Tekelec EAGLE® 5 Integrated Signaling System

Feature Manual - Equipment Identity Register

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Introduction

Overview

This manual provides details of the Equipment Identity Register (EIR) feature of the EAGLE 5 ISS (Integrated Signaling 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. MSs on the black list will be denied access to the network. MSs on the gray list will be allowed on the network, but may be tracked.

EIR is an optional feature on the EAGLE 5 ISS, 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 ISS. Users of this manual and the others in the EAGLE 5 ISS 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 ISS EIR Commands, describes the new or updated commands that support the EIR feature. It provides some sample reports and explanations of appropriate command usage.
- Chapter 4 EIR Configuration, describes how to activate the EIR feature.
- Chapter 5 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.

Related Publications

For information about additional publications that are related to this document, refer to the *Related Publications* document. The *Related Publications* document is published as a part of the *Release Documentation* and is also published as a separate document on the Tekelec Customer Support Site.

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The Tekelec EAGLE 5 ISS documentation set is released on a CD-ROM. This format allows for easy searches through all parts of the documentation set.

The electronic file of each manual is also available from the Tekelec Customer Support site. This site allows for 24-hour access to the most up-to-date documentation.

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A critical situation is defined as a problem with an EAGLE 5 ISS 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

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2

Feature Description

Equipment Identity Register Overview

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. MSs on the black list are denied access to the network. MSs 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, gray, 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 DSM cards with 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.

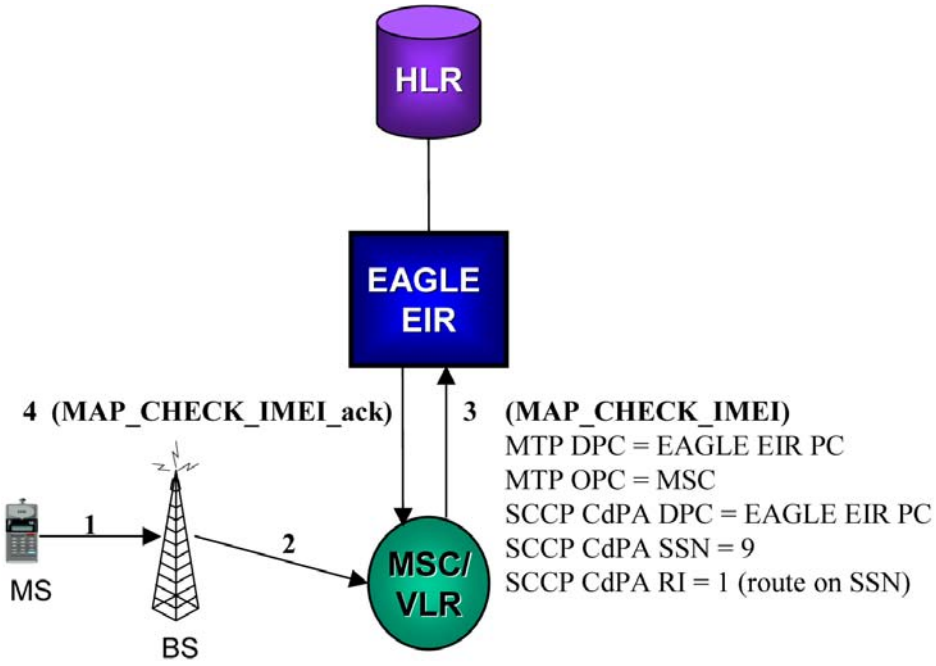
In the EIR network, the MSC/VLR sends a MAP_CHECK_IMEI message to the EIR prior to sending a location update to the HLR. This message contains, at a minimum, the IMEI of the MS attempting registration. It may also

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, gray, 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, gray, 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 ISS 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 ISS EIR. This message is either MTP-routed directly to the point code of the EAGLE 5 ISS and the EIR subsystem (SSN = "EIR"), or is GT-routed and the EAGLE 5 ISSGT-translates the message to its own point code and local EIRSSN = "EIR".

4. The EAGLE 5 ISS EIR retrieves the IMEI and/or IMSI from the message and searches the EIR tables for a match. Refer to **Table 2-1** and **Table 2-2** . This search may result in the IMEI being on the white, gray, 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 ISS 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 where 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 ISSdatabase 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	Gray 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 gray and/or black list). The logic described by Logic for IMEIs in Multiple Lists table is used to determine which answer to return in the CHECK_IMEI response, determined by which list(s) the IMEI is on. The Logic for IMEIs in Multiple Lists table 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	Gray	Black	Type 1	Type 2	Type 3
X			in white list	in white list	in white list
X	X		in gray list	in gray list	in gray 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 gray list	in gray 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 Scenarios

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 gray 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 gray 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.

EIR Protocol

The EAGLE 5 ISS 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 ISS's true point code or the EIR capability point code in the DPC field of the message, and EAGLE 5 ISS's EIR Subsystem number in the Called Party Subsystem field of the message. If EIR queries has the EAGLE 5 ISS's capability point code for the DPC, then the EAGLE 5 ISS 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 ISS's capability point codes in the DPC field. The EAGLE 5 ISS also processes the message if it has the EAGLE 5 ISS'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 ISS is acting as an end node, and end nodes do not reroute. If the return on error option is set, the EAGLE 5 ISS 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 ISS 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 ISS sends SSPs that cause 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 ISS 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 ISS'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 ISS's True Point Code, the EAGLE 5 ISS will not generate a TFP. Therefore, nodes that send *rt-on-gt* traffic to the EAGLE 5 ISS should use one of EIR Capability Point Codes, not the EAGLE 5 ISS's True Point Code.

If the EAGLE 5 ISS receives an RSP (Route Set Test Message - Prohibited) for an EIR Capability Point Code, and the EIR subsystem is offline, the EAGLE 5 ISS does not reply. If the EAGLE 5 ISS receives an RSR (Route Set Test Message - Restricted) for EIR Capability Point Code, and the EIR subsystem is offline, the EAGLE 5 ISS 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 message is 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 ISS 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 ISS 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 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 ISS 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

Data Type	Size	Creation	Cleanup
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 ISS, each file will be no more than 25MB	Automatic	Automatic. There should be approximately 25 logs at most.

MPS/EPAP Platform

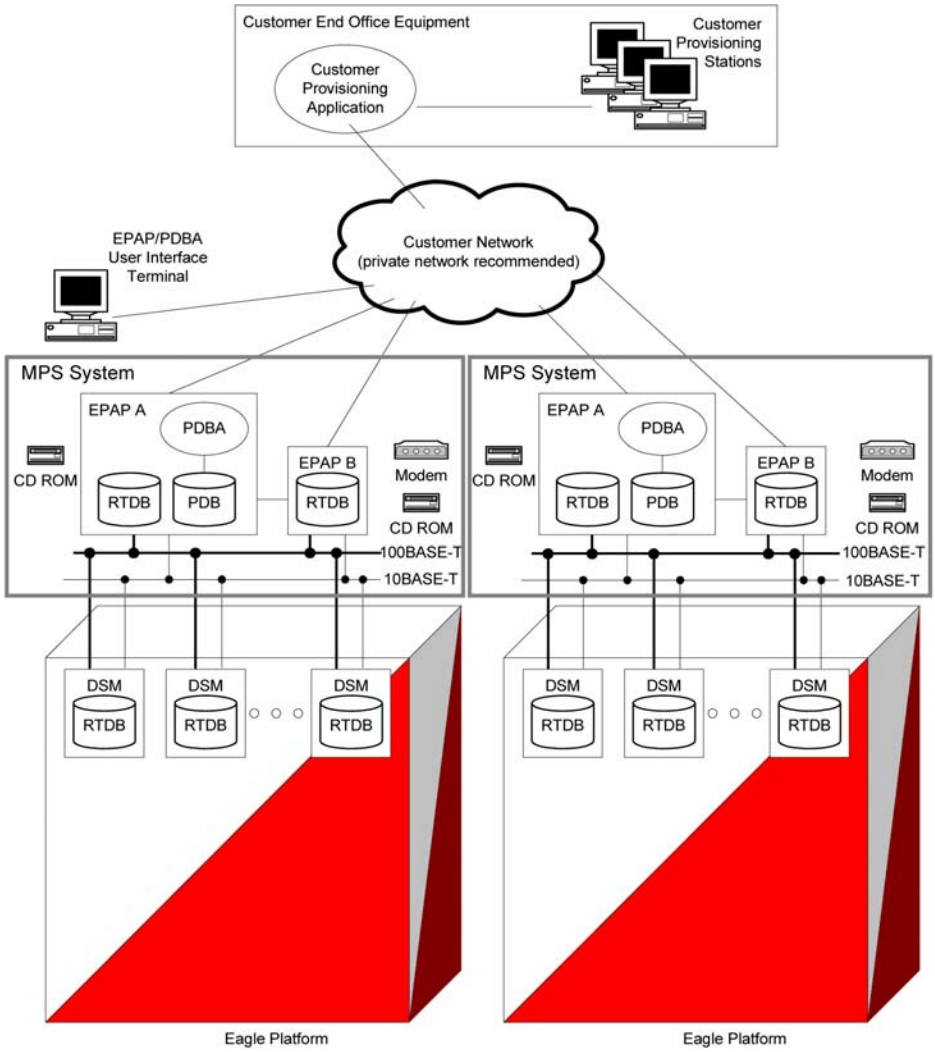
Tekelec provides the MPS (Multi-Purpose Server) platform as a subsystem of the EAGLE 5 ISS. The MPS provides support for the AINPQ, A-Port, EIR , G-Flex, G-Port, IGM, and INP features.

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 *Tekelec 1000 Application Server Hardware Manual*.) The MPS provides the means of interfacing the customer provisioning application with the EAGLE 5 ISS. It connects the customer with the EAGLE 5 ISS and accepts the customer number portability data, while accommodating numbers of varying lengths.

The EAGLE Provisioning Application Processor (EPAP) is software that runs on the MPS hardware platform. It collects and organizes customer provisioning data, and forwards it to the EAGLE 5 ISS 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 ISS DSM databases.

NOTE: The EAGLE 5 ISS supports more than one type of hardware card that provides the DSM function. The cards differ in the size of database and the transactions/second rate that they support. In this manual, the term DSM is used to mean any hardware card that supports the DSM function, unless a specific card (such as E5-SM4G) is mentioned. For more information about the hardware cards that support the DSM function, refer to the *Hardware Manual - EAGLE 5 ISS*.

Figure 2-2. MPS/EPAP Platform Architecture



Design Overview and System Layout

Figure 2-2 illustrates the overall system architecture 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, each containing a RealTime Database (RTDB), a Provisioning Database (PDB), servers, optical media , modems, and network hubs. Each MPS and its EPAPs may be thought of as an ‘EPAP system’; the EPAP system and the mated EAGLE 5 ISS is referred to as the ‘mated EPAP system’. Each EPAP system is a T1000 AS system with a total of four Ethernet interfaces: one from each EPAP to the 100Base-T Ethernet and one from each EPAP to the 10Base-T Ethernet.

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

The RTDB 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 subscriber database. In the case where the active link fails, the active EPAP switches to the standby link to continue provisioning the DSM cards. 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 subscriber databases on the EAGLE 5 ISS DSM cards using the Reliable Multicast Transport Protocol (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 subscriber database. The PDB module can run on one of the EPAPs of either of the mated EAGLE 5 ISSs.

Functional Overview

The main function of the MPS / EPAP platform is to provision the data from the customer network to the DSM cards on the EAGLE 5 ISS. Subscriber 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 connection to provision the DSM cards on the EAGLE 5 ISS. The maintenance module is responsible for the overall stability and performance of the system.

It is possible for the current copy of the RTDB database on the DSM cards to get out-of-sync due to missed provisioning or card rebooting. Therefore, the RTDB on the EPAP contains a coherent, current copy of the subscriber 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 user database required for EAGLE 5 ISS EPAP-based features. The following functions are supported:

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

The PDBA operates on the master Provisioning Database (PDB). The EPAP and PDBA are both installed on the MPS hardware platform.

The EPAP platform performs the following:

- maintains an exact copy of the real-time database (RTDB) on the EPAP

- distributes the subscription database to the DSM cards
- maintains a redundant copy of the RTDB database

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.Subscription 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 transmit by the EPAPs across a private network to the DSM cards located in the EAGLE 5 ISS frame.

The primary interface to the PDBA consists of machine-to-machine messages. The interface is defined by Tekelec and is described in the Provisioning Database Interface Manual. Provisioning software compatible with the EPAP socket interface can be created or updated using the interface described in that manual.

Additionally, a direct user interface is provided on each EPAP to allow for 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 required high provisioning rates. Compared to the traditional OAM platform, the persistent database and provisioning in an open systems 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

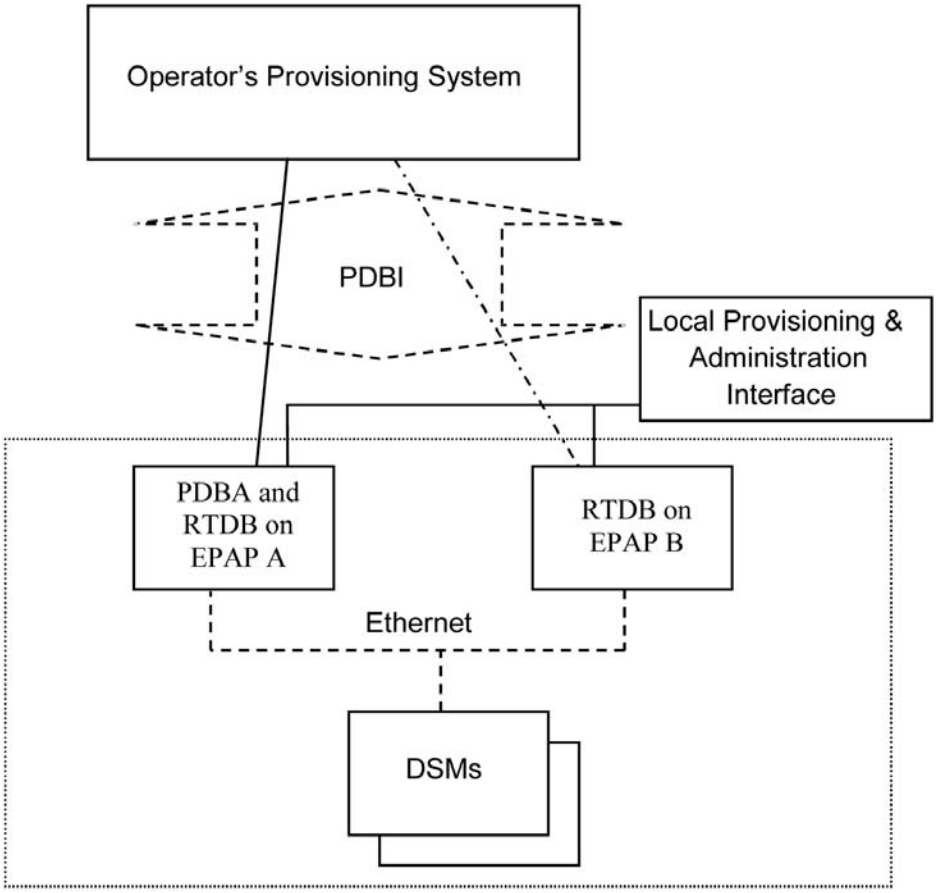
Each EPAP server maintains a copy of the Real-Time Database (RTDB) in order to provision the EAGLE 5 ISS DSM cards. The EPAP server must comply with the hardware requirements in the *MPS Hardware Manual*. **Figure 2-2** illustrates the EPAP architecture contained in the MPS subsystem.

Each EPAP has a dedicated optical media drive. One EPAP per EAGLE 5 ISS platform has a modem capable of supporting remote diagnostics, configuration, and maintenance. These remote operations are performed through EPAP login sessions and are accessible across the customer network as well as through a direct terminal connection to the EPAP using an RS232 connection. Refer to the *Tekelec T1000 Application Server Hardware Manual* for details about the hardware devices and network connections.

Subscriber Data Provisioning

Figure 2-3 shows the current high-level view of the subscriber data provisioning architecture. Only those parts of the EAGLE 5 ISS platform that are relevant to subscriber data provisioning are shown. This section defines requirements for the PDBI (Provisioning Database Interface) between the EPAP and the operator's provisioning system (OPS). Provisioning clients connect to the EPAPs via the Provisioning Database Interface (PDBI). This interface contains commands that allow all of the provisioning and retrieving of subscription data. The PDBI is used for real-time provisioning of subscriber and network entity data only. Refer to the *Provisioning Database Interface Manual* for more details.

Figure 2-3. Subscriber Data Provisioning Architecture (High Level)



A pair of active/standby EPAP servers provides the interface between the Realtime Database (RTDB) of the EAGLE 5 ISS DSM cards (Database Service Modules) and the OPS. EPAP A is equipped with both the PDB (Provisioning Database) and the RTDB database, and EPAP B has just the RTDB. An EPAP with just the RTDB must be updated by the EPAP that has the PDB.

For more information about the EPAP, refer to the *EPAP Administration Manual*. For more information about the MPS hardware, refer to the *Tekelec 1000 Application Server Hardware Manual*.

Distributed Administrative Architecture

This section describes, at a high level, the distributed administrative architecture for the EAGLE 5 ISS, including the EPAP.

In general, EAGLE 5 ISS database updates are sent via an EAGLE 5 ISS terminal across an RS232 serial port to the active OAM (Operation Administration and Maintenance). The active OAM commits the update to TDM fixed disk and then sends the update control information to the standby OAM and to the rest of the network cards. When all databases are updated, the active OAM responds with a *Command Completed* indication to the user terminal. EAGLE 5 ISS database updates are generally considered to be EAGLE 5 ISS link, linkset, route, destination, mated application, gateway screening, and global title types of information.

Databases requiring high update and retrieval rates, (compared to the rates provided by the OAM) are not administered via EAGLE 5 ISS terminals. These databases,such as the EPAP RTDB, are populated using redundant Ethernet connections to DSM cards from an EPAPMPS platform.

An EPAP consists of a combined Provisioning (MySQL) and RTDB database. The Provisioning Database (PDB) responds to requests for updates by the active and standby RTDB databases on both mated EAGLE 5 ISSs. The active EPAPRTDB database is responsible for initiating multi-cast updates of changed database records to the DSM cards after the data has been committed to the EPAP disks. Furthermore, the PDB may accept and commit more database updates while the RTDB databases are completing their previous updates.

It is this overlapping of database updates, coupled with an RTDB transactional database engine and fast download time, that allows larger amounts of data at a time to be transferred from the PDB. Committing larger amounts of data at a time to the RTDB (versus a single update at a time) allows faster overall transaction rates to be achieved. The boundaries of the transaction rates become more closely related to cache size and disk cache flush time than the disk access time of a single update. Thus, successful completion of EPAP database updates only guarantees that the PDB has been updated, but it does *not* mean the RTDB has completed the update and sent the new subscription data to the DSM card.

The EPAP architecture contains a local provisioning terminal and a modem for remote access, as well as other functions. A backup device can be used to back up or restore the provisioning database. The local provisioning terminal is used to manually repair the standby EPAPRTDB database or to turn the subscriber database audit on or off. For additional information, refer to the *Tekelec T1000 Application Server Hardware Manual* and *EPAP Administration Manual*.

EPAP (EAGLE Provisioning Application Processor)

As shown in **Figure 2-2** , a single MPS system contains two EPAP (EAGLE Provisioning Application Processor) servers. At any given time, only one actively communicates with the DSM (Database Service Module) boards. The other EPAP server is in standby mode. In addition, two MPS systems can be deployed in a mated-pair configuration.

The primary purpose of the EPAP systems is to maintain the RTDB and PDB and to download copies of the RTDB to the DSM cards on the EAGLE 5 ISS.

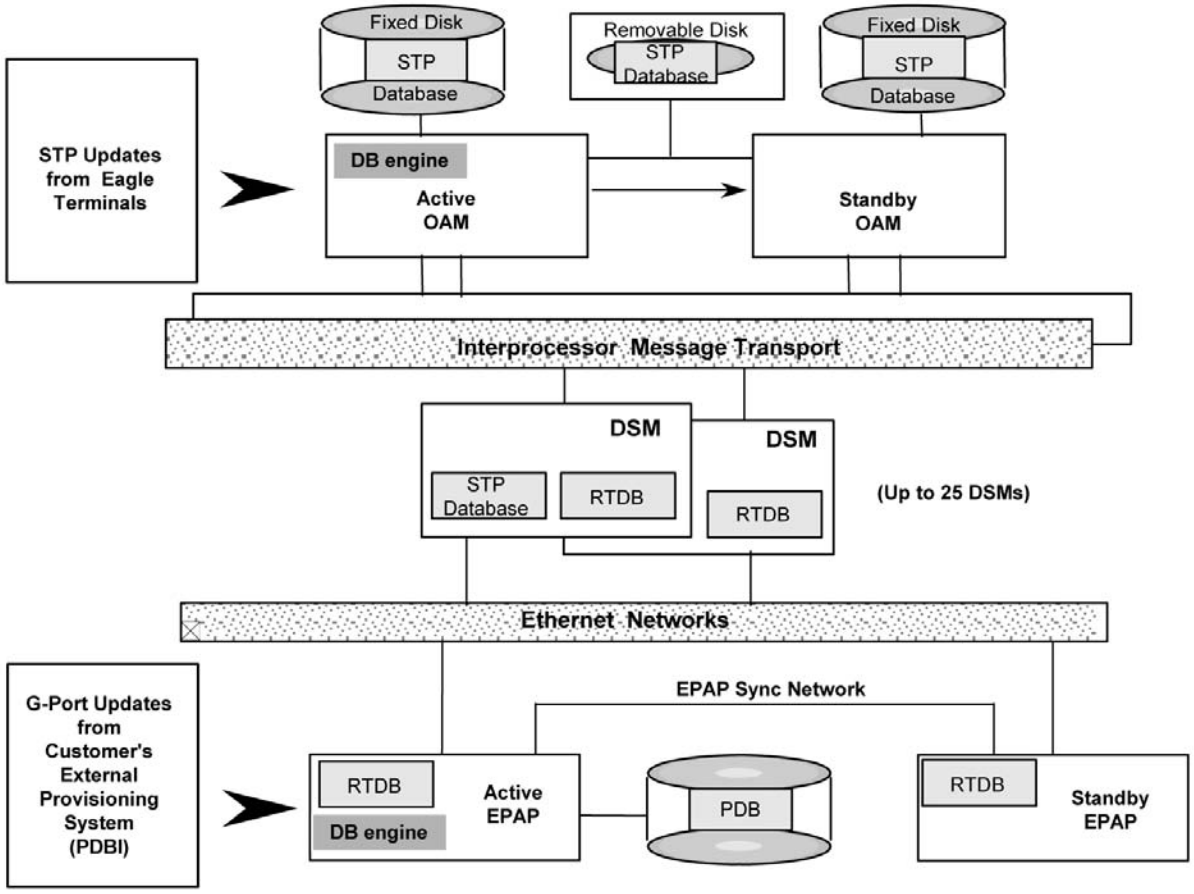
The PDB on the active EPAP receives subscription data from the customer network through the PDBI, the external source of provisioning information. The PDBA continually updates the active EPAP's PDB. The PDB uses MySQL database software. Once an update is applied to the active PDB, it is sent to the RTDBs on the active and standby EPAPs.

Both the active and standby EPAPs maintain copies of the RTDB. Periodically, the DSM card polls the active EPAP RTDB for any new updates. The active EPAP downloads the updates to the DSM for its own resident copy of the RTDB database.

In a mated-pair configuration, there are two mated MPS Systems, as shown in **Figure 2-2** . The PDB on the active EPAP automatically updates the PDB on the mate platform. The PDB on the mate platform then updates its EPAP RTDBs, which in turn update the RTDBs on the associated DSM cards.

Provisioning of the EAGLE 5 ISS's DSM cards is performed through two interfaces, using two different sets of commands. Provisioning is accomplished by the STP updates from EAGLE 5 ISS terminals and by updates from the customer's external provisioning system. This system of dual provisioning is illustrated in **Figure 2-4** .

Figure 2-4. Database Administrative Architecture



Database Service Module Cards

From 1 to 25 DSM cards can be provisioned with the EIR feature enabled. TheEIR feature requires that all DSM cards contain 4 GB of memory. **Figure 2-4** illustrates each DSM card having two Ethernet links, the main DSM network on the 100BASE-T link and the backup DSM network on the 10BASE-T link.

The extra memory holds a copy of the RTDB. The DSM Ethernet ports are linked to the EPAP systems to receive the downloaded RTDBs. The DSM cards run a version of the SCCP software application that has been ported to the VxWorks operating system. To differentiate the DSM-VxWorks-SCCP application from the SCCP that runs on Translation Services Module (TSM) cards, the DSM version is named ‘VSCCP’.

Multiple DSM cards 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 subscriber 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 loaded, it cannot receive new updates that have arrived at the EPAP since reload began. 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 (PDB) 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.

Overview of EPAP to DSM Communications

Before discussing DSM status reporting or EPAP status reporting, it is helpful to understand the communications between the DSM cards and the EPAP in broad terms.

- UDP - sending DSM status messages

  The DSM cards and EPAPs create a UDP (User Datagram Protocol) socket which is used for status messages. One of the last things a DSM card does when it is initialized is to send a status message to the EPAP, containing the DSM ID, database level, and memory size. The EPAP maintains tables containing the last known status of each DSM card. EPAP uses these to determine whether or not the DSM card needs to download the database.

- IP - reporting EPAP maintenance data

  The DSM cards create an TCP socket when they are initialized, and listen for connection requests. During initialization or after a loss of connectivity, the active EPAP chooses one of the DSM cards and issues a *Connect* to establish the TCP/IP connection with that DSM card (referred to as the primary DSM). The purpose of this link is to provide a path for reporting EPAP alarms and to forward maintenance blocks to the DSM.

- IP Multicast - downloading GSM database

  Because of the large size of the database and the need to download it quickly on up to 25 DSM cards, EIR uses a technique known as IP multicasting. This technique is based on Reliable Multicast Transport Protocol-II (RMTP-II), a product of Globalcast Communications. IP multicasting downloads the RTDB and database updates to all of the DSM cards simultaneously.

  The administration of IP multicasting is based on the concept of a “tree”, or stream of data, which is constantly being broadcast by the EPAP. DSM cards that need to download the real time database or to receive database updates “join the tree”. DSM cards can also “leave the tree”, typically when the database fills their available memory.

DSM Provisioning and Reload

One of the core functions of the EPAP is to provision the DSM cards with the RTDB database updates. In order to provide redundancy for this feature, separate RMTP channels are created on each interface from each EPAP:

- EPAP A, Link A (on the main DSM network, 100BASE-T)
- EPAP A, Link B (on the backup DSM network, 10BASE-T)
- EPAP B, Link A (on the main DSM network, 100BASE-T)

- EPAP B, Link B (on the backup DSM network, 10BASE-T)

Provisioning and other data is broadcast on one of these channels to all of the DSM cards. Provisioning is done by database level in order to leave DSM tables coherent between updates.

The DSM cards do the following:

- Detect the need for incremental updates and send a status message to the EPAP.
- Discriminate between the various streams according to the database level contained in each message and accept updates according to the DSM card's current database level.

DSM Reload Model

DSM cards may require a complete database reload in the event of reboot or loss of connectivity for a significant amount of time. The EPAP provides a mechanism to quickly load a number of DSM cards with the current database. The database on the EPAP is large and may be updated constantly. The database sent to the DSM card or cards will likely be missing some of these updates making it corrupt, in addition to being "back level."

EPAP Continuous Reload

It is important to understand how the EPAP handles reloading of multiple DSM cards from different starting points. Reload begins when the first DSM card requires it. Records are read sequentially from the real-time database from an arbitrary starting point, wrapping back to the beginning. If another DSM card requires reloading at this time, it uses the existing record stream and notifies the DSM provisioning task of the first record it read. This continues until all DSM cards are satisfied.

DSM Database Levels and Reloading

The current database level when the reload started is of special importance during reload. When a DSM card detects that the last record has been received, it sends a status message back to the EPAP indicating the database level at the start of reload. This action starts incremental loading. The DSM card continues to reload until it is completely caught up with the current level of the RTDB. As database records are sent to the DSM cards during reload, normal provisioning can *change* those records. All records changed between the start and end of reloading must be incrementally loaded before the database is coherent and usable by the DSM card.

The following terminology is used here for the stages of database reload for a given DSM.

- **Stage 1 loading**: The database is being copied record for record from the golden RTDB in the EPAP to the DSM RTDB. The database is incoherent during stage 1 loading.
- **Incremental update**: The database is receiving all of the updates missed during stage 1 loading or some other reason (e.g., network outage, processor limitation, lost communication, etc.). The database is coherent, but back-level during incremental update.
- **Current**: The database is receiving current updates from the DSM provisioning task.
- **Coherent:** The database is at a whole database level, that is, not currently updating records belonging to a database level.

DSM Reload Requirements

DSM cards may require a complete database reload if there is a reboot or loss of connectivity for a significant amount of time. The EPAP provides a mechanism to quickly load a number of DSM cards with the current database. The RTDB on the EPAP is large and can be updated constantly from the customer’s provisioning network.

The upload process is divided into two stages:

1. Sequentially send the initial database records.
2. Send any updates missed since the beginning of the first stage.

The DSM reload stream uses a separate RMTP channel from the provisioning and incremental update streams. This allows DSM multicast hardware to filter out the high volume of reload traffic for DSM cards that do not require it.

DSM cards do the following:

- Detect the need for stage 1 loading and send a status message to the EPAP.
- Identify the first record DSM was able to read in the above status message if a record stream is already in progress.
- Handle the record stream regardless of the starting point (that is, records starting with the middle record of the middle table).
- Expect tables to be sent in a particular order and therefore detect any gap in the record stream.
- Send a status message if a gap is detected. Stage 1 loading is essentially reset to the last update received.
- Handle wrapping from the last record from the last table to the first record of the first table of the last update received.
- Know when they have received all the required records to proceed to stage 2 loading.`
- Send a status message when stage 1 loading is complete, indicating the database level at the beginning of stage 1.
- Detect when the master RTDB crosses a memory boundary during stage 1 loading; the card automatically reboots and then auto-inhibits.

DSM Reload Requirements

DSM cards may require a complete database reload if there is a reboot or loss of connectivity for a significant amount of time. The EPAP provides a mechanism to quickly load a number of DSM cards with the current database. The RTDB on the EPAP is large and can be updated constantly from the customer's provisioning network. As the RTDB is sent to the DSM cards, it can possibly miss some updates, making it inconsistent as well as back level.

The upload process is divided into two stages, one that sequentially sends the initial database records and another that sends any updates missed since the beginning of the first stage. The DSM reload stream uses a separate RMTP channel from the provisioning and incremental update streams. This allows DSM multicast hardware to filter out the high volume of reload traffic from DSM cards that do not require it.

DSM cards do the following:

- Detect the need for stage 1 loading and send a status message to the EPAP.
- Identify the first record DSM was able to read in the above status message if a record stream is already in progress.
- Handle the record stream regardless of the starting point (that is, accommodate records starting with the middle record of the middle table).
- Expect tables to be sent in a particular order and therefore detect any gap in the record stream.

- Send a status message if a gap is detected. Stage1 loading is essentially reset to the last update received.
- Handle wrapping from the last record from the last table to the first record of the first table.
- Know when they have received all the required records to proceed to stage 2 loading.
- Send a status message when stage 1 loading is complete, indicating the database level at the beginning of stage 1.
- Detect when the master RTDB crosses a memory boundary during stage 1 loading; the card automatically reboots and then auto-inhibits.

EPAP Status and Error Reporting via Maintenance Blocks

The EPAPs forward all status and error messages to the DSM cards in maintenance blocks. Maintenance blocks are asynchronously sent whenever the EPAP has something to report. The maintenance blocks eventually update EPAP Device Control Blocks (DCBs) located on the EAGLE 5 ISS. The DCBs provide the status information that is received when a **`rept-stat-mps`** command is issued.

Network Connections

Several customer and Tekelec-installed private networks are *required* to support the provisioning of subscription data. These networks are:

- Customer Provisioning Network
- EPAP Sync Network
- DSM Networks
- Dial-Up PPP Network

The following discussion is an overview of these private networks. It expands on the networks in the architecture diagram shown in **Figure 2-5** . (For details about configuring these networks, refer to the *EPAP Administration Manual*.)

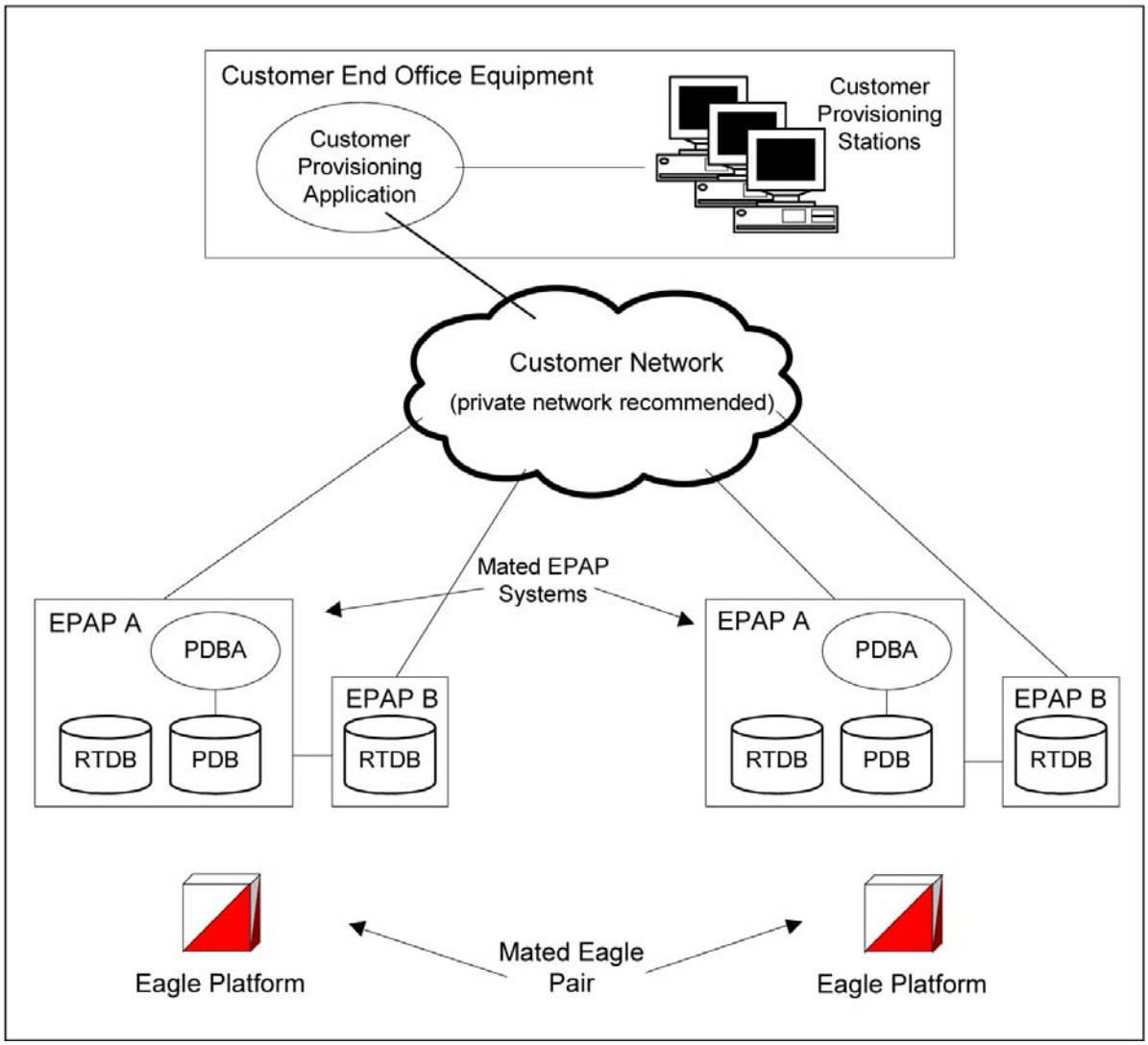
Customer Provisioning Network

The customer network carries the following traffic:

- Customer queries and responses to the PDB via the PDBI from the customer provisioning network
- Updates between PDBs of a mated EAGLE 5 ISS pair
- Updates between a PDB on one EAGLE 5 ISS and RTDBs on a mated EAGLE 5 ISS
- PDBA import/export (file transfer) traffic
- Traffic from a PDBA reloading from its mate
- EPAP and PDBA user interface traffic.

A typical customer network is shown in **Figure 2-5** .

Figure 2-5. Customer Provisioning Network

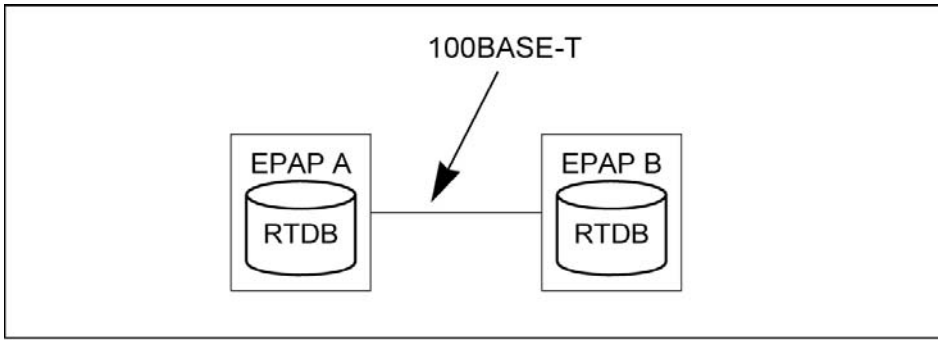


Although a dedicated network is recommended, it is possible that unrelated customer traffic can use the network as well. The determination, either to have a dedicated network or to allow other customer traffic, should be based on available external Ethernet bandwidth and network performance considerations.

EPAP Sync Network

The EPAP sync network carries RTDB and maintenance application traffic between active and standby EPAP servers on an MPS system. It synchronizes the contents of the RTDBs of both EPAP A and B. The EPAP Sync network is a single Ethernet connection between EPAP A and EPAP B running at 100BASE-T, as shown in **Figure 2-6** .

Figure 2-6. EPAP Sync Network

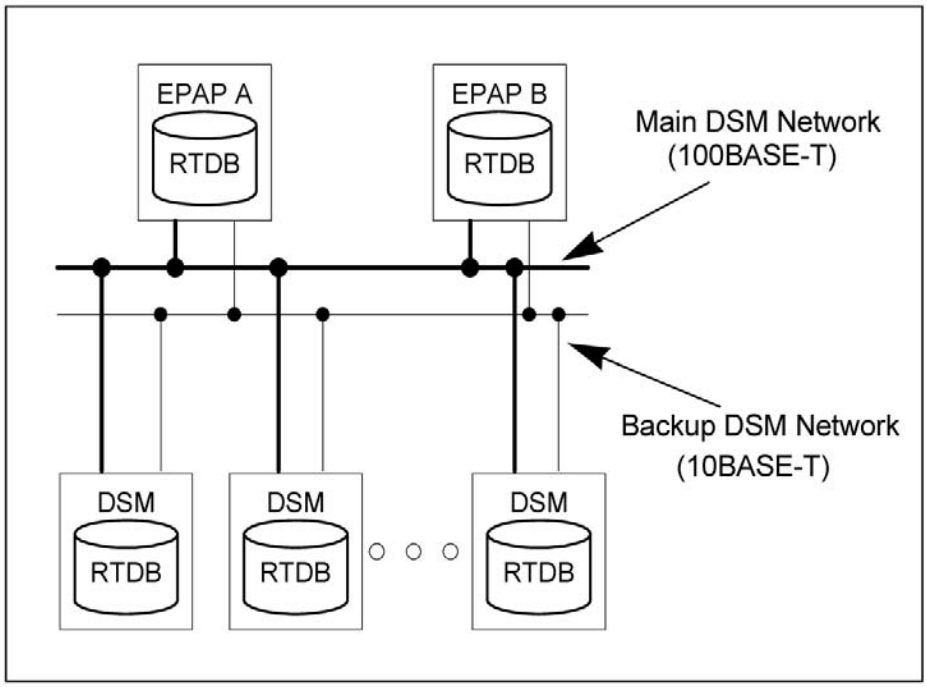


DSM Networks

The DSM card networks are shown in **Figure 2-7** . They carry provisioning data from the active EPAP RTDB to the DSM cards. They also carry reload and maintenance traffic to the DSM cards.

The DSM networks consist of two Ethernet networks: the main DSM network running at 100BASE-T, and the backup DSM network running at 10BASE-T. Both Ethernet networks connect EPAP A and EPAP B with every DSM card on a single EAGLE 5 ISS platform.

Figure 2-7. DSM Card Networks



Maintenance information is sent from the active EPAP to an arbitrarily selected DSM card. The selected DSM is known as the primary DSM. Static information is exchanged across this interface at initialization, and dynamic information is exchanged on occasion.

While much of the traditional OAM provisioning and database functionality is implemented on the EPAP, the maintenance reporting mechanism is still the OAM.

The first and second octets of the EPAP network addresses for this network are 192.168. (The first two octets for private class C networks are defined in RFC 1597.)

The third octet is a customer specifiable for each DSM network. It is important to select values that do not interfere with the customer's network addressing scheme.

The fourth octet of the address is specified as follows:

- If the EPAP is configured as “EPAP A”, the fourth octet has a value of 100.
- If the EPAP is configured as “EPAP B”, the fourth octet has a value of 200.

Table 2-4 summarizes the contents of each octet.

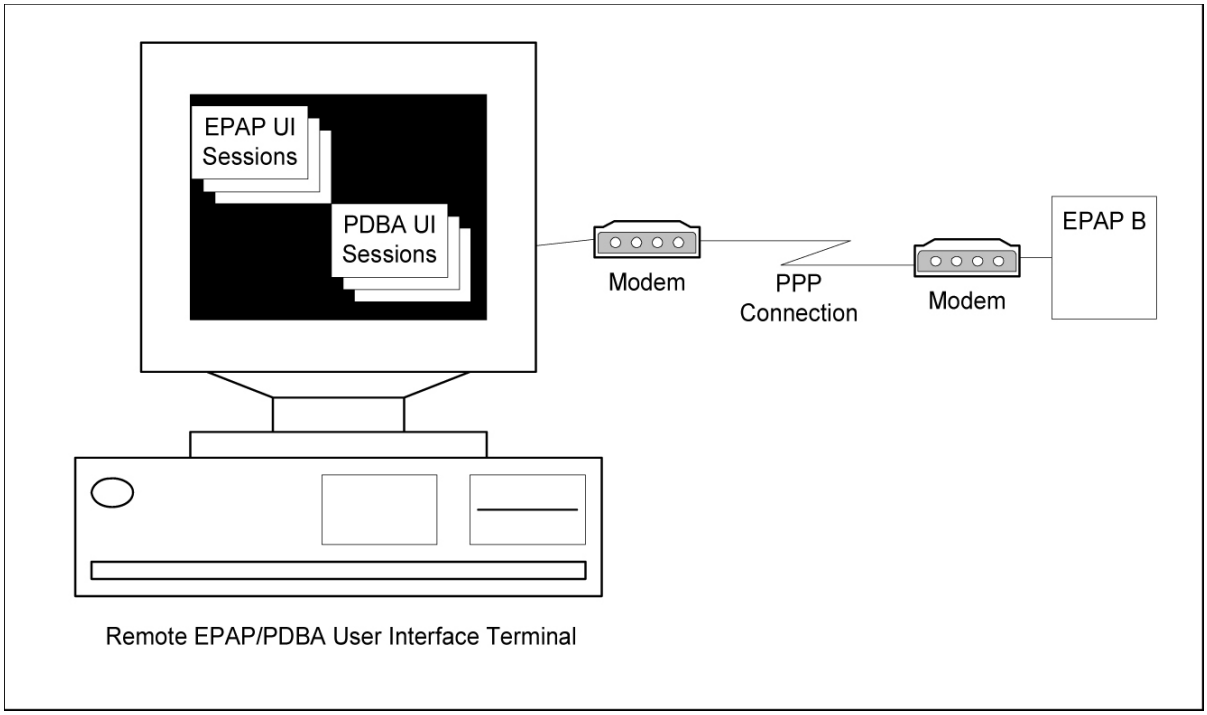
Table 2-4. EPAP IP Addresses in the DSM Network

Octet	Value
1	‘192’
2	‘168’
3	One customer-provisioned value for DSM network A, and another for DSM network B
4	‘100’ for EPAP A‘200’ for EPAP B

Dial-Up PPP Network

The dial-up PPP network allows multiple user-interface sessions to be established with the EPAP. The network connects a remote EPAP/PDBA user interface terminal with the EPAP in the EAGLE 5 ISS’s MPS subsystem. The dial-up PPP network is illustrated in Figure 2-8 .

Figure 2-8. Dial-Up PPP Network



Serviceability Hints

The following hints are offered to aid in the serviceability of EIR databases:

- Mated Application Considerations
- Entity Point Codes and Routes

Mated Application Considerations

An EPAP-administered entity data can possibly become out-of-sync with the EAGLE 5 ISS mated application table because the creation of entity point codes (and/or subsystem numbers) in the mated application table is not performed at database administration time.

If this mismatch is discovered in real-time operations, a UIM message (such as “SCCP did not route - DPC not in MAP tbl” or “SCCP did not route - SS not in MAP tbl”) is sent to the EAGLE 5 ISS maintenance terminal. This message means the MSU was discarded.

For this reason, it is recommended that the entity (SP or RN) not be administered until the entity point code (and/or subsystem number) has been entered into the EAGLE 5 ISS mated application (MAP) table.

Entity Point Codes and Routes

Verification that an entity point code exists in the route table and has a route is not performed at database administration time. Therefore, it is possible for the EPAP entity data to be out-of-sync with the EAGLE 5 ISS route table.

If an out-of-sync condition is discovered during real-time operation, a UIM is sent to the EAGLE 5 ISS maintenance terminal, indicating one of these conditions:

- Destination point code is not in the route table.
- Destination point code exists in the route table but is not assigned a route.
- Destination point code exists in the route table and has been assigned a route, but it is out of service.

3

EAGLE 5 ISS EIR Commands

Introduction

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

EAGLE 5 ISS Commands for EIR

This section includes the EAGLE 5 ISS 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 ISS EIR

EAGLE 5 ISS 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

EAGLE 5 ISS Commands for EIR Feature			
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 ISS 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 35.0.0
    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 ISS 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
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

Black List	Gray List	White List	IMSI Check	IMSI Match	Result Type	LOG Entry	LOG Entry Result	MSU Result Equipment Status
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
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	EIRIMSI Check status

Command examples follow.

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

- **rtrv-gsmopts: Retrieve EIR 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 ISS 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 ISS 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

Parameter	Optional/ Mandatory	Range	Description
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
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

Parameter	Optional/ Mandatory	Range	Description
SERV	Optional	eir	GSM service
SSN	Mandatory	0-255, *	Subsystem number
TT	Optional	0-255	Translation Type

EAGLE 5 ISS 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 ISS.

- **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 turn on the EIR feature. The EIR feature cannot be enabled if any 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 to 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-measopts
- chg-sid / dlt-sid
- ent-map / chg-map / dlt-map
- ent-ss-appl / chg-ss-appl / dlt-ss-appl / rtrv-ss-appl
- rept-stat-sys
- rept-stat-sccp
- rept-stat-mps
- rept-ftp-meas
- rtrv-measopts / chg-measopts
- 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 35.0.0-49.10.0
    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 35.0.0-49.10.0
    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 35.0.0-49.10.0
                    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 35.0.0-49.10.0

    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
    0035.0318 ** 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/EPAPIP 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 35.0.0
    rept-stat-alm
    Command entered at terminal #10.
;
    eagle10605 99-06-24 23:59:39 EAGLE 35.0.0
```

```
    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 ISSdatabases. 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 ISS.

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 ISS. The self-identification identifies the EAGLE 5 ISS 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 VSCCPGPL. 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 35.0.0
    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 35.0.0
    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 35.0.0
    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 35.0.0
    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

EIR Configuration

Introduction

The EIR feature is configured on the EAGLE 5 ISS and on the EPAP (in association with either the G-Flex or G-Port features). This chapter covers the EAGLE 5 ISS 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 ISS configuration of the EIR feature consists of the following:

- The EAGLE 5 ISS must contain DSM cards running the VSCCP application – This can be verified with the **`rtrv-card`** command. To add DSM cards, see Adding a DSM.

- The EIR feature must be enabled and activated – This can be verified with the **`rtrv-ctrl-feat`** command. To enable and activate the EIR feature, see Enabling and Activating the EIR Feature.

- Change the self ID of the EAGLE 5 ISS 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 ISS'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 Adding the EIR Subsystem Application or Changing a Subsystem Application .
- The GSM Service Selector, verified with the **rtrv-srvsel** command. To configure GSM Service Selectors, see Adding an EIR Service Selector .
- The EIR Global Response status, EIR Response Type, and EIRIMSI Check status options, verified with the **rtrv-gsmopts** command, can be changed. To change these options, see Changing the EIR Options .

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) cannot be used with the EIR feature. If any cards running the SCCP application are present in the system, they must be replaced by DSM cards. Contact Customer Care Center before replacing any cards running the SCCP application.**

The DSM card 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 card cannot be inserted in slot 09. The DSM card can be inserted in the control shelf, but only in slots 01, 03, 05, and 07. The DSM card occupies two card slots, so the even numbered

card slot to the right of the odd numbered slot where the DSM card has been inserted must be empty, as shown in Table 4-1 . The DSM card is connected to the network through the odd numbered card slot connector.

Table 4-1. 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 DSM cards to support the number of LIMs in the system. This parameter does not apply to configuring DSM cards 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 DSM cards.

The amount of memory required on these DSM cards 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

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*.

2. Turn the global title translation feature on by entering this command.**chg-feat:gtt=on**

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

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 35.0.0
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.

   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 card 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.

   This is an example of the possible output.

```
rlghncxa03w 03-06-25 09:58:31 GMT Rel 35.0.0
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 card 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 DSM cards. Contact Tekelec Technical Services before replacing any cards running the SCCP application. See Customer Care Center .

   NOTE: Verify the temperature threshold settings for an E5-SM4G card by performing the "Changing the High-Capacity Card Temperature Alarm Thresholds" procedure in the *Database Administration Manual - SS7*.

5. Add the DSM card 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 35.0.0
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 35.0.0
```

```
CARD   TYPE      APPL      LSET NAME     PORT SLC LSET NAME     PORT SLC
1301   DSM       VSCCP     ------------  --   --  ------------  --   --
```

7. Turn the enhanced global title translation feature on by entering this command.**chg-feat:egtt=on**

> **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.**
>
> **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 35.0.0
CHG-FEAT: MASP A - COMPLTD
```

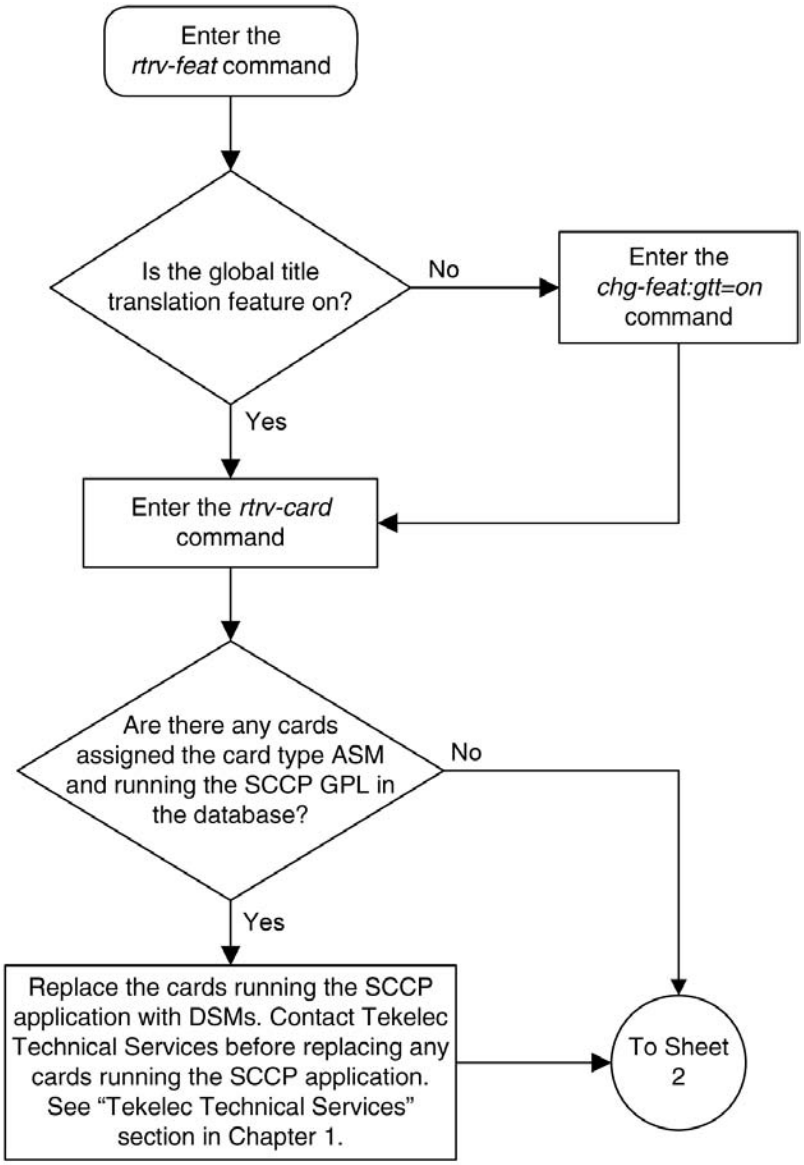
8. Backup the new changes using the **`chg-db:action=backup:dest=fixed`** command.

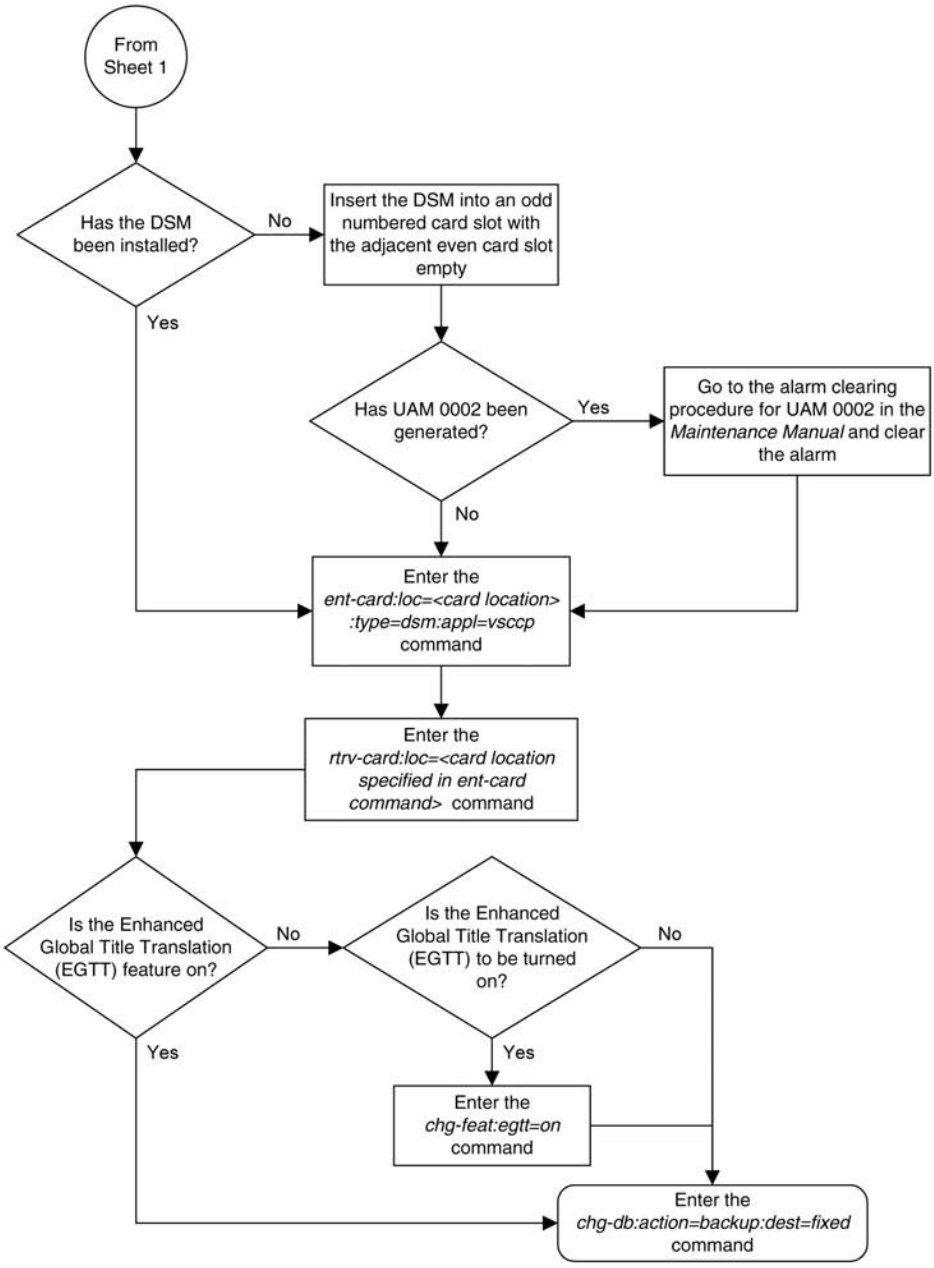
These messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

```
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.
```

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

Flowchart 4-1. Adding a DSM





Removing a DSM

This procedure is used to remove DSM cards, 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 TSM card is the last card in service, removing this card from the database will cause global title translation traffic to be lost.

The DSM card 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.

1. Display the status of the DSM cards by entering the **rept-stat-sccp** command.

This is an example of the possible output.

```
rlghncxa03w 03-06-12 09:12:36 GMT  Rel 35.0.0
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 DSMcard to be inhibited is the only DSMcard 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 35.0.0
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 35.0.0
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.

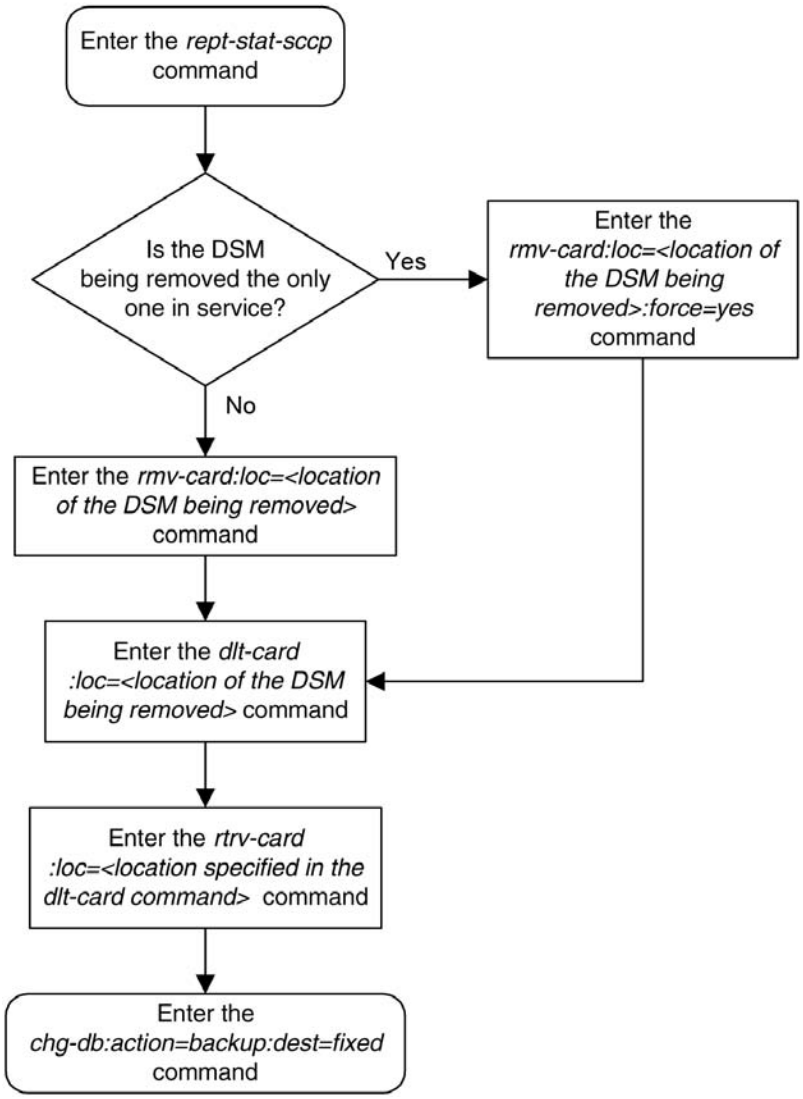
```
E2144 Cmd Rej: Location invalid for hardware configuration
```

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.
```

Figure 4-1. 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 DSM cards to be configured in the system. The amount of memory on these DSMcards 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 card database capacity requirements.

If there are no DSMcards present in the EAGLE 5 ISS, they must be added before the EIR feature can be enabled and activated. Go to Adding a DSM and add the required DSMcards to the EAGLE 5 ISS.

If DSMcards are present in the EAGLE 5 ISS, but are not at the level required for the EIR feature, or cards running the SCCP application are present in the system, new DSMcards that meet the minimum requirements for the EIR feature must be added using Adding a DSM . After the new DSMcards have been added, the DSM cards 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 Removing a DSM . 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 ISS, 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 permanently 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.

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 35.0.0
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 35.0.0
CHG-FEAT: MASP A - COMPLTD
```

4. The EIR feature requires that DSM cards 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 DSM cards 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 35.0.0
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 DSMcards are not shown in the output of the **rtrv-card** command, go to Adding a DSM and add the necessary DSM cards, making sure that the DSM cards meet the requirements. If the **rtrv-card** output shows cards running the SCCP application, these cards must be removed after the DSM cards are added to the database. Go to Removing a DSM and remove all the cards running the SCCP application from the database.

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

5. Choose one of the DSM cards shown in the **rtrv-card** output in step 4.

Display the amount of memory on the DSM card, using the **rept-stat-card** command specifying the card location of the DSM card, 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 35.0.0
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 card 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 card that meets the requirements to the database using Adding a DSM.

b. Remove the DSM card specified in the **rept-stat-card** command from the database using Removing a DSM.

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

Repeat this step for all DSM cards 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 35.0.0
System serial number = ntxxxxxxxxxxxx
System serial number is not locked.
```

```
rlghncxa03w 03-06-30 21:15:37 GMT Rel 35.0.0
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 35.0.0
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 35.0.0
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 35.0.0
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 35.0.0
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.

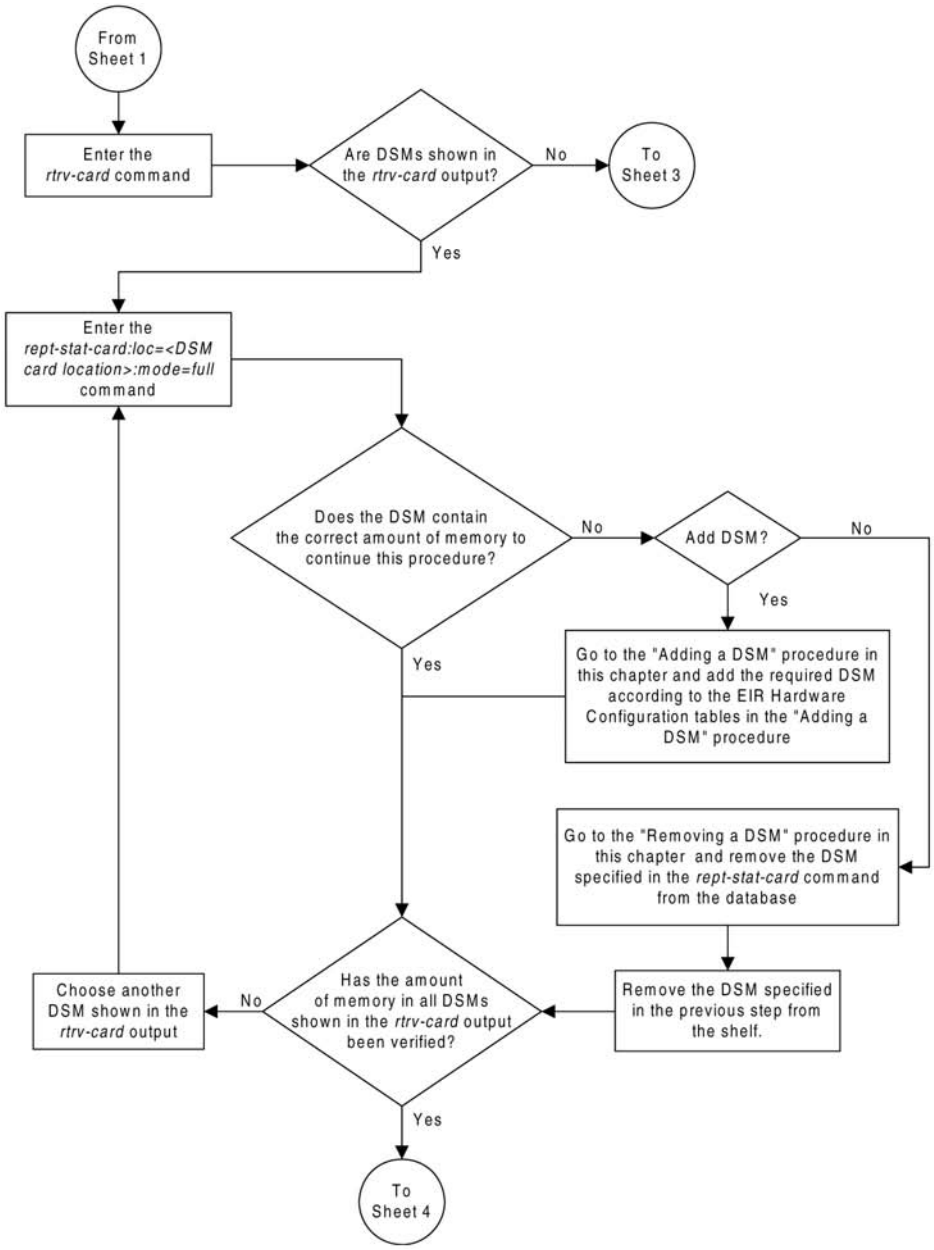
These messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first.

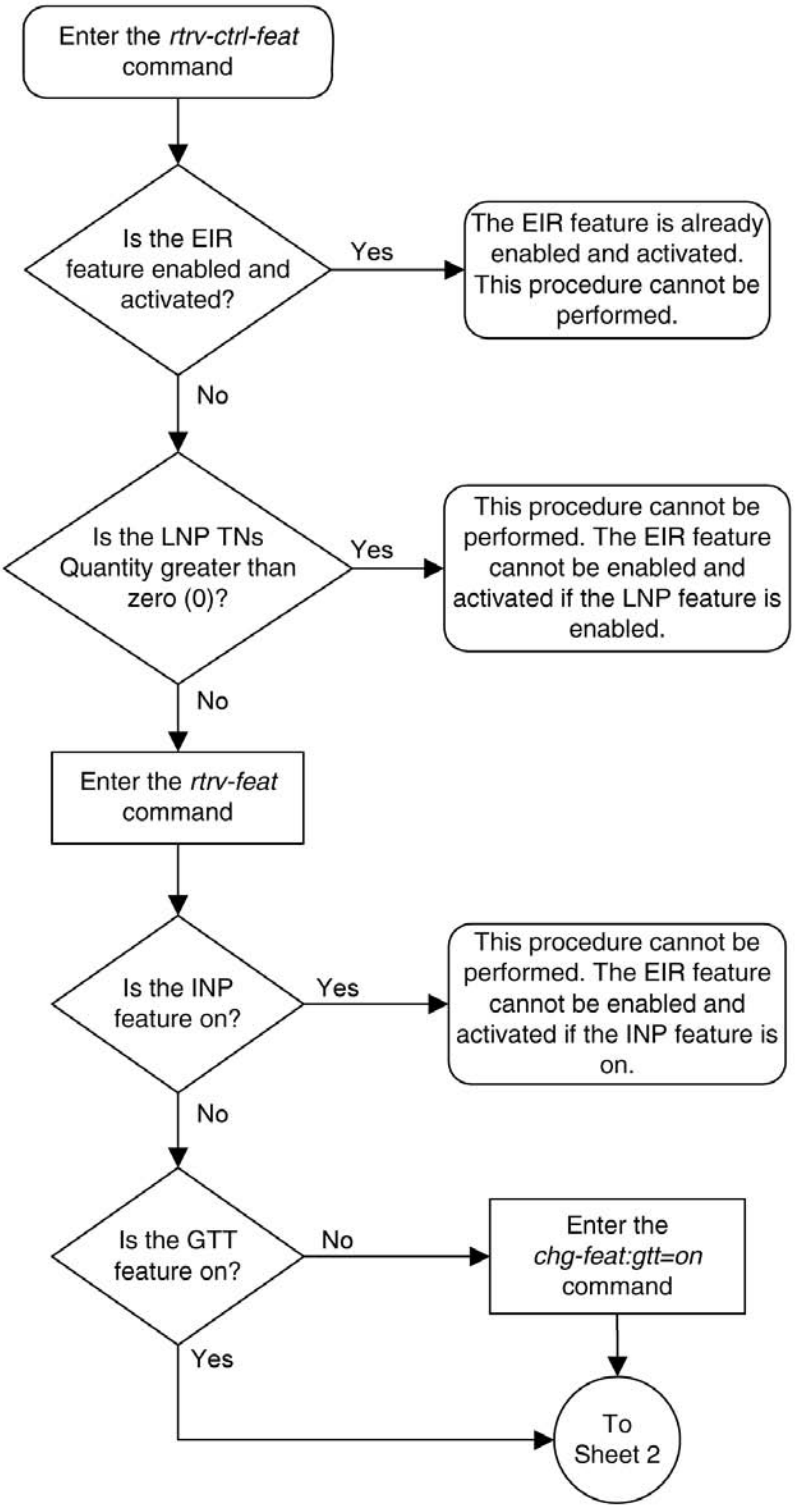
```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
```

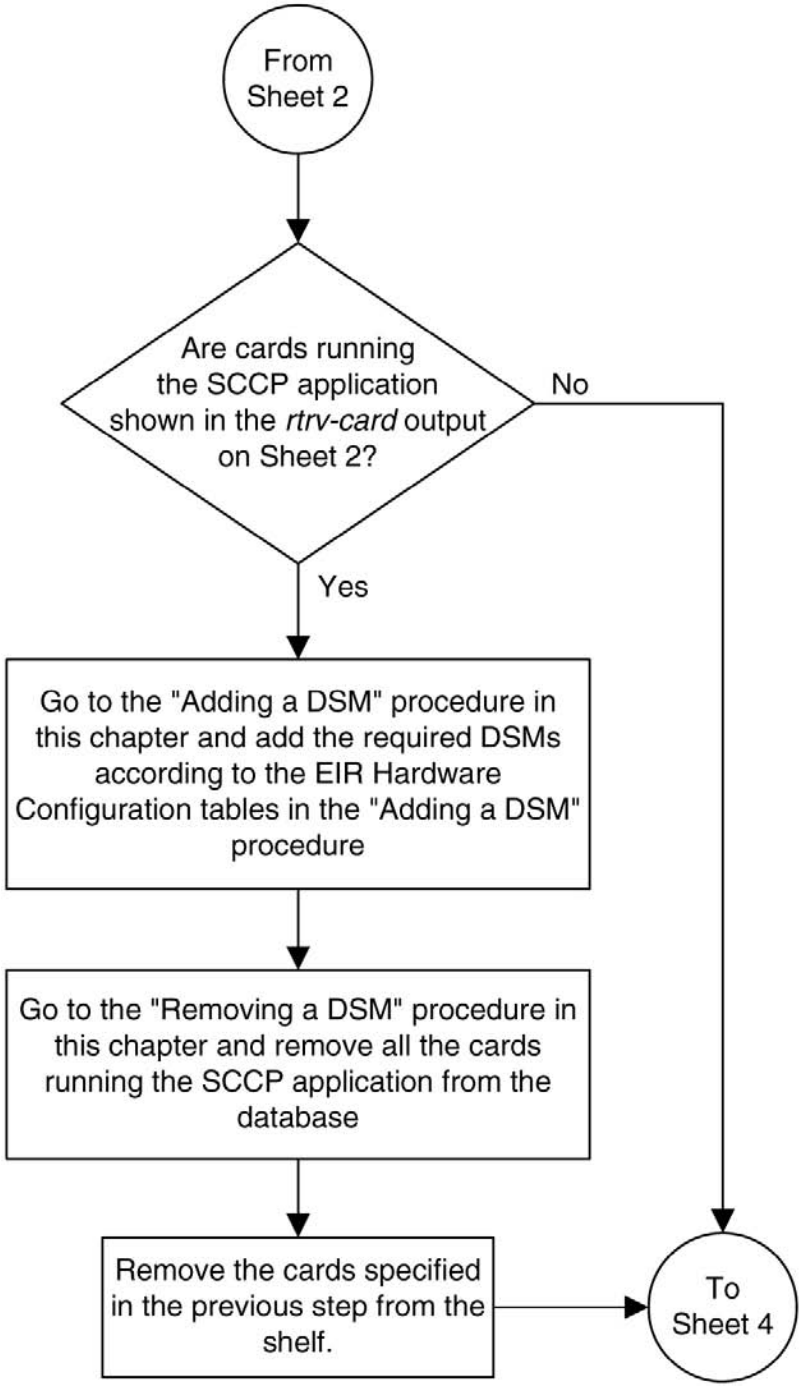
```
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

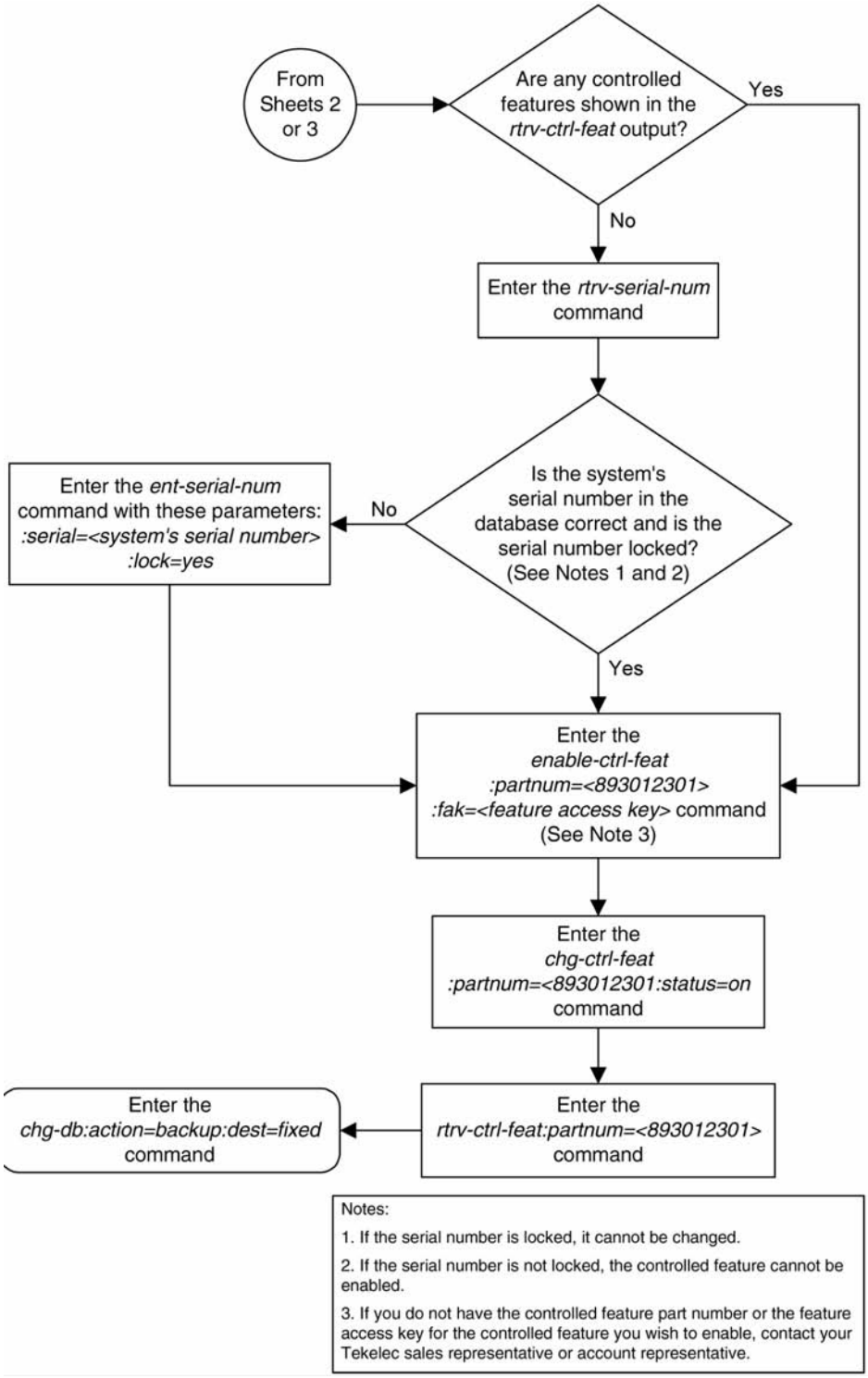
Figure 4-2. Enabling and Activating the EIR Feature

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.




Enter the *rtrv-ctrl-feat* command
Is the EIR feature enabled and activated?
Yes
The EIR feature is already enabled and activated. This procedure cannot be performed.
No
Is the LNP TNs Quantity greater than zero (0)?
Yes
This procedure cannot be performed. The EIR feature cannot be enabled and activated if the LNP feature is enabled.
No
Enter the *rtrv-feat* command
Is the INP feature on?
Yes
This procedure cannot be performed. The EIR feature cannot be enabled and activated if the INP feature is on.
No
Is the GTT feature on?
No
Enter the *chg-feat:gtt=on* command
Yes
To Sheet 2


From Sheet 2
Are cards running the SCCP application shown in the *rtrv-card* output on Sheet 2?
No
Yes
Go to the "Adding a DSM" procedure in this chapter and add the required DSMs according to the EIR Hardware Configuration tables in the "Adding a DSM" procedure
Go to the "Removing a DSM" procedure in this chapter and remove all the cards running the SCCP application from the database
Remove the cards specified in the previous step from the shelf.
To Sheet 4


From Sheets 2 or 3
Are any controlled features shown in the *rtrv-ctrl-feat* output?
Yes
No
Enter the *rtrv-serial-num* command
Is the system's serial number in the database correct and is the serial number locked? (See Notes 1 and 2)
No
Enter the *ent-serial-num* command with these parameters: *:serial=<system's serial number>* *:lock=yes*
Yes
Enter the *enable-ctrl-feat* *:partnum=<893012301>* *:fak=<feature access key>* command (See Note 3)
Enter the *chg-ctrl-feat* *:partnum=<893012301:status=on* command
Enter the *rtrv-ctrl-feat:partnum=<893012301>* command
Enter the *chg-db:action=backup:dest=fixed* command
Notes:
1. If the serial number is locked, it cannot be changed.
2. If the serial number is not locked, the controlled feature cannot be enabled.
3. If you do not have the controlled feature part number or the feature access key for the controlled feature you wish to enable, contact your Tekelec sales representative or account representative.

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.

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 ISS'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 ISS'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 ISS'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 ISS'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 ISS'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.

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 35.0.0
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 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 35.0.0
APPL       SSN       STAT
SS-APPL table is (0 of 1)  0% full
```

3. Display the EAGLE 5 ISS's true point code using the **rtrv-sid** command.

The EAGLE 5 ISS'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 35.0.0
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 ISS'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 35.0.0
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 ISS'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 ISS's true point code and the subsystem to a mated application.

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 35.0.0
ENT-SS-APPL: MASP A - COMPLTD
```

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

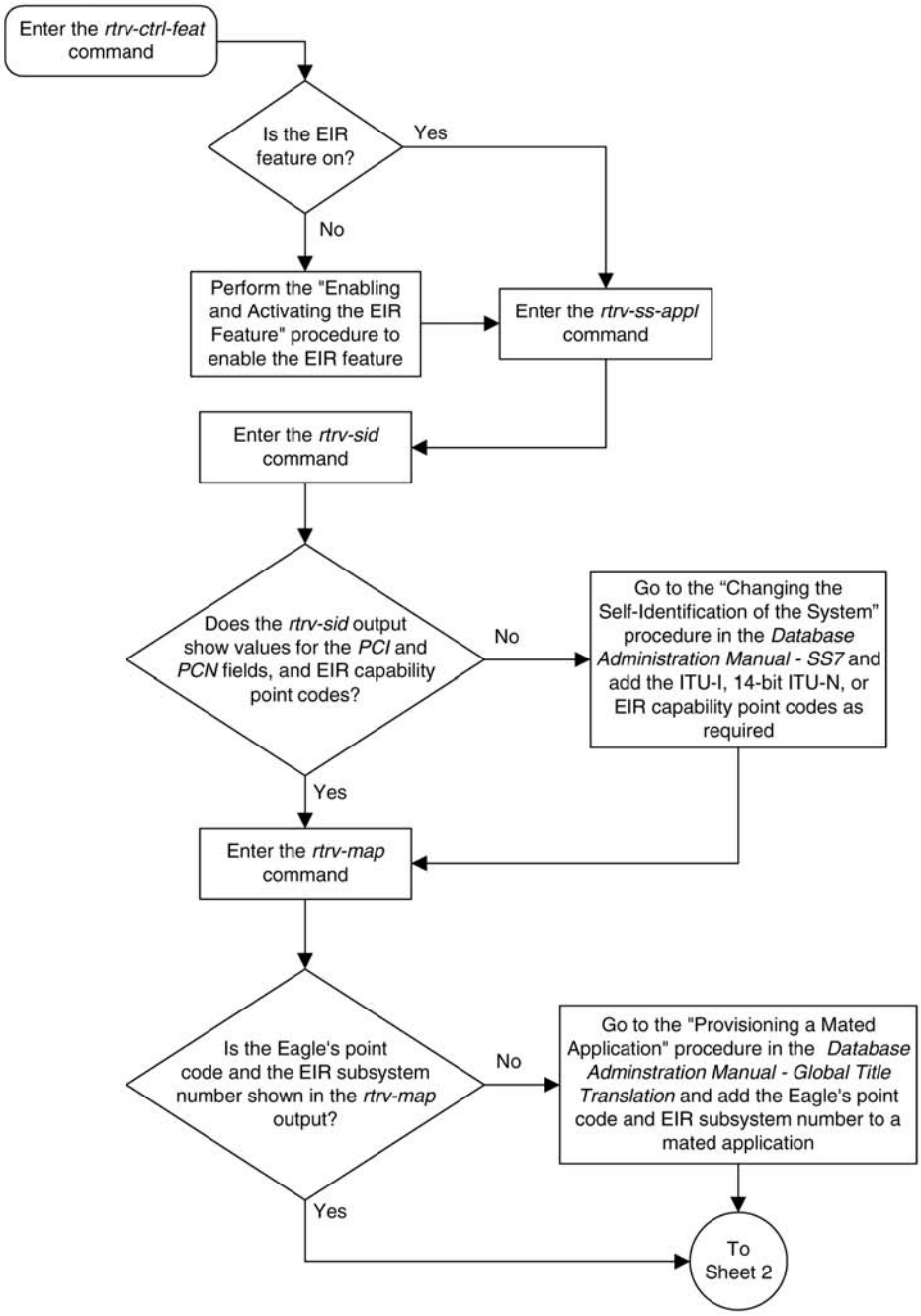
```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0
APPL       SSN       STAT
EIR        100       ONLINE
SS-APPL table is (1 of 1) 100% full
```

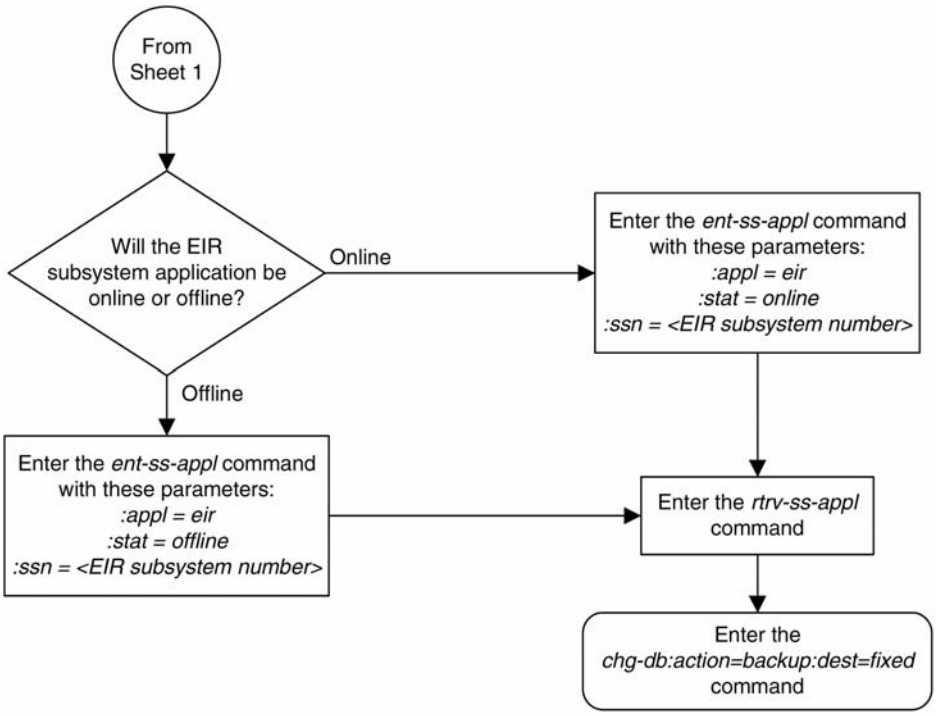
6. Backup the new changes using the **chg-db:action=backup:dest=fixed** command.

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.
```

Figure 4-3. Adding the EIR Subsystem Application





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 ISS 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.

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 35.0.0
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 35.0.0
APPL       SSN       STAT
EIR        100       ONLINE
SS-APPL table is (1 of 1) 100% full
```

3. Place the EIR subsystem application out of service with the **inh-map-ss** command specifying the EIRsubsystem number displayed in step 2.

> **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.**

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 35.0.0
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 35.0.0
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 35.0.0
DLT-SS-APPL: MASP A - COMPLTD
```

6. Verify the changes with the **rtrv-ss-appl** command.

This is an example of the possible output.

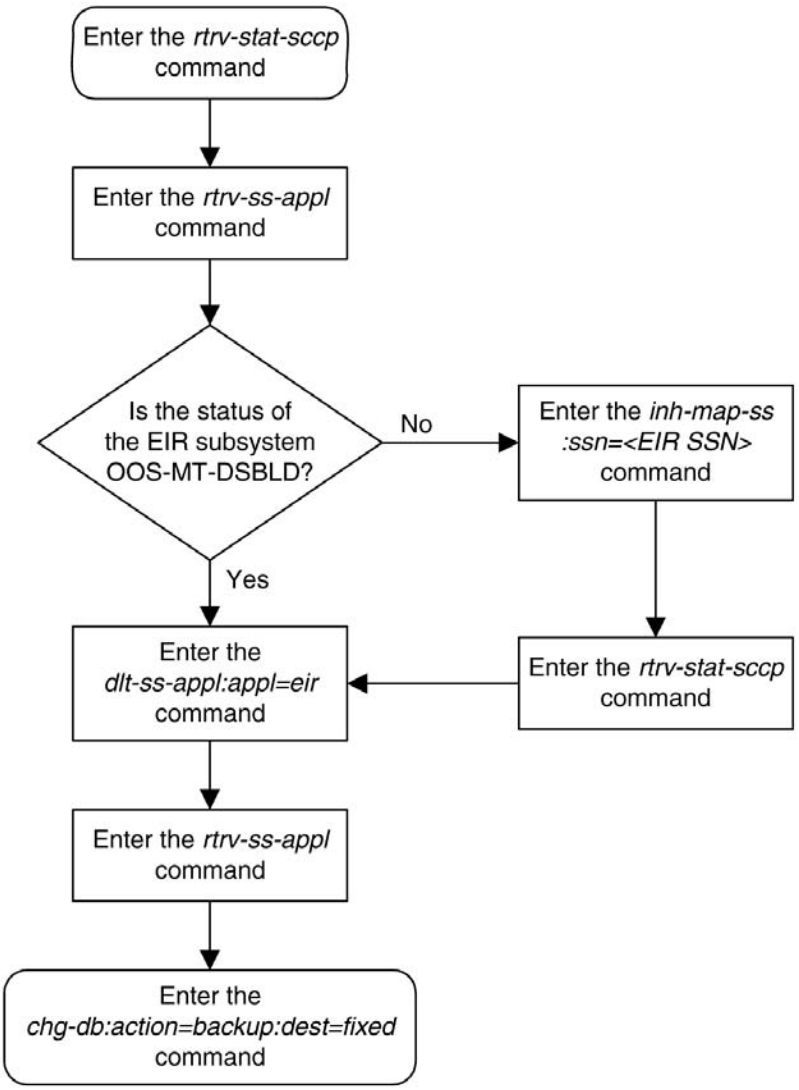
```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0
APPL       SSN       STAT
SS-APPL table is (0 of 1) 0% full
```

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.
```

Figure 4-4. 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 ISS 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 4-6. 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 35.0.0
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 35.0.0
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 35.0.0
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 35.0.0
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 35.0.0
CHG-SS-APPL: MASP A - COMPLTD
```

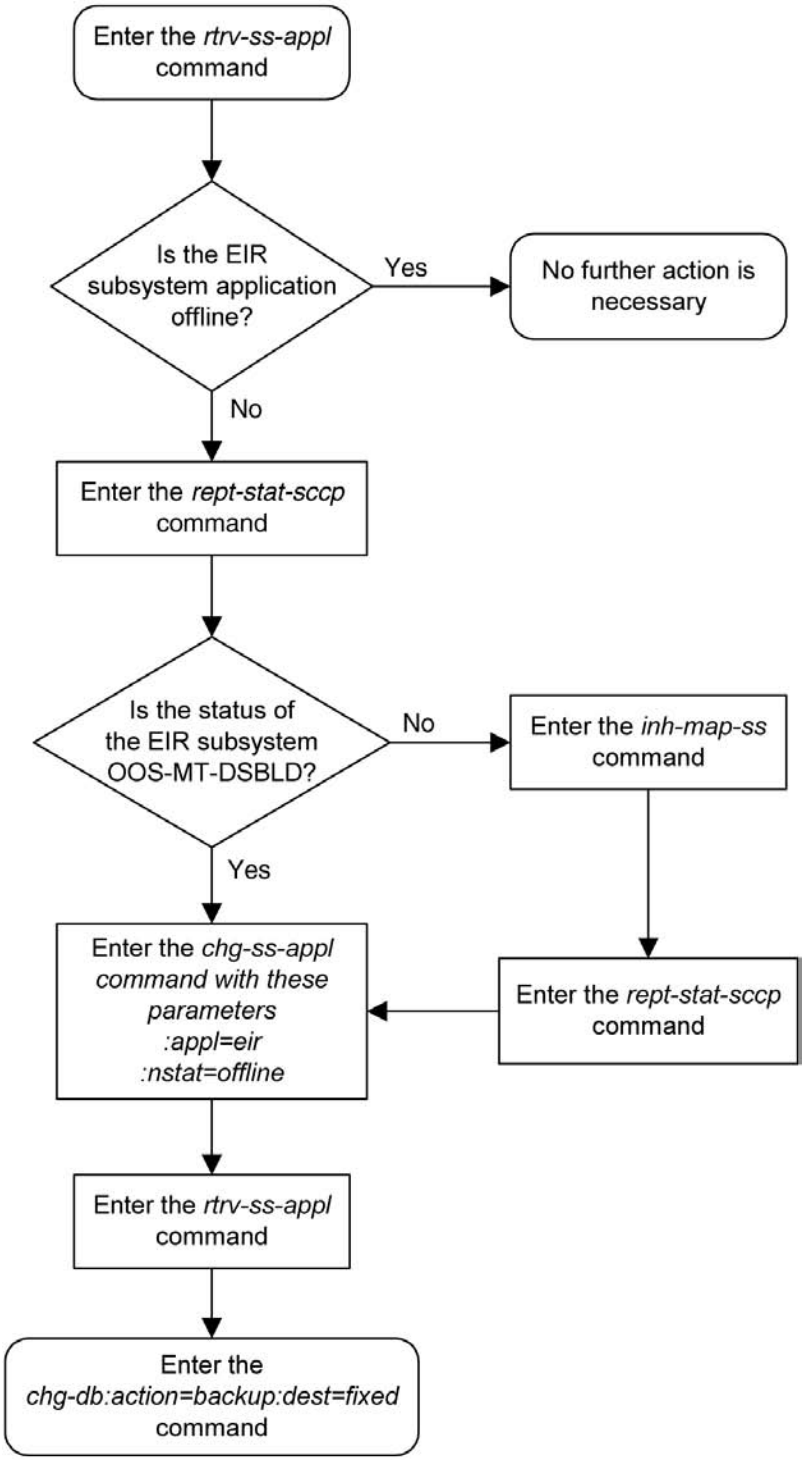
6. Verify the changes with the **rtrv-ss-appl** command. This is an example of the possible output.

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0
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.
```

Figure 4-5. Taking the EIR Subsystem 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 35.0.0
```

```
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 35.0.0
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 35.0.0
CHG-SS-APPL: MASP A - COMPLTD
```

4. Verify the changes with the **rtrv-ss-appl** command.

This is an example of the possible output.

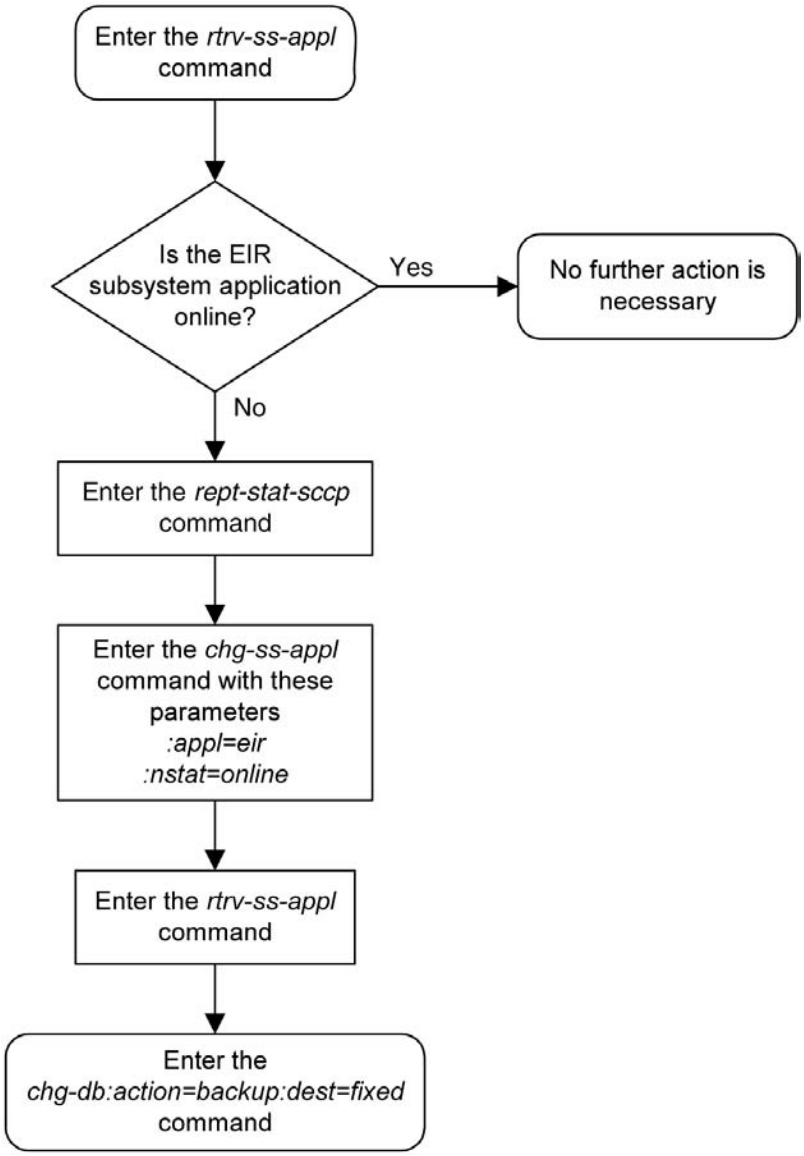
```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0
APPL
SSN
STAT
EIR        100       ONLINE

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

5. Back up 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.
```

Figure 4-6. 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 4-2**)

:naiv – Nature of address indicator value (see**Table 4-2**)

> **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. Table 4-2 shows the mapping between the naiv and the nai parameters.**

Table 4-2. 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 4-3**)

:npv – Numbering plan value (see **Table 4-3**)

> **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 4-3 shows the mapping between the npv and the np parameters.**

Table 4-3. 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

NPV	NP	Description
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 .

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-srvsel`** 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.

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 35.0.0
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 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 35.0.0

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 35.0.0
```

```
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 35.0.0

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:

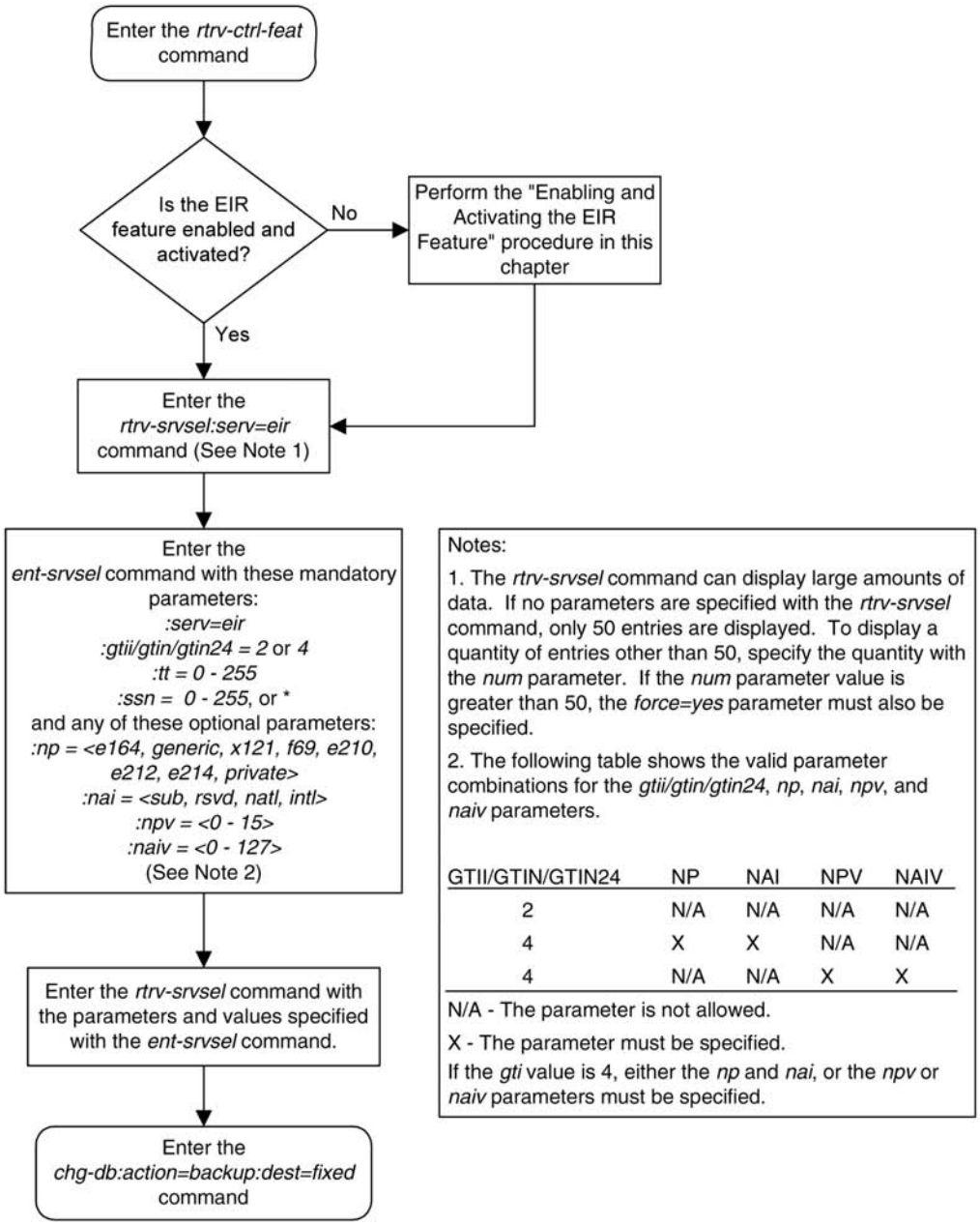
```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0

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

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

5. Back up 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.
```

Figure 4-7. Adding an EIR Service Selector



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 4-4**)

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

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 4-4 shows the mapping between the naiv and the nai parameters.

Table 4-4. 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
	–	Spare

:np – Numbering plan (see **Table 4-5**)

:npv – Numbering plan value (see **Table 4-5**)

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 4-5 shows the mapping between the npv and the np parameters.

Table 4-5. 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 4-4 and Table 4-5 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 4-4 and Table 4-5 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-srvsel** 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.

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 35.0.0

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 35.0.0
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 35.0.0

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:

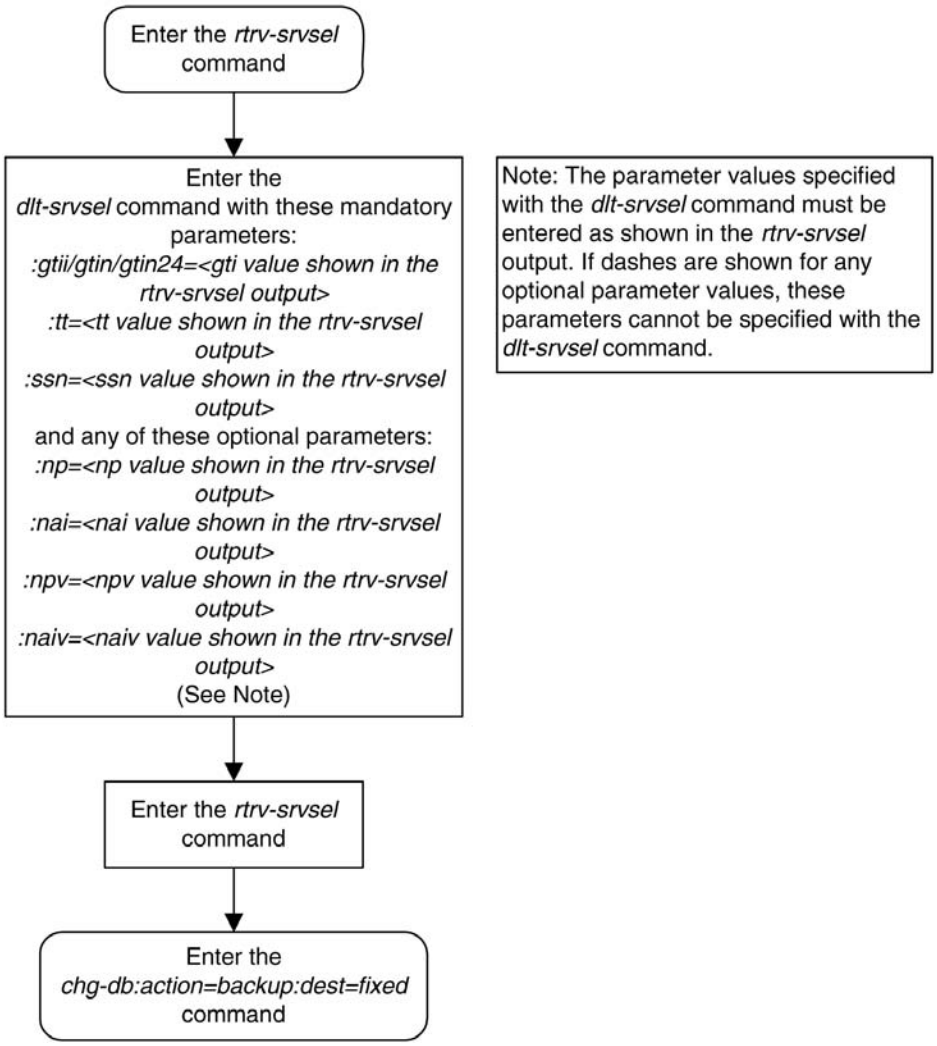
```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0

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.
```

Figure 4-8. 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 Removing a Service Selector procedure, then add the new EIR service selector with the new parameter information using the Adding an EIR Service Selector 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 4-6**)

`:naiv` – Nature of address indicator value (see **Table 4-7**)

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 4-6 shows the mapping between the `naiv` and the `nai` parameters.

Table 4-6. 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 4-7**)

`:npv` – Numbering plan value (see **Table 4-7**)

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 4-7 shows the mapping between the `npv` and the `np` parameters.

Table 4-7. 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-srvsel`** 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.

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 35.0.0
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 35.0.0
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 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 Table 4-6 and Table 4-7 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, then re-enter the service selector as an EIR service selector using the Adding an EIR Service Selector procedure.**

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

```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0
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.

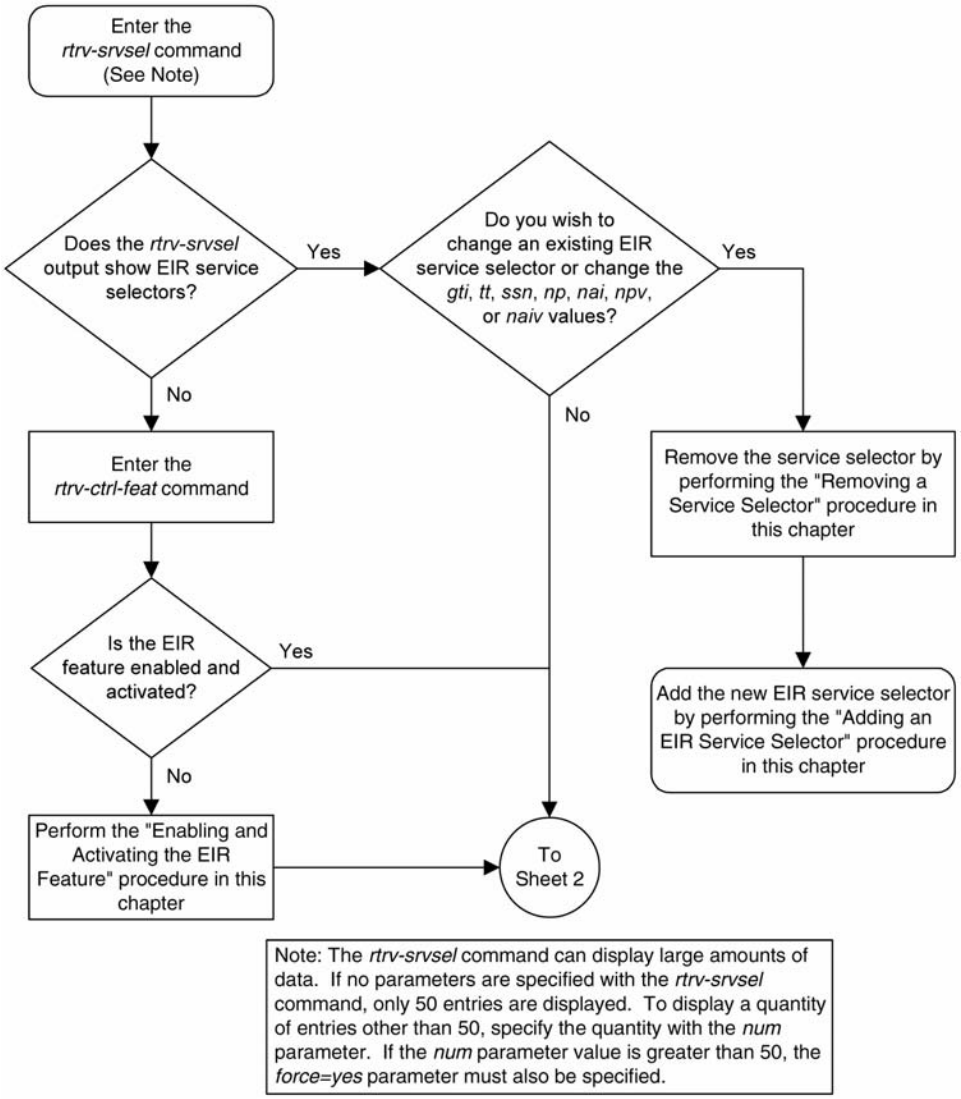
```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0

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
```

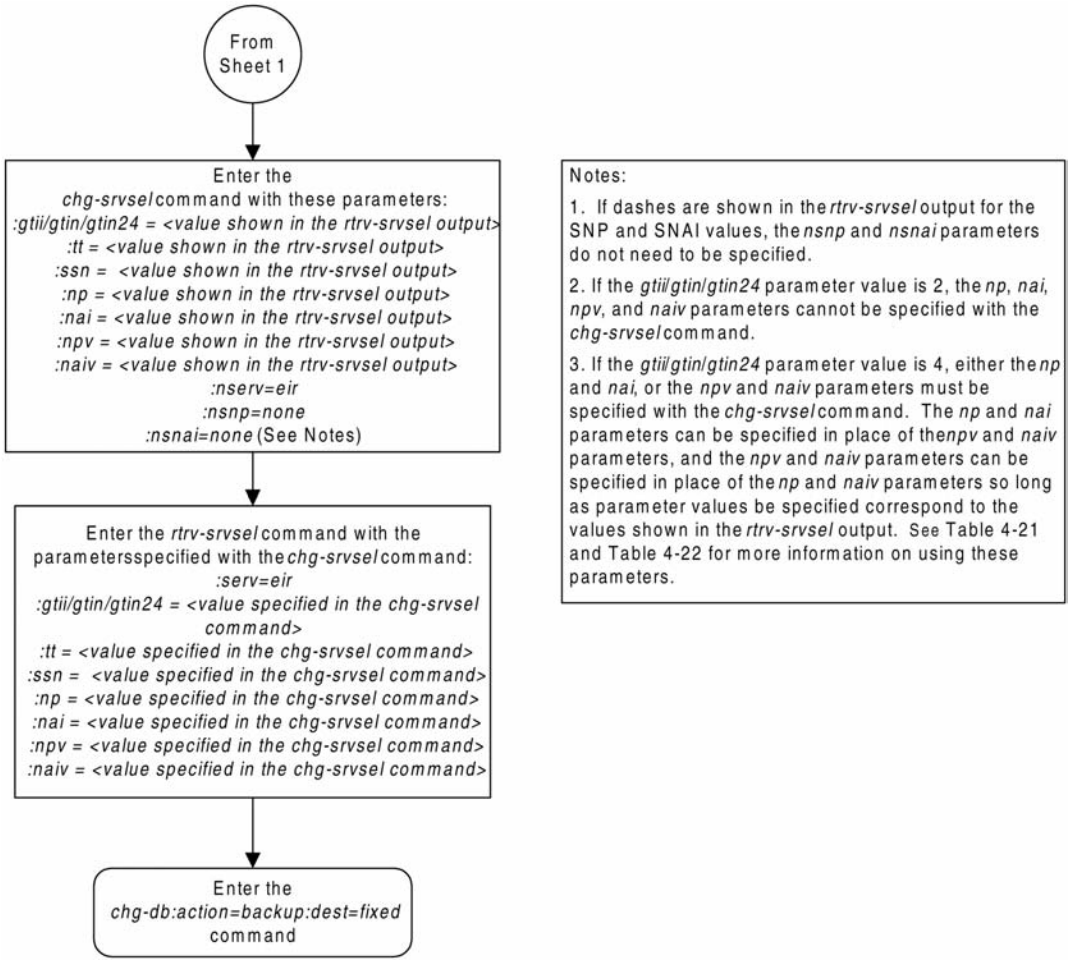
5. Backup the new changes using the **chg-db:action=backup:dest=fixed** command.

   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 4-2. Changing an Existing Non-EIR Service Selector to an EIR Service Selector





Changing the EIR Options

This procedure is used to change the EIR Global Response status, EIR Response Type, and EIRIMSI 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 the White 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 Enabling and Activating the EIR Feature procedure.

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 35.0.0
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 Enabling and Activating the EIR Feature procedure, 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 35.0.0
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 35.0.0
GSM OPTIONS
----------------------
EIRGRSP     = WHITELST
EIRRSPTYPE  = TYPE3
EIRIMSICHK  = OFF
```

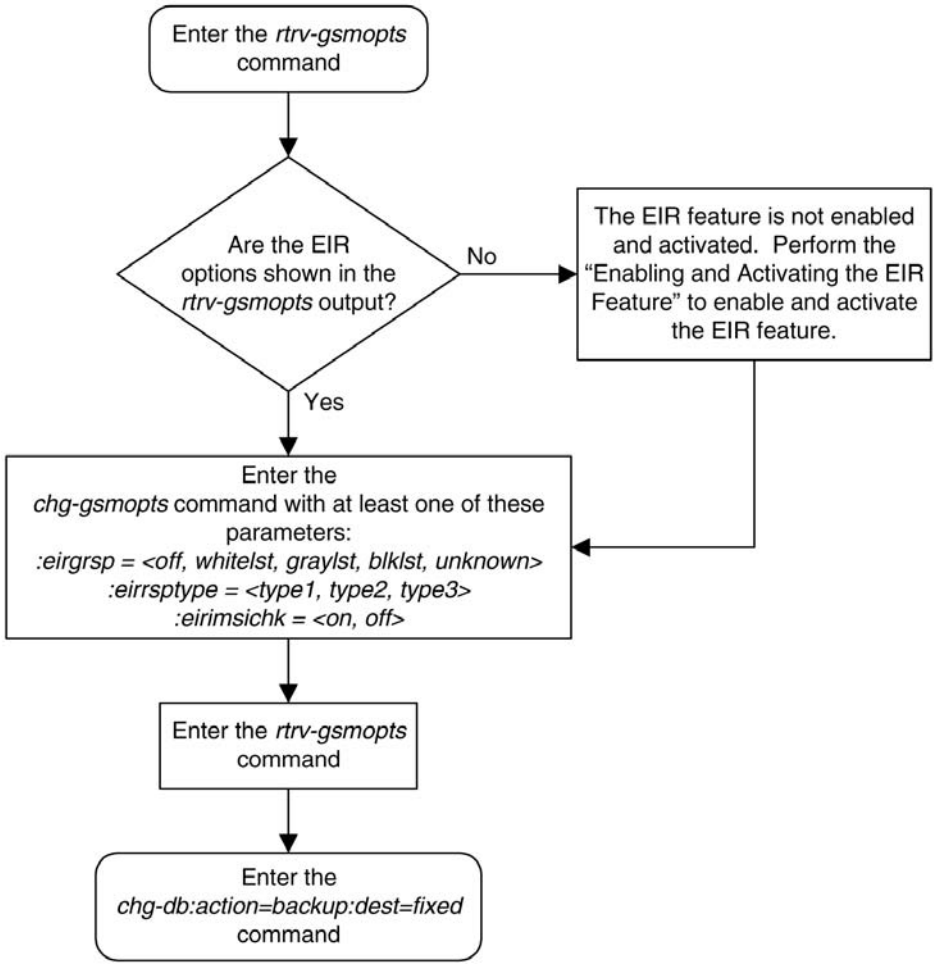
   NOTE: The rtrv-gsmopts command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the rtrv-stpopts command, see the rtrv-gsmopts command description in the *Commands Manual*.

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.
```

Figure 4-9. Changing the EIR Options



The 1100 TPS/DSM for ITU NP Feature

This procedure is used to enable and turn on the 1100 TPS/DSM for ITU NP feature. This feature provides up to 26,400 transactions per second when the maximum number of DSM cards are installed in the EAGLE 5 ISS and one or more EPAP-related features (such as G-Port, G-Flex, A-Port, INP, EIR, Migration) are enabled and turned on.

This feature can be enabled only for DSM cards that are rated at 850 transactions per second (TPS).

CAUTION

CAUTION: The increase of the DSM card capacity, 1100 TPS per DSM card, assumes incoming traffic consists of at least 30% of GTT routed traffic that does not require EPAP based lookup. If more than 70% of incoming traffic requires EPAP based lookup, Group Ticket Voucher (TVG) may shutdown and overall TVG capacity of 1100 for the card may not be met.

The feature access key is based on the feature's part number and the serial number of the EAGLE 5 ISS, making the feature access key site-specific.

The **`enable-ctrl-feat`** command enables the 1100 TPS/DSM for ITU NP feature by inputting the feature's access key and the feature's part number with these parameters:

:fak
The feature access key provided by Tekelec. The feature access key contains 13 alphanumeric characters and is not case sensitive.

:partnum
The Tekelec-issued part number of the 1100 TPS/DSM for ITU NP feature, 893018001.

After the 1100 TPS/DSM for ITU NP feature has been enabled, the feature must be turned on with the **chg-ctrl-feat** command. The **chg-ctrl-feat** command uses these parameters:

:partnum
The Tekelec-issued part number of the 1100 TPS/DSM or ITU NP feature, 893019101.

:status=on
Used to turn the 1100 TPS/DSM for ITU NP feature on.

Activating the 1100 TPS/DSM for ITU NP Feature

Before you start:

The 1100 TPS/DSM for ITU NP feature cannot be enabled with a temporary feature access key.

The 1100 TPS/DSM for ITU NP feature cannot be enabled if:

- The EAGLE 5 ISS does not contain any DSM cards.
- The LNP feature is enabled.

  The status of the LNP feature is shown with the **rtrv-ctrl-feat** command output.

- The ANSI G-Flex STP Option is enabled.

  The status of the ANSI G-Flex STP Option is shown in the **rtrv-stpopts** command output.

- The GTT feature is not turned on.

  The status of the GTT feature is shown in the **rtrv-feat** command output.

The **enable-ctrl-feat** command requires that the database contain a valid serial number for the EAGLE 5 ISS, and that this serial number is locked. This can be verified with the **rtrv-serial-num** command. The EAGLE 5 ISS 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 EAGLE 5 ISS is on-site, with the **ent-serial-num** command. The **ent-serial-num** command uses these parameters.

:serial
The serial number assigned to the EAGLE 5 ISS. 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.

NOTE: To enter and lock the EAGLE 5 ISS's serial number, the ent-serial-num command must be entered twice, once to add the correct serial number to the database with the serial parameter, then again with the serial and the lock=yes parameters to lock the serial number. Verify that the serial number in the database is correct before locking the serial number. The serial number can be found on a label affixed to the control shelf (shelf 1100).

The 1100 TPS/DSM for ITU NP feature increases the processing capacity of SCCP traffic for an EAGLE 5 ISS processing EPAP-based traffic to 26,400 transactions per second. To achieve this increase in SCCP processing capacity, a maximum of 25 DSM cards must be provisioned and installed in the EAGLE 5 ISS.

1. Display the status of the 1100 TPS/DSM feature by entering the **rtrv-ctrl-feat** command.

   The following is an example of the possible output:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0

The following features have been permanently enabled:
   Feature Name              Partnum    Status  Quantity
   TPS                       893000110  on      1000
   ISUP Normalization        893000201  on      ----
   Prepaid SMS Intercept Ph1 893006701  on      ----
   MNP Circ Route Prevent    893007001  on      ----
   1100 TPS/DSM for ITU NP   893018001  on      ----

   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
   OnOffFeatV                893492401
```

2. Based on the output from the previous step, do one of the following:

   - If the **rtrv-ctrl-feat** output shows that the 1100 TPS/DSM for ITU NP feature is enabled, shown by the entry 1100 TPS/DSM for ITU NP, and its status is **on**, no further action is necessary.
   - If the feature is enabled, and its status is **off**, skip Step 3 through Step 12 , and go to Step 13 .
   - If the rtrv-ctrl-feat output shows that the LNP feature is enabled, this procedure cannot be performed. The 1100 TPS/DSM for ITU NP feature cannot be enabled if the LNP feature is enabled.
   - If the 1100 TPS/DSM for ITU NP and LNP features are not enabled, go to Step 3 .

3. Determine whether the G-Flex feature is turned on by entering the **rtrv-ctrl-feat**.

   (If the G-Flex feature is off, then the ANSIGFLEX option is not displayed in the **rtrv-stpopts** output in Step 4 .)

   The status of the G-Flex feature is shown by the entry **G-Flex** in the **rtrv-ctrl-feat** output.

   - If the G-Flex feature is turned off, skip to Step 5 .
   - If the G-Flex feature is turned on, go to Step 4 .

4. Verify that the ANSI G-Flex option is not enabled or turned on by entering the **rtrv-stpopts** command.

   The 1100 TPS/DSM ITU NP feature cannot be enabled if the ANSI G-Flex option is turned on.

   The ANSI G-Flex option is shown by the entry **ANSIGFLEX** in the **rtrv-stpopts** output. If the **ANSIGFLEX** entry is displayed in the **rtrv-stpopts** output, both the G-Flex and the GTT features are turned on.

   - If the ANSIGFLEX value is **yes** in the **rtrv-stpopts** output , the ANSI G-Flex option is enabled and the remainder of this procedure cannot be performed.
   - If the ANSIGFLEX value is **no** in the **rtrv-stpopts** output, the ANSI G-Flex option is *not* enabled. Skip Step 5 and go to Step 6 .

5. Determine whether the GTT feature is turned on by examining the output of the **rtrv-feat** command.

   The 1100 TPS/DSM ITU NP feature cannot be enabled unless the GTT feature is turned on. The GTT feature is shown by the entry **GTT** in the **rtrv-feat** output executed in Step 3 .

- If the GTT feature is turned on, go to Step 6 .
- If the GTT feature is turned off, perform "Adding an SCCP card" in the *Database Administration Manual - Global Title Translation* manual to turn the GTT feature on and to add the required number of DSM cards to the database. After "Adding an SCCP card" has been performed, go to Step 11 (skip Step 6 through Step 10).

6. Verify the number of DSM cards that are provisioned in the database using the **rept-stat-gpl:gpl=sccphc** command.

This is an example of the possible output.

```
rlghncxa03w 07-05-01 11:40:26 GMT EAGLE5 37.5.0
GPL    CARD   RUNNING      APPROVED     TRIAL
VSCCCP 1201  126-002-000  126-002-000  126-003-000
VSCCCP 1203  126-002-000  126-002-000  126-003-000
VSCCCP 1207  126-002-000  126-002-000  126-003-000
VSCCCP 1213  126-002-000  126-002-000  126-003-000
VSCCCP 1215  126-002-000  126-002-000  126-003-000
VSCCCP 1305  126-002-000  126-002-000  126-003-000
VSCCCP 1313  126-002-000  126-002-000  126-003-000
VSCCCP 2103  126-002-000  126-002-000  126-003-000
Command Completed
```

7. Based on the output shown in Step 6 , do one of the following:

- If the required number of DSM cards are provisioned in the database, go to Step 8 .
- If the required number of DSM cards are not provisioned in the database, perform "Adding an SCCP card" in the *Database Administration Manual - Global Title Translation* to add the required number of DSM cards to the database. After "Adding an SCCP card" has been performed, go to Step 8 .

8. Display the serial number in the database with the **rtrv-serial-num** command.

This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0

System serial number = nt00001231

System serial number is not locked
.
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0 Command Completed
```

9. Compare the actual serial number (located on a label affixed to the control shelf, shelf 1100) to the output shown in Step 8 , and do one of the following:

- If the serial number is correct and locked, go to Step 13 (skip Step 10 through Step 12)
- If the serial number is correct but not locked, go to Step 12 (skip Step 10 and Step 11).
- If the serial number is not correct, but is locked, this feature cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed.

10. Enter the correct serial number into the database using the **ent-serial-num** command with the serial parameter.

For this example, enter this command.

ent-serial-num:serial=<EAGLE 5 ISS's correct serial number>

When this command has successfully completed, the following message appears.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0
ENT-SERIAL-NUM: MASP A - COMPLTD
```

11. Verify that the serial number entered into step 7 was entered correctly:

a. Enter the **rtrv-serial-num** command.

This is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0
System serial number = nt00001231

System serial number is not locked.

rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0
Command Completed
```

b. If the serial number was not entered correctly, repeat steps Step 10 and Step 11 and re-enter the correct serial number.

12. Lock the serial number in the database by entering the **ent-serial-num** command with the serial number shown in Step 8 (if the serial number shown in Step 8 is correct) or with the serial number shown in Step 10 (if the serial number was changed in Step 10), and with the **lock=yes** parameter.

For this example, enter this command.

ent-serial-num:serial=<EAGLE 5 ISS's serial number>:lock=yes

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

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0
ENT-SERIAL-NUM: MASP A - COMPLTD
```

13. Enable the 1100 TPS/DSM for ITU NP feature with the permanent key by entering the **enable-ctrl-feat** command.

For this example, enter this command.

enable-ctrl-feat:partnum=893018001:fak=<1100 TPS/DSM for ITU NP feature access key>

NOTE: The values for the feature access key (the fak parameter) are provided by Tekelec. If you do not have the feature access key for the 1100 TPS/DSM for ITU NP feature, contact your Tekelec Sales Representative or Account Representative.

When the **enable-crtl-feat** command has successfully completed, a message similar to the following should appear.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0
ENABLE-CTRL-FEAT: MASP B - COMPLTD
```

14. Do one of the following:

- If you do not wish to turn the 1100 TPS/DSM for ITU NP feature on, skip this step and go to Step 16 . If you do not turn this feature on, the transaction rate will remain at 850 TPS/DSM.
- If you do wish to turn on the 1100 TPS/DSM for ITU NP feature, enter the **chg-ctrl-feat** command, specifying the 1100 TPS/DSM for ITU NP feature part number used in Step 13 and the **status=on** parameter and enter the command again as shown in Step 15 .

For this example, enter this command:

chg-ctrl-feat:partnum=893018001:status=on

The following output message appears:

```
CAUTION: Rated TPS for this feature supports an engineered GTT traffic mix of no more than 70
percent EPAP-based traffic. Re-enter the command within 30 seconds to confirm change.
```

CAUTION: If the EPAP-based traffic is higher than 70% of all traffic on the EAGLE 5ISS, the DSM cards performance may not reach 1100 TPS per DSM.

15. Re-enter the chg-ctrl-feat command to turn the feature ON.

For example **chg-ctrl-feat:partnum=893018001:status=on**

When this command has successfully completed, a message similar to the following should appear:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0
CHG-CTRL-FEAT: MASP B - COMPLTD
```

16. Verify the changes by entering the **rtrv-ctrl-feat** command with the 1100 TPS/DSM for ITU NP feature part number specified in Step 14 or Step 15 .

rtrv-ctrl-feat:partnum=893018001

The following is an example of the possible output.

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0
The following features have been permanently enabled:
 Feature Name              Partnum   Status Quantity
 TPS                       893000110 on     1000
 ISUP Normalization        893000201 on     ----
 Prepaid SMS Intercept Ph1 893006701 on     ----
 MNP Circ Route Prevent    893007001 on     ----
 1100 TPS/DSM for ITU NP   893018001 on     ----

 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
 OnOffFeatV                 893492401
```

17. Backup the new changes by entering:

chg-db:action=backup:dest=fixed

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.
```

18. If you wish to turn off TPS/DSM for ITU NP feature, enter the **chg-ctrl-feat** command, specifying the 1100 TPS/DSM feature part number used in step Step 14 and the **status=off** parameter.

For this example, enter this command.

chg-ctrl-feat:partnum=893018001:status=off

The following output message appears:

```
CAUTION: This command decreases the total TPS of the SCCP system from 1100 to 850 TPS for each
DSM card.
```

19. Confirm that you wish to turn off TPS/DSM for ITU NP feature by re-entering the command, as shown below, within 30 seconds:

chg-ctrl-feat:partnum=893018001:status=off

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

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.5.0
CHG-CTRL-FEAT: MASP B - COMPLTD
```

Activating the E5-SM4G Throughput Capacity Feature

This procedure is used to enable and turn on the E5-SM4G Throughput Capacity feature. This feature provides up to 75,000 transactions per second when the maximum number of E5-SM4G cards are installed in the EAGLE 5 ISS and one or more EPAP-related features (such as G-Port, A-Port, G-Flex) are enabled and turned on.

The feature access key is based on the feature's part number and the serial number of the EAGLE 5 ISS, making the feature access key site-specific.

The **enable-ctrl-feat** command enables the E5-SM4G Throughput Capacity feature by inputting the feature's access key and the feature's part number with these parameters:

:fak
The feature access key provided by Tekelec. The feature access key contains 13 alphanumeric characters and is not case sensitive.

:partnum
The Tekelec-issued part number of the E5-SM4G Throughput Capacity feature, 893019101.

This feature cannot be enabled with a temporary feature access key.

The E5-SM4G Throughput Capacity feature cannot be enabled if:

- The LNP feature is enabled.
- The STPLAN feature is turned on.
- The GTT feature is not turned on.

The E5-SM4G Throughput Capacity feature cannot be enabled unless the EAGLE 5 ISS contains E5-SM4G cards, and E5-SM4G cards cannot be installed in the EAGLE 5 ISS unless HIPR cards are installed in all shelves containing E5-SM4G cards. Enter the **rept-stat-gpl:gpl=hipr** command to verify if HIPR cards are installed in all shelves containing E5-SM4G cards.

The status of the LNP feature is shown with the **rtrv-ctrl-feat** command output.

The status of the GTT is shown in the **rtrv-feat** command output.

The **enable-ctrl-feat** command requires that the database contain a valid serial number for the EAGLE 5 ISS, and that this serial number is locked. This can be verified with the **rtrv-serial-num** command. The EAGLE 5 ISS 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 EAGLE 5 ISS is on-site, with the **ent-serial-num** command. The **ent-serial-num** command uses these parameters.

:serial
The serial number assigned to the EAGLE 5 ISS. 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.

NOTE: To enter and lock the EAGLE 5 ISS's serial number, the ent-serial-num command must be entered twice, once to add the correct serial number to the database with the serial parameter, then again

with the serial and the `lock=yes` parameters to lock the serial number. Before locking the serial number, insure that the serial number in the database is correct. The serial number can be found on a label affixed to the control shelf (shelf 1100).

Once the E5-SM4G Throughput Capacity feature has been enabled, the feature must be turned on with the **`chg-ctrl-feat`** command. The **`chg-ctrl-feat`** command uses these parameters:

:partnum
The Tekelec-issued part number of the E5-SM4G Throughput Capacity feature, 893019101

:status=on
used to turn the E5-SM4G Throughput Capacity feature on.

This feature increases the processing capacity of SCCP traffic for an EAGLE 5 ISS processing EPAP-based traffic to 75,000 transactions per second. To achieve this increase in SCCP processing capacity, a maximum of 25 E5-SM4G cards must be provisioned and installed in the EAGLE 5 ISS.

1. Display the status of the E5-SM4G Throughput Capacity feature by entering the **`rtrv-ctrl-feat`** command.

   `Possible output of this command follows:`

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
IPGWx Signaling TPS       893012814   on      20000
ISUP Normalization        893000201   on      ----
Command Class Management  893005801   on      ----
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
HC-MIM SLK Capacity       893012707   on      64

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial Period Left
Zero entries found.

The following features have expired temporary keys:

Feature Name              Partnum
Zero entries found.
MNP Circ Route Prevent    893007001 On        ----  20 days 8 hrs 57 mins
```

   If the **`rtrv-ctrl-feat`** output shows that the E5-SM4G Throughput Capacity feature is enabled, shown by the entry E5-SM4G Throughput Cap, and its status is on, no further action is necessary.

   If the **`rtrv-ctrl-feat`** output shows that the LNP feature is enabled, this procedure cannot be performed. The E5-SM4G Throughput Capacity feature cannot be enabled if the LNP feature is enabled.

   If the feature is enabled, and its status is off, go to Step 9 (skip Step 2 through Step 8).

   If the E5-SM4G Throughput Capacity and LNP features are not enabled, go to Step 2 .

2. Enter the **`rtrv-feat`** command to verify the status of the STPLAN feature.

   To enable the E5-SM4G Throughput Capacity feature, the STPLAN feature cannot be turned on.

   The STPLAN feature is shown by the entry LAN in the **`rtrv-feat`** output.

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

If the STPLAN feature is turned off, go to Step 3

3. Verify that the GTT feature is turned on.

   To enable the E5-SM4G Throughput Capacity feature, the GTT feature must be turned on. The GTT feature is shown by the entry GTT in the rtrv-feat output executed in Step 2 . If the GTT feature is turned on, go to Step 4 . If the GTT feature is turned off, perform the "Adding an SCCP card" in the *Database Administration Manual* - Global Title Translation in order to:

   - Turn the GTT feature
   - add the required number of E5-SM4G cards to the database

   After the "Adding an SCCP card" step has been performed, go to Step 5 (skip Step 4).

4. Verify the number of E5-SM4G cards that are provisioned in the database using the **rept-stat-gpl:gpl=sccphc** command.

   This is an example of the possible output.

```
rlghncxa03w 07-05-01 11:40:26 GMT EAGLE5 37.0.0
GPL     CARD   RUNNING       APPROVED      TRIAL
SCCPHC  1201   126-002-000   126-002-000   126-003-000
SCCPHC  1203   126-002-000   126-002-000   126-003-000
SCCPHC  1207   126-002-000   126-002-000   126-003-000
SCCPHC  1213   126-002-000   126-002-000   126-003-000
SCCPHC  1215   126-002-000   126-002-000   126-003-000
SCCPHC  1305   126-002-000   126-002-000   126-003-000
SCCPHC  1313   126-002-000   126-002-000   126-003-000
SCCPHC  2103   126-002-000   126-002-000   126-003-000
Command Completed
```

   If the required number of E5-SM4G cards are provisioned in the database, go to Step 5 .

   If the required number of E5-SM4G cards are not provisioned in the database, perform the "Adding an SCCP card" in the *Database Administration Manual* - Global Title Translation to add the required number of E5-SM4G cards to the database. After the required number of E5-SM4G cards are provisioned in the database, go to Step 5 .

5. Verify whether HIPR cards are installed on all the EAGLE 5 ISS shelves containing E5-SM4G cards using the **rept-stat-gpl:gpl=hipr** command.

```
the rept-stat-gpl:gpl=hipr command.
rlghncxa03w 07-05-01 11:40:26 GMT EAGLE5 37.0.0
GPL     CARD   RUNNING       APPROVED      TRIAL
HIPR    1109   126-002-000   126-002-000   126-003-000
HIPR    1110   126-002-000   126-002-000   126-003-000
HIPR    1209   126-002-000   126-002-000   126-003-000
HIPR    1210   126-002-000   126-002-000   126-003-000
HIPR    1309   126-002-000   126-002-000   126-003-000
HIPR    1310   126-002-000   126-002-000   126-003-000
HIPR    2109   126-002-000   126-002-000   126-003-000
HIPR    2110   126-002-000   126-002-000   126-003-000
Command Completed
```

   If HIPR cards are installed in all shelves containing E5-SM4G cards , go to Step 6 .

   If HIPR cards are not installed on all shelves containing E5-SM4G cards, refer to the *Installation Manual - EAGLE 5 ISS* and install the HIPR cards on each of the shelves. Once the HIPR cards have been installed, go to Step 6 .

6. Display the serial number in the database with the **rtrv-serial-num** command.

   An example of output from this command follows:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
System serial number = nt00001231
```

```
System serial number is not locked.

rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
Command Completed
```

If the serial number is correct and locked, go to Step 10 (skip Step 7, Step 8, and Step 9). If the serial number is correct but not locked, go to Step 9 (skip Step 7 and Step 8). If the serial number is not correct, but is locked, this feature cannot be enabled and the remainder of this procedure cannot be performed. Contact the Customer Care Center to get an incorrect and locked serial number changed. The serial number can be found on a label affixed to the control shelf (shelf 1100).

7. Enter the correct serial number into the database using the **ent-serial-num** command with the serial parameter .

   For this example, enter this command:

   ent-serial-num:serial=<EAGLE 5 ISS's correct serial number>

   When this command has successfully completed, the following message appears.

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   ENT-SERIAL-NUM:  MASP A - COMPLTD
   ```

8. Verify that the serial number entered into Step 7 was entered correctly using the **rtrv-serial-num** command.

   An example of output from this command follows:

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   System serial number = nt00001231

   System serial number is not locked.

   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   Command Completed
   ```

   If the serial number was not entered correctly, repeat Step 7 and Step 8 and re-enter the correct serial number.

9. Lock the serial number in the database by entering the **ent-serial-num** command with the serial number shown in Step 6, if the serial number shown in Step 6 is correct, or with the serial number shown in Step 8, if the serial number was changed in Step 7, and with the l**ock=yes** parameter.

   For this example, enter this command:

   ent-serial-num:serial=<EAGLE 5 ISS's serial number>:lock=yes

   When this command has successfully completed, the following message appears:

   ```
   rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
   ENT-SERIAL-NUM:  MASP A - COMPLTD
   ```

10. Enable the E5-SM4G Throughput Capacity feature with the permanent key by entering the **enable-ctrl-feat** command.

    For this example, enter the following command:

    enable-ctrl-feat:partnum=893019101:fak=<E5-SM4G Throughput Capacity feature access key>

    NOTE: The values for the feature access key (the fak parameter) are provided by Tekelec. If the feature access key for the E5-SM4G Throughput Capacity feature is not known, contact your Tekelec Sales Representative or Account Representative.

    When the **enable-crtl-feat** command has successfully completed, this message appears:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
ENABLE-CTRL-FEAT: MASP B - COMPLTD
```

Note: If you do not wish to turn the E5-SM4G Throughput Capacity feature on, go to Step 12 (and skip Step 11) .

11. Turn the E5-SM4G Throughput Capacity feature using the **chg-ctrl-feat** command, specifying the E5-SM4G Throughput Capacity feature part number used in Step 10 and the **status=on** parameter.

For example, enter the following command:

chg-ctrl-feat:partnum=893019101:status=on

NOTE: Once this feature is turned on, it cannot be turned off.

When this command has successfully completed, the following message appears:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
CHG-CTRL-FEAT: MASP B - COMPLTD
```

12. Verify the changes by entering the rtrv-ctrl-feat command with the E5-SM4G Throughput Capacity feature part number specified in Step 10 or Step 11 .

For example, enter the following command:

rtrv-ctrl-feat:partnum=893019101

An example of output from this command follows:

```
rlghncxa03w 07-05-28 21:15:37 GMT EAGLE5 37.0.0
The following features have been permanently enabled:

Feature Name              Partnum   Status Quantity
E5-SM4G Throughput Cap    893019101   on      ----

The following features have been temporarily enabled:

Feature Name              Partnum    Status  Quantity     Trial Period Left
Zero entries found.
G-Port Circ Route Prevent 893007001 On        ----  20 days 8 hrs 57 mins

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

13. Backup the new changes using the **chg-db:action=backup:dest=fixed** command.

The following messages appear, with the active Maintenance and Administration Subsystem Processor (MASP) appearing first, as shown.

```
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.
```

5

Maintenance and Measurements

Hardware Requirements

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

CAUTION: Having a mix of VSCCP (DSM and E5-SM4G cards) and SCCP card types (TSM cards) is not permitted when the EIR feature is enabled. 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 T1000 AS based MPS system.

EPAP Status and Alarms

EPAP has no direct means of accepting user input or displaying output messages on EAGLE 5 ISS terminals, so maintenance, measurements, and status information are routed through a DSM. EPAP sends two types of messages to the DSM: 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 card, it sends a DSM status request to that DSM card. Since status messages are sent over UDP, the EPAP broadcasts the DSM status request (to all DSM cards) and each DSM card returns its status to the EPAP.

DSM Status Reporting to the EPAP

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

DSM Status Messages – When Sent

DSM cards send a DSM status message to the EPAP when any the following events occur in the DSM card:

- The DSM card is booted
- The DSM card receives a DSM Status Request message from the EPAP
- The DSM card determines that it needs to download the entire database, for example, if the DSM card 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.
- The DSM card starts receiving database downloads or database updates. When a DSM card starts downloading the RTDB or accepting database updates, it sends a DSM Status Message informing the EPAP of the first record received. This helps the EPAP keep track of downloads in progress.

DSM Status Messages Fields

The DSM Status Message provides the following information to the EPAP:

- **DSM Memory Size**. When the DSM card is initialized, it determines the amount of memory present. The EPAP uses the value to determine if the DSM card 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 card database capacity requirements.

- **Load Mode Status**. This indicator indicates whether or not 80% of the IS-NR (In-Service Normal) LIMs have access to SCCP services.

EIR System Status Reports

Status reporting described here includes the following:

- System status
- EIR status
- DSM card 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 provisioning system. See "Maintenance and Measurements User Interface Commands", for more details. EIR statistics are placed in the **rept-stat-sccp** command.

DSM Memory Capacity Status Reporting

As described in the DSM Status Messages Fields , the DSM card sends a message to the EPAP containing the amount of memory on the DSM board. The EPAP determines whether the DSM card has enough memory to store the RTDB and sends an ack or nak back to the DSM card indicating whether or not the DSM card 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 DSM cards, 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 card 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 , 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 ISSOAM 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 ISS. The GPL and data loading support this additional table loading while maintaining support for loading the existing EAGLE 5 ISS tables.

In order to support both RTDB and EAGLE 5 ISS 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 are 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, HOMERN, 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. 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 occurs 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 in the is-nr (In Service - Normal) or oos-mt-dsbld (Out of Service - Maintenance Disabled) 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

The current system implementation interrupts and aborts card loading upon execution of an STP database **chg** command. Loading mode support denies the execution of EAGLE 5 ISS 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 or is-anr).

Effects of System 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 response 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 ISS 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 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 arrives during STP database loading, the DSM aborts the current loading, issues a class 01D7 obit, and reboots. **Figure 5-1** shows an example.

Figure 5-1. Obit Message for Abort of Card Loading

```
tekelecstp 97-04-08 12:29:04 EAGLE 35.0.0
------------------------------------------------------------------------
     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

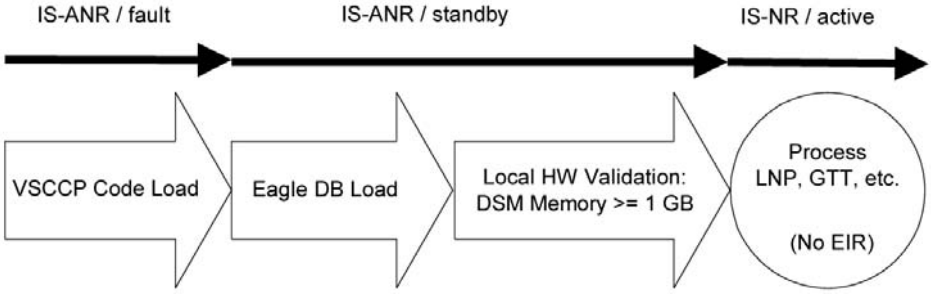
Use the force option to force the execution of commands that would put the system in unstable loading mode. If executing the **`ent-card`** or **`inh-card`** commands would cause the system to enter an unstable loading mode, use the force option on the command.

State Transitions During Start-Up

Figure 5-2 through Figure 5-9 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.

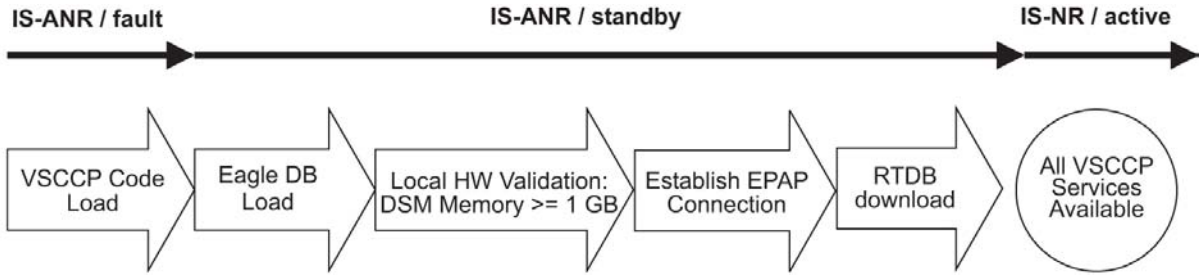
In Figure 5-2 , the EIR feature is not enabled, and the DSM card can operate in TSM emulation mode, although it does not provide EIR operation.

Figure 5-2. EIR Not Enabled, DSM Running in TSM Emulation



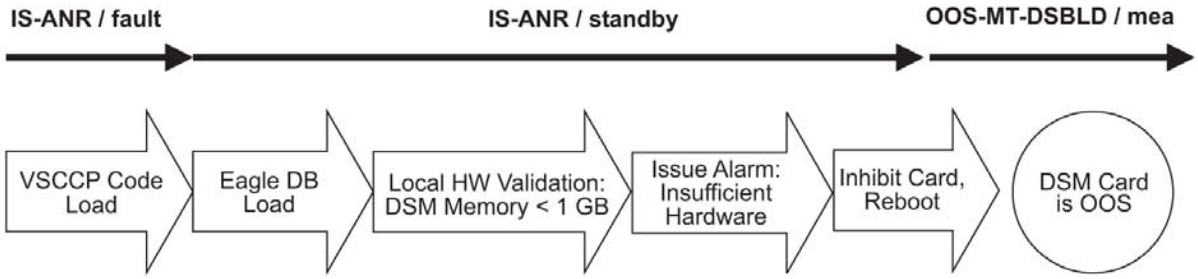
In **Figure 5-3** , the EIR feature is enabled, and the DSM card memory is at least 1 GB and is connected to the EPAP. A normal DSM card operating sequence occurs, providing EIR service.

Figure 5-3. EIR Enabled, Normal Operating Sequence



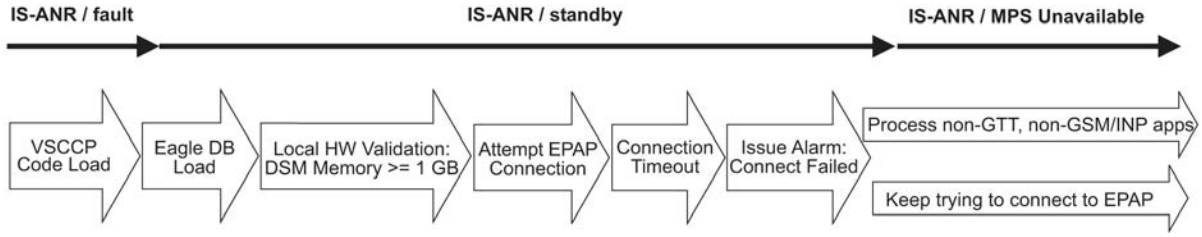
In **Figure 5-4** , the EIR feature is enabled, but the DSM card memory is less than 1 GB. The EIR feature cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements.

Figure 5-4. EIR Enabled, but DSM Memory Less Than 1 GB



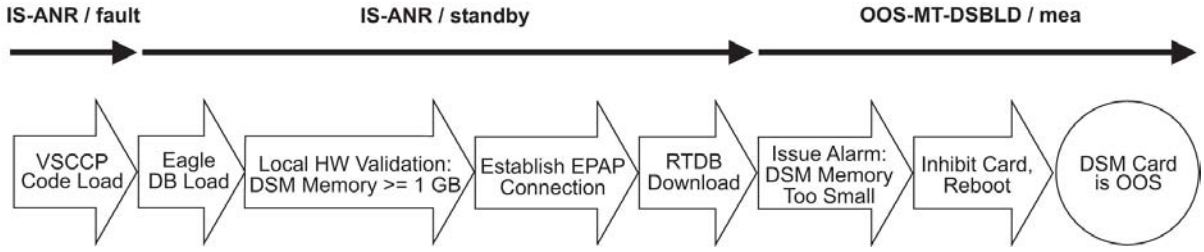
In **Figure 5-5** , the EIR feature is enabled, the DSM card memory has at least 1 GB, but the DSM card is unable to connect EPAP; the EIR cannot begin operation.

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



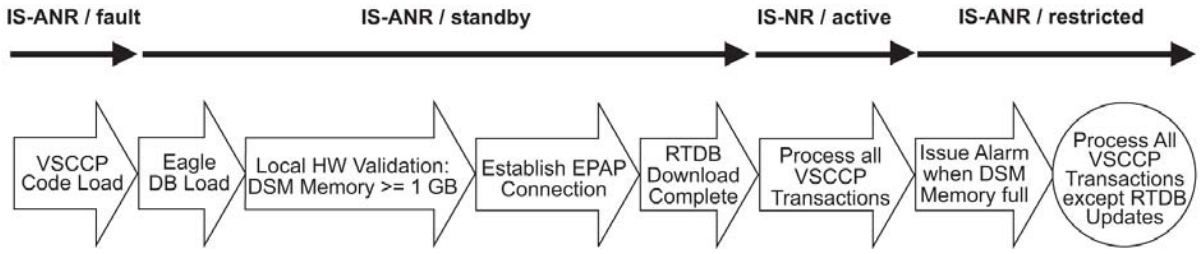
In **Figure 5-6** , the EIR feature is enabled, the DSM card has the required 1 GB memory and is connected to the EPAP, but the DSM card is too small for the required database; the EIR cannot begin operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information on the dimensioning rules and the DSM database capacity requirements**.**

Figure 5-6. EIR Enabled, but DSM Memory Insufficient for Database



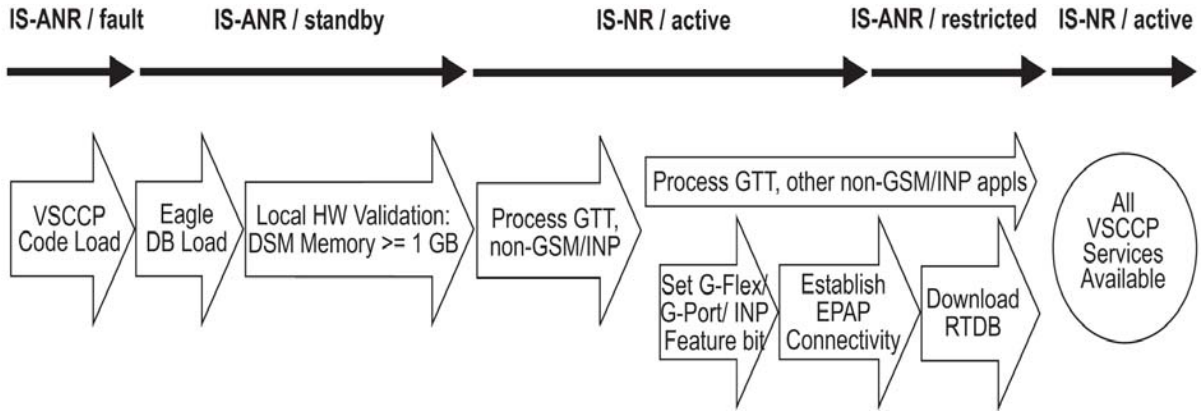
In **Figure 5-7** , the EIR feature is enabled, the DSM card is connected to the EPAP, but the RTDB grows eventually to exceed the capacity of the DSM card memory, despite its memory size of at least 1 GB (an alarm is issued when the DSM memory becomes full from the RTDB update). The EIR cannot begin 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 5-7. EIR Enabled, but Database Exceeds DSM Memory



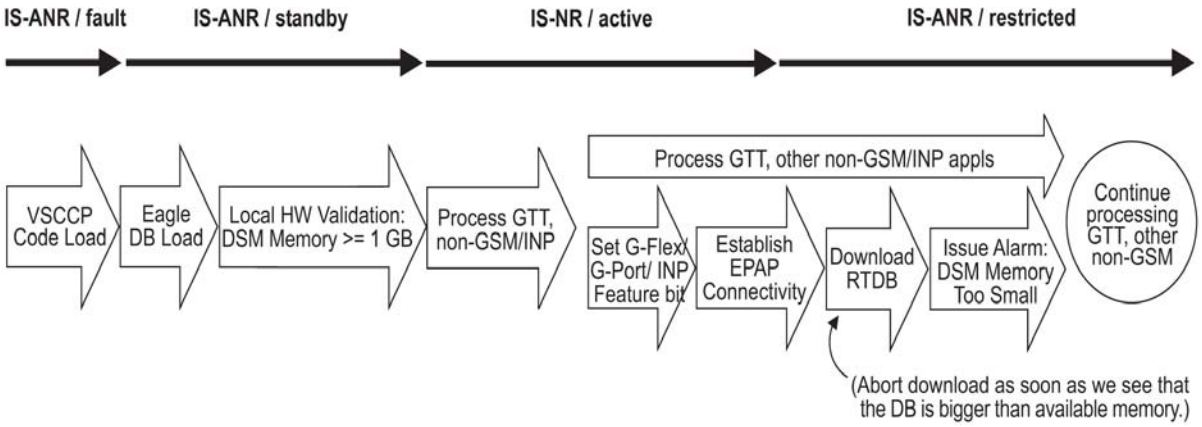
In **Figure 5-8** , the EIR feature is not initially enabled; the DSM card memory has at least 1 GB but no EPAP connection; the DSM card is running other applications when the EIR feature is turned on; the DSM has sufficient memory to provide EIR service.

Figure 5-8. EIR Not Enabled at First, but then Activated on DSM



In **Figure 5-9** , 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 5-9. 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 5-1** contains a listing of UAMs used to support the EIR feature.

Refer to the *EAGLE 5 ISS Maintenance Manual* for more information and corrective procedures for the EAGLE 5 ISS related alarms. Refer to the*MPS Platform Software and Maintenance Manual* for more information and corrective procedures for the MPS related alarms.

Table 5-1. EIR UAMs

UAM	Severity	Message Text	MPS or EAGLE 5 ISS
0013	Major	Card is isolated from system	EAGLE 5 ISS
0084	Major	IP Connection Unavailable	EAGLE 5 ISS
0085	None	IP Connection Available	EAGLE 5 ISS
0099	Major	Incompatible HW for provisioned slot	EAGLE 5 ISS
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 ISS
0423	None	Card reload attempted	EAGLE 5 ISS
0441	Major	Incorrect MBD - CPU	EAGLE 5 ISS
0442	Critical	RTDB database capacity is 95% full	EAGLE 5 ISS
0443	Major	RTDB database is corrupted	EAGLE 5 ISS
0444	Minor	RTDB database is inconsistent	EAGLE 5 ISS
0445	None	RTDB database has been corrected	EAGLE 5 ISS
0446	Major	RTDBDatabase capacity is 80% full	EAGLE 5 ISS
0447	None	RTDB database capacity alarm cleared	EAGLE 5 ISS
0448	Minor	RTDB database is incoherent	EAGLE 5 ISS
0449	Major	RTDB resynchronization in progress	EAGLE 5 ISS
0451	Major	RTDB reload is required	EAGLE 5 ISS
0455	Critical	EIR Subsystem is not available	EAGLE 5 ISS
0456	Critical	EIR Subsystem is disabled	EAGLE 5 ISS
0457	Minor	EIR Subsystem normal, card(s) abnormal	EAGLE 5 ISS
0458	None	EIR Subsystem is available	EAGLE 5 ISS
0459	None	EIR Subsystem is removed	EAGLE 5 ISS

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 35.0.0
**  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 35.0.0
    5676.0085    DSM B   1101           IP Connection Available
```

MPS (EPAP) Alarms

The following alarms are output on the EAGLE 5 ISS and include an alarm data string in the output. Refer to the *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 ISS 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 35.0.0
*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 35.0.0
*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 35.0.0
*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 35.0.0
**  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 35.0.0
**   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 35.0.0
*   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 35.0.0
*   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 ISS. 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 35.0.0
**  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 35.0.0
**  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 35.0.0
**  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 35.0.0
     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 35.0.0
 **  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 35.0.0
*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 35.0.0
**  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 35.0.0
*   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 35.0.0
     0012.0445    CARD 1108  VSCCP       RTDB database has been corrected
```

- **UAM 0446** - RTDBDatabase 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 35.0.0
**   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 35.0.0
     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 35.0.0
*   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 35.0.0
**  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 35.0.0
**  0012.0451 ** CARD 1108  VSCCP       RTDB reload is required
```

EIR Subsystem Alarms

The following alarms are output on the EAGLE 5 ISS 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 35.0.0
*C  0056.0455 *C EIR SYSTEM             EIR Subsystem is not available
```

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

  Indicates all IS-NRSCCP 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 35.0.0
*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 35.0.0
*   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 35.0.0
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 35.0.0
0056.0459    EIR SYSTEM           EIR Subsystem is removed
```

EIR UIMs

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

Table 5-2. EIR UIMs

UIM	Text	Description	Action
1030	Inh EIRSS request already outstanding	An **inh-map-ss** command is already entered and queued.	None
1031	Failure Inhibiting EIRSS	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 CGPATT in the GTTTT table
1037	SCCP rsp did not route - bad Xlation	The SCCP response did not route due to a bad translation	Provision the CGPAGTA address in the GTT database
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 CGPAGTI, 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 CDPASSN 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

UIM	Text	Description	Action
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
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
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	None

UIM	Text	Description	Action
		External element in the dialogue portion of the message.	
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
1288	LSS: Unsupported operation 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 ISS 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 EIRSYS 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 EIRMTCH and

EIRMTCD 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 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 EIRMSUs (Message Signaling Units) are supported for the EIR feature (Table 5-3).

Table 5-3. 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**

Glossary

A

ACM	Address Complete Message
ACM	*Application Communications Module*
ADL	Application Data Loader
AINPQ	ANSI-41 INP Query
ANSI	American National Standards Institute
A-Port	ANSI-41 Mobile Number Portability
AS	Application Server
ASM	Application Services Module
ATH	Application Trouble Handler

B

BS	Base Station

C

CC	Connection Confirmed
CC	Country Code
CgPA	Calling Party Address
CLLI	Common Language Location Identifier
CPC	Capability Point Code
CPU	Central Processing Unit
CSR	Customer Service Request

D

Database	All data that can be administered by the user, including cards, destination point codes, gateway screening tables, global title translation tables, links, LNP services, LNP service providers, location routing numbers, routes, shelves, subsystem applications, and 10 digit telephone numbers.
DB	Database
DB	Daughter Board
DB	Documentation Bulletin
DC	Direct Current
DCB	Device Control Block
DCM	Database Communication Module The DCM provides IP connectivity for applications. Connection to a host is achieved through an ethernet LAN using the TCP/IP protocol.
DPC	Destination Point Code

	The point code of the signaling point to which the MSU is routed. This point code can be adjacent to the EAGLE 5 ISS, but does not have to be.
DSM	Database Service Module.

E

EGTT	Enhanced Global Title Translation
EIR	Equipment Identity Register
Enhanced Global Title Translation	A feature that is designed for the signaling connection control part (SCCP) of the SS7 protocol. The EAGLE 5 ISS uses this feature to determine to which service database to send the query message when a Message Signaling Unit (MSU) enters the system.
EPAP	EAGLE Provisioning Application Processor

F

FTP	Feature Test Plan
FTP	File Transfer Protocol.

G

GB	Gigabyte — 1,073,741,824 bytes
G-Flex	GSM Flexible numbering A feature that allows the operator to flexibly assign individual subscribers to HLRs and route signaling messages, based on subscriber numbering, accordingly.
GPL	Generic Program Load
G-Port	GSM Mobile Number Portability A feature that provides mobile subscribers the ability to change the GSM subscription network within a portability cluster, while retaining their original MSISDN(s).
GPSM-II	General Purpose Service Module
GSM	Global System for Mobile Communications
GT	Global Title Routing Indicator
GTA	Global Title Address
GTI	Global Title Translation Indicator
GTT	Global Title Translation.
GUI	Graphical User Interface

H

HLR	Home Location Register
HMUX	High-Speed Multiplexer
HOMERN	Home Network Routing Number Prefix
HW	Hardware

I

ID	Identity
ID	Identity, identifier
IGM	IS41 GSM Migration

IMEI	International Mobile Equipment Identifier
IMSI	International Mobile Station Identifier
INAP	Intelligent Network Application Protocol
INP	INAP-based Number Portability
INP	Intelligent Network (IN) Portability
INP	INAP-based Number Portability
IP	Intelligent Peripheral
IP	Internet Protocol
IP^7	Tekelec's Internet Protocol to SS7 Interface
ISDN	Integrated Services Digital Network
IS-NR	In Service - Normal
ISDN	Integrated Services Digital Network
ISS	Integrated Signaling System
ITU	International Telecommunications Union

L

LIM	Link Interface Module
Link	Signaling Link
LNP	Local Number Portability
LNPQS	LNP Query Service
LSS	Local Subsystem

M

MAP	Mated Application Part
MAP	Mobile Application Part
MASP	Maintenance and Administration Subsystem Processor
Mated Application	The point codes and subsystem numbers of the service databases that messages are routed to for global title translation.
MB	Megabyte — A unit of computer information storage capacity equal to 1,048, 576 bytes.
MCC	Mobile Country Code
MCP	Measurement Collection Processor This application is used by the MCPM card for the Measurements Platform feature.
MCPM	Measurement Collection and Polling Module
MIM	Multi-Channel Interface Module
MPS	Multi-Purpose Server
MS	Mobile Station
MSC	Mobile Switching Center
MSISDN	Mobile Station International Subscriber Directory Number The MSISDN is the number dialed by someone trying to reach the subscriber.
MSU	Message Signaling Unit
MT	Mobile Terminated
MTP	Message Transfer Part
MTP	Module Test Plan

N

NAI	Nature of Address Indicator
NAIV	NAI Value
NP	Number Plan
NP	Numbering Plan
NP	Number Portability
NPV	Numbering Plan Value

O

OAM	Operations, Administration, and Maintenance
OOS-MT	Out of Service - Maintenance
OPC	Originating Point Code
OPS	Operator Provisioning System

P

PC	Point Code.
PDB	Provisioning Database
PDBA	Provisioning Database Application
PDBI	Provisioning Database Interface
PM	Processing Module
PPP	Point-to-Point Protocol

R

Restricted	The network management state of a route, link set, or signaling link that is not operating properly and cannot carry all of its traffic. This condition only allows the highest priority messages to sent to the database entity first, and if space allows, followed by the other traffic. Traffic that cannot be sent on the restricted database entity must be rerouted or the traffic is discarded.
RFC	Request for Comment
RMTP	Reliable Multicast Transport Protocol
RN	Routing Number
Route	A path to another signaling point.
RSR	Reset Request
RTDB	DSM Real-time database

S

SAT	Supervisory Audio Tone
SCCP	Signaling Connection Control Part
SCP	Service Control Point.
SCRC	SCCP Routing Control
SIM	Subscriber Identity Module

SNAI	Service Nature of Address Indicator
SP	Service Provider
SP	Signaling Point
SS	Subsystem
SS7	Signaling System #7
SSN	Subsystem Number
SSN	SS7 Subsystem Number
SSP	Subsystem Prohibited network management message.
	Subsystem Prohibited SCCP (SCMG) management message. (CER) Service Switching Point (SS7 Network)
STP	Signal Transfer Point.

T

TCAP	Transaction Capabilities Application Part
TCP	Transfer-Cluster-Prohibited
TCP	Transfer Control Protocol
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TDM	Terminal Disk Module.
True Point Code	The point code defining a destination in the Destination Point Code table.
TSM	Translation Service Module
TSM	Translation Services Module
TT	Translation Type.

U

UAM	Unsolicited Alarm Message.
UDP	User Datagram Protocol
UDTS	Unit Data Transfer Service
UI	User Interface
UIM	Unsolicited Information Message

V

VLR	Visitor Location Register
VSCCP	VxWorks Signaling Connection Control Part
	The application used by the DSM card to support the G-Flex, G-Port, INP, EIR, and LNP features. If the G-Flex, G-Port, INP, or LNP feature is not turned on, and a DSM card is present, the VSCCP GPL processes normal GTT traffic.

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