EAGLE® 5 SAS Feature Manual – Equipment Identity Register

Table of Chapters

910-0195-001 Revision B, October 2005

Tekelec EAGLE® 5
Signaling Application System

Feature Manual - Equipment Identity Register

910-0195-001 Revision B
October 2005

TEKELEC

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Introduction

Overview

This manual provides details of the Equipment Identity Register (EIR) feature of the EAGLE 5 SAS (Signaling Application System). This feature is intended to reduce the number of GSM mobile handset thefts by providing a mechanism to assist network operators in preventing stolen or disallowed handsets from accessing the network. This control will be done by using the International Mobile Equipment Identity (IMEI) provided during handset registration and comparing it against a set of lists provided by the network operator. There will be three lists Black, Gray and White. Mobile Stations (MS) on the white list will be allowed access to the network. MS's on the black list will be denied access to the network. MS's on the gray list will be allowed on the network, but may be tracked.

EIR is an optional feature on the EAGLE 5 SAS, and can be turned on, but not off, via a Feature Access Key. Note that EIR requires the Global Title Translation (GTT) feature and the EIR Subsystem is mutually exclusive of the existing INP and LNP subsystems.

Scope and Audience

This manual is intended for anyone responsible for installing, maintaining, and using the EIR feature in the EAGLE 5 SAS. Users of this manual and the others in the EAGLE 5 SAS family of documents must have a working knowledge of telecommunications and network installations.

Manual Organization

This document is organized into the following chapters:

- Chapter 1, "Introduction" , contains general information about the EIR documentation, the organization of this manual, and how to get technical assistance.
- Chapter 2, "Feature Description", provides a functional description of the EIR feature, including network perspectives, assumptions and limitations, a database overview, DSM provisioning and reloading, EIR user interface, and an audit overview.
- Chapter 3, "EAGLE 5 SAS EIR Commands", describes the new or updated commands that support the EIR faeture. It provides some sample reports and explanations of appropriate comand usage.
- Chapter 4, "Maintenance and Measurements", describes maintenance and measurements in detail, including EPAP status and alarms, hardware verification messages, TSM emulation mode, EIR system status reports and commands, code and application data loading, and alarms.
- Chapter 5, "EIR Configuration", describes how to activate the EIR feature.

Related Publications

The *EIR Feature Manual* is part of the EAGLE 5 SAS documentation and may refer to one or more of the following manuals:

- The *Commands Manual* contains procedures for logging into or out of the EAGLE 5 SAS, a general description of the terminals, printers, the disk drive used on the system, and a description of all the commands used in the system.
- The *Commands Pocket Guide* is an abridged version of the *Commands Manual*. It contains all commands and parameters, and it shows the command-parameter syntax.

- The *Commands Quick Reference Guide* contains an alphabetical listing of the commands and parameters. The guide is sized to fit a shirt-pocket.
- The *Commands Error Recovery Manual* contains the procedures to resolve error message conditions generated by the commands in the *Commands Manual*. These error messages are presented in numerical order.
- The *Database Administration Manual – Features* contains procedural information required to configure the EAGLE 5 SAS to implement these features:
  - X.25 Gateway
  - STP LAN
  - Database Transport Access
  - GSM MAP Screening
  - EAGLE 5 SAS Support for Integrated Sentinel
- The *Database Administration Manual - Gateway Screening* contains a description of the Gateway Screening (GWS) feature and the procedures necessary to configure the EAGLE 5 SAS to implement this feature.
- The *Database Administration Manual – Global Title Translation* contains procedural information required to configure an EAGLE 5 SAS to implement these features:
  - Global Title Translation
  - Enhanced Global Title Translation
  - Variable Length Global Title Translation
  - Interim Global Title Modification
  - Intermediate GTT Load Sharing
  - ANSI-ITU-China SCCP Conversion
- The *Database Administration Manual - IP7 Secure Gateway* contains procedural information required to configure the EAGLE 5 SAS to implement the SS7-IP Gateway.
- The *Database Administration Manual – SEAS* contains the EAGLE 5 SAS configuration procedures that can be performed from the Signaling Engineering and Administration Center (SEAC) or a Signaling Network Control Center (SNCC). Each procedure includes a brief description of the procedure, a flowchart showing the steps required, a list of any EAGLE 5 SAS commands that may be required for the procedure but that are not supported by SEAS, and a reference to optional procedure-related information, which can be found in one of these manuals:
  - Database Administration Manual – Gateway Screening
  - Database Administration Manual – Global Title Translation
  - Database Administration Manual – SS7

- The *Database Administration Manual – SS7* contains procedural information required to configure an EAGLE 5 SAS to implement the SS7 protocol.
- The *Database Administration Manual – System Management* contains procedural information required to manage the EAGLE 5 SAS database and GPLs, and to configure basic system requirements such as user names and passwords, system-wide security requirements, and terminal configurations.
- The *Dimensioning Guide for EPAP Advanced DB Features* is used to provide EPAP planning and dimensioning information. This manual is used by Tekelec personnel and EAGLE 5 SAS customers to aid in the sale, planning, implementation, deployment, and upgrade of EAGLE 5 SAS systems equipped with one of the EAGLE 5 SAS EPAP Advanced Database (EADB) Features.
- The *ELAP Administration Manual* defines the user interface to the EAGLE 5 SAS LNP Application Processor on the MPS/ELAP platform. The manual defines the methods for accessing the user interface, menus, screens available to the user and describes their impact. It provides the syntax and semantics of user input, and defines the output the user receives, including information and error messages, alarms, and status.
- The *EPAP Administration Manual* describes how to administer the EAGLE 5 SAS Provisioning Application Processor on the MPS/EPAP platform. The manual defines the methods for accessing the user interface, menus, and screens available to the user and describes their impact. It provides the syntax and semantics of user input and defines the output the user receives, including messages, alarms, and status.
- The *Feature Manual - EIR* provides instructions and information on how to install, use, and maintain the EIR feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 SAS. The feature provides network operators with the capability to prevent stolen or disallowed GSM mobile handsets from accessing the network.
- The *Feature Manual - G-Flex C7 Relay* provides an overview of a feature supporting the efficient management of Home Location Registers in various networks. This manual gives the instructions and information on how to install, use, and maintain the G-Flex feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 SAS.
- The *Feature Manual - G-Port* provides an overview of a feature providing the capability for mobile subscribers to change the GSM subscription network within a portability cluster while retaining their original MSISDNs. This manual gives the instructions and information on how to install, use, and maintain the G-Port feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 SAS.
- The *Feature Manual - INP* provides the user with information and instructions on how to implement, utilize, and maintain the INAP-based Number Portability (INP) feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 SAS.

- The *FTP-Based Table Retrieve Application (FTRA) User Guide* describes how to set up and use a PC to serve as the offline application for the EAGLE 5 SAS FTP Retrieve and Replace feature.
- The *Hardware Manual* - EAGLE 5 SAS contains hardware descriptions and specifications of Tekelec's signaling products. These include the EAGLE 5 SAS, OEM-based products such as the ASi 4000 Service Control Point (SCP), the Netra-based Multi-Purpose Server (MPS), and the Integrated Sentinel with Extended Services Platform (ESP) subassembly.

  The Hardware Manual provides an overview of each system and its subsystems, details of standard and optional hardware components in each system, and basic site engineering. Refer to this manual to obtain a basic understanding of each type of system and its related hardware, to locate detailed information about hardware components used in a particular release, and to help configure a site for use with the system hardware.
- The *Hardware Manual - Tekelec 1000 Application Server* provides general specifications and a description of the Tekelec 1000 Applications Server (T1000 AS). This manual also includes site preparation, environmental and other requirements, procedures to physically install the T1000 AS, and troubleshooting and repair of Field Replaceable Units (FRUs).
- The *Hardware Manual - Tekelec 1100 Application Server* provides general specifications and a description of the Tekelec 1100 Applications Server (T1000 AS). This manual also includes site preparation, environmental and other requirements, procedures to physically install the T1100 AS, and troubleshooting and repair of Field Replaceable Units (FRUs).
- The *Installation Manual* - EAGLE 5 SAS contains cabling requirements, schematics, and procedures for installing the EAGLE 5 SAS along with LEDs, Connectors, Cables, and Power Cords to Peripherals. Refer to this manual to install components or the complete systems.
- The *Installation Manual - Integrated Applications* provides the installation information for integrated applications such as EPAP 4.0 or earlier (Netra-based Multi-Purpose Server (MPS) platform) and Sentinel. The manual includes information about frame floors and shelves, LEDs, connectors, cables, and power cords to peripherals. Refer to this manual to install components or the complete systems.
- The *LNP Database Synchronization Manual - LSMS with* EAGLE 5 SAS describes how to keep the LNP databases at the LSMS and at the network element (the EAGLE 5 SAS is a network element) synchronized through the use of resynchronization, audits and reconciles, and bulk loads. This manual is contained in both the LSMS documentation set and in the EAGLE 5 SAS documentation set.

- The *LNP Feature Activation Guide* contains procedural information required to configure the EAGLE 5 SAS for the LNP feature and to implement these parts of the LNP feature on the EAGLE 5 SAS:
  - — LNP services
  - — LNP options
  - — LNP subsystem application
  - — Automatic call gapping
  - — Triggerless LNP feature
  - — Increasing the LRN and NPANXX Quantities on the EAGLE 5 SAS
  - — Activating and Deactivating the LNP Short Message Service (SMS) feature
- The *Maintenance Manual* contains procedural information required for maintaining the EAGLE 5 SAS and the card removal and replacement procedures. The *Maintenance Manual* provides preventive and corrective maintenance procedures used in maintaining the different systems.
- The *Maintenance Pocket Guide* is an abridged version of the Maintenance Manual and contains all the corrective maintenance procedures used in maintaining the EAGLE 5 SAS.
- The *Maintenance Emergency Recovery Pocket Guide* is an abridged version of the Maintenance Manual and contains the corrective maintenance procedures for critical and major alarms generated on the EAGLE 5 SAS.
- The *MPS Platform Software and Maintenance Manual* - EAGLE 5 SAS *with Tekelec 1000 Application Server* describes the platform software for the Multi-Purpose Server (MPS) based on the Tekelec 1000 Application Server (T1000 AS) and describes how to perform preventive and corrective maintenance for the T1000 AS-based MPS. This manual should be used with the EPAP-based applications (EIR, G-Port, G-Flex, and INP).
- The *MPS Platform Software and Maintenance Manual* - EAGLE 5 SAS *with Tekelec 1100 Application Server* describes the platform software for the Multi-Purpose Server (MPS) based on the Tekelec 1100 Application Server (T1100 AS) and describes how to perform preventive and corrective maintenance for the T1100 AS-based MPS. This manual should be used with the ELAP-based application (LNP).
- The *Provisioning Database Interface Manual* defines the programming interface that populates the Provisioning Database (PDB) for the EAGLE 5 SAS features supported on the MPS/EPAP platform. The manual defines the provisioning messages, usage rules, and informational and error messages of the interface. The customer uses the PDBI interface information to write his own client application to communicate with the MPS/EPAP platform.
- The *Previously Released Features Manual* summarizes the features of previous EAGLE, EAGLE 5 SAS, and IP^7 Secure Gateway releases, and it identifies the release number of their introduction.

- The *Release Documentation* contains the following documents for a specific release of the system:
  - — *Feature Notice* - Describes the features contained in the specified release. The Feature Notice also provides the hardware baseline for the specified release, describes the customer documentation set, provides information about customer training, and explains how to access the Customer Support website.
  - — *Release Notice* - Describes the changes made to the system during the lifecycle of a release. The Release Notice includes Generic Program Loads (GPLs), a list of PRs resolved in a build, and all known PRs.

    NOTE: The *Release Notice* is maintained solely on Tekelec's Customer Support site to provide you with instant access to the most up-to-date release information.
  - — *System Overview* - Provides high-level information on SS7, the IP7 Secure Gateway, system architecture, LNP, and EOAP.
  - — *Master Glossary* - Contains an alphabetical listing of terms, acronyms, and abbreviations relevant to the system.
  - — *Master Index* - Lists all index entries used throughout the documentation set.
- The *System Manual – EOAP* describes the Embedded Operations Support System Application Processor (EOAP) and provides the user with procedures on how to implement the EOAP, replace EOAP-related hardware, device testing, and basic troubleshooting information.

Documentation Packaging, Delivery, and Updates

Customer documentation is provided with each system in accordance with the contract agreements. It is updated whenever significant changes that affect system operation or configuration are made. Updates may be issued as an addendum, or a reissue of the affected documentation.

The document part number appears on the title page along with the current revision of the document, the date of publication, and the software release that the document covers. The bottom of each page contains the document part number and date of publication.

Two types of releases are major software releases and maintenance releases. Maintenance releases are issued as addenda with a title page and change bars. On changed pages, the date and document part number are changed; on unchanged pages that accompany the changed pages, the date and document part number are unchanged.

When the software release has a minimum affect on documentation, an addendum is provided. The addendum contains an instruction page, a new title page, a change history page, and replacement chapters with the date of publication, the document part number, and change bars.

If a new release has a major impact on documentation, such as a new feature, the entire documentation set is reissued with a new part number and a new release number.

Documentation Admonishments

Admonishments are icons and text throughout this manual that alert the reader toassure personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage. This manual has three admonishments, listed in descending order of priority.

DANGER: This icon and text indicate the possibility of *personal injury*.

WARNING: This icon and text indicate the possibility of *equipment damage*.

CAUTION: This icon and text indicate the possibility of *service interruption*.

Customer Assistance

The Tekelec Customer Contact Center offers a point of contact through which customers can receive support for problems. The Tekelec Customer Contact Center is staffed with highly-trained engineers to provide solutions to technical questions and issues seven days a week, twenty-four hours a day. A variety of service programs are available through the Tekelec Customer Contact Center to maximize the performance of Tekelec products that meet and exceed customer needs.

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To receive technical assistance, call the Tekelec Customer Contact Center at one of the following locations by one of the following methods:

- Tekelec, UK

  Phone:+44 1784 467804

  Fax: +44 1784 477120

Email:ecsc@tekelec.com

- Tekelec, USA

  Phone(within continental US):(888) 367-8552

  (outside continental US): +1 919-460-2150

  Email:support@tekelec.com

When the call is received, a Customer Service Report (CSR) is issued to record the request for service. Each CSR includes an individual tracking number.

Once a CSR is issued, Technical Services determines the classification of the trouble. If a critical problem exists, emergency procedures are initiated. If the problem is not critical, information regarding the serial number of the system, COMMON Language Location Identifier (CLLI), initial problem symptoms (includes outputs and messages) is recorded. A primary Technical Services engineer is also assigned to work on the CSR and provide a solution to the problem. The CSR is closed when the problem is resolved.

Emergency Response

In the event of a critical service situation, emergency response is offered by Tekelec Technical Services twenty-four hours a day, seven days a week. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with an EAGLE 5 SAS that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical problems affect service and/or system operation resulting in:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with Tekelec Technical Services.

Acronyms

ADL	Application Data Loader
AuC	Authentication Center
CC	E.164 Country Code
CCRNDN	Country Code + Routing Number + National Directory Number
CdPA	Called Party Address
CgPA	Calling Party Address
CPC	Capability Point Code
CRP	Circular Route Prevention
DCB	Device Control Block
DCM	Data Communications Module
DSM	Database Services Module
EIR	Equipment Identity Register
EPAP	EAGLE Provisioning Application Processor
ES	Encoding Scheme
ETSI	European Telecommunications Standards Institution
FTP	File Transport Protocol
FTR	File Transfer Region
GDB	G-Flex/G-Port/INP Database
GFDB	G-Flex Database
G-Flex	GSM Flexible Numbering
GMSC	Gateway Mobile Switching Center
G-Port	GSM Mobile Number Portability
GPL	Generic Program Load
GSM	Global System for Mobile communications
GTA	Global Title Address
GTAI	Global Title Address Information
GTI	Global Title Indicator
GTT	Global Title Translation
HLR	Home Location Register
HomeRN	Home Network Routing Number Prefix
IAM	Initial Address Message
IMEI	International Mobile Equipment Identity

IMSI	International Mobile Station Identifier
IN	Intelligent Network
INAP	Intelligent Network Application Protocol
INP	INAP-Based Number Portability
IP	Internet Protocol
IS-41	International Standard 41, same as ANSI-41
ISDN	Integrated Services Digital Network
ITU	International Telecommunications Union
LIM	Link Interface Module
LNP	Local Number Portability
LSS	Local Subsystem
MAP	(1) Mobile Application Part (2) Mated APplication
MAS	Maintenance and Administration Subsystem
MCAP	MAS Communication Application Processor Card
MEA	Mismatch of Equipment and Attributes
MDN	Mobile Directory Number
MGT	Mobile Global Title
MIN	Mobile Identification Number
MMI	Man-Machine Interface
MNP	Mobile Number Portability
MPS	Multi-Purpose Server (Multi-Platform Server)
MS	Mobile Station
MSRN	Mobile Station Roaming Number
MSC	Mobile Switching Center
MSISDN	Mobile Station international ISDN number
MSU	Message Signaling Unit
MTP	Message Transfer Part
NC	E.214 Network Code
NDC	E.164 National Destination Code
NP	(1) Number Portability (2) Numbering Plan
NPA	Numbering Plan Area
NPDB	Number Portability Database

NPV	Numbering Plan Value
NSD	Network Systems Division, Tekelec
OAI	Object Access Interface
OAM	Operation Administration & Maintenance
OAP	Operations Support System/ Application Processor
OPS	Operator Provisioning System
PDB	Provisioning Database
PDBA	Provisioning Database Application
PDBI	Provisioning Database Interface
PFS	Product Functional Specification
PLMN	Public Land Mobile Network
PMTC	Peripheral Maintenance Control
RMTP	Reliable Multicast Transport Protocol
RNIDN	Routing Number prefix + International dialed / Directory Number
RNNDN	Routing Number prefix + National dialed / Directory Number
RNSDN	Routing Number prefix + Subscriber dialed / Directory Number
RTDB	Real-Time Database
SCCP	Signaling Connection Control Part
SCMG	SCCP Management
SCP	Service Control Point
SDS	System Debug Services
SIM	Subscriber Identity Module
SMS	(1) Service Management System, or (2) Short Message Service
SNP	Service Numbering Plan
SP	Signaling Point
SPC	Secondary Point Code
SRF	Signaling Relay Function
SRI	Send Routing Information
SS7	Signaling System 7
SSH	Secure Shell
SSN	Subsystem Number
SSP	Service Switching Point

STP	Signal Transfer Point
TCAP	Transaction Capabilities Application Part
TCP	Transmission Control Protocol
TFA	Transfer Allowed
TFP	Transfer Prohibited
TSM	Translation Service Module
TT	Translation Type
UAM	Unsolicited Alarm Message
UDP	User Datagram Protocol
UDT	Unit Data Transfer
UDTS	Unit Data Transfer Service
UIM	Unsolicited Information Message
UPU	User Part Unavailable
VLR	Visitor Location Register
VMSC	Voice Mail Service Center
VSCCP	VxWorks Signaling Connection Control Part

2

Feature Description

Introduction

A handset theft problem exists in GSM networks in many countries. A person obtains a legitimate subscription to a network, and then obtains a legitimate IMSI, MSISDN, and SIM card. The person initially buys an inexpensive handset and then steals a better handset from another subscriber. Once the handset is stolen, the thief replaces the SIM card with his/her own legitimate SIM card. Since the SIM card and subscriber information contained therein (IMSI, MSISDN) are

legitimate, the phone will operate and the network operator has no way to determine that the subscriber is using a stolen handset. In addition to individual handset theft, organized groups have begun stealing entire shipments of mobile handsets from warehouses, and then selling these handsets on the black market.

This feature is intended to reduce the number of GSM mobile handset thefts by providing a mechanism that allows network operators to prevent stolen or disallowed handsets from accessing the network. This control is done by using the International Mobile Equipment Identity (IMEI) provided during handset registration and comparing it against a set of lists provided by the network operator. There are three lists; Black, Gray, and White. Mobile Stations (MS) on the white list are allowed access to the network. MS's on the black list are denied access to the network. MS's on the gray list are allowed on the network, but may be tracked.

The Equipment Identity Register (EIR) is a network entity used in GSM networks that stores lists of International Mobile Equipment Identity (IMEI) numbers, which correspond to physical handsets (not subscribers). The IMEI is used to identify the actual handset, and is not dependent upon the International Mobile Subscriber Identity (IMSI), Mobile Station International ISDN Number (MSISDN) or the Subscriber Identity Module (SIM). The IMSI, MSISDN, and SIM are all subscriber-specific, and move with the subscriber when he/she buys a new handset. The IMEI is handset specific.

The EIR database stores white, grey, and black lists of IMEI numbers. When a subscriber roams to a new MSC/VLR location, the handset attempts registration with the MSC/VLR. Before the MSC registers the subscriber with the VLR, it may sends a query to the EIR. The EIR returns a response indicating whether the IMEI is allowed, disallowed, or invalid. If the IMEI is allowed, the MSC completes registration, otherwise, registration is rejected.

The EIR may also contain associations between individual IMEIs and IMSIs. This would provide a further level of screening by directly associating a particular IMEI with a particular IMSI. This association is used in the following way:

- If an IMEI is found on a black list, an additional check of the IMSI could then be made.
- If the IMSI from the handset matches the IMSI provisioned with the IMEI, this would override the black list condition, and allow registration to continue. This could be used to protect against mistaken black list entries in the database, or to prevent unauthorized "handset sharing". Obviously, this association could be used in other ways.

Use of the EIR can prevent the use of stolen handsets since the network operator can enter the IMEI of these handsets into a 'blacklist' and prevent them from being registered on the network, thus making them useless.

EIR Considerations

1. GTT must be ON before the EIR feature can be enabled.
2. The EIR feature is mutually exclusive with INP.
3. The EIR feature is mutually exclusive with LNP.
4. The EIR feature cannot be enabled if any ASMs or TSMs are in the system.
5. The EIR feature may require DSMs wth additional memory capacity.

EIR Call Flows

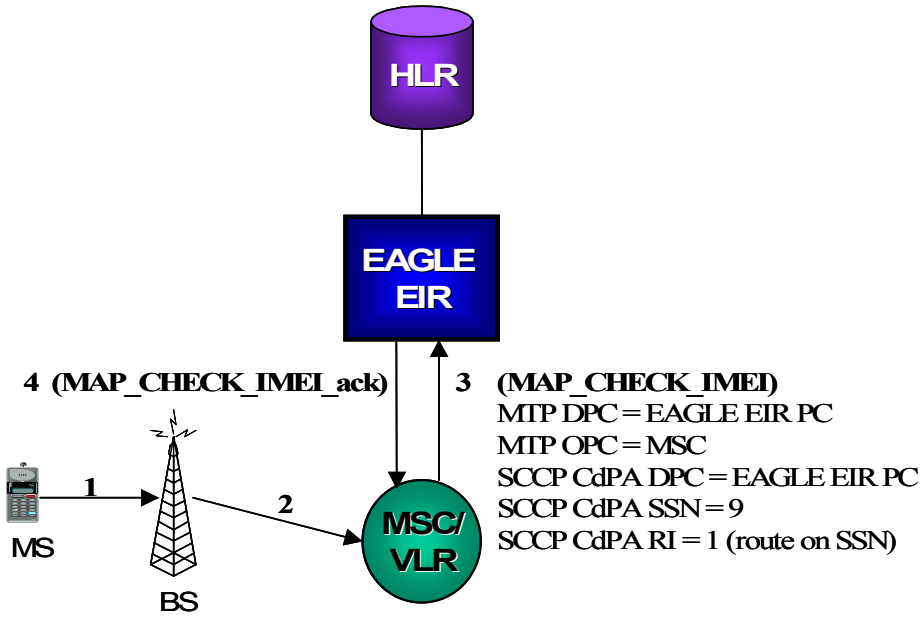
When a handset roams into a new MSC/VLR area, it attempts a registration procedure with the VLR. In a network without the EIR function, this procedure results in the VLR sending a location update message to the HLR, providing the HLR with the current MSC location of the Mobile Station (MS)/handset. Once the EIR is deployed, this registration procedure is interrupted in order to validate the IMEI of the MS/handset attempting to register before completing the registration procedure and updating the HLR.

In the EIR network, the MSC/VLR sends a MAP_CHECK_IMEI message to the EIR prior to sending a location update to the HLR. This message contains, at a minimum, the IMEI of the MS attempting registration. It may also contain the IMSI of the subscriber whose SIM card is currently being used in the MS/handset. Upon receipt of this message, the EIR searches the white, grey, and black lists for a match on the IMEI. The EIR then returns a response to the MSC. Depending upon the result of the search, the response contains either the Equipment Status of the MS/handset (whether the IMEI for the MS/handset is allowed or not based on its status in the white, grey, or black lists), or a User Error (invalid or unknown IMEI). The MSC then either continues the registration procedure (if the IMEI is allowed), or rejects it (if the IMEI is disallowed, invalid, or unknown).

If the IMSI is also included in the message, the EIR attempts to match this IMSI to one provisioned with the IMEI prior to sending a response to the MSC. A match on IMSI in this case overrides any black list condition found based on the IMEI match alone, and causes a response of *MS allowed*.

Refer to Figure 2-1 and the following text for EAGLE 5 SAS EIR call flow information.

Figure 2-1. EIR Call Flow



1. The MS/handset roams into new serving MSC/VLR area, and begins registration procedure with Base Station (BS).
2. The BS begins the registration procedure with MSC/VLR
3. Before allowing the MS/handset to register on the network, and prior to updating the HLR with the new MSC information, the MSC launches a MAP_CHECK_IMEI message to the EAGLE 5 SAS EIR. This message is either MTP-routed directly to the point code of the EAGLE 5 SAS and the EIR subsystem (SSN = "EIR"), or is GT-routed and the EAGLE 5 SAS GT-translates the message to its own point code and local EIR SSN = "EIR"
4. The EAGLE 5 SAS EIR retrieves the IMEI and/or IMSI from the message and searches the EIR tables for a match. Refer to Tables 2-5. This search may result in the IMEI being on the white, grey, and/or black lists, or it may result in an invalid or unknown IMEI (no match). It may also result in an invalid IMSI-IMEI combination. Based on the results of the search, the EAGLE 5 SAS EIR returns a MAP_CHECK_IMEI_ack containing either the Equipment Status (IMEI on allowed or not allowed), or a User Error (invalid or unknown IMEI).
5. (Not shown). The MSC either rejects or completes the registration attempt, depending on the information returned by the EIR.

The EIR tables contain lists of IMEIs, and an indication as to the list they are located. There are two types of tables - an Individual IMEI table (Table 2-1) and a Range IMEI table. The Individual IMEI table is searched first. The IMEI entries in this table may also contain an association to an IMSI. If no match is found in the individual table, the range IMEI table is searched.

The EIR can support up to 32 million individual IMEIs. A total of up to 50,000 IMEI ranges are supported.The total EAGLE 5 SAS database capacity for all advanced database service features, including EIR, G-Flex, and G-Port is 56 million individual numbers. If entries exist for these other services (MSISDNs for G-Port or IMSIs for G-Flex), reduces the available capacity for IMEIs. Also, if IMSIs are entered for the "IMSI Check" option of the EIR, those entries will also reduce the available IMEI capacity.

Table 2-1. Example Individual IMEI Table

IMEI	IMSI (optional)	White List	Grey List	Black List
12345678901234	495867256894125	No	No	Yes
234567890123456		No	Yes	No
49876523576823		No	Yes	Yes
68495868392048	495867565874236	Yes	Yes	No
29385572695759		Yes	Yes	Yes

As shown in Table 2-1, it is possible for a given IMEI to be on multiple lists (e.g. on the white list, and also on the grey and/or black list). The logic described by Table 2-2 is used to determine which answer to return in the CHECK_IMEI response, determined by which list(s) the IMEI is on. Table 2-2 also shows three possible EIR Response Types. The EIR Response Type is a system-wide EIR option, that is configured by the user. The combination of the setting of the EIR Response Type, in which list(s) the IMEI is located, and the optional IMSI check, determines the response that is returned to the querying MSC.

Table 2-2. Logic for IMEIs in Multiple Lists

Presence in List			EIR Response Type		
White	Grey	Black	Type 1	Type 2	Type 3
X			in white list	in white list	in white list
X	X		in grey list	in grey list	in grey list
X	X	X	in black list	in black list	in black list
X		X	in black list	in black list	in black list
	X		in grey list	in grey list	unknown
	X	X	in black list	in black list	unknown
		X	in black list	in black list	unknown
			in white list	unknown	unknown

Example Scenerios

Example 1

1. A CHECK_IMEI is received with IMEI = 49876523576823, no IMSI in message.
2. A match is found in the Individual table (Table 2-1, entry 3), indicating the IMEI is on the grey and black lists.The EIR Response Type is set to Type 3, and an IMSI is not present.
3. Per the logic in Table 2-2, the required response is *Unknown*.
4. The EIR formulates a CHECK_IMEI error response with `Error = 7 unknownEquipment`.

Example 2

Same as Example 1, but the setting of the EIR Response Type is re-provisioned by the operator to Type 2.

1. A CHECK_IMEI is received with IMEI = 49876523576823, no IMSI in message.
2. A match is found in the Individual table (Table 2-1, entry 3), indicating the IMEI is on the grey and black lists.The EIR Response Type is set to Type 2, and an IMSI is not present.
3. Per the logic in Table 2-2, the required response is *Black Listed*.
4. The EIR formulates a CHECK_IMEI response with `Equipment Status = 1 blackListed`.

Example 3

1. A CHECK_IMEI is received with IMEI = 12345678901234, and IMSI = 495867256894125.
2. A match is found in the Individual table (Table 2-1, entry 1), indicating the IMEI is on the black list.
3. The EIR Response Type is set to Type 1.
4. Per the logic in Table 2-2, the normally required response would be *Black Listed*, however; since an IMSI is present in the message, and the IMEI is on the black list, the IMSI is compared to the IMSI entry in the database for this IMEI.
5. In this case, the IMSI in the DB matches the IMSI in the query, thus the black list condition is cancelled.
6. The EIR formulates a CHECK_IMEI response with `Equipment Status = 0 whiteListed`.

Example 4

1. A CHECK_IMEI is received with IMEI = 12345678901234, and IMSI = 495867256894125.
2. A match is found in the Individual table (Table 2-1, entry 1), indicating the IMEI is on the black list.

3. The EIR Response Type is set to Type 1.
4. Per the logic in Table 2-2, the normally required response would be *Black Listed*, however; since an IMSI is present in the message, and the IMEI is on the black list, the IMSI is compared to the IMSI entry in the database for this IMEI.
5. In this case, the IMSI in the DB does not match the IMSI in the query, thus the black list condition is maintained.
6. The EIR formulates a CHECK_IMEI response with `Equipment Status = 1 blackListed`.

EIR List Determination

If the global response option is set (with the **eirgrsp** parameter of the **chg-gsmopts** command) to a value other than **off**, the IMEI is treated as being on the list indicated by the global response option, regardless of the actual status of the IMEI. No list logic processing is performed on the IMEI.

If the global response option is set to **off**, the IMEI table is searched first. If no match is found in the IMEI table, the IMEI Block table is searched next. If the IMEI is found on only the White List after either table search, the list logic processing is complete, and the White List status of the IMEI is sent to the MSC.

Black List Processing

If the IMEI is found on the Black List after either table search, list logic processing continues based on the EIR response type, set by the **eirrsptype** parameter of the **chg-gsmopts** command. If the EIR response type is type 3, and the IMEI is not also found on the White List, the status of the IMEI is unknown.

If the IMEI is found on the White List also, or if the EIR response type is either type 1 or 2, the value of the IMSI check option, set with the **eirimsichk** parameter of the **chg-gsmopts** command is checked. If the IMSI check option is **on**, and the IMSI is present in the message, the IMSI table is searched. If there is a match for the IMSI, the status of the IMEI is determined to be "White with Override." If there is no match for the IMSI, the status of the IMEI is determined to be "Black with IMSI Match Failed." If the value of the IMSI check option is **off**, the status of the IMEI is determined to be on the Black List.

Gray List Processing

If the IMEI is found on the Gray List after either table search, list logic processing continues based on the EIR response type, set by the **eirrsptype** parameter of the **chg-gsmopts** command. If the EIR response type is type 3, and the IMEI is not also found on the White List, the status of the IMEI is unknown.

If the IMEI is found on the White List also, or if the EIR response type is either type 1 or 2, the status of the IMEI is determined to be on the Gray List.

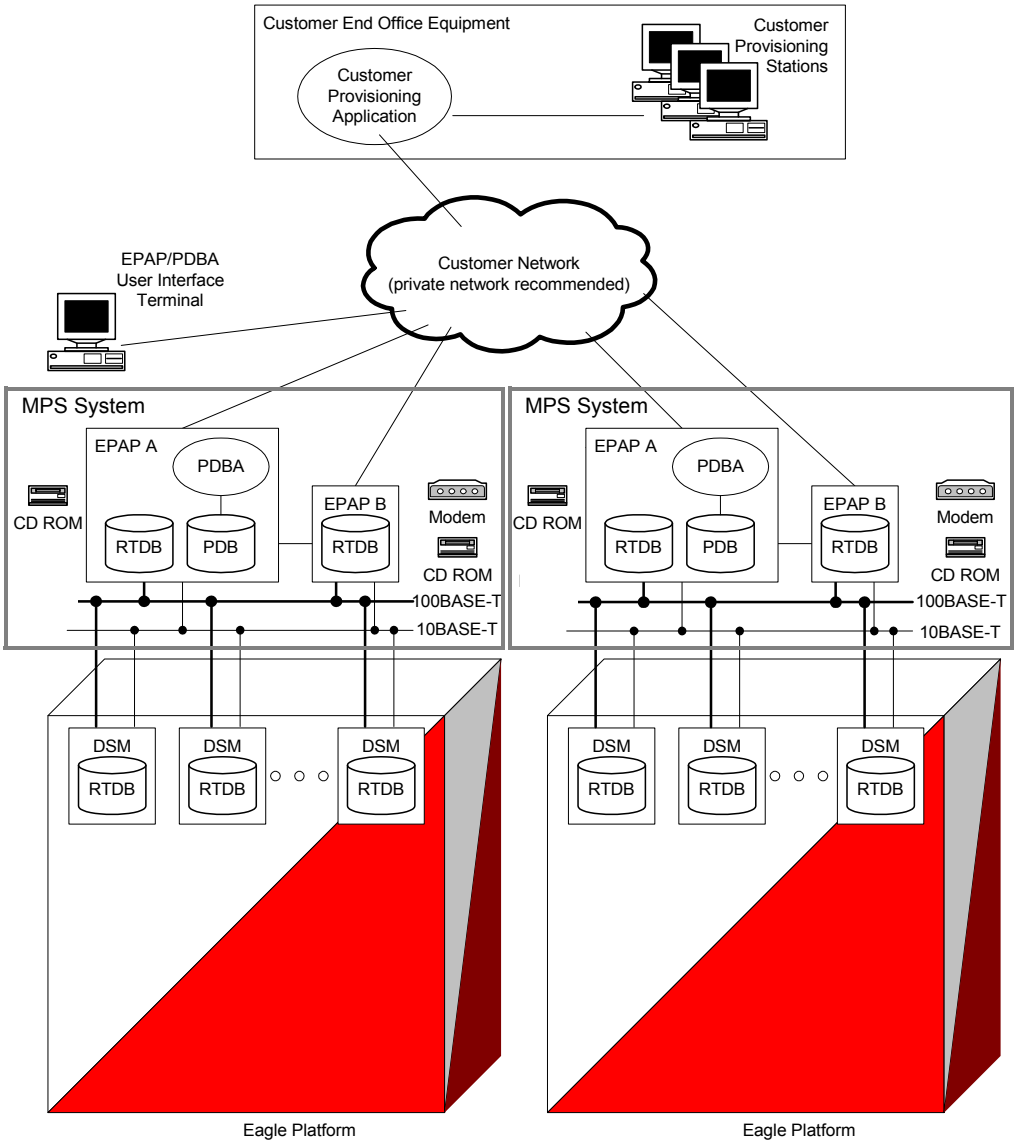
MPS/EPAP Platform

Tekelec provides the MPS (Multi-Purpose Server) platform as a subsystem of the EAGLE 5 SAS. The MPS provides support for multiple features, which currently are the INP, G-Flex, G-Port, and EIR features.

The MPS is composed of hardware and software components that interact to create a secure and reliable platform. (For details about the MPS hardware, refer to the MPS Hardware Manual.) The MPS provides the means of interfacing the customer provisioning application with the EAGLE 5 SAS. It connects the customer with the EAGLE 5 SAS and accepts the customer number portability data, while accommodating numbers of varying lengths.

The EAGLE Provisioning Application Processor (EPAP) is the software that runs on the MPS hardware platform. It collects and organizes customer provisoning data, and forwards it to the EAGLE 5 SAS DSM cards. Figure 2-2 shows the overall system architecture, providing a graphic overview of MPS/EPAP platform from customer provisioning through the MPS subsystem to the EAGLE 5 SAS DSM databases.

Figure 2-2. MPS/EPAP Platforms for Provisioning EIR



Design Overview and System Layout

Figure 2-2 illustrates the overall system architecture of EIR and identifies the different tasks, databases and interfaces involved. The system consists of two mated MPS servers. Each MPS contains two EPAP platforms, EPAP A and EPAP B, a RealTime Database, a Provisioning Database, servers, CD ROMS, modems, and network hubs. Each MPS and its EPAPs may be thought of as an 'EPAP system'; the EPAP system at the mated EAGLE 5 SAS is referred to as the 'mated EPAP system'. Each EPAP system is a TekServer system with a total of four Ethernet interfaces.

On the EAGLE 5 SAS platform side, a set of DSMs, which hold the EIR database, is part of the STP. Two high-speed Ethernet links connect the DSMs and the EPAPs. One of the links is a 100BASE-T Ethernet bus, and the other is a 10BASE-T Ethernet bus.

The EIR database is provisioned and maintained through the EPAPs. EPAP A and EPAP B act as the active EPAP and the standby EPAP. One link serves as the active link, and the other as the standby link. At any given time, there is only one active EPAP and one active link. The database is provisioned through the active link by the active EPAP; the other EPAP provides redundancy.

In case of failure of the active EPAP, the standby EPAP takes over the role of active EPAP and continues to provision the EIR database. In the case where the active link fails, the active EPAP switches to the standby link to continue provisioning the DSMs. The two Ethernet links are part of the DSM network.

Another 100BASE-T Ethernet link exists between the EPAPs; that link is called the EPAP sync network.

Major modules on the EPAP are the:

- DSM provisioning module
- Maintenance module
- RTDB module
- PDB module

The DSM provisioning module is responsible for updating EIR databases on the EAGLE 5 SAS DSM cards using the RMTP multicast. The maintenance module is responsible for the proper functioning of the EPAP platform. The PDB module is responsible for preparing and maintaining the Real Time Database, which is the "golden copy" of the EIR database. The PDB module can run on one of the EPAPs of either of the mated EAGLE 5 SASs.

Functional Overview

The main function of the MPS/EPAP platform is to provision the EIR data from the customer network to the DSM cards on the EAGLE 5 SAS. EIR database records are continuously updated from the customer network to the PDB. The PDB module communicates with the maintenance module and the RTDB task over a TCP/IP socket to provision the DSM cards on the EAGLE 5 SAS. The maintenance module is responsible for the overall stability and performance of the system.

It is possible for the DSM database to get out-of-sync due to missed provisioning or card rebooting. Therefore, the RTDB contains a coherent, current copy of the DSM database. The EPAP-DSM provisioning task sends database information out on the provisioning link. The DSM cards act as the receivers and are reprovisioned.

EPAP/PDBA Overview

The EAGLE Provisioning Application Processor (EPAP) platform and the Provisioning Database Application (PDBA) coupled with the Provisioning Database Interface (PDBI) facilitate the database required for the EIR feature. It performs the following two basic functions in support of the EIR feature:

- Accept and store EIR data provisioned by the customer
- Update and reload EIR databases on the DSM cards

The PDBA operates on the master EIR provisioning database (PDB). The EPAP and PDBA are both installed on the MPS hardware platform.

The EPAP platform maintains an exact copy of the real-time database (RTDB) required by the EAGLE 5 SAS DSM cards, provisions the EAGLE 5 SAS DSM cards, and maintains redundant copies of both databases on mated EPAP hardware. The EPAP platform is a mated pair of processors (the upper processor, called EPAP A, and the lower processor, EPAP B) contained in one frame.

During normal operation, information flows through the EPAP/PDBA software with no intervention. EIR data is generated at one or more operations centers and is delivered to the PDBA through a TCP socket interface (PDBI). The PDBA software stores and replicates data on EPAP A on the mated EPAP system. The data is then transmitted across a private network to the DSM cards located in the EAGLE 5 SAS frame by the EPAPs.

The primary interface to the PDBA consists of machine-to-machine messages. The interface is defined by Tekelec and is available in the Provisioning Database Interface Manual. Use that manual to update or create provisioning software compatible with the EPAP socket interface.

A direct user interface is provided on each EPAP to allow configuration, maintenance, debugging, and platform operations. A direct user interface is also provided by the PDBA for configuration and database maintenance.

The MPS/EPAP is an open systems platform and easily accommodates the high provisioning rates that EIR requires. Implementing the persistent database and provisioning as an open systems platform, compared to the traditional OAM platform, provides these benefits:

- Variety of hardware components and vendors
- Availability of third party communication and database tools
- Standard communication protocols
- Availability of personnel with related experience

Each EPAP server maintains a copy of the real-time database in order to provision the EAGLE 5 SAS DSM cards. The EPAP server must comply with the hardware requirements in the *MPS Hardware Manual*. Figure 2-2 illustrates the EPAP architecture contained in the MPS subsystem.

Each EPAP has a dedicated CD ROM drive. One EPAP per EAGLE 5 SAS platform has a modem capable of supporting remote diagnostics, remote configuration, and remote maintenance; these remote operations are performed through EPAP login sessions. These sessions are accessible across the customer network (that is, the ssh) as well as through direct terminal connection to the EPAP via an RS232 connection. Refer to the *MPS Hardware Manual* for details about the hardware devices and network connections.

EPAP (EAGLE Provisioning Application Processor)

As shown in Figure 2-2, a MPS/EPAP platform contains two EPAP servers to provide EIR service. At any given time, only one EPAP actively communicates with the DSMs. The other EPAP is in standby mode.

The primary purpose of the EPAPs is to maintain the provisioning database (PDB) and to download copies of the RTDB to the DSM cards. The EPAP receives EIR data from the customer network through the PDBI, the external source of EIR provisioning information. The PDBI continually updates the active EPAP's PDB. Once an update is applied to the active PDB, it is sent to the RTDBs on the active and standby EPAPs.

Each EPAP maintains a copy of the RTDB. When a DSM needs a copy of the RTDB, the EPAP downloads the file to the DSM for its own resident copy of the RTDB database.

The EPAP maintains a file of database updates to be sent to the DSMs. This file contains the changes necessary to keep the DSM files current relative to the RTDB database.

DSM (Database Services Module)

The EIR feature can provision from 1 to 25 DSM cards.

Multiple DSMs provide a means of load balancing in high-traffic situations. The DSM database is in a format that facilitates rapid lookups. Each DSM contains an identical database. Furthermore, all DSM EIR databases are identical to the RTDB maintained by the EPAPs.

However, the various databases may not be identical at all times for several reasons. First of all, when a DSM card is initialized, it downloads the current copy of the database from the EPAP. While that card is being downloaded, it cannot provide VSCCP services. Another condition that can result in databases being out-of-sync occurs when the EPAP receives updates from its provisioning source, but it has not yet sent them down to the DSM cards. Updates are applied to the provisioning database as they are received.

Two possible scenarios contribute to a condition where a DSM may not have enough memory to hold the entire database. In the first case, the database is downloaded successfully to the DSM, but subsequent updates eventually increase the size of the database beyond the capacity of the DSM memory. In this situation, it is desirable to continue processing EIR transactions, even though the database may not be as up-to-date as it could be.

The other case occurs when a DSM card is booted. If it is determined then that the card does not have enough memory for the entire database, the database is not loaded on that card. Each DSM is responsible for recognizing and reporting its out-of-memory conditions by means of alarms.

Incremental Downloading

Once a download is in progress, it is possible for another DSM to determine that it also needs to download the file. The new DSM can "jump in" and join the download in progress and begin its download with whatever record is currently being sent. When the last record in the file has been sent, the EPAP restarts the download from the beginning. The EPAP then sends the records that the new DSM needs to complete its database.

EPAP Status and Error Reporting via Maintenance Blocks

The EPAPs forward all status and error messages to the DSMs in maintenance blocks. Maintenance blocks are asynchronously sent whenever the EPAP has something to report. The maintenance blocks eventually update EPAP DCBs located on the EAGLE 5 SAS.

EIR Protocol

The EAGLE 5 SAS supports the EIR capability point code type and an additional local subsystem that is entered into the MAP table. Like other entries in the MAP table, this subsystem has a mate subsystem, and a concerned point code group assigned to it. This subsystem is administered using MAP commands (*ent-map*, *chg-map*, *dlt-map*). Both ITU-I and ITU-N point codes are supported in the MAP commands. The EIR subsystem cannot be set to Load Shared mode (as end nodes do not perform load sharing), but is set to Dominant or Solitary mode. The EIR Subsystem has the restriction that only one local subsystem and capability point code type can be active at any instant.

Messages for Local Subsystems

The message arrives on the EIR subsystem on *rt-on-ssn* or *rt-on-gt*. If the message arrives *rt-on-ssn*, it must contain either the EAGLE 5 SAS's true point code or the EIR capability point code in the DPC field of the message, and EAGLE 5 SAS's EIR Subsystem number in the Called Party Subsystem field of the message. If EIR queries has the EAGLE 5 SAS's capability point code for the DPC, then the EAGLE 5 SAS processes the message, but is not able to divert this message in the event of subsystem failure.

If a message arrives on the EIR subsystem on *rt-on-gt*, it should also contain a service selector that translates to an EIR Subsystem. These messages also contain one of EAGLE 5 SAS's capability point codes in the DPC field. The EAGLE 5 SAS also processes the message if it has the EAGLE 5 SAS's true point code for the DPC, but it is not able to divert these messages in the event of subsystem failure.

If the local EIR subsystem is offline and the mated subsystem is available, the routing indicator is used to determine whether to reroute:

- If the message arrived *route-on-ssn*, the message is not rerouted to the mate. In this case, EAGLE 5 SAS is acting as an end node, and end nodes do not reroute. If the return on error option is set, the EAGLE 5 SAS generates a UDTS, otherwise it will discard the message
- If the message arrived on *route-on-gt*, the message is rerouted to the mated subsystem. In this case, EAGLE 5 SAS is acting as both STP and SCP, and STPs do reroute messages.

MTP and SCCP Management to Support EIR

If the EIR is offline, the EAGLE 5 SAS sends SSPs that causes the *rt-on-ssn* message to be diverted to the mate subsystem.These do not cause the *rt-on-gt* messages to be diverted. In order to make other nodes divert *rt-on-gt* traffic to the mate, the EAGLE 5 SAS will send response method TFPs to the OPC of the message, when messages arrive *rt-on-gt* for one of the EIR Capability Point Codes and the result of translation is the EAGLE 5 SAS's EIR Subsystem. This TFP should cause the OPC to divert traffic to the mate. If a message arrives *rt-on-gt* for the EAGLE 5 SAS's True Point Code, the EAGLE 5 SAS will not generate a TFP. Therefore, nodes that send *rt-on-gt* traffic to the EAGLE 5 SAS should use one of EIR Capability Point Codes, not the EAGLE 5 SAS's True Point Code.

If the EAGLE 5 SAS receives an RSP (Route Set Test Message - Prohibited) for a EIR Capability Point Code, and the EIR subsystem is offline, the EAGLE 5 SAS does not reply. If the EAGLE 5 SAS receives an RSR (Route Set Test Message - Restricted) for EIR Capability Point Code, and the EIR subsystem is offline, the EAGLE 5 SAS replies with a TFP concerning the Capability Point Code. When EIR is online, RSRT replies to both RSRs and RSPs for EIR Capability Point Code with a TFA.

Check_IMEI Message Handling

When the CHECK_IMEI message is received by protocol, the, IMSI (if active) and SVN are parsed from the MSU. Because different vendors place the IMSI information in different locations within the message, the decoder searches for the IMSI in multiple locations.

Once the required data is parsed, a call is made to the RTDB to determine the response type for the IMEI/IMSI combination.

The appropriate response messageis sent to the originating MSC.

Encoding Errors

When a Response is generated, it is sent based on the CgPA information in the incoming message. However, some conditions may prevent the EAGLE 5 SAS from generating the response. Most of the errors involve GTT on the CgPA; if the incoming data is *rt-on-ss*, the number of potential errors is much smaller.

Whenever an encoding error is detected, the Response message is discarded.

Data Collection

All messages received peg the following measurement: Total Messages (confirmed to have MAP Operation of CheckIMEI). At the end of processing, a single measurement is pegged:

- black listed
- black listed, but allowed due to IMSI match
- black listed, IMSI did not match
- white listed
- gray listed
- unknown
- no match (based on Response Type, this could be White or Unknown)

This following information is reported to ATH for **`rept-Stat-sccp`**.

- Counters
- Success
- Failures
- Processing Time
- Total Messages

At the end of the EIR service, Processing Time is updated with the elapsed time for this MSU. Total Messages is incremented, as is either success or failure. Warnings and Fall-thrus are not possible for EIR.

SCRC message counting is updated for SERVICE_MSG type.

EIR List Log File

The EIR feature allows for detection and logging of subscribers using handsets that have been black-listed or grey-listed by a service provider. These messages are generated by the EAGLE 5 SAS platform and forwarded to the MPS platform for later retrieval. Messages may be forwarded from any of the provisioned DSM cards. Messages will be received and logged independently by both MPS servers.

The files are located in the */var/TKLC/epap/free* filesystem and is named as follows: `eirlog_hostname.csv`

Where:

hostname = the hostname of the MPS server that recorded the log

Each entry in the EIR log file contains information about the caller and handset, a timestamp, documenting the time the server received the log entry, and a unique identifier used for comparison with the mate server. Refer to the EIR List Log Format section for more information about the format of the file and the fields within the file.

The log file is available via Secure FTP using the *appuser* user.

The EIR log file will contain the last 2 million entries received from the EAGLE 5 SAS platform. This file may be deleted through the GUI "Manage Files & Backups" screen.

EIR Log File Serviceability

The file system used by EIR Log Files is approximately 35 GB in size and is used for all of the following in addition to storing EIR log files:

- UI Configuration database backup
- Provisioning database backup
- Real-time database backup
- System log file captures

When the file system reaches 80% of it's total capacity a minor alarm is raised. A major alarm is raised at 90%. All of the files in this partition are managed from the **Debug->Manage Logs & Backups** screen on the GUI.

EIR Log entries are delivered to and stored on MPS using a "best effort" approach. The three major factors that impact the successful delivery of a log entry are as follows:

- **DSM card connectivity:** DSM cards have a limited buffer for storage of EIR log entries. If the data cannot be delivered, it is discarded.
- **UDP Broadcast:** A DSM card will broadcast a log entry to both MPS servers. Although experience shows this broadcast method on a private network to be highly reliable, it is not guaranteed.
- **MPS server availability:** If an MPS server is down or unreachable, log entries are not collected and stored. Hourly log entries may be later compared with those collected on the mate MPS server using the entry's unique identifier.

EIR List Log Format

The export IMEI blacklist hits file consists of CSV entries separated by newlines. Each entry contains the following fields:

- **Time/Date stamp:** This field represents the time at which the MPS server received the entry from the DSM. The time is generated by the MPS using the configured system time. It will be formatted as yyyyMMddhhmmss (year, month, day, hour, minute, second)
- **Source Identifier:** This field is an IP address that uniquely identifies the DSM card that sent the log entry. This field can be used in combination with the Source Sequence Number to correlate log entries with those on the mate MPS server.
- **Source Sequence Number**: This field is an integer that uniquely identifies the entry per source DSM card. This field can be used in combination with the Source Identifier to correlate log entries with those on the mate MPS server.
- **IMSI:** International Mobile Subscriber Identity for this entry
- **IMEI:** International Mobile Equipment Identity for this entry
- **Response Code:** The following response codes are possible (**2** and **4** are invalid values):
  - **0:** Indicates that the IMEI is Black Listed.
  - **1:** Indicates that the IMEI is Gray Listed.
  - **3:** Indicates that the IMEI was Black Listed, but the IMSIs matched resulting in a White List Override.
  - **5:** Indicates that the IMEI was Black Listed and the IMSIs did not match resulting in Black List Continues.

For example, If an MPS server receives entry id 1234 on July 15, 2003 at exactly 4:36 PM from a DSM provisioned at address 192.168.120.1 indicating that blacklisted subscriber 9195551212 using handset 12345678901234 was detected, the following entry is created:

```
20030715163600,192.168.61.1,1234,9195551212,12345678901234,0
```

Additional EIR Data Files

This feature makes significant use of the */var/TKLC/epap/free* filesystem. The following files may be present:

Table 2-3. Additional Files

Data Type	Size	Creation	Cleanup
UI Configuration database backup	< 1K each	On demand at upgrade	Manual
Provisioning database backup	Up to 12 GB each depending on the amount of customer data and the size of the transaction logs	On demand at upgrade	Manual
Real-time database backup	4 GB each	On demand at upgrade	Manual
System log file captures	5-20 MB or more depending on core files, and overall life of system.	On demand by customer service	Manual
EIR Export	Depends on the amount of customer data. Less than 100MB per million instances	Manual by customer	Manual
EIR Auto Export (new for EIR)	Depends on the amount of customer data. Less than 100MB per million instances	Scheduled by customer	Automatic after transferred to customer
PDBI Import	Determined by customer need	Manual (FSTP)	Manual
PDBI Auto Import (new for EIR)	Determined by customer need	Manual (FSTP)	Automatic after data imported
PDBI Auto Import results (new for EIR)	If no errors, very small. May be up to double the PDBI Auto Import file size worst case	Automatic	Automatic after transferred to customer
EIR blacklist logs (new for EIR)	Assuming no more than 360,000 updates per hour from the EAGLE 5 SAS, each file will be no more than 25MB	Automatic	Automatic. There should be approxima tely 25 logs at most.

3

EAGLE 5 SAS EIR Commands

Introduction

This chapter describes the Commands for maintenance, measurements, and administration of the EIR features. EAGLE 5 SAS EIR commands provide for the provisioning, operations, and maintenance activities of the EAGLE 5 SAS DSM cards and associated network connections.

EAGLE 5 SAS Commands for EIR

This section includes the EAGLE 5 SAS commands that are either entirely new or modified for the EIR feature. This chapter contains a brief description of the functions they provide and appropriate examples of their use. User commands are listed in Table 3-1.

The command examples in this chapter illustrate the requirements and provide suggestions for suitable names and output. Complete descriptions of these commands, however, are shown in detail in the Commands Manual, including parameter names, valid values, and output examples for the commands.

Table 3-1. Commands for EAGLE 5 SAS EIR

EAGLE 5 SAS Commands for EIR Feature			
alw-card	chg-ss-appl	ent-srvsel	rept-stat-sys
alw-map-ss	dlt-map	ent-ss-appl	rept-stat-trbl
chg-ctrl-feat	dlt-card	inh-card	rtrv-ctrl-feat
chg-feat	dlt-srvsel	inh-map-ss	rtrv-card
chg-gsmopts	dlt-ss-appl	rept-ftp-meas	rtrv-gsmopts
chg-measopts	dlt-sid	rept-stat-alm	rtrv-measopts
chg-map	enable-ctrl-feat	rept-stat-db	rtrv-sid
chg-sid	ent-card	rept-stat-mps	rtrv-srvsel
chg-srvsel	ent-map	rept-stat-sccp	rtrv-ss-appl

EAGLE 5 SAS chg-feat Commands

The **chg-feat** command administers the EIR feature. It has two variations, each of which is described in the following: **chg-feat** and **rtrv-feat**. For further details on these commands, please refer to the *Commands Manual*.

- **chg-feat: Change Feature Status Command** – The **chg-feat** command activates optional features available for the system. Features can only be turned on. Once the feature is activated, it cannot be turned off. The **chg-feat** command turns on the EIR capabilities and enforces mutual exclusion between LNP and EIR. The GTT feature is a prerequisite for EIR. A command example follows.

  chg-feat: eir=on

  eir= {on,off}

- **rtrv-feat: Retrieve Feature Status Command** – The **rtrv-feat** command displays the feature status for the EIR feature. An example of command output follows.

```
tekelecstp 99-04-02 14:23:37 EAGLE 34.0.0
    EAGLE FEATURE LIST

    GTT      = on      GWS      = off     NRT      = off
    X25G     = off     LAN      = off     CRMD     = off
    SEAS     = off     LFS      = off     MTPRS    = off
    LNP      = off     FAN      = off     DSTN4000 = off
    WNP      = off     CNCF     = off     LNP12MIL = off
    TLNP     = off     SCCPCNV  = off     TCAPCNV  = off
    X252000  = off     PLNP     = off     NCR      = off
    ITUMTPRS = off     SLSOCB   = off     EGTT     = off
    IPISUP   = on      DYNRTK   = on      PVGTT    = off
    PRFXDLGT = on      MPC      = on      EIR      = on
    ITUDUPPC = on      GFLEX    = off     GPORT    = on
;
```

EAGLE 5 SAS EIR System Options Commands

The EIR system options (gsmopts) commands are used to change and report on the values of one or more of the STP node level processing option indicators maintained in the STP option tables. All values are assigned initially to system defaults at STP installation time, and they can be updated later using the chg-stpopts command.

Three parameters were added for EIR.

The first parameter (EIRIMSICHK) is used to indicate whether or not the IMSI will be used when determining if an IMEI is to be *black* listed. If this parameter is **on** and an IMEI is found on the *black* list, then the corresponding IMSI is retrieved. If the IMSI found in the message matches the IMSI retrieved, then the IMEI is considered to be on the *white* list. If the IMSI's do not match or is not found, then the IMEI will remain *black* listed.

The second parameter (EIRRSPTYPE) is used to determine the EIR Response Type. The Response Type is used to determine how the lists are searched. Refer to Table 3-2 to determine the EIR Response Type.

Table 3-2. Individual IMEI List Determination Table

Black List	Gray List	White List	IMSI Check	IMSI Match	Result Type	LOG Entry	LOG Entry Result	MSU Result Equipment Status
Y	N	N	Y	Y	DC	N	White with IMSI Override	0
Y	N	N	Y	N	1	Y	Black with IMSI Failed	1
Y	N	N	Y	N	2	Y	Black with IMSI Failed	1
Y	N	N	Y	N	3	N	Unknown	RE=7
Y	N	Y	N	DC	1	Y	Black	1
Y	N	Y	N	DC	2	Y	Black	1
Y	N	Y	N	DC	3	Y	Black	1
Y	N	Y	Y	Y	1	N	White with IMSI Override	0
Y	N	Y	Y	Y	2	N	White with IMSI Override	0
Y	N	Y	Y	Y	3	N	White with IMSI Override	0
Y	Y	N	N	DC	1	Y	Black	1
Y	Y	N	N	DC	2	Y	Black	1

Table 3-2. Individual IMEI List Determination Table (Continued)

Black List	Gray List	White List	IMSI Check	IMSI Match	Result Type	LOG Entry	LOG Entry Result	MSU Result Equipment Status
Y	Y	N	N	DC	3	N	Unknown	RE=7
Y	Y	N	Y	Y	1	Y	White with IMSI Override	0
Y	Y	N	Y	Y	2	Y	White with IMSI Override	0
Y	Y	N	Y	Y	3	Y	White with IMSI Override	0
N	Y	N	Y	DC	1	Y	Gray	2
N	Y	N	Y	DC	2	Y	Gray	2
N	Y	N	Y	DC	3		Unknown	RE=7
N	Y	Y	DC	DC	1	Y	Gray	2
N	Y	Y	DC	DC	2	Y	Gray	2
N	Y	Y	DC	DC	3	Y	Gray	2
N	N	Y	DC	DC	1	N	White	0
N	N	Y	DC	DC	2	N	White	0
N	N	Y	DC	DC	3	N	White	0
N	N	N	DC	DC	1	N	White	0
N	N	N	DC	DC	2	N	Unknown	RE=7
N	N	N	DC	DC	3	N	Unknown	RE=7
Y	Y	Y	N	DC	1	Y	Black	1
Y	Y	Y	N	DC	2	Y	Black	1
Y	Y	Y	N	DC	3	Y	Black	1
Y	Y	Y	Y	Y	1	N	White with IMSI Override	0
Y	Y	Y	Y	Y	2	N	White with IMSI Override	0
Y	Y	Y	Y	Y	3	N	White with IMSI Override	0
Y	Y	Y	Y	N	1	N	Black with IMSI Failed	1

Table 3-2. Individual IMEI List Determination Table (Continued)

Black List	Gray List	White List	IMSI Check	IMSI Match	Result Type	LOG Entry	LOG Entry Result	MSU Result Equipment Status
Y	Y	Y	Y	N	2	N	Black with IMSI Failed	1
Y	Y	Y	Y	N	3	N	Black with IMSI Failed	1

The third parameter (EIRGRSP) is used to turn on the EIR Global Response Type. The Global Response Type is used to override the response that is sent back to the MSC. The default is set to **OFF**. When set to **OFF**, the normal list logic is applied to the IMEI. If the Global Response Type is set to something other than **OFF**, then there is no list logic processing and the corresponding response is sent to the MSC. Refer to the *Commands Manual* for details of this command.

- **chg-gsmopts: Change EIR System Options Command** – The **`chg-gsmopts`** command changes EIR-specific system options in the database. This command updates the GSMOPTS table. The default parameters are always overwritten when specified.

Table 3-3. chg-gsmopts Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
EIRGRSP	Optional	OFF, WHITELST, GRAYLST, BLKLST, UNKNOWN	EIR Global Response status
EIRRSPTYPE	Optional	TYPE1, TYPE2, TYPE3	EIR Response Type
EIRIMSICHK	Optional	OFF or ON	EIR IMSI Check status

Command examples follow.

```
chg-gsmopts:eirimsichk=on:eirrsptype=type1
chg-gsmopts:eirimsichk=on:eirrsptype=type2:eirgrsp=blklst
```

- **rtrv-gsmopts: Retrieve G-Port System Options Command** – The rtrv-gsmopts command displays all EIR-specific system options from the database.

  The following EIR options are displayed.

```
GSM OPTIONS
-----------------------
EIRGRSP     = BLKLST
EIRRSPTYPE  = TYPE2
EIRIMSICHK  = ON
```

EAGLE 5 SAS EIR Service Selector Commands

The EIR service selector (srvsel) commands are used to provision, remove, change, and report on the applicable service selectors required to change a service entry for DSM services. These commands provide some flexibility when provisioning the type of messages that require EIR processing. There are four variants, each of which is described in the following sections: **`ent-srvsel`**, **`chg-srvsel`**, **`dlt-srvsel`**, and **`rtrv-srvsel`**. For further details on the EAGLE 5 SAS service selector commands (such as command rules and output format), refer to the *Commands Manual*.

- **ent-srvsel: Enter EIR Service Selectors Command** – The ent-srvsel command specifies that the applicable EIR service selectors indicating EIR processing are required. The available parameters follow:

Table 3-4. ent-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
GTII, GTIN, GTIN24	Mandatory	2, 4	Global Title Indicator
SERV	Mandatory	eir	GSM service
SSN	Mandatory	0-255, *	Subsystem number
TT	Mandatory	0-255	Translation Type
NAI	Optional	sub, rsvd, natl, intl	Nature Of Address Indicator
NAIV	Optional	0-127	NAI Value
NP	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
NPV	Optional	0-15	Numbering Plan Value

- **chg-srvsel: Change EIR Service Selector Command** – The **`chg-srvsel`** command specifies the applicable EIR selectors required to change an existing EIR selector entry. The available parameters follow:

Table 3-5. chg-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
GTII, GTIN, GTIN24	Mandatory	2, 4	Global Title Indicator
SSN	Mandatory	0-255, *	Subsystem number
TT	Mandatory	0-255	Translation Type

Table 3-5. chg-srvsel Parameters - Class = DATABASE (Continued)

Parameter	Optional/ Mandatory	Range	Description
NAI	Optional	sub, rsvd, natl, intl	Nature Of Address Indicator
NAIV	Optional	0-127	NAI Value
NP	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
NPV	Optional	0-15	Numbering Plan Value
NSERV	Mandatory	gport, gflex, inpq, inpmr, eir	New GSM service

- **dlt-srvsel: Delete EIR Service Selector Command** – The **`dlt-srvsel`** command deletes a EIR service selector. The available parameters follow:

Table 3-6. dlt-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
GTII, GTIN, GTIN24	Mandatory	2, 4	Global Title Indicator
TT	Mandatory	0-255	Translation Type
SSN	Mandatory	0-255, *	Subsystem number
NAI	Optional	sub, rsvd, natl, intl	Nature Of Address Indicator
NAIV	Optional	0-127	NAI Value
NP	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
NPV	Optional	0-15	Numbering Plan Value

- **rtrv-srvsel: Retrieve EIR Service Selector Command** – The **`rtrv-srvsel`** command displays a list of administered EIR service selector combinations. All output is sorted first by service, then by global title domain (ANSI first, followed by ITU), GTI, translation type, numbering plan, and by the nature of address indicator. The output can be filtered by specifying any optional parameter. The available parameters follow:

Table 3-7. rtrv-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
GTII, GTIN, GTIN24	Optional	2, 4	Global Title Indicator
NAI	Optional	sub, rsvd, natl, intl	Nature Of Address Indicator
NAIV	Optional	0-127	NAI Value
NP	Optional	e164, generic, x121, f69, e210, e212, e214, private	Numbering Plan
NPV	Optional	0-15	Numbering Plan Value
SERV	Optional	eir	GSM service
SSN	Mandatory	0-255, *	Subsystem number
TT	Optional	0-255	Translation Type

EAGLE 5 SAS Feature Key Control Commands

These commands are used to enable, update, view, and control the EIR feature. A Feature Access Key is used to turn the EIR feature on. This feature must be purchased in order to have access to the Feature Access Key, which must be used when enabling these features.

There is no temporary key associated with this feature and once the feature is on it cannot be turned off. There are two steps that will be taken to turn the EIR feature on. The first step is to enable the feature. The second step is to turn the status to **on**.

Additional verifications are done to ensure the correct hardware is present in the system. These checks include verifying that the GTT bit is on and that there are no SCCP GLP cards provisioned. Refer to the *Commands Manual* for details of this command.

The part number 893012301 is used to enable EIR feature on the EAGLE 5 SAS.

- **enable-ctrl-feat: Enable Control Feature Command** – The **`enable-ctrl-feat`** command is used for the permanent enabling of the EIR feature. An example of the command using the EIR part number follows:

  `enable-ctrl-feat:partnum=893012301:fak=<Feature Access Key>`

- **chg-ctrl-feat: Change Control Feature Command** – The **`chg-ctrl-feat`** command is used to activate the EIR feature. This feature requires the EIR feature bit to be turned on as a prerequisite. The EIR feature cannot be enabled if any ASMs or TSMs are in the system.

  `chg-ctrl-feat:partnum=893012301:status=on`

- **rtrv-ctrl-feat: Retrieve Control Feature Command** – The **rtrv-ctrl-feat** command is used display the status of the features (on/off) and to show the trial period remaining if temporarily enabled. An example output follows :

```
The following features have been permanently enabled:
    Feature Name              Partnum    Status  Quantity
    IPGWx Signaling TPS       893012805  on          2000
    ISUP Normalization        893000201  on          ----
    Command Class Management  893005801  on          ----
    Prepaid SMS Intercept Ph1 893006701  on          ----
    Intermed GTT Load Sharing 893006901  on          ----
    G-Port Circ Route Prevent 893007001  on          ----
    XGTT Table Expansion      893006101  on        400000
    XMAP Table Expansion      893007710  on          3000
    Large System # Links      893005910  on          2000
    Routesets                 893006401  on          6000
    EAGLE5 Product            893007101  off         ----
    EAGLE Product             893007201  off         ----
    IP7 Product               893007301  off         ----
    Network Security Enhance  893009101  off         ----
    HC-MIM SLK Capacity       893011801  on            64
    EIR                       893012301  on          ----
    EAGLE OA&M IP Security    893400001  off         ----
    SCCP Conversion           893012001  on          ----


   The following features have been temporarily enabled:
   Feature Name              Partnum   Status Quantity   Trial Period Left
   G-Port Circ Route Prevent 893007001 On        ----  20 days 8 hrs 57 mins

   The following features have expired temporary keys:
   Feature Name              Part Num
   OnOffFeatV                893492401

;
```

Maintenance and Measurements User Interface Commands

This section provides a description of the user interface for maintenance and measurements for the EIR feature. The commands that follow allow provisioning, operations, and maintenance activities for DSM cards.

The command examples shown illustrate the requirements and provide suggestions for suitable names and output. The commands are described in detail in the *Commands Manual*, where the actual parameter names, valid values, and output for the commands are provided.

Commands described here include:

- chg-measopt
- chg-sid / dlt-sid
- ent-map / chg-map / dlt-map
- ent-ss-appl / chg-ss-appl / dtl-ss-appl / rtrv-ss-appl
- rept-stat-sys
- rept-stat-sccp

- rept-stat-mps
- rept-ftp-meas
- rtrv-measopt / chg-measopt
- rept-stat-trbl
- rept-stat-alm
- rept-stat-db
- inh-card / alw-card
- ent-card
- chg-gpl / act-gpl / rtrv-gpl / rept-stat-gpl / copy-gpl
- inh-alm / unhb-alm

rept-stat-sys

This command is modified to output the status of the EIR subsystem. The remainder of the report is unchanged. Refer to the *Commands Manual* for details of this command.

A sample output follows:

```
eagle10605 01-07-25 02:32:46 EST  Rel 33.1.0-49.10.0
    MAINTENANCE STATUS REPORT
       Maintenance Baseline established.
       Routing Baseline established.
       SCCP Baseline established.
       ALARMS:     CRIT=    9     MAJR=  10   MINR=   3     INH=    2
       OAM 1113    IS-NR          Active                    INH=    0
       OAM 1115    IS-NR          Standby                   INH=    0
       LIM  CARD   IS-NR=   3     Other=        0           INH=    0
       X25  CARD   IS-NR=   0     Other=        0           INH=    0
       SCCP CARD   IS-NR=   1     Other=        0           INH=    0
       GLS  CARD   IS-NR=   0     Other=        0           INH=    0
       SLAN CARD   IS-NR=   0     Other=        0           INH=    0
       EMDC CARD   IS-NR=   2     Other=        0           INH=    0
       MCPM CARD   IS-NR=   2     Other=        0           INH=    0
       IMT         IS-NR=   2     Other=        0
       HMUX        IS-NR=   2     Other=        0           INH=    0
       HIPR        IS-NR=   2     Other=        0           INH=    0
       SLK         IS-NR=   0     Other=        6           INH=    0
       DLK         IS-NR=   0     Other=        0           INH=    0
       LINK SET    IS-NR=   0     Other=        4           INH=    0
       NDC IP LK   IS-NR=   4     Other=        0           INH=    0
       MCPM IP LK  IS-NR=   2     Other=        0           INH=    0
       SS7 DPC     IS-NR=   0     Other=        6           INH=    0
       X25 DPC     IS-NR=   0     Other=        0           INH=    0
       CLUST DPC   IS-NR=   0     Other=        1           INH=    0
       XLIST DPC   IS-NR=   0     Other=        0
       DPC  SS     Actv =   0     Other=        0
       SEAS SS     IS-NR=   0     Other=        0
       SEAS  X25   IS-NR=   0     Other=        0           INH=    0
       LSMS SS     IS-NR=   0     Other=        0
       LSMS Conn   IS-NR=   0     Other=        0           INH=    0
       NDC SS      IS-NR=   1     Other=        0
```

```
       NDC  Q.3    IS-NR=   0     Other=        2           INH=    1
       TERMINAL    IS-NR=   2     Other=       14           INH=    0
       MPS         IS-NR=   2     Other=        0
       EIR SS      IS-NR=   1     Other=        0
```

rept-stat-sccp

The command handling and scroll area output for the **rept-stat-sccp** command includes the DSM card. The loc parameter displays detailed card traffic statistics. This command is modified to output EIR Subsystem status, EIR status (for card) and EIR statistics for the summary and "loc=XXXX" report output. Also added to reports is CPU usage related to EIR. Refer to the *Commands Manual* for details of this command. A sample output follows:

```
tekelecstp 00-06-23 13:34:22 EST  Rel 33.1.0-49.10.0
    SCCP SUBSYSTEM REPORT IS-NR          Active      -----
         SCCP ALARM STATUS = No Alarms
    EIR SUBSYSTEM REPORT  IS-ANR         Restricted  -----
         ASSUMING MATE'S LOAD
         EIR: SSN STATUS = Allowed      MATE SSN STATUS  = Prohibited
         EIR ALARM STATUS  = No Alarms * 0457 EIR Subsystem normal,card(s)
abnormal

    SCCP Cards Configured=4  Cards IS-NR=2
    System TPS Alarm Threshold = 100% Total Capacity
    System Peak SCCP Load = 3000 TPS
    System Total SCCP Capacity = 5000 TPS

    CARD   VERSION      PST          SST          AST       MSU USAGE  CPU USAGE

------------------------------------------------------------------------------
    1212   101-001-000  IS-NR        Active       ALMINH       45%         30%
    1301 P 101-001-000  IS-NR        Active       ------       35%         20%
    1305   -----------  OOS-MT       Isolated     ------        0%          0%
    2112   -----------  OOS-MT-DSBLD Manual       ------        0%          0%

------------------------------------------------------------------------------
    SCCP Service Average MSU Capacity = 40%       Average CPU Capacity = 25%

    AVERAGE CPU USAGE PER SERVICE:
      GTT   = 15%
      EIR   =  2%

    TOTAL SERVICE STATISTICS:
      SERVICE    SUCCESS    ERRORS    WARNINGS    FORWARD TO GTT    TOTAL
      GTT:          1995         5           -                 -     2000
      EIR:            55         5           -                 -       60
    Command Completed.
;
```

rept-stat-mps

Command output for the various reports of this command are modified to output the EIR status for cards and Primary card status. The check for MPS-related features that are required to be on for this report are extended to the EIR feature. Refer to the *Commands Manual* for details of this command.

A sample output follows:

```
Integrat40 00-06-24 10:37:22 EST  Rel 33.1.0-49.10.0

                    VERSION       PST            SST        AST
    EPAP A          027-015-000   IS-NR          Active     -----
       CRITICAL PLATFORM    ALARM DATA = No Alarms
       MAJOR    PLATFORM    ALARM DATA = No Alarms
       MINOR    PLATFORM    ALARM DATA = No Alarms
       CRITICAL APPLICATION ALARM DATA = No Alarms
       MAJOR    APPLICATION ALARM DATA = No Alarms
       MINOR    APPLICATION ALARM DATA = No Alarms
             ALARM STATUS = No Alarms

                    VERSION       PST            SST        AST
     EPAP B         027-015-000    OOS-MT         Fault      Standby
       CRITICAL PLATFORM    ALARM DATA = No Alarms
       MAJOR    PLATFORM    ALARM DATA = h'0123456789ABCDEF
       MINOR    PLATFORM    ALARM DATA = h'0123456789ABCDEF
       CRITICAL APPLICATION ALARM DATA = No Alarms
       MAJOR    APPLICATION ALARM DATA = h'0123456789ABCDEF
       MINOR    APPLICATION ALARM DATA = No Alarms
             ALARM STATUS = ** 0371  Major Platform Failure(s)

    CARD   PST          SST       EIR STAT
    1106 P IS-NR        Active    ACT
    1201   IS-ANR       Active    SWDL
    1205   OOS-MT-DSBLD Manual    -------
    1302   OOS-MT       Isolated  -------
    1310   IS-ANR       Standby   SWDL

    CARD 1106 ALARM STATUS = No Alarms
      DSM PORT A:      ALARM STATUS       = No Alarms
      DSM PORT B:      ALARM STATUS       = No Alarms
    CARD 1201 ALARM STATUS = No Alarms
      DSM PORT A:      ALARM STATUS       = **  0084 IP Connection Unavailable
      DSM PORT B:      ALARM STATUS       = **  0084 IP Connection Unavailable
    CARD 1205 ALARM STATUS = No Alarms
      DSM PORT A:      ALARM STATUS       = **  0084 IP Connection Unavailable
      DSM PORT B:      ALARM STATUS       = **  0084 IP Connection Unavailable
    CARD 1302 ALARM STATUS = ** 0013 Card is isolated from the system
      DSM PORT A:      ALARM STATUS       = **  0084 IP Connection Unavailable
      DSM PORT B:      ALARM STATUS       = **  0084 IP Connection Unavailable
    CARD 1310 ALARM STATUS = No Alarms
      DSM PORT A:      ALARM STATUS       = **  0084 IP Connection Unavailable
      DSM PORT B:      ALARM STATUS       = **  0084 IP Connection Unavailable

    Command Completed.
;
```

rept-stat-trbl

This command displays a summary of any trouble notifications for the EIR Subsystem. The severity of each alarm is indicated in the output report. Refer to the *Commands Manual* for details of this command.

A sample output follows:

```
eagle10207 02-08-23 10:09:59 EST  Rel 33.1.0-49.10.0

    SEQN UAM  AL DEVICE    ELEMENT       TROUBLE TEXT
    0001.0013 ** CARD 1201 GLS           Card is isolated from the system
    0002.0013 ** CARD 1211 SS7ANSI       Card is isolated from the system
    0011.0013 ** CARD 1101 SCCP          Card is isolated from the system
    0013.0013 ** CARD 1103 GLS           Card is isolated from the system
    0015.0013 ** CARD 1105 VSCCP         Card is isolated from the system
    0018.0013 ** CARD 1115 OAM           Card is isolated from the system
    0019.0236 ** SLK 1211,B   ls1134     REPT-LKF: not aligned
    0020.0236 ** SLK 1311,A   ls1134567  REPT-LKF: not aligned
    0021.0236 ** SLK 1312,A   ls113456   REPT-LKF: not aligned
    0022.0236 ** SLK 1313,A   ls11345    REPT-LKF: not aligned
    0023.0236 ** SLK 1314,A   ls113467   REPT-LKF: not aligned
    0024.0236 ** SLK 1315,A   ls11234567 REPT-LKF: not aligned
    0025.0236 ** SLK 1316,A   ls11345678 REPT-LKF: not aligned
    0026.0318 ** LSN ls11234567          REPT-LKSTO: link set prohibited
    0027.0318 ** LSN ls11345678          REPT-LKSTO: link set prohibited
    0028.0318 ** LSN ls1134567           REPT-LKSTO: link set prohibited
    0029.0318 ** LSN ls113456            REPT-LKSTO: link set prohibited
    0030.0318 ** LSN ls11345             REPT-LKSTO: link set prohibited
    0033.1318 ** LSN ls113467            REPT-LKSTO: link set prohibited
    0032.0318 ** LSN ls1134              REPT-LKSTO: link set prohibited
    0033.0336 ** SCCP SYSTEM             LIM(s) have been denied SCCP service
    0034.0349 *C SEAS SYSTEM             SEAS unavailable
    0035.0356 *C LSMS SYSTEM             LSMS unavailable
    0036.0455 *C EIR SYSTEM              EIR Subsystem is not available
    0019.0236 *C T1PORT 1301,1           REPT-T1F:FAC-T1   LOS failure
    Command Completed.
```

chg-measopts

The chg-measopts command provides the user with the capability to enable and disable measurement options related to the Measurements Platform. This command is modified to allow the use of the mtcheir and the mtcdeir options to set whether or not the EIR reports will be automatically generated and transferred to the FTP server. By default, both EIR options are disabled and cannot be changed unless the EIR feature is activated. Once the feature is activated, the EIR options can be enabled and disabled as desired. Refer to the *Commands Manual* for details of this command. .

rept-stat-alm

This command includes the alarm totals of the EIR subsystem and DSM/EPAP IP links. Refer to the *Commands Manual* for details of this command. Here is an example of the command and output.

```
rept-stat-alm
```

```
Command Accepted - Processing

    eagle10605 99-06-24 23:59:39 EAGLE 34.0.0
    rept-stat-alm
    Command entered at terminal #10.
;

    eagle10605 99-06-24 23:59:39 EAGLE 34.0.0
    ALARM  TRANSFER= RMC
    ALARM  MODE      CRIT= AUDIBLE     MAJR= AUDIBLE     MINR= AUDIBLE
    ALARM  FRAME 1     CRIT=   9         MAJR=  12         MINR=   2
    ALARM  FRAME 2     CRIT=   0         MAJR=   0         MINR=   0
    ALARM  FRAME 3     CRIT=   0         MAJR=   0         MINR=   0
    ALARM  FRAME 4     CRIT=   0         MAJR=   0         MINR=   0
    ALARM  FRAME 5     CRIT=   0         MAJR=   0         MINR=   0
    ALARM  FRAME 6     CRIT=   0         MAJR=   0         MINR=   0
    ALARM  FRAME GPF   CRIT=   1         MAJR=   2         MINR=   1
    PERM. INH. ALARMS  CRIT=   0         MAJR=   0         MINR=   0
    TEMP. INH. ALARMS  CRIT=   0         MAJR=   0         MINR=   0
    ACTIVE ALARMS      CRIT=  10         MAJR=  14         MINR=   3
    TOTAL ALARMS       CRIT=  10         MAJR=  14         MINR=   3
    Command Completed.
;
```

rept-stat-db

This command displays the status information for the EAGLE 5 SAS databases. This includes the level information for each DSM network card, and for the active and standby EPAP databases. It reports database exception status such as corrupted, incoherent, or inconsistent, as well as providing the birthdates and levels. It is enhanced to show the status of the PDB and RTDB databases if the EIR feature key is on. For details about this command, refer to the *Commands Manual*.

inh-card / alw-card

The inh-card command is used to change the state of the card from in-service normal (IS-NR) to Out-of-Service Maintenance-Disabled (OOS-MT-DSBLD). A craftsperson then can test the DCM/LIM/ACM/ASM/DSM/GPSM-II/MIM card or physically remove it from the shelf.

The alw-card command is used to change the card from OOS-MT-DSBLD (out-of-service maintenance-disabled) to IS-NR (in-service normal) if the loading is successful.

Refer to the *Commands Manual* for details of these commands.

ent-card / rtrv-card / dlt-card

The command-handling and scroll area output for these commands includes the DSM card. For the ent-card command, the appl=vsccp is supported. Refer to the *Commands Manual* for details of this command.

If the addition of a LIM card exceeds the system's VSCCP service capabilities, the force=yes parameter is required.

Here is a sample of the reports produced by these commands.

```
ent-card:loc=1201:type=dsm:appl=vsccp

    Command entered at terminal #3.
;
      Command Completed.
;
```

alw-map-ss / inh-map-ss

The alw-map-ss command is used to allow the EIR subsystem which brings the subsystem back on-line. The command is rejected if the subsystem specified with the SSN parameter is not the EIR subsystem. The current state of the LNPQS, INPQS or EIR subsystem must be OOS-MT-DSBLD (out of service maintenance disabled) in order for the command to be accepted.

When the inh-map-ss is entered for the EIR subsystem, a coordinated shutdown is attempted. If the coordinated shutdown fails, a UIM is output indicating the shutdown failed. If the FORCE parameter is specified, the specified subsystem is forced to shutdown. A coordinated shutdown is not performed.

Refer to the *Commands Manual* for details of these commands.

ent-map / chg-map / dlt-map

These commands are used to provision, remove, change, and report on the mate point code and subsystem number and its attributes. A mate point code defines an adjacent signaling point, which is considered the mated signal transfer point (STP) to the EAGLE 5 SAS.

These commands are updated to allow both ITU-N and ITU-I true point codes to be defined for the same SSN. Refer to the *Commands Manual* for details of these commands.

chg-sid / dlt-sid

These commands are used to change and report on the self-identification of the EAGLE 5 SAS. The self-identification identifies the EAGLE 5 SAS to other signaling points in the network. This command adds new CPC type for EIR. Refer to the *Commands Manual* for details of this command.

ent-ss-appl / chg-ss-appl / dlt-ss-appl / rtrv-ss-appl

These commands are used to provision, remove, change, and report on the entry of a subsystem number for an application and set the application status online or offline. Only one subsystem can be defined per application, and the application must be unique. This command adds new subsystem application value for EIR. Refer to the *Commands Manual* for details of these commands.

ent-card

This command now verifies that if the EIR feature is turned on, that the gpl that is being provisioned is a VSCCP gpl, and if it is, an error is displayed and the ent-card command is rejected.

chg-gpl / act-gpl / rtrv-gpl / rept-stat-gpl / copy-gpl

The command-handling and scroll area output for these commands include the VSCCP GPL. Refer to the *Commands Manual* for details of these commands.

Here are samples of the reports produced by these commands.

```
chg-gpl:appl=vsccp:ver=101-3-0

    Command entered at terminal #3.
;
    tekelecstp 99-10-24 06:54:39 EAGLE 34.0.0
    VSCCP upload to 1114 completed
    VSCCP upload to 1116 completed
;

act-gpl:appl=vsccp:ver=101-3-0

    Command entered at terminal #3.
;
    tekelecstp 99-10-24 06:54:39 EAGLE 34.0.0
    VSCCP activate on 1114 completed
    VSCCP activate on 1116 completed
;

rtrv-gpl:appl=vsccp

    Command entered at terminal #3.
;
    tekelecstp 99-10-04 07:01:08 EAGLE 34.0.0
    GPL Auditing  ON

    APPL  CARD  RELEASE      APPROVED         TRIAL        REMOVE TRIAL
    VSCCP 1114  101-001-000  101-003-000      101-001-000  101-003-000
    VSCCP 1116  101-001-000  101-003-000      101-003-000  -----------
;

rept-stat-gpl:appl=vsccp

    Command entered at terminal #3.
;
    tekelecstp 99-10-04 12:55:50 EAGLE 34.0.0
```

```
    APPL  CARD      RUNNING            APPROVED      TRIAL
    VSCCP 1205      101-003-000 ALM    101-003-000   101-003-000
    VSCCP 1211      101-001-000 ALM+   101-003-000   -----------
    Command Completed.
;
```

inh-alm / unhb-alm

These commands allow both Port A and Port B to be specified for the dev=dlk. This allows alarms to be inhibited on the DSM ports. Refer to the *Commands Manual* for details of these commands.

rept-ftp-meas

This command provides on-demand measurements reporting capabilities. this command initiates generation and FTP transfer of a measurements report from the MCPM to the FTP server. The **rept-ftp-meas** command is modified to accept a new EIR enttype. The combination of this enttype and a report type determines which on-demand EIR report is generated. There are only two report types that are accepted in conjunction with enttype=eir: MTCH and MTCD. The EIR enttype is only valid with the EIR feature enabled. Refer to the *Commands Manual* for details of this command.

rtrv-measopts / chg-measopts

The **chg-measopts** command provides the user with the capability to enable and disable measurement options related to the Measurements Platform. This command is modified to allow the use of the mtcheir and the mtcdeir options to set whether or not the EIR reports will be automatically generated and transferred to the FTP server. By default, both EIR options are disabled and cannot be changed unless the EIR feature is activated. Once the feature is activated, the EIR options can be enabled and disabled as desired.

The **rtrv-measopts** command displays the current state of the Measurements Platform options. The output of this command is modified to display the status of the EIR report options.

Refer to the *Commands Manual* for details of these commands.

4

Maintenance and Measurements

Hardware Requirements

The EIR feature requires DSM-based boards to run the VSCCP GPL. The EAGLE 5 SAS may be equipped with from 1 to 25 DSM cards to support EIR.

CAUTION: Having a mix of SCCP and VSCCP card types is not permitted with the EIR feature enabled, that is, VSCCP cards and SCCP cards cannot coexist in a system operating the EIR feature.
Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

The EIR feature also requires a TekServer based MPS system.

EPAP Status and Alarms

EPAP has no direct means of accepting user input or displaying output messages on EAGLE 5 SAS terminals, so maintenance, measurements, and status information are routed through a DSM. EPAP sends two types of messages to the DSM: EPAP maintenance blocks and DSM status requests. Each is discussed in the following sections.

EPAP Maintenance Blocks

The active EPAP generates and sends maintenance blocks to the primary DSM. One maintenance block is sent as soon as the IP link is established between the active EPAP and the primary DSM. Additional maintenance blocks are sent whenever the EPAP needs to report any change in status or error conditions. The information returned in maintenance blocks is included in the output of the **rept-stat-mps** and **rept-stat-sccp** commands.

The EPAP sends maintenance blocks that contain (at least) the following information.

- Status of EPAP 'A' - actual states are active, standby, and down (inoperative). Maintenance blocks include a field so this information can be forwarded to the EPAP A Device Control Block (DCB), where it is available for the output of the **rept-stat-mps** command.
- Status of EPAP 'B' - actual states are active, standby, and down (inoperative). Maintenance blocks include a field so this information can be forwarded to the EPAP B DCB, where it is available for the output of the rept-stat-mps command.
- Identification of active EPAP - a field to identify the active EPAP.
- Congestion indicator - an indicator showing provisioning link congestion. The link between the EPAPs and the external source of provisioning data can become congested in high provisioning traffic situations. When this occurs and subsequently as the congestion clears, the EPAP sends maintenance blocks to the DSM. The EPAP must ensure that no more than one maintenance block per second is sent to the primary DSM if the only reason is to report a change in congestion status.
- Alarm conditions - an error code field. If the EPAP needs to report an alarm condition, it puts an appropriate UAM identifier in this field.
- Current MPS database size - a field indicating the current RTDB size. The DSM uses this information to calculate the percentage of memory utilized by the RTDB.

DSM Status Requests

When the EPAP needs to know the status of a DSM, it can send a DSM Status Request to that DSM. Since status messages are sent over UDP, the EPAP broadcasts the DSM Status Request and all DSMs return their status.

DSM Status Reporting to the EPAP

The sections that follow describe the DSM status reporting for the EPAP.

DSM Status Messages – When Sent

The EPAP needs to know the current status of various aspects of the DSMs. Accordingly, the DSM sends a DSM status message to the EPAP when the following events occur:

- When the DSM is booted.
- When the DSM receives a DSM Status Request message from the EPAP.
- When the DSM determines that it needs to download the entire database, for example, if the DSM determines that the RTDB needs to be downloaded (for instance, if the database is totally corrupted), or if a craftsperson requests that the database be reloaded.
- When the DSM starts receiving DB downloads or DB updates. When the DSM card(s) starts downloading the RTDB, or if the DSM starts accepting database updates, it needs to send a status message informing the EPAP of the first record received. This helps the EPAP keep track of downloads in progress.

DSM Status Message Fields

The DSM status message provides the following information to the EPAP:

- **DSM Memory Size**. When the DSM is initialized, it determines the amount of applique memory present. The EPAP uses this value to determine if the DSM has enough memory to hold the RTDB.
  Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements**.**
- **Load Mode Status**. This is a flag indicating whether or not 80% of the IS-NR LIMs have access to SCCP services.

EIR System Status Reports

Status reporting described here includes the following:

- System status
- EIR status
- DSM memory capacity status
- Loading mode support status

System Status Reporting

The **rept-stat-sys** command supports the DSM cards running the VSCCP application.

The **rept-stat-sccp** command supports the DSM cards running the VSCCP application and reports EIR statistics.

EIR Status Reporting

The **rept-stat-mps** command supports EIR system reporting. rept-stat-mps concentrates on reporting the status of the EIR provisioning system. See "Maintenance and Measurements User Interface Commands" on page 3-9, for more details. EIR statistics are placed in the **rept-stat-sccp** command.

DSM Memory Capacity Status Reporting

As mentioned in the ""DSM Status Reporting to the EPAP" on page 4-3, the DSM sends a message to the EPAP containing the amount of memory on the DSM board. The EPAP determines whether the DSM has enough memory to store the RTDB and sends an ack or nak back to the DSM indicating whether or not the DSM has an adequate amount of memory. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements**.**

When the EPAP sends database updates to the DSMs, the update messages include a field that contains the new database memory requirements. Each DSM monitors the DB size requirements, and issues a minor alarm if the size of the DB exceeds 80% of its memory. If a database increases to the point that there is insufficient DSM memory, a major alarm is issued.

The **rept-stat-mps:loc=xxxx** command shows the amount of memory used by the RTDB as a percent of available DSM memory.

Loading Mode Support Status Reporting

The OAM application determines whether or not the system is in an unstable loading mode since it knows the state of all LIM, SCCP, and DSM cards in the system. When the loading mode is unstable, the **rept-stat-sys** command reports the existence of the unstable loading mode and the specific conditions that caused it. Refer to "Loading Mode Support" on page 4-6, for more details.

Code and Application Data Loading

In general, administrative updates can occur while a DSM card is loading. The DSM card should also remain in an in-transition state if the STP portion of the database has completed loading and is waiting for the RTDB to download.

DSM Code Loading

The EAGLE 5 SAS OAM performs code loading of the DSM card.

EPAP Application Data Loading

The EIR feature requires that new TDM-resident data tables be loaded in addition to those currently supported by EAGLE 5 SAS. The GPL and data loading support this additional table loading while maintaining support for loading the existing EAGLE 5 SAS tables.

In order to support both RTDB and STP data loading, the VSCCP GPL verifies its hardware configuration during initialization to determine if it has the capacity to support the RTDB.

The VSCCP GPL application data loader registers all tables for loading, independent of the EIR feature provisioning and main board / applique hardware configuration. As a result, load requests are always identical. During loading, multiple DSM load requests can then be combined into a single download, reducing the overall download time. The DSM card stores or discards RTDB table data based on whether or not it has RTDB-capable hardware for features like G-Port, G-Flex, INP, and EIR.

The OAM, on the other hand, downloads or sets memory boundaries for the EIR options, entity, and service selector tables only if the EIR feature is provisioned. When the EIR feature is not provisioned, the OAM does not attempt to read these tables from disk. Instead, empty tables (i.e., tables without entries) are downloaded. All other tables requested for loading are read from disk and downloaded routinely.

Non-EIR Data Initialization

If the DSM card's hardware configuration cannot support the RTDB, the EIR tables are marked as absent during Service Management System initialization. Memory is not reserved for the EIR table data. Additionally, the EIR tables are registered with the application data loader (ADL) specifying a data discard function. EIR table data is discarded during loading by the ADL discard function, rather than storing it in memory.

EIR Data Initialization

If the DSM card detects EIR-capable hardware, the EIR tables are registered with ADL specifying a data load function. Any EIR table data downloaded are stored in memory during loading.

EPAP-DSM Loading Interface

The DSM must convey to the EPAP that it needs to download the RTDB. This is done when the DSM sends a Full Download Request message to the EPAP.

Loading Mode Support

No more than 16 LIMs can be serviced by each SCCP (or VSCCP) card.

80% Threshold of Support

Loading mode is based on the ability of the system to provide SCCP service to at least 80% of the LIMs.

VSCCP Capacity

An insufficient number of VSCCP cards that are is-nr or oos-mt-dsbld relative to 80% of the number of provisioned LIMs is called a "failure to provide adequate SCCP capacity."

Insufficient SCCP Service

It is also possible for LIMs or VSCCP cards to be inhibited or to have problems that prevent them from operating normally. If enough VSCCP cards are out of service, it may not be possible for the remaining is-nr VSCCP cards to service at least 80% of the number of is-nr LIMs. This is called "insufficient SCCP service." When this occurs, some of the LIMs are denied SCCP service. It is possible to inhibit LIMs to bring the ratio back to 16:1 (or better).

Conditions That Create an Unstable Loading Mode

Current system implementation interrupts and aborts card loading upon execution of an STP database chg command. Loading mode support denies the execution of STP database chg commands when the system is in an unstable loading mode. An unstable loading mode exists when any of the following conditions are true:

- The system's maintenance baseline has not been established.
- Less than 80% of the number of LIMs provisioned are is-nr or oos-mt-dsbld.
- The number of is-nr and oos-mt-dsbld sccp cards is insufficient to service at least 80% of all provisioned LIMs.
- Insufficient SCCP service occurs when an insufficient number of is-nr VSCCP cards are available to service at least 80% of the number of is-nr LIMs.
- LIM cards are being denied SCCP service and any VSCCP cards are in an abnormal state (oos-mt, is-anr).

Actions Taken When the System is in an Unstable Loading Mode

- No affect on RTDB downloads or updates.

  Unstable loading mode has no impact on RTDB downloads or the stream of RTDB updates.

- **rept-stat-sys** reports unstable loading mode.

  When the loading mode is unstable, the **rept-stat-sys** command reports the existence of the unstable loading mode and the specific trigger that caused it.

- No STP database updates allowed.

  When in an unstable loading mode, the EAGLE 5 SAS does not accept STP database updates. When updates are rejected, the reason is given as: E3112 Cmd Rej: Loading Mode unstable due to SCCP service is deficient.

  The **inh-card** and **alw-card** commands can be used to alter SCCP service levels to achieve the 80% threshold. This can be repeated for each card until the system is able to supply SCCP services to at least 80% of the is-nr LIMs. The remaining 20% LIM or supporting VSCCP cards may remain out of service until the stream of STP database updates ceases. This stream of updates can be temporarily interrupted to allow the remaining 20% of the system to come in service.

  Once an STP database has been loaded, that database can be updated (as long as the system is not in an unstable loading mode). However, if an STP update comes in during STP database loading, the DSM aborts the current loading, issues a class 01D7 obit, and reboots. Figure 4-1 shows an example.

Figure 4-1. Obit Message for Abort of Card Loading

```
tekelecstp 97-04-08 12:29:04 EAGLE 34.0.0
------------------------------------------------------------------------
     Card 1317   Module RADB_MGR.C  Line  337  Class 01d7
        Card 1317   Module RADB_MGR.C  Line  337  Class 01d7
        Register Dump :
            EFL=00000246    CS =0058        EIP=0000808d    SS =0060
            EAX=000a6ff3    ECX=000a0005    EDX=00000000    EBX=000a6fa0
            ESP=00108828    EBP=0010882c    ESI=001f1e10    EDI=00000000
            DS =0060        ES =0060        FS =0060        GS =0060

        Stack Dump :
        [SP+1E]=001f    [SP+16]=0000    [SP+0E]=000a    [SP+06]=0010
        [SP+1C]=1e10    [SP+14]=0004    [SP+0C]=6fa0    [SP+04]=8850
        [SP+1A]=0010    [SP+12]=001f    [SP+0A]=0004    [SP+02]=0001
        [SP+18]=886c    [SP+10]=4928    [SP+08]=7ec3    [SP+00]=504b

        User Data Dump :

        14 02 fa ed 01 01 1d 01 5a 01 00                    ........Z..

    Report Date:97-04-08  Time:12:29:04
```

Using the force Option

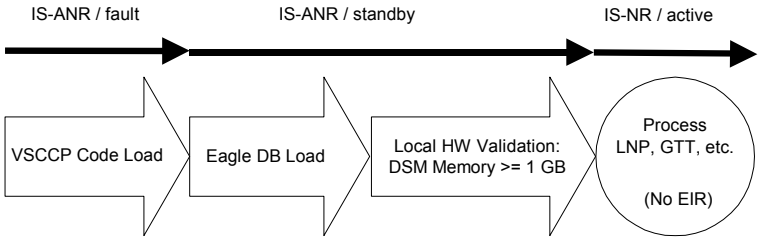
Use the force option to execute commands that would put the system in unstable loading mode. If executing the **ent-card** or **inh-card** commands would cause the system to enter an unstable loading mode, use the force option on the command.

State Transitions during Start-Up

Figures 4-2 through 4-9 show the transitions that a DSM card goes through as it boots, loads code and data, and runs various VSCCP services. These figures do not illustrate every possible situation, but they do include the most common scenarios involving the EIR feature.

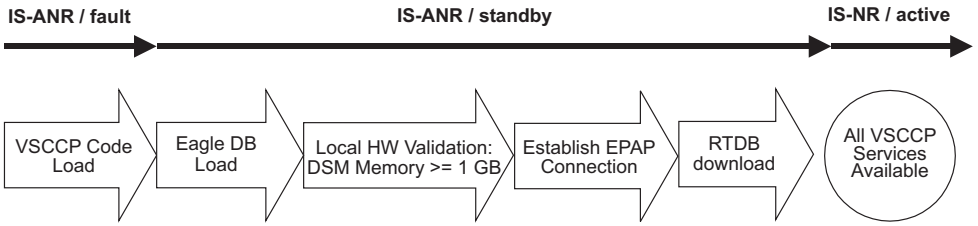
In Figure 4-2, the EIR feature is not enabled, and the DSM card can operate in TSM emulation mode, although it does not provide EIR operation.

Figure 4-2. EIR Not Enabled, DSM Running in TSM Emulation



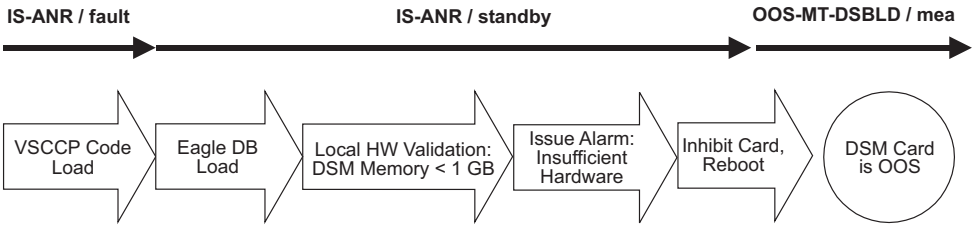
In Figure 4-3, the EIR feature is enabled, and the DSM card memory is at least 1 GB and is connected to the EPAP. A normal DSM card operating sequence occurs, providing EIR service.

Figure 4-3. EIR Enabled, Normal Operating Sequence



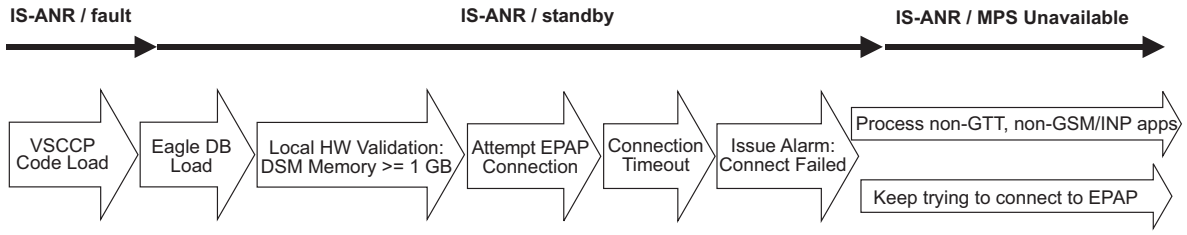
In Figure 4-4, the EIR feature is enabled, but the DSM card memory is less than 1 GB. The EIR feature cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements**.**

Figure 4-4. EIR Enabled, but DSM Memory Less Than 1 GB



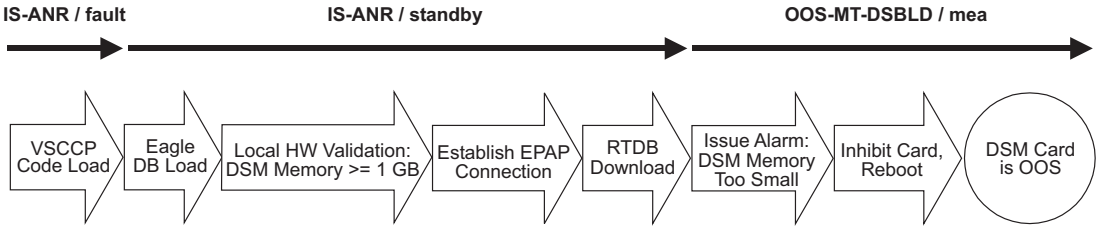
In Figure 4-5, the EIR feature is enabled, the DSM card memory has at least 1 GB, but the DSM card is unable to connect EPAP; the EIR cannot begin operation.

Figure 4-5. EIR Enabled, but DSM Not Connected to EPAP



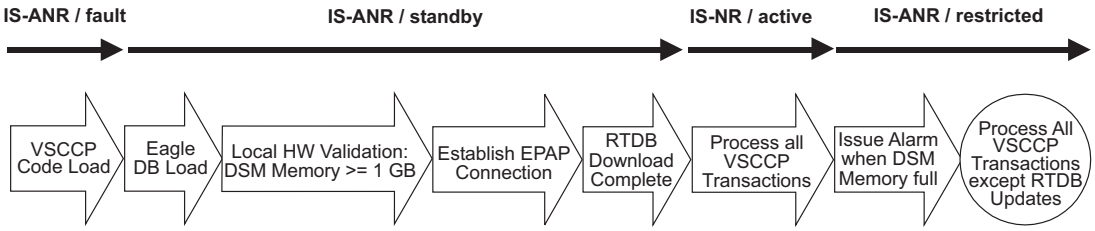
In Figure 4-6, the EIR feature is enabled, the DSM card has the required 1 GB memory and is connected to the EPAP, but the DSM card is too small for the required database; the EIR cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements**.**

Figure 4-6. EIR Enabled, but DSM Memory Insufficient for Database



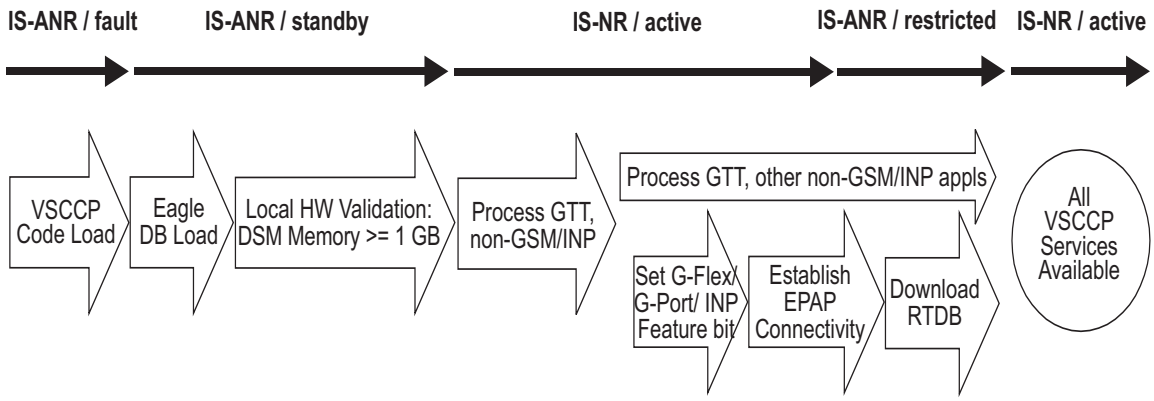
In Figure 4-7, the EIR feature is enabled, the DSM card is connected to the EPAP, but the RTDB grows eventually to exceed the capacity of the DSM card memory, despite its memory size of at least 1 GB (an alarm is issued when the DSM memory becomes full from the RTDB update). The EIR cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements**.**

Figure 4-7. EIR Enabled, but Database Exceeds DSM Memory



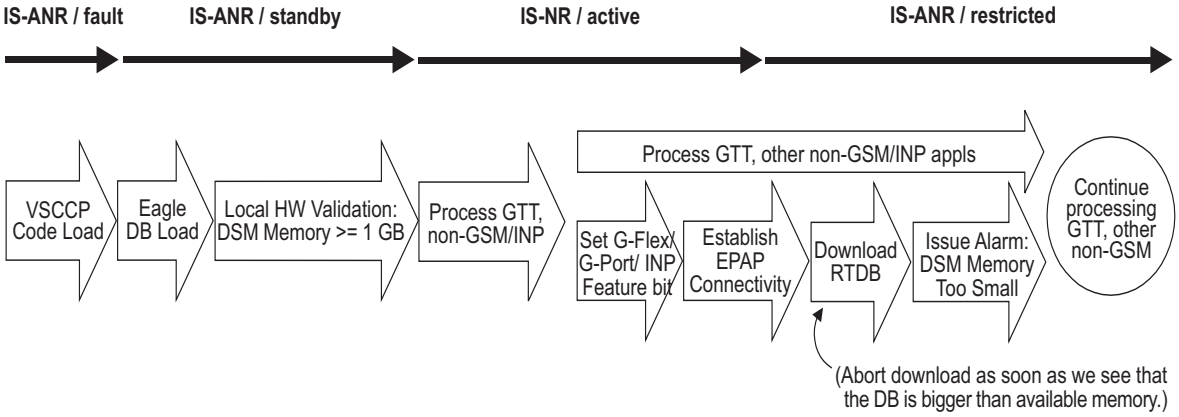
In Figure 4-8, the EIR feature is not initially enabled; the DSM card memory has at least 1 GB but no EPAP connection; the DSM card is running other applications when the EIR feature is turned on; the DSM has sufficient memory to provide EIR service.

Figure 4-8. EIR Not Enabled at First, but then Activated on DSM



In Figure 4-9, the EIR feature is not initially enabled; the DSM card memory has at least 1 GB but no EPAP connection, and is running other applications when the EIR feature is turned on. However, the DSM card memory is insufficient for the needed database, and the cannot provide EIR operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements**.**

Figure 4-9. EIR Activation Unsuccessful due to Insufficient Database



EIR Alarms

All EIR related UAMs are output to the Maintenance Output Group. The *Maintenance Manual* contains a complete description of all UAMs. Table 4-1 contains a listing of UAMs used to support the EIR feature.

Refer to the *EAGLE 5 SAS Maintenance Manual* for more information and corrective procedures for the EAGLE 5 SAS related alarms. Refer to the *EAGLE 5 SAS STP with TekServer IAS MPS Platform Software and Maintenance Manual* for more information and corrective procedures for the MPS related alarms.

Table 4-1. EIR UAMs

UAM	Severity	Message Text	MPS or EAGLE 5 SAS
0013	Major	Card is isolated from system	EAGLE 5 SAS
0084	Major	IP Connection Unavailable	EAGLE 5 SAS
0085	None	IP Connection Available	EAGLE 5 SAS
0099	Major	Incompatible HW for provisioned slot	EAGLE 5 SAS
0250	None	MPS available	MPS
0261	Critical	MPS unavailable	MPS
0370	Critical	Critical Platform Failure(s)	MPS
0371	Critical	Critical Application Failure(s)	MPS
0372	Major	Major Platform Failure(s)	MPS
0373	Major	Major Application Failure(s)	MPS
0374	Minor	Minor Platform Failure(s)	MPS
0375	Minor	Minor Application Failure(s)	MPS
0422	Major	Insufficient extended memory	EAGLE 5 SAS
0423	None	Card reload attempted	EAGLE 5 SAS
0441	Major	Incorrect MBD - CPU	EAGLE 5 SAS
0442	Critical	RTDB database capacity is 95% full	EAGLE 5 SAS
0443	Major	RTDB database is corrupted	EAGLE 5 SAS
0444	Minor	RTDB database is inconsistent	EAGLE 5 SAS
0445	None	RTDB database has been corrected	EAGLE 5 SAS
0446	Major	RTDB Database capacity is 80% full	EAGLE 5 SAS
0447	None	RTDB database capacity alarm cleared	EAGLE 5 SAS
0448	Minor	RTDB database is incoherent	EAGLE 5 SAS
0449	Major	RTDB resynchronization in progress	EAGLE 5 SAS

Table 4-1. EIR UAMs (Continued)

UAM	Severity	Message Text	MPS or EAGLE 5 SAS
0451	Major	RTDB reload is required	EAGLE 5 SAS
0455	Critical	EIR Subsystem is not available	EAGLE 5 SAS
0456	Critical	EIR Subsystem is disabled	EAGLE 5 SAS
0457	Minor	EIR Subsystem normal,card(s) abnormal	EAGLE 5 SAS
0458	None	EIR Subsystem is available	EAGLE 5 SAS
0459	None	EIR Subsystem is removed	EAGLE 5 SAS

DSM-EPAP Link

Two alarms are used to indicate the DSM-to-EPAP link status. Refer to the *Signaling Products Maintenance Manual* for more information and corrective procedures for the following alarms.

- **UAM 0084** - IP Connection Unavailable

  This message indicates that an IP application socket is out of service due to a IP link down (Ethernet problem) or due to the DSM card.

```
   station1234 00-09-30 16:28:08 EAGLE 34.0.0
**  5676.0084 ** DSM B   1101          IP Connection Unavailable
```

- **UAM 0085** - IP Connection Available

  This message indicates that a previously broken link between the EPAP and DSM card is now functioning properly.

```
   station1234 00-09-30 16:28:08 EAGLE 34.0.0
   5676.0085    DSM B   1101          IP Connection Available
```

MPS (EPAP) Alarms

The following alarms are output on the EAGLE 5 SAS and include an alarm data string in the output. Refer to the *EAGLE 5 SAS with TekServer IAS MPS Platform Software and Maintenance Manual* (except where noted) for more information and corrective procedures for the following MPS related alarms.

- **UAM 0261** - MPS unavailable

  This message indicates that the EAGLE 5 SAS is unable to communicate with the MPS or the MPS has an internal failure. Refer to the *Maintenance Manual* for the corrective action procedure.

  Example:

```
   station1234 00-09-30 16:28:08 EAGLE 34.0.0
*C  0259.0261 *C MPS   B           MPS unavailable
```

- **UAM 0370** - Critical Platform Failure (s)

This message indicates the application running in the MPS server has detected a critical platform failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'1xxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

Example:

```
   station1234 00-09-30 16:28:08 EAGLE 34.0.0
*C  0259.0370 *C MPS   B              Critical Platform Failure(s)
            ALARM DATA = h'1000000000000008'
```

- **UAM 0371** - Critical Application Failure (s)

  This message indicates the application running in the MPS server has detected a critical application failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'2xxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

  Example:

```
   station1234 00-09-30 16:28:08 EAGLE 34.0.0
*C   0259.0371 *C MPS   B              Critical Application Failure(s)
            ALARM DATA = h'2000000000000001'
```

- **UAM 0372** - Major Platform Failure (s)

  This message indicates the application running in the MPS server has detected a major platform failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'3xxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

  Example:

```
   station1234 00-09-30 16:28:08 EAGLE 34.0.0
**  0259.0372 ** MPS   B              Major Platform Failure(s)
            ALARM DATA = h'3000000000000002'
```

- **UAM 0373** - Major Application Failure (s)

  This message indicates the application running in the MPS server has detected a major application failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'4xxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

  Example:

```
    station1234 00-09-30 16:28:08 EAGLE 34.0.0
**   0259.0373 ** MPS   B              Major Application Failure(s)
            ALARM DATA = h'4000000000000008'
```

- **UAM 0374** - Minor Platform Failure (s)

  This message indicates the application running in the MPS server has detected a minor platform failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'5xxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

  Example:

```
   station1234 00-09-30 16:28:08 EAGLE 34.0.0
*   0259.0374 *  MPS   B              Minor Platform Failure(s)
```

```
            ALARM DATA = h'5000000000000004'
```

- **UAM 0375** - Minor Application Failure (s)

  This message indicates the application running in the MPS server has detected a minor application failure. The Alarm Data in the message contains a 16-character hexadecimal string in the format of h'6xxxxxxxxxxxxxx'. This alarm will be reset when UAM #250, MPS Available is issued.

  Example:

```
   station1234 00-09-30 16:28:08 EAGLE 34.0.0
*  0259.0375 *  MPS   B              Minor Application Failure(s)
            ALARM DATA = h'6000000000000001'
```

Card Related MPS Alarms

The following alarms are output on the EAGLE 5 SAS. Refer to the *Signaling Products Maintenance Manual* for more information and corrective procedures for the following card related MPS alarms.

- **UAM 0013** - Card is isolated from system

  This indicates a card has become isolated and is unable to communicate to other cards in the system. This could be caused by a defective card, a power failure occurred on the card, or the system software has ordered a reset.

  This also appears when the card has been manually reset by a command.

  Example:

```
   station1234 00-04-30 16:28:08 EAGLE 34.0.0
**  0012.0013 ** CARD 1101 SCCP        Card is isolated from the system
            ASSY SN:  102199815a1234
```

- **UAM 0099** - Incompatible HW for provisioned slot

  This indicates a DCM or DSM card does not have an extended memory. This card is automatically inhibited.

  Example:

```
   station1234 00-04-30 16:28:08 EAGLE 34.0.0
**  0012.0099 ** CARD 1101 VSCCP  Incompatible hardware for provisioned slot
            ASSY SN:  102199815a1234
```

- **UAM 0422** - Insufficient extended memory

  At least one SCCP card does not have enough memory for the EIR application. Loading of the SCCP card is automatically inhibited.

  Example:

```
   station1234 00-04-30 16:28:08 EAGLE 34.0.0
**  0012.0422 ** CARD 1108  SCCP       Insufficient extended memory
```

- **UAM 0423** - Card reload attempted

  Card loading is no longer inhibited. The once inhibited card is now attempting to load.

Example:

```
    station1234 00-04-30 16:28:08 EAGLE 34.0.0
  0012.0423    CARD 1108  SCCP      Card reload attempted
```

- **UAM 0441** - Incorrect main board - CPU

  A DSM card does not have the required hardware configuration for the EIR application.

  Example:

```
    station1234 00-04-30 16:28:08 EAGLE 34.0.0
**  0012.0441 ** CARD 1108  VSCCP      Incorrect MBD - CPU
```

- **UAM 0442** - Insufficient RTDB database capacity

  At least one DSM card does not have at least 1Gb of memory or does not have enough capacity for the RTDB. Loading of the DSM card is automatically inhibited.

  Example:

```
    station1234 00-04-30 16:28:08 EAGLE 34.0.0
*C  0012.0442 *C CARD 1108  VSCCP      RTDB database capacity is 95% full
```

- **UAM 0443** - RTDB database is corrupted

  A RTDB database is corrupt. The calculated checksum did not match the checksum value stored for one or more records.

  Example:

```
    station1234 00-04-30 16:28:08 EAGLE 34.0.0
**  0012.0443 **  CARD 1108  VSCCP      RTDB database is corrupted
```

- **UAM 0444** - RTDB database is inconsistent

  One or more DSM card's real time database is not identical to the current real time database on the active EPAP fixed disks.

  Example:

```
    station1234 00-04-30 16:28:08 EAGLE 34.0.0
*   0012.0444 *  CARD 1108  VSCCP      RTDB database is inconsistent
```

- **UAM 0445** - RTDB database has been corrected

  This message indicates that a problem with the RTDB has been corrected.

  Example:

```
    station1234 00-04-30 16:28:08 EAGLE 34.0.0
  0012.0445    CARD 1108  VSCCP      RTDB database has been corrected
```

- **UAM 0446** - RTDB Database capacity is 80% full

  This message is displayed when a DSM card detects that its daughterboard memory is at least 80% full.

  Example:

```
    station1234 00-04-30 16:28:08 EAGLE 34.0.0
**   0012.0446 **  CARD 1108  VSCCP      RTDB Database capacity is 80% full
```

- **UAM 0447** - RTDB database capacity alarm cleared

  This message indicates that a problem with the RTDB memory has been corrected.

  Example:

```
   station1234 00-04-30 16:28:08 EAGLE 34.0.0
  0012.0447    CARD 1108  VSCCP       RTDB database capacity alarm cleared
```

- **UAM 0448** - RTDB database is incoherent

  This message indicates that the RTDB database download is in-process.

  Example:

```
   station1234 00-04-30 16:28:08 EAGLE 34.0.0
*   0012.0448 *  CARD 1108  VSCCP       RTDB database is incoherent
```

- **UAM 0449** - RTDB resynchronization in progress

  This message indicates that the MPS database resynchronization is in-process.

  Example:

```
   station1234 00-04-30 16:28:08 EAGLE 34.0.0
**  0012.0449 ** CARD 1108  VSCCP       RTDB resynchronization in progress
```

- **UAM 0451** - RTDB reload is required

  The RTDB database on the DSM card needs to be reloaded because the resynch log does not contain all of the required updates.

  Example:

```
   station1234 00-04-30 16:28:08 EAGLE 34.0.0
**  0012.0451 ** CARD 1108  VSCCP       RTDB reload is required
```

EIR Subsystem Alarms

The following alarms are output on the EAGLE 5 SAS for the EIR subsystem.

- **UAM 0455** - EIR Subsystem is not available

  Indicates no SCCP cards have an EIR status of active. All are OOS or loading.

  Example:

```
   station1234 00-04-30 16:28:08 EAGLE 34.0.0
*C  0056.0455 *C EIR SYSTEM           EIR Subsystem is not available
```

- **UAM 0456** - EIR Subsystem is disabled

  Indicates all IS-NR SCCP cards have EIR status of Offline (with at least 1 card IS-NR). The **inh-map-ss** command has been executed.

  Example:

```
   station1234 00-04-30 16:28:08 EAGLE 34.0.0
*C  0056.0456 *C EIR SYSTEM           EIR Subsystem is disabled
```

- **UAM 0457** - EIR Subsystem normal,card(s) abnormal

1 SCCP card has EIR status of Active and there are 1 or more cards with an EIR status other than Active.

Example:

```
   station1234 00-04-30 16:28:08 EAGLE 34.0.0
*  0056.0457 *  EIR SYSTEM         EIR Subsystem normal, card(s) abnormal
```

- **UAM 0458** - EIR Subsystem is available

  All SCCP cards are IS-NR and have an EIR status of Active.

  Example:

```
   station1234 00-04-30 16:28:08 EAGLE 34.0.0
   0056.0458    EIR SYSTEM         EIR Subsystem is available
```

- **UAM 0459** - EIR Subsystem is removed

  Indicates the last SCCP card deleted.

  Example:

```
   station1234 00-04-30 16:28:08 EAGLE 34.0.0
   0056.0459    EIR SYSTEM         EIR Subsystem is removed
```

EIR UIMs

The EAGLE 5 SAS Maintenance Manual contains a complete description of all UIM text and formats. If EIR is provisioned, then the following UIMs (Tables 4-2) are used.

Table 4-2. EIR UIMs

UIM	Text	Description	Action
1030	Inh EIR SS request already outstanding	An **inh-map-ss** command is already entered and queued.	None
1031	Failure Inhibiting EIR SS	The **inh-map-ss** command was unsuccessful in taking the EIR subsystem off-line.	Enter the **inh-map-ss** command with the **force** parameter.
1035	SCCP rsp did not route - invalid GTI	The SCCP response did not route due to an invalid GTI	Use a valid GTI in the CGPA part of the query
1036	SCCP rsp did not route - invalid TT	The SCCP response did not route due to an invalid TT	Provision the CGPA TT in the GTT TT table
1037	SCCP rsp did not route - bad Xlation	The SCCP response did not route due to a bad translation	Provision the CGPA GTA address in the GTT database

Table 4-2. EIR UIMs (Continued)

UIM	Text	Description	Action
1038	SCCP rsp did not route - SSP not True PC	The SCCP response did not route due to SSP is not true point code	Use the true point code in the CGPA point code or OPC of the query
1039	SCCP rsp did not route - bad Selectors	The SCCP response did not route due to invalid selectors	Provision the CGPA GTI, TT, NP, and NAI in the EGTT selector table
1040	ITU<-> ANSI translation not supported	This message indicates an invalid translation PC type in attempting to cross the ANSI to ITU domain.	Change the translation PC type to not cross the domain (ANSI <-> ITU), by using the appropriate EPAP commands.
1041	SCCP rsp did not route - SSP not true point code	This message indicates the SCCP message did not route because the SSN was not found in the message or translation data.	Change the message to include the CDPA SSN in the message or provision the SSN in the translation table.
1102	Invalid Length for Map IMEI Parameter	The EIR subsystem received a Check-IMEI message in which the Map IMEI parameter had an invalid length.	None
1103	LSS:No Map IMEI Parameter present	The EIR subsystem received a Check-IMEI message in which the Map IMEI parameter is not present	None
1232	SCCP Encode Failure 2	This message indicates that there is an SCCP encode failure.	Contact the distant end node this message refers to and verify action is being taken to correct the SCCP encode failure problem.
1244	Conv to intl num - Dflt MCC not found	Default MCC not defined when NAI = National or Subscriber	Define the default CC using the **`chg-gsmopts:defmnc`** command. Refer to the *Commands Manual* for the proper usage
1245	Conv to intl num - Dflt MNC not found	Default MNC not defined, when NAI = Subscriber	Define the default CC using the **`chg-gsmopts:defmnc`** command. Refer to the *Commands Manual* for the proper usage
1246	Invalid length of conditioned digits	This message indicates that the the length of the conditioned international number is less than 5 or greater than 15 digits.	None

Table 4-2. EIR UIMs (Continued)

UIM	Text	Description	Action
1260	LSS: Unsupported TCAP msg type	The local subsystem received an SCCP message containing an unsupported TCAP (transaction capabilities application portion) message type.	None
1261	LSS: Invalid len in transaction portion	The local subsystem received a TCAP message containing an invalid length in the transaction portion of the message.	None
1262	LSS: Invalid len in dialogue portion	The local subsystem received a TCAP message with an invalid length in the dialogue portion of the message.	None
1263	LSS: Invalid len in component portion	The local subsystem received a TCAP message with an invalid length in the component portion of the message.	None
1264	LSS: No originating transaction ID	The local subsystem received a TCAP message that does not have an originating transaction ID.	None
1265	LSS: Invalid transaction ID len	The local subsystem received a TCAP message containing an invalid transaction ID length.	None
1266	LSS: Dest transaction ID in Begin	The local subsystem received a Begin TCAP message containing a destination transaction ID. (The Begin message should have an originating transaction ID only. A destination transaction ID is valid only in Abort, Continue, and End TCAP messages.)	None
1267	LSS: No External element	The local subsystem received a TCAP message that does not contain an External element in the dialogue portion of the message.	None
1268	LSS: No External Object Identifier	The local subsystem received a TCAP message that does not contain an Object Identifier element in the External element in the dialogue portion of the message.	None

Table 4-2. EIR UIMs (Continued)

UIM	Text	Description	Action
1269	LSS: Not Structured Dialogue	The local subsystem received a TCAP message with an Object Identifier value in the External element in the dialogue portion that does not indicate a structured dialogue as specified in ITU Q.773.	None
1270	LSS: No External ASN1-Type	The local subsystem received a TCAP message that does not have an ASN1-Type element in the External element in the dialogue portion of the message.	None
1271	LSS: No Dialogue Request	The local subsystem received a TCAP message that odes not have a Dialogue Request element in the ASN1-Type element in the dialogue portion of the message.	None
1272	LSS: No Application Context Name	The local subsystem received a TCAP message that does not have an Application Context Name element in the Dialogue Request element in the dialogue portion of the message.	None
1273	LSS: No ACN Object Identifier	The local subsystem received a TCAP message that does not have an Object Identifier element in the Application Context Name element in the dialogue portion of the message.	None
1274	LSS: No component portion	The local subsystem received a TCAP message that does not contain a component portion tag.	None
1276	LSS: No Invoke ID	The local subsystem received a TCAP message that does not contain an Invoke ID within the component.	None
1277	LSS: No operation code	The local subsystem received a TCAP message that does not contain an operation code tag within the component.	None
1279	LSS: Unsupported network type	The local subsystem received an SCCP message of an unsupported network type.	None

Table 4-2. EIR UIMs (Continued)

UIM	Text	Description	Action
1288	LSS: Unsupported operaton code	The local subsystem received a TCAP message in which the operation code is unsupported.	None
1293	LSS: Linked ID in query	The local subsystem received an INAP message containing an invalid number of digits in the Called Party Number (CdPN) parameter.	None
1306	GSMOPTS: EIR Global Response is ON	The EIR Global Response Type is on. The EIR Global Response Type is set by the **chg-gsmopts** command and the **eirgrsp** parameter.	For information about **eirgrsp**, refer to the **chg-gsmopts** command in the *Commands Manual*
1307	GSMOPTS: EIR Global Response is OFF	The EIR Global Response Type is off. The EIR Global Response Type is set by the **chg-gsmopts** command and the **eirgrsp** parameter.	For information about **eirgrsp**, refer to the **chg-gsmopts** command in the *Commands Manual*.

EIR Measurements

Refer to the *Maintenance Manual* for for detailed measurement usage information.

The EAGLE 5 SAS Measurement system supports the collection and retrieval of measurements related to the EIR feature.The EIR measurement registers are supported only with the Measurements Platform feature enabled and the Measurements Platform option on. There are eight measurement registers specifically for the EIR feature. The registers are reported in two new EIR SYS reports: Hourly Maintenance Measurements (MTCH) on EIR System and Daily Maintenance Measurements (MTCD) on EIR System. The data for these registers originates in the VSCCP cards. The interface to the customers network supports the FTP transfer of the EIR MTCH and EIR MTCD reports to a FTP server. Following collection, scheduled reports are automatically generated and transferred to the customer's FTP server via the FTP interface.

For IMEIs present in multiple lists, the appropriate measurement peg is determined by the logic in Table 2-2 on page 2-5 and the outcome of the IMSI Check.

When the EIR feature is enabled, the MCP collects EIR measurements data each hour following the hour boundary (0000, 0100, 0200, etc.). The collected data is retained in the appropriate data store. The retention period for hourly EIR measurements data is 24 hours. The EIR measurements data collected each hour is aggregated into a daily sum total that is reported in the MTCD report. The retention period for daily EIR measurements data is 7 days.

Existing FTP file server reports are overwritten by subsequent requests that produce the identical file name.

Reports can be scheduled or printed on-demand. Scheduled and on-demand reports are accessible by the following administrative commands:

- **`chg-measopts`** - Used to enable or disable the automatic generation and FTP transfer of scheduled measurement reports to the FTP server.
- **`rept-stat-meas`** - Reports the status of the measurements subsystem including card location and state, Alarm level, and Subsystem State.
- **`rept-ftp-meas`** - Manually initiates generation and FTP transfer of a measurements report from the MCPM to the FTP server.
- **`rtrv-measopts`** - Generates a user interface display showing the enabled/disabled status of all FTP scheduled reports.

The following Pegs per System measurement peg counts of EIR MSUs (Message Signaling Units) are supported for the EIR feature (Table 4-3).

Table 4-3. Pegs for Per System EIR Measurements

Event Name	Description	Type	Unit
IMEIRCV	Total number of MAP_CHECK_IMEI messages received.	System	Peg count
WHITEIMEI	Total number of searches that resulted in a match with a "white listed" IMEI.	System	Peg count
GRAYIMEI	Total number of searches that resulted in a match with a "gray listed" IMEI.	System	Peg count
BLACKIMEI	Total number of searches that resulted in a match with a "black listed" IMEI.	System	Peg count
BLKALIMEI	Total number of searches that resulted in a match with a "black listed" IMEI, but were allowed due to IMSI Check match.	System	Peg count
BLKNALIMEI	Total number of searches that resulted in a match with a "black listed" IMEI, and the IMSI in the database did not match the IMSI in the message.	System	Peg count
UNKNIMEI	Total number of searches that resulted in a match with an "unknown" IMEI.	System	Peg count
NOMTCHIME	Total number of searches that resulted in no match in the database.	System	Peg count

Measurement Reports

Measurements are available with these report commands. Refer to the *Commands Manual* for detailed usage information.

The commands are specified as follows, where **xxx** is a three-letter abbreviation for a day of the week (MON, TUE, WED, THU, FRI, SAT, or SUN) and yy is an hour of the day:

EIR daily: **`rept-ftp-meas:type=mtcd:enttype=eir[:day=xxx:period=specific`**

EIR hourly: **`rept-ftp-meas:mtch:enttype=eir[:hh=yy:period=specific`**

5

EIR Configuration

Introduction

The EIR feature is configured on the EAGLE 5 SAS and on the EPAP (in association with either the G-Flex or G-Port features). This chapter covers the EAGLE 5 SAS configuration only. The EPAP configuration is covered in the EPAP Administration Manual.

CAUTION: Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

The EAGLE 5 SAS configuration of the EIR feature consists of the following:

- The EAGLE 5 SAS must contain DSMs running the VSCCP application – This can be verified with the **rtrv-card** command. To add DSMs, see the "Adding a DSM" procedure on page 5-4.
- The EIR feature must be enabled and activated – This can be verified with the **rtrv-ctrl-feat** command. To enable and actviate the EIR feature, see the "Enabling and Activating the EIR Feature" procedure on page 5-13.
- Change the self ID of the EAGLE 5 SAS to include EIR capability point codes – This can be verified with the **rtrv-sid** command. To provision EIR capability point codes, see the "Changing the Self-Identification of the System" procedure in the *Database Administration Manual - SS7*.
- Mated applications containing the EAGLE 5 SAS's ITU-I and ITU-N true point code, the EIR capability point codes, and the EIR subsystem number. This can be verified with the **rtrv-map** command. To provision mated applications for the EIR feature, see the "*Provisioning a Mated Application" or "Changing a Mated Application*" procedures in the *Database Administration Manual - Global Title Translation*.
- The EIR subsystem application number, verified with the **rtrv-ss-appl** command. To configure the EIR subsystem application number, see the "Adding the EIR Subsystem Application" procedure on page 5-23 or the "Changing a Subsystem Application" procedure on page 5-33.
- The GSM Service Selector, verified with the **rtrv-srvsel** command. To configure GSM Service Selectors, see the "Adding an EIR Service Selector" procedure on page 5-40.
- The EIR Global Response status, EIR Response Type, and EIR IMSI Check status options, verified with the **rtrv-gsmopts** command, can be changed. To change these options, see the "Changing the EIR Options" procedure on page 5-58.

The Provisioning Database Interface (PDBI) is used to provision large numbers of subscriptions. The *Provisioning Database Interface Manual* defines the programming interface that populates the Provisioning Database (PDB). For normal provisioning of large numbers of subscriptions, a separate provisioning application that communicates with the PDBA program must be created. The PDBI manual defines the provisioning messages, usage rules, and informational and error messages of the interface.

The EPAP GUI utilizes the PDBA / Manage Data menu to add, update, delete, and view subscriptions in the Provisioning Database. This EPAP GUI is not used for the provisioning of large numbers of subscriptions. Refer to the *EPAP Administration Manual* for more information on the EPAP GUI.

Adding a DSM

This procedure is used to add a DSM to support the Global Title Translation or Enhanced Global Title Translation feature, and the EIR feature to the database using the **ent-card** command.

A DSM can be one of the following:

- DSM 1G – a DSM with 1 gigabyte of memory
- DSM 2G – a DSM with 2 gigabyte of memory
- DSM 3G – a DSM with 3 gigabyte of memory
- DSM 4G – a DSM with 4 gigabyte of memory

NOTE: Cards running the SCCP application (TSMs and ASMs) cannot be used with the EIR feature. If any cards running the SCCP application are present in the system, they must be replaced by DSMs. Contact Tekelec Technical Services before replacing any cards running the SCCP application. See "Tekelec Technical Services" on page 1-9.

The DSM can be inserted only in the odd numbered card slots of the extension shelf. Slot 09 of each shelf contains the HMUX card, thus the DSM cannot be inserted in slot 09. The DSM can be inserted in the control shelf, but only in slots 01, 03, 05, and 07. The DSM occupies two card slots, so the even numbered card slot to the right of the odd numbered slot where the DSM has been inserted must be empty, as shown in Table 5-1. The DSM is connected to the network through the odd numbered card slot connector.

Table 5-1. DSM Card Locations

Location of the DSM	Empty Card Location	Location of the DSM	Empty Card Location
Slot 01	Slot 02	Slot 11	Slot 12
Slot 03	Slot 04	Slot 13	Slot 14
Slot 05	Slot 06	Slot 15	Slot 16
Slot 07	Slot 08	Slot 17	Slot 18

The **ent-card** command uses these parameters.

:loc – The location of the card being added to the database.

:type – The type of card being added to the database. The value of this parameter is **dsm**.

:appl – The application software or GPL that is assigned to the card. The value of this parameter is **vsccp**.

:force – Allow the LIM to be added to the database even if there are not enough DSMs to support the number of LIMs in the system. This parameter does not apply to configuring DSMs and should not be used.

The shelf to which the card is to be added, must already be in the database. This can be verified with the **rtrv-shlf** command. If the shelf is not in the database, see the "Adding a Shelf" procedure in the *Database Administration Manual – System Management*.

The card cannot be added to the database if the specified card location already has a card assigned to it.

The system can contain a maximum of 25 DSMs.

The amount of memory required on these DSMs is determined by the directory number, IMSI, and IMEI quantities contained in the EIR portion of the database.

CAUTION: Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

Procedure 5-1. Adding a DSM

1. Verify that the GTT feature is on, by entering the **rtrv-feat** command. If the GTT feature is on, the **GTT** field should be set to **on**. For this example, the GTT feature is off.

   NOTE: The rtrv-feat command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the rtrv-feat command, see the rtrv-feat command description in the *Commands Manual*.

   NOTE: If the GTT feature is on, shown by the entry GTT = on in the rtrv-feat command output in step 1, skip this step and go to step 3.

2. Turn the global title translation feature on by entering this command.

   chg-feat:gtt=on

   NOTE: Once the Global Title Translation (GTT) feature is enabled with the chg-feat command, it cannot be disabled.

   The GTT feature must be purchased before turning it on. If you are not sure whether you have purchased the GTT feature, contact your Tekelec Sales Representative or Account Representative.

   When the **chg-feat** has successfully completed, this message should appear.

   ```
   rlghncxa03w 03-06-25 09:57:41 GMT Rel 33.1.0
   CHG-FEAT: MASP A - COMPLTD
   ```

3. Display the cards in the system using the **rtrv-card** command. This is an example of the possible output.

   NOTE: Cards should be distributed throughout the system for proper power distribution. Refer to the *Installation Manual* for the shelf power distribution.

This is an example of the possible output.

```
rlghncxa03w 03-06-25 09:58:31 GMT Rel 33.1.0
CARD   TYPE      APPL      LSET NAME     PORT SLC LSET NAME     PORT SLC
1102   ASM       GLS       ------------  --   --  ------------  --   --
1113   GPSM      EOAM
1114   TDM-A
1115   GPSM      EOAM
1116   TDM-B
1117   MDAL
1118   RESERVED
1201   LIMDS0    SS7ANSI   sp2           A    0   sp1           B    0
1203   LIMDS0    SS7ANSI   sp3           A    0   ------------  --   --
1204   LIMDS0    SS7ANSI   sp3           A    1   ------------  --   --
1206   LIMDS0    SS7ANSI   nsp3          A    1   nsp4          B    1
1207   LIMV35    SS7GX25   nsp1          A    0   ------------  --   --
1208   LIMV35    SS7GX25   nsp1          A    1   ------------  --   --
1216   ACMENET   STPLAN    ------------  --   --  ------------  --   --
1308   LIMDS0    SS7ANSI   sp6           A    1   sp7           B    0
1314   LIMDS0    SS7ANSI   sp7           A    1   sp5           B    1
1317   ACMENET   STPLAN    ------------  --   --  ------------  --   --
```

4. Verify that the DSM has been physically installed into the proper location. If any cards running the SCCP application (ASMs or TSMs) are present in the system, they must be replaced by DSMs. Contact Tekelec Technical Services before replacing any cards running the SCCP application. See "Customer Assistance" on page -8.

CAUTION: If the version of the BPDCM GPL on the DSM card does not match the BPDCM GPL version in the database when the DSM is inserted into the card slot, UAM 0002 is generated indicating that these GPL versions do not match. If UAM 0002 has been generated, perform the alarm clearing procedure for UAM 0002 in the *Maintenance Manual* before proceeding with this procedure.

5. Add the DSM to the database using the **ent-card** command. For this example, enter this command.

ent-card:loc=1301:type=dsm:appl=vsccp

When this command has successfully completed, this message should appear.

```
rlghncxa03w 03-06-25 09:57:51 GMT  Rel 33.1.0
ENT-CARD: MASP A - COMPLTD
```

6. Verify the changes using the **rtrv-card** command with the card location specified. For this example, enter this command.

rtrv-card:loc=1301

This is an example of the possible output.

```
rlghncxa03w 03-06-25 09:58:31 GMT Rel 33.1.0
CARD   TYPE      APPL      LSET NAME     PORT SLC LSET NAME     PORT SLC
1301   DSM       VSCCP     ------------  --   --  ------------  --   --
```

NOTE: If the EGTT feature is on, shown by the entry `EGTT = on` in the `rtrv-feat` command output in step 1, or if the EGTT feature is off and will not be enabled in this procedure, skip this step and go to step 9.

7. Turn the enhanced global title translation feature on by entering this command.

   `chg-feat:egtt=on`

   NOTE: Once the Enhanced Global Title Translation (EGTT) feature is enabled with the `chg-feat` command, it cannot be disabled.

   The EGTT feature must be purchased before turning it on. If you are not sure whether you have purchased the EGTT feature, contact your Tekelec Sales Representative or Account Representative.

   When the **`chg-feat`** has successfully completed, this message should appear.

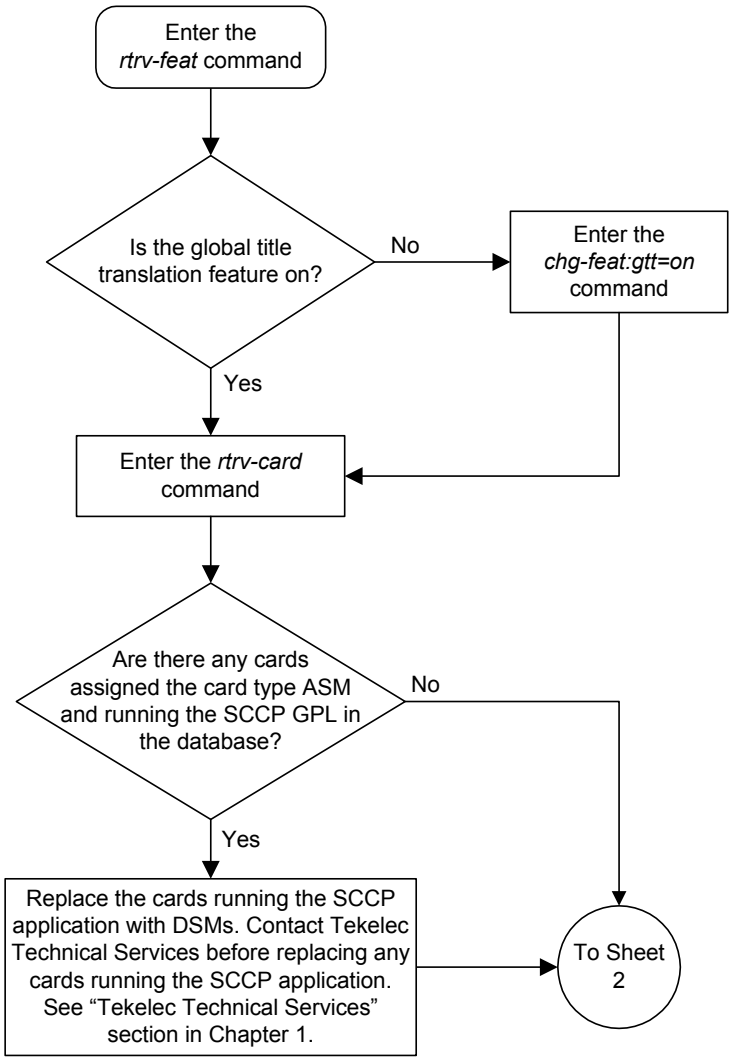
   ```
   rlghncxa03w 03-06-25 09:57:41 GMT Rel 33.1.0
   CHG-FEAT: MASP A - COMPLTD
   ```

8. Backup the new changes using the **`chg-db:action=backup:dest=fixed`** command. These messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

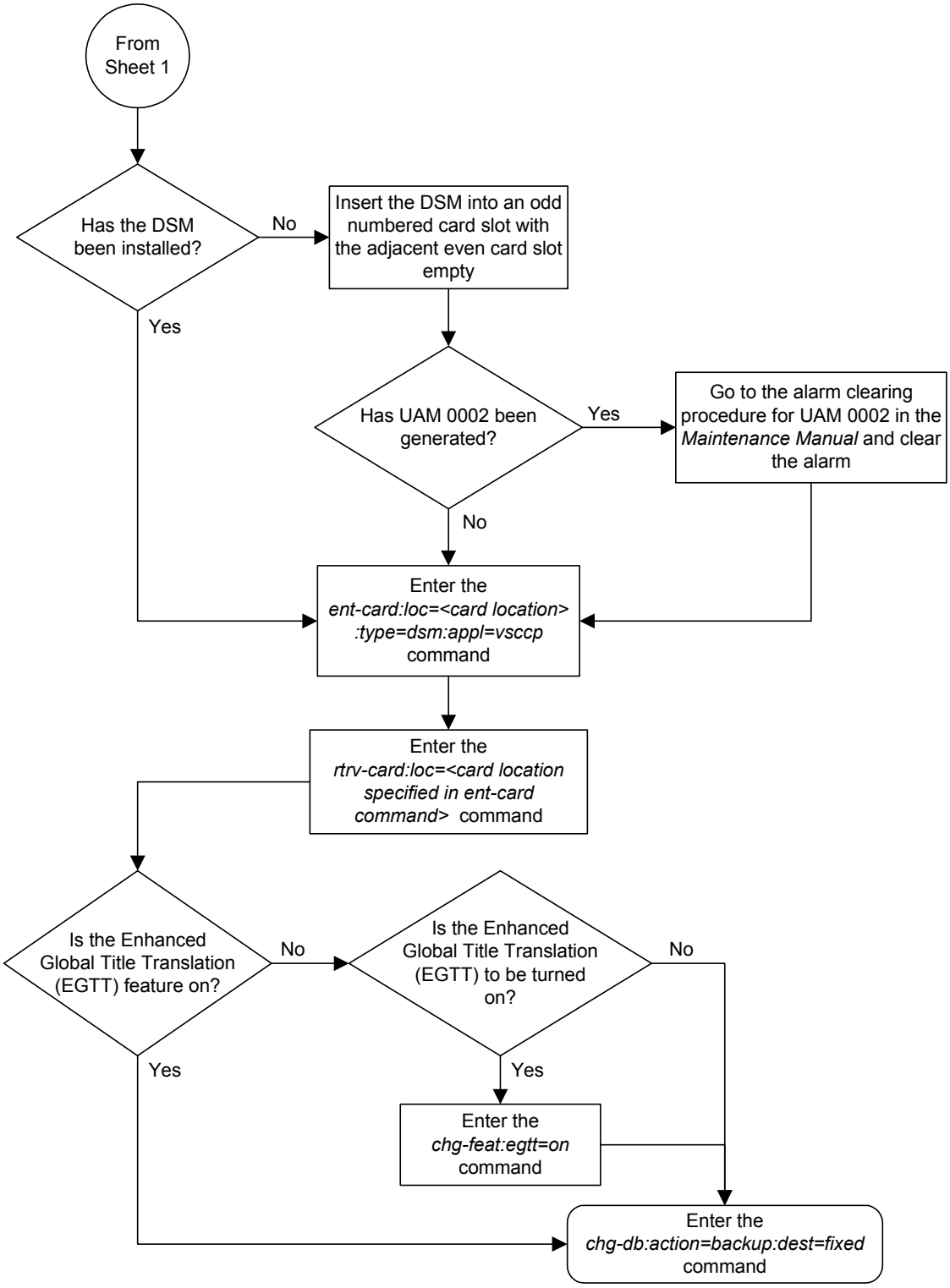
   ```
   BACKUP (FIXED) : MASP A - Backup starts on active MASP.
   BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
   BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
   BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
   ```

Flowchart 5-1. Adding a DSM (Sheet 1 of 2)

NOTE: Before executing this procedure, make sure you have purchased the Global Title Translation (GTT) and Enhanced Global Title Translation (EGTT) (if the EGTT feature is being enabled) features. If you are not sure whether you have purchased the GTT and EGTT features, contact your Tekelec Sales Representative or Account Representative.



Flowchart 5-1. Adding a DSM (Sheet 2 of 2)



Removing a DSM

This procedure is used to remove DSMs, used by the global title translation and EIR features, from the database using the **dlt-card** command. The card cannot be removed if it does not exist in the database.

CAUTION: If the DSM is the last DSM in service, removing this card from the database will cause global title translation and EIR traffic to be lost.

The DSM is shown in the database with the entries **DSM** in the **TYPE** field and **VSCCP** in the **APPL** field or the of the **rtrv-card** command output

The examples in this procedure are used to remove the DSM in card location 1204.

Procedure 5-2. Removing a DSM

1. Display the status of the DSMs by entering the **rept-stat-sccp** command. This is an example of the possible output.

```
rlghncxa03w 03-06-12 09:12:36 GMT  Rel 33.1.0
SCCP SUBSYSTEM REPORT IS-NR          Active     -----
    SCCP Cards Configured= 5  Cards IS-NR= 5  Capacity Threshold = 100%
    CARD  VERSION      PST       AST          MSU SST       CPU USAGE
    ------------------------------------------------------------------
    1204  113-002-001  IS-NR     ALMINH         Active          81%
    1208  113-002-001  IS-NR     ALMINH         Active          50%
    2101  113-002-001  IS-NR     ALMINH         Active          29%
    2105  113-002-001  IS-NR     ALMINH         Active          52%
    2112  113-002-001  IS-NR     ALMINH         Active          71%
    ------------------------------------------------------------------
SCCP Service Average Capacity = 56%
Command Completed.
```

2. Remove the card from service using the **rmv-card** command and specifying the card location. If the DSM to be inhibited is the only DSM in service, the **force=yes** parameter must also be specified. The cards that are in service are shown by the entry **IS-NR** in the **PST** field in the output in step 1. For this example, enter this command.

rmv-card:loc=1204

When this command has successfully completed, this message should appear.

```
rlghncxa03w 03-06-12 09:12:36 EST  Rel 33.1.0
Card has been inhibited.
```

3. Remove the card from the database using the **dlt-card** command. The **dlt-card** command has only one parameter, **loc**, which is the location of the card. For this example, enter this command.

dlt-card:loc=1204

When this command has successfully completed, this message should appear.

```
rlghncxa03w 03-06-12 09:12:36 EST  Rel 33.1.0
DLT-CARD: MASP A - COMPLTD
```

4. Verify the changes using the **rtrv-card** command specifying the card that was removed in step 3. For this example, enter this command.

   rtrv-card:loc=1204

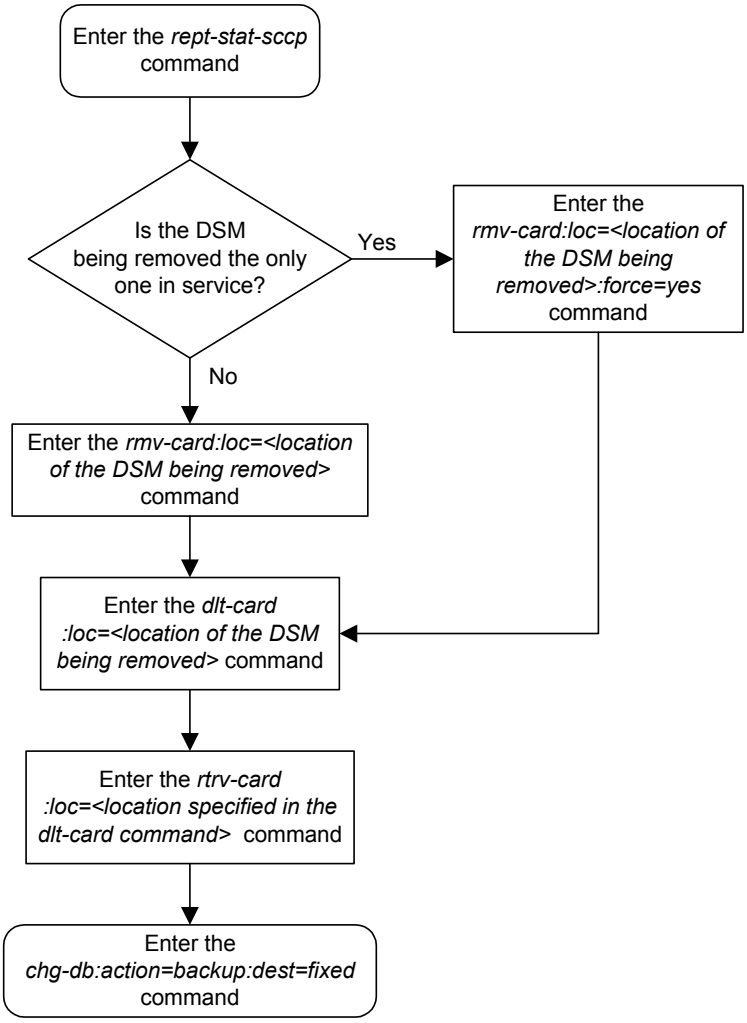
   When this command has successfully completed, this message should appear.

```
E2144 Cmd Rej: Location invalid for hardware configuration
```

5. Backup the new changes using the **chg-db:action=backup:dest=fixed** command. These messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Flowchart 5-2. Removing a DSM



Enabling and Activating the EIR Feature

This procedure is used to enable and activate the EIR feature.

The EIR feature is enabled with a part number and feature access key.

The EIR feature requires DSMs to be configured in the system. The amount of memory on these DSMs is determined by the directory number, IMSI, and IMEI quantities contained in the EIR portion of the database.

CAUTION: Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

If there are no DSMs present in the EAGLE 5 SAS, they must be added before the EIR feature can be enabled and activated. Go to the "Adding a DSM" procedure on page 5-4 and add the required DSMs to the EAGLE 5 SAS.

If DSMs are present in the EAGLE 5 SAS, but are not at the level required for the EIR feature, or cards running the SCCP application are present in the system, new DSMs that meet the minimum requirements for the EIR feature must be added using the "Adding a DSM" procedure on page 5-4. After the new DSMs have been added, the DSMs that do not meet the level required for the EIR feature, or the cards running the SCCP application, must be removed from the database, using the "Removing a DSM" procedure on page 5-10. After these cards have been removed from the database, These cards must be removed from the system.

CAUTION: The EIR feature cannot be enabled if either the LNP feature is enabled or the INP feature is on. Enter the `rtrv-feat` command to verify whether or not the INP feature is on and the `rtrv-ctrl-feat` command to verify whether or not the LNP feature is enabled. If the INP feature is on, shown with the entry `inp = on` in the `rtrv-feat` output, this procedure cannot be performed. If the LNP feature is enabled, shown with a quantity greater than zero for the `LNP TNs` field, this procedure cannot be performed.

The feature access key is based on the EIR feature's part number and the serial number of the system, making the feature access key site-specific.

The **`enable-ctrl-feat`** command enables the EIR feature by inputting the EIR feature's access key and part number with these parameters:

`:fak` – The feature access key generated by the feature access key generator. The feature access key contains 13 alphanumeric characters and is not case sensitive.

`:partnum` – The Tekelec-issued part number of the EIR feature, 893012301.

The **enable-ctrl-feat** command requires that the database contain a valid serial number for the EAGLE 5 SAS, and that this serial number is locked. This can be verified with the **rtrv-serial-num** command. The system is shipped with a serial number in the database, but the serial number is not locked. The serial number can be changed, if necessary, and locked once the system is on-site, with the **ent-serial-num** command. The **ent-serial-num** command uses these parameters.

:serial – The serial number assigned to the system. The serial number is not case sensitive.

:lock – Specifies whether or not the serial number is locked. This parameter has only one value, **yes**, which locks the serial number. Once the serial number is locked, it cannot be changed.

Once the EIR feature has been enabled, the EIR feature must be activated with the **chg-ctrl-feat** command. The **chg-ctrl-feat** command uses these parameters:

:partnum – The Tekelec-issued part number of the EIR feature, 893012301.

:status=on – used to activate the controlled features that customer has purchased and enabled.

The status of the controlled features in the system is shown with the **rtrv-ctrl-feat** command.

NOTE: Once the EIR feature is enabled and activated, the EIR feature cannot be disabled. When the EIR feature is enabled, it is permantly enabled. The EIR feature cannot be temporarily enabled.

The feature access key for the desired EIR telephone number quantity must be purchased before you enable the EIR feature. If you are not sure if you have purchased the EIR feature access key, contact your Tekelec Sales Representative or Account Representative.

Procedure 5-3. Enabling and Activating the EIR Feature

1. Display the status of the controlled features by entering the **rtrv-ctrl-feat** command. The following is an example of the possible output.

```
rlghncxa03w 03-06-30 21:15:37 GMT Rel 33.1.0
The following features have been permanently enabled:
Feature Name              Partnum    Status  Quantity
TPS                       893000110  on      1000
ISUP Normalization        893000201  on      ----
Command Class Management  893005801  off     ----
LNP Short Message Service 893006601  off     ----
Intermed GTT Load Sharing 893006901  off     ----
XGTT Table Expansion      893006101  off     ----
XMAP Table Expansion      893007710  on      3000
Large System # Links      893005910  on      2000
Routesets                 893006401  on      6000

The following features have been temporarily enabled:
Feature Name              Partnum    Status  Quantity     Trial Period Left
TPS                       893000140  on      4000         20 days 8 hrs 57
mins

The following features have expired temporary keys:
Feature Name              Part Num
Zero entries found.
```

   If the EIR feature is enabled and activated, performing this procedure is not necessary.

   If the **rtrv-ctrl-feat** output shows that the LNP telephone number quantity is greater than zero, this procedure cannot be performed.

2. Verify that the INP feature is off, by entering the **rtrv-feat** command. The EIR feature cannot be enabled is the INP feature is on. If the INP feature is off, the **INP** field should be set to **off**.

   NOTE: The rtrv-feat command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the rtrv-feat command, see the rtrv-feat command description in the *Commands Manual*.

   If the INP feature is on, this procedure cannot be performed.

   NOTE: If the rtrv-feat output in step 2 shows that the global title translation (GTT) is on, skip this step and go to step 4.

3. Turn the GTT feature on by entering this command.

   chg-feat:gtt=on

NOTE: Once the GTT feature is turned on with the `chg-feat` command, it cannot be turned off.

The GTT feature must be purchased before you turn the feature on with the `chg-feat` command. If you are not sure if you have purchased the GTT feature, contact your Tekelec Sales Representative or Account Representative.

When the **`chg-feat`** has successfully completed, this message should appear.

```
rlghncxa03w 03-06-07 00:57:31 GMT Rel 33.1.0
CHG-FEAT: MASP A - COMPLTD
```

---

4. The EIR feature requires that DSMs must be configured in the database. Display the cards in the database with the **`rtrv-card`** command. The ASMs and TSMs are shown with the entries **`ASM`** in the **`TYPE`** field and **`SCCP`** in the **`APPL`** field. The DSMs are shown with the entries **`DSM`** in the **`TYPE`** field and **`VSCCP`** in the **`APPL`** field. This is an example of the possible output.

```
rlghncxa03w 03-06-07 00:57:31 GMT Rel 33.1.0
CARD   TYPE          APPL      PORT A LSET (SLC)   PORT B LSET (SLC)
1101   DSM           VSCCP     --------    (--)    --------    (--)
1113   GPSM          EOAM
1114   TDM-A
1115   GPSM          EOAM
1116   TDM-B
1117   MDAL
1118   RESERVED
1201   LIMDS0        SS7ANSI   sp2         (00)    sp1         (00)
1214   ASM           GLS       --------    (--)    --------    (--)
1216   ACMENET       STPLAN    --------    (--)    --------    (--)
1305   LIMDS0        SS7ANSI   sp5         (00)    sp6         (00)
```

If DSMs are not shown in the output of the **`rtrv-card`** command, go to the "Adding a DSM" procedure on page 5-4 and add the necessary DSMs, making sure that the DSMs meet the requirements.

If the **`rtrv-card`** output shows cards running the SCCP application, these cards must be removed after the DSMs are added to the database. Go the "Removing a DSM" procedure on page 5-10 and remove all the cards running the SCCP application from the database.

NOTE: If the rtrv-card output in step 4 did not contain DSMs, skip step 5 and go to step 6.

5. Choose one of the DSMs shown in the **`rtrv-card`** output in step 4. Display the amount of memory on the DSM, using the **`rept-stat-card`** command specifying the card location of the DSM, and the **`mode=full`** parameter. For this example, enter this command.

`rept-stat-card:loc=1101:mode=full`

This is an example of the possible output.

```
tekelecstp 03-06-17 14:12:27 EAGLE 34.0.0
CARD   VERSION      TYPE      APPL       PST            SST        AST
1101   118-021-001  DSM       VSCCP      IS-NR          Active     -----
  ALARM STATUS       = No Alarms
  IMT    VERSION     = 118-021-000
  PROM   VERSION     = 028-002-001
  IMT BUS A          = Conn
  IMT BUS B          = Conn
  CLOCK A            = Idle
  CLOCK B            = Idle
  CLOCK I            = Active
  MBD BIP STATUS     = valid
  DB STATUS          = valid
  DBD MEMORY SIZE    = 1024M
  HW VERIFICATION CODE = -----
  SCCP % OCCUP       = 10%
  SNM    TVG RESULT  = 24 hr: ------, 5 min: ------
Command Completed.
```

The amount of memory on the DSM is shown in the **DBD MEMORY SIZE** field. If the amount of memory does not meet the requirements, refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* before performing the following steps.

a. Add the DSM that meet the requirements to the database using the "Adding a DSM" procedure on page 5-4.

b. Remove the DSM specified in the **rept-stat-card** command from the database using the "Removing a DSM" procedure on page 5-10.

c. Remove the card specified in substep *b* from the EAGLE 5 SAS.

Repeat this step for all DSMs shown in the **rtrv-card** output in step 4.

NOTE: If the rtrv-ctrl-feat output in step 1 shows any controlled features, skip steps 6 and 7, and go to step 8.

6. Display the serial number in the database with the **rtrv-serial-num** command. This is an example of the possible output.

```
rlghncxa03w 03-06-30 21:15:37 GMT Rel 33.1.0
System serial number = ntxxxxxxxxxxxxx

System serial number is not locked.

rlghncxa03w 03-06-30 21:15:37 GMT Rel 33.1.0
Command Completed
```

NOTE: If the serial number is locked, skip step 7 and go to step 8.

7. If the serial number shown in step 6 is not correct and not locked, enter the correct serial number into the database and lock the serial number using the **ent-serial-num** command with the serial and lock parameters.

If the serial number is correct, but is not locked, enter the **ent-serial-num** command specifying the serial number shown in step 6 with the **lock=yes** parameter.

For this example, enter this command.

ent-serial-num:serial=<system serial number>:lock=yes

When this command has successfully completed, the following message should appear.

```
rlghncxa03w 03-06-30 21:15:37 GMT Rel 33.1.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

8. Enable the EIR feature by entering the **enable-ctrl-feat** command. For this example, enter this command.

   enable-ctrl-feat:partnum=893012301:fak=<feature access key>

   NOTE: The values for the feature access key (the fak parameter) are provided by Tekelec. If you do not have the controlled feature part number or the feature access key for the feature you wish to enable, contact your Tekelec Sales Representative or Account Representative.

   When the **enable-ctrl-feat** command has successfully completed, this message should appear.

   ```
   rlghncxa03w 03-06-30 21:15:37 GMT Rel 33.1.0
   ENABLE-CTRL-FEAT: MASP B - COMPLTD
   ```

9. The EIR feature enabled in step 7 must be activated using the **chg-ctrl-feat** command, specifying the EIR feature part number used in step 7 and the **status=on** parameter. For this example, enter this command.

   chg-ctrl-feat:partnum=893012301:status=on

   When this command has successfully completed, the following message should appear.

   ```
   rlghncxa03w 03-06-28 21:15:37 GMT Rel 33.1.0
   CHG-CTRL-FEAT: MASP B - COMPLTD
   ```

10. Verify the changes by entering the **rtrv-ctrl-feat**command with the part number specified in step 9.

    rtrv-ctrl-feat:partnum=893012301

    The following is an example of the possible output.

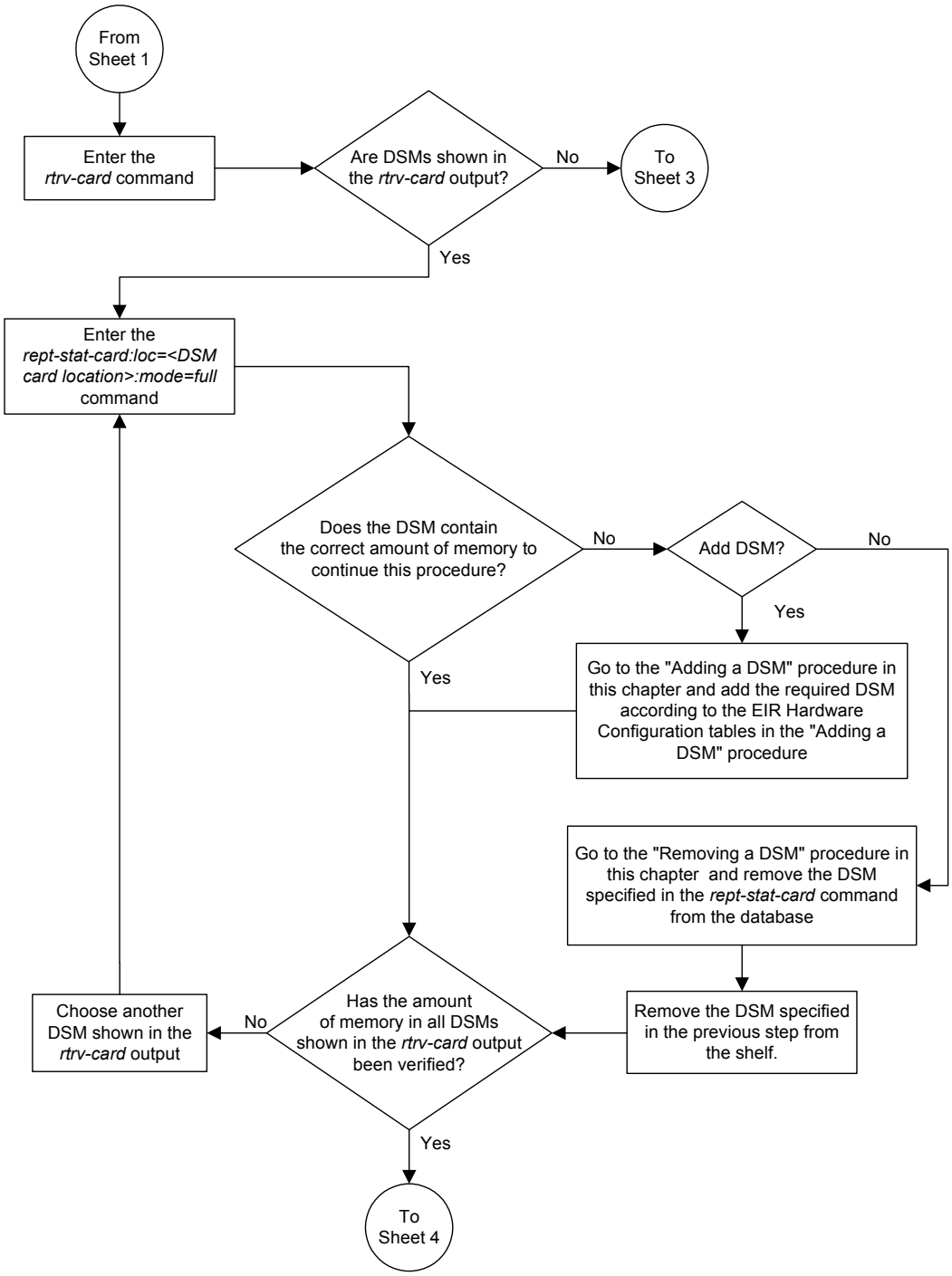
    ```
    rlghncxa03w 03-06-30 21:16:37 GMT Rel 33.1.0
    The following features have been permanently enabled:
    Feature Name              Partnum    Status  Quantity
    EIR                       893012301  on      ------
    ```

11. Backup the new changes using the **chg-db:action=backup:dest=fixed** command. These messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

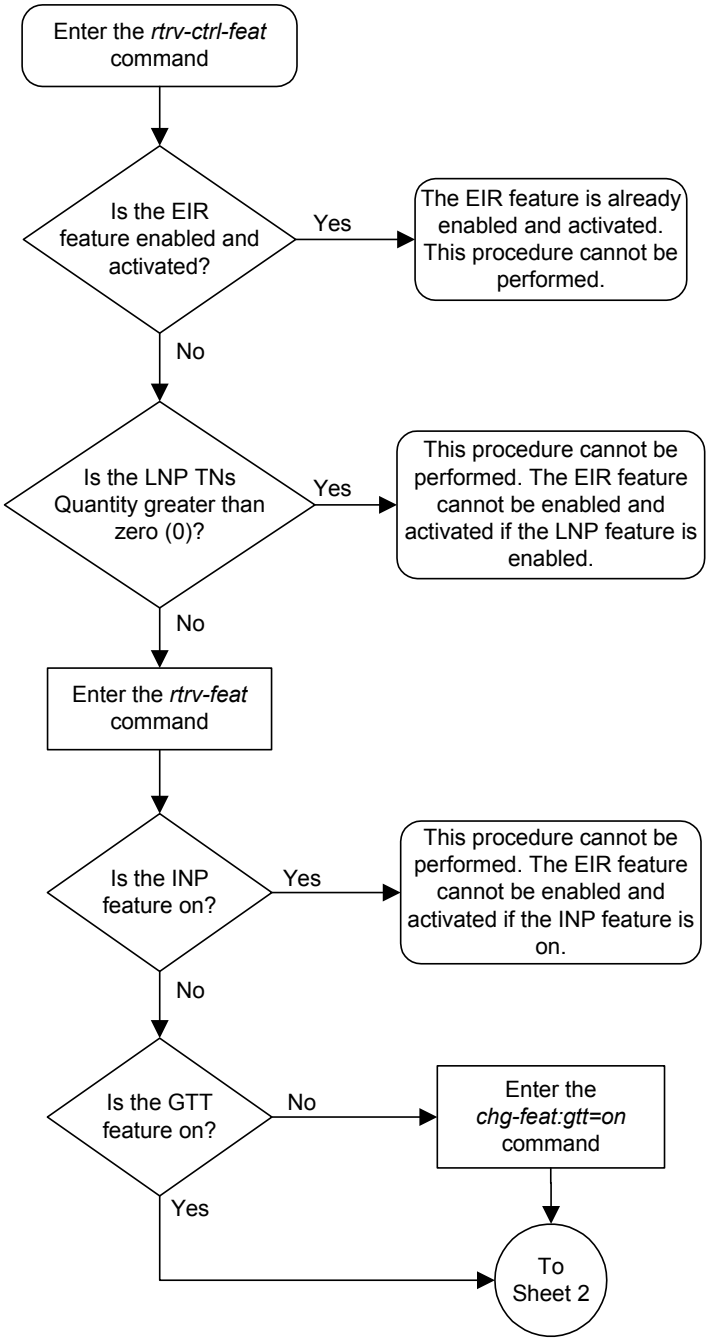
    ```
    BACKUP (FIXED) : MASP A - Backup starts on active MASP.
    BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
    BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
    BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
    ```

Flowchart 5-3. Enabling and Activating the EIR Feature (Sheet 1 of 4)

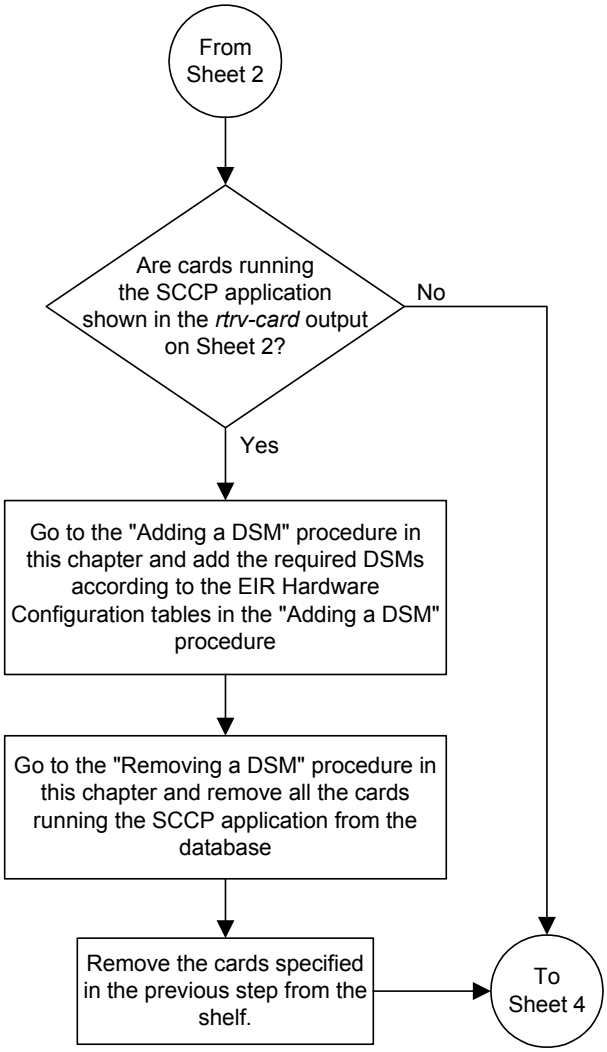
NOTE: Before executing this procedure, make sure you have purchased the global title translation (GTT) feature and the feature access key for the EIR feature. If you are not sure if you have purchased the GTT feature or the EIR feature access key, contact your Tekelec Sales Representative or Account Representative.



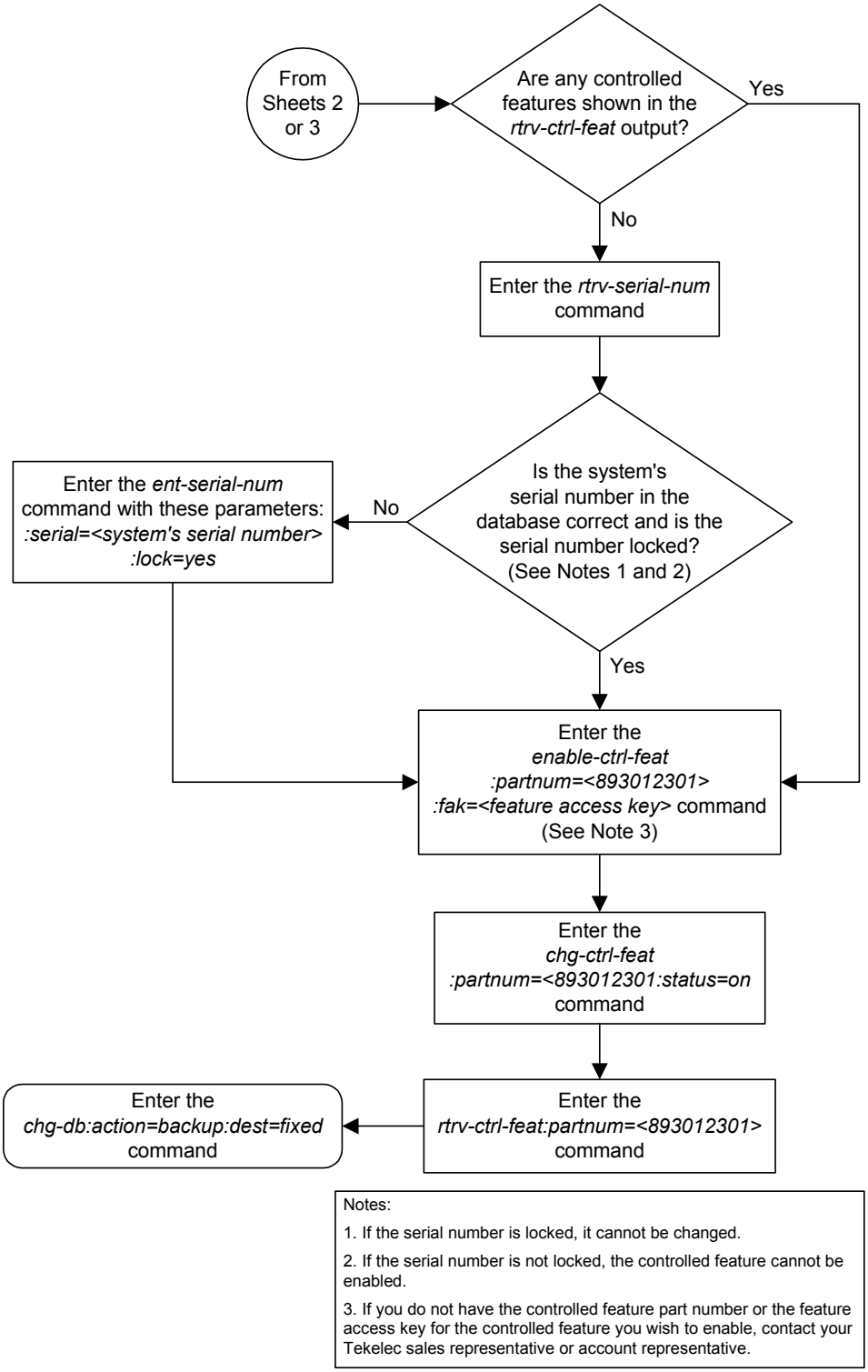
Flowchart 5-3. Enabling and Activating the EIR Feature (Sheet 2 of 4)



Flowchart 5-3. Enabling and Activating the EIR Feature (Sheet 3 of 4)



Flowchart 5-3. Enabling and Activating the EIR Feature (Sheet 4 of 4)



Adding the EIR Subsystem Application

This procedure is used to reserve a subsystem number for the EIR (equipment identity register) application and place the EIR application either online or offline using the **ent-ss-appl** command. The **ent-ss-appl** command uses these parameters.

:appl – the application type, **EIR**

NOTE: The appl parameter contains the values INP, for reserving a subsystem number for the INP subsystem, and LNP, for reserving a subsystem number for the LNP subsystem. These values cannot be used in this procedure. To reserve a subsystem number for the INP or LNP subsystem, perform the procedures in the *Feature Manual - INP* or *Database Administration Manual - LNP* and do not perform this procedure.

:ssn – the EIR subsystem number

:stat – the state of the EIR application

The EIR feature must be enabled and activated. Verify this by entering the rtrv-ctrl-feat command. If the EIR feature is enabled and activated, the status of the EIR feature should be on. If the EIR feature is not enabled and activated, perform the "Enabling and Activating the EIR Feature" procedure on page 5-13.

Only one subsystem number for each application can be defined.

If the **stat** parameter is not specified, the application will be offline.

The application specified by the **appl** parameter cannot already be in the database.

Before the subsystem application can be added to the database, the EAGLE 5 SAS's true point code and the subsystem number, for ITU-I and 14-bit ITU-N point codes, must be in the mated application table. The EAGLE 5 SAS's true point code is verified with the **rtrv-sid** command and is shown in the **PCI** and **PCN** fields. The mated application table is displayed with the **rtrv-map** command. The EAGLE 5 SAS's true point code is shown in the **PCI** and **PCN** fields of the **rtrv-map** command output and the subsystem number is shown in the **SSN** field of the **rtrv-map** command output. If the EAGLE 5 SAS's true point code and the subsystem number are not shown in the **rtrv-map** command output, go to the "Adding a Mated Application" procedure in the *Database Administration Manual – Global Title Translation* and add the EAGLE 5 SAS's true point code and the subsystem to a mated application.

The example in this procedure reserves the subsystem number 100 for the EIR application and sets the EIR application online.

Procedure 5-4.

1. Verify that the EIR feature is enabled and activated by entering the **rtrv-ctrl-feat** command. If the EIR feature is enabled and activated, the status of the EIR feature is **on**. This is an example of the possible output.

```
rlghncxa03w 03-06-30 21:15:37 GMT Rel 33.1.0
The following features have been permanently enabled:
Feature Name              Partnum    Status  Quantity
TPS                       893000110  on      1000
ISUP Normalization        893000201  on      ----
Command Class Management  893005801  off     ----
Intermed GTT Load Sharing 893006901  off     ----
XGTT Table Expansion      893006101  off     ----
XMAP Table Expansion      893007710  on      3000
Large System # Links      893005910  on      2000
Routesets                 893006401  on      6000

The following features have been temporarily enabled:
Feature Name              Partnum    Status  Quantity     Trial Period Left
TPS                       893000140  on      4000         20 days 8 hrs 57
mins

The following features have expired temporary keys:
Feature Name              Part Num
Zero entries found.
```

   If the EIR feature is not enabled or activated, perform the "Enabling and Activating the EIR Feature" procedure on page 5-13 to enable and activate the EIR feature. Go to step 2.

   If the EIR feature is enabled and activated, go to step 2.

2. Display the subsystem number for the EIR application in the database with the **rtrv-ss-appl** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
APPL       SSN       STAT


SS-APPL table is (0 of 1)  0% full
```

3. Display the EAGLE 5 SAS's true point code using the **rtrv-sid** command. The EAGLE 5 SAS's true point code is shown in the **PCA**, **PCI**, **PCN**, or **PCN24** field of the **rtrv-sid** output. The **PCN24** field is displayed only if 24-bit ITU-N point codes are being used. The **PCN** field is displayed only if 14-bit ITU-N point codes are being used. Either the **PCN** or **PCN24** fields will be displayed, but both fields will not be displayed at the same time. The EIR feature requires ITU-I (**PCI**) and ITU-N (**PCN**) true point codes.

The following is an example of the possible output.

```
rlghncxa03w 03-06-10 11:43:04 GMT  Rel 33.1.0
PCA               PCI              PCN            CLLI             PCTYPE
100-100-100       3-75-7           7-9-8-1        rlghncxa03w      OTHER

CPCA
002-002-002       002-002-003       002-002-004      002-002-005
002-002-006       002-002-007       002-002-008      002-002-009
004-002-001       004-003-003       050-060-070

CPCI
1-002-1           1-002-2           1-002-3          1-002-4
2-001-1           7-222-7

CPCN
2-0-10-3          2-0-11-0          2-0-11-2         2-0-12-1
2-2-3-3           2-2-4-0           10-14-10-1
```

If the **rtrv-sid** output does not show entries in the **PCI** or **PCN** fields, or if the values of the **PCI** or **PCN** fields need to be changed, perform the "Changing the Self-Identification of the System" procedure in the *Database Administration Manual - SS7* to add the correct **PCI** and **PCN** values.

---

4. Display the mated applications using the **rtrv-map** command specifying the EAGLE 5 SAS's true point code (shown in step 3) and the EIR subsystem number. For this example, enter this command.

   rtrv-map:pci=3-57-7:ssn=100

   This is an example, of the possible output.

```
rlghncxa03w 03-06-10 09:28:10 GMT  Rel 33.1.0
MAP TABLE IS   3 % FULL (33 of 1024)

PCI          SSN  RC MULT MPCA        MSSN MATERC MULT SRM MRC GRP NAME SSO
3-57-7       100  10 SOL                                --- --- -------- OFF
```

   If the EAGLE 5 SAS's true point code and EIR subsystem number are not shown in the **rtrv-map** output, go to the "Provisioning a Mated Application" procedure in the *Database Administration Manual – Global Title Translation* and add the EAGLE 5 SAS's true point code and the subsystem to a mated appplication.

---

5. Add the subsystem number for the EIR application using the **ent-ss-appl** command. For this example, enter these commands.

   ent-ss-appl:appl=eir:ssn=100:stat=online

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
ENT-SS-APPL: MASP A - COMPLTD
```

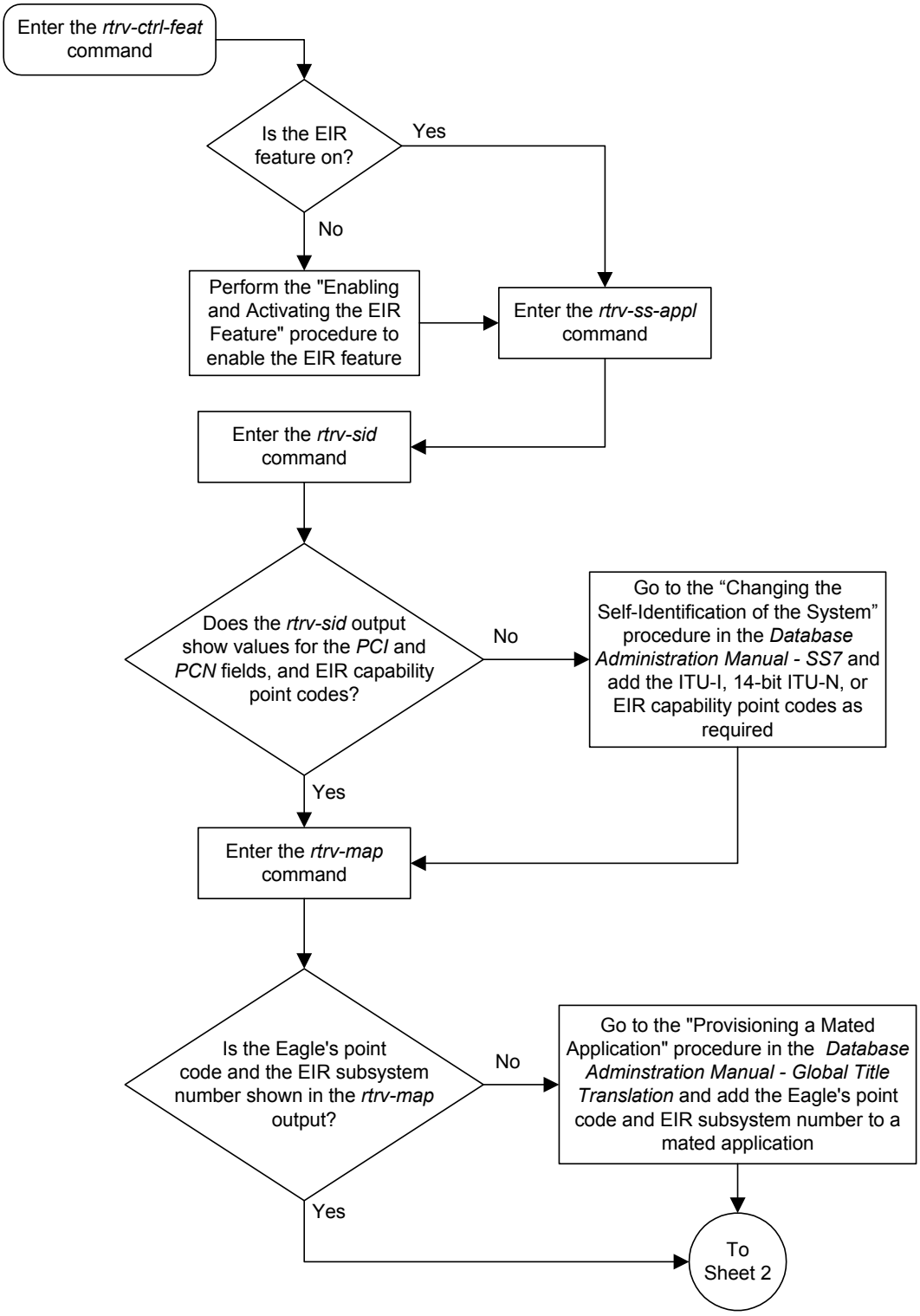
Verify the changes with the **rtrv-ss-appl** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
APPL       SSN       STAT
EIR        100       ONLINE

SS-APPL table is (1 of 1) 100% full
```

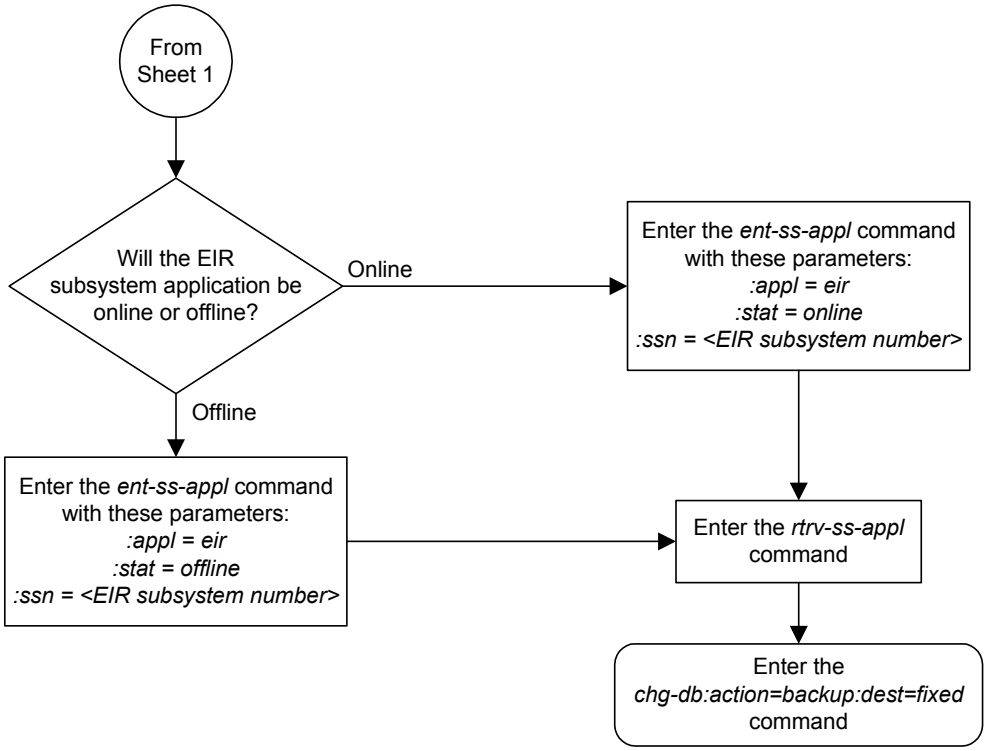
6. Backup the new changes using the **chg-db:action=backup:dest=fixed** command. The following messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.
```

Flowchart 5-4. Adding the EIR Subsystem Application (Sheet 1 of 2)



Flowchart 5-4. Adding the EIR Subsystem Application (Sheet 2 of 2)



Removing the EIR Subsystem Application

This procedure is used to remove a subsystem application from the database using the **dlt-ss-appl** command. The **dlt-ss-appl** command uses only one parameter, **:appl** – the subsystem application. The EAGLE 5 SAS contains only one subsystem application, the EIR subsystem application.

NOTE: The appl parameter contains the values INP, for removing the INP subsystem, and LNP, for removing the LNP subsystem. These values cannot be used in this procedure. To remove the INP or LNP subsystems, perform the procedures in the *Feature Manual - INP* or *Database Administration Manual - LNP* and do not perform this procedure.

The subsystem application must be in the database and the subsystem must be out of service.

Procedure 5-5.

1. Display the status of the EIR subsystem with the **rept-stat-sccp** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
SCCP SUBSYSTEM REPORT IS-NR          Active      -----
     SCCP ALARM STATUS = No Alarms
EIR  SUBSYSTEM REPORT IS-NR          Restricted  -----
     ASSUMING MATE'S LOAD
     EIR: SSN STATUS = Allowed      MATE SSN STATUS  = Allowed
     EIR ALARM STATUS  = No Alarms

SCCP Cards Configured=4  Cards IS-NR=4
System TPS Alarm Threshold = 100% Total Capacity
System Peak SCCP Load = 3000 TPS
System Total SCCP Capacity = 5000 TPS

CARD   VERSION      PST          SST          AST       MSU USAGE  CPU USAGE
------------------------------------------------------------------------------
1212   101-001-000  IS-NR        Active       ------       45%         30%
1301 P 101-001-000  IS-NR        Active       ------       35%         20%
1305   101-001-000  IS-NR        Active       ------       30%         15%
2112   101-001-000  IS-NR        Active       ------       20%         10%
------------------------------------------------------------------------------
SCCP Service Average MSU Capacity = 33%       Average CPU Capacity = 19%

AVERAGE CPU USAGE PER SERVICE:
  GTT   = 15%  GFLEX =  10%  GPORT = --%
  EIR   =  2%

TOTAL SERVICE STATISTICS:
  SERVICE    SUCCESS    ERRORS    WARNINGS    FORWARD TO GTT    TOTAL
  GTT:          1995         5           -                 -     2000
  GFLEX:         500         1           4                10      515
  EIR:            55         5           -                 -       60
Command Completed.
```

2. Display the subsystem application number for the EIR application in the database with the **rtrv-ss-appl** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
APPL       SSN       STAT
EIR        100       ONLINE

SS-APPL table is (1 of 1) 100% full
```

NOTE: If the EIR subsystem is out of service, shown by the entry LNP SUBSYSTEM REPORT OOS-MT_DSBLD in the rept-stat-lnp output in step 1, skip steps 3 and 4, and go to step 5.

3. Place the EIR subsystem application out of service with the **inh-map-ss** command specifying the EIR subsystem number displayed in step 2. For this example, enter this command.

inh-map-ss:ssn=100

When this command has successfully completed, this message should appear.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
Inhibit map subsystem command sent to all SCCP cards.
Command Completed.
```

4. Verify that the EIR subsystem is out of service with the **rept-stat-sccp** command. This an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
SCCP SUBSYSTEM REPORT IS-NR          Active      -----
     SCCP ALARM STATUS = No Alarms
EIR  SUBSYSTEM REPORT IS-NR          Restricted  -----
     ASSUMING MATE'S LOAD
     EIR: SSN STATUS = Allowed      MATE SSN STATUS  = Allowed
     EIR ALARM STATUS  = No Alarms

SCCP Cards Configured=4  Cards IS-NR=4
System TPS Alarm Threshold = 100% Total Capacity
System Peak SCCP Load = 3000 TPS
System Total SCCP Capacity = 5000 TPS

CARD   VERSION      PST          SST          AST       MSU USAGE  CPU USAGE
------------------------------------------------------------------------------
1212   101-001-000  IS-NR        Active       ------       45%         30%
1301 P 101-001-000  IS-NR        Active       ------       35%         20%
1305   101-001-000  IS-NR        Active       ------       30%         15%
2112   101-001-000  IS-NR        Active       ------       20%         10%
------------------------------------------------------------------------------
SCCP Service Average MSU Capacity = 33%       Average CPU Capacity = 19%

AVERAGE CPU USAGE PER SERVICE:
  GTT   = 15%  GFLEX =  10%  GPORT = --%
  EIR   =  2%

TOTAL SERVICE STATISTICS:
  SERVICE    SUCCESS    ERRORS    WARNINGS    FORWARD TO GTT    TOTAL
  GTT:          1995         5           -                 -     2000
  GFLEX:         500         1           4                10      515
  EIR:            55         5           -                 -       60
Command Completed.
```

5. Remove the EIR subsystem application from the database using the **dlt-ss-appl** command. For this example, enter this command.

dlt-ss-appl:appl=eir

When each of this command has successfully completed, this message should appear.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
DLT-SS-APPL: MASP A - COMPLTD
```

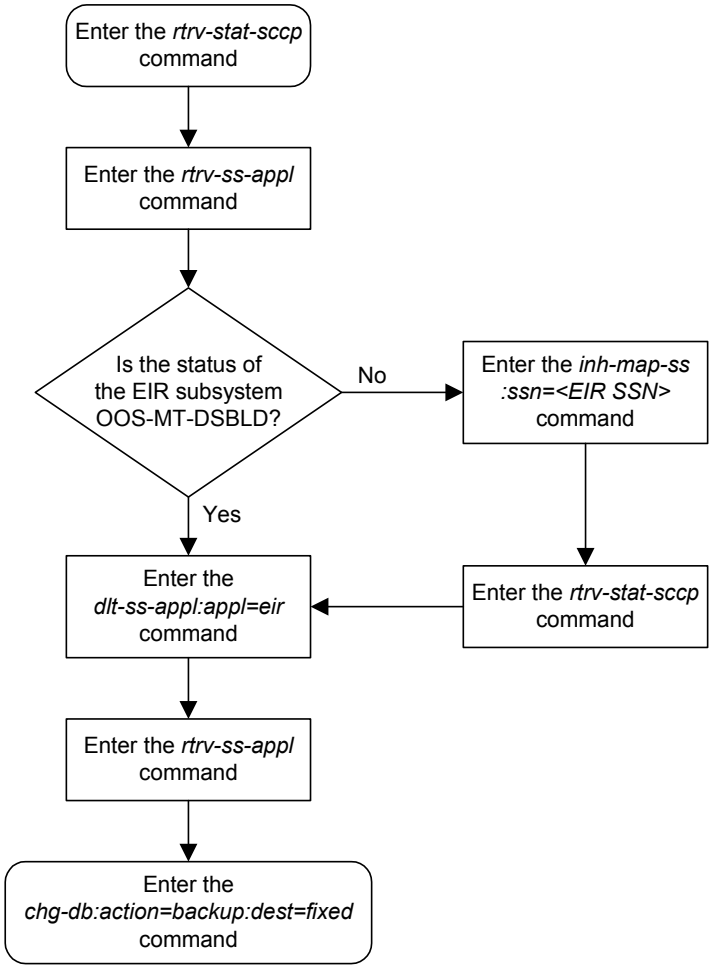
6. Verify the changes with the **rtrv-ss-appl** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
APPL       SSN       STAT


SS-APPL table is (0 of 1) 0% full
```

7. Backup the new changes using the **chg-db:action=backup:dest=fixed** command. The following messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.
```

Flowchart 5-5. Removing a Subsystem Application



Changing a Subsystem Application

This procedure is used to set an existing subsystem application either online or offline using the **chg-ss-appl** command. The **chg-ss-appl** command uses these parameters.

:appl – the application type. The EAGLE 5 SAS contains only one subsystem application, the EIR subsystem application.

NOTE: The appl parameter contains the values INP, for changing the INP subsystem, and LNP, for changing the LNP subsystem. These values cannot be used in this procedure. To change the INP or LNP subsystem, perform the procedures in the *Feature Manual - INP* or *Database Administration Manual - LNP* and do not perform this procedure.

:nstat – the new state of the subsystem application

If the **nstat=offline** parameter is specified, the subsystem application must be online. If the **nstat=online** parameter is specified, the subsystem application must be offline. The state of the subsystem application is shown in the **STAT** field of the **rtrv-ss-appl** command output.

If the subsystem application is to be taken offline (**nstat=offline**), the subsystem must be taken out of service (OOS-MT-DSBLD) with the **inh-map-ss** command.

The **rept-stat-sccp** command is used to determine the state of the EIR subsystem.

This example contains two procedures, one for taking the EIR subsystem application offline, and another for placing the EIR subsystem application online.

Procedure 5-6. Taking the EIR Subsystem Application Offline

1. Verify whether or not the EIR subsystem is online or offline with the **rtrv-ss-appl** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
APPL       SSN       STAT
EIR        100       ONLINE

SS-APPL table is (1 of 1) 100% full
```

   If the EIR subsystem is offline, this procedure does not need to be performed.

2. Display the status of the EIR subsystem with the **rept-stat-sccp** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
SCCP SUBSYSTEM REPORT IS-NR          Active      -----
     SCCP ALARM STATUS = No Alarms
EIR  SUBSYSTEM REPORT IS-NR          Restricted  -----
     ASSUMING MATE'S LOAD
     EIR: SSN STATUS = Allowed      MATE SSN STATUS  = Allowed
     EIR ALARM STATUS  = No Alarms

SCCP Cards Configured=4  Cards IS-NR=4
System TPS Alarm Threshold = 100% Total Capacity
System Peak SCCP Load = 3000 TPS
System Total SCCP Capacity = 5000 TPS

CARD   VERSION      PST          SST          AST       MSU USAGE  CPU USAGE
------------------------------------------------------------------------------
1212   101-001-000  IS-NR        Active       ------       45%         30%
1301 P 101-001-000  IS-NR        Active       ------       35%         20%
1305   101-001-000  IS-NR        Active       ------       30%         15%
2112   101-001-000  IS-NR        Active       ------       20%         10%
------------------------------------------------------------------------------
SCCP Service Average MSU Capacity = 33%       Average CPU Capacity = 19%

AVERAGE CPU USAGE PER SERVICE:
  GTT   = 15%  GFLEX =  10%  GPORT = --%
  EIR   =  2%

TOTAL SERVICE STATISTICS:
  SERVICE    SUCCESS    ERRORS    WARNINGS    FORWARD TO GTT    TOTAL
  GTT:          1995         5           -                 -     2000
  GFLEX:         500         1           4                10      515
  EIR:            55         5           -                 -       60
Command Completed.
```

3. Place the EIR subsystem out of service with the **inh-map-ss** command specifying the EIR subsystem number displayed in step 2. For this example, enter this command.

inh-map-ss:ssn=100

When this command has successfully completed, this message should appear.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
Inhibit map subsystem command sent to all SCCP cards.
Command Completed.
```

4. Verify that the EIR subsystem is out of service with the **rept-stat-sccp** command. This an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
SCCP SUBSYSTEM REPORT IS-NR          Active      -----
     SCCP ALARM STATUS = No Alarms
EIR  SUBSYSTEM REPORT IS-NR          Restricted  -----
     ASSUMING MATE'S LOAD
     EIR: SSN STATUS = Allowed      MATE SSN STATUS  = Allowed
     EIR ALARM STATUS  = No Alarms

SCCP Cards Configured=4  Cards IS-NR=4
System TPS Alarm Threshold = 100% Total Capacity
System Peak SCCP Load = 3000 TPS
System Total SCCP Capacity = 5000 TPS

CARD   VERSION      PST          SST          AST       MSU USAGE  CPU USAGE
------------------------------------------------------------------------------
1212   101-001-000  IS-NR        Active       ------       45%         30%
1301 P 101-001-000  IS-NR        Active       ------       35%         20%
1305   101-001-000  IS-NR        Active       ------       30%         15%
2112   101-001-000  IS-NR        Active       ------       20%         10%
------------------------------------------------------------------------------
SCCP Service Average MSU Capacity = 33%       Average CPU Capacity = 19%

AVERAGE CPU USAGE PER SERVICE:
  GTT   = 15%  GFLEX =  10%  GPORT = --%
  EIR   =  2%

TOTAL SERVICE STATISTICS:
  SERVICE    SUCCESS    ERRORS    WARNINGS    FORWARD TO GTT    TOTAL
  GTT:          1995         5           -                 -     2000
  GFLEX:         500         1           4                10      515
  EIR:            55         5           -                 -       60
Command Completed.
```

5. Place the EIR subsystem offline using the **chg-ss-appl** command with the **nstat=offline** parameter. For this example, enter this command.

   chg-ss-appl:appl=eir:nstat=offline

   When this command has successfully completed, this message should appear.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
CHG-SS-APPL: MASP A - COMPLTD
```

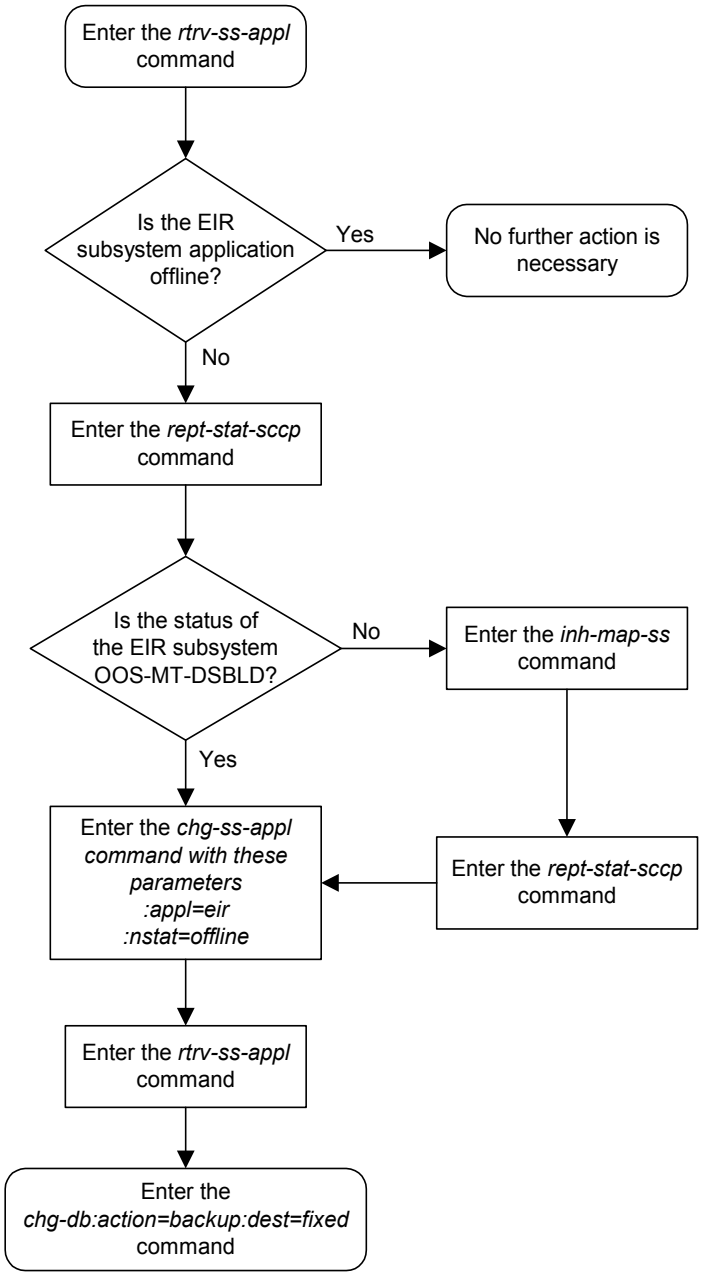
6. Verify the changes with the **rtrv-ss-appl** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
APPL       SSN       STAT
EIR        100       OFFLINE

SS-APPL table is (1 of 1) 100% full
```

7. Backup the new changes using the **chg-db:action=backup:dest=fixed** command. The following messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.
```

Flowchart 5-6. Taking the EIR Subsystem Offline



Procedure 5-7. Placing the EIR Subsystem Application Online

1. Verify whether or not the EIR subsystem is online or offline with the **rtrv-ss-appl** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
APPL       SSN       STAT
EIR        100       OFFLINE

SS-APPL table is (1 of 1) 100% full
```

If the EIR subsystem is online, this procedure does not need to be performed.

2. Display the status of the EIR subsystem with the **rept-stat-sccp** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
SCCP SUBSYSTEM REPORT IS-NR          Active      -----
     SCCP ALARM STATUS = No Alarms
EIR  SUBSYSTEM REPORT IS-NR          Restricted  -----
     ASSUMING MATE'S LOAD
     EIR: SSN STATUS = Allowed      MATE SSN STATUS  = Allowed
     EIR ALARM STATUS  = No Alarms

SCCP Cards Configured=4  Cards IS-NR=4
System TPS Alarm Threshold = 100% Total Capacity
System Peak SCCP Load = 3000 TPS
System Total SCCP Capacity = 5000 TPS

CARD   VERSION      PST          SST          AST       MSU USAGE  CPU USAGE
------------------------------------------------------------------------------
1212   101-001-000  IS-NR        Active       ------       45%         30%
1301 P 101-001-000  IS-NR        Active       ------       35%         20%
1305   101-001-000  IS-NR        Active       ------       30%         15%
2112   101-001-000  IS-NR        Active       ------       20%         10%
------------------------------------------------------------------------------
SCCP Service Average MSU Capacity = 33%       Average CPU Capacity = 19%

AVERAGE CPU USAGE PER SERVICE:
  GTT   = 15%  GFLEX =  10%  GPORT = --%
  EIR   =  2%

TOTAL SERVICE STATISTICS:
  SERVICE    SUCCESS    ERRORS    WARNINGS    FORWARD TO GTT    TOTAL
  GTT:          1995         5           -                 -     2000
  GFLEX:         500         1           4                10      515
  EIR:            55         5           -                 -       60
Command Completed.
```

3. Place the EIR subsystem application online using the **chg-ss-appl** command with the **nstat=online** parameter. For this example, enter this command.

chg-ss-appl:appl=eir:nstat=online

When this command has successfully completed, this message should appear.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
CHG-SS-APPL: MASP A - COMPLTD
```

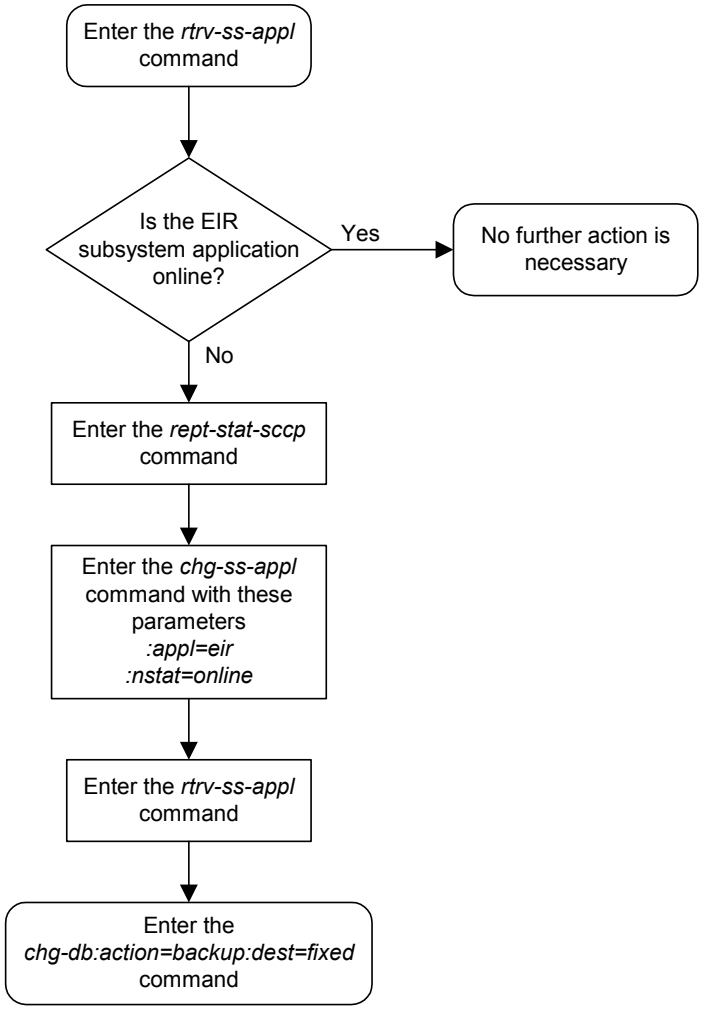
4. Verify the changes with the **rtrv-ss-appl** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
APPL       SSN       STAT
EIR        100       ONLINE

SS-APPL table is (1 of 1) 100% full
```

5. Backup the new changes using the **chg-db:action=backup:dest=fixed** command. The following messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.
```

Flowchart 5-7. Placing the EIR Subsystem Online



Adding an EIR Service Selector

This procedure is used to add a service selector for the EIR feature using the **ent-srvsel** command. The **ent-srvsel** command uses these parameters.

:serv – the DSM service type, **EIR**

NOTE: The serv parameter contains other values. These values cannot be used in this procedure.

:gtii/gtin/gtin24 – Global title indicator for ITU international (**gtii**), ITU national using 14-bit point codes (**gtin**), and ITU national using 24-bit point codes (**gtin24**).

:tt – the translation type.

:ssn – the subsystem number

:nai – Nature of address indicator (see Table 5-2)

:naiv – Nature of address indicator value (see Table 5-2)

NOTE: The nature of address indicator parameters (naiv or nai) can be specified by supplying either a mnemonic or an explicit value. At no time may both the mnemonic and the explicit value be specified at the same time for the same parameter. You can specify either the naiv or nai parameter. Tables 5-2 shows the mapping between the naiv and the nai parameters.

Table 5-2. NAIV/NAI Mapping

NAIV	NAI	Description
0	–	Unknown
1	Sub	Subscriber Number
2	Rsvd	Reserved for national use
3	Natl	National significant number
4	Intl	International number
5–127	–	Spare

:np – Numbering plan (see Table 5-3 on page 5-41

:npv – Numbering plan value (see Table 5-3)

NOTE: The numbering plan parameters (npv or np) can be specified by supplying either a mnemonic or an explicit value. At no time may both the mnemonic and the explicit value be specified at the same time for the same parameter. You can specify either the npv or np parameter. Table 5-3 shows the mapping between the npv and the np parameters.

Table 5-3. NPV/NP Mapping

NPV	NP	Description
0	–	Unknown
1	E164	ISDN/telephony numbering plan
2	Generic	Generic numbering plan
3	X121	Data numbering plan
4	F69	Telex numbering plan
5	E210	Maritime mobile numbering plan
6	E212	Land mobile numbering plan
7	E214	ISDN/mobile numbering plan
8	Private	Private network or network-specific numbering plan
9–15	–	Spare

NOTE: The `ent-srvsel` contains other parameters that are not used in this procedure. For a description of these parameters, see the *Commands Manual*.

The EIR feature must be enabled and activated. Verify this by entering the **`rtrv-ctrl-feat`** command. If the EIR feature is enabled and activated, the status of the EIR feature should be **`on`**. If the EIR feature is not enabled and activated, perform the "Enabling and Activating the EIR Feature" procedure on page 5-13.

The **`gtii`**/**`gtin`**/**`gtin24`** value can be either 2 or 4.

If the **`gtii`**/**`gtin`**/**`gtin24`** value is 2, the **`np`**, **`nai`**, **`npv`**, or **`naiv`** parameters cannot be specified with the **`ent-srvsel`** command.

If the **`gtii`**/**`gtin`**/**`gtin24`** value is 4, either the **`np`** and **`nai`** or the **`npv`** and **`naiv`** parameters must be specified with the **`ent-srvsel`** command.

If either the **`np`** or **`nai`** parameters are specified with the **`ent-srvsel`** command, then both parameters must be specified with the **`ent-srvsel`** command and neither the **`npv`** and **`naiv`** parameters can be specified with the **`ent-srvsel`** command.

If either the **`npv`** or **`naiv`** parameters are specified with the **`ent-srvsel`** command, then both parameters must be specified with the **`ent-srvsel`** command and neither the **`np`** and **`nai`** parameters can be specified with the **`ent-srvsel`** command.

Parameters of the `rtrv-srvsel` Command

The **`rtrv-srvsel`** command is used to display the service selectors in the database. Because of the large number of service selectors that can be in the database, the **`rtrv-srvsel`** command contains these parameters, **`num`** and **`force`**. The **`num`** parameter specifies the maximum number of entries to display. The

force parameter specifies whether more than 50 entries are displayed. This prevents trying to display extremely large amounts of entries which could take hours. The **rtrv-servsel** command has 10 other parameters, **gti/gtia/gtii/gtin/gtin24**, **tt**, **np**, **nai**, **npv**, **naiv**, **ssn**, **snp**, **snai**, and **serv**.

- **gti/gtia/gtii/gtin/gtin24** – the GTI value assigned to the service selector.
- **tt** – the translation type assigned to the service selector.
- **np** – the NP value assigned to the service selector.
- **nai** – the NAI value assigned to the service selector.
- **npv** – the NPV value assigned to the service selector.
- **naiv** – the NAIV value assigned to the service selector.
- **ssn** – the subsystem number assigned to the service selector.
- **snp** – the SNP value assigned to the service selector.
- **snai** – the SNAI value assigned to the service selector.
- **serv** – the DSM service assigned to the service selector.

These parameters can also be used to limit the amount of information displayed with the **rtrv-srvsel** command.

NOTE: The snp and snai parameters are not used with EIR service selectors.

Procedure 5-8.

1. Verify that the EIR feature is enabled and activated by entering the **rtrv-ctrl-feat** command. If the EIR feature is enabled and activated, the status of the EIR feature is **on**. This is an example of the possible output.

```
rlghncxa03w 03-06-30 21:15:37 GMT Rel 33.1.0
The following features have been permanently enabled:
Feature Name              Partnum    Status  Quantity
TPS                       893000110  on      1000
ISUP Normalization        893000201  on      ----
Command Class Management  893005801  off     ----
Intermed GTT Load Sharing 893006901  off     ----
XGTT Table Expansion      893006101  off     ----
XMAP Table Expansion      893007710  on      3000
Large System # Links      893005910  on      2000
Routesets                 893006401  on      6000

The following features have been temporarily enabled:
Feature Name              Partnum    Status  Quantity     Trial Period Left
TPS                       893000140  on      4000         20 days 8 hrs 57 mins

The following features have expired temporary keys:
Feature Name              Part Num
Zero entries found.
```

   If the EIR feature is not enabled or activated, perform the "Enabling and Activating the EIR Feature" procedure on page 5-13 to enable and activate the EIR feature. Go to step 2.

If the EIR feature is enabled and activated, go to step 2.

2. Display the EIR service selectors in the database using the **rtrv-srvsel:serv=eir** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0

GTII  TT   NP       NAI   NPV  NAIV  SSN  SNP   SNAI   SERV
4     1    e214     intl  ---  ---   3    ---   ---    eir
4     2    e214     intl  ---  ---   *    ---   ---    eir

SRV SELECTOR table is (4 of 20992)   1 % full
```

3. Add the EIR service selector using the **ent-srvsel** command. For this example, enter these commands.

ent-srvsel:serv=eir:tt=35:ssn=100:gtin=4:np=e214:nai=natl

ent-srvsel:serv=eir:tt=57:ssn=75:gtin=2

When these commands have successfully completed, this message should appear.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
Service Selector table is (6 of 20992) 1% full
ENT-SRVSEL: MASP A - COMPLTD
```

4. Verify the changes with the **rtrv-srvsel** command with the parameters and values used in step 3. For this example, enter these commands.

rtrv-srvsel:serv=eir:tt=35:ssn=100:gtin=4:np=e214:nai=intl

This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0

GTIN  TT   NP       NAI   NPV  NAIV  SSN  SNP   SNAI   SERV
4     35   e214     natl  ---  ---   100  ---   ---    eir

SRV SELECTOR table is (6 of 20992)   1 % full
```

rtrv-srvsel:serv=eir:tt=57:ssn=75:gtin=2

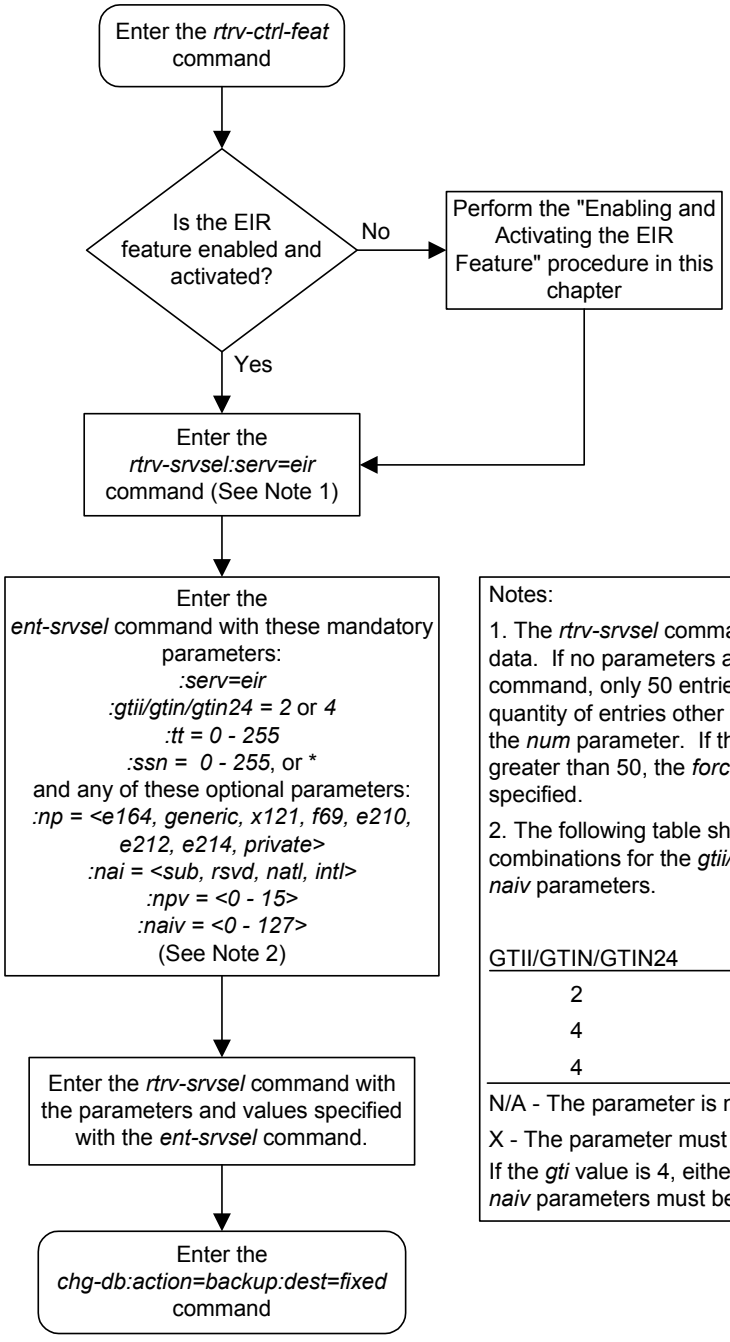
This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0

GTIN  TT   NP       NAI   NPV  NAIV  SSN  SNP   SNAI   SERV
2     57   ---      ---   ---  ---   75   ---   ---    eir

SRV SELECTOR table is (6 of 20992)   1 % full
```

5. Backup the new changes using the **chg-db:action=backup:dest=fixed** command. The following messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.
```

Flowchart 5-8. Adding an EIR Service Selector



Notes:

1. The *rtrv-srvsel* command can display large amounts of data. If no parameters are specified with the *rtrv-srvsel* command, only 50 entries are displayed. To display a quantity of entries other than 50, specify the quantity with the *num* parameter. If the *num* parameter value is greater than 50, the *force=yes* parameter must also be specified.

2. The following table shows the valid parameter combinations for the *gtii/gtin/gtin24*, *np*, *nai*, *npv*, and *naiv* parameters.

GTII/GTIN/GTIN24	NP	NAI	NPV	NAIV
2	N/A	N/A	N/A	N/A
4	X	X	N/A	N/A
4	N/A	N/A	X	X

N/A - The parameter is not allowed.

X - The parameter must be specified.

If the *gti* value is 4, either the *np* and *nai*, or the *npv* or *naiv* parameters must be specified.

Removing a Service Selector

This procedure is used to remove a service selector from the database using the **dlt-srvsel** command. The **dlt-srvsel** command uses these parameters.

:gtii/gtin/gtin24 – Global title indicator for ITU international (**gtii**), ITU national using 14-bit point codes (**gtin**), and ITU national using 24-bit point codes (**gtin24**).

:tt – the translation type.

:ssn – the subsystem number

:nai – Nature of address indicator (see Table 5-4)

:naiv – Nature of address indicator value (see Table 5-4)

NOTE: The nature of address indicator parameters (naiv or nai) can be specified by supplying either a mnemonic or an explicit value. At no time may both the mnemonic and the explicit value be specified at the same time for the same parameter. You can specify either the naiv or nai parameter. Table 5-4 shows the mapping between the naiv and the nai parameters.

Table 5-4. NAIV/NAI Mapping

NAIV	NAI	Description
0	–	Unknown
1	Sub	Subscriber Number
2	Rsvd	Reserved for national use
3	Natl	National significant number
4	Intl	International number
5–127	–	Spare

:np – Numbering plan (see Table 5-5 on page 5-47)

:npv – Numbering plan value (see Table 5-5 on page 5-47)

NOTE: The numbering plan parameters (npv or np) can be specified by supplying either a mnemonic or an explicit value. At no time may both the mnemonic and the explicit value be specified at the same time for the same parameter. You can specify either the npv or np parameter. Table 5-5 on page 5-47 shows the mapping between the npv and the np parameters.

Table 5-5. NPV/NP Mapping

NPV	NP	Description
0	–	Unknown
1	E164	ISDN/telephony numbering plan
2	Generic	Generic numbering plan
3	X121	Data numbering plan
4	F69	Telex numbering plan
5	E210	Maritime mobile numbering plan
6	E212	Land mobile numbering plan
7	E214	ISDN/mobile numbering plan
8	Private	Private network or network-specific numbering plan
9–15	–	Spare

To remove a service selector, the **gtii**/**gtin**/**gtin24**, **tt**, and **ssn** parameter values must be entered as shown in the **rtrv-srvsel** output.

Either the **np** and **nai**, or **npv** and **naiv** parameters can be specified with the **dlt-srvsel** command, but only if the **gtii**/**gtin**/**gtin24** value for the service selector being removed is 4. If the **gtii**/**gtin**/**gtin24** value of service selector being removed is 2, only the **gtii**/**gtin**/**gtin24**, **tt**, and **ssn** parameters can be specified with the **dlt-srvsel** command.

If either the **np** or **nai** parameters are specified with the **dlt-srvsel** command, then both parameters must be specified with the **dlt-srvsel** command and neither the **npv** and **naiv** parameters can be specified with the **dlt-srvsel** command.

NOTE: If the service selector being removed does not show values for the np and nai parameters, and you wish to use these parameters with the dlt-srvsel command, see Table 5-4 on page 5-46 and Table 5-5 on page 5-47 for the np and nai values the correspond to the npv and naiv values shown for the service selector being removed.

If either the **npv** or **naiv** parameters are specified with the **dlt-srvsel** command, then both parameters must be specified with the **dlt-srvsel** command and neither the **np** and **nai** parameters can be specified with the **dlt-srvsel** command.

NOTE: If the service selector being removed does not show values for the npv and naiv parameters, and you wish to use these parameters with the dlt-srvsel command, see Table 5-4 on page 5-46 and Table 5-5 on page 5-47 for the npv and naiv values the correspond to the np and nai values shown for the service selector being removed.

Parameters of the `rtrv-srvsel` Command

The **`rtrv-srvsel`** command is used to display the service selectors in the database. Because of the large number of service selectors that can be in the database, the **`rtrv-srvsel`** command contains these parameters, **`num`** and **`force`**. The **`num`** parameter specifies the maximum number of entries to display. The **`force`** parameter specifies whether more than 50 entries are displayed. This prevents trying to display extremely large amounts of entries which could take hours. The **`rtrv-servsel`** command has 10 other parameters, **`gti/gtia/gtii/gtin/gtin24`**, **`tt`**, **`np`**, **`nai`**, **`npv`**, **`naiv`**, **`ssn`**, **`snp`**, **`snai`**, and **`serv`**.

- **`gti/gtia/gtii/gtin/gtin24`** – the GTI value assigned to the service selector.
- **`tt`** – the translation type assigned to the service selector.
- **`np`** – the NP value assigned to the service selector.
- **`nai`** – the NAI value assigned to the service selector.
- **`npv`** – the NPV value assigned to the service selector.
- **`naiv`** – the NAIV value assigned to the service selector.
- **`ssn`** – the subsystem number assigned to the service selector.
- **`snp`** – the SNP value assigned to the service selector.
- **`snai`** – the SNAI value assigned to the service selector.
- **`serv`** – the DSM service assigned to the service selector.

These parameters can also be used to limit the amount of information displayed with the **`rtrv-srvsel`** command.

NOTE: The `snp` and `snai` parameters are not used with EIR service selectors.

Procedure 5-9.

1. Display the service selectors in the database using the **rtrv-srvsel** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0

GTII  TT   NP       NAI   NPV  NAIV  SSN  SNP   SNAI   SERV
4     1    e214     intl  ---  ---   3    ---    ---   eir
4     1    e214     intl  ---  ---   4    e164  intl   gport
4     1    e214     intl  ---  ---   5    e164  intl   smsmr
4     2    e214     intl  ---  ---   5    e164  intl   mnpsms
4     2    e214     intl  ---  ---   *    ---   ---    eir

GTIN  TT   NP       NAI   NPV  NAIV  SSN  SNP   SNAI   SERV
2     75   ---      ---   ---  ---   57   ---   ---    eir
4     4    e214     natl  ---  ---   ---  e164  intl   gflex
4     9    e214     natl  ---  ---   ---  e164  intl   gflex
4     35   e214     natl  ---  ---   100  ---   ---    eir

SRV SELECTOR table is (9 of 20992)   1 % full
```

2. Remove the service selector from the database using the **dlt-srvsel** command. For this example, enter these commands.

dlt-srvsel:serv=eir:tt=35:ssn=100:gtin=4:np=e214:nai=natl

dlt-srvsel:serv=eir:tt=57:ssn=75:gtin=2

When these commands have successfully completed, this message should appear.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
Service Selector table is (7 of 20992) 1% full
DLT-SRVSEL: MASP A - COMPLTD
```

3. Verify the changes with the **rtrv-srvsel** command with the parameters and values used in step 2. For this example, enter these commands.

rtrv-srvsel:serv=eir:tt=35:ssn=100:gtin=4:np=e214:nai=intl

This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0

GTIN  TT   NP       NAI   NPV  NAIV  SSN  SNP   SNAI   SERV
No SRV Selector found in range
```

rtrv-srvsel:serv=eir:tt=57:ssn=75:gtin=2

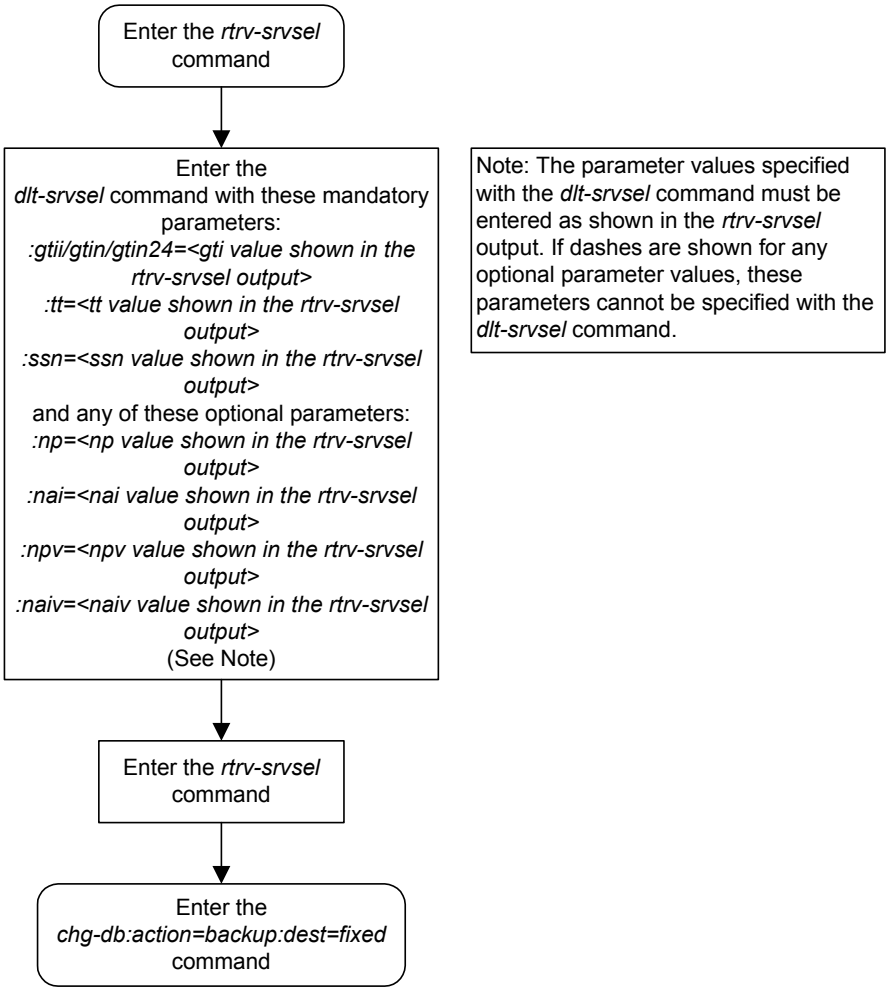
This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0

GTIN  TT   NP       NAI   NPV  NAIV  SSN  SNP   SNAI   SERV
No SRV Selector found in range
```

4. Backup the new changes using the **chg-db:action=backup:dest=fixed** command. The following messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.
```

Flowchart 5-9. Removing a Service Selector



Changing an Existing Non-EIR Service Selector to an EIR Service Selector

This procedure is used to change a non-EIR service selector to an EIR service selector for the EIR feature using the **chg-srvsel** command.

These are the only parameters that can be changed using this procedure:

:nserv – the new DSM service type, **EIR**

NOTE: The nserv parameter contains other values. These values cannot be used in this procedure. The nserv parameter can be used only if the current serv parameter value is not eir.

:nsnp – An EIR service selector cannot contain an SNP value, so if the service selector being changed contains an SNP value, this value must be changed to **none** with this parameter.

:nsnai – An EIR service selector cannot contain an SNAI value, so if the service selector being changed contains an SNAI value, this value must be changed to **none** with this parameter.

The **chg-srvsel** command requires that these parameters be specified with the values shown in the **rtrv-srvsel** output for the service selector being changed. If you wish to change any of these parameter values for an EIR service selector, remove the existing service selector using the Procedure , "Removing a Service Selector," on page 5-46, then add the new EIR service selector with the new parameter information using the Procedure , "Adding an EIR Service Selector," on page 5-40.

:gtii/gtin/gtin24 – Global title indicator for ITU international (**gtii**), ITU national using 14-bit point codes (**gtin**), and ITU national using 24-bit point codes (**gtin24**).

:tt – the translation type.

:ssn – the subsystem number

:nai – Nature of address indicator (see Table 5-6 on page 5-52)

:naiv – Nature of address indicator value (see Table 5-6 on page 5-52)

NOTE: The nature of address indicator parameters (naiv or nai) can be specified by supplying either a mnemonic or an explicit value. At no time may both the mnemonic and the explicit value be specified at the same time for the same parameter. You can specify either the naiv or nai parameter. Table 5-6 on page 5-52 shows the mapping between the naiv and the nai parameters.

Table 5-6. NAIV/NAI Mapping

NAIV	NAI	Description
0	–	Unknown
1	Sub	Subscriber Number
2	Rsvd	Reserved for national use
3	Natl	National significant number
4	Intl	International number
5–127	–	Spare

:np – Numbering plan (see Table 5-7)

:npv – Numbering plan value (see Table 5-7)

NOTE: The numbering plan parameters (npv or np) can be specified by supplying either a mnemonic or an explicit value. At no time may both the mnemonic and the explicit value be specified at the same time for the same parameter. You can specify either the npv or np parameter. Table 5-7 shows the mapping between the npv and the np parameters.

Table 5-7. NPV/NP Mapping

NPV	NP	Description
0	–	Unknown
1	E164	ISDN/telephony numbering plan
2	Generic	Generic numbering plan
3	X121	Data numbering plan
4	F69	Telex numbering plan
5	E210	Maritime mobile numbering plan
6	E212	Land mobile numbering plan
7	E214	ISDN/mobile numbering plan
8	Private	Private network or network-specific numbering plan
9–15	–	Spare

Parameters of the `rtrv-srvsel` Command

The **rtrv-srvsel** command is used to display the service selectors in the database. Because of the large number of service selectors that can be in the database, the **rtrv-srvsel** command contains these parameters, **num** and **force**. The **num** parameter specifies the maximum number of entries to display. The

force parameter specifies whether more than 50 entries are displayed. This prevents trying to display extremely large amounts of entries which could take hours. The **rtrv-servsel** command has 10 other parameters, **gti/gtia/gtii/gtin/gtin24**, **tt**, **np**, **nai**, **npv**, **naiv**, **ssn**, **snp**, **snai**, and **serv**.

- **gti/gtia/gtii/gtin/gtin24** – the GTI value assigned to the service selector.
- **tt** – the translation type assigned to the service selector.
- **np** – the NP value assigned to the service selector.
- **nai** – the NAI value assigned to the service selector.
- **npv** – the NPV value assigned to the service selector.
- **naiv** – the NAIV value assigned to the service selector.
- **ssn** – the subsystem number assigned to the service selector.
- **snp** – the SNP value assigned to the service selector.
- **snai** – the SNAI value assigned to the service selector.
- **serv** – the DSM service assigned to the service selector.

These parameters can also be used to limit the amount of information displayed with the **rtrv-srvsel** command.

NOTE: The snp and snai parameters are not used with EIR service selectors.

Procedure 5-10.

1. Display the service selectors in the database using the **rtrv-srvsel** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0

GTII  TT   NP       NAI   NPV  NAIV  SSN  SNP   SNAI   SERV
4     1    e214     intl  ---  ---   3    ---    ---   eir
4     1    e214     intl  ---  ---   4    e164  intl   gport
4     1    e214     intl  ---  ---   5    e164  intl   smsmr
4     2    e214     intl  ---  ---   5    e164  intl   mnpsms
4     2    e214     intl  ---  ---   *    ---   ---    eir

GTIN  TT   NP       NAI   NPV  NAIV  SSN  SNP   SNAI   SERV
2     75   ---      ---   ---  ---   57   ---   ---    eir
4     4    e214     natl  ---  ---   34   e164  intl   gflex
4     9    e214     natl  ---  ---   250  e164  intl   gflex
4     35   e214     natl  ---  ---   100  ---   ---    eir

SRV SELECTOR table is (9 of 20992)   1 % full
```

NOTE: If the rtrv=srvsel output in step 1 shows EIR service selectors, skip step 2 and go to step 3.

2. Verify that the EIR feature is enabled and activated by entering the **rtrv-ctrl-feat** command. If the EIR feature is enabled and activated, the status of the EIR feature is **on**. This is an example of the possible output.

```
rlghncxa03w 03-06-30 21:15:37 GMT Rel 33.1.0
The following features have been permanently enabled:
Feature Name              Partnum    Status  Quantity
TPS                       893000110  on      1000
ISUP Normalization        893000201  on      ----
Command Class Management  893005801  off     ----
Intermed GTT Load Sharing 893006901  off     ----
XGTT Table Expansion      893006101  off     ----
XMAP Table Expansion      893007710  on      3000
Large System # Links      893005910  on      2000
Routesets                 893006401  on      6000

The following features have been temporarily enabled:
Feature Name              Partnum    Status  Quantity     Trial Period Left
TPS                       893000140  on      4000         20 days 8 hrs 57
mins

The following features have expired temporary keys:
Feature Name              Part Num
Zero entries found.
```

If the EIR feature is not enabled or activated, perform the "Enabling and Activating the EIR Feature" procedure on page 5-13 to enable and activate the EIR feature. Go to step 3.

If the EIR feature is enabled and activated, go to step 3.

---

3. Change the service selector using the **chg-srvsel** command. For this example, enter this command.

chg-srvsel:gtin=4:tt=4:np=e214:nai=natl:ssn=34:nsnp=none :nsnai=none:nserv=eir

NOTE:

1. **If the SNP, or SNAI parameter values are shown as dashes in the rtrv-srvsel output, these parameters cannot be specified with the chg-srvsel command. If the gtii/gtin/gtin24 parameter value is 2, the np, nai, npv, and naiv parameters cannot be specified with the chg-srvsel command.**
2. **If the gtii/gtin/gtin24 parameter value is 4, either the np and nai, or the npv and naiv parameters must be specified with the chg-srvsel command. The np and nai parameters can be specified in place of the npv and naiv parameters, and the npv and naiv parameters can be specified in place of the np and naiv parameters so long as parameter values be specified correspond to the values shown in the rtrv-srvsel output. See Tables 5-6 and Table 5-7 on page 5-52 for more information on using these parameters.**
3. **The gtii/gtin/gtin24, tt, ssn, np, nai, npv, or naiv parameters cannot be changed in this procedure. To change these parameters, remove the service selector using the "Removing a Service Selector" procedure on**

page 5-46, then re-enter the service selector as an EIR service selector using the "Adding an EIR Service Selector" procedure on page 5-40.

When this command has successfully completed, this message should appear.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
Service Selector table is (9 of 20992) 1% fullCHG-SRVSEL: MASP A - COMPLTD
```

4. Verify the changes with the **rtrv-srvsel** command with the **serv=eir**, **gtii/gtin/gtin24**, **tt**, **ssn**, **np**, **nai**, **npv**, and **naiv** parameters and values, as applicable, used in step 3. For this example, enter these commands.

   rtrv-srvsel:gtin=4:tt=4:np=e214:nai=natl:ssn=34:serv=eir

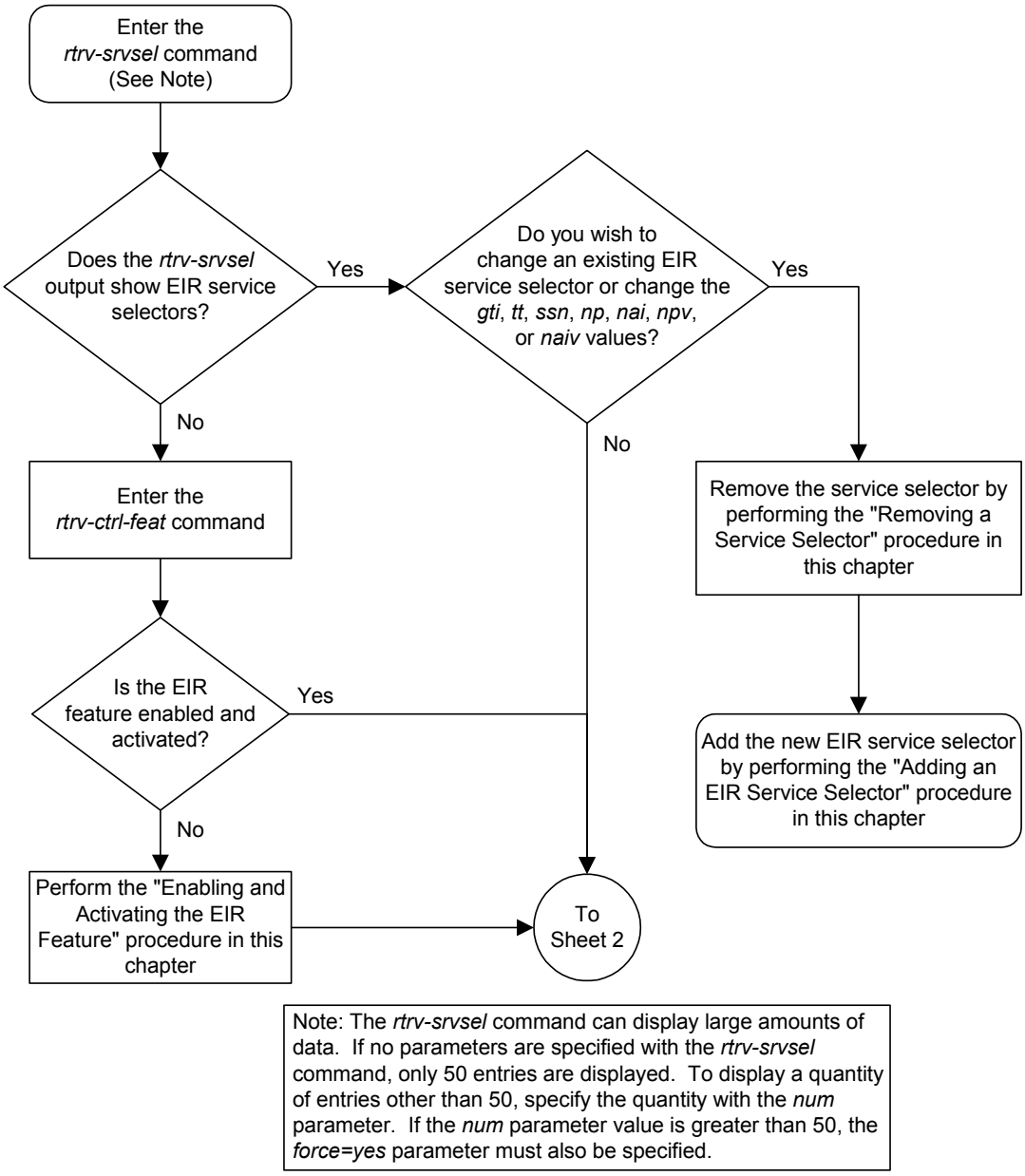
   This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0

GTIN  TT   NP       NAI   NPV  NAIV  SSN  SNP   SNAI   SERV
4     4    e214     natl  ---  ---   34   ---   ---    eir

SRV SELECTOR table is (9 of 20992)   1 % full
```

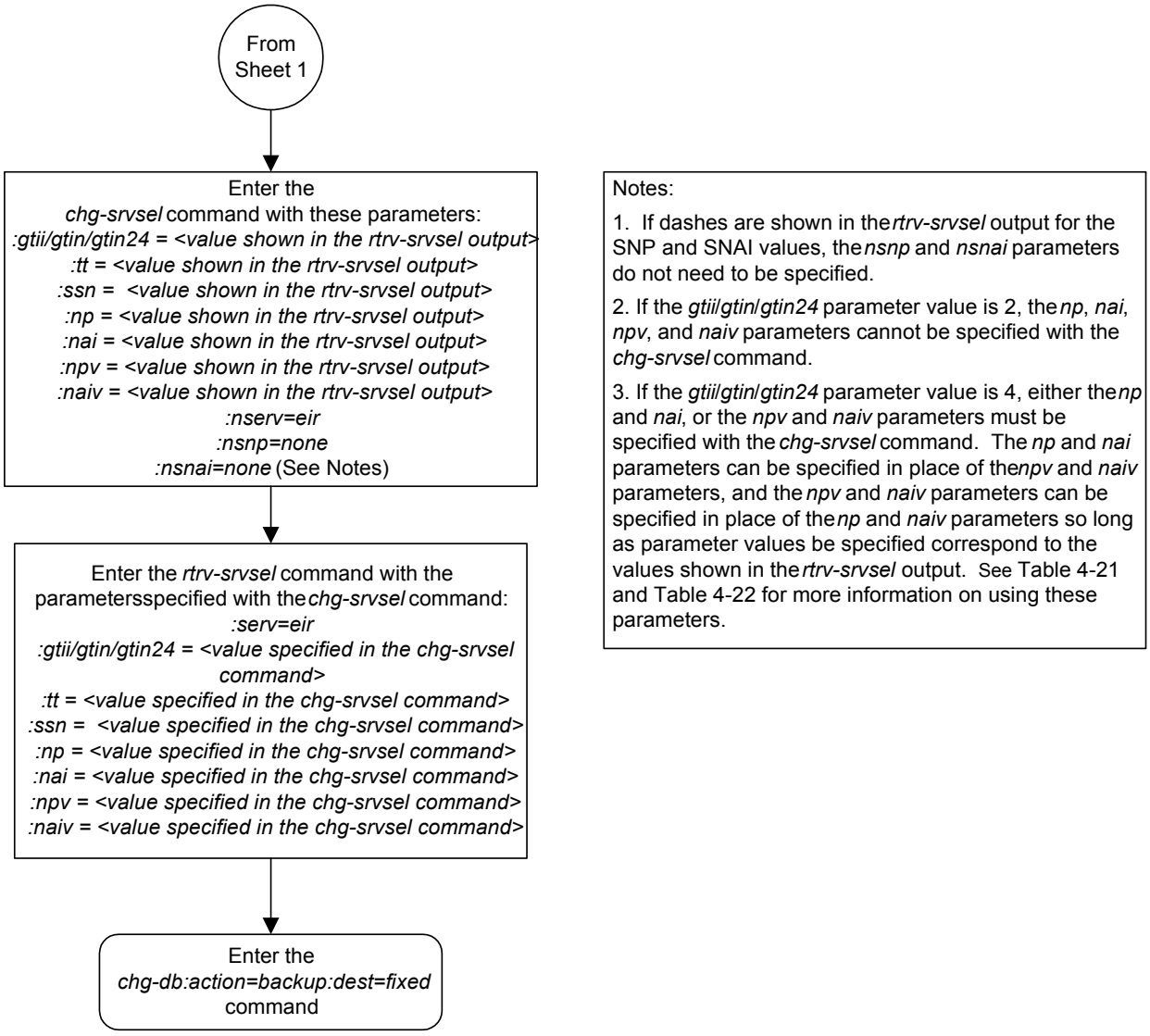
5. Backup the new changes using the **chg-db:action=backup:dest=fixed** command. The following messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

```
BACKUP (FIXED): MASP A - Backup starts on active MASP.
BACKUP (FIXED): MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED): MASP A - Backup starts on standby MASP.
BACKUP (FIXED): MASP A - Backup on standby MASP to fixed disk complete.
```

Flowchart 5-10. Changing an Existing Non-EIR Service Selector to an EIR Service Selector (Sheet 1 of 2)



Flowchart 5-10. Changing an Existing Non-EIR Service Selector to an EIR Service Selector (Sheet 2 of 2)



Changing the EIR Options

This procedure is used to change the EIR Global Response status, EIR Response Type, and EIR IMSI Check status settings with the **chg-gsmopts** command. The **chg-gsmopts** command uses these parameters to detect circular routing in the system.

:eirgrsp – The EIR Global Response type. The values for this parameter are:

- **off** – the EIR global response type is turned off.
- **whitelst** – the White List EIR global response type is turned on
- **graylst** – the Gray List EIR global response type is turned on
- **blklst** – the Black List EIR global response type is turned on
- **unknown** – the Unknown EIR global response type is turned on

The default value for this parameter is **off**.

When this parameter is set to **off**, the normal list logic is applied to the IMEI.

If the Global Response Type parameter is set to something other than **off**, no list logic processing occurs and the response is sent to the MSC is either White List, Gray List, Black List, or Unknown, regardless of the actual status of the IMEI.

:eirrsptype – the EIR Response Type. This parameter determines how the lists are to be searched. The EIR Response Types are **type1**, **type2**, and **type3**.

For EIR Response Types 1 or 2, the IMEI searches are handled in this manner:

- If the IMEI is found in the Black List table, the search stops without searching the White and Gray List tables. The IMEI is considered black listed regardless of IMEI's presence on the White or Gray List tables.
- If the IMEI is found in the Gray List table, but not found in the Black List table, the search stops without searching theWhite List table. The IMEI is considered gray listed regardless of the IMEI's presence on the White List table.

For EIR Response Type 3, the IMEI searches are handled in this manner:

- The White List table is searched first. If the IMEI is not found in the White List table, the IMEI is treated as unknown - no other table searches need to be performed.
- If the IMEI is found in the White List table, the Black List table is searched next. If the IMEI is in the White and Black tables, the IMEI is considered black listed - no need to search the Gray List table.
- If the IMEI is found in White List table, but not in the Black List table, the Gray List table is searched. If the IMEI is in the White and Gray list tables, the IMEI is considered gray listed. If the IMEI is in the White List table, but not in the Gray List table, the IMEI is considered white listed.

:eirimsichk – EIR IMSI Check status, **off** or **on**. This parameter indicates whether or not the IMSI is used when determining if an IMEI is to be black listed. If the **eirimsichk** parameter value is **on** and an IMEI is found on the black list, then the corresponding IMSI is retrieved. If the IMSI found in the message matches the IMSI retrieved, then the IMEI is considered to be on the white list. If the IMSI's do not match or is not found, then the IMEI will remain black listed.

The EIR feature must be enabled and activated. Verify this by entering the **rtrv-ctrl-feat** command. If the EIR feature is enabled and activated, the status of the EIR feature should be **on**. If the EIR feature is not enabled and activated, perform the Procedure , "Enabling and Activating the EIR Feature," on page 5-13.

Procedure 5-11.

1. Display the status of the EIR options with the **rtrv-gsmopts** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
GSM OPTIONS
-----------------------
EIRGRSP     = BLKLST
EIRRSPTYPE  = TYPE2
EIRIMSICHK  = ON
```

NOTE: The rtrv-gsmopts command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the rtrv-stpopts command, see the rtrv-gsmopts command description in the *Commands Manual*.

If the EIR options are not shown in the **rtrv-gsmopts** output, the EIR feature is not enabled and activated. Perform the Procedure , "Enabling and Activating the EIR Feature," on page 5-13, to enable and activate the EIR feature.

2. Change the EIR options by entering the chg-gsmopts command with at least one of the EIR option parameters. For this example, enter this command.

chg-gsmopts:eirgrsp=whitelst:eirrsptype=type3:eirimsichk=off

When this command has successfully completed, this message should appear.

```
rlghncxa03w 03-06-07 00:22:57 GMT  Rel 33.1.0
CHG-GSMOPTS: MASP A - COMPLTD
```

3. Verify the changes using the **rtrv-gsmopts** command. This is an example of the possible output.

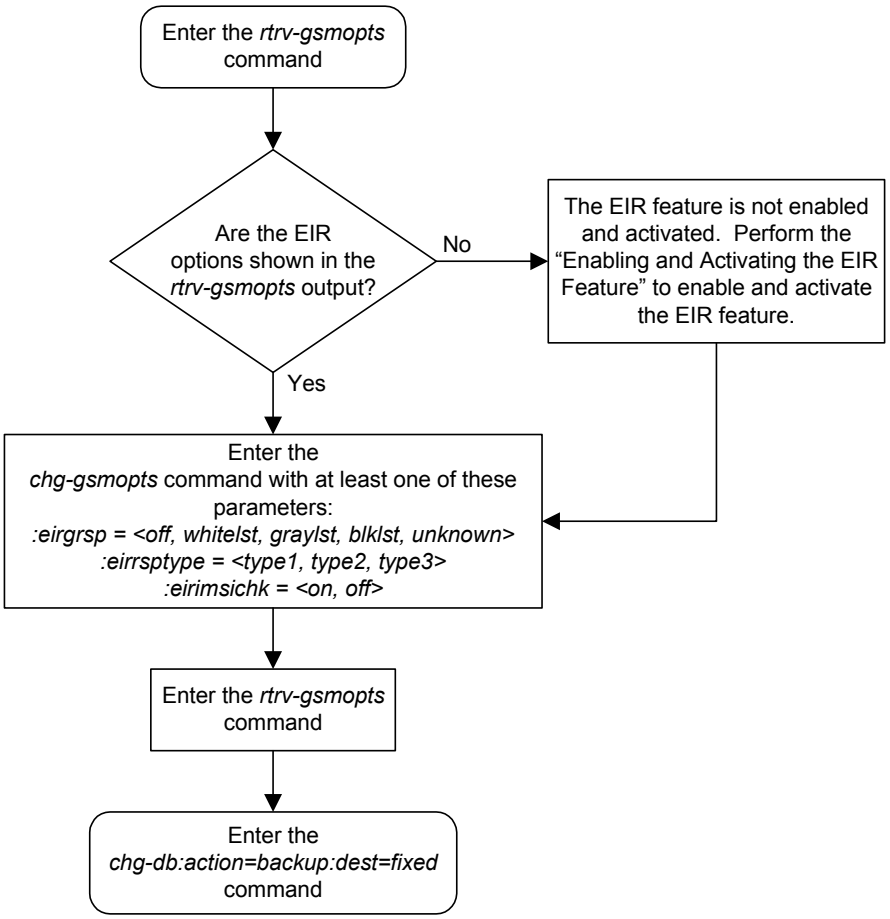
```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 33.1.0
GSM OPTIONS
-----------------------
EIRGRSP     = WHITELST
EIRRSPTYPE  = TYPE3
EIRIMSICHK  = OFF
```

NOTE: The `rtrv-gsmopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-stpopts` command, see the `rtrv-gsmopts` command description in the *Commands Manual*.

4. Back up the new changes using the **`chg-db:action=backup:dest=fixed`** command. These messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

Flowchart 5-11. Changing the EIR Options



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