Tekelec EAGLE® 5
Integrated Signaling System

Feature Manual - Equipment Identity Register

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Patents

This product is covered by one or more of the following U.S. and foreign patents:
U.S. Patent Numbers:
5,732,213; 5,953,404; 6,115,746; 6,167,129; 6,324,183; 6,327,350; 6,456,845; 6,606,379; 6,639,981; 6,647,113; 6,662,017; 6,735,441; 6,745,041; 6,765,990; 6,795,546; 6,819,932; 6,836,477; 6,839,423; 6,885,872; 6,901,262; 6,914,973; 6,940,866; 6,944,184; 6,954,526;6,954,794; 6,959,076; 6,965,592; 6,967,956; 6,968,048; 6,970,542; 6,987,781; 6,987,849; 6,990,089; 6,990,347; 6,993,038; 7,002,988; 7,020,707; 7,031,340; 7,035,239; 7,035,387; 7,043,000; 7,043,001; 7,043,002; 7,046,667; 7,050,456; 7,050,562; 7,054,422; 7,068,773; 7,072,678; 7,075,331; 7,079,524; 7,088,728; 7,092,505; 7,108,468; 7,110,780; 7,113,581; 7,113,781; 7,117,411; 7,123,710; 7,127,057; 7,133,420; 7,136,477; 7,139,388; 7,145,875; 7,146,181; 7,155,206; 7,155,243; 7,155,505; 7,155,512; 7,181,194; 7,190,702; 7,190,772; 7,190,959; 7,197,036; 7,206,394; 7,215,748; 7,219,264; 7,222,192; 7,227,927; 7,231,024; 7,242,695; 7,254,391; 7,260,086; 7,260,207; 7,283,969; 7,286,516; 7,286,647; 7,286,839; 7,295,579; 7,299,050; 7,301,910; 7,304,957; 7,318,091; 7,319,857; 7,327,670
Foreign Patent Numbers:
EP1062792; EP1308054; EP1247378; EP1303994; EP1252788; EP1161819; EP1177660; EP1169829; EP1135905; EP1364520; EP1192758; EP1240772; EP1173969; CA2352246

Ordering Information

Your Tekelec Sales Representative can provide you with information about how to order additional discs.

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Chapter 1

Introduction

Topics:

This chapter contains general information about the EIR documentation, the organization of this manual, and how to get technical assistance.

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 - Mobile Stations (MS) on the Black List will be denied access to the network
- White - MSs on the White List will be allowed access to the network
- Gray - 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. EIR requires the Global Title Translation (GTT) feature and the EIR Subsystem is mutually exclusive of the existing LNP subsystem.

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:

- *Introduction* on page 1, contains general information about the EIR documentation, the organization of this manual, and how to get technical assistance.
- *Feature Description* on page 9, provides a functional description of the EIR feature, including network perspectives, assumptions and limitations, a database overview, Service Module card provisioning and reloading, EIR user interface, and an audit overview.
- *EAGLE 5 ISS EIR Commands* on page 37, describes the new or updated commands that support the EIR feature. It provides some sample reports and explanations of appropriate command usage.
- *EIR Configuration* on page 55, describes how to activate the EIR feature.
- *Maintenance and Measurements* on page 115, describes maintenance and measurements in detail, including EPAP status and alarms, hardware verification messages, EIR system status reports and commands, code and application data loading, and alarms.

Documentation Admonishments

Admonishments are icons and text throughout this manual that alert the reader to assure personal safety, to minimize possible service interruptions, and to warn of the potential for equipment damage.

Table 1: Admonishments

	**DANGER**: (This icon and text indicate the possibility of *personal injury*.)
	**WARNING**: (This icon and text indicate the possibility of *equipment damage*.)
	**CAUTION**: (This icon and text indicate the possibility of *service interruption*.)

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The Customer Care Center is available 24 hours a day, 7 days a week, 365 days a year, and is linked to TAC Engineers around the globe.

Tekelec TAC Engineers are available to provide solutions to your technical questions and issues 7 days a week, 24 hours a day. After a CSR is issued, the TAC Engineer determines the classification of the trouble. If a critical problem exists, emergency procedures are initiated. If the problem is not critical, normal support procedures apply. A primary Technical Engineer is assigned to work on the CSR and provide a solution to the problem. The CSR is closed when the problem is resolved.

Tekelec Technical Assistance Centers are located around the globe in the following locations:

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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

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

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.

Documentation Availability, Packaging, and Updates

Tekelec provides documentation with each system and in accordance with contractual agreements. For General Availability (GA) releases, Tekelec publishes a complete EAGLE 5 ISS documentation set. For Limited Availability (LA) releases, Tekelec may publish a documentation subset tailored to specific feature content or hardware requirements. Documentation Bulletins announce a new or updated release.

The Tekelec EAGLE 5 ISS documentation set is released on an optical disc. 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 (*support.tekelec.com*). This site allows for 24-hour access to the most up-to-date documentation, including the latest versions of Feature Notices.

Printed documentation is available for GA releases on request only and with a lead time of six weeks. The printed documentation set includes pocket guides for commands and alarms. Pocket guides may also be ordered separately. Exceptions to printed documentation are:

- Hardware or Installation manuals are printed without the linked attachments found in the electronic version of the manuals.
- The Release Notice is available only on the Customer Support site.

Note: Customers may print a reasonable number of each manual for their own use.

Documentation is updated when significant changes are made that affect system operation. Updates resulting from Severity 1 and 2 PRs are made to existing manuals. Other changes are included in the documentation for the next scheduled release. Updates are made by re-issuing an electronic file to the customer support site. Customers with printed documentation should contact their Sales Representative for an addendum. Occasionally, changes are communicated first with a Documentation Bulletin to provide customers with an advanced notice of the issue until officially released in the documentation. Documentation Bulletins are posted on the Customer Support site and can be viewed per product and release.

Locate Product Documentation on the Customer Support Site

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1. Log into the Tekelec **new** Customer Support site at *support.tekelec.com*.

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2. Click the **Product Support** tab.
3. Use the Search field to locate a document by its part number, release number, document name, or document type. The Search field accepts both full and partial entries.
4. Click a subject folder to browse through a list of related files.
5. To download a file to your location, right-click the file name and select **Save Target As**.

Chapter 2

Feature Description

Topics:

This chapter 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.

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 - Mobile Stations (MS) on the Black List are denied access to the network
- Gray - MSs on the Gray List are allowed on the network, but may be tracked
- White - MSs on the White List are allowed access to the network.

The Equipment Identity Register (EIR) is a network entity used in GSM networks that stores lists of 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 send 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

- GTT must be ON before the EIR feature can be enabled.
- The EIR feature is mutually exclusive with LNP.
- The EIR feature cannot be enabled if any TSMs are in the system.
- The EIR feature may require Service Module cards with additional memory capacity.

EIR Call Flows

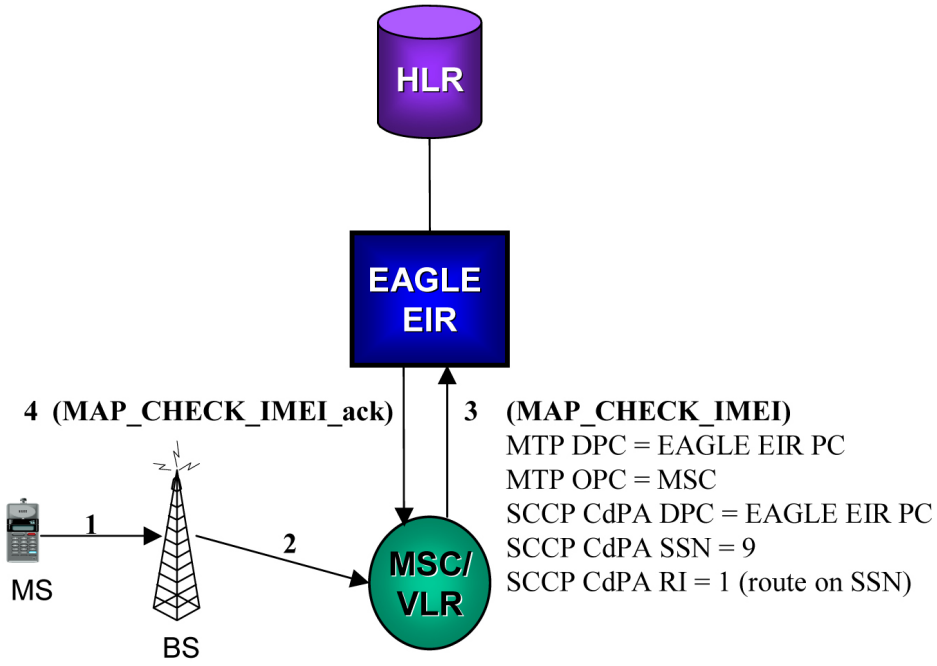
When a handset roams into a new MSC/VLR area, it attempts a registration procedure with the VLR. In a network without the EIR function, this procedure results in the VLR sending a location update message to the HLR, providing the HLR with the current MSC location of the Mobile Station (MS)/handset. Once 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 1: EIR Call Flow* on page 11 and the following text for EAGLE 5 ISS EIR call flow information.

Figure 1: EIR Call Flow



Detailed explanations for each step in the *Figure 1: EIR Call Flow* on page 11 process:

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 ISS GT-translates the message to its own point code and local EIR SSN = "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: Example Individual IMEI Table* on page 13 and *Table 3: Logic for IMEIs in Multiple Lists* on page 13. 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 EIRreturns 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: Example Individual IMEI Table* on page 13) 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 totalEAGLE 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: 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: Example Individual IMEI Table* on page 13, 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 3: 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	inBlack 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

Presence in List			EIR Response Type		
White	Gray	Black	Type 1	Type 2	Type 3
			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: Example Individual IMEI Table* on page 13, 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 3: Logic for IMEIs in Multiple Lists* on page 13, 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: Example Individual IMEI Table* on page 13, 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 3: Logic for IMEIs in Multiple Lists* on page 13, 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: Example Individual IMEI Table* on page 13, 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 3: Logic for IMEIs in Multiple Lists* on page 13, 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: Example Individual IMEI Table* on page 13, 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 3: Logic for IMEIs in Multiple Lists* on page 13, 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 Service Module 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* on page 19 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:

- **Service Module card connectivity:** Service Module cards have a limited buffer for storage of EIR log entries. If the data cannot be delivered, it is discarded.
- **UDP Broadcast:** A Service Module 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 Black List 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 Service Module card. 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 Service Module 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 Service Module 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 Service Module card provisioned at address 192.168.120.1 indicating that Black Listed 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 4: 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

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

MPS/EPAP Platform

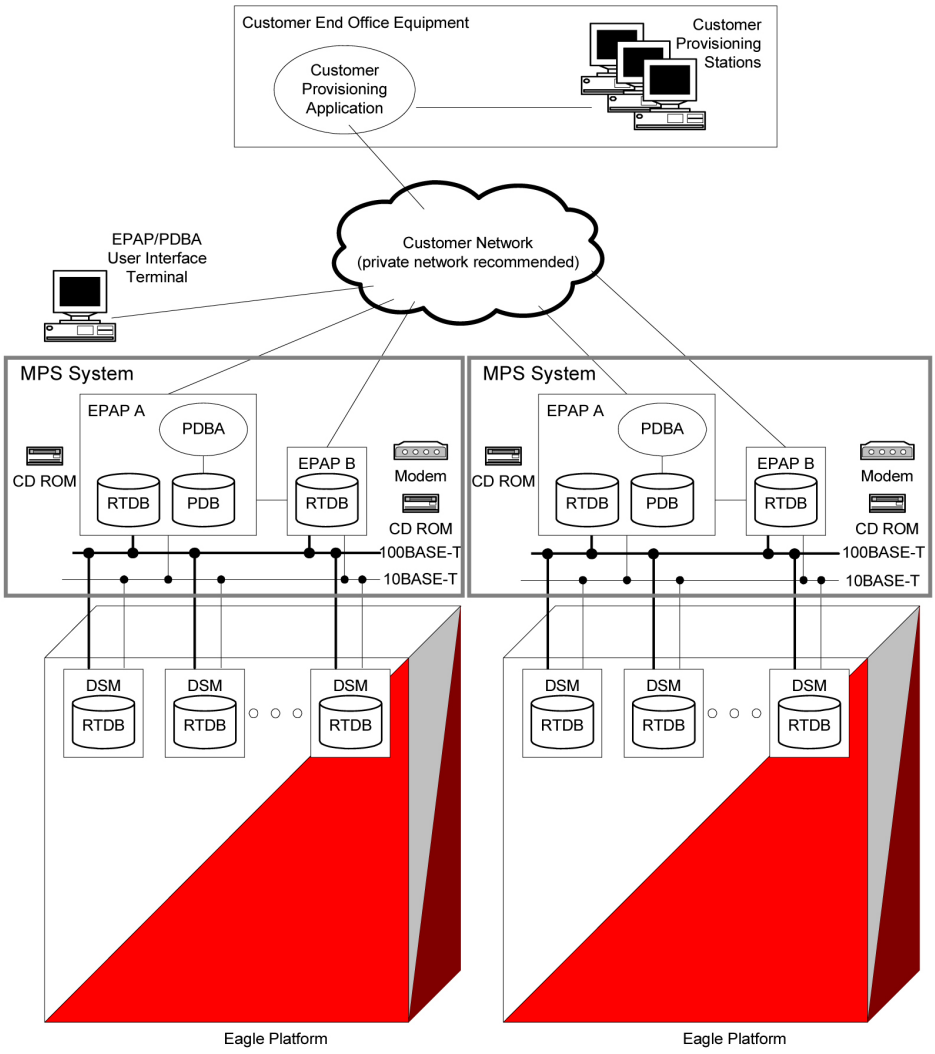
Tekelec provides the MPS (Multi-Purpose Server) platform as a subsystem of the EAGLE 5 ISS. The MPS provides support for the AINPQ, A-Port, EIR , G-Flex, G-Port, IGM, and INP features.

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 Service Module cards. *Figure 2: MPS/EPAP Platform Architecture* on page 21 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 Service Module card databases.

Note: In this Manual, Service Module Card refers to either a DSM card or an E5-SM4G card unless a specific card is required. For more information about the supported cards, refer to the *EAGLE 5 ISS Hardware Manual*.

Figure 2: MPS/EPAP Platform Architecture



Design Overview and System Layout

Figure 2: MPS/EPAP Platform Architecture on page 21 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 Service Module cards, which hold the RTDB database, is part of the STP. Two high-speed Ethernet links connect the Service Module 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 Service Module 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.

The major modules on the EPAP are:

- Service Module card provisioning module
- Maintenance module
- RTDB module
- PDB module

The Service Module card provisioning module is responsible for updating subscriber databases on the EAGLE 5 ISS Service Module 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 Service Module 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 Service Module 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 Service Module 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-Service Module card provisioning task sends database information out on the provisioning link. The Service Module 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 Service Module 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 Service Module 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 transmitted by the EPAPs across a private network to the Service Module 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 Service Module cards. The EPAP server must comply with the hardware requirements in the *MPS Hardware Manual*. *Figure 2: MPS/EPAP Platform Architecture* on page 21 illustrates the EPAP architecture contained in the MPS subsystem.

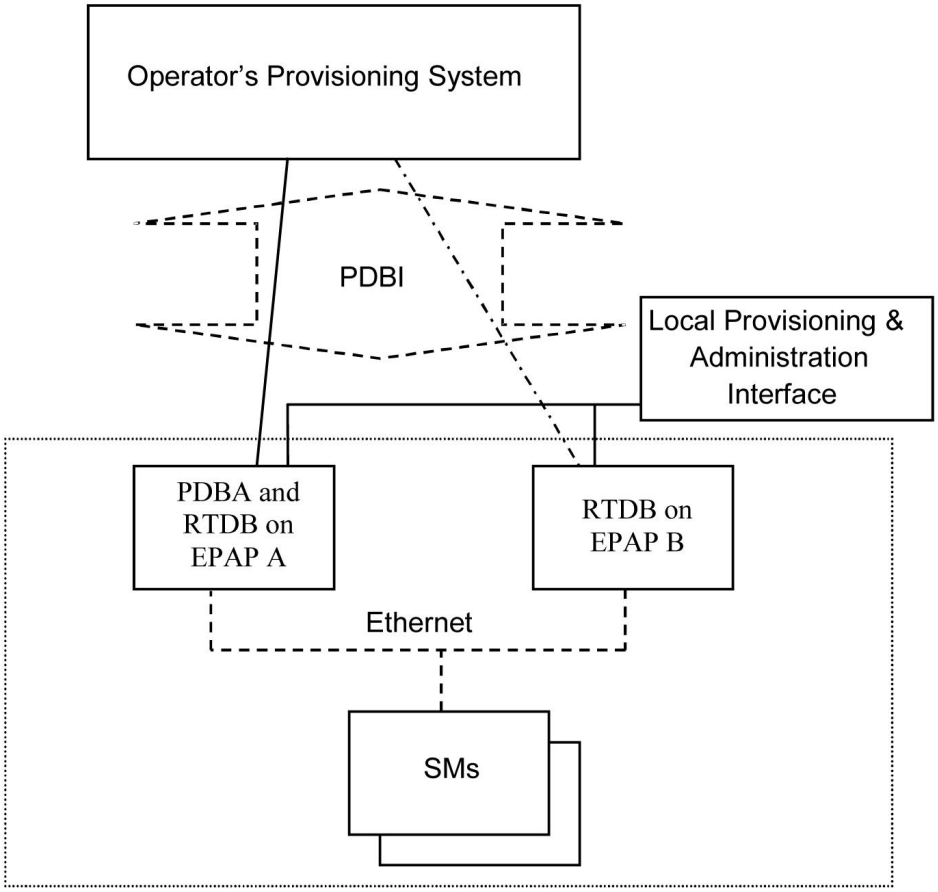
Each EPAP has a dedicated optical media drive. One EPAP per EAGLE 5 ISS platform has a modem capable of supporting remote diagnostics, configuration, and maintenance. These remote operations are performed through EPAP login sessions and are accessible across the customer network as well as through a 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 3: Subscriber Data Provisioning Architecture (High Level) on page 25 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 Provisioning Database Interface (PDBI) between the EPAP and the operator's provisioning system (OPS). Provisioning clients connect to the EPAPs via the 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 3: Subscriber Data Provisioning Architecture (High Level)



A pair of active/standby EPAP servers provides the interface between the Real Time Database (RTDB) of the EAGLE 5 ISS Service Module cards and the OPS. EPAP A is equipped with both the PDB (Provisioning Database) and the RTDB, 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.

Databases requiring high update and retrieval rates, such as the EPAP RTDB, are populated using redundant Ethernet connections to Service Module cards from an EPAP MPS platform.

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

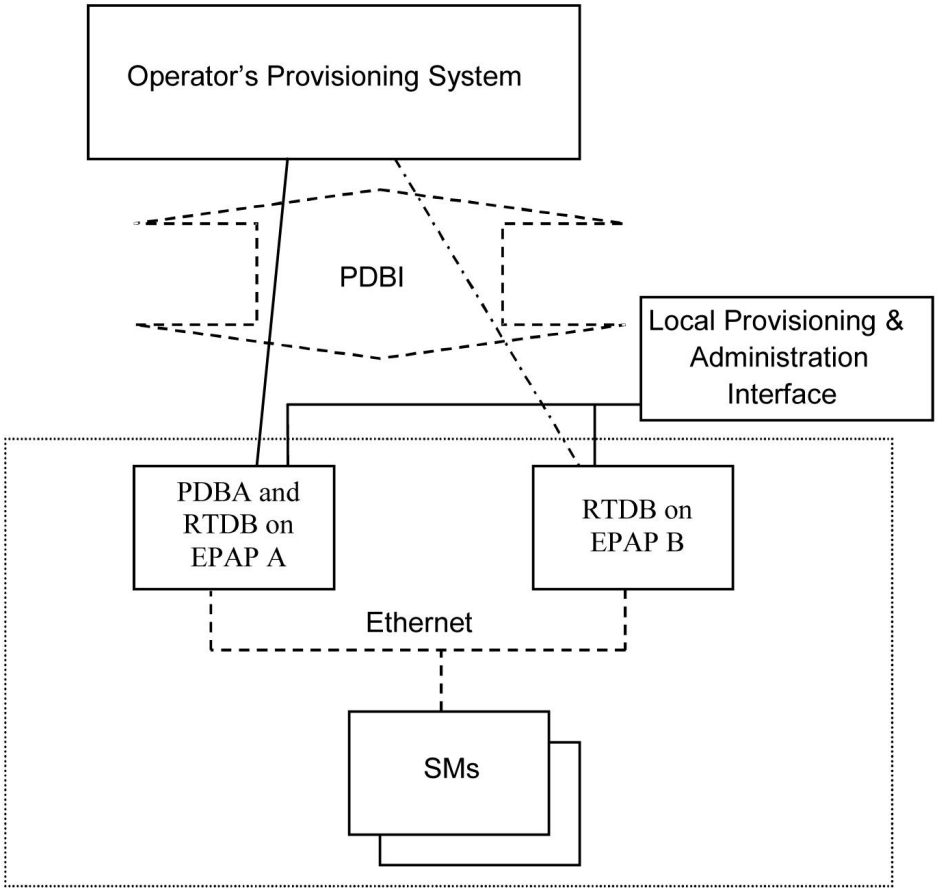
It is this overlapping of database updates, coupled with an RTDB transactional database engine and fast download time, that allows larger amounts of data at a time to be transferred from the PDB. Committing larger amounts of data at a time to the RTDB (versus a single update at a time) allows faster 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 Service Module 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 EPAP RTDB 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*.

Subscriber Data Provisioning

Figure 3: Subscriber Data Provisioning Architecture (High Level) on page 25 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 Provisioning Database Interface (PDBI) between the EPAP and the operator's provisioning system (OPS). Provisioning clients connect to the EPAPs via the 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 4: Subscriber Data Provisioning Architecture (High Level)



A pair of active/standby EPAP servers provides the interface between the Real Time Database (RTDB) of the EAGLE 5 ISS Service Module cards and the OPS. EPAP A is equipped with both the PDB (Provisioning Database) and the RTDB, 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*.

EPAP (EAGLE Provisioning Application Processor)

As shown in *Figure 2: MPS/EPAP Platform Architecture* on page 21, a single MPS system contains two EPAP (EAGLE Provisioning Application Processor) servers. At any given time, only one actively communicates with the Service Module cards. 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 Service Module cards on the EAGLE 5 ISS.

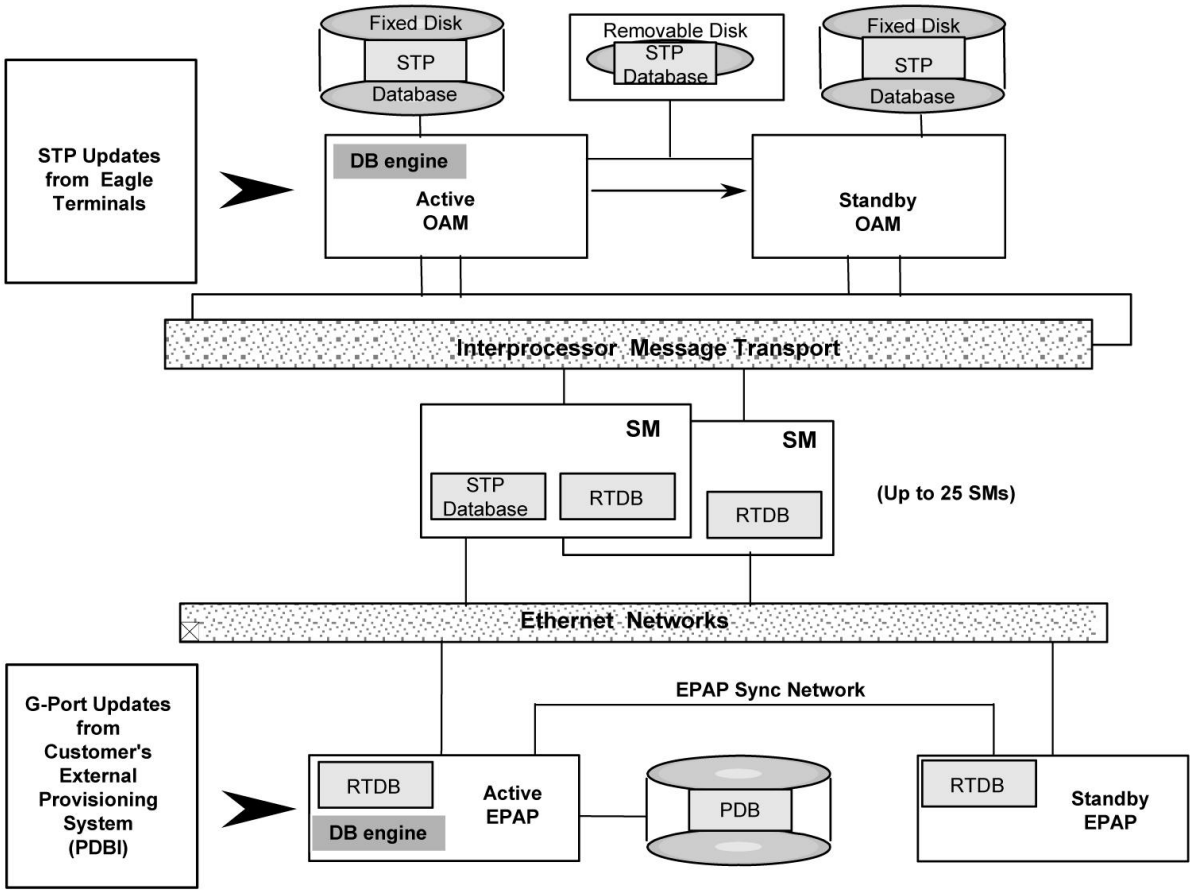
The PDB on the active EPAP receives subscription data from the customer network through the PDBI, the external source of provisioning information. The PDBA continually updates the active EPAP's PDB. The PDB uses MySQL database software. Once an update is applied to the active PDB, it is sent to the RTDBs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

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

In a mated-pair configuration, there are two mated MPS Systems, as shown in *Figure 2: MPS/EPAP Platform Architecture* on page 21. 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 Service Module cards.

Provisioning of the EAGLE 5 ISS's Service Module 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 5: Database Administrative Architecture* on page 27.

Figure 5: Database Administrative Architecture



Service Module Cards

From 1 to 25 Service Module cards can be provisioned with one or more EPAP-related features enabled. EPAP-related features require that all Service Module cards contain 4 GB of memory. *Figure 5: Database Administrative Architecture* on page 27 illustrates each Service Module card having two Ethernet links, the main Service Module network on the 100BASE-T link and the

backup Service Module network on the 10BASE-T link. The Service Module cards run the VSCCP software application.

The Service Module Ethernet ports are linked to the EPAP system to receive the downloaded Real Time database (RTDB). Multiple Service Module cards provide a means of load balancing in high-traffic situations. The RTDB on the Service Module card is in a format that facilitates rapid lookups.

Though the Service Module card copies of the RTDB are intended to be identical, the various databases may not be identical at all times for the following reasons:

- When a Service Module card is initialized, the card 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..
- Card databases can become out-of-sync with the EPAP RTDB when the EPAP receives updates from its provisioning source, but it has not yet sent the updates down to the Service Module cards. Updates are applied to the Provisioning Database (PDB) as they are received.

Two possible scenarios contribute to a condition where a Service Module card may not have enough memory to hold the entire database:

- The database is downloaded successfully to the Service Module card, but subsequent updates eventually increase the size of the database beyond the capacity of the Service Module card memory. In this situation, it is desirable for EPAP-related features to continue processing transactions, even though the database might not be up-to-date.
- When a Service Module card is booted and 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 Service Module card is responsible for recognizing and reporting its out-of-memory conditions by means of alarms.

Overview of EPAP to Service Module Card Communications

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

- UDP - sending Service Module card status messages

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

- IP - reporting EPAP maintenance data

  The Service Module 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 Service Module cards and issues a *Connect* to establish the TCP/IP connection with that Service Module card (referred to as the primary Service Module). The purpose of this link is to provide a path for reporting EPAP alarms and to forward maintenance blocks to the Service Module card.

- IP Multicast - downloading GSM database

  Because of the large size of the database and the need to download it quickly on up to 25 Service Module cards, EPAP-related features use 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 Service Module 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. Service Module cards that need to download the real time database or to receive database updates "join the tree". Service Module cards can also "leave the tree", typically when the database fills their available memory.

Service Module Card Provisioning and Reload

One of the core functions of the EPAP is to provision the Service Module cards with the Real Time Database (RTDB) 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 Service Module cards. Provisioning is done by database level in order to leave tables coherent between updates.

The Service Module 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 based on the Service Module card database level.

Service Module Card Reload Model

Service Module 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 Service Module cards with the current database. The database on the EPAP is large and may be updated constantly. The database sent to the Service Module 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 Service Module cards from different starting points. Reload begins when the first Service Module card requires it. Records are read sequentially from the Real Time Database (RTDB) from an arbitrary starting point, wrapping back to the beginning. If another Service Module card requires reloading at this time, it uses the existing record stream and notifies the Service Module card provisioning task of the first record it read. This continues until all Service Module cards are satisfied.

Service Module Card Database Levels and Reloading

The current database level when the reload started is of special importance during reload. When a Service Module 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 Service Module card continues to reload until it is completely caught up with the current level of the RTDB. As database records are sent to the Service Module 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 Service Module card.

The following terminology is used here for the stages of database reload for a given Service Module card.

- **Stage 1 loading**: The database is being copied record for record from the golden RTDB in the EPAP to the Service Module card 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 Service Module card provisioning task.
- **Coherent:** The database is at a whole database level, that is, not currently updating records belonging to a database level.

EPAP Status and Error Reporting via Maintenance Blocks

The EPAPs forward all status and error messages to the Service Module 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* on page 30
- *EPAP Sync Network* on page 31
- *DSM Networks* on page 32
- *Dial-Up PPP Network* on page 33

The following discussion is an overview of these private networks. It expands on the networks in the architecture diagram shown in *Figure 6: Customer Provisioning Network* on page 31. (For details about configuring these networks, refer to the EPAP *Administration Manual*.)

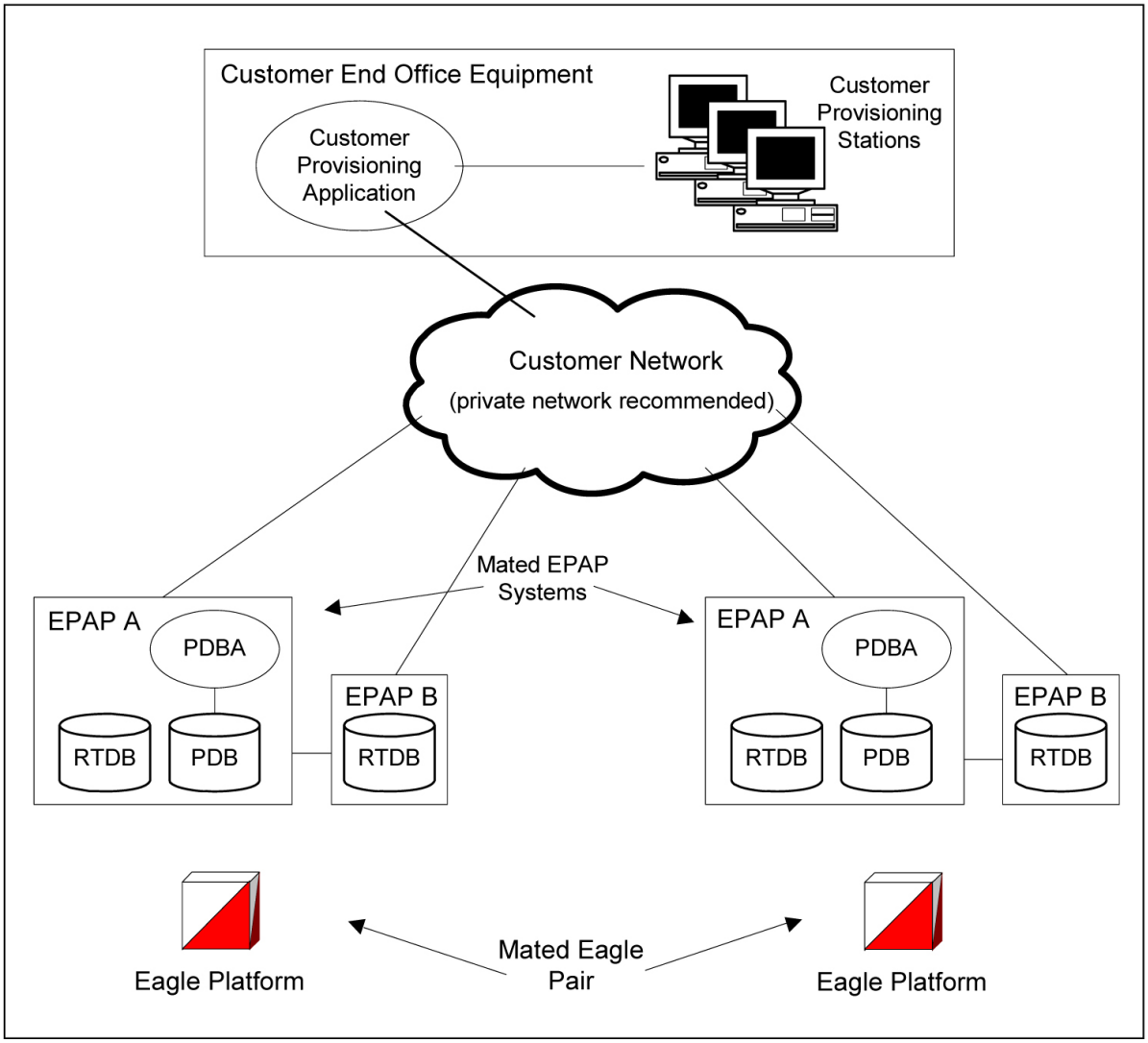
Customer Provisioning Network

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 6: Customer Provisioning Network* on page 31.

Figure 6: Customer Provisioning Network

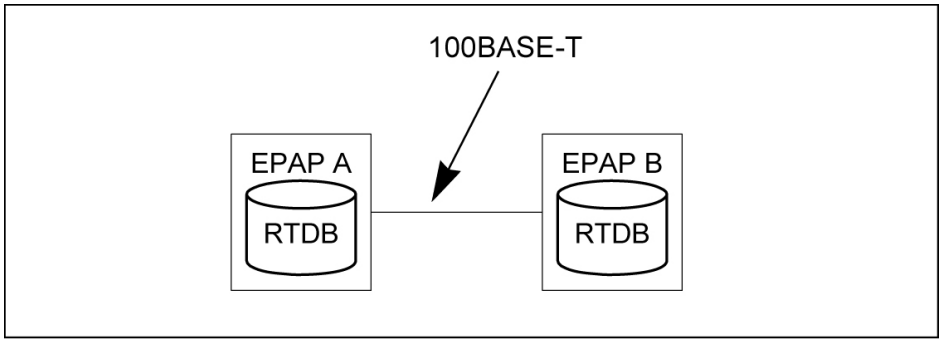


Although a dedicated network is recommended, it is possible that unrelated customer traffic can use the network as well. The determination, either to have a dedicated network or to allow other customer traffic, should be based on available external Ethernet bandwidth and network performance considerations.

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 7: EPAP Sync Network* on page 31.

Figure 7: EPAP Sync Network

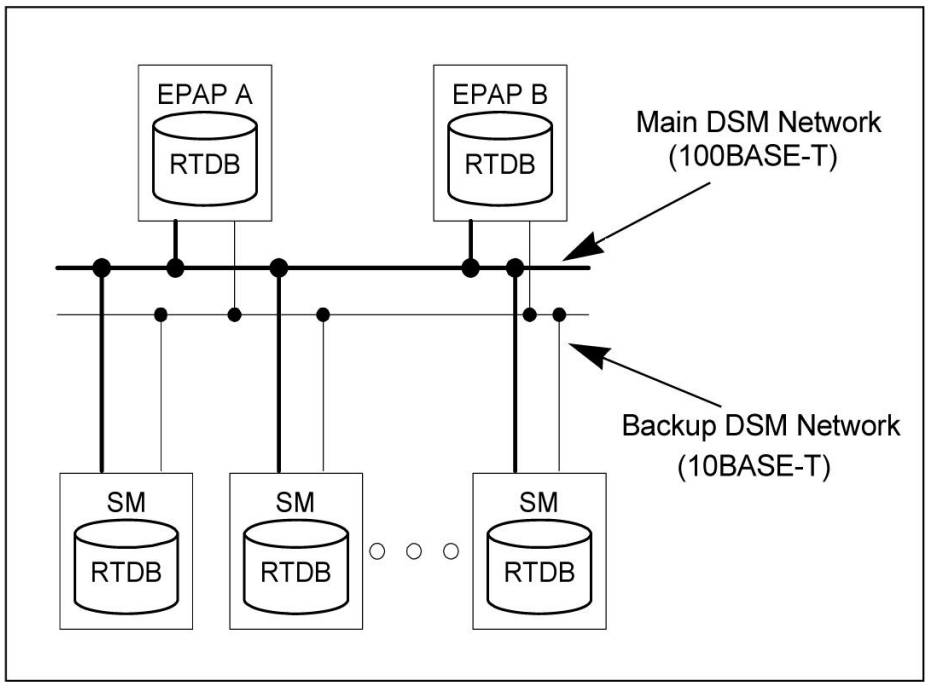


DSM Networks

The DSM networks are shown in *Figure 8: DSM Networks* on page 32. They carry provisioning data from the active EPAP RTDB to the Service Module cards. They also carry reload and maintenance traffic to the Service Module 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 Service Module card on a single EAGLE 5 ISS platform.

Figure 8: DSM Networks



Maintenance information is sent from the active EPAP to an arbitrarily selected Service Module card. The selected Service Module card is known as the primary Service Module card. 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 1918.)

The third octet is 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 5: EPAP IP Addresses in the DSM Network on page 33 summarizes the contents of each octet.

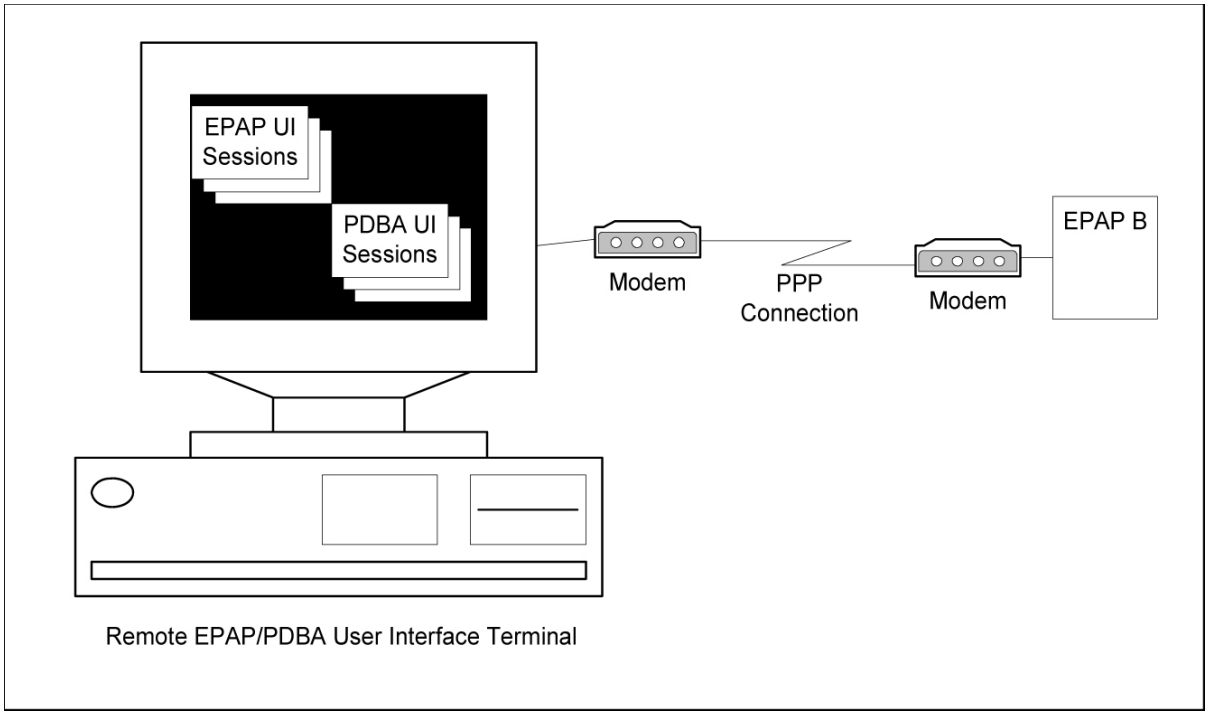
Table 5: EPAP IP Addresses in the DSM Network

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 9: Dial-Up PPP Network* on page 33.

Figure 9: Dial-Up PPP Network



Serviceability Hints

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

- *Mated Application Considerations* on page 34
- *Entity Point Codes and Routes* on page 34

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.

Chapter 3

EAGLE 5 ISS EIR Commands

Topics:

This chapter describes the new or updated commands that support the EIR faeture. It provides some sample reports and explanations of appropriate comand usage.

Introduction

This chapter describes the Commands for maintenance, measurements, and administration of the EIR features. EAGLE 5 ISS EIR commands provide for the provisioning, operations, and maintenance activities of the EAGLE 5 ISS Service Module 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 6: Commands for EAGLE 5 ISS EIR* on page 38.

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 6: 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
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
    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     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 7: Individual IMEI List Determination Table* on page 40 to determine the EIR Response Type.

Table 7: 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

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

Black List	Gray List	White List	IMSI Check	IMSI Match	Result Type	LOG Entry	LOG Entry Result	MSU Result Equipment Status
Y	Y	Y	Y	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 8: chg-gsmopts Parameters - Class = DATABASE

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

  Command examples follow.

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

- **rtrv-gsmopts: Retrieve 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 9: 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 10: chg-srvsel Parameters - Class = DATABASE

Parameter	Optional/ Mandatory	Range	Description
GTII, GTIN, GTIN24	Mandatory	2, 4	Global Title Indicator
SSN	Mandatory	0-255, *	Subsystem number
TT	Mandatory	0-255	Translation Type
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 11: 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

Parameter	Optional/ Mandatory	Range	Description
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 12: rtrv-srvsel Parameters - Class = DATABASE

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

EAGLE 5 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 Service Module 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:

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
       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
       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
       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 Service Module 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:

```
rlghncxa03w 09-01-07 10:23:93 EST  EAGLE 40.0.0
                  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 = 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

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       = No Alarms
  DSM PORT B:      ALARM STATUS       = No Alarms
CARD 1205 ALARM STATUS = No Alarms
  DSM PORT A:      ALARM STATUS       = No Alarms
  DSM PORT B:      ALARM STATUS       = No Alarms
CARD 1302 ALARM STATUS = No Alarms
  DSM PORT A:      ALARM STATUS       = No Alarms
  DSM PORT B:      ALARM STATUS       = No Alarms
CARD 1310 ALARM STATUS = No Alarms
  DSM PORT A:      ALARM STATUS       = No Alarms
  DSM PORT B:      ALARM STATUS       = No Alarms
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/EPAP IP links. Refer to the *Commands Manual* for details of this command. Here is an example of the command and output.

```
rept-stat-alm
Command Accepted - Processing
    eagle10605 99-06-24 23:59:39 EAGLE 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 ISS databases. This includes the level information for each DSM network card, and for the 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*. active and

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 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 Service Module 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 VSCCP GPL. Refer to the *Commands Manual* for details of these commands.

Here are samples of the reports produced by these commands.

```
chg-gpl:appl=vsccp:ver=101-3-0
    Command entered at terminal #3.
;
    tekelecstp 99-10-24 06:54:39 EAGLE 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 128-002-000 128-002-000 128-002-000 128-002-000 VSCCP 1116
128-002-000 128-002-000 128-002-000 -----------
;
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.

Chapter 4

EIR Configuration

Topics:

This chapter identifies prerequisites for the EIR feature activation procedure, an overview of the activation steps, and a matching number of detailed step descriptions to turn on the EIR feature.

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 Service Module cards running the VSCCP application – This can be verified with the `rtrv-card` command. To add Service Module cards, see *Adding a Service Module Card* on page 57.
- 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 Turning On the EIR Feature* on page 61.
- 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* on page 70 or *Changing a Subsystem Application* on page 77.
- The GSM Service Selector, verified with the `rtrv-srvsel` command. To configure GSM Service Selectors, see *Adding an EIR Service Selector* on page 84.
- The EIR Global Response status, EIR Response Type, and EIR IMSI Check status options, verified with the `rtrv-gsmopts` command, can be changed. To change these options, see *Changing the EIR Options* on page 99.

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 Service Module Card

This procedure is used to add a Service Module card 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 Service Module card can be one of the following:

- Service Module card 1G – a Service Module card with 1 gigabyte of memory
- Service Module card 2G – a Service Module card with 2 gigabyte of memory
- Service Module card 3G – a Service Module card with 3 gigabyte of memory
- Service Module card 4G – a Service Module card with 4 gigabyte of memory

The Service Module 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 Service Module card cannot be inserted in slot 09. The Service Module card can be inserted in the control shelf, but only in slots 01, 03, 05, and 07. The Service Module card occupies two card slots, so the even numbered card slot to the right of the odd numbered slot where the Service Module card has been inserted must be empty, as shown in *Table 13: Service Module Card Locations* on page 57. The Service Module card is connected to the network through the odd numbered card slot connector.

Table 13: Service Module Card Locations

Location of the Service Module card	Empty Card Location	Location of the Service Module card	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 Service Module cards to support the number of LIMs in the system. This parameter does not apply to configuring Service Module 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 Service Module cards.

The amount of memory required on these Service Module 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 Service Module database capacity requirements.

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* on page 58, skip this step and go to *Step 3* on page 58.

   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.

3. Display the cards in the system using the `rtrv-card` command.

CAUTION: If the version of the BPDCM GPL on the Service Module card does not match the BPDCM GPL version in the database when the Service Module 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 *Unsolicited Alarm and Information Messages* manual before proceeding with this procedure.

```
rlghncxa03w 03-06-25 09:58:31 GMT Rel 35.0.0
CARD   TYPE      APPL      LSET NAME     PORT SLC LSET NAME     PORT SLC
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
1216   DCM       STPLAN    ------------ --   --  ------------ --   --
1308   LIMDS0    SS7ANSI   sp6          A    1   sp7          B    0
1314   LIMDS0    SS7ANSI   sp7          A    1   sp5          B    1
1317   DCM       STPLAN    ------------ --   --  ------------ --   -
```

4. Verify that the Service Module card has been physically installed into the proper location.

   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 Service Module 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* on page 58, or if the EGTT feature is off and will not be enabled in this procedure, skip this step and go to *Step 8* on page 59.

   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.

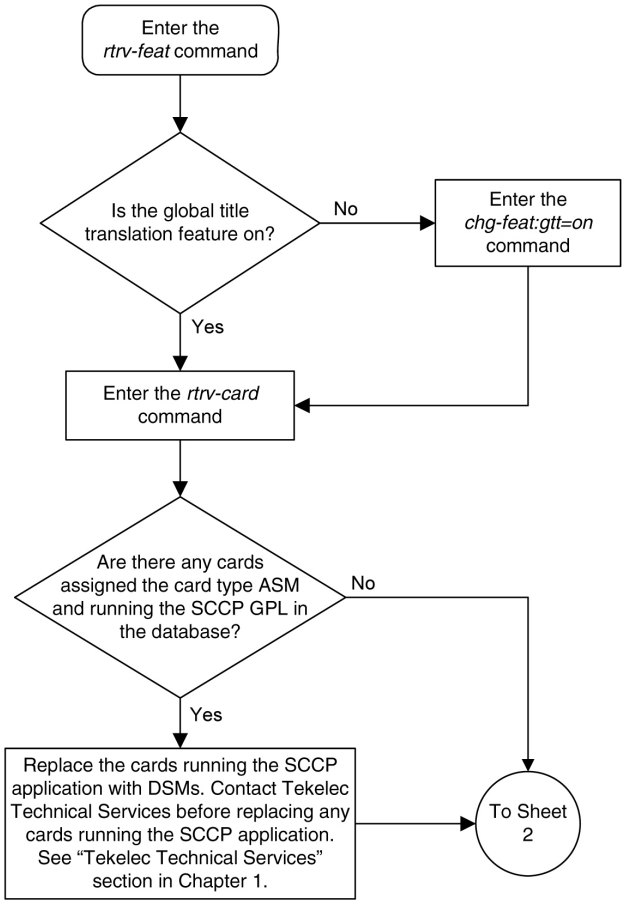
These messages should appear; the active Maintenance and Administration Subsystem Processor (MASP) appears first.

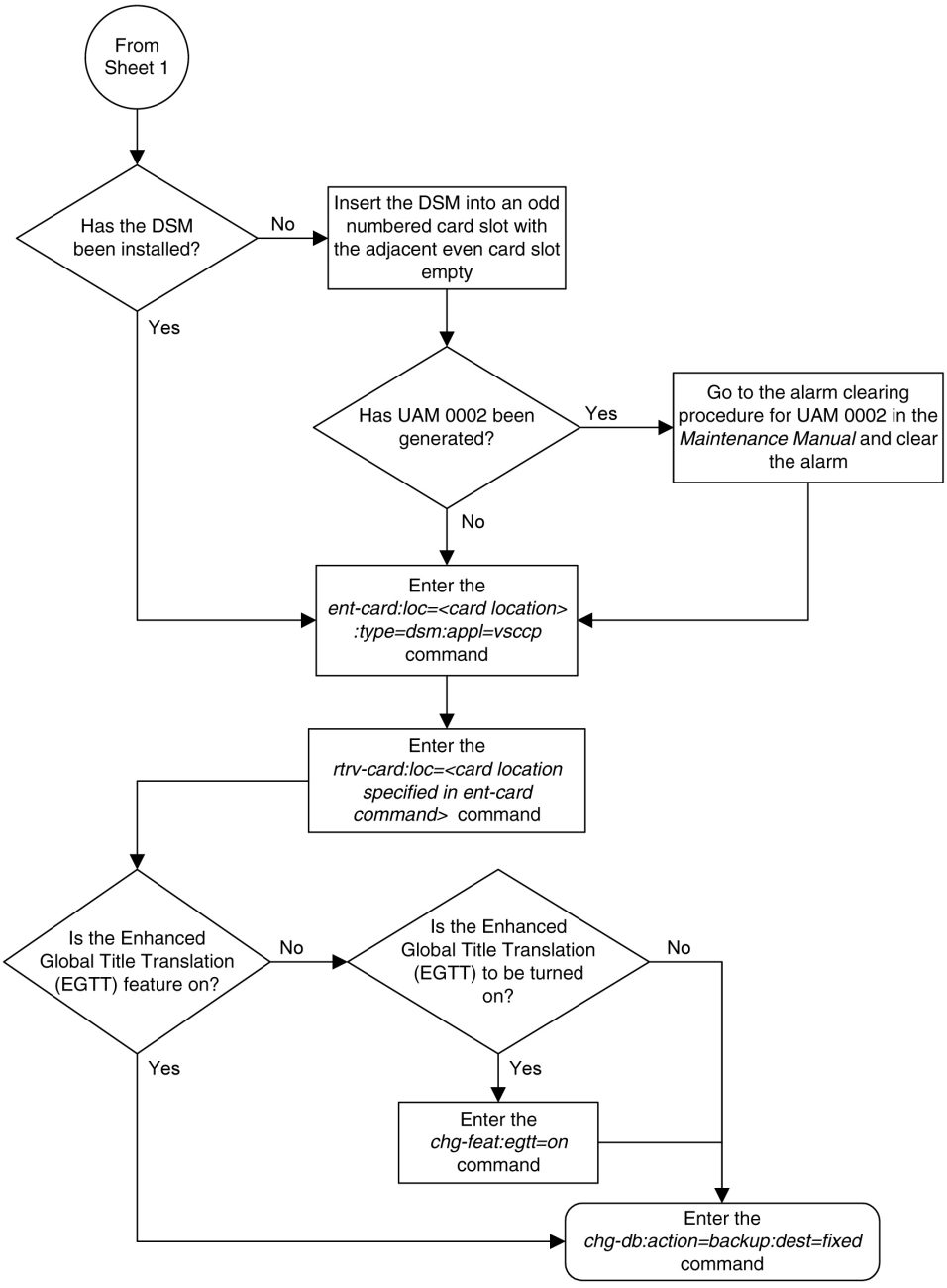
```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

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.

Figure 10: Adding a Service Module Card





Enabling and Turning On the EIR Feature

This procedure is used to enable and turn on the EIR feature.

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

The EIR feature requires Service Module cards to be configured in the system. The amount of memory on these Service Module 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 Service Module card database capacity requirements.

If there are no Service Module cards present in the EAGLE 5 ISS, they must be added before the EIR feature can be enabled and turned on. Go to *Adding a Service Module Card* on page 57 and add the required Service Module cards to the EAGLE 5 ISS.

CAUTION:

The EIR feature cannot be enabled if the LNP feature is enabled. Enter the `rtrv-ctrl-feat` command to verify whether or not the LNP feature is enabled. 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 turned on, 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 turned on, 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. 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.

3. The EIR feature requires that Service Module cards must be configured in the database.

   Display the cards in the database with the `rtrv-card` command. The TSM cards are shown with the entries `TSM` in the `TYPE` field and `GLS SCCP` in the `APPL` field. The DSM cards are shown with the entries `Service Module Card` in the `TYPE` field and `VSCCP` in the `APPL` field.

```
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   TSM         GLS       --------    (--)    --------    (--)
```

```
1216   DCM         STPLAN    --------    (--)    --------    (--)
1305   LIMDS0      SS7ANSI   sp5         (00)    sp6         (00)
```

If Service Module cards are not shown in the output of the `rtrv-card` command, go to *Adding a Service Module Card* on page 57 and add the necessary Service Module cards, making sure that the Service Module cards meet the requirements.

Note:

If the rtrv-card output in *Step 3* on page 63did not contain Service Module cards, skip *Step 4* on page 64 and go to *Step 5* on page 64.

4. Choose one of the Service Module cards shown in the `rtrv-card` output in *Step 4* on page 64.

   Display the amount of memory on the Service Module card, using the `rept-stat-card` command specifying the card location of the Service Module 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 07-09-30 09:41:08 EST  EAGLE 37.0.0
CARD   VERSION      TYPE      GPL        PST            SST        AST
1108   128-021-000  DSM       VSCCP      OOS-MT-DSBLD   MEA      -----

  ALARM STATUS       =  ** 441 Incorrect Motherboard - CPU
  BPDCM   GPL VERSION = 128-021-000
  IMT BUS A          = Disc
  IMT BUS B          = Conn
  CLOCK A            = Idle
  CLOCK B            = Active
  CLOCK I            = Idle
  MBD BIP STATUS     = Valid
  MOTHER BOARD ID    = E486
  DBD STATUS         = Valid
  DBD TYPE           = Invalid
  DBD MEMORY SIZE    = 1024M
  HW VERIFICATION CODE = 004
  SCCP % OCCUP        = 0%
  TVG STATUS
      SNM     TVG RESULT   = 24 hr: ------, 5 min: ------
      INM     TVG RESULT   = 24 hr: ------, 5 min: ------

  Command Completed.
```

   The amount of memory on the Service Module card is shown in the `DBD MEMORY SIZE` field.

   Repeat this step for all Service Module cards shown in the `rtrv-card` output in *Step 3* on page 63.

   Note:

   If the `rtrv-ctrl-feat` output in *Step 1* on page 63 shows any controlled features, skip *Step 5* on page 64 and *Step 6* on page 65, and go to *Step 7* on page 65.

5. 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 6* on page 65 and go to *Step 7* on page 65.

6. If the serial number shown in *Step 5* on page 64 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 5* on page 64 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
   ```

7. 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
   ```

8. The EIR feature enabled in *Step 7* on page 65 must be activated using the `chg-ctrl-feat` command, specifying the EIR feature part number used in *Step 7* on page 65 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
   ```

9. Verify the changes by entering the `rtrv-ctrl-feat`command with the part number specified in *Step 8* on page 65. `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      ------
   ```

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

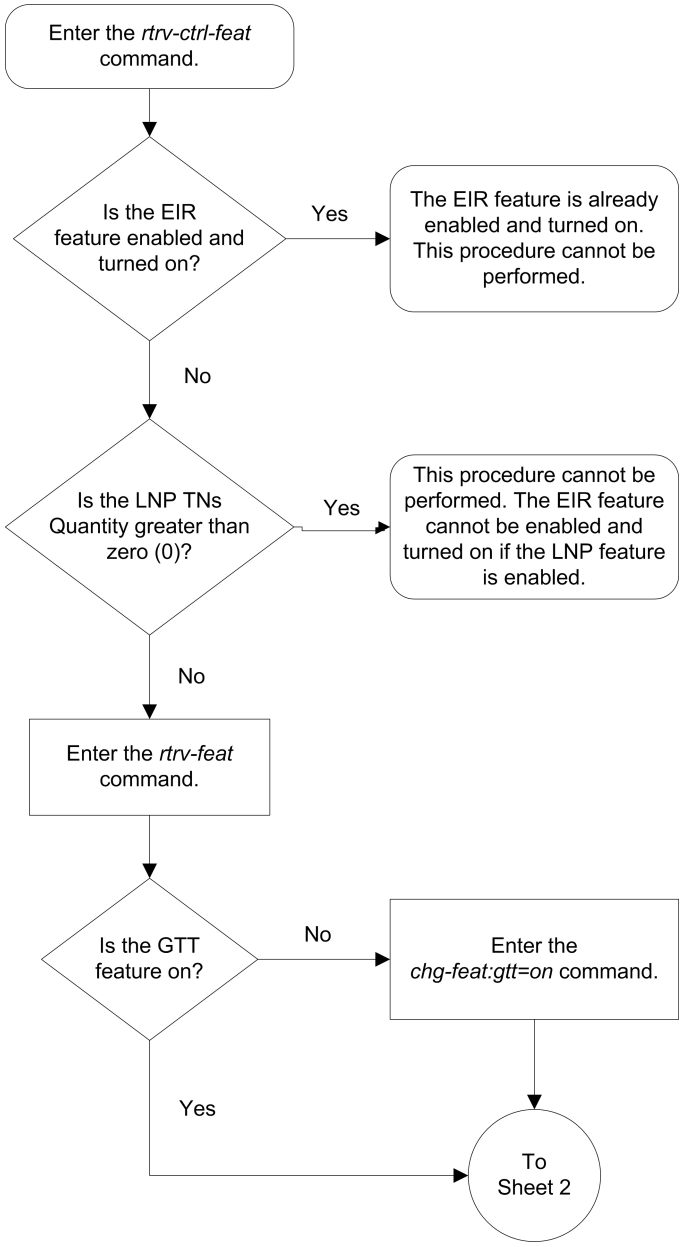
    These messages should appear, the active Maintenance and Administration Subsystem Processor (MASP) appears first:

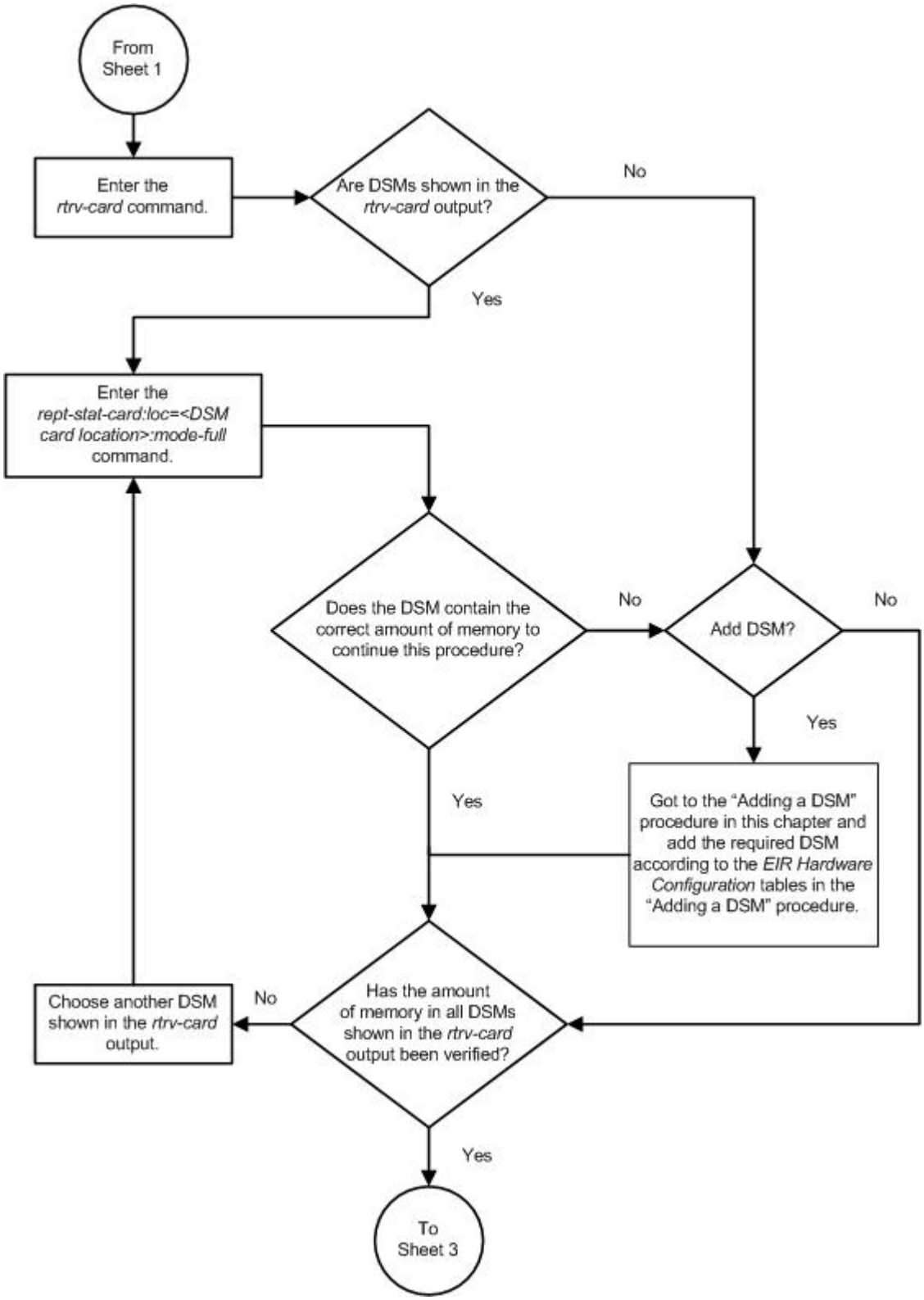
```
BACKUP (FIXED) : MASP A - Backup starts on active MASP.
BACKUP (FIXED) : MASP A - Backup on active MASP to fixed disk complete.
BACKUP (FIXED) : MASP A - Backup starts on standby MASP.
BACKUP (FIXED) : MASP A - Backup on standby MASP to fixed disk complete.
```

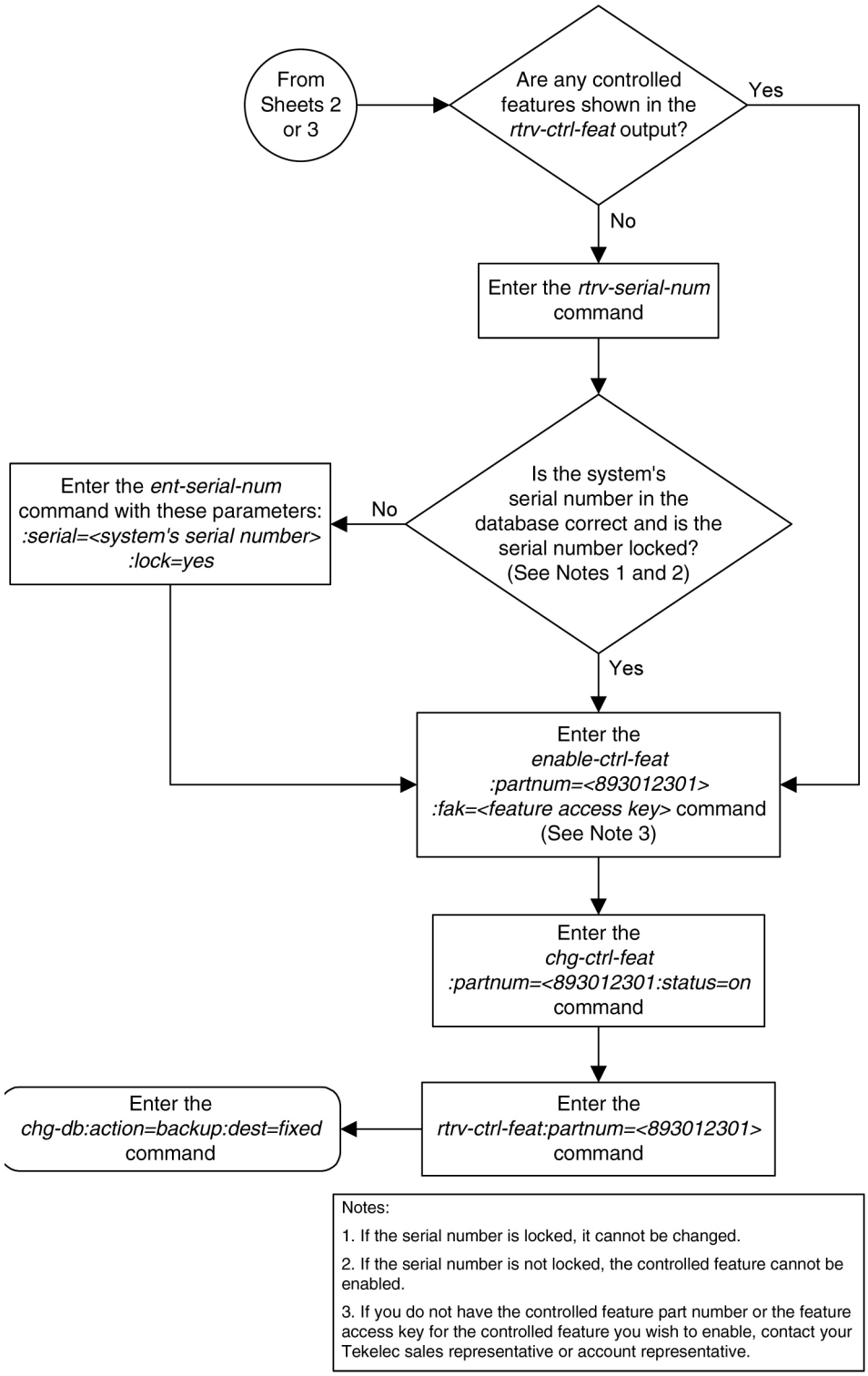
Figure 11: Enabling and Turning On the EIR Feature

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 turned on?
Yes
The EIR feature is already enabled and turned on. 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 turned on if the LNP feature is enabled.
No
Enter the *rtrv-feat* command.
Is the GTT feature on?
No
Enter the *chg-feat:gtt=on* command.
Yes
To Sheet 2


From Sheet 1
Enter the *rtrv-card* command.
Are DSMs shown in the *rtrv-card* output?
No
Yes
Enter the *rept-stat-card:loc=<DSM card location>:mode-full* command.
Does the DSM contain the correct amount of memory to continue this procedure?
No
Add DSM?
No
Yes
Got to the "Adding a DSM" procedure in this chapter and add the required DSM according to the *EIR Hardware Configuration* tables in the "Adding a DSM" procedure.
Yes
Choose another DSM shown in the *rtrv-card* output.
No
Has the amount of memory in all DSMs shown in the *rtrv-card* output been verified?
Yes
To Sheet 3


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 value `LNP` for reserving a subsystem number for the LNP subsystem. This value cannot be used in this procedure. To reserve a subsystem number for the LNP subsystem, perform the procedures in the 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 Turning On the EIR Feature* on page 61 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 Turning On the EIR Feature* on page 61 procedure to enable and activate the EIR feature. Go to *Step 2* on page 71. If the EIR feature is enabled and activated, go to *Step 2* on page 71.

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* on page 71) 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:

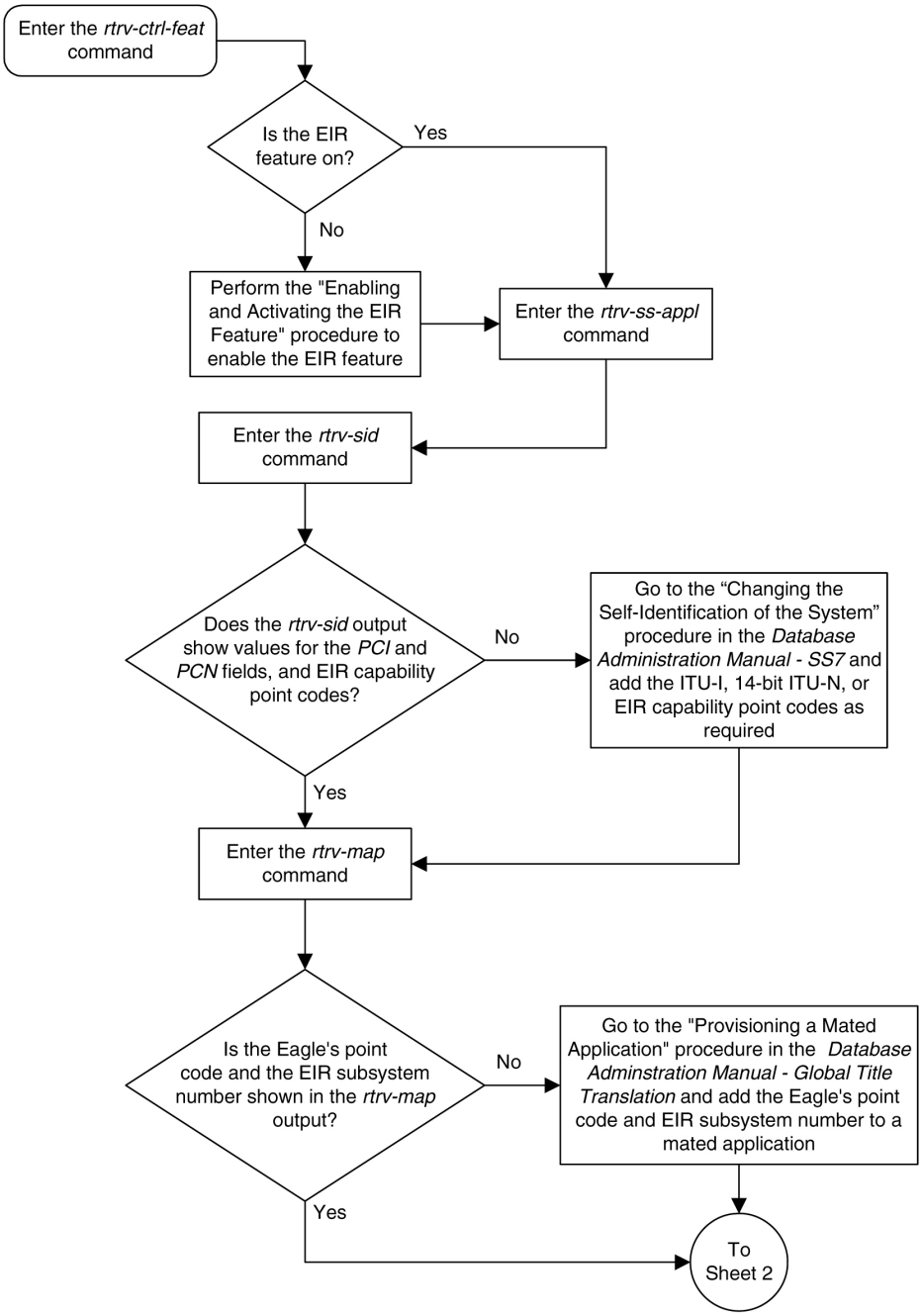
```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0
APPL       SSN       STAT
EIR        100       ONLINE
SS-APPL table is (1 of 1) 100% full
```

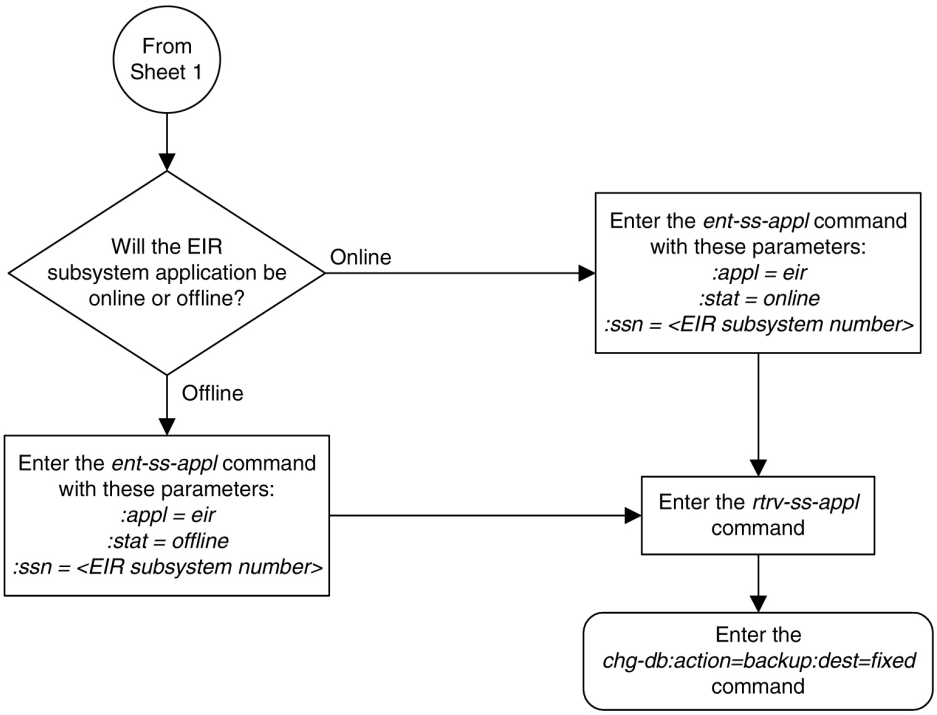
6. Backup the new changes using the `chg-db:action=backup:dest=fixed` command.

   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 12: Adding the EIR Subsystem Application


Enter the *rtrv-ctrl-feat* command
Is the EIR feature on?
Yes
No
Perform the "Enabling and Activating the EIR Feature" procedure to enable the EIR feature
Enter the *rtrv-ss-appl* command
Enter the *rtrv-sid* command
Does the *rtrv-sid* output show values for the *PCI* and *PCN* fields, and EIR capability point codes?
No
Go to the “Changing the Self-Identification of the System” procedure in the *Database Administration Manual - SS7* and add the ITU-I, 14-bit ITU-N, or EIR capability point codes as required
Yes
Enter the *rtrv-map* command
Is the Eagle's point code and the EIR subsystem number shown in the *rtrv-map* output?
No
Go to the "Provisioning a Mated Application" procedure in the *Database Adminstration Manual - Global Title Translation* and add the Eagle's point code and EIR subsystem number to a mated application
Yes
To Sheet 2



Removing the EIR Subsystem Application

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

Note:

The `appl` parameter contains the value `LNP` for removing the LNP subsystem. This value cannot be used in this procedure. To remove the LNP subsystem, perform the procedure in the *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 EIR subsystem number displayed in *Step 3* on page 75.

   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* on page 74, skip *Step 3* on page 75and *Step 4* on page 75, and go to *Step 5* on page 76.

   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 09-04-05 17:34:20 EST  EAGLE 41.0.0
DLT-SS-APPL: MASP A - CAUTION: DELETED APPL SSN MAY BE REFERENCED BY GTT ENTRY
DLT-SS-APPL: MASP A - COMPLTD
;
```

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

   This is an example of the possible output:

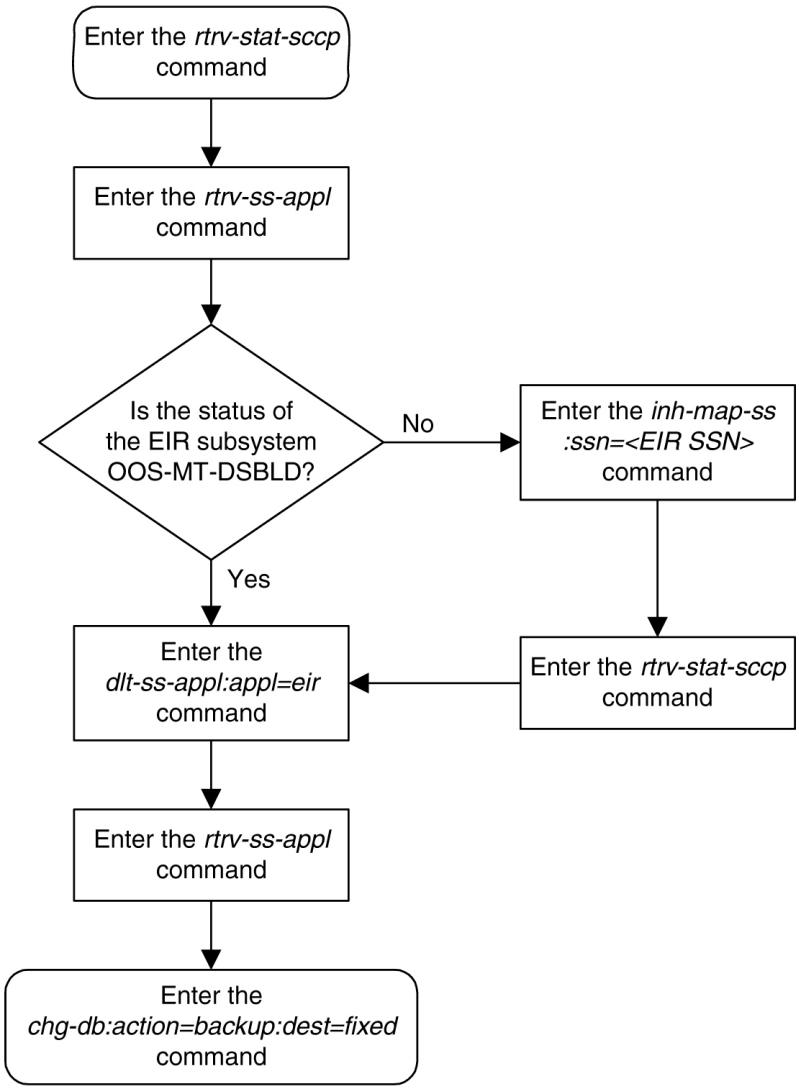
```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0
APPL       SSN       STAT
SS-APPL table is (0 of 1) 0% full
```

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 13: 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 value `LNP` for changing the LNP subsystem. This value cannot be used in this procedure. To change the LNP subsystem, perform the procedure in the 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 *List item.* on page 78. 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:

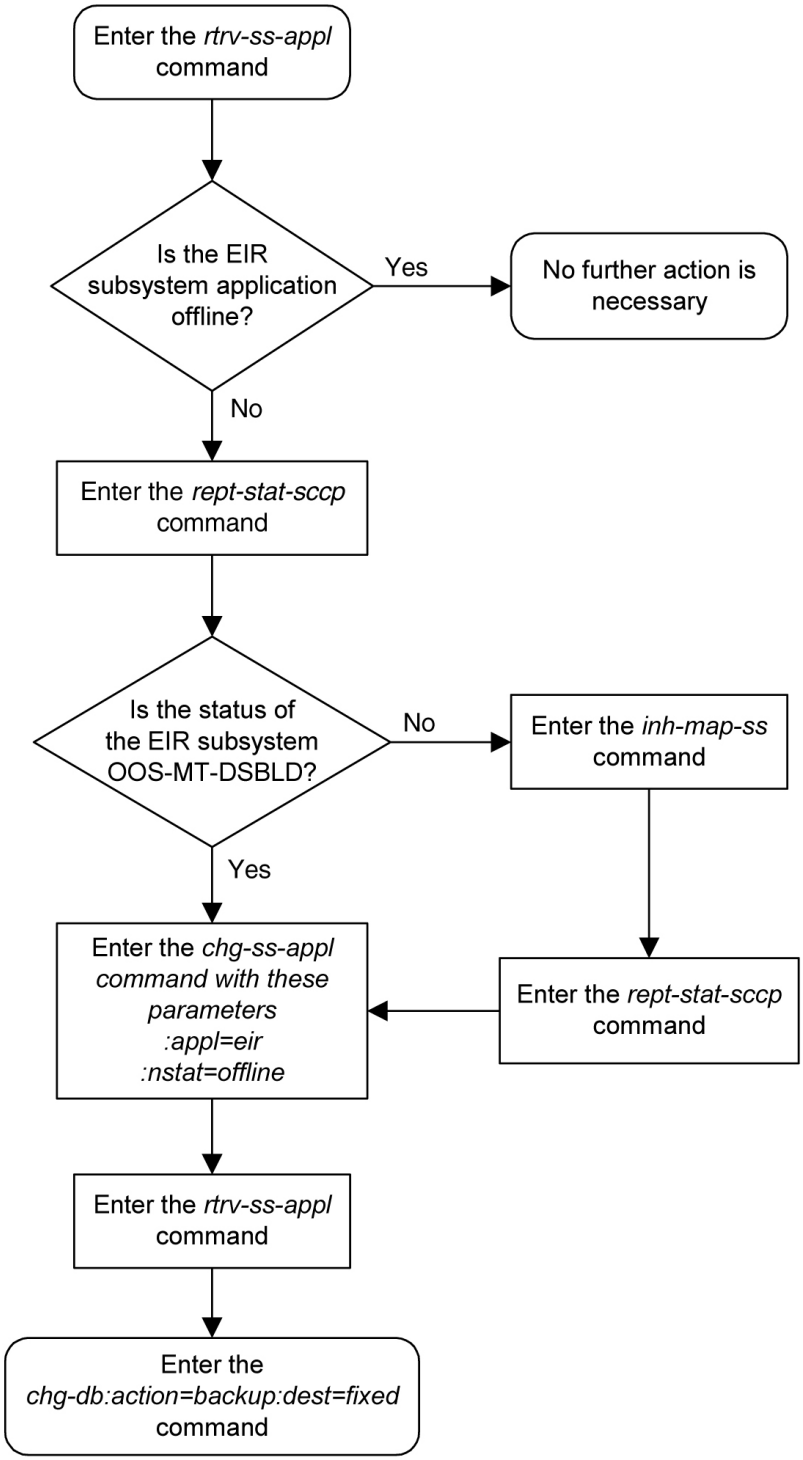
```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0
APPL
```

```
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 14: 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
```

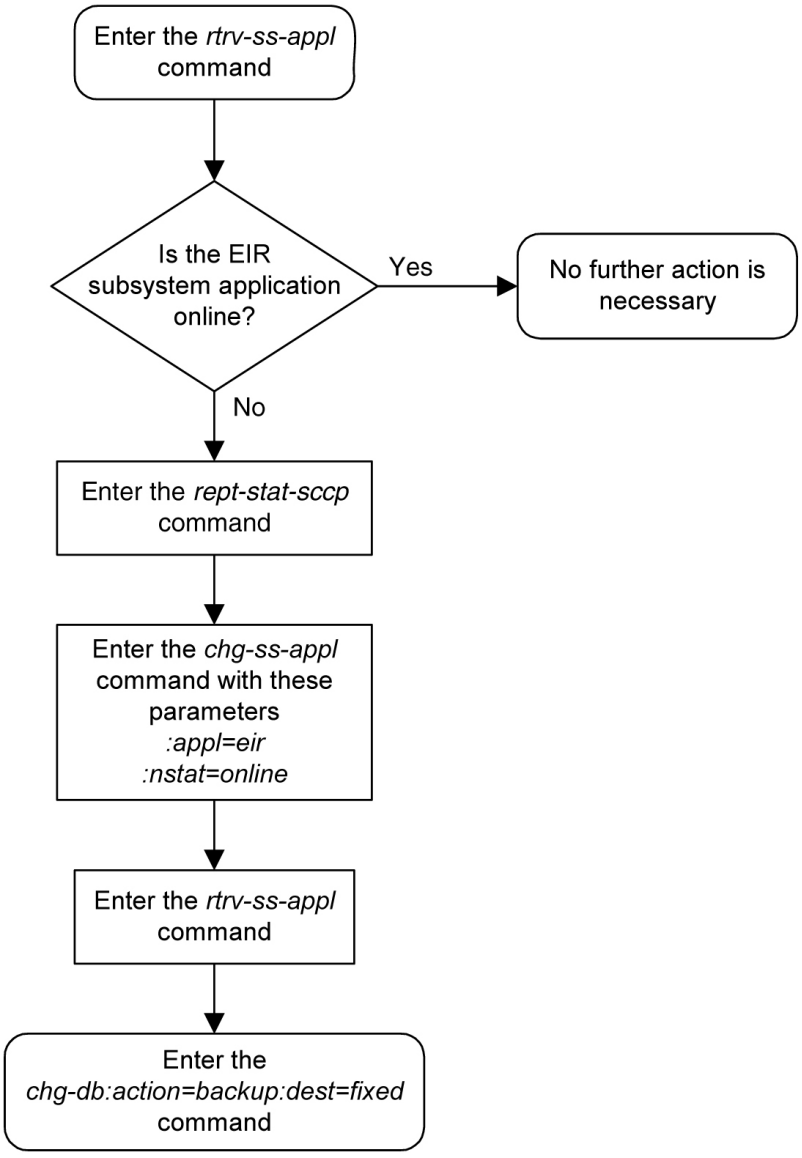
```
EIR        100       ONLINE

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 15: 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 Service Module card 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 14: NAIV/NAI Mapping* on page 84)

`:naiv` – Nature of address indicator value (see*Table 14: NAIV/NAI Mapping* on page 84)

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 14: NAIV/NAI Mapping* on page 84 shows the mapping between the `naiv` and the `nai` parameters.

Table 14: 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 15: NPV/NP Mapping* on page 85)

`:npv` – Numbering plan value (see *Table 15: NPV/NP Mapping* on page 85)

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 15: NPV/NP Mapping* on page 85 shows the mapping between the npv and the np parameters.

Table 15: NPV/NP Mapping

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

Note:

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

The EIR feature must be enabled and activated. Verify this by entering the rtrv-ctrl-feat command. If the EIR feature is enabled and activated, the status of the EIR feature should be on. If the EIR feature is not enabled and activated, perform the *Enabling and Turning On the EIR Feature* on page 61 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 Turning On the EIR Feature* on page 61 to enable and activate the EIR feature. Go to *Step 2* on page 87. If the EIR feature is enabled and activated, go to *Step 2* on page 87.

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* on page 87.

   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:

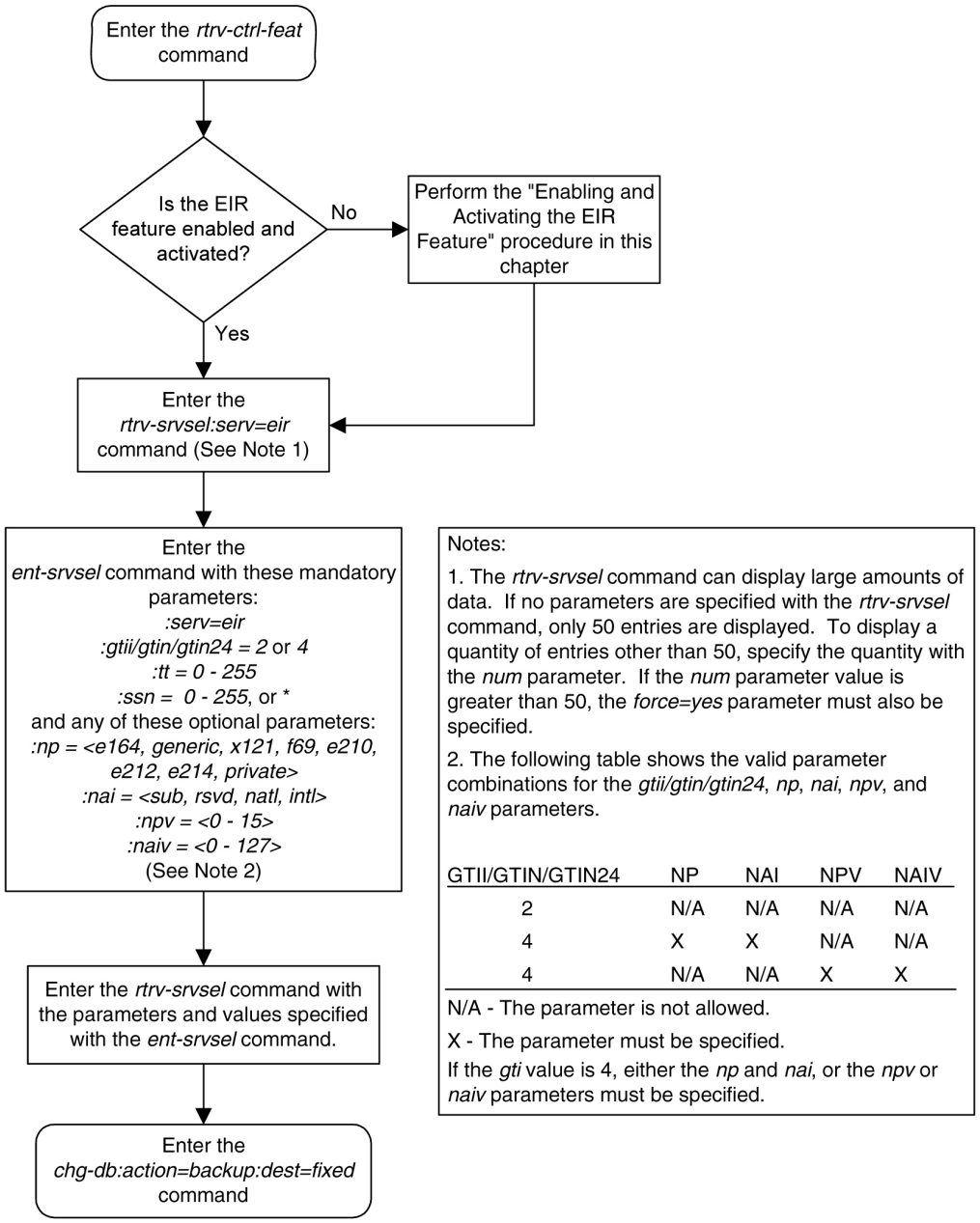
```
rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0

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 16: 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 16: NAIV/NAI Mapping* on page 89)

`:naiv` – Nature of address indicator value (see *Table 16: NAIV/NAI Mapping* on page 89)

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 16: NAIV/NAI Mapping* on page 89 shows the mapping between the `naiv` and the `nai` parameters.

Table 16: 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 17: NPV/NP Mapping* on page 90)

`:npv` – Numbering plan value (see *Table 17: NPV/NP Mapping* on page 90)

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 17: NPV/NP Mapping* on page 90 shows the mapping between the `npv` and the `np` parameters.

Table 17: 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 16: NAIV/NAI Mapping* on page 89 and *Table 17: NPV/NP Mapping* on page 90 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 16: NAIV/NAI Mapping* on page 89 and *Table 17: NPV/NP Mapping* on page 90 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* on page 92.

   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:

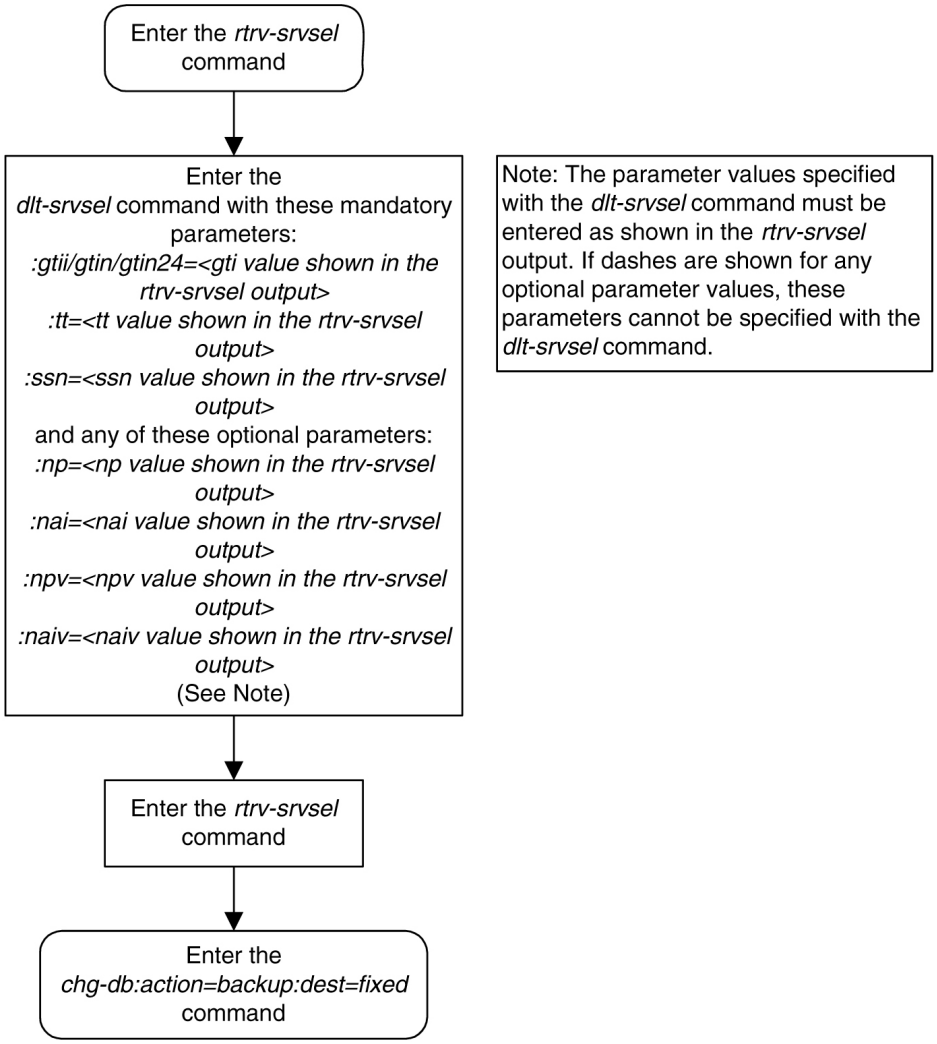
   ```
   rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0

   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 17: 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 Service Module card 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* on page 89 procedure, then add the new EIR service selector with the new parameter information using the *Adding an EIR Service Selector* on page 84 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 18: NAIV/NAI Mapping* on page 94)

`:naiv` – Nature of address indicator value (see *Table 19: NPV/NP Mapping* on page 95)

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 18: NAIV/NAI Mapping* on page 94 shows the mapping between the `naiv` and the `nai` parameters.

Table 18: 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 19: NPV/NP Mapping* on page 95)

`:npv` – Numbering plan value (see *Table 19: NPV/NP Mapping* on page 95)

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 19: NPV/NP Mapping* on page 95 shows the mapping between the `npv` and the `np` parameters.

Table 19: 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* on page 96 shows EIR service selectors, skip *Step 2* on page 96 and go to *Step 3* on page 97.

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 Turning On the EIR Feature* on page 61 procedure to enable and activate the EIR feature before going to *Step 3* on page 97. If the EIR feature is enabled and activated, go to *Step 3* on page 97.

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 18: NAIV/NAI Mapping* on page 94 and *Table 19: NPV/NP Mapping* on page 95 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* on page 89 procedure, then re-enter the service selector as an EIR service selector using the *Adding an EIR Service Selector* on page 84 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* on page 97.

   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:

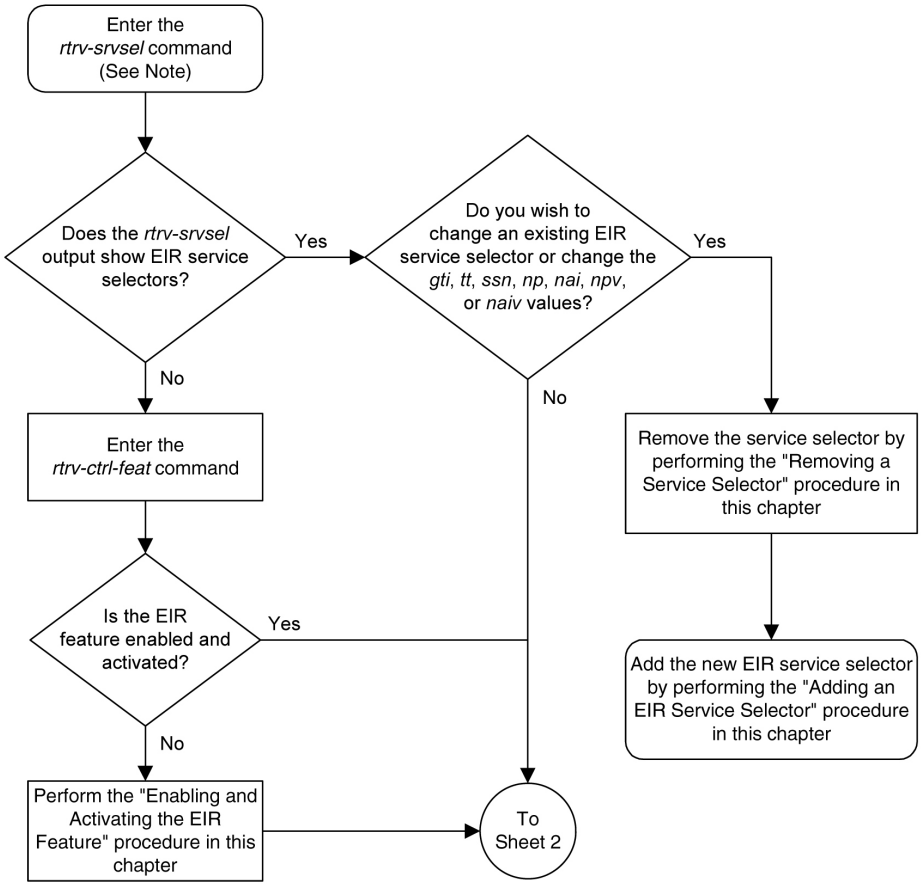
   ```
   rlghncxa03w 03-06-28 14:42:38 GMT Rel 35.0.0

   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
   ```

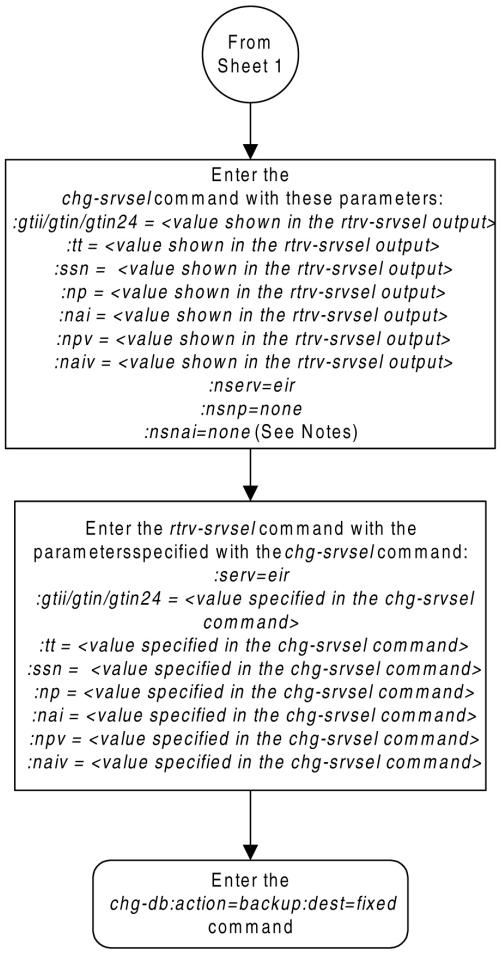
5. Backup the new changes using the `chg-db:action=backup:dest=fixed` command.

   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.
   ```

Figure 18: Changing an Existing Non-EIR Service Selector to an EIR Service Selector


Enter the *rtrv-srvsel* command (See Note)
Does the *rtrv-srvsel* output show EIR service selectors?
Yes
Do you wish to change an existing EIR service selector or change the *gti*, *tt*, *ssn*, *np*, *nai*, *npv*, or *naiv* values?
Yes
No
No
Enter the *rtrv-ctrl-feat* command
Remove the service selector by performing the "Removing a Service Selector" procedure in this chapter
Is the EIR feature enabled and activated?
Yes
Add the new EIR service selector by performing the "Adding an EIR Service Selector" procedure in this chapter
No
Perform the "Enabling and Activating the EIR Feature" procedure in this chapter
To Sheet 2
Note: The *rtrv-srvsel* command can display large amounts of data. If no parameters are specified with the *rtrv-srvsel* command, only 50 entries are displayed. To display a quantity of entries other than 50, specify the quantity with the *num* parameter. If the *num* parameter value is greater than 50, the *force=yes* parameter must also be specified.



Notes:

1. If dashes are shown in the *rtrv-srvsel* output for the SNP and SNAI values, the *nsnp* and *nsnai* parameters do not need to be specified.
2. If the *gtii/gtin/gtin24* parameter value is 2, the *np*, *nai*, *npv*, and *naiv* parameters cannot be specified with the *chg-srvsel* command.
3. 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 4-21 and Table 4-22 for more information on using these parameters.

Changing the EIR Options

This procedure is used to change the EIR Global Response status, EIR Response Type, and EIR IMSI Check status settings with the `chg-gsmopts` command. The `chg-gsmopts` command uses these parameters to detect circular routing in the system:

`:eirgrsp` – The EIR Global Response type. The values for this parameter are:

- `off` – The EIR global response type is turned off.
- `whitelst` – The White List EIR global response type is turned on.
- `graylst` – The Gray List EIR global response type is turned on.
- `blklst` – The Black List EIR global response type is turned on.
- `unknown` – The Unknown EIR global response type is turned on.

The default value for this parameter is `off`.

When this parameter is set to `off`, the normal list logic is applied to the IMEI.

If the Global Response Type parameter is set to something other than `off`, no list logic processing occurs and the response is sent to the MSC is either White List, Gray List, Black List, or Unknown, regardless of the actual status of the IMEI.

`:eirrsptype` – The EIR Response Type. This parameter determines how the lists are to be searched. The EIR Response Types are `type1`, `type2`, and `type3`.

For EIR Response Types 1 or 2, the IMEI searches are handled in this manner:

- If the IMEI is found in the Black List table, the search stops without searching the White and Gray List tables. The IMEI is considered Black Listed regardless of IMEI's presence on the White or Gray List tables.
- If the IMEI is found in the Gray List table, but not found in the Black List table, the search stops without searching 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 List 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 Turning On the EIR Feature* on page 61 procedure.

1. Display the status of the EIR options with the `rtrv-gsmopts` command.

   This is an example of the possible output:

```
tekelecstp 08-09-08 14:53:59 EST  EAGLE5 39.2.0
    GSM OPTIONS
    -----------------------
    DEFMCC           = NONE
    DEFMNC           = NONE
    SRFADDR          = NONE
    MSRNDIG          = RN
    IS412GSM         = NONE
    DEFMAPVR         = 1
    EIRGRSP          = BLKLST
    EIRRSPTYPE       = TYPE2
    EIRIMSICHK       = ON
    SRIDNNOTFOUND    = GTT
```

```
;
```

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-gsmopts` 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 Turning On the EIR Feature* on page 61 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:

```
tekelecstp 08-09-08 14:53:59 EST  EAGLE5 39.2.0
    GSM OPTIONS
    -----------------------
    DEFMCC           = NONE
    DEFMNC           = NONE
    SRFADDR          = NONE
    MSRNDIG          = RN
    IS412GSM         = NONE
    DEFMAPVR         = 1
    EIRGRSP          = BLKLST
    EIRRSPTYPE       = TYPE2
    EIRIMSICHK       = ON
    SRIDNNOTFOUND    = GTT
;
```

Note:

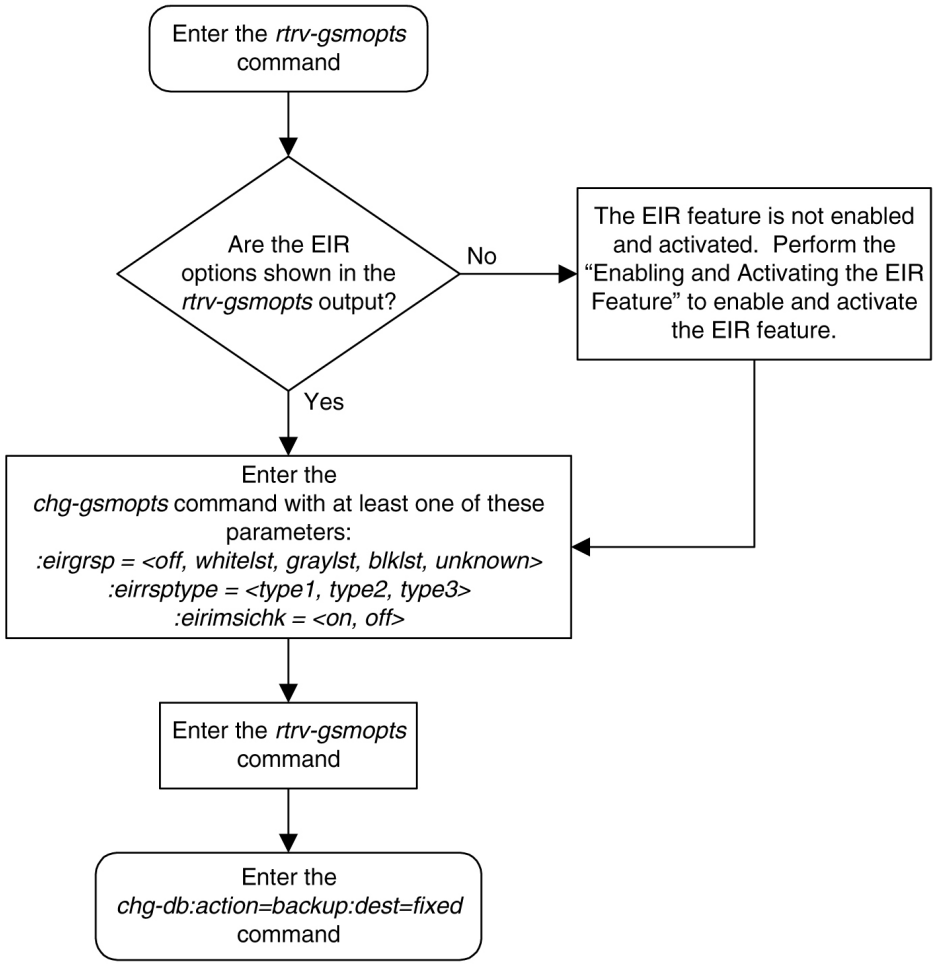
The `rtrv-gsmopts` command output contains other fields that are not used by this procedure. If you wish to see all the fields displayed by the `rtrv-gsmopts` command, see the `rtrv-gsmopts` command description in the *Commands Manual*.

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 19: Changing the EIR Options



The 1100 TPS/Service Module Card for ITU NP Feature

This procedure is used to enable and turn on the 1100 TPS/Service Module card for ITU NP feature. This feature provides up to 26,400 transactions per second when the maximum number of Service Module 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 Service Module cards that are rated at 850 transactions per second (TPS).

CAUTION

CAUTION: The increase of the Service Module card capacity, 1100 TPS per Service Module 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/Service Module card 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/Service Module card for ITU NP feature, 893018001.

After the 1100 TPS/Service Module card 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/Service Module card for ITU NP feature, 893018001.

:status=on

Used to turn the 1100 TPS/Service Module card for ITU NP feature on.

Activating 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.

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 provide this increase in SCCP processing capacity, the maximum of 25 Service Module cards must be provisioned and installed in the EAGLE 5 ISS, and one or more EPAP-related features enabled and turned on. This feature can be enabled only for Service Module cards that are rated at 850 transactions per second (TPS).

Note: The increased capacity to 1100 TPS per Service Module 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 1100 TPS/DSM for ITU NP feature cannot be enabled if:

- The EAGLE 5 ISS does not contain any Service Module cards.
- The LNP feature is enabled.
- The ANSI G-Flex STP Option is enabled.
- The GTT feature is not turned on.

The feature access key for the 1100 TPS/DSM for ITU NP feature is provided by Tekelec. Contact your Tekelec Sales Representative or Account Representative before beginning the feature activation procedure if you do not have the feature access key for this feature. Based on the feature part number and the serial number of the EAGLE 5 ISS, the feature access key is site-specific. The feature access key contains thirteen alphanumeric characters and is not case sensitive. The 1100 TPS/DSM for ITU NP feature cannot be enabled with a temporary feature access key.

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. Verify 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 after the EAGLE 5 ISS is on-site with the `ent-serial-num` command.

Note: To enter and lock the serial number of the EAGLE 5 ISS, the `ent-serial-num` command must be entered twice. The first entry of the `ent-serial-num` command adds the correct serial number to the database with the `serial` parameter. The second entry of the `ent-serial-num` command with the `serial` and `lock=yes` parameters locks the serial number. Verify that the serial number in the database is correct before locking the serial number. The serial number is on a label attached to the control shelf (shelf 1100).

Refer to *Commands Manual* for detailed descriptions of all commands used in this procedure.

1. Display the status of the 1100 TPS/DSM for ITU NP feature by entering the `rtrv-ctrl-feat` command.

   Example of a possible output:

```
rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0

The following features have been permanently enabled:
Feature Name              Partnum    Status  Quantity
HC-MIM SLK Capacity       893012707  on            64
Prepaid SMS Intercept Ph1 893006701  on          ----
1100 TPS/DSM for ITU NP   893018001  on          ----

The following features have been temporarily enabled:
Feature Name              Partnum    Status  Quantity     Trial Period Left
MNP Circ Route Prevent    893000140  On          ----  20 days 8 hrs 57 mins

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

2. Based on the output in *Step 1* on page 104, perform one of the following:

   - 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 entry of the `rtrv-ctrl-feat` output shows that the 1100 TPS/DSM for ITU NP feature is enabled and the feature status is on, no further action is necessary.
   - If the feature is enabled and the feature status is off, go to *Step 13* on page 106.
   - If the 1100 TPS/DSM for ITU NP and LNP features are not enabled, continue to *Step 3* on page 104.

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

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

   - If the G-Flex feature is on, continue to *Step 4* on page 104.
   - If the G-Flex feature is off, go to *Step 5* on page 105.

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 ANSIGFLEX entry 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. Proceed to *Step 6* on page 105.

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 GTT entry in the `rtrv-feat` output in *Step 3* on page 104.

   - If the GTT feature is turned on, continue to *Step 6* on page 105.
   - If the GTT feature is turned off, perform "Adding a Service Module" in *Database Administration Manual - Global Title Translation* to turn on the GTT feature and to add the required number of Service Module cards to the database. After "Adding a Service Module" has been performed, go to *Step 11* on page 106.

6. Verify the number of Service Module cards provisioned in the database using the `rtrv-card:appl=vsccp` command:

   Example of a possible output:

```
tklc1110501 07-04-12 17:28:02 EST  EAGLE5 37.0.0
CARD   VERSION      TYPE      GPL         PST            SST        AST
1111   128-015-000  DSM       SCCPHC      IS-NR          Active     -----
1101   128-015-000  DSM       VSCCP       IS-NR          Active     -----

Command Completed.
```

7. Based on the output shown in *Step 6* on page 105, perform one of the following:

   - If the required number of Service Module cards is provisioned in the database, continue to *Step 8* on page 105.
   - If the required number of Service Module cards is not provisioned in the database, perform "Adding a Service Module" in *Database Administration Manual - Global Title Translation* to add the required number of Service Module cards to the database. After "Adding a Service Module" has been performed, continue with *Step 8* on page 105.

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

   Example of a possible output:

```
rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0

System serial number = nt00000123

System serial number is not locked
.
rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0
Command Completed
```

9. Compare the serial number located on a label affixed to the control shelf (shelf 1100) to the output shown in *Step 8* on page 105, then perform one of the following:

- If the serial number is not correct and is locked, this feature cannot be enabled and the remainder of this procedure cannot be performed. Contact *Customer Care Center* on page 3 to change an incorrect and locked serial number.
- If the serial number is not correct and is not locked, continue to *Step 10* on page 106.
- If the serial number is correct but is not locked, go to *Step 12* on page 106.
- If the serial number is correct and is locked, go to *Step 13* on page 106.

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

Command example:

```
ent-serial-num:serial=<EAGLE 5 ISS serial number>
```

After the command has completed successfully, this message is displayed:

```
rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

11. Verify with the `rtrv-serial-num` command that the serial number entered in *Step 10* on page 106 was entered correctly. If the serial number was not entered correctly, repeat *Step 10* on page 106 and enter the correct serial number.

Example of a possible output:

```
rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0
System serial number = nt00000123

System serial number is not locked.

rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0
Command Completed
```

12. Lock the serial number in the database by entering the `ent-serial-num` command with the correct serial number as shown in *Step 11* on page 106 and with the `lock=yes` parameter value.

Command example:

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

After the command has completed successfully, this message is displayed:

```
rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

13. Enable the 1100 TPS/DSM for ITU NP feature with the feature access key using the `enable-ctrl-feat` command.

Command example:

```
enable-ctrl-feat:partnum=893018001:fak=<feature access key>
```

Note: The feature access key for the 1100 TPS/DSM for ITU NP feature is provided by Tekelec. Contact your Tekelec Sales Representative or Account Representative if you do not have the feature access key for this feature. This feature cannot be enabled with a temporary feature access key.

After the command has completed successfully, this message is displayed:

```
rlghncxa03w 09-08-24 21:15:37 EST EAGLE 40.1.0
ENABLE-CTRL-FEAT: MASP B - COMPLTD
```

14. Perform on of the following:

- To turn on the 1100 TPS/DSM for ITU NP feature, go to *Step 15* on page 107.
- To not turn on the 1100 TPS/DSM for ITU NP feature, go to *Step 17* on page 107. The transaction rate will remain at 850 TPS per Service Module card.

15. 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 and the `status=on` parameter value.

Command example:

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

This message is displayed:

```
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 5 ISS, the Service Module card performance may not reach 1100 TPS per Service Module card.

16. Re-enter the `chg-ctrl-feat` command to turn on the feature.

Command example:

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

After the command has completed successfully, this message is displayed:

```
rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0
CHG-CTRL-FEAT:  MASP B - COMPLTD
```

17. Verify the changes by entering the `rtrv-ctrl-feat` command with the 1100 TPS/DSM for ITU NP feature part number.

Command example:

```
rtrv-ctrl-feat:partnum=893018001
```

Example of a possible output:

```
rlghncxa03w 09-08-24 21:15:37 EST EAGLE 40.1.0
The following features have been permanently enabled:
Feature Name              Partnum    Status  Quantity
1100 TPS/DSM for ITU NP   893018001  on      ----

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              Part Num
Zero entries found.
```

18. Back up the new database changes with the `chg-db` command:

Command example:

```
chg-db:action=backup:dest=fixed
```

These messages are displayed. The active Maintenance and Administration Subsystem Processor (MASP) is displayed 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.
```

To turn off the 1100 TPS/DSM for ITU NP feature, enter the `chg-ctrl-feat` command, specifying the 1100 TPS/DSM feature part number and the `status=off` parameter value.

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

This message is displayed:

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

Confirm that you wish to turn off the 1100 TPS/DSM for ITU NP feature by re-entering the command within 30 seconds.

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

This message is displayed:

```
rlghncxa03w 09-08-24 21:15:37 EST EAGLE 40.1.0
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.

The E5-SM4G Throughput Capacity 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, the maximum number of 25 E5-SM4G cards must be provisioned and installed in the EAGLE 5 ISS and one or more EPAP-related features enabled and turned on.

The E5-SM4G Throughput Capacity feature cannot be enabled unless the EAGLE 5 ISS contains Service Module cards. Service Module cards cannot be installed in the EAGLE 5 ISS unless HIPR cards are installed in all shelves containing Service Module cards. Use the `rept-stat-gpl:gpl=hipr` command to verify whether HIPR cards are installed in all shelves containing Service Module cards.

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 feature access key for the E5-SM4G Throughput Capacity feature is provided by Tekelec. Contact your Tekelec Sales Representative or Account Representative before beginning the feature activation procedure if you do not have the feature access key for this feature. Based on the feature part number and the serial number of the EAGLE 5 ISS, the feature access key is site-specific. The feature access key contains thirteen alphanumeric characters and is not case sensitive. The E5-SM4G

Throughput Capacity feature cannot be enabled with a temporary feature access key. The E5-SM4G Throughput Capacity feature cannot be turned off after the feature is turned on.

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. Verify 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 after the EAGLE 5 ISS is on-site, with the `ent-serial-num` command.

Note:

To enter and lock the serial number of the EAGLE 5 ISS, the `ent-serial-num` command must be entered twice. The first entry of the `ent-serial-num` command adds the correct serial number to the database with the `serial` parameter. The second entry of the `ent-serial-num` with the `serial` and `lock=yes` parameters locks the serial number. Verify that the serial number in the database is correct before locking the serial number. The serial number is on a label affixed to the control shelf (shelf 1100).

Refer to *Commands Manual* for detailed descriptions of all commands used in this procedure.

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

   Example of a possible output:

```
rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0
The following features have been permanently enabled:

Feature Name              Partnum    Status  Quantity
HC-MIM SLK Capacity       893012707  on            64
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                 893006403  on          8000

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.
```

   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 `rtrv-ctrl-feat` output shows the E5-SM4G Throughput Cap entry status as *on*, then the E5-SM4G Throughput Capacity feature is enabled and turned on. No further action in this procedure is necessary.

   If the `rtrv-ctrl-feat` output shows the E5-SM4G Throughput Cap entry status as *off*, then the E5-SM4G Throughput Capacity feature is enabled but not turned on. Go to *Step 9* on page 111 to turn on the feature.

If the E5-SM4G Throughput Capacity and LNP features are not enabled, continue to *Step 2* on page 110.

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

   The STPLAN feature is displayed as the LAN entry in the `rtrv-feat` output.

   If the STPLAN feature is turned on, the E5-SM4G Throughput Capacity feature cannot be enabled and this procedure cannot be performed.

   If the STPLAN feature is turned off, continue to *Step 3* on page 110.

3. Verify that the GTT feature is turned on.

   The GTT feature is displayed as the GTT entry in the rtrv-feat output in *Step 2* on page 110. To enable the E5-SM4G Throughput Capacity feature, the GTT feature must be turned on.

   If the GTT feature is turned off, continue to *Step 4* on page 110.

   If the GTT feature is turned on, go to *Step 5* on page 110.

4. Perform "Adding a Service Module" in *Database Administration Manual - Global Title Translation* to:

   - Turn on the GTT feature
   - Add the required number of Service Module cards to the database

   After the "Adding a Service Module" procedure is completed, go to *Step 6* on page 110

5. Verify the number of E5-SM4G cards provisioned in the database using the `rept-stat-gpl:gpl=sccphc` command.

   Example of a possible output.

```
rlghncxa03w 09-08-24 11:40:26 EST  EAGLE 40.1.0
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 Service Module cards is provisioned in the database, continue to *Step 6* on page 110.

   If the required number of Service Module cards is not provisioned in the database, perform "Adding a Service Module" in *Database Administration Manual - Global Title Translation* to add the required number of Service Module cards to the database. After the "Adding a Service Module" procedure is completed, continue to *Step 6* on page 110..

6. 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.

```
rlghncxa03w 09-08-24 11:40:26 EST  EAGLE 40.1.0
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, continue to *Step 7* on page 111.

If HIPR cards are not installed on all shelves containing E5-SM4G cards, perform the procedure in *Installation Manual - EAGLE 5 ISS* to install the HIPR cards. After the HIPR cards have been installed, continue to *Step 7* on page 111.

7. Display the serial number in the database with the `rtrv-serial-num` command. The serial number is on a label affixed to the control shelf (shelf 1100).

   Example of a possible output:

   ```
   rlghncxa03w 09-08-24 21:15:37 EST EAGLE 40.1.0
   System serial number = nt00001231

   System serial number is not locked.

   rlghncxa03w 09-08-24 21:15:37 EST EAGLE 40.1.0
   Command Completed
   ```

   If the serial number is not correct and is locked, this feature cannot be enabled and the remainder of this procedure cannot be performed. Contact *Customer Care Center* on page 3 to change an incorrect and locked serial number.

   If the serial number is not correct and is not locked, continue to *Step 8* on page 111.

   If the serial number is correct and is not locked, go to *Step 10* on page 111.

   If the serial number is correct and locked, go to *Step 11* on page 112.

8. Enter the correct serial number into the database using the `ent-serial-num` command with the `serial` parameter .

   Command example:

   ```
   ent-serial-num:serial=<EAGLE 5 ISS serial number>
   ```

   After the command has completed successfully, this message is displayed.

   ```
   rlghncxa03w 09-08-24 21:15:37 EST EAGLE 40.1.0
   ENT-SERIAL-NUM:  MASP A - COMPLTD
   ```

9. Verify that the serial number entered in *Step 8* on page 111 was entered correctly using the `rtrv-serial-num` command.

   Example of a possible output:

   ```
   rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0
   System serial number = nt00001231

   System serial number is not locked.

   rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0
   Command Completed
   ```

   If the serial number was not entered correctly, repeat *Step 8* on page 111 and enter the correct serial number.

10. Lock the serial number in the database by entering the `ent-serial-num` command with the correct serial number as shown in *Step 9* on page 111 and with the `lock=yes` parameter value.

Command example:

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

After this command has completed successfully, this message is displayed:

```
rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0
ENT-SERIAL-NUM:  MASP A - COMPLTD
```

11. Enable the E5-SM4G Throughput Capacity feature with the feature access key by entering the `enable-ctrl-feat` command.

    Command example:

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

    Note: The feature access key for the E5-SM4G Throughput Capacity feature is provided by Tekelec. Contact your Tekelec Sales Representative or Account Representative if you do not have the feature access key for this feature. This feature cannot be enabled with a temporary feature access key.

    After the command has completed successfully, this message is displayed:

    ```
    rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0
    ENABLE-CTRL-FEAT: MASP B - COMPLTD
    ```

12. Perform one of the following:

    - To turn on the E5-SM4G Throughput Capacity feature, continue to *Step 13* on page 112.
    - To not turn on the E5-SM4G Throughput Capacity feature, go to *Step 14* on page 112.

13. Turn on the E5-SM4G Throughput Capacity feature using the `chg-ctrl-feat` command, specifying the E5-SM4G Throughput Capacity feature part number and the `status=on` parameter value.

    Note: After this feature is turned on, it cannot be turned off.

    Command example:

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

    After the command has completed successfully, this message is displayed:

    ```
    rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0
    CHG-CTRL-FEAT:  MASP B - COMPLTD
    ```

14. Verify the changes by entering the `rtrv-ctrl-feat` command with the E5-SM4G Throughput Capacity feature part number .

    Command example:

    ```
    rtrv-ctrl-feat:partnum=893019101
    ```

    Example of a possible output:

    ```
    rlghncxa03w 09-08-24 21:15:37 EST  EAGLE 40.1.0
    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.
    ```

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

15. Back up the new changes using the `chg-db` command.

    Command example:

    ```
    chg-db:action=backup:dest=fixed
    ```

    The following messages appear with the active Maintenance and Administration Subsystem Processor (MASP) appearing 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.
    ```

Chapter 5

Maintenance and Measurements

Topics:

This chapter describes maintenance and measurements in detail, including EPAP status and alarms, hardware verification messages, EIR system status reports and commands, code and application data loading, and alarms.

Hardware Requirements

The EIR feature requires Service Module cards to run the VSCCP application. The EAGLE 5 ISS may be equipped with from 1 to 25 Service Module cards to support EIR.

The EIR feature also requires a T1000 AS based MPS system.

EPAP Status and Alarms

Because EPAP has no direct means of accepting user input or displaying output messages on EAGLE 5 ISS terminals, maintenance, measurements, and status information are routed through a Service Module card. EPAP sends two types of messages to the Service Module card: *EPAP Maintenance Blocks* on page 116 and *DSM Status Requests* on page 117. Each message type is discussed in the following sections.

EPAP Maintenance Blocks

The active EPAP generates and sends maintenance blocks to the primary Service Module card. One maintenance block is sent as soon as the IP link is established between the active EPAP and the primary Service Module card. 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 for this information so that it 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 for this information so that it 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 Service Module card. The EPAP must ensure that no more than one maintenance block per second is sent to the primary Service Module card 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 Service Module card 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 Service Module card, it sends a DSM status request to that Service Module card. Because status messages are sent over UDP, the EPAP broadcasts the DSM status request (to all Service Module cards) and each Service Module 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

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

- The Service Module card is booted.
- The Service Module card receives a DSM Status Request message from the EPAP
- The Service Module card determines that it needs to download the entire database, for example, if the Service Module 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 Service Module card starts receiving database downloads or database updates. When a Service Module 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 Service Module card is initialized, it determines the amount of memory present. The EPAP uses the value to determine if the Service Module 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 Service Module 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
- Service Module card memory capacity status

- Loading mode support status

System Status Reporting

The `rept-stat-sys` command supports the Service Module cards running the VSCCP application.

The `rept-stat-sccp` command supports the Service Module 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.

Service Module card Memory Capacity Status Reporting

As described in the *DSM Status Messages Fields* on page 117, the Service Module card sends a message to the EPAP containing the amount of memory on the Service Module card. The EPAP determines whether the Service Module card has enough memory to store the RTDB and sends an ack or nak back to the Service Module card indicating whether or not the Service Module 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 Service Module card database capacity requirements**.**

When the EPAP sends database updates to the Service Module cards, the update messages include a field that contains the new database memory requirements. Each Service Module card 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 Service Module card 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 Service Module 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 Service Module cards in the system. When the loading mode is unstable, the `rept-stat-sys` command reports the existence of the unstable loading mode and the specific conditions that caused it. Refer to *Loading Mode Support* on page 119, for more details.

Code and Application Data Loading

In general, administrative updates can occur while a Service Module card is loading. The Service Module 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.

Service Module Card Code Loading

The EAGLE 5 ISS OAM performs code loading of the Service Module 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 Service Module card GPL verifies its hardware configuration during initialization to determine if it has the capacity to support the RTDB.

The Service Module card 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 Service Module card load requests are combined into a single download, reducing the overall download time. The Service Module 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 Service Module 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.

EPAP-Service Module Card Loading Interface

The Service Module card must convey to the EPAP that it needs to download the RTDB. This occurs when the Service Module card sends a Full Download Request message to the EPAP.

Loading Mode Support

No more than 16 LIMs can be serviced by each Service Module 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.

Service Module Card Capacity

An insufficient number of Service Module 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 Service Module cards to be inhibited or to have problems that prevent them from operating normally. If enough Service Module cards are out of service, it may not be possible for the remaining is-nr Service Module 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 Service Module cards running the VSCCP application is insufficient to service at least 80% of all provisioned LIMs.
- Insufficient SCCP service occurs when an insufficient number of is-nr Service Module cards are available to service at least 80% of the number of is-nr LIMs.
- LIM cards are being denied SCCP service and any Service Module 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.

  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 Service Module card aborts the current loading, issues a class 01D7 obit, and reboots. *Figure 20: Obit Message for Abort of Card Loading* on page 120 shows an example.

  Figure 20: 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

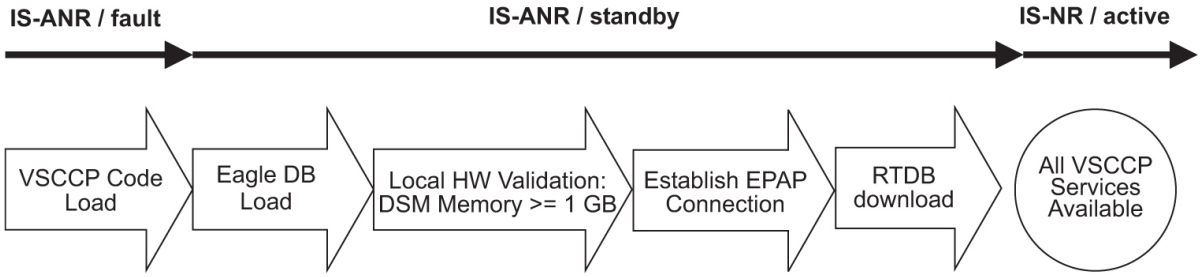
Use the force option to force the execution of commands that would put the system in unstable loading mode. If executing the `ent-card` or `inh-card` commands would cause the system to enter an unstable loading mode, use the force option on the command.

State Transitions During Start-Up

Figure 21: EPAP-related Feature Enabled, Normal Operating Sequence on page 121 through *Figure 27: EPAP-related Feature Activation Unsuccessful due to Insufficient Database* on page 124 show the transitions that a Service Module 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 EPAP-related features.

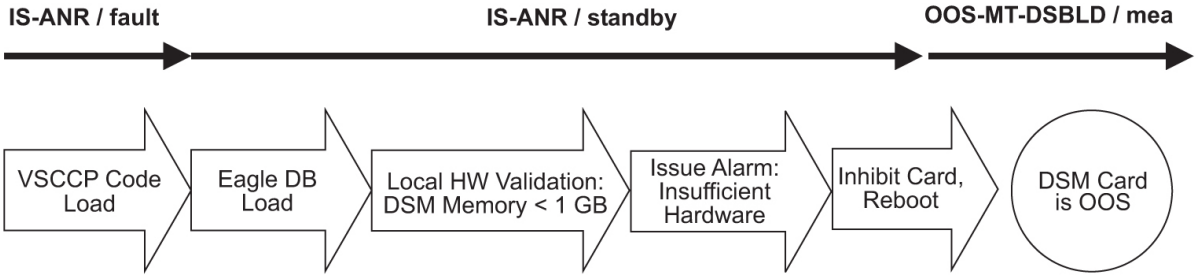
In *Figure 21: EPAP-related Feature Enabled, Normal Operating Sequence* on page 121, the EPAP-related feature is enabled, and the Service Module card memory is at least 1 GB and is connected to the EPAP. A normal Service Module card operating sequence occurs, providing EPAP-related feature service.

Figure 21: EPAP-related Feature Enabled, Normal Operating Sequence



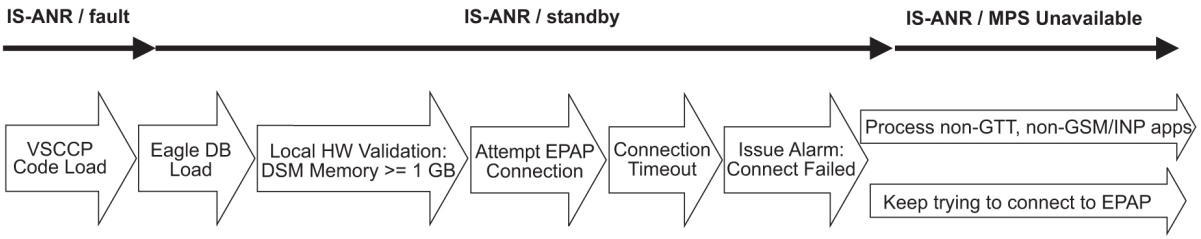
In *Figure 22: EPAP-related Feature Enabled, but Service Module card Memory Less Than 1 GB* on page 122, the EPAP-related feature is enabled, but the Service Module card memory is less than 1 GB. The EPAP-related feature cannot begin operation. Refer to *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information about the dimensioning rules and the Service Module card database capacity requirements.

Figure 22: EPAP-related Feature Enabled, but Service Module card Memory Less Than 1 GB



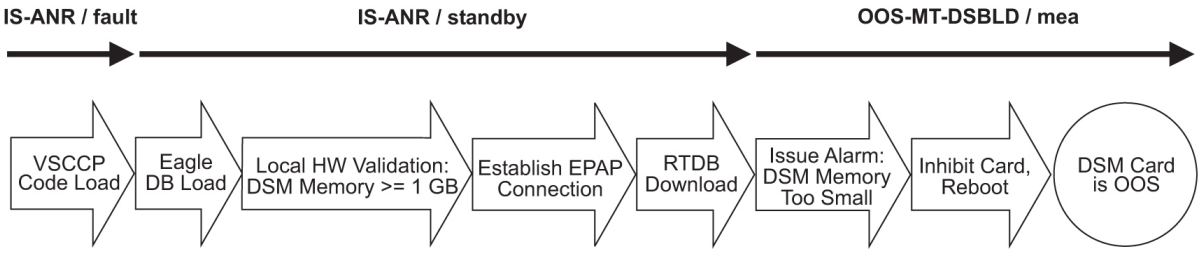
In *Figure 23: EPAP-related Feature Enabled, but Service Module card Not Connected to EPAP* on page 122, the EPAP-related feature is enabled, the Service Module card memory has at least 1 GB, but the Service Module card is unable to connect EPAP; the EPAP-related feature cannot begin operation.

Figure 23: EPAP-related Feature Enabled, but Service Module card Not Connected to EPAP



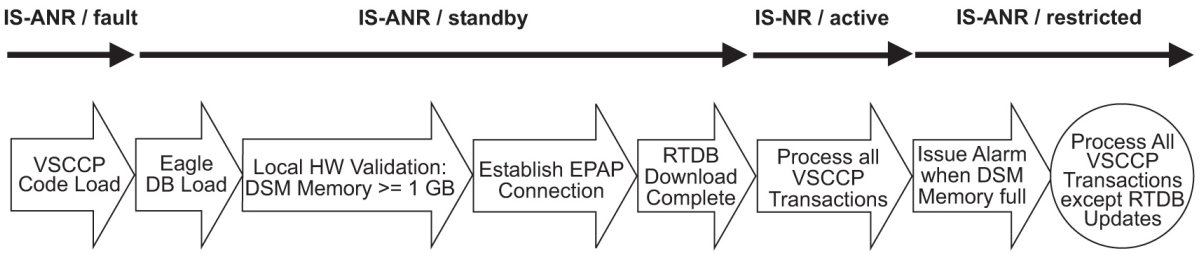
In *Figure 24: EPAP-related Feature Enabled, but Service Module card Memory Insufficient for Database* on page 122 , the EPAP-related feature is enabled, the Service Module card has the required 1 GB memory and is connected to the EPAP, but the Service Module card is too small for the required database; the EPAP-related feature cannot begin operation. Refer to *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information about the dimensioning rules and the Service Module card database capacity requirements.

Figure 24: EPAP-related Feature Enabled, but Service Module card Memory Insufficient for Database



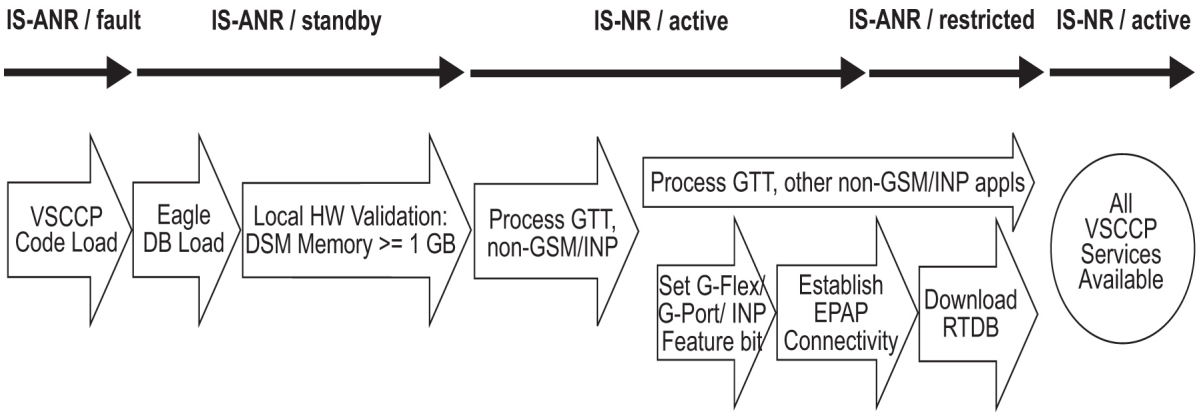
In *Figure 25: EPAP-related Feature Enabled, but Database Exceeds Service Module card Memory* on page 123, the EPAP-related feature is enabled, the Service Module card is connected to the EPAP, but the RTDB grows eventually to exceed the capacity of the Service Module card memory, despite its memory size of at least 1 GB (an alarm is issued when the Service Module card memory becomes full from the RTDB update). The EPAP-related feature cannot begin operation. Refer to *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information about the dimensioning rules and the Service Module card database capacity requirements.

Figure 25: EPAP-related Feature Enabled, but Database Exceeds Service Module card Memory



In *Figure 26: EPAP-related Feature Not Enabled at First, but then Activated on Service Module card* on page 123, the EPAP-related feature is not initially enabled; the Service Module card memory has at least 1 GB but no EPAP connection; the Service Module card is running other applications when the EPAP-related feature is turned on; the Service Module card has sufficient memory to provide EPAP-related feature service.

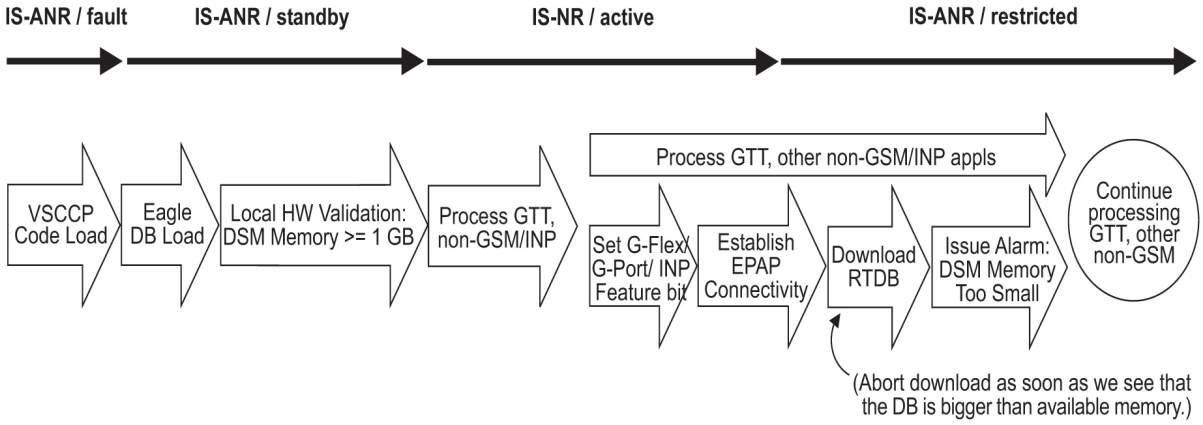
Figure 26: EPAP-related Feature Not Enabled at First, but then Activated on Service Module card



In *Figure 27: EPAP-related Feature Activation Unsuccessful due to Insufficient Database* on page 124, the EPAP-related feature is not initially enabled; the Service Module card memory has at least 1 GB but no EPAP connection, and is running other applications when the EPAP-related feature is

turned on. However, the Service Module card memory is insufficient for the needed database, and the cannot provide EPAP-related feature operation. Refer to the *Dimensioning Guide for EPAP Advanced DB Features Technical Reference* for important information about the dimensioning rules and the Service Module card database capacity requirements.

Figure 27: EPAP-related Feature Activation Unsuccessful due to Insufficient Database



EIR Alarms

All EIR related UAMs are output to the Maintenance Output Group. The *Unsolicited Alarm and Information Messages* manual contains a complete description of all UAMs. *Table 20: EIR UAMs* on page 124 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 20: 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

UAM	Severity	Message Text	MPS or EAGLE 5 ISS
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	RTDB Database 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

UAM	Severity	Message Text	MPS or EAGLE 5 ISS
0458	None	EIR Subsystem is available	EAGLE 5 ISS
0459	None	EIR Subsystem is removed	EAGLE 5 ISS

Service Module Card-EPAP Link

Two alarms are used to indicate the Service Module card-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 Service Module 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 Service Module 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 *Unsolicited Alarm and Information Messages* 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 Service Module 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 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 Service Module 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 Service Module card does not have at least 1Gb of memory or does not have enough capacity for the RTDB. Loading of the Service Module 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 Service Module 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** - RTDB Database capacity is 80% full

  This message is displayed when a Service Module 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 Service Module 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 UIMs

The *Unsolicited Alarm and Information Messages* manual contains a complete description of all UIM text and formats. If EIR is provisioned, then the following UIMs (*Table 21: EIR UIMs* on page 130) are used.

Table 21: EIR UIMs

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

UIM	Text	Description	Action
1037	SCCP rsp did not route - bad Xlation	The SCCP response did not route due to a bad translation	Provision the CGPA GTA address in the GTT database
1038	SCCP rsp did not route - SSP not True PC	The SCCP response did not route due to SSP is not true point code	Use the true point code in the CGPA point code or OPC of the query
1039	SCCP rsp did not route - bad Selectors	The SCCP response did not route due to invalid selectors	Provision the CGPA GTI, TT, NP, and NAI in the EGTT selector table
1040	ITU<-> ANSI translation not supported	This message indicates an invalid translation PC type in attempting to cross the ANSI to ITU domain.	Change the translation PC type to not cross the domain (ANSI <-> ITU), by using the appropriate EPAP commands.
1041	SCCP rsp did not route - SSP not true point code	This message indicates the SCCP message did not route because the SSN was not found in the message or translation data.	Change the message to include the CDPA SSN in the message or provision the SSN in the translation table.
1102	Invalid Length for Map IMEI Parameter	The EIR subsystem received a Check-IMEI message in which the Map IMEI parameter had an invalid length.	None
1103	LSS:No Map IMEI Parameter present	The EIR subsystem received a Check-IMEI message in which the Map IMEI parameter is not present	None
1232	SCCP Encode Failure 2	This message indicates that there is an SCCP encode failure.	Contact the distant end node this message refers to and verify action is being taken to correct the SCCP encode failure problem.
1244	Conv to intl num - Dflt MCC not found	Default MCC not defined when NAI = National or Subscriber	Define the default CC using the `chg-gsmopts:defmnc` command. Refer to the *Commands Manual* for the proper usage

UIM	Text	Description	Action
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	None

UIM	Text	Description	Action
		destination transaction ID is valid only in Abort, Continue, and End TCAP messages.)	
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 External element in the dialogue portion of the message.	None
1271	LSS: No Dialogue Request	The local subsystem received a TCAP message that odes not have a Dialogue Request element in the ASN1-Type element in the dialogue portion of the message.	None
1272	LSS: No Application Context Name	The local subsystem received a TCAP message that does not have an Application Context Name element in the Dialogue Request element in the dialogue portion of the message.	None
1273	LSS: No ACN Object Identifier	The local subsystem received a TCAP message that does not have an Object Identifier element in the Application Context Name element	None

UIM	Text	Description	Action
		in the dialogue portion of the message.	
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 *Measurements* 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 EIR SYS reports: Hourly Maintenance Measurements (MTCH) on EIR System and Daily Maintenance Measurements (MTCD) on EIR System. The data for these registers originates in the Service Module cards. The interface to the customers network supports the FTP transfer of the EIR MTCH and EIR MTCD reports to a FTP server. Following collection, scheduled reports are automatically generated and transferred to the customer's FTP server via the FTP interface.

For IMEIs present in multiple lists, the appropriate measurement peg is determined by the logic in *Table 3: Logic for IMEIs in Multiple Lists* on page 13and the outcome of the IMSI Check.

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

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

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

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

The following Pegs per System measurement peg counts of EIR MSUs (Message Signaling Units) are supported for the EIR feature (*Table 22: Pegs for Per System EIR Measurements* on page 135):

Table 22: 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

Event Name	Description	Type	Unit
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

ADL	Application Data Loader
AINPQ	ANSI-41 INP Query
ANSI	American National Standards Institute An organization that administers and coordinates the U.S. voluntary standardization and conformity assessment system. ANSI develops and publishes standards. ANSI is a non-commercial, non-government organization which is funded by more than 1000 corporations, professional bodies, and enterprises.
A-Port	ANSI-41 Mobile Number Portability
AS	Application Server A logical entity serving a specific Routing Key. An example of an Application Server is a virtual switch element handling all call processing for a unique range of PSTN trunks, identified by an SS7 DPC/OPC/CIC_range. Another example is a virtual database element, handling all HLR transactions for a particular SS7 DPC/OPC/SCCP_SSN combination. The AS contains a set of one or more unique Application Server Processes, of which one or more normally is actively processing traffic.

A

ATH — Application Trouble Handler

B

BS — Base Station

C

CC — Country Code

CgPA — Calling Party Address

The point code and subsystem number that originated the MSU. This point code and subsystem number are contained in the calling party address portion of the signaling information field of the MSU. Gateway screening uses this information to determine if MSUs that contain this point code and subsystem number area allowed in the network where the EAGLE 5 ISS is located.

CPC — Capability Point Code

A capability point code used by the SS7 protocol to identify a group of functionally related STPs in the signaling network.

CPU — Central Processing Unit

CSV — Comma-separated value

The comma-separated value file format is a delimited data format that has fields separated by the comma character and records separated by newlines (a newline is a special character or sequence of characters signifying the end of a line of text).

D

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 Daughter Board 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 DPC refers to the scheme in SS7 signaling to identify the receiving signaling point. In the SS7 network, the point codes are numeric addresses which uniquely identify each signaling point. This point code can be adjacent to the EAGLE 5 ISS, but does not have to be.
DSM	Database Service Module. The DSM provides large capacity SCCP/database functionality. The DSM is an application card that supports network specific

D

	functions such as EAGLE Provisioning Application Processor (EPAP), Global System for Mobile Communications (GSM), EAGLE Local Number Portability (ELAP), and interface to Local Service Management System (LSMS).

E

EGTT	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.
EIR	Equipment Identity Register A network entity used in GSM networks, as defined in the 3GPP Specifications for mobile networks. The entity stores lists of International Mobile Equipment Identity (IMEI) numbers, which correspond to physical handsets (not subscribers). Use of the EIR can prevent the use of stolen handsets because 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.
Enhanced Global Title Translation	See EGTT.
EPAP	EAGLE Provisioning Application Processor

F

FTP	File Transfer Protocol

F

	A client-server protocol that allows a user on one computer to transfer files to and from another computer over a TCP/IP network.

G

GB	Gigabyte — 1,073,741,824 bytes
G-Flex	GSM Flexible numbering A feature that allows the operator to flexibly assign individual subscribers across multiple HLRs and route signaling messages, based on subscriber numbering, accordingly.
GPL	Generic Program Load Software that allows the various features in the system to work. GPLs and applications are not the same software.
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).
GSM	Global System for Mobile Communications
GT	Global Title Routing Indicator
GTA	Global Title Address
GTI	Global Title Indicator
GTT	Global Title Translation

G

	A feature of the signaling connection control part (SCCP) of the SS7 protocol that the EAGLE 5 ISS uses to determine which service database to send the query message when an MSU enters the EAGLE 5 ISS and more information is needed to route the MSU. These service databases also verify calling card numbers and credit card numbers. The service databases are identified in the SS7 network by a point code and a subsystem number.
GUI	Graphical User Interface The term given to that set of items and facilities which provide the user with a graphic means for manipulating screen data rather than being limited to character based commands.

H

HLR	Home Location Register
HMUX	High-Speed Multiplexer A card that supports the requirements for up to 1500 links, allowing communication on IMT buses between cards, shelves and frames. HMUX cards interface to 16 serial links, creating a ring from a series of point to point links. Each HMUX card provides a bypass multiplexer to maintain the ring's integrity as cards are removed and inserted into an operational shelf. High-Speed IMT Multiplexer, a replacement card for the IPMX.
HOMERN	Home Network Routing Number Prefix

H

HW	Hardware

I

ID	Identity, identifier
IGM	IS41 GSM Migration
IMEI	International Mobile Equipment Identifier
IMSI	International Mobile Subscriber Identity
INAP	Intelligent Network Application Protocol
INP	INAP-based Number Portability Tekelec's INP can be deployed as a stand-alone or an integrated signal transfer point/number portability solution. With Tekelec's stand-alone NP server, no network reconfiguration is required to implement number portability. The NP server delivers a much greater signaling capability than the conventional SCP-based approach. Intelligent Network (IN) Portability
IP	Internet Protocol IP specifies the format of packets, also called datagrams, and the addressing scheme. The network layer for the TCP/IP protocol suite widely used on Ethernet networks, defined in STD 5, RFC 791. IP is a connectionless, best-effort packet switching protocol. It provides

I

	packet routing, fragmentation and re-assembly through the data link layer.
ISDN	Integrated Services Digital Network
IS-NR	In Service - Normal
ISDN	Integrated Services Digital Network Integrates a number of services to form a transmission network. For example, the ISDN network integrates, telephony, facsimile, teletext, Datex-J, video telephony and data transfer services, providing users with various digital service over a single interface: voice, text, images, and other data.
ISS	Integrated Signaling System
ITU	International Telecommunications Union

L

LIM	Link Interface Module Provides access to remote SS7, IP and other network elements, such as a Signaling Control Point (SCP) through a variety of signaling interfaces (DS0, MPL, E1/T1 MIM, LIM-ATM, E1-ATM, IPLIMx, IPGWx). The LIMs consist of a main assembly and possibly, an interface appliqué board. These appliqués provide level one and some level two functionality on SS7 signaling links.

L

Link	Signaling Link
LNP	Local Number Portability
LNPQS	LNP Query Service
LSS	Local Subsystem

M

MAP	Mobile Application Part
MASP	Maintenance and Administration Subsystem Processor The Maintenance and Administration Subsystem Processor (MASP) function is a logical pairing of the GPSM-II card and the TDM card. The GPSM-II card is connected to the TDM card by means of an Extended Bus Interface (EBI) local bus. The MDAL card contains the removable cartridge drive and alarm logic. There is only one MDAL card in the Maintenance and Administration Subsystem (MAS) and it is shared between the two MASPs.
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

M

MCP	Measurement Collection Processor This application is used by the MCPM card for the Measurements Platform feature.
MCPM	Measurement Collection and Polling Module The Measurement Collection and Polling Module (MCPM) provides comma delimited core STP measurement data to a remote server for processing. The MCPM is an EDSM with 2 GB of memory running the MCP application.
MPS	Multi-Purpose Server The Multi-Purpose Server provides database/reload functionality and a variety of high capacity/high speed offboard database functions for applications. The MPS resides in the General Purpose Frame.
MS	Mobile Station
MSC	Mobile Switching Center
MSISDN	Mobile Station International Subscriber Directory Number The MSISDN is thenetwork specific subscriber number of a mobile communications subscriber. This is normally the phone number that is used to reach the subscriber.
MSU	Message Signaling Unit The SS7 message that is sent between signaling points in the SS7 network with the necessary information to get the message to

M

	its destination and allow the signaling points in the network to set up either a voice or data connection between themselves. The message contains the following information: • The forward and backward sequence numbers assigned to the message which indicate the position of the message in the traffic stream in relation to the other messages. • The length indicator which indicates the number of bytes the message contains. • The type of message and the priority of the message in the signaling information octet of the message. • The routing information for the message, shown in the routing label of the message, with the identification of the node that sent message (originating point code), the identification of the node receiving the message (destination point code), and the signaling link selector which the EAGLE 5 ISS uses to pick which link set and signaling link to use to route the message.
MT	Mobile Terminated All transmissions that reach the mobile station and are accepted by it, such as calls or short messages.
MTP	The levels 1, 2, and 3 of the SS7 protocol that control all the functions necessary to route an SS7 MSU through the network.

N

N

NAI	Nature of Address Indicator Standard method of identifying users who request access to a network.
NAIV	NAI Value
NP	Number Plan
NPV	Numbering Plan Value

O

OAM	Operations, Administration, and Maintenance The generic load program (application) that operates the Maintenance and Administration Subsystem which controls the operation of the EAGLE 5 ISS.
OOS-MT	Out of Service - Maintenance The entity is out of service and is not available to perform its normal service function. The maintenance system is actively working to restore the entity to service.
OPC	Originating Point Code
OPS	Operator Provisioning System

P

PC	Point Code The identifier of a signaling point or service control point in a network. The format of the point code can be one of the following types:

P

	• ANSI point codes in the format network indicator-network cluster-network cluster member (**ni-nc-ncm**). • Non-ANSI domestic point codes in the format network indicator-network cluster-network cluster member (**ni-nc-ncm**). • Cluster point codes in the format network indicator-network cluster-* or network indicator-*-*. • ITU international point codes in the format **zone-area-id**. • ITU national point codes in the format of a 5-digit number (**nnnnn**), or 2, 3, or 4 numbers (members) separated by dashes (**m1-m2-m3-m4**) as defined by the Flexible Point Code system option. A group code is required (**m1-m2-m3-m4-gc**) when the ITUDUPPC feature is turned on. • 24-bit ITU national point codes in the format main signaling area-subsignaling area-service point (**msa-ssa-sp**). The EAGLE 5 ISS LNP uses only the ANSI point codes and Non-ANSI domestic point codes.
PDB	Provisioning Database
PDBA	Provisioning Database Application There are two Provisioning Database Applications (PDBAs), one in EPAP A on each EAGLE 5 ISS. They follow an Active/Standby model. These processes are responsible for updating and maintaining the Provisioning Database (PDB).

P

PDBI	Provisioning Database Interface The interface consists of the definition of provisioning messages only. The customer must write a client application that uses the PDBI request/response messages to communicate with the PDBA.
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 RFCs are standards-track documents, which are official specifications of the Internet protocol suite defined by the Internet Engineering Task Force (IETF) and its steering group the IESG.
RMTP	Reliable Multicast Transport Protocol
RN	Routing Number

R

Route	A path to another signaling point.
RSP	Routeset Prohibited Test (Msg)
RSR	Reset Request
RTDB	Real Time Database

S

SAT	Supervisory Audio Tone
SCCP	Signaling Connection Control Part
SCP	Service Control Point Service Control Points (SCP) are network intelligence centers where databases or call processing information is stored. The primary function of SCPs is to respond to queries from other SPs by retrieving the requested information from the appropriate database, and sending it back to the originator of the request. Secure Copy
SCRC	SCCP Routing Control
SIM	Subscriber Identity Module An ID card the size of a credit card for GSM network subscribers, and is typically referred to as a chip card or smartcard.
SNAI	Service Nature of Address Indicator

S

	An internal G-Port parameter that allows a user to specify how to interpret the signaling connection control part (SCCP) called party address (CdPA) GTA of a LOCREQ/SMSREQ message.
SP	Service Provider Signaling Point
SS	Subsystem
SS7	Signaling System #7
SSN	Subsystem Number The subsystem number of a given point code. The subsystem number identifies the SCP application that should receive the message, or the subsystem number of the destination point code to be assigned to the LNP subsystem of the EAGLE 5 ISS. A value of the routing indicator portion of the global title translation data commands indicating that no further global title translation is required for the specified entry.
SSP	Subsystem Prohibited network management message. Subsystem Prohibited SCCP (SCMG) management message. (CER)
STP	Signal Transfer Point STPs are ultra-reliable, high speed packet switches at the heart of SS7 networks, which terminate all link

S

	types except F-links. STPs are nearly always deployed in mated pairs for reliability reasons. Their primary functions are to provide access to SS7 networks and to provide routing of signaling messages within and among signaling networks.

T

TCAP	Transaction Capabilities Application Part
TCP	Transfer Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TDM	Terminal Disk Module Time Division Multiplexing
TFA	TransFer Allowed (Msg)
TFP	TransFer Prohibited (Msg) A procedure included in the signaling route management (functionality) used to inform a signaling point of the unavailability of a signaling route.
True Point Code	The point code defining a destination in the Destination Point Code table.
TSM	Translation Services Module Provides translation capability and Global Title Translation (GTT) implementation for the Local

T

	Number Portability (LNP) function and is used for downloading gateway screening tables to link interface modules (LIMs).
TT	Translation Type. Resides in the Called Party Address (CdPA) field of the MSU and determines which service database is to receive query messages. The translation type indicates which Global Title Translation table determines the routing to a particular service database.

U

UAM	Unsolicited Alarm Message.
UDP	User Datagram Protocol
UDTS	Unitdata Service message
UI	User Interface
UIM	Unsolicited Information Message

V

VLR	Visitor Location Register
VSCCP	VxWorks Signaling Connection Control Part The application used by the Service Module card to support the G-Flex, G-Port, INP, AINPQ, EIR, A-Port, IGM, V-Flex, and LNP features. If the G-Flex, G-Port, INP, AINPQ, EIR, A-Port, IGM, V-Flex, or LNP feature is not turned on, and a Service Module card is present, the

V

VSCCP GPL processes normal GTT traffic.

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