of the keys in the list.

R7-108.3 Phone Confirmation

The recipient shall call the sender by phone for further confirmation and provide the sender with the MD5 hash of the whole list.

R7-109.1 Periodic Paper List of Public Keys NPAC Uses

NPAC SMS shall generate a paper list to each Service Provider of the MD5 hashes of all the public keys used by a Service Provider once a month.

R7-109.2 Acknowledgment of Paper List of Public Keys

NPAC SMS shall verify the identity of the Service Provider to whom the MD5 hashes of the public keys was sent.

R7-110.1 List Encryption Keys

NPAC SMS shall provide each Service Provider with a numbered list of encryption keys, numbered from 1 to 1000.

R7-110.2

(Duplicate - refer to R7-107.2)

R7-110.3 List Encryption Keys

NPAC SMS shall ensure unique numbering of the keys.

R7-111.1 New Encryption Key Can Be Chosen

NPAC SMS shall allow a new encryption key to be chosen with every message that contains a key identifier.

R7-111.2 Keys Not Reused

NPAC SMS shall reject messages that use a key whose usage has stopped.

R7-111.3 Compromised Keys

NPAC SMS shall allow authorized NPAC SMS personnel to initiate a new key for messages.

R7-111.4 Key Change Once Per Year

NPAC SMS shall change the key used between the NPAC SMS and Service Provider after one year of usage.

R7-111.5 Key Size Increase Per Year

NPAC SMS shall allow NPAC SMS personnel to change key sizes for Service Providers as needed to ensure secure communications between the NPAC SMS and the Service Providers.

R7-111.6 Per Service Provider Application Basis

NPAC SMS shall expect new key initiation to be requested on a per Service Provider application basis.

R7-111.7 NPAC Key Change Algorithm

NPAC SMS shall, upon determination that their key list has been compromised, change their own private key.

R7-111.8 Service Provider Key Marked Used/Invalid

NPAC SMS shall only mark a SP key as invalid or used when the service provider changes keys.

RR7-1 Load Key List

NPAC SMS shall be able to load a new key list in 15 minutes or less.

This change order should be sized as a point release as early as possible during or prior to turn-up testing with the service providers.

RN7-1 Authenticator Contents - Individual System Clock Accuracy

NPAC SMS shall be responsible for ensuring that the system clock is accurate to within two minutes of GMT.

RN7-2 Authenticator Contents - Zero Sequence Number

A sequence number equal to zero shall be required for association request and association response messages.

RR7-2 Modifying User Name

NPAC SMS shall provide a mechanism for authorized NPAC personnel to change a user name in the NPAC SMS.

8. Audit Administration

8.1 Overview

An audit function will be necessary for troubleshooting a customer problem and also as a maintenance process to ensure data integrity across the entire LNP network. Audit will be concerned with the process of comparing the NPAC view of the LNP network with one or more of the Service Provider's view of its network. In the case of "on demand" audits, audits may be initiated by any Service Provider who has reason to believe a problem may exist in another Service Provider's network. Such audits are executed via queries to the appropriate Service Provider's network, and corrected via downloads to those same networks. Requirements pertaining to these requirements are given in Sections through .

With audits, two different scenarios are supported, one designed to "sync up" the information contained in the various Local SMS databases with the content of the NPAC SMS database, the other for the NPAC to perform random integrity checks of its own database.

The local SMS will be responsible for comparing database extracts written to an FTP site by the NPAC SMS with its own version of that same data. Note that the Service Provider network may contain several network nodes designated for local number portability and may also choose to keep its own copy in its respective SMS. In the second scenario, the NPAC SMS will select a random sample of active Subscription Versions from its own database, then compare those samples to the representation of that same data in the various Local SMS databases. Requirements pertaining to periodic audits are given in Section .

A8-1 Service Provider Audits Issued Immediately

NPAC SMS will process audit requests from service providers immediately.

8.2 Service Provider User Functionality

R8-1 Service Providers Audit Request - Single TN

NPAC SMS shall receive an audit request on a single telephone number from the Service Providers.

R8-2.1 Service Providers Audit Request - Range of TNs

NPAC SMS shall receive an audit request for a range of telephone numbers from the Service Providers.

R8-2.2

DELETE

R8-8

DELETE

R8-9 NPAC Personnel Specify Audit Scope

NPAC SMS shall allow NPAC SMS Personnel to specify the scope of an audit by specifying one or more of the following parameters:

- Specific Service Provider network **or** ALL Service Providers networks.
- Full audit for all LNP attributes **or** a partial audit where the Service Provider can specify one or more of the following LNP attributes:
  - LIDB data
  - CLASS data
  - LRN data
  - CNAM data
  - ISVM data

  Default: Full audit

Specify an activation Date/Time stamp range, i.e., only audit records activated between a specific time window.

R8-10 NPAC Personnel Status of Audit Request

NPAC SMS shall allow NPAC personnel to obtain the final results of an audit request.

R8-11 Audit Progress Indicators

NPAC SMS shall indicate the progress of an audit as the percentage of records audited, when supplying the status of an audit request.

R8-12 NPAC Personnel Cancel of an Audit

NPAC SMS shall allow NPAC personnel to cancel an audit request.

R8-13

DELETE

R8-14.1

DELETE

R8-14.2

DELETE

8.4 System Functionality

R8-15.1 NPAC Personnel View of ALL Audit Requests

NPAC SMS shall allow NPAC Personnel to view ALL audit requests including requests issued by the Service Providers.

R8-15.2 Mechanized SOA Interface Obtain Audit Requests

NPAC SMS shall allow the mechanized SOA interface to obtain all audit requests issued from that particular mechanized SOA interface.

R8-15.3 Send Audit Results to Originating SOA

NPAC SMS shall send audit results to the originating SOA.

R8-16.1 Flow of Audit Execution

NPAC SMS shall send the query resulting from the audit request to the local Service Providers' networks that are accepting Subscription Version data downloads for the given NPA-NXX via the NPAC SMS to Local SMS interface, as described in the NPAC SMS Interoperable Interface Specification.

R8-16.2

DELETE

R8-16.3

DELETE

R8-16.4

DELETE

R8-17.1 Compare NPAC SMS Subscription Versions to Service Provider Subscription Versions

NPAC SMS shall conduct a comparison of the Subscription Versions belonging to the Service Provider to its own Subscription Versions.

R8-17.2 Add TNs to Service Provider Subscription Versions

NPAC SMS shall, following the comparison of its own Subscription Versions to the Service Provider’s Subscription Versions, add any TN found to be absent back into the Service Provider’s Subscription Version database.

R8-17.3 Modify Erroneous TNs

NPAC SMS shall, following the comparison of its own Subscription Versions to the Service Provider’s Subscription Versions, modify any TN found to be in error.

R8-17.4 Delete Discrepant TNs from Service Provider Subscription Versions

NPAC SMS shall, following the comparison of its own Subscription Versions to the Service Provider's Subscription Versions, delete any discrepant TNs from the Service Provider's Subscription Version database.

R8-18

(Duplicate - refer to R8-7.3)

R8-19 Record Audit Results in an Audit Log

NPAC SMS shall record all audit results in an audit log.

8.5 Audit Report Management

R8-20 Service Providers Audit Retrieval

NPAC SMS shall allow NPAC personnel and Service Provider personnel to retrieve an audit report for a specific audit request.

R8-21.1 Generate an Audit Report

NPAC SMS shall be capable of generating an audit report for each audit request that has been requested.

R8-21.2 Audit Report Contents

NPAC SMS shall generate an audit report containing the following information:

- Audit request parameters which identified the scope of the audit.
- Date and Time of Audit.
- Progress indication.
- Service Provider network which contains database conflict.

A difference indicator which indicates one of the following:

- Mismatch between the NPAC SMS and local SMS
- Record missing in local SMS
- An audit failure
- No discrepancies found

R8-22 NPAC Personnel Generate and View an Audit Report

NPAC SMS shall allow NPAC and Service Provider personnel to generate and view an audit report on-line.

R8-23.1 NPAC Personnel View an In-progress Audit Report

NPAC SMS shall allow NPAC personnel to view an audit report while the audit is in progress so the current audit results can be viewed on-line up to this point.

R8-23.2 Service Providers View Results of Audits They Have Requested

NPAC SMS shall ensure that Service Providers can only view the results of those audits which they have requested.

R8-24

(Duplicate - refer to R9-2)

R8-25 NPAC Personnel Specify Time Audit Results Retained

NPAC SMS shall allow NPAC personnel to specify the length of time audit results will be retained in the audit log.

8.6 Additional Requirements

RX8-1 Valid Audit Statuses

NPAC SMS shall support the following valid audit statuses:

- In-progress
- Canceled
- Complete

8.7 Database Integrity Sampling

RR8-1 Random Sampling of Active Subscription Versions

NPAC SMS shall select a random sample of active Subscription Versions to query over the NPAC SMS to Local SMS interface to monitor NPAC SMS data integrity.

RR8-2.1 Data Integrity Sample Size - Tunable Parameter

NPAC SMS shall provide a Data Integrity Sample Size tunable parameter which is defined as the number of active Subscription Versions in the sample to monitor NPAC SMS data integrity.

RR8-2.2 Data Integrity Sample Size - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Data Integrity Sample Size tunable parameter.

RR8-2.3 Data Integrity Sample Size - Tunable Parameter Default

NPAC SMS shall default the Data Integrity Sample Size tunable parameter to 1000.

RR8-3.1 Data Integrity Frequency - Tunable Parameter

NPAC SMS shall provide a Data Integrity Frequency tunable parameter which is defined as the frequency in days that the data integrity sampling is performed.

RR8-3.2 Data Integrity Frequency - Tunable Parameter Modification

NPAC SMS shall allow the NPAC SMS Administrator to modify the Data Integrity Frequency tunable parameter.

RR8-3.3 Data Integrity Frequency - Tunable Parameter Default

NPAC SMS shall default the Data Integrity Frequency tunable parameter to seven days. The allowable range is between one and ninety (1-90) days.

9. Reports

9.1 Overview

The NPAC SMS must support scheduled and ad hoc report generation for selectable reports. The report generation service shall create output report files according to specified format definitions, and distribute reports to output devices as requested. A report distribution service is used to distribute report files to selected output devices. Authorized NPAC personnel can request reports from active database, history logs, error logs, traffic measurements, usage measurements, and performance reports.

9.2 User Functionality

R9-1 NPAC Personnel Report Selection

NPAC SMS shall allow NPAC personnel using the NPAC Administrative Interface to select the type of report required.

R9-2 NPAC Personnel Selection of Output Destination

NPAC SMS shall allow NPAC personnel using the NPAC Administrative Interface to select the predefined report output destination. Destinations are printer, file system, email, display or FAX.

R9-3 NPAC Personnel Re-print of Reports

NPAC SMS shall allow NPAC personnel using the NPAC Administrative Interface to re-print reports from previously saved report outputs.

R9-4 NPAC Personnel Create Customized Reports

NPAC SMS shall allow NPAC personnel to create customized reports through an ad-hoc facility.

R9-5 NPAC Personnel Define Scope and Filtering

NPAC SMS shall allow NPAC personnel to define scope and filtering for items to be included in the customized reports.

R9-6 Service Providers Receive Reports on Their Activities

NPAC SMS shall allow Service Provider personnel to receive reports on information related to their activities.

17. Access Privileges Matrix
18. Authorized Users List
19. Security Log
20. Invalid Access Attempts
21. Encryption Keys List

RX9-6 Log File Reports

NPAC SMS shall support the following log file reports for NPAC personnel using the NPAC Administrative Interface:

22. History Report
23. Error Report
24. Service Provider Notification Report
25. Subscription Transaction Report
26. Service Provider Administration Report
27. Subscription Administration Report

RX9-7 Audit Reports

NPAC SMS shall support an Audit Results Report.

RX9-8 Regularly Scheduled Reports

NPAC SMS shall support the generation of regularly scheduled standard or ad hoc reports, to be provided at the request of a Service Provider.

RR9-1 Data Integrity Report

NPAC SMS shall generate an NPAC SMS data integrity report.

9.3 System Functionality

R9-8

(Duplicate - refer to R9-2)

R9-9 Verification of User Privileges

NPAC SMS shall verify whether the user requesting the report has the proper viewing privileges for the selected data.

R9-10 Support of On-line File Transfer

NPAC SMS shall support on-line file transfer capabilities to transfer report files.

R9-11 Transaction History Log

NPAC SMS shall maintain a History Log to keep track of transactions processed.

R9-12.1 Error Log - Transaction Errors

NPAC SMS shall maintain an Error Log to keep track of transaction errors.

R9-12.2 Error Log - Transmission Errors

NPAC SMS shall maintain an Error Log to keep track of transmission errors.

R9-12.3

(Duplicate - refer to RX9-5 number 20)

R9-13

(Duplicate - refer to R9-2)

10. Performance and Reliability

This section defines the reliability, availability, performance and capacity requirements for the NPAC SMS. The NPAC SMS will be designed for high reliability, including fault tolerance and data integrity features, symmetrical multi-processing capability, and allow for economical and efficient system expansion.

Note that throughout this section, “downtime” refers to the unavailability of the NPAC service. This is to be distinguished from cases where users can still switch to a backup machine.

The following are the availability, reliability, performance and capacity requirements for the NPAC SMS system.

10.1 Availability and Reliability

R10-1 System Availability

NPAC SMS shall be available 24 hours a day, 7 days a week with the exception of scheduled downtime and unscheduled downtime within the time frame defined in R10-3 and R10-5.

R10-2 System Reliability

NPAC SMS shall be 99.9 percent reliable. This applies to functionality and data integrity.

R10-3 Unscheduled Downtime

NPAC SMS shall have unscheduled downtime per year less than or equal to 9 hours.

R10-4 Mean Time to Repair for Unscheduled Downtime

NPAC SMS shall support a mean time to repair of less than or equal to 1 hour, for unscheduled downtime.

R10-5 Scheduled Downtime

NPAC SMS shall have NPAC initiated, scheduled downtime of less than or equal to 24 hours per year.

AR10-1 Scheduled Downtime

NPAC initiated downtime as defined in R10-5 does not include downtime needed for software release updates initiated by or collectively agreed to by the Service Providers.

R10-6.1 Communication Link Monitoring

NPAC shall be capable of monitoring the status of all of its communication links.

R10-6.2 Detecting Communication Link Failures

NPAC shall be capable of detecting and reporting all communication link failures.

R10-7 Detecting Single Bit Data Transmission Errors

NPAC SMS shall be capable of detecting and correcting single bit errors during data transmission between hardware components (both internal and external).

R10-8 Continue Transaction Processing After Downtime

NPAC SMS shall complete processing of all sending transactions at the time of system failure when the NPAC SMS resumes processing.

R10-9.1 Self Checking Logic

NPAC SMS shall support functional components with on board automatic self checking logic for immediate fault locating.

R10-9.2 Continuous Hardware Checking

NPAC SMS shall support continuous hardware checking without any performance penalty or service degradation.

R10-9.3 Duplexing of Hardware

NPAC SMS shall support duplexing of all major hardware components for continuous operation in the event of a system hardware failure.

R10-9.4 Transparent Hardware Fault Tolerance

NPAC SMS shall support hardware fault tolerance that is transparent to the Service Providers.

R10-10.1 Service Provider Notification of System Unavailability

NPAC SMS shall notify Service Providers of the system unavailability via both the NPAC SMS to Local SMS interface and the SOA to NPAC SMS interface if the system becomes unavailable for normal operations due to any reason, including both scheduled and unscheduled maintenance.

R10-10.2 System Availability Notification Method

NPAC SMS shall notify Service Providers via their contact numbers if electronic communication is not possible.

R10-10.3 System Availability Notification Contents

NPAC SMS shall include the following information in the notification:

- The reason for the downtime
- When the down time will start
- When the down time will stop
- An NPAC contact number

R10-11 Updates Highest Priority

NPAC SMS shall ensure the capability of receiving, processing and broadcasting updates will be given the highest priority during any maintenance, if resources allow only partial functionality.

R10-12.1 Tolerance to Communication Link Outages

NPAC SMS shall provide tolerance to communication link outages and offer alternate routing for such outages.

R10-12.2 Alternate routing

NPAC SMS shall offer alternate routing during communication link outages.

R10-13.1 Switch to Backup or Disaster Recovery Machine

NPAC SMS shall, in cases where Service Providers have been switched to a backup or disaster recovery machine, adhere to a maximum time to repair of 4 hours for the primary machine.

R10-13.2 Time to Switch Machines

NPAC SMS shall ensure that the time to switch the Service Providers to another machine and provide full functionality must not exceed the mean time to repair.

R10-13.3 Total Disaster Recovery

NPAC SMS shall restore the capability of receiving, processing and broadcasting updates within 24 hours in the event of a disaster that limits the ability of both the NPAC and NPAC SMS to function.

R10-13.4 Full Functionality Restored

NPAC SMS shall restore full functionality within 48 hours, in the event of a disaster that limits both the NPAC and NPAC SMS ability to function.

R10-14 Reports on Reliability

NPAC shall provide reliability reports documenting the following:

- Schedule down time
- Unscheduled down time
- Mean time to repair
- System availability on a monthly basis to the Service Provider

10.2 Capacity and Performance

R10-15

DELETE

A10-1

DELETE

R10-16 Capacity

NPAC SMS will have the capacity to support a user group in the NPAC sized for the region they service.

R10-17

DELETE

A10-2

DELETE

R10-18 History File Data Storage

NPAC SMS shall ensure that the data storage of the History file must keep track of all transactions made for a tunable parameter period of time (default of one year).

A10-3

DELETE

R10-19 Broadcast Update Response Time

NPAC SMS shall ensure that from the time an activation notice, modification or deletion request is received from a Service Provider until the time the broadcast of the update is started to all Service Provider local SMS will be less than 60 seconds.

R10-20 Request/Transaction Response Time

NPAC SMS, under normal operating conditions, shall ensure that the response time from when a request or transaction is received in the system to the time an acknowledgment is returned will be less than 3 seconds for 95% of all transactions. This does not include the transmission time across the interface to the Service Providers' SOA or Local SMS.

R10-21 Future System Growth

NPAC SMS shall be expandable to handle future growth due to circumstances described as follows:

- Added areas of portability
- Added Service Providers

10.3 Requirements in RFP Not Given a Unique ID

RN10-1

DELETE

RN10-2 Return to the Primary Machine SOA Notification

NPAC SMS shall send an electronic notification to the Service Provider's SOA indicating the time the NPAC will switch them back to the primary machine.

RN10-3 Return to the Primary Machine Local SMS Notification

NPAC SMS shall send an electronic notification to the Service Provider's Local SMS indicating the time the NPAC will switch them back to the primary machine.

RN10-4 Database Sync After Return to the Primary Machine

NPAC SMS shall sync up the database in its primary SMS with any updates sent to the backup or disaster recovery machine during the downtime.

11. Billing

A11-1

DELETE

A11-2 Accounting Measurements Will Not Degrade the Basic System Performance

The resource accounting measurements will not cause degradation in the performance of the basic functions of the NPAC.

11.1 User Functionality

R11-1 Toggling the Generation of Usage Measurements

NPAC SMS shall allow the NPAC administrator to turn on and off the recording of Service Provider usage statistics for the service elements.

11.2 System Functionality

R11-2 Generating Usage Measurements for NPAC Resources

NPAC SMS shall measure and record the usage of NPAC resources on a per Service Provider basis.

R11-3 Generating Usage Measurements for Allocated Connections

NPAC SMS shall generate usage measurements for allocated connections for each Service Provider.

R11-4 Generating Usage Measurements for Allocated Mass Storage

NPAC SMS shall generate usage measurements for the allocated mass storage (number of records stored) for each Service Provider.

R11-5 Generating Usage Measurements for the Number of Messages Processed by type

NPAC SMS shall measure the number of messages processed by type for each Service Provider.

R11-6 Generating Usage Measurements for the Number of Messages Downloaded

NPAC SMS shall measure the number of messages downloaded to each Service Provider.

0 Business Process Flow Diagrams

This appendix contains pictorial representations of the business process flows discussed in Section , 2. Business Process Flows, on page 1.

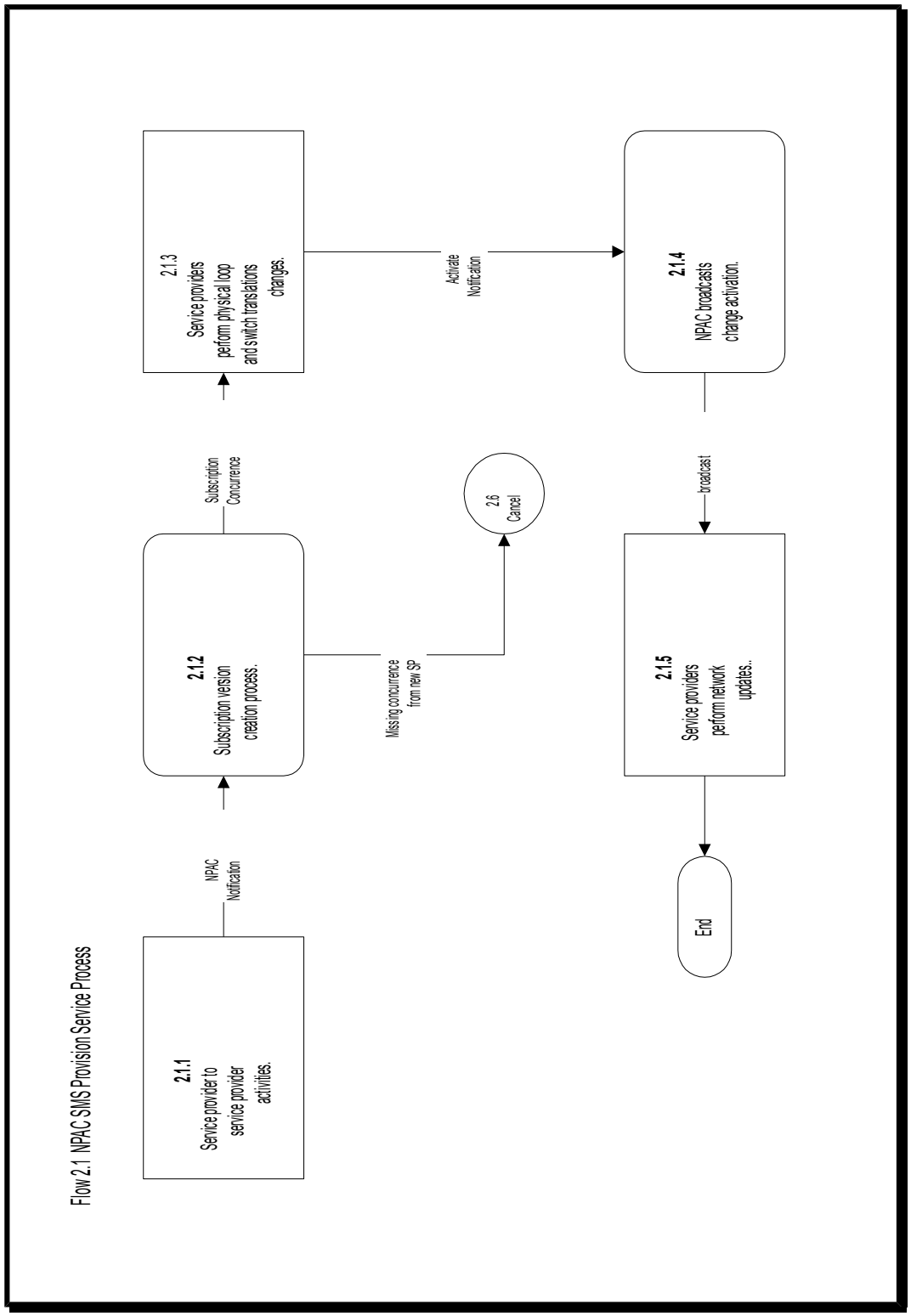


Figure A-4 Flow 2.1 NPAC SMS Provision Service Process

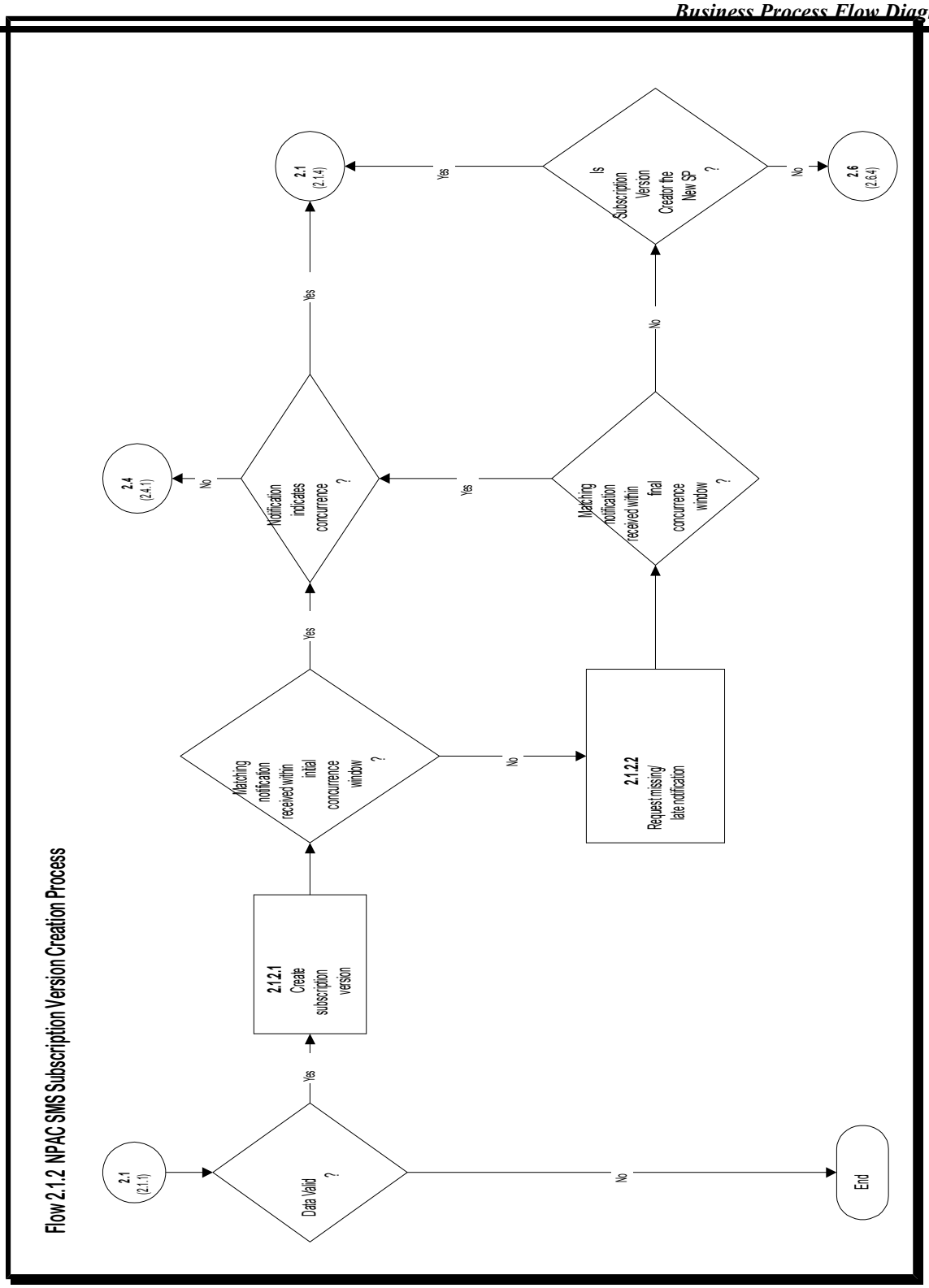


Figure A-5 Flow 2.1.2 NPAC SMS Subscription Version Creation Process

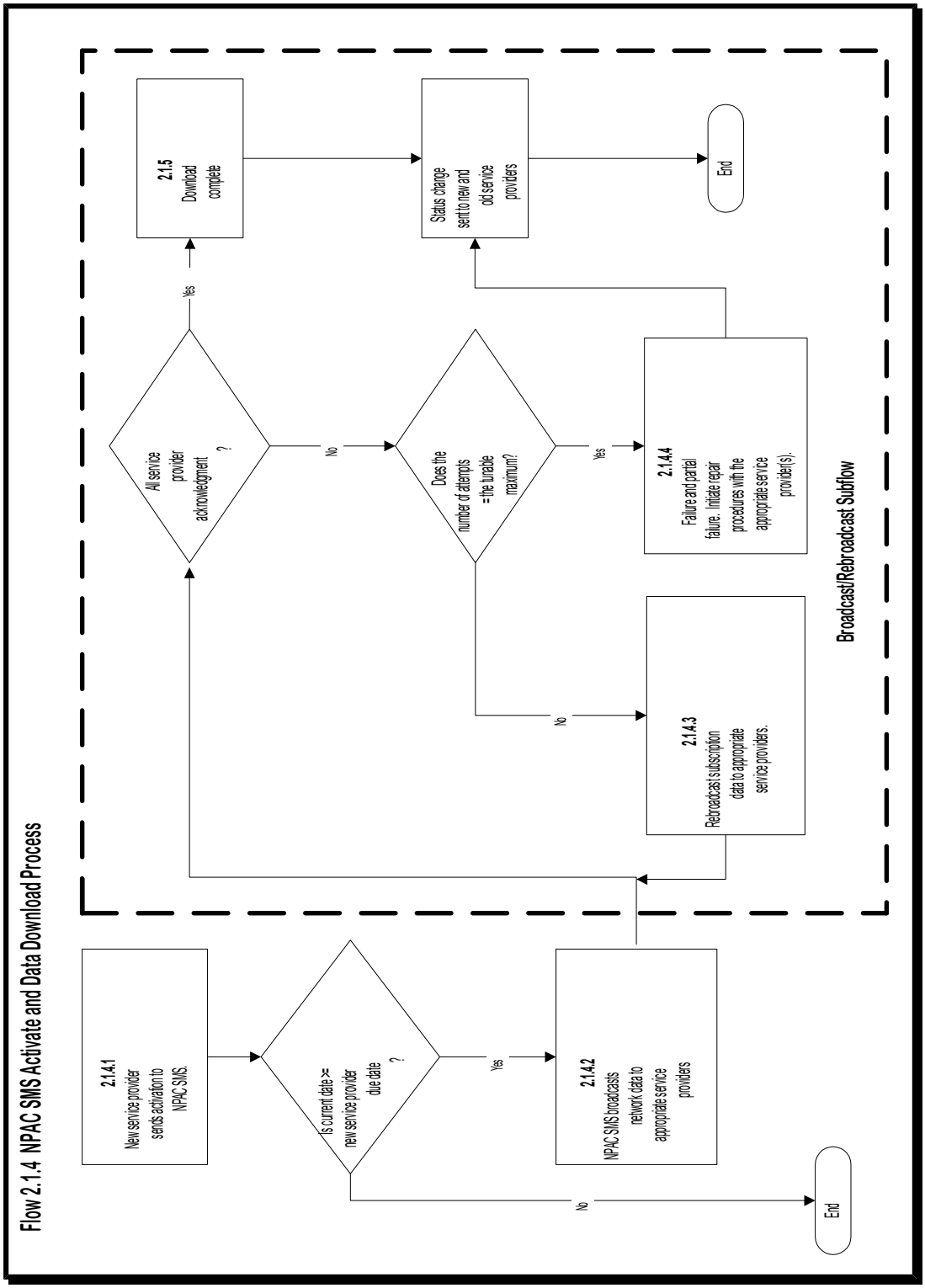


Figure A-6 Flow 2.1.4 NPAC SMS Activate and Data Download Process

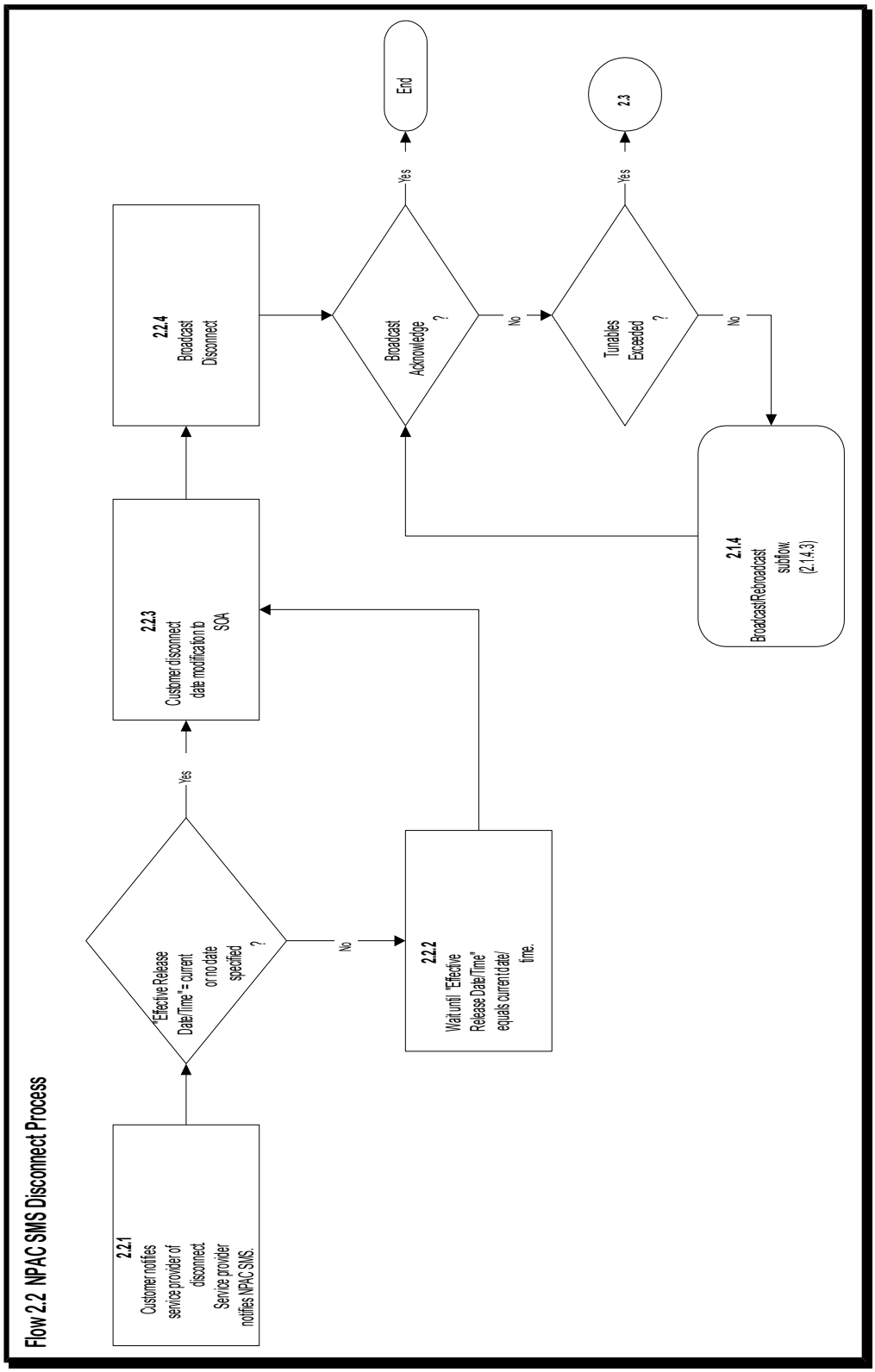


Figure A-7 Flow 2.2 NPAC SMS Disconnect Process

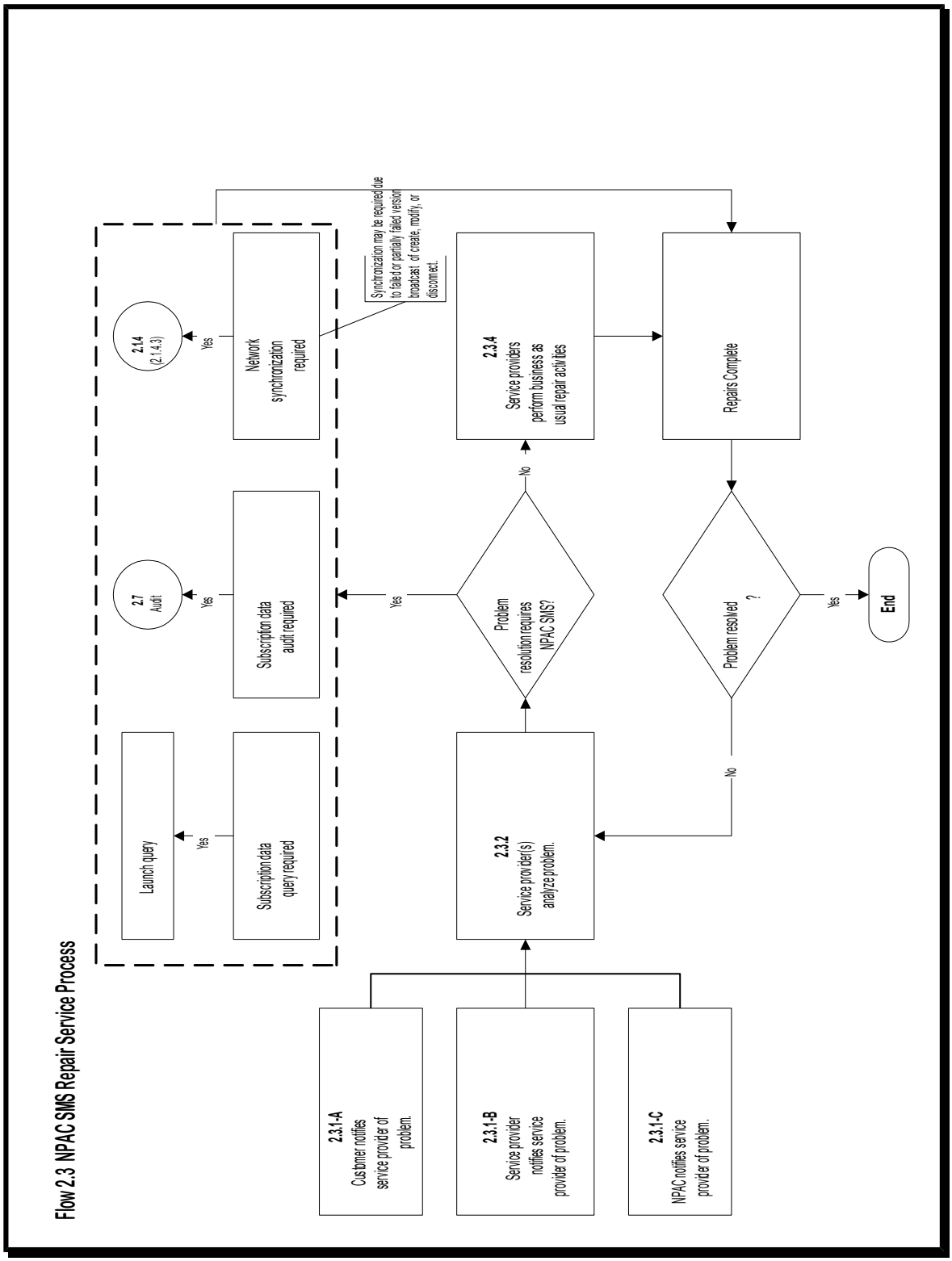


Figure A-8 Flow 2.3 NPAC SMS Repair Process

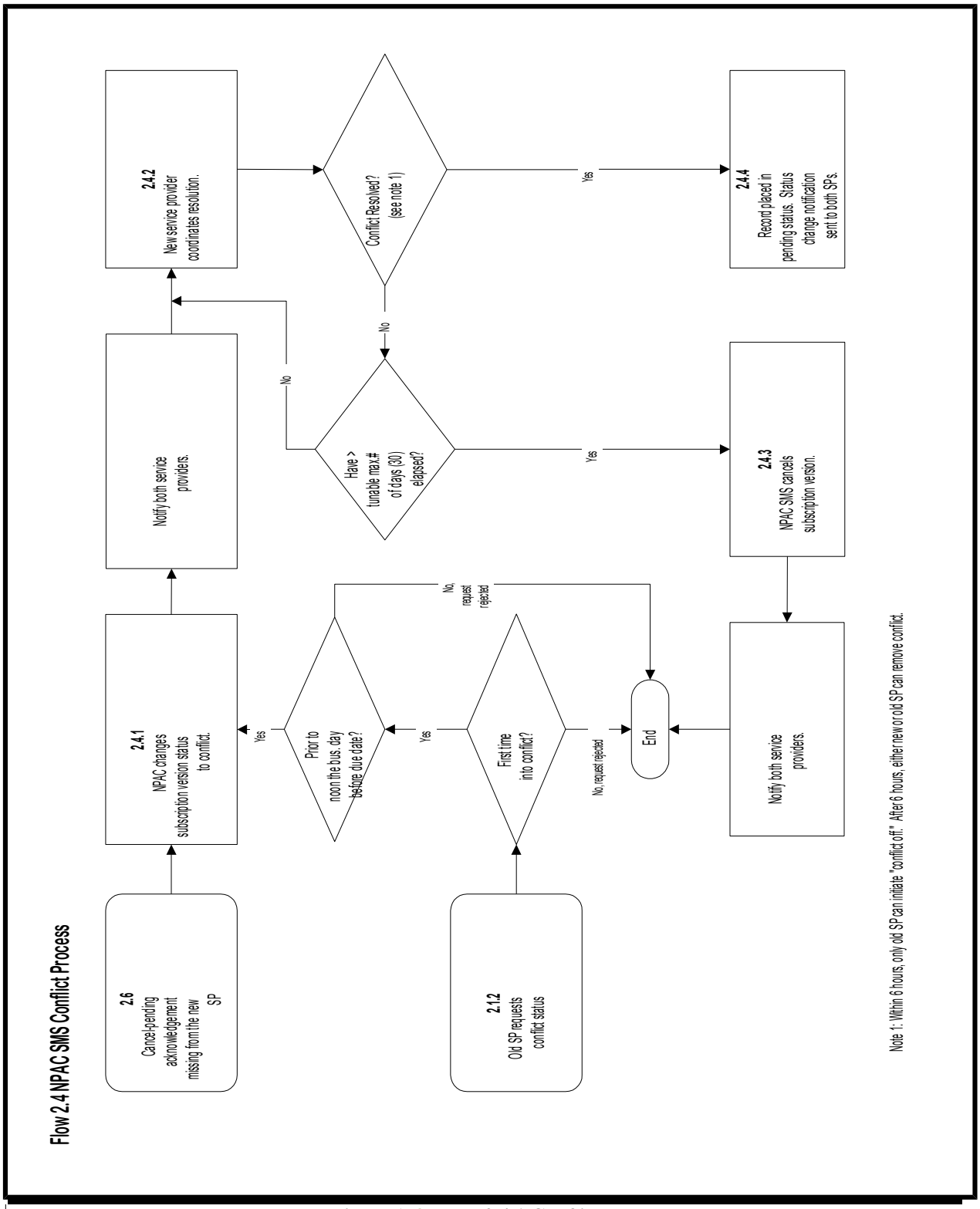


Figure A-9 Flow 2.4.1 Conflict Process

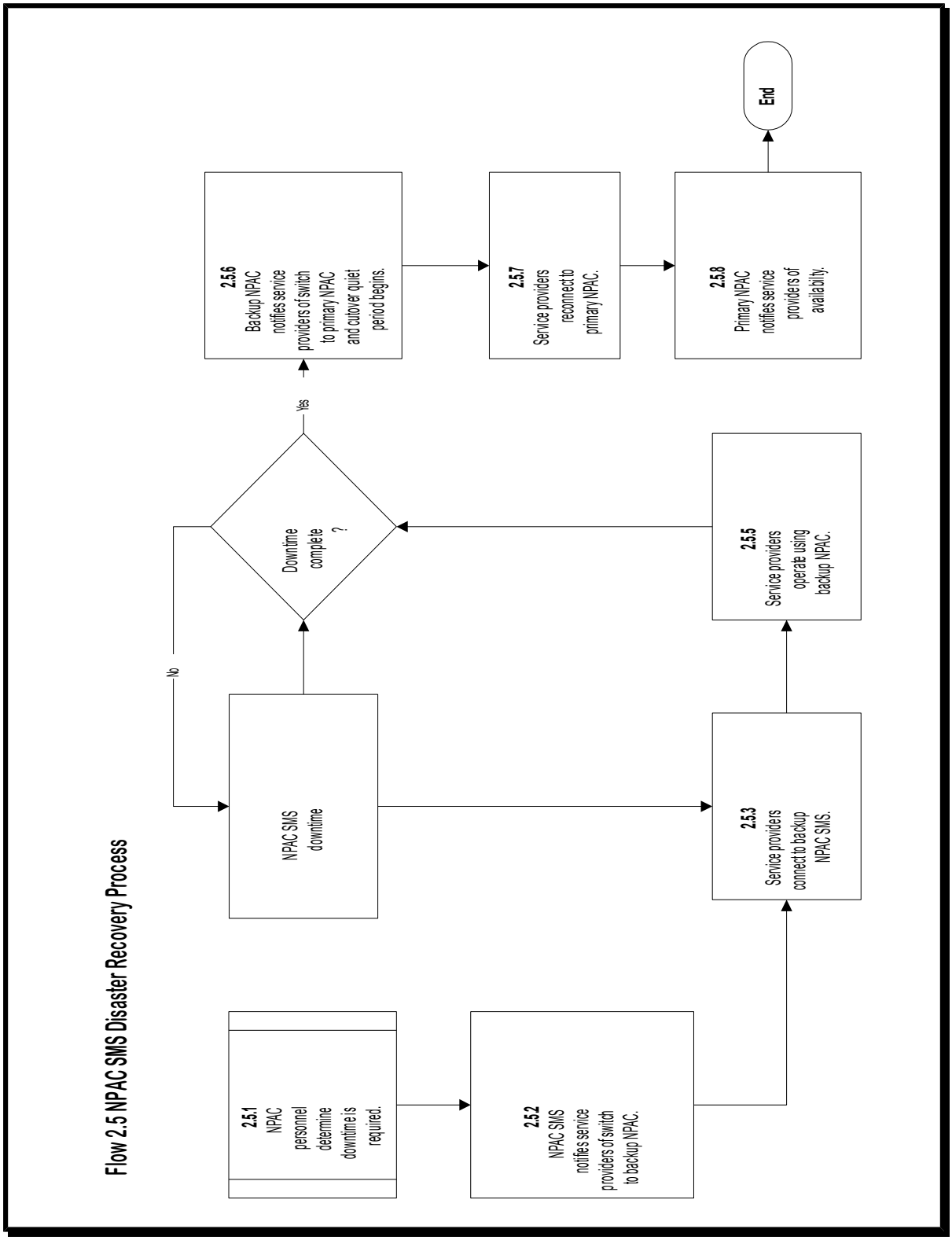


Figure A-10 Flow 2.5 NPAC SMS Disaster Recovery Process

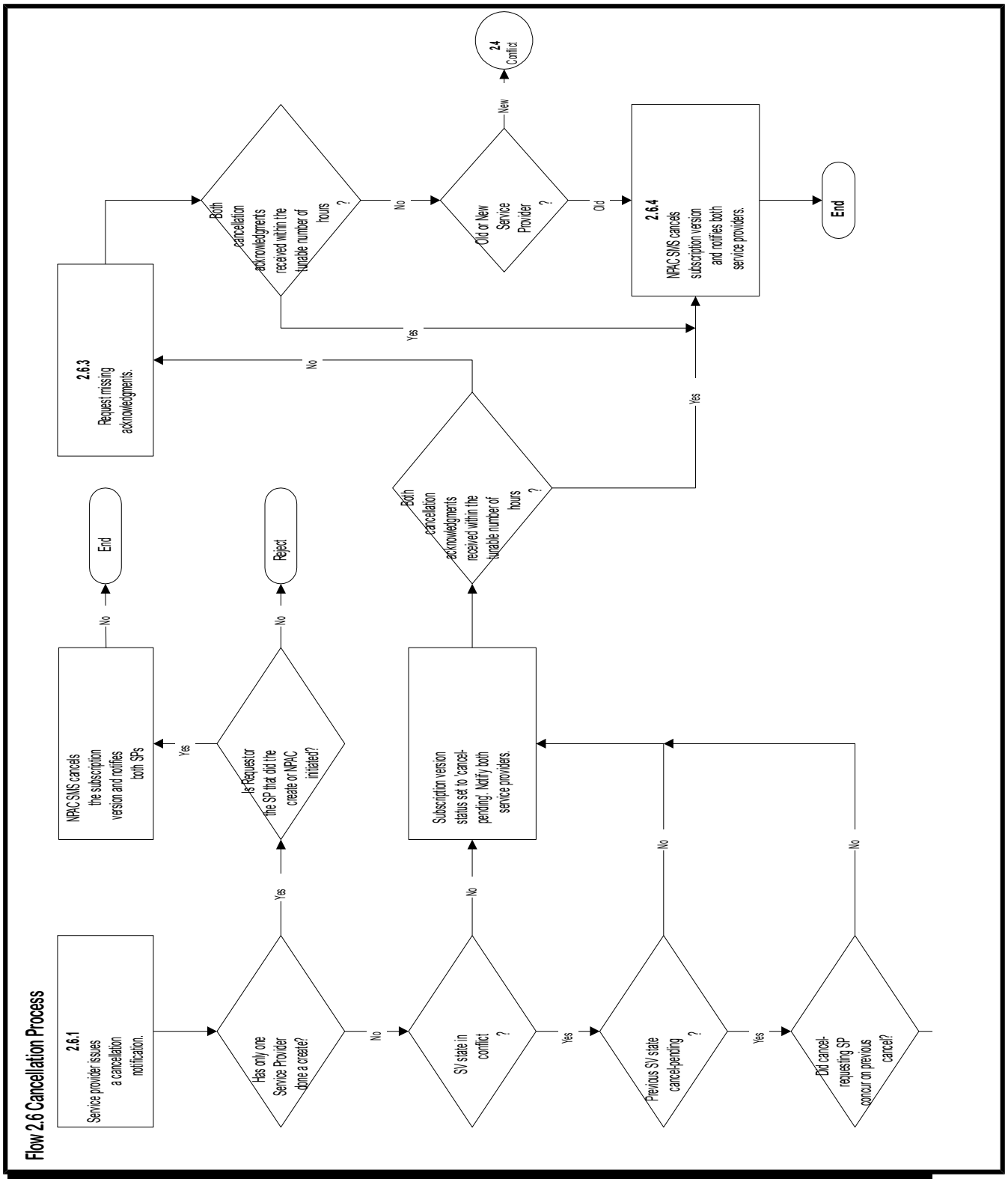


Figure A-11 Flow 2.6 Cancellation Process

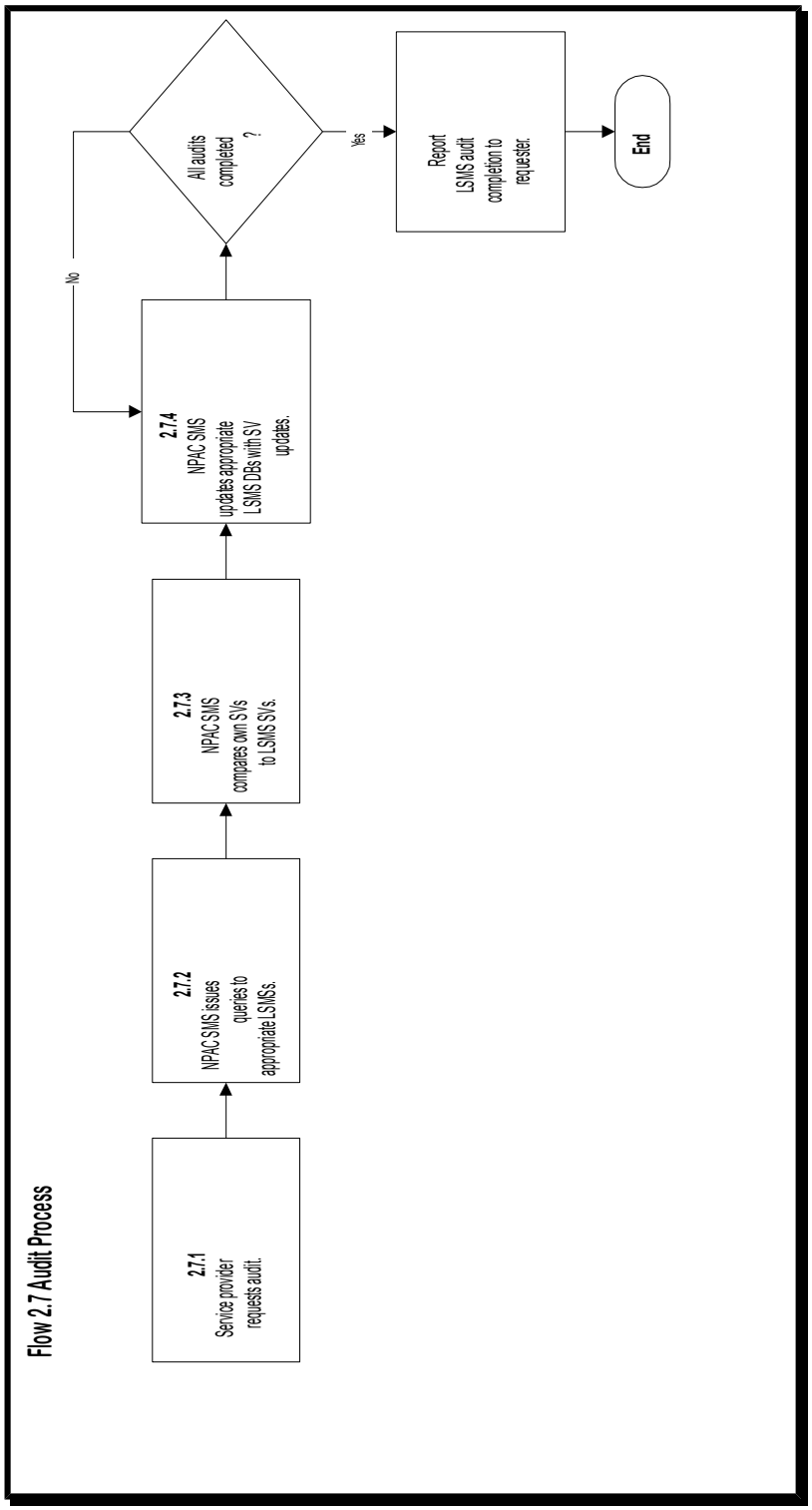


Figure A-12 Flow 2.7 Audit Process

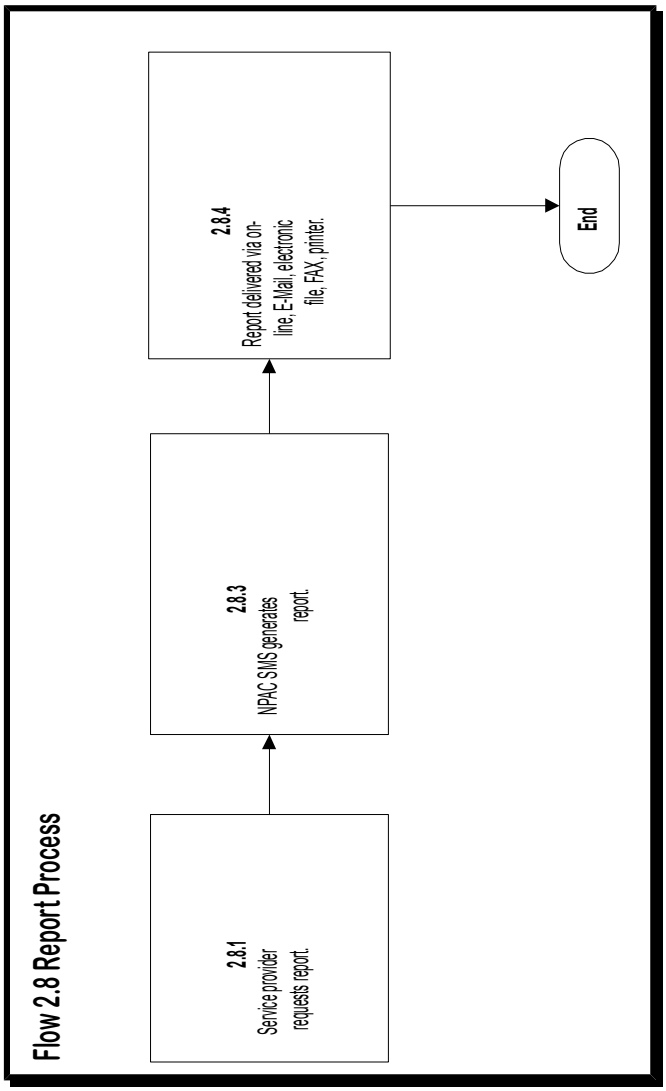


Figure A-13 Flow 2.8 Report Process

1 Glossary

This glossary provides a comprehensive list of definitions and acronyms that apply to NPAC SMS.

CLASS	Custom Local Area Signaling Services. Premium local service features, such as call forwarding or automatic callback.
CMIP	Common Management Information Protocol
CMISE	Common Management Information Service Element
CNAM	Caller Id with Name
DPC	Destination Point Code
FR	Frame Relay
GDMO	Guideline for Definition of Managed Objects
GMT	Greenwich Mean Time
GTT	Global Title Translation
ICC	Illinois Commerce Commission
ISO	International Organization of Standardization
ISVM	Inter-Switch Voice Mail
LERG	Location Exchange Routing Guide
LIDB	Line Information Database
LNP	Local Number Portability
LRN	Location Routing Number. A routing number in the same form as a TN used to identify the TN's serving switch when the TN is a ported number.
LSMS	Local Service Management System
LISP	Local Intra-Service Provider Portability. Movement of end-user TN from one switch to another, but within the same Service Provider's Network.
LSPP	Local Service Provider Portability. Movement of end user TN from one Service Provider to another Service Provider.
MAC	Media Access Control
MD5	Message Digest (Version 5)
NANP	North American Numbering Plan. A 10-digit numbering scheme used in North America to uniquely identify a directory number.
NPA	An NPA code is the first three digits of the 10-digit destination number for all inter-NPA calls within the North America Numbering Plan Area.
NPAC Customer	Any customer of the NPAC SMS.

NPAC SMS	Number Portability Administration Center and Service Management System
NSAP	Network Layer Service Access Point
NXX	A code normally used as a central office code. It may also be used as an NPA code or special NPA code.
OCN	Operating Company Number
OSI	Open Systems Interconnect
PKCS	Public Key Crypto System
Ported TN	A TN ported to a switch that is not the NANP-assigned switch.
PPP	Point-To-Point Protocol
PSAP	Presentation Layer Service Access Point
RFP	Request for Proposal
RSA	A popular encryption algorithm whose name is derived from the initials of its inventors: Rivest, Shamir, and Adelman.
SCP	Service Control Point
SMS	Service Management System
SOA	Service Order Activation
SP	Service Provider. Generally refers to a facilities-based user of the NPAC SMS.
SSAP	Session Layer Service Access Point
SSN	Subsystem Number
TN	Telephone Number
TSAP	Transport Layer Service Access Point
Version	Time-sensitive or status-sensitive instance of a subscription.

2 System Tunables

This appendix provides a comprehensive list of tunables identified throughout the FRS and their default values.

SUBSCRIPTION TUNABLES				
Tunable Name	**Tunable Variable Name**	**Default Value**	**Units**	**Valid Range**
Initial Concurrence Window	SP_Initial_Concurrence_Window	9	business hours	1-72
The hours subsequent to the time the subscription version was initially created by which both Service Providers are expected to authorize transfer of service if this is an Inter-Service Provider port.				
Final Concurrence Window	SP_Final_Concurrence_Window	9	business hours	1-72
The number of hours after the concurrence request is sent by the NPAC SMS by which time both Service Providers are expected to authorize transfer of subscription service for an Inter-Service Provider port.				
Conflict Expiration Window	SV_Conflict_Cancellation_Window	30	calendar days	1-180
The length of time conflict subscriptions will remain in the conflict state before cancellation.				
Maximum Subscriber Query	Max_Subscriber_Query	50	records	10-150
The maximum number of active subscription versions returned by a query to the NPAC.				
Pending Subscription Retention	Pending_SV_Cancellation	90	calendar days	1-180
The length of time pending subscriptions will remain in the pending state before cancellation.				
Conflict Restriction Window	Conflict_Restriction_Window	12	HH:MM	00:00-24:00
The time on the business day prior to the New Service Provider due date that a Subscription version **is no longer allowed to be set** to conflict by the Old Service Provider.				
Conflict Resolution New Service Provider Restriction	New_SP_Conflict_Resolution_Restriction	6	business hours	1-72

SUBSCRIPTION TUNABLES				
Tunable Name	**Tunable Variable Name**	**Default Value**	**Units**	**Valid Range**
The number of business hours after the subscription version is put into conflict that the NPAC SMS will prevent it from being removed from conflict by the new Service Provider.				
Cancellation-Initial Concurrence Window	Cancellation_Initial_Ack_Window	9	business hours	1-72
The numbers of hours after the version is set to cancel pending by which both Service Providers are expected to acknowledge the pending cancellation.				
Cancellation-Final Concurrence Window	Cancellation_Final_Ack_Window	9	business hours	1-72
The number of hours after the second cancel pending notification is sent by which both Service Providers are expected to acknowledge the pending cancellation.				
Old Subscription Retention	Purge_Old_SV	18	calendar months	1-36
The length of time old subscriptions will be retained.				
Cancel-Pending Subscription Retention	Purge_Canceled_Pending_SV	90	calendar days	1-360
The length of time canceled subscriptions, with last status of pending, will be retained.				
Cancel-Conflict Subscription Retention	Purge_Canceled_Conflict_SV	30	calendar days	1-360
The length of time canceled subscriptions, with last status of conflict, will be retained.				
Business Day Duration	Business_Day_Duration	12	calendar hours	1-24
The number of hours from the tunable business day start time.				
Business Day Start Time	Business_Day_Start	TBD	hh:mm	00:00 - 24:00
Parameter tunable to the value specified by the contracting region.				

Table C-13 Subscription Tunables

COMMUNCIATIONS TUNABLES				
Tunable Name	**Tunable Variable Name**	**Default Value**	**Units**	**Valid Range**
Subscription Activation Retry Attempts	Subscription_Version_Activation_Retry	3	attempts	1-10
The number of times a new subscription version will be sent to a Local SMS which has not acknowledged receipt of the activation request.				
Subscription Activation Retry Interval	Subscription_Version_Activation_Retry _Interval	2	minutes	1-60
The delay between sending new Subscription Versions to a Local SMS that has not acknowledged receipt of the activation request.				
Subscription Modification Retry Attempts	Subscription_Version_Modification_Retry	3	attempts	1-10
The number of times a modified active subscription version will be sent to a Local SMS which has not acknowledged receipt of the modification request.				
Subscription Modification Retry Interval	Subscription_Version_Modification_Retry _Interval	2	minutes	1-60
The delay between sending modified active subscription versions to a Local SMS that has not acknowledged receipt of the modification request.				
Subscription Disconnect Retry Attempts	Subscription_Version_Disconnect_Retry	3	attempts	1-10
The number of times the NPAC SMS will resend a subscription disconnect message to an unresponsive Local SMS.				
Subscription Disconnect Retry Interval	Subscription_Version_Disconnect_Retry _Interval	2	minutes	1-60
The amount of time that shall elapse between subscription disconnect retries.				
Local SMS Retry Attempts	LSMS_Retry_Attempts	3	attempts	1-10
The default number of times the NPAC SMS will resend a message to an unresponsive Local SMS.				
Local SMS Retry Interval	LSMS_Retry_Interval	2	minutes	1-60
The default delay between sending messages to an unresponsive Local SMS.				
SOA Retry Attempts	SOA_Retry_Attempts	3	attempts	1-10

COMMUNCIATIONS TUNABLES				
Tunable Name	**Tunable Variable Name**	**Default Value**	**Units**	**Valid Range**
The default number of times the NPAC SMS will resend a message to an unresponsive SOA.				
SOA Retry Interval	SOA_Retry_Interval	2	minutes	1-60
The default delay between sending messages to an unresponsive SOA.				
Failed Login Attempts	Failed_Login_Attempts	3	attempts	0-10
The number of allowable incorrect logon attempts				
Failed Login Shutdown Period	Failed_Login_Shutdown_Period	60	seconds	0-300
The amount of time the NPAC SMS will wait to restart the logon process after a user has exceeded the Failed_Login_Attempts tunable.				
Unused User Id Disable Period	Unused_User_Id_Disable_Period	60	days	1-360
The number of days for which a userId has not been used before the NPAC SMS disables that userId.				
Password Age Limit	Password_Age_Limit	90	days	1-360
The amount of time for password aging.				
Password Expiration Notice	Password_Expiration_Notice	7	days	1-30
The amount of time prior to a password expiring that the NPAC SMS will notify a user.				
Post Expiration Logins	Post_Expiration_Logins	2	logins	0-10
The number of logins a user is permitted after the user's password has expired.				
Password Reuse Limit	Password_Reuse_Limit	6	months	1-36
The amount of time in which a password cannot be reused.				
Record Logons After Failure	Record_Logons_After_Failure	10	attempts	0-100
The threshold for consecutive failed logon attempts after which logon attempts will be recorded in the audit log.				
Non-Use Disconnect	Non_Use_Disconnect	60	minutes	1-1440
The amount of idle (non-use) time before the NPAC SMS will disconnect a user's logon session.				

COMMUNCIATIONS TUNABLES				
Tunable Name	**Tunable Variable Name**	**Default Value**	**Units**	**Valid Range**
Maximum Number of Download Records	Maximum_Number_Download_Records	10000	records	1-200000
The maximum number of records for a single data download.				
Maximum Download Duration	Maximum_Download_Duration	60	minutes	1-1440
The maximum time range allowed for a data download.				

Table C-14 Communications Tunables

AUDIT TUNABLES				
Tunable Name	**Tunable Variable Name**	**Default Value**	**Units**	**Valid Range**
Canceled Audit Retention Period	Canceled_Audit_Retention_Period	30	days	1-360
The length of time canceled audits will be retained.				
Data Integrity Sample Size	Data_Integrity_Sample_Size	1000	SVs	1-5000
The number of active Subscription Versions in a sample to be monitored by the NPAC SMS.				
Data Integrity Sample Frequency	Data_Integrity_Sample _Frequency	7	Days	1-90
The interval in days between Data Integrity Samples conducted by the NPAC SMS.				
Subscription Query Record Limit	Subscription_Query_Record_Limit	50	Subscriptions	1-5000
The maximum number of records that can be returned from a query.				

Table C-15 Audit Tunables

LOGS TUNABLES				
Tunable Name	**Tunable Variable Name**	**Default Value**	**Units**	**Valid Range**
Local SMS Activation Log Retention Period	Local_SMS_Activation_Log_Duration	90	days	1-360
The number of days Local SMS activation responses will remain in the log.				
Audit Log Retention Period	Audit_Log_Retention_Period	90	days	1-360
The length of time audit logs will be retained.				
Error Log Retention Period	Error_Log_Retention_Period	90	days	1-360
The length of time system error logs will be retained.				
History File Data Storage	History_File_Data_Storage	365	days	1-365
The length of time history logs will be retained.				
Usage Log Retention	Usage_Log_Retention	90	days	1-360
The length of time usage logs will be retained.				

Table C-16 Logs Tunables

KEYS TUNABLES				
Tunable Name	**Tunable Variable Name**	**Default Value**	**Units**	**Valid Range**
Key Change Interval	Key_Change_Interval	365	days	1-365
How often the key is changed automatically.				

Table C-17 Keys Tunables

3 Encryption Key Exchange

The mechanized interface to NPAC SMS requires an exchange of the encryption keys used to verify digital signatures. This exchange will consist of a file containing the 1000 key list, and an acknowledgment of receipt of the list will consist of a file containing the MD5 checksum value of each key in the list. The formats for these files is described here.

Key Exchange File

The following table shows the format of the encryption key exchange file. This file consists of some header information, followed by 1000 instances of key information. There are no separators of any kind between the individual fields, between the header and key data, or between each set of key data.

ENCRYPTION KEY EXCHANGE FILE FORMAT

Field Number	Field Name	Type	Size (bytes)	Format
1	NPAC Customer Id	ASCII	4	Character String
2	File Creation Date	ASCII	14	MMDDYYYYHHmmSS
3	List Id	Binary	2	16 bit integer
4	Key Size (in bits)	Binary	4	32 bit integer
5	Key Id	Binary	2	16 bit integer
6	public exponent size	Binary	2	16 bit integer
7	public exponent	Binary	variable[1]	integer
8	public modulus	Binary	variable[2]	integer

[1] . The size of the public exponent is determined by the previous field of the key data, public exponent size.

[2] . The size of the public modulus is determined by the key size field in the header data. The number of bytes for each modulus is equal to the number of bits divided by 8, rounded up.

ENCRYPTION KEY EXCHANGE FILE FORMAT				
Field Number	**Field Name**	**Type**	**Size (bytes)**	**Format**
9	Key Id	Binary	2	16 bit integer
10	public exponent size	Binary	2	16 bit integer
11	public exponent	Binary	variable	integer
12	public modulus	Binary	variable	integer
. . .	. . .	. . .	. . .	. . .
4001	Key Id	Binary	2	16 bit integer
4002	public exponent size	Binary	2	16 bit integer
4003	public exponent	Binary	variable	integer
4004	public modulus	Binary	variable	integer

Table D-1 Encryption Key Exchange File Format

Key Acknowledgment File

Before a key list may be used, the sender must receive a key acknowledgment file. The key acknowledgment file serves two purposes:

1. Verify that the key list has been received by the intended recipient.

2. Verify the correctness of each key in the list.

Furthermore, the need for an acknowledgment of this kind is specified in requirement R7-108.2. Once this file has been received, the sender of the key list can put the list into active use.

Table D-1 below shows the format of the encryption key acknowledgment file. This file consists of some header information, followed by 1000 instances of key hash information. There are no separators of any kind between the individual fields, between the header and key hash data, or between each set of key hash data. The MD5 hash value will be calculated from the public modulus value of the key.

ENCRYPTION KEY ACKNOWLEDGEMENT FILE FORMAT				
Field Number	**Field Name**	**Type**	**Size (bytes)**	**Format**
1	NPAC Customer Id	ASCII	4	Character String
2	File Creation Date	ASCII	14	MMDDYYYYHHmmSS
3	List Id	Binary	2	16 bit integer
4	Key Id	Binary	2	16 bit integer
5	Key's MD5 hash	Binary	16	128 bit integer
6	Key Id	Binary	2	16 bit integer
7	Key's MD5 hash	Binary	16	128 bit integer
. . .	. . .	. . .	. . .	. . .
2002	Key Id	Binary	2	16 bit integer
2003	Key's MD5 hash	Binary	16	128 bit integer

Table D-2 Encryption Key Acknowledgement File Format

Key Exchange using PGP

LNP Key exchange can be accomplished via email, ftp or an exchange of physical media using PGP for security. Using PGP, a Service Provider will generate a pair of keys, one private and one public. The Service Provider will transmit the public key to the NPAC. This may be done via email or ftp, or any other mechanism of exchanging files. The key in this file is then saved by the NPAC's PGP program. This key can now be used to encrypt files that only the Service Provider may decrypt, even if the key is intercepted by someone, it will not matter, they cannot use it to do anything other than encrypt messages for the Service Provider.

At this point, the NPAC can encrypt a file containing the keys for the Service Provider. This file may be emailed, put on the ftp site, or put on a disk for the Service Provider.

For LNP key lists that the Service Provider must provide to the NPAC, the reverse procedure would apply. First the NPAC would send a public key to the Service Provider. The Service Provider then encrypts their key list using the public key, and somehow gets the encrypted file to the NPAC.

4 Download File Examples

All fields within files discussed in the following section are variable length. The download reason in all download files is always set to new. ASCII 13 is the value used as the value for carriage return (CR) in the download files.

Subscription Download File

The following table describes each field of the sample subscription download file. This download file example contains data for three subscriptions, with three lines for each subscription. Each subscription is one record in the file, pipe delimited, with a carriage return(CR) between each subscription. The breaks in the lines and the parenthesized comments are solely for ease of reading and understanding.

Table E-1 Table describes the entries for subscription 1: The "Value in Example" column directly correlates to the values for subscription 1 in the download file example, as seen in Figure E-1.

Subscription versions in the download file are selected by an NPA-NXX begin and end range. The file name for the Subscriptions download file will be in the format:

NPANXX-NPANXX.DD-MM-YYYYHH24MISS

The NPANXX-NPANXX values map to the selection criteria and the time stamp maps to the current time.

The Subscriptions file given in the example would be named:

303123-303125.10-13-1996081122

The files available for LSMS compares will be defined as one NPA-NXX per file.

0001|3031231000|1234567890|0001|19960916152337|
123456789|123|123456789|123|123456789|123|123456789|123|
123456789012|12|0001||0|0(CR) (end of subscription 1)
0002|3031241000|1234567891|0001|19960825011010||
123456789|123|123456789|123|123456789|123|123456789|123|
123456789013|13|0001|0|0(CR) (end of subscription 2)
0003|3031251000|1234567892|19960713104923|
123456789|123|123456789|123|123456789|123|123456789|123|
123456789014|13|0001|0|0(CR) (end of subscription 3)

EXPLANA		DAD FILE
Field Numbe r		
1	Version	
2	Version	
3	LRN	1234567890
4	New Current Service Provider Id	0001

EXPLANATION OF THE FIELDS IN THE SUBSCRIPTION DOWNLOAD FILE		
Field Number	**Field Name**	**Value in Example**
5	Activation Timestamp	19960916152337 (yyyymmddhhmmss)
7	CLASS DPC	123456789
8	CLASS SSN	123
9	LIDB DPC	123456789
10	LIDB SSN	123
11	ISVM DPC	123456789
12	ISVM SSN	123
13	CNAM DPC	123456789
14	CNAM SSN	123
15	End user Location Value	123456789012
16	End User Location Type	12
17	Billing Id	0001
18	LNP Type	0
19	Download Reason	0

Table E-1 Explanation of the Fields in The Subscription Download File

Network Download File

The following tables describe each field of the network download files. There are no selection criteria for these files: all data is included. This series of download file examples contain data for one Service Provider that has three NPA-NXXs and three LRNs.

The Service Provider block contains one record in the file, individual fields are pipe delimited, with a carriage return(CR) after the Service Provider Id/Name. The breaks in the lines and the parenthesized comments are solely for ease of reading and understanding.

The "Value in Example" column in Table E-2 Table directly correlates to the values for the Service Provider in the download file example, as seen in Figure E-2.

The file name for the Service Provider download file will be in the format:

SPID.DD-MM-YYYYHH24MISS (The "SPID" portion is the literal string "SPID".)

The Service Provider file given in the example would be named:

SPID.10-13-1996081122

EXPLANATION OF THE FIELDS IN THE NETWORK SERVICE PROVIDER DOWNLOAD FILE		
Field Number	**Field Name**	**Value in Example**
1	Service Provider Id	0001
2	Service Provider Name	AMERITECH

Table E-2 Explanation of the Fields in the Network Service Provider Download File

Figure E-2 Network Service Provider Download File Example

```
0001|AMERITECH(CR)                    (Service Provider Id/Name)
```

NPA/NXX Download File

The NPA/NXX download block contains three records in the file, individual fields are pipe delimited, with a carriage return(CR) after each NPA-NXX record. The breaks in the lines and the parenthesized comments are solely for ease of reading and understanding. There are no selection criteria for these files: all data is included.

The "Value in Example" column in Table E-3 directly correlates to the values for the first NPA/NXX in the download file example, as seen in Figure E-3.

The file name for the NPA-NXX download file will be in the format:

NPANXX.DD-MM-YYYYHH24MISS (The NPANXX portion is the literal string "NPANXX".)

The NPA-NXX file given in the example would be named:

NPANXX.10-13-1996081122

EXPLANATION OF THE FIELDS IN THE NETWORK NPA/NXX DOWNLOAD FILE		
Field Number	**Field Name**	**Value in Example**
1	Service Provider Id	0001
2	NPA-NXX Id	2853
3	NPA-NXX Value	303-123
4	Creation TimeStamp	19960101155555
5	Effective TimeStamp	19960105000000
6	Download Reason	0

Table E-3 Explanation of the Fields in the Network NPA/NXX Download File

Figure E-3 Network NPA/NXX Download File Example

```
0001|2853|303-123|19960101155555|19960105000000|0(CR)  (NPA-NXX 1)
0001|2864|303-124|19960101155556|19960105000000|0(CR)  (NPA-NXX 2)
0001|2870|303-125|19960101155557|19960105000000|0(CR)          (NPA-NXX 3)
```

LRN Download File

The LRN download block contains three records in the file, individual fields are pipe delimited, with a carriage return(CR) after each LRN record. There are no selection criteria for these files: all data is included. The breaks in the lines and the parenthesized comments are solely for ease of reading and understanding.

The "Value in Example" column in Table E-4 directly correlates to the values for the first LRN in the download file example, as seen in Figure E-4.

The file name for the LRN download file will be in the format:

LRN.DD-MM-YYYYHHMMSS (The LRN portion is the literal string "LRN".)

The LRN file given in the example would be named:

LRN.10-13-1996081122

EXPLANATION OF THE FIELDS IN THE NETWORK LRN DOWNLOAD FILE		
Field Number	**Field Name**	**Value in Example**
1	Service Provider Id	0001
2	LRN Id	1624
3	LRN Value	1234567890
4	Creation TimeStamp	19960101155559
5	Download Reason	0

Table E-4 Explanation of the Fields in the Network LRN Download File

Figure E-4 Network LRN Download File Example

```
0001|1624|1234567890|19960101155559|0(CR)          (LRN 1)
0001|1633|1234567891|1996010115570010|0(CR)        (LRN 2)
0001|1650|1234567892|1996010115580505|0(CR)        (LRN 3)
```