Replacing an NPU1 C with an NPU1 D
MINI-LINK TN ETSI

OPERATING INSTRUCTIONS

Contents

1 Introduction

This instruction describes how to replace an NPU1 C with an NPU1 D, and how to move the existing licenses from the NPU1 C to the NPU1 D by reusing the RMM from the NPU1 C. Hardware management is described in *HW Management Overview*, Reference [6].

2 Prerequisites

The following sections include information about required preparations before performing any hardware replacement.

2.1 Safety Information

Make sure that the information in the following documents has been understood by the persons performing the procedures:

- *Personal Health and Safety Information*, Reference [8]
- *System Safety Information*, Reference [10]
- *Supplementary Safety Information for MINI-LINK*, Reference [9]

2.2 Required Tools and Equipment

The following tools and equipment are required when replacing an NPU1 C with an NPU1 D:

- ESD wrist strap

- Torx screwdriver TX8 (M3)

- PC with MINI-LINK Craft installed and the electronic MINI-LINK TN CPI library available (on-line or, when needed, off-line, locally downloaded)

- USB cable

2.3 Required Hardware

The following hardware is required when replacing an NPU1 C with an NPU1 D:

- A MINI-LINK TN equipped with AMM 20p B

- NPU1 D

2.4 Required Licences and Software

NPU1 D requires Software Baseline (SBL) TN 5.4 or later.

To get the same functionality on the NPU1 D as on the NPU1 C, move the licenses from the NPU1 C.

2.5 Required Documentation

Read through this document and make sure referenced documentation is available during the replacement process. Ensure this by having the electronic CPI library available on your PC. See Library Description on how to make it available. It is recommended to print out a copy of the MINI-LINK TN Failure Report, which can be found in *Handling Faulty Equipment*, Reference [5].

For a detailed description of the parameters mentioned in these instructions, see *MINI-LINK Craft User Interface Descriptions*, Reference [7].

3 Flowchart

The flowcharts in this section describe the flow of the tasks needed to complete the hardware replacement.
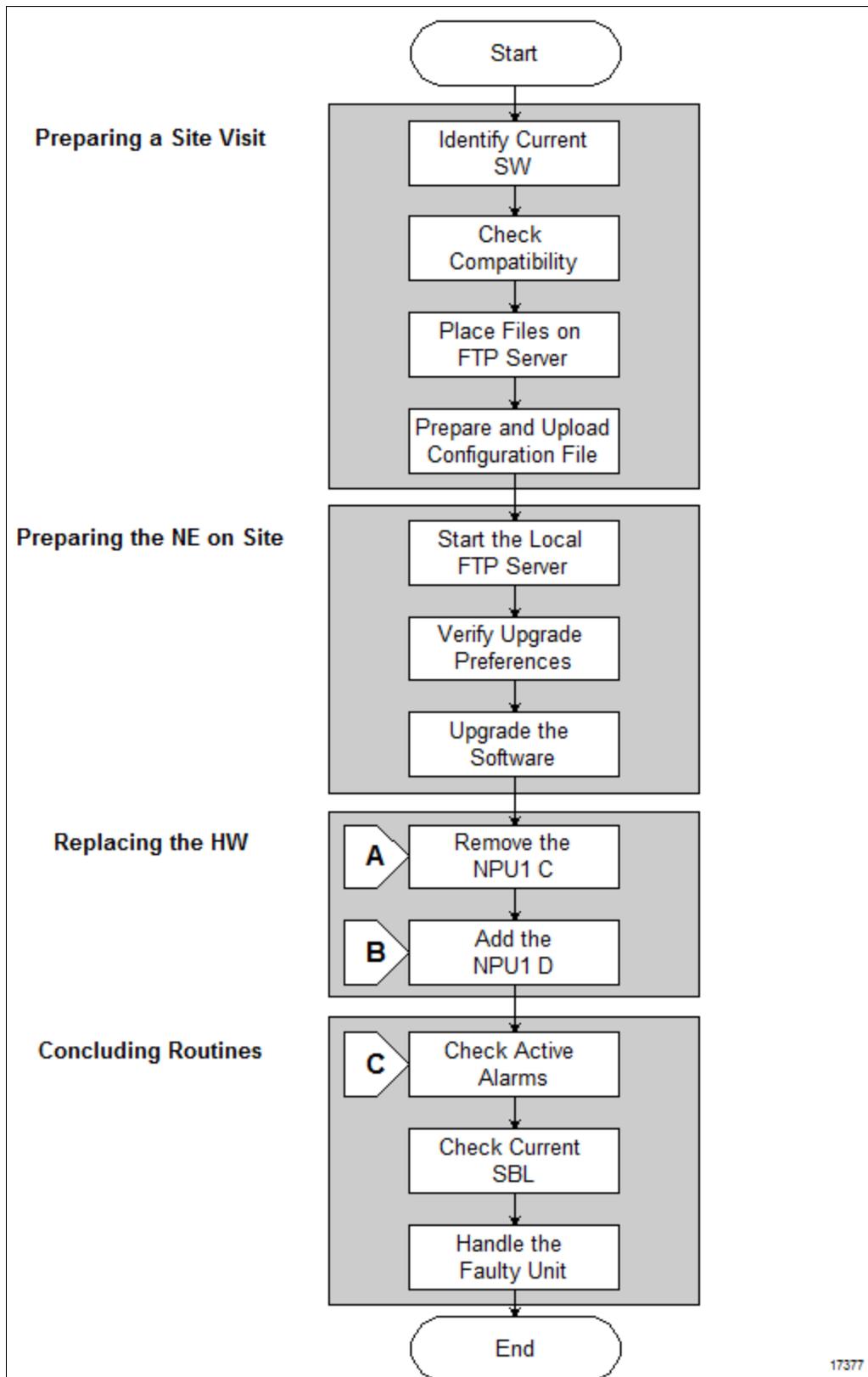
Figure 1   Main Flow

Figure 2   Removing an NPU1 C

Figure 3   Adding an NPU1 D

4 Replacing an NPU1 C with an NPU1 D

The following sections describe how to replace an NPU1 C with an NPU1 D, and how to move the existing licenses from the NPU1 C to the NPU1 D by reusing the RMM from the NPU1 C.
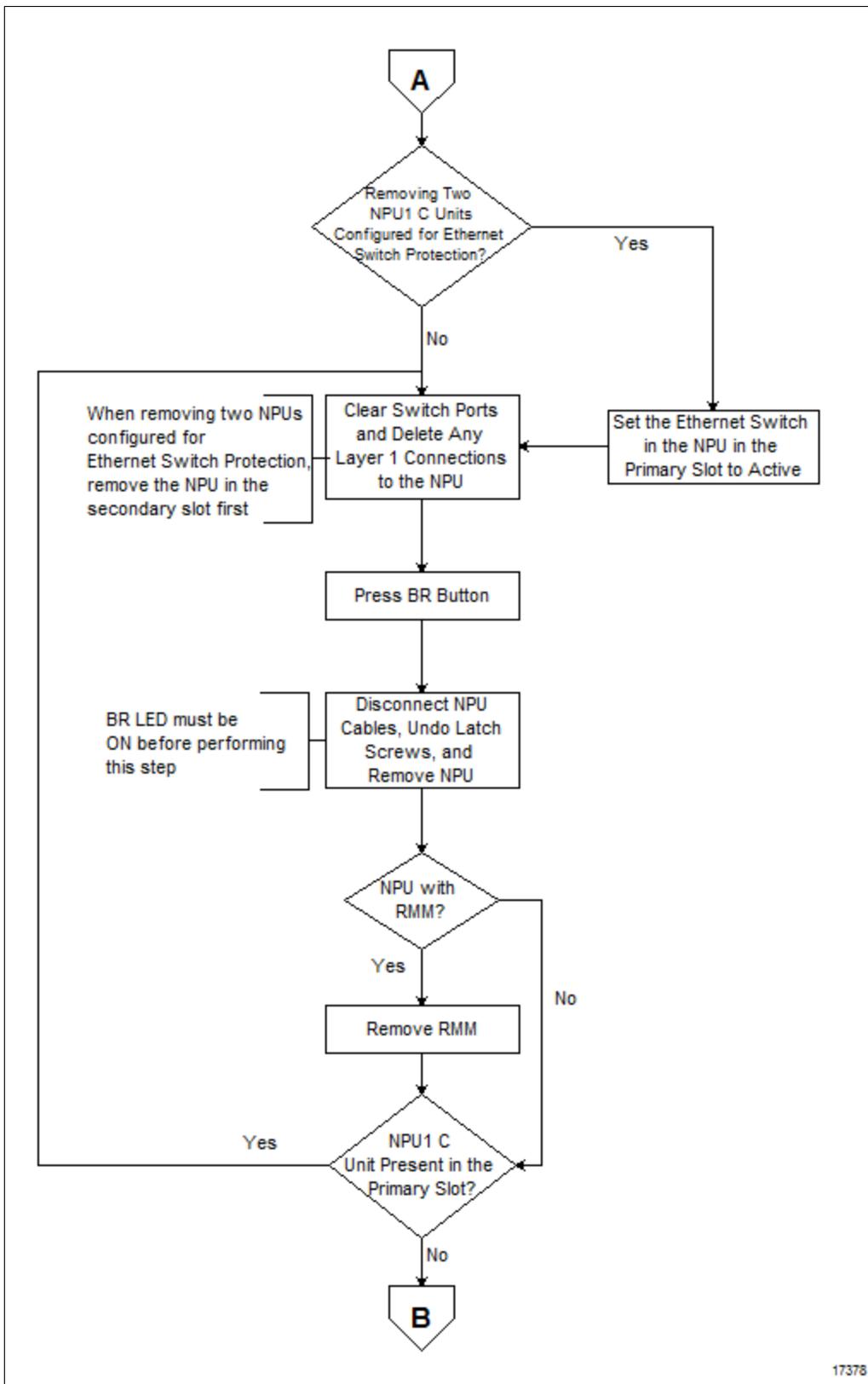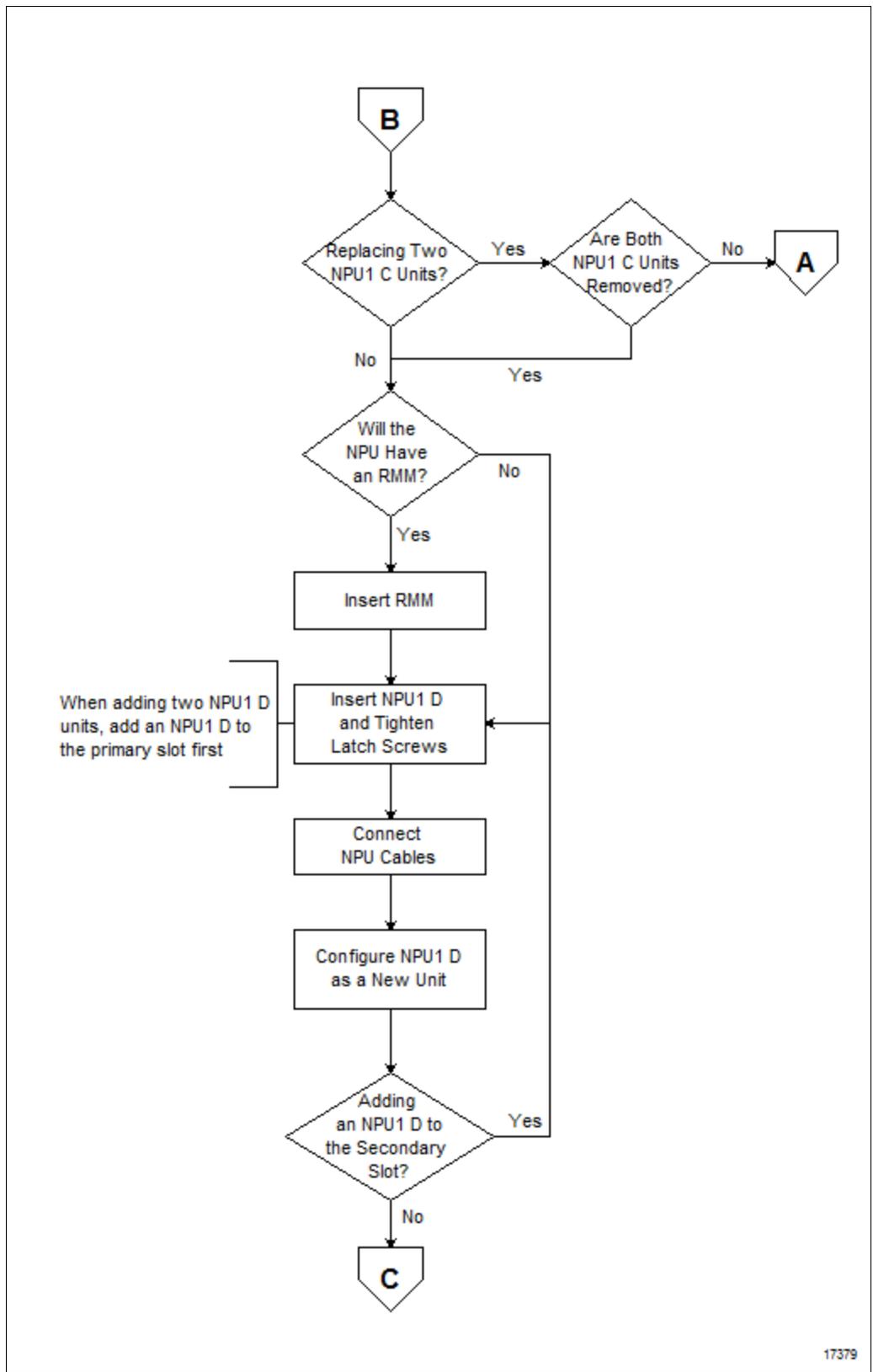
4.1 Preparing a Site Visit

This section presents the preparations needed for a successful completion of the procedures in this instruction. All these preparations can be performed both locally and remotely.

4.1.1 Identifying Current Software

To identify which SBL is running on the NE:

1. Access the NE and start MINI-LINK Craft by following the instructions in *Accessing a Network Element*, Reference [1].

2. In the **Management Tree**, right-click the NE.

3. Point to **Tools**, **Software Upgrade**, and click **Software Upgrade**.

4. On the ***Software Upgrade*** page, identify the current SBL running on the NE.

4.1.2 Placing Files on an FTP Server

If the SBL needs to be upgraded, place the SBL files on a remote FTP server or a local FTP server by following the instructions in *Upgrading or Downgrading a SW Baseline*, Reference [11].

4.1.3 Preparing a Configuration File

Because the configuration file for the NPU1 C cannot be used to configure the NPU1 D, it is recommended to prepare a configuration file for the NPU1 D before visiting the site. For more information on configuration management, see applicable *Configuration Documents*. For more information on preparing and transferring a CLI script, see *Preparing a CLI Script File Offline*, Reference [12], and *Transferring a CLI Script File on Site*, Reference [13].

It is also recommended to upload the existing configuration file for the NPU1 C and to generate a configuration report as a back up, in case the installation of the NPU1 D fails. Do this by following the instructions in *Backing Up and Restoring a Configuration File*, Reference [3] and *Generating a Configuration Report*, Reference [4].

4.2 Preparing the NE on Site

4.2.1 Starting the Local FTP Server

To start the local FTP server:

1. Access the NE locally and start MINI-LINK Craft by following the instructions in *Accessing a Network Element*, Reference [1].

2. On the **Tools** menu, click **FTP Server**.

3. On the *FTP Server* page, under **Starting and Stopping**, click **Start** to start the FTP server.

4.2.2 Verifying the Software Upgrade Preferences

To verify the software upgrade preferences:

1. In MINI-LINK Craft, in the **Management Tree**, right-click the NE.

2. Point to **Tools**, **Software Upgrade**, and click **Preferences**.

3. On the *Preferences* page, make sure **Version Control** is enabled. If **Version Control** is disabled, it is recommended to perform an upgrade of the SBL to enable **Version Control** before replacing the HW. See Section 4.2.3 on page 7 for more information on SBL upgrade.

   Version Control checks if load modules comply to the active SBL. If necessary, load modules are automatically upgraded or downgraded to comply with the active SBL.

4.2.3 Upgrading the SBL

If an SBL upgrade is required, upgrade the SBL by following the instructions in *Upgrading or Downgrading a SW Baseline*, Reference [11].

4.3 Replacing the Hardware

Note: Before performing the replacement, make sure that the required configuration file is on the local FTP server, and that the required SBL with **Version Control** enabled is running on the NE.

Make sure the local FTP server has been started as described in Section 4.2.1 on page 7.

This section describes how to replace the hardware and how to move licenses from the NPU1 C to the NPU1 D by reusing the RMM from the NPU1 C.

Replacing an NPU1 C interrupts traffic. When replacing two NPU1 C units configured for Ethernet Switch Protection, both NPUs must be removed and

both slots cleared before an NPU1 D is inserted. This means that Ethernet Switch Protection does not protect the NE during the replacement.

Replacing an NPU1 C interrupts the following traffic types:

- Traffic connected to the PDH Interfaces at the NPU1 C front panel

- Traffic connected to the Ethernet Interfaces at the NPU1 C front panel

- Traffic routed through the NPU1 C for robbed timeslot DCN connections

- Ethernet traffic connected through the NPU1 C backplane

- DCN connections to all far-end NEs

4.3.1 Removing an NPU1 C

Caution!

Electrostatic Discharge (ESD) may damage the equipment. Always use an approved ESD wrist strap to avoid damage to components fitted on printed circuit boards.

To minimize downtime when removing two NPU1 C units configured for Ethernet Switch Protection, do as follows:

1. Set the Ethernet Switch in the NPU in the primary slot to active.

2. Remove the NPU in the secondary slot according to the procedure described in Section 4.3.1.2 on page 10.

3. Remove the NPU in the primary slot according to the procedure described in Section 4.3.1.1 on page 8.

4.3.1.1 Removing an NPU1 C from the Primary Slot

Remove an NPU1 C from the primary slot by performing the following steps:

1. Clean any switch ports connected to the NPU1 C by assuring that the following conditions are met:

    - The port is not a member of any VLAN. See *Configuring an Ethernet Layer 2 Connection*, Reference [17].

    - The port is not a member of any LAG. See *Configuring Link Aggregation Groups (LAG)*, Reference [18].

- The port has no bandwidth policing. See *Configuring Quality of Service*, Reference [19].

- The port has no RSTP or MSTP enabled. See *Configuring Spanning Tree*, Reference [20].

- The port has no MAC white list connected. See *Configuring Ethernet Security and Admission Control*, Reference [21].

- The port is not member of any mirror connection. See *Performance Management Operations*, Reference [22].

2. Delete any Layer 1 connections to the NPU1 C, see *Configuring an Ethernet Layer 1 Connection*, Reference [23].

3. Press the BR button gently and release it. This action is a request to change the status of the NPU1 C to Out of Service and all traffic-related alarms are disabled.

    Note: Press the BR button before removing the NPU1 C, even if the Power (green) LED is OFF.
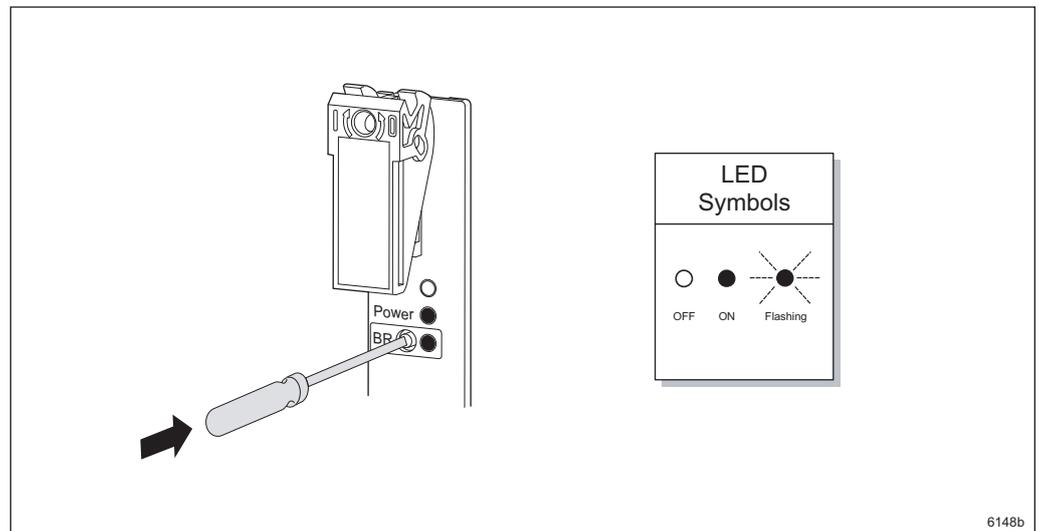

4. Wait until the BR (yellow) LED is ON. This takes up to 60 seconds.

5. If the LED is not ON within 60 seconds, press and release the BR button again. Wait another 60 seconds and if the LED is still not ON, move on to the next step anyway.

6. Disconnect all cables and SFPs, undo the screws on the latches, and remove the NPU within 90 seconds.

Note: If you do not remove the NPU1 C within 90 seconds, the NPU automatically performs a cold restart and the unit is taken into service in about 180 seconds. The amount of time may vary depending on the circumstances.

When the unit performs a cold restart, several traffic types are interrupted as described in Section 4.3 on page 7.

7. Remove the RMM from the NPU.
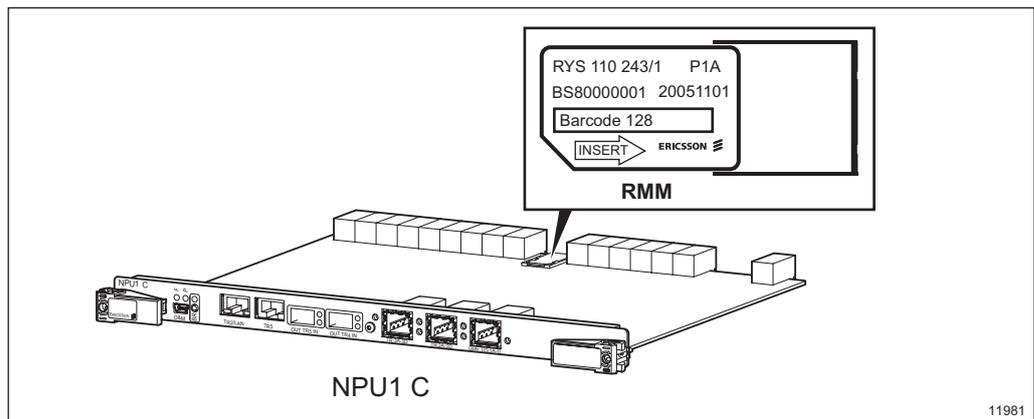
4.3.1.2 **Removing an NPU1 C from the Secondary Slot**

Remove an NPU1 C from the secondary slot by performing the following steps:

1. Clean any switch ports connected to the NPU1 C by assuring that the following conditions are met:

- The port is not a member of any VLAN. See *Configuring an Ethernet Layer 2 Connection*, Reference [17].

- The port is not a member of any LAG. See *Configuring Link Aggregation Groups (LAG)*, Reference [18].

- The port has no bandwidth policing. See *Configuring Quality of Service*, Reference [19].

- The port has no RSTP or MSTP enabled. See *Configuring Spanning Tree*, Reference [20].

- The port has no MAC white list connected. See *Configuring Ethernet Security and Admission Control*, Reference [21].

- The port is not member of any mirror connection. See *Performance Management Operations*, Reference [22].

If these connections are still present, clearing the position in Step 9 results in an error.

2. Delete any Layer 1 connections to the NPU1 C, see *Configuring an Ethernet Layer 1 Connection*, Reference [23].

    If these connections are still present, clearing the position in Step 9 results in an error.

3. Press the BR button gently and release it. This action is a request to change the status of the NPU1 C to Out of Service and all traffic-related alarms are disabled.

    Note: Press the BR button before removing the NPU1 C, even if the Power (green) LED is OFF.
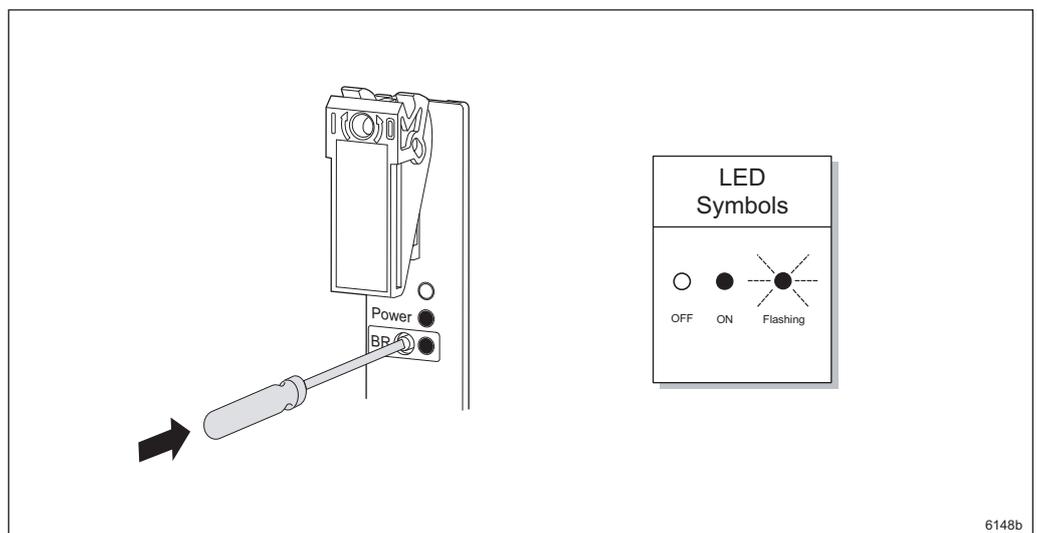
4. Wait until the BR (yellow) LED is ON. This takes up to 60 seconds.

5. If the LED is not ON within 60 seconds, press and release the BR button again. Wait another 60 seconds and if the LED is still not ON, move on to the next step anyway.

6. Disconnect all cables and SFPs, undo the screws on the latches, and remove the NPU within 10 minutes.

    Note: If you do not remove the NPU1 C within 10 minutes, it is automatically taken into service. It is also possible to take the unit into service before the end of the 10 minutes by pressing the BR button again.

7. In the **Management Tree**, right-click the NE.

8. Point to **View Status** and click **Slot State**. The *Slot Status Table* appears.

9. Select the **Clear** check box for the position with state Inaccessible Unit.

    Note: When selecting **Clear**, the NE removes the configuration for the NPU1 C and it is not possible to recover.

10. On the **File** menu, click **Save**.

11. In the **Management Tree**, right-click the NE.

12. Point to **View Status** and click **Alarms**, and make sure that the ⊗ icon is not shown.

4.3.2 Adding an NPU1 D

Caution!

Electrostatic Discharge (ESD) may damage the equipment. Always use an approved ESD wrist strap to avoid damage to components fitted on printed circuit boards.

Note: When replacing two NPU1 C units configured for Ethernet Switch Protection, both units must be removed and both positions cleared before inserting a new NPU1 D.

To minimize downtime when adding two NPU1 D units, insert and configure an NPU1 D in the primary slot, before inserting an NPU1 D into the secondary slot.

4.3.2.1 Adding an NPU1 D to the Primary Slot

To add an NPU1 D to the primary slot, and move the licenses from the NPU1 C to the NPU1 D by reusing the RMM from the NPU1 C:

1. Remove the NPU1 D from the ESD-protective packaging.

2. Insert the RMM from the NPU1 C into the RMM holder on the NPU1 D.
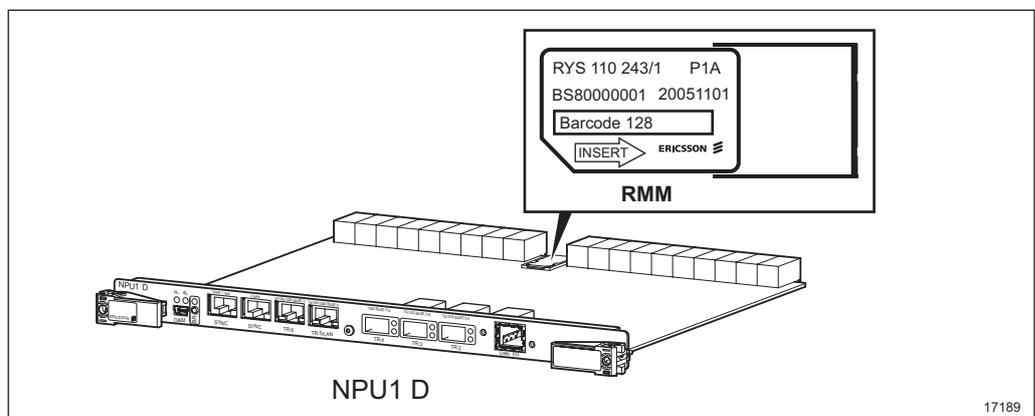
3. Insert the NPU1 D by pressing it until it connects to the back of the subrack. To make sure the NPU is inserted straight into the subrack, slowly push the front panel of the NPU using an even force with two fingers close to the two ends of the front panel.

   Note: The event `Compliant software running` is triggered when a plug-in unit with a software load module version that is later than that in the current SBL has been inserted and accepted. This is displayed only as information and requires no action from the user.

4. Press and release the BR button while the Fault (red), Power (green), and BR (yellow) LEDs are ON (NPU power up).

5. Wait until the BR (yellow) LED starts flashing, indicating that the NE is in NPU Installation mode.

6. Use the two latches to lock the NPU1 D and tighten the screws to secure it.

   Note: If the screw is covered by a label, fold back the label before tightening the screw. Cover the screw with the label when finished tightening.

7. Connect the SFPs.

8. Connect all cables, including the USB cable.

9. Start MINI-LINK Craft by following the instructions in *Accessing a Network Element*, Reference [1].

10. Wait until MINI-LINK Craft displays the ***Restore NPU Configuration*** page.

11. On the ***Restore NPU Configuration*** page, select **Factory Settings** from the **Select Configuration** list to remove the current configuration on the RMM.

12. On the **File** menu, click **Save**. The NPU restarts.

13. Configure the NPU1 D as a new unit using a configuration file from the local FTP server, or manually. For more information on how to configure the NPU using an configuration file on the local FTP server, see *Backing Up and Restoring a Configuration File*, Reference [3].

4.3.2.2 Adding an NPU1 D to the Secondary Slot

To add an NPU1 D to the secondary slot:

1. Remove the NPU1 D from the ESD-protective packaging.

2. Insert the NPU1 D by pressing it until it connects to the back of the subrack. To make sure the NPU is inserted straight into the subrack, slowly push the front panel of the NPU using an even force with two fingers close to the two ends of the front panel.

> **Note:** The event `Compliant software running` is triggered when a plug-in unit with a software load module version that is later than that in the current SBL has been inserted and accepted. This is displayed only as information and requires no action from the user.

3. Use the two latches to lock the NPU1 D and tighten the screws to secure it.

> **Note:** If the screw is covered by a label, fold back the label before tightening the screw. Cover the screw with the label when finished tightening.

4. Connect the SFPs.

5. Connect all cables.

6. Start MINI-LINK Craft by following the instructions in *Accessing a Network Element*, Reference [1].

7. Configure the NPU1 D as a new unit manually.

4.3.2.3 Licensing Mode

The licensing mode information is stored in the internal flash memory of the NPU. Replacing an NPU1 C with an NPU1 D affects the licensing mode, even if the RMM from the old NPU is used. The licensing mode of the new NPU is applicable after the replacement.

The possible replacement cases in the primary slot are the following:

- If the new NPU has never been used with MINI-LINK TN 5.4 or later and there are missing licenses, the NE enters Software Upgrade Unlocked Period after an upgrade to MINI-LINK TN 5.4 or later.

- If the new NPU has never been used with MINI-LINK TN 5.4 or later and all the required licenses are installed on the RMM, the NE enters locked mode after an upgrade to MINI-LINK TN 5.4 or later.

- If the new NPU has been used with MINI-LINK TN 5.4 or later before, the NE enters the licensing mode that is connected to the new NPU.

- If the new NPU is from the factory with MINI-LINK TN 5.4 or later, the NE enters locked mode.

> **Note:** If the new licensing mode after the NPU replacement is not according to user preferences, user action is required to enter the correct licensing mode.
>
> When the NE is not in unlocked mode after the NPU replacement, it is only possible to configure an unlocked period when there are available unlock tokens.

For more information about the license system, see *MINI-LINK TN License System*, Reference [24].

4.4 Concluding Routines

Perform the following concluding routines before leaving the site.

4.4.1 Checking Active Alarms

To check active alarms:

1. In MINI-LINK Craft, in the **Management Tree**, right-click the unit.

2. Click **Alarms**.

3. If alarms are active on the ***Alarms and Status*** page, perform corrective actions for each active alarm as described in *Alarm Descriptions*, Reference [2].

4.4.2 Checking Current SBL

To check Software Baseline (SBL):

1. In MINI-LINK Craft, in the **Management Tree**, right-click the NE.

2. Point to **Tools**, **Software Upgrade** and click **Software Upgrade**.

3. On the ***Software Upgrade*** page, identify the current SBL running on the NE.

4. If the current SBL is not the desired SBL, upgrade the SBL by following the instructions in *Upgrading or Downgrading a SW Baseline*, Reference [11].

4.4.3 Handling Faulty Units

If the old unit was faulty, follow the instructions in *Handling Faulty Equipment*, Reference [5].

Reference List

[1]   *Accessing a Network Element*, 3/1543-HRA 901 20

[2]   *Alarm Descriptions*, 5/1543-HRA 901 20

[3]   *Backing Up and Restoring a Configuration File*, 80/1543-HRA 901 20

[4]   *Generating a Configuration File*, 81/1543-HRA 901 20

[5]   *Handling Faulty Equipment*, 1/1541-HRA 901 20

[6]   *HW Management Overview*, 5/1551-HRA 901 20

[7]   *MINI-LINK Craft User Interface Descriptions*, 7/1551-HRA 901 20

[8]   *Personal Health and Safety Information*, 124 46-2885

[9]   *Supplementary Safety Information for MINI-LINK*, 124 46-HSD 101 16/1

[10]   *System Safety Information*, 124 46-2886

[11]   *Upgrading or Downgrading a SW Baseline*, 12/1543-HRA 901 20

[12]   *Preparing a CLI Script File Offline*, 16/1553-HRA 901 20

[13]   *Transferring a CLI Script File on Site*, 17/1553-HRA 901 20

[14]   *Installing Indoor Equipment*, 1531-HRA 901 20

[15]   *Recommendations for Positioning of Plug-in Units*, 8/1543-HRA 901 20

[16]   *Installing and Managing Licenses*, 9/1543-HRA 901 20

[17]   *Configuring an Ethernet Layer 2 Connection*, 73/1543-HRA 901 20

[18]   *Configuring Link Aggregation Groups (LAG)*, 76/1543-HRA 901 20

[19]   *Configuring Quality of Service*, 75/1543-HRA 901 20

[20]   *Configuring Spanning Tree*, 77/1543-HRA 901 20

[21]   *Configuring Ethernet Security and Admission Control*, 74/1543-HRA 901 20

[22]   *Performance Management Operations*, 7/1543-HRA 901 20

[23]   *Configuring an Ethernet Layer 1 Connection*, 72/1543-HRA 901 20

[24]   *MINI-LINK TN License System*, 12/1551-HRA 901 20

[25] *MINI-LINK LH License System*, 12/1551-HRA 901 20

[26] *Removing a Plug-In Unit*, 20/1543-HRA 901 20

[27] *Adding a Plug-In Unit*, 10/1543-HRA 901 20