# Spares Planning
# Avaya Communication Server 1000

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# Contents

# Chapter 1: New in this release

The following sections details what is new in this document for Avaya Communication Server 1000 Release 7.6.

## Navigation



## Features

There are no updates to the feature descriptions in this document.

## Other changes

See the following section for information about changes that are not feature-related.

### Revision history

| | |
|---|---|
| March 2013 | Standard 06.01. This document is up-issued to support Avaya Communication Server 1000 Release 7.6. |
| December 2011 | Standard 05.04. This document is up-issued to support the removal of End of Life (EoL) and Manufactured Discontinued (MD) hardware content and associated diagrams. |
| February 2011 | Standard 05.03. This document is up-issued to remove legacy feature and hardware content that is no longer applicable to or supported by Communication Server 1000 systems. |
| November 2010 | Standard 05.02. This document is up-issued to support Avaya Communication Server 1000 Release 7.5. |

| | |
|---|---|
| November 2010 | Standard 05.01. This document is up-issued to support Avaya Communication Server 1000 Release 7.5. |
| June 2010 | Standard 04.01. This document is up-issued to support Avaya Communication Server 1000 Release 7.0. |
| September 2009 | Standard 03.03. This document is up-issued to reflect changes to technical content. Table 4: Failure rates - circuit cards on page 25 contains an entry that provides a failure rate for MG XPEC cards. |
| May 2009 | Standard 03.02. This document is up-issued to reflect changes to technical content. |
| May 2009 | Standard 03.01. This document is up-issued to support Communication Server 1000 Release 6.0. |
| November 2008 | Standard 02.06. This document is up-issued to add technical content under chapters Failure rates - power and cooling equipment and Converting NFT values to spares requirements. |
| August 2008 | Standard 02.05. This document has been up-issued to support Communication Server Release 5.5. |
| July 2008 | Standard 02.04. This document has been up-issued to support Communication Server Release 5.5. |
| December 2007 | Standard 02.03. This document has been up-issued to support Communication Server Release 5.5. |
| June 2007 | Standard 01.03. This document is up-issued to correct references to Release 4.5 and to add spares entries where available. |
| May 2007 | Standard 01.02. This document is up-issued to support Communication Server 1000 Release 5.0. This document contains information previously contained in the following legacy document, now retired, Spares Planning (553-3001-153). |
| August 2005 | Standard 18.00. This document is up-issued for Communication Server 1000 Release 4.5. |
| September 2004 | Standard 17.00. This document is up-issued for Communication Server 1000 Release 4.0. Missing part numbers have been added, and terminal equipment updated with all IP Phones. |
| September 2003 | Standard 16.00. This document is up-issued to support Succession 3.0 Software. This document is up-issued to include information for Succession 1000M and Meridian 1 Small Systems. |
| January 2002 | Standard 15.00. This document is up-issued to support Meridian 1 Release 25.40 systems. This document is up-issued to include Call Processor Pentium (CP PII) and Fibre Network Fabric (FNF) for Option 81C. |
| April 2000 | Standard 14.00. This is a global document and is up-issued for X11 Release 25.0x. Document changes include removal of: redundant content; references to equipment types except Options 11C, 51C, 61C, and 81C; and references to previous software releases. |

| | |
|---|---|
| June 1999 | Standard 13.00. This document is reissued to include the NT5D03 Call Processor Card and minor edits. Changes to technical content are noted by revision bars in the margins. |
| October 1997 | Standard 12.00. Changes are noted by revision bars in the margins. |
| August 1996 | Standard 11.00. Changes to technical content are noted by revision bars in the margins. |
| August 1996 | Standard 10.00. This document is reissued to include the Fiber Remote Multi-IPE units. Changes to technical content are noted by revision bars in the margins. |
| December 1995 | Standard 9.00. This document is reissued to include the NT9D19 Call Processor Card and minor edits. Changes to technical content are noted by revision bars in the margins. |
| July 1995 | Standard 8.00. This document is reissued to include international information to create a global document and Meridian 1 option 81C. Changes to technical content are noted by revision bars in the margins. |
| December 1994 | Standard, 7.0. This document is reissued to include Small Systems Multi Disk Unit (SMDU), option 51C, and failure rate information updates. Changes to technical content are noted by revision bars in the margins. |
| April 1994 | Standard 6.0. This document is reissued to include information on Meridian 1 system option 61C. New information and changes to technical content are noted by revision bars in the margins. |
| April 1993 | Standard 5.0 |
| December 1992 | Standard 4.0. This document is reissued to include information on system option 81 and equipment required for compatibility with X11 release 18. New information and changes to technical content are noted by revision bars in the margins. |
| December 1991 | Standard 3.0. This document is reissued to include technical content updates. Due to the extent of changes revision bars are omitted. |
| December 1990 | Standard 2.0. Reissued to include MTBF information for station equipment. |
| January 1990 | Standard 1.0. |

# Chapter 2: Introduction

This document is a global document. Contact your system supplier or your Avaya representative to verify that the hardware and software described are supported in your area.

## Subject

This document provides the information needed to calculate and plan for spare (replaceable) equipment. The document also contains failure rate information for the equipment.

## Note on legacy products and releases

This technical document contains information about systems, components, and features that are compatible with Avaya Communication Server 1000 Software. For more information on legacy products and releases, click the **Documentation** link under **Support** on the Avaya home page:

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## Applicable systems

This document applies to the following systems:

- Communication Server 1000M Single Group (CS 1000M SG)
- Communication Server 1000M Multi Group (CS 1000M MG)
- Communication Server 1000E (CS 1000E)
- Meridian 1

## System migration

When particular Meridian 1 systems are upgraded to run Avaya Communication Server 1000 software and configured to include a Signaling Server, they become Communication Server 1000 systems. The following table lists each Meridian 1 system that supports an upgrade path to an Avaya CS 1000 system.

**Table 1: Meridian 1 systems to CS 1000 systems**

| This Meridian 1 system... | Maps to this CS 1000 system |
|---|---|
| Meridian 1 PBX 11C Chassis | CS 1000E |
| Meridian 1 PBX 11C Cabinet | CS 1000E |
| Meridian 1 PBX 61C | CS 1000M Single Group |
| Meridian 1 PBX 81C | CS 1000M Multi Group |

For more information, see the following technical publications:

- *CS 1000M and Meridian 1 Large System Upgrades Overview, NN43021-458*
- *Avaya Communication Server 1000E Upgrade Procedures, NN43041-458*
- *Communication Server 1000E Upgrade - Hardware Upgrade Procedures, NN43041-464*

# Intended audience

This document is intended for individuals responsible for system administration.

# Conventions

## Terminology

In this document, the following systems are referred to generically as system:

- Communication Server 1000M (CS 1000M)
- Communication Server 1000E (CS 1000E)
- Meridian 1

# Related information

This section lists information sources that relate to this document.

# Technical publications

The following technical publications are referenced in this document:

- *Avaya Features and Services Fundamentals (NN43001-106)*
- *Avaya Software Input/Output Reference — Administration (NN43001-611)*
- *Avaya Software Input/Output Reference — Maintenance (NN43001-711)*

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## Navigation



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# Chapter 4: Spares planning

## Contents

This section contains information on the following topics:



## Introduction

Spares planning is used to determine desired inventory levels of spare (replaceable) items. Spares planning is used by repair houses and centralized depots in order to ensure that there is an adequate stock of replaceable items on hand.

## Definitions and assumptions

Failure rate — Failure rate is the estimated number of failures for an item during one million ($10^6$) hours of operation. The only exception is to measurements for cabling or other items with low failure rates. Failure rates are also measured in Failures in Time (FIT) measurements. One FIT equals one billion ($10^9$) hours of operation.

Sparing interval — Sparing interval is the period of time that stocks of replaceable items should last without being replenished. This period is assumed to be one year following the installation of the system.

Stock confidence level — Stock confidence level is the allowed probability of not being out of stock when the sparing interval of one year is greater than 99.9 percent.

Card ambient temperature — Card ambient temperature is the average temperature of the air immediately surrounding the circuit card (usually higher than the ambient room temperature).

Card failure rates in this document are based on a card ambient temperature of 40° C (104° F).

Turnaround time for repair — Equipment may be serviced at a repair house or at a centralized depot that serves sub-depots. The turnaround time for the return-to-stock of a failed item is about ten working days (240 hours) from a repair house. The turnaround time for the return-to-stock of a failed item is about two working days (48 hours) from a centralized depot.

Actual turnaround periods vary in the field. As the number of systems served increases, the percentage of replaceable items required in stock is reduced.

Population range — Population range is the quantity of each type of system in the area served by the depot.

Spare stock size — The quantity of spares for a given stock item depends on the sparing interval, stock confidence level, failure rate, turnaround time for repair, and population range.

# Calculating spares requirements

Use Calculating spares requirements on page 18 to calculate the number of spares required to stock a depot for a one-year sparing interval:

### Calculating spares requirements

1. Determine the number (N) of in-service specified circuit cards serviced by the depot.
2. Obtain the card failure rate (F) for the specified circuit card from the sections in this document.

   Card failure rates are expressed in terms of the number of failures per one million hours ($10^6$).
3. Determine turnaround time (T) in hours.
4. For repair house service, turnaround time is typically ten working days (240 hours). For centralized depot service, turnaround time is typically two working days (48 hours).
5. Calculate the NFT value by multiplying N x F x T.
6. Look up the number of spares required in Table 7: Number of spares required on page 39.

# Example

A centralized depot services 10,000 NT8D02 Digital Line Cards. The failure rate for this card is 6.0 failures per 1 million hours. With a turnaround time of 48 hours:

$$NFT = 10{,}000 \times \frac{6.0}{1{,}000{,}000} \times 48 = 2.88$$

The number of spares required for an NFT value of 2.88 = 10.

# Linux applications

Red Hat Linux 5 (update 1) supports Linux kernel version 2.6.18 and the following applications:

- Unified Communications Management (UCM)
- Simple Network Management Protocol (SNMP)
- Deployment Manager (DM)
- Signaling Server (SS)
- Network Routing Service (NRS)
- Call Server (CS)
- Session Initiation Protocol Line (SIPL)
- Element Manager (EM)
- Subscriber Manager (SubM)

For more information about the Linux applications, see *Avaya Linux Platform Base and Applications Installation and Commissioning (NN43001-315).*

# Chapter 5: Failure rates - system components

## Contents

This section contains information on the following topics:



## Overview

Failure rates are based on a circuit card ambient temperature of 40° C (104° F). This temperature is usually higher than the surrounding room temperature. Running the system at a lower temperature increases the life expectancy of components and improves overall system reliability.

## Failure rates

Table 2: Failure rates - system components on page 21 gives the failure rates for system components. In this table, "N/A" indicates that the failure rate is not available at this time.

**Table 2: Failure rates - system components**

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| NT6R14 | Enhanced Processors:Enhanced Modular Option | 0.454 |
| NT6R15 | Enhanced Processors:Modular Opt. EC and EC11 | 0.436 |
| NT7D00AA<br>NT7D00BA | Top Cap (AC) Top Cap (DC) | 0.14 |

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| NT8D35AA<br>NT8D35DC | Network Module AC Network Module DC | 0.90 |
| NT8D37AA<br>NT8D37DC | Intelligent Peripheral Equipment IPE Module AC IPE Module DC | 0.80 |
| NTDK91 | Chassis | 1.70 |
| NTDK92 | Chassis Expander | 1.70 |
| NTDU14 | Chassis | 0.66 |
| NTDU15 | Chassis Expander | 0.66 |
| NTDU63AA | Call server chassis/backplane | 0.33 |
| NTDU97AAE5 | HP 1U Server | 7.5 |
| NTHF77 | 80486 BASED VPS DSE-SYMPOSIUM EXPRESS CALL CENTRE HARDWARE | < 0.25 |
| NTVW00 | iTouch Terminal Server | 0.225 |

# Chapter 6: Failure rates - power and cooling equipment

## Contents

This section contains information on the following topics:



## Overview

Failure rates are based on a circuit card ambient temperature of 40° C (104° F). This temperature is usually higher than the surrounding room temperature. Running the system at a lower temperature increases the life expectancy of components and improves overall system reliability.

## Failure rates

Failure rates - power and cooling equipment on page 23 gives the failure rates for power and cooling equipment. In this table, "N/A" indicates that the failure rate is not available at this time.

**Table 3: Failure rates - power and cooling equipment**

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| A0355200 | Power Failure Transfer Unit | 5.70 |
| MFA150 | Modular Power System | 8.330 |
| MPP600 | Modular Power Plant | 8.330 |
| NT4N49 | Four Feed Power Distribution Unit (PDU) | 0.045 |

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| NT4N57 | PDU Assembly DC | 1.266 |
| NT6D40 | PE Power Supply DC | 1.60 |
| NT6D41 | CE Power Supply DC | 0.61 |
| NT6D42 | Ringing Generator DC | 2.02 |
| NT8D06 | PE Power Supply AC | 2.10 |
| NT8D21 | Ringing Generator AC | 2.02 |
| NT8D22 | System Monitor | 1.00 |
| NT8D29 | CE Power Supply AC | 1.27 |
| NT8D52AB NT8D52DD | Pedestal Blower Unit AC Pedestal Blower Unit DC | 2.00 1.123 |
| NT8D53 | Power Distribution Unit AC | 0.006 |
| NTAK75 | Battery Back-Up Unit | < 2.85 |
| NTAK76 | 15-30 Minute Battery Back-up Unit | < 2.85 |
| NTDK70 | AC/DC Global Power Supply | 1.660 |
| NTDK72 | DC/DC Power Supply | 3.60 |
| NTDK78 | AC/DC Power Supply | 3.60 |
| NTWB16AA NTWB16BA | Candeo Power System (Large) – 50 A Rectifier Kit | 8.33 |
| NTWB16CA NTWB16DA | Candeo Power System (Small) – 30 A Rectifier Kit | 8.33 |
| QUA6A | Power Failure Transfer Unit (PFTU) | 0.026 |
| NT6D43 | CE/PE Power Supply DC | 1.5 |
| NT7D03 | Ringing Generator | 1.81 |
| NT7D14 | CE/PE Power Supply | 2.34 |
| NTAK04 | AC/DC Power Supply | 5 |
| NTDK70AB | AC/DC Power Supply | 1.65 |

# Chapter 7: Failure rates - circuit cards

## Contents

This section contains information on the following topics:



## Overview

Failure rates are based on a circuit card ambient temperature of 40° C (104° F). This temperature is usually higher than the surrounding room temperature. Running the system at a lower temperature increases the life expectancy of components and improves overall system reliability.

## Failure rates

Table 4: Failure rates - circuit cards on page 25 gives the failure rates for circuit cards. In this table, "N/A" indicates that the failure rate is not available at this time.

**Table 4: Failure rates - circuit cards**

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| A0634492 A0634493 | Fiber Remote Multi-IPE Redundant Option Single-mode Multi-mode | 1.86 |
| A0773054 A0773055 | Fiber Remote Multi-IPE Multi-mode 1-4 Superloops 1-2 Superloops | 1.86 |
| A0773056 A0773059 | Fiber Remote Multi-IPE Single-mode 1-4 Superloops 1-2 Superloops | 1.86 |
| NT1P61 | Fiber Superloop Network Card | 1.05 |

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| NT1P62 | Fiber Controller Card | 1.03 |
| NT1P63 | Electro-optical Interface | 1.14 |
| NT1R20 | Off-Premises Station Analog Line Card | 5.00 |
| NT4N39 | Call Processor Pentium IV® | 1.99 |
| NT4N48 | cPCI® System Utility (Sys Util) | 0.184 |
| NT4N48BA | System Utility Card | 0.26 |
| NT4N65 | cPCI® Core to Network Interface | 0.266 |
| NT5D11 | Line side T1 Line Card | 6.000 |
| NT5D14 | Line side T1 Line Card | 4.6 |
| NT5D15 | Extended Universal Trunk Card (Japan) | 3.4 |
| NT5D26 | Extended Universal Trunk Card | 4.6 |
| NT5D29 | Central Office Trunk Card (India) | 4.6 |
| NT5D31 | Extended Universal Trunk Card | 0.490 |
| NT5D33 | Line-side E1 Line Card | 0.454 |
| NT5D34 | Line-side E1 Line Card | 0.454 |
| NT5D39 | Extended Universal Trunk Card (Japan) | 0.445 |
| NT5D49 | Analog Message Waiting Line Card (Brazil) | 6.0 |
| NT5D51 | Integrated Conference Bridge Card | < 7.5 |
| NT5D60 | CLASS Modem Card (XCMC) | 5.8 |
| NT5D62GA | MICB PC Card | 1.095 |
| NT5D64 | Local Mini-Carrier Interface Card | 3.125 |
| NT5D65 | Local Mini-Carrier Extender Card | 2.200 |
| NT5D67 | Remote Mini-Carrier Interface Card | 3.020 |
| NT5D68 | Local Mini-Carrier Interface Card | 3.125 |
| NT5D69 | Local Mini-Carrier Extender Card | 2.200 |
| NT5D97 | Dual DTI/PRI (DDP) Card | 5.500 |
| NT5G01AB | MICA KIT LARGE (ROHS) | < 7.5 |
| NT5G03AB | MICA KIT (FLASH) SMALL (ROHS) | < 7.5 |
| NT5G11 | Integrated Call Assistant Card | < 7.5 |
| NT5G15AAE5 | Meridian Integrated Voice Services (MIVS) | < 7.5 |
| NT5G31AB | MICA PCMCIA CARD (ROHS) | 1.095 |

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| NT5G32AAE5 | MICA PCMCIA CARD | 1.095 |
| NT5G33AAE5 | MIVS PC Card | 1.095 |
| NT5G53BA | Meridian Integrated Personal Call Director (MIPCD) Kit | < 7.5 |
| NT5G71AAE5 | ICD REL 2 SPARE CARD (ROHS) | < 7.5 |
| NT5G91BAE5 | ICD PROG PCMCIA CARD | 0.345 |
| NT5G94AAE5 | MICA PC Card | 1.095 |
| NT5K02 | Flexible Analog Line Card | 6.0 |
| NT5K07 | Universal Trunk Card (Hong Kong) | 4.30 |
| NT5K09 | Quad Density Receiver | 1.50 |
| NT5K17 | Enhanced Dual Loop Buffer Card | 19.0 |
| NT5K18 | Extended PPM CO Trunk Card | < 18 |
| NT5K19 | E and M/2280 Hz Trunk Card | < 18 |
| NT5K21 | XMFC/MFE Sender Receiver card | 2.70 |
| NT5K36 | Direct Inward Dial/Direct Outward Dial Trunk Card | 19.00 |
| NT5K48 | Tone Detector Card | 0.487 |
| NT5K50 | E and M TIE Trunk Card (France) | < 18 |
| NT5K70 | Central Office Trunk Card (8 units) | < 4.5 |
| NT5K71 | Central Office Trunk Card (4 units) | 4.60 |
| NT5K72 | E and M Trunk Card | 19.00 |
| NT5K75 | D-Channel Handler Card | 19.00 |
| NT5K82 | Central Office Trunk Card | < 4.5 |
| NT5K83 | E and M Trunk Card | < 18 |
| NT5K84 | Direct Inward Dial Trunk Card | < 2.5 |
| NT5K90 | Central Office Trunk Card (Denmark) | < 4.5 |
| NT5K93 | Central Office Trunk Card (Norway) | < 4.5 |
| NT5K96 | Flexible Analog Line Card without Message Waiting | 6.0 |
| NT5K99 | Central Office Trunk Card (Spain) | 4.60 |
| NT6D70 | S/T Interface Line Card (SILC) | 3.0 |
| NT6D71 | U Interface Line Card (UILC) | 4.0 |

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| NT6D73 | Multipurpose ISDN Signaling Processor (MISP) | 5.000 |
| NT7R51 | Local Carrier Interface Card | 2.40 |
| NT7R52 | Remote Carrier Interface Card | 1.80 |
| NT8D01BC NT8D01BD | Controller-4 Card SMT Controller-2 Card | 1.86 1.86 |
| NT8D02 | Digital Line Card | .231 |
| NT8D04 | Superloop Network Card | 2.32 |
| NT8D09 | Analog Message Waiting Line Card | 5.80 |
| NT8D14 | Universal Trunk Card | 3.40 |
| NT8D15 | E and M Trunk Card | 3.70 |
| NT8D16 | Digitone Receiver Card | 2.70 |
| NT8D17 | Conference/TDS Card | 5.10 |
| NTAG03 | Central Office Trunk Card (Holland) | 19.00 |
| NTAG04 | Central Office/Direct Inward Dial Trunk Card (Holland) | 19.00 |
| NTAG26 | Extended Multi-frequency Receiver | 5.500 |
| NTAG54 | DASS/DPNSS Card | 0.969 |
| NTAK02 | SDI/DCH Circuit Card | 2.90 |
| NTAK10 | 2.0 Mb DTI | 2.40 |
| NTAK20 | Clock Controller | 0.54 |
| NTAK79 | 2 MByte PRI card | < 7.80 |
| NTAK93 | D-Channel Handler Interface (DCHI) Daughterboard | 1.60 |
| NTBK22 | MISP Circuit Card | 7.66 |
| NTBK50 | 2.0 Mb PRI | 3.40 |
| NTBK51 | Downloadable D-Channel Handler (DDCH) Daughterboard | 3.50 |
| NTCG01 | CIS Trunk Card | < 7.5 |
| NTCG02 | CIS Trunk Card | < 7.5 |
| NTCK16 | Generic Central Office Trunk Card | 4.6 |
| NTCK18 | Central Office Trunk Card | < 4.5 |
| NTCK22 | Direct Inward Dial Trunk Card (Italy) | < 18 |

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| NTCK24 | Central Office Trunk Card (Portugal) | < 4.5 |
| NTDK16 | 48-port Digital Line Card | .693 |
| NTDK23 | 10m Fiber Receiver Card | 2.15 |
| NTDK24 | 3km Fiber Daughterboard | 2.19 |
| NTDK25 | 3km FIber Receiver Card | 2.15 |
| NTDR68 | Single Reach Line Card | 3.900 |
| NTDR69 | Remote Gateway 9150 | 8.800 |
| NTDR70 | Reach Line Card (32-port) | 6.100 |
| NTDR71 | Reach Line Card (32-port) | 6.100 |
| NTDU19 | Expansion Kit | 7.800 |
| NTDU41 | Voice Gateway Media Card | 2.48 |
| NTDW12AAE5 | Universal Clock Controller (UDT CC) daughter board | 0.54 |
| NTDW20AAE6 | MG XPEC Card | 1.36 |
| NTDW53AAE6 | CP DC single slot Card | 2.88 |
| NTDW54AAE6 | CP DC double slot Card | 2.88 |
| NTDW56BAE6 | CP MG 32 Card | 2.63 |
| NTDW59BAE6 | CP MG 128 Card | 2.63 |
| NTDW60BAE5<br>NTDW98AAE5 | MGC Card | 1.36 |
| NTDW61BAE5<br>NTDW99AAE5 | CP PM Card (Call Server) | 2.38 |
| NTDW61BAE5<br>NTDW99AAE5 | CP PM Card (Signaling Server) | 4.96 |
| NTDW62AAE5 | DSP Daughterboard, 32-port | 0.23 |
| NTDW64AAE5 | DSP Daughterboard, 96-port | 0.23 |
| NTDW65AAE5 | MC 32S Card | 0.93 |
| NTDW66BAE5 | CP PM Card (Signaling Server) | 4.96 |
| NTDW78AAE5 | DSP Daughterboard, 128-port | 0.23 |
| NTDW79AAE5 | Universal Digital Trunk (UDT) card | 0.91 |
| NTRA02 | Extended Universal Trunk Card (China) | 4.6 |
| NTRA04 | Flexible Message Waiting Line Card (China) | 6.000 |

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| NTRA05 | Flexible Analog Line Card (China) | 6.000 |
| NTRA06 | Off-premises Station (OPS) Analog Line Card (China) | 1.200 |
| NTRA07 | Pack Extended Conference & Tone & Digit Switch, XCT-C | 0.526 |
| NTRA10 | Extended Universal Trunk Card (China) | < 4.6 |
| NTRA11 | Extended Digital Tone Receiver Card (China) | < 4.6 |
| NTRB18 | CP Mgate | 2.700 |
| NTRB21BA | TMDI Card | 0.91 |
| NTRB34 | Core to Network Interface 3 Card (CNI-3) | 0.53 |
| NTRB37 | Extended Universal Trunk Card (Hong Kong) | 0.490 |
| NTRB53 | Downloadable Clock Controller Card | 0.725 |
| NTTK01 | Single-port 100BaseF IP Expansion Daughterboard | 7.800 |
| NTTK02 | Dual-port 100BaseF IP Expansion Daughterboard | 7.800 |
| NTTK25CA | Software Daughterboard | 0.46 |
| NTVQ01AA | ITGSA card | 1.65 |
| QPC43 | Peripheral Signaling Card | 1.73 |
| QPC414 | Network Card | 3.00 |
| QPC441 | Three-Port Extender Card | 2.00 |
| | –Vintage H or later | 1 |

# Chapter 8: Failure rates - terminal equipment

## Contents

This section contains information on the following topics:



## Overview

Failure rates are based on a circuit cardambient temperature of 40° C (104° F). This temperature is usually higher than the surrounding room temperature. Running the system at a lower temperature increases the life expectancy of components and improves overall system reliability.

## Failure rates

Table 5: Failure rates - station equipment on page 31 gives the failure rates for terminal equipment. In this table, "N/A" indicates that the failure rate is not available at this time.

**Table 5: Failure rates - station equipment**

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| NE-DGQC-35 | Line Cord | 3.50 |
| NE-G3AR-35 | Handset | 0.50 |
| NE-G3DRN-3 | Console Handset | 0.50 |
| NTAG58BB | PC Console Interface Unit (PCCIU) | 0.472 |

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| NT7G10AA | Attendant Supervisory Module | 0.041 |
| NTEX00 | IP Phone Key Expansion Module (KEM) | 3.3 |
| NT6G00 | M2250 TDM Console | 0.653 |
| NTDU64AA | Fan/Alarm Module | 0.01 |
| NTDU65AA | Sparkle Power Supply | 1.67 |
| NTDU68AA | Blank | 0.0 |
| NTDU90 | IP Phone 2001 | 5.760 |
| NTDU92 | IP Phone 2004 | 0.84 |
| NTDU96 | Avaya 2007 IP Deskphone | 3.650 |
| NTEX11 | Avaya 2033 IP Conference Phone | 5.260 |
| NTMN31 | M3901 Telephone | 0.46 |
| NTMN32 | M3902 Telephone | 0.57 |
| NTMN33 | M3903 Telephone | 0.76 |
| NTMN34 | M3904 Telephone | 1.23 |
| NTMN35 | M3905 Call Center Telephone | 1.14 |
| NTMN66 | Key-based Expansion Unit | 0.23 |
| NTMN69 | Meridian Communications Adapter | 0.23 |
| NTMN70 | CTI Accessory (CTIA) | 2.28 |
| NTMN80 | Power Supply for M3900-series Telephones | 3.81 |
| NTTQ4010 | WLAN Handset 2210y only hav et | 6.660 |
| NTTQ4050 | WLAN Handset 2210 Battery Pack | N/A |
| NTTQ4060 | WLAN Handset 2210 Desktop Charger | 6.660 |
| NTTQ4101 | WLAN Handset 2210/2211 Charger & WLAN Application Gateway 2246-64 Power Supply (North America) | 6.660 |
| NTTQ5010 | WLAN Handset 2211 | 22.470 |
| NTTQ5050 | WLAN Handset 2211 Battery Pack | N/A |
| NTTQ5060 | WLAN Handset 2211 Desktop Charger | 22.470 |
| NTTQ60 | WLAN IP Telephony Manager 2245 | 3.750 |
| NTZK06 | M2006 Telephone | 3.08 |
| NTZK08 | M2008 Telephone | 3.10 |
| NTZK16 | M2616 Telephone | 3.88 |

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| NTZK20 | M2016S Telephone | 5.87 |
| NTZK22 | M2216ACD-1 Telephone | 4.68 |
| NTZK23 | M2216ACD-2 Telephone | 5.37 |
| | WLAN Handset 2212 | 5.5 |

**Note:**

The battery pack is a consumable and lasts typically for 500 charge cycles before needing to be replaced.

# Chapter 9: Failure rates - cables

## Contents

This section contains information on the following topics:



## Overview

Failure rates are based on a circuit card ambient temperature of 40° C (104° F). This temperature is usually higher than the surrounding room temperature. Running the system at a lower temperature increases the life expectancy of components and improves overall system reliability.

## Failure rates

There are many cables available from Avaya. The approximate failure rate for most cables, based on failures in time per billion hours ($10^9$), is 0.5. For a detailed listing of cables, see *Avaya Equipment Identification Reference (NN43001-254)*.

# Chapter 10: Failure rates - miscellaneous components

## Contents

This section contains information on the following topics:



## Overview

Failure rates are based on a circuit card ambient temperature of 40° C (104° F). This temperature is usually higher than the surrounding room temperature. Running the system at a lower temperature increases the life expectancy of components and improves overall system reliability.

## Failure rates

Table 6: Failure rates - miscellaneous equipment on page 37 gives the failure rates for miscellaneous equipment not included in other sections of this document. In this table, "N/A" indicates that the failure rate is not available at this time.

**Table 6: Failure rates - miscellaneous equipment**

| Order code | Description | Failure rate per $10^6$ hrs |
|---|---|---|
| NT5D52 | Ethernet Adapter Card | < 7.5 |

# Chapter 11: Converting NFT values to spares requirements

Table 7: Number of spares required on page 39 translates NFT values, calculated in Calculating spares requirements on page 18, to the number of spares required in stock.

**Table 7: Number of spares required**

| NFT values | | Spares required | | NFT values | | Spares required |
|---|---|---|---|---|---|---|
| From | To | | | From | To | |
| 0 | 0.001 | 1 | | 8.26 | 8.91 | 20 |
| 0.001 | 0.0452 | 2 | | 8.91 | 9.57 | 21 |
| 0.0452 | 0.189 | 3 | | 9.57 | 10.2 | 22 |
| 0.189 | 0.425 | 4 | | 10.2 | 10.9 | 23 |
| 0.425 | 0.734 | 5 | | 10.9 | 11.5 | 24 |
| 0.734 | 1.09 | 6 | | 11.5 | 12.2 | 25 |
| 1.09 | 1.5 | 7 | | 12.2 | 12.9 | 26 |
| 1.5 | 1.95 | 8 | | 12.9 | 13.6 | 27 |
| 1.95 | 2.43 | 9 | | 13.6 | 14.3 | 28 |
| 2.43 | 2.94 | 10 | | 14.3 | 15 | 29 |
| 2.94 | 3.46 | 11 | | 15 | 15.8 | 30 |
| 3.46 | 4.01 | 12 | | 15.8 | 16.5 | 31 |
| 4.01 | 4.58 | 13 | | 16.5 | 17.2 | 32 |
| 4.58 | 5.16 | 14 | | 17.2 | 17.9 | 33 |
| 5.16 | 5.76 | 15 | | 17.9 | 18.7 | 34 |
| 5.76 | 6.37 | 16 | | 18.7 | 19.4 | 35 |
| 6.37 | 6.99 | 17 | | 19.4 | 20.1 | 36 |
| 6.99 | 7.62 | 18 | | 20.1 | 20.9 | 37 |
| 7.62 | 8.26 | 19 | | 20.9 | 21.6 | 38 |
| 21.6 | 22.4 | 39 | | 47.6 | 48.4 | 72 |
| 22.4 | 23.1 | 40 | | 48.4 | 49.2 | 73 |

| NFT values | | Spares required | | NFT values | | Spares required |
|---|---|---|---|---|---|---|
| From | To | | | From | To | |
| 23.1 | 23.9 | 41 | | 49.2 | 50 | 74 |
| 23.9 | 24.6 | 42 | | 50 | 50.9 | 75 |
| 24.6 | 25.4 | 43 | | 50.9 | 51.7 | 76 |
| 25.4 | 26.2 | 44 | | 51.7 | 52.5 | 77 |
| 26.2 | 26.9 | 45 | | 52.5 | 53.3 | 78 |
| 26.9 | 27.7 | 46 | | 53.3 | 54.2 | 79 |
| 27.7 | 28.5 | 47 | | 54.2 | 55 | 80 |
| 28.5 | 29.2 | 48 | | 55 | 55.8 | 81 |
| 29.2 | 30 | 49 | | 55.8 | 56.6 | 82 |
| 30 | 30.8 | 50 | | 56.6 | 57.5 | 83 |
| 30.8 | 31.6 | 51 | | 57.5 | 58.3 | 84 |
| 31.6 | 32.4 | 52 | | 58.3 | 59.1 | 85 |
| 32.4 | 33.2 | 53 | | 59.1 | 60 | 86 |
| 33.2 | 33.9 | 54 | | 60 | 60.8 | 87 |
| 33.9 | 34.7 | 55 | | 60.8 | 61.6 | 88 |
| 34.7 | 35.5 | 56 | | 61.6 | 62.5 | 89 |
| 35.5 | 36.3 | 57 | | 62.5 | 63.3 | 90 |
| 36.3 | 37.1 | 58 | | 63.3 | 64.1 | 91 |
| 37.1 | 37.9 | 59 | | 64.1 | 65 | 92 |
| 37.9 | 38.7 | 60 | | 65 | 65.8 | 93 |
| 38.7 | 39.5 | 61 | | 65.8 | 66.6 | 94 |
| 39.5 | 40.3 | 62 | | 66.6 | 67.5 | 95 |
| 40.3 | 41.1 | 63 | | 67.5 | 68.3 | 96 |
| 41.1 | 41.9 | 64 | | 68.3 | 69.2 | 97 |
| 41.9 | 42.7 | 65 | | 69.2 | 70 | 98 |
| 42.7 | 43.5 | 66 | | 70 | 70.9 | 99 |
| 43.5 | 44.3 | 67 | | 70.9 | 71.7 | 100 |
| 44.3 | 45.2 | 68 | | 71.7 | 72.5 | 101 |
| 45.2 | 46 | 69 | | 72.5 | 73.4 | 102 |
| 46 | 46.8 | 70 | | 73.4 | 74.2 | 103 |

| NFT values | | Spares required | | NFT values | | Spares required |
|---|---|---|---|---|---|---|
| From | To | | | From | To | |
| 46.8 | 47.6 | 71 | | 74.2 | 75.1 | 104 |
| 75.1 | 75.9 | 105 | | 103.4 | 104.3 | 138 |
| 75.9 | 76.8 | 106 | | 104.3 | 105.1 | 139 |
| 76.8 | 77.6 | 107 | | 105.1 | 106 | 140 |
| 77.6 | 78.5 | 108 | | 106 | 106.9 | 141 |
| 78.5 | 79.3 | 109 | | 106.9 | 107.7 | 142 |
| 79.3 | 80.2 | 110 | | 107.7 | 108.6 | 143 |
| 80.2 | 81 | 111 | | 108.6 | 109.5 | 144 |
| 81 | 81.9 | 112 | | 109.5 | 110.3 | 145 |
| 81.9 | 82.7 | 113 | | 110.3 | 111.2 | 146 |
| 82.7 | 83.6 | 114 | | 111.2 | 112.1 | 147 |
| 83.6 | 84.4 | 115 | | 112.1 | 113 | 148 |
| 84.4 | 85.3 | 116 | | 113 | 113.8 | 149 |
| 85.3 | 86.2 | 117 | | 113.8 | 114.7 | 150 |
| 86.2 | 87 | 118 | | 114.7 | 115.6 | 151 |
| 87 | 87.9 | 119 | | 115.6 | 116.4 | 152 |
| 87.9 | 88.7 | 120 | | 116.4 | 117.3 | 153 |
| 88.7 | 89.6 | 121 | | 117.3 | 118.2 | 154 |
| 89.6 | 90.4 | 122 | | 118.2 | 119.1 | 155 |
| 90.4 | 91.3 | 123 | | 119.1 | 119.9 | 156 |
| 91.3 | 92.2 | 124 | | 119.9 | 120.8 | 157 |
| 92.2 | 93 | 125 | | 120.8 | 121.7 | 158 |
| 93 | 93.9 | 126 | | 121.7 | 122.6 | 159 |
| 93.9 | 94.7 | 127 | | 122.6 | 123.5 | 160 |
| 94.7 | 95.6 | 128 | | 123.5 | 124.3 | 161 |
| 95.6 | 96.5 | 129 | | 124.3 | 125.2 | 162 |
| 96.5 | 97.3 | 130 | | 125.2 | 126.1 | 163 |
| 97.3 | 98.2 | 131 | | 126.1 | 127 | 164 |
| 98.2 | 99.1 | 132 | | 127 | 127.8 | 165 |
| 99.1 | 99.9 | 133 | | 127.8 | 128.7 | 166 |

| NFT values | | Spares required | | NFT values | | Spares required |
|---|---|---|---|---|---|---|
| From | To | | | From | To | |
| 99.9 | 100.8 | 134 | | 128.7 | 129.6 | 167 |
| 100.8 | 101.7 | 135 | | 129.6 | 130.5 | 168 |
| 101.7 | 102.5 | 136 | | 130.5 | 131.4 | 169 |
| 102.5 | 103.4 | 137 | | 131.4 | 132.2 | 170 |
| 132.2 | 133.1 | 171 | | 161.5 | 162.4 | 204 |
| 133.1 | 134 | 172 | | 162.4 | 163.3 | 205 |
| 134 | 134.9 | 173 | | 163.3 | 164.1 | 206 |
| 134.9 | 135.8 | 174 | | 164.1 | 165 | 207 |
| 135.8 | 136.6 | 175 | | 165 | 165.9 | 208 |
| 136.6 | 137.5 | 176 | | 165.9 | 166.8 | 209 |
| 137.5 | 138.4 | 177 | | 166.8 | 167.7 | 210 |
| 138.4 | 139.3 | 178 | | 167.7 | 168.6 | 211 |
| 139.3 | 140.2 | 179 | | 168.6 | 169.5 | 212 |
| 140.2 | 141.1 | 180 | | 169.5 | 170.4 | 213 |
| 141.1 | 141.9 | 181 | | 170.4 | 171.3 | 214 |
| 141.9 | 142.8 | 182 | | 171.3 | 172.2 | 215 |
| 142.8 | 143.7 | 183 | | 172.2 | 173.1 | 216 |
| 143.7 | 144.6 | 184 | | 173.1 | 174 | 217 |
| 144.6 | 145.5 | 185 | | 174 | 174.9 | 218 |
| 145.5 | 146.4 | 186 | | 174.9 | 175.8 | 219 |
| 146.4 | 147.3 | 187 | | 175.8 | 176.7 | 220 |
| 147.3 | 148.1 | 188 | | 176.7 | 177.5 | 221 |
| 148.1 | 149 | 189 | | 177.5 | 178.4 | 222 |
| 149 | 149.9 | 190 | | 178.4 | 179.3 | 223 |
| 149.9 | 150.8 | 191 | | 179.3 | 180.2 | 224 |
| 150.8 | 151.7 | 192 | | 180.2 | 181.1 | 225 |
| 151.7 | 152.6 | 193 | | 181.1 | 182 | 226 |
| 152.6 | 153.5 | 194 | | 182 | 182.9 | 227 |
| 153.5 | 154.4 | 195 | | 182.9 | 183.8 | 228 |
| 154.4 | 155.2 | 196 | | 183.8 | 184.7 | 229 |

| NFT values | | Spares required | | NFT values | | Spares required |
|---|---|---|---|---|---|---|
| From | To | | | From | To | |
| 155.2 | 156.1 | 197 | | 184.7 | 185.6 | 230 |
| 156.1 | 157 | 198 | | 185.6 | 186.5 | 231 |
| 157 | 157.9 | 199 | | 186.5 | 187.4 | 232 |
| 157.9 | 158.8 | 200 | | 187.4 | 188.3 | 233 |
| 158.8 | 159.7 | 201 | | 188.3 | 189.2 | 234 |
| 159.7 | 160.6 | 202 | | 189.2 | 190.1 | 235 |
| 160.6 | 161.5 | 203 | | 190.1 | 191 | 236 |
| 191 | 191.9 | 237 | | 200 | 200.9 | 247 |
| 191.9 | 192.8 | 238 | | 200.9 | 201.8 | 248 |
| 192.8 | 193.7 | 239 | | 201.8 | 202.7 | 249 |
| 193.7 | 194.6 | 240 | | 202.7 | 203.6 | 250 |
| 194.6 | 195.5 | 241 | | 203.6 | 204.5 | 251 |
| 195.5 | 196.4 | 242 | | 204.5 | 205.4 | 252 |
| 196.4 | 197.3 | 243 | | 205.4 | 206.3 | 253 |
| 197.3 | 198.2 | 244 | | 206.3 | 207.2 | 254 |
| 198.2 | 199.1 | 245 | | 207.2 | 208.1 | 255 |
| 199.1 | 200 | 246 | | 208.1 | 209 | 256 |

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