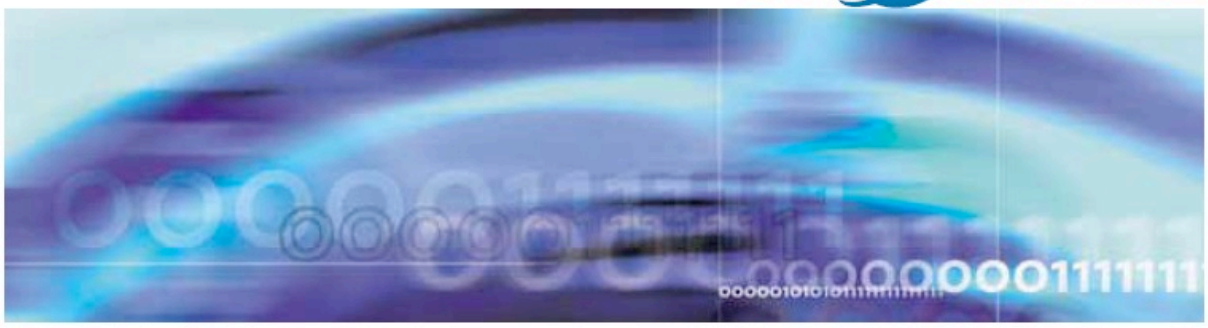


Communication Server 1000 Cabinet

(Nortel Meridian 1 PBX 11C Cabinet)

System Evaluation

NN43011-301

Document status: Standard
Document version: 03.02
Document date: 03 July 2009

Contents

Communication Server 1000 Cabinet
Nortel Meridian 1 PBX 11C Cabinet
System Evaluation

for

SUMMARY: A system evaluation of the _____(Customer) Communication Server 1000 Cabinet solution in _____(City) was requested by _____(Name) of _____(Company). The evaluation was performed on _____(Date). The nature of the evaluation was to determine if the Communication Server 1000 Cabinet was installed according to Nortel manufacturing specifications and Product Bulletin requirements.

DISTRIBUTION:

EVALUATED BY:

DATE:

Descriptions and procedures pertaining to IP applications in this document are provided for continuity for customers remaining on Communication Server Release 4.5.

A stand-alone IP Trunk (ITG Trunk) configuration is the only IP application supported on the Meridian 1 Option 11C platform in Communication Server 1000 Release 5.5 or earlier. For information on software-only upgrades, refer to Meridian 1 Small System Software-only Upgrade (NN43011-459).

Systems described within this document that are configured with IP Phones or Signaling Servers using Communication Server 1000 Release 4.5 and want to upgrade to Communication Server 1000 Release 6.0 must be upgraded to Communication Server 1000E with a Common Processor Pentium Mobile (CP PM) call processor. For migrations to Communication Server Release 6.0, refer to:

- Communication Server 1000E Upgrade - Hardware Upgrade Procedures (NN43041-464)
- Communication Server 1000E Upgrade - Software Upgrades (NN43041-458)
- Meridian 1 Small System Software-only Upgrade (NN43011-459)

Location Profile

Site Information:

Audit Engineer:		Evaluation Date:	
Distributor:		Customer:	
Address:		Address:	
Contact:		Site Telephone:	
Telephone:		Attendees:	
Email:			

System Information:

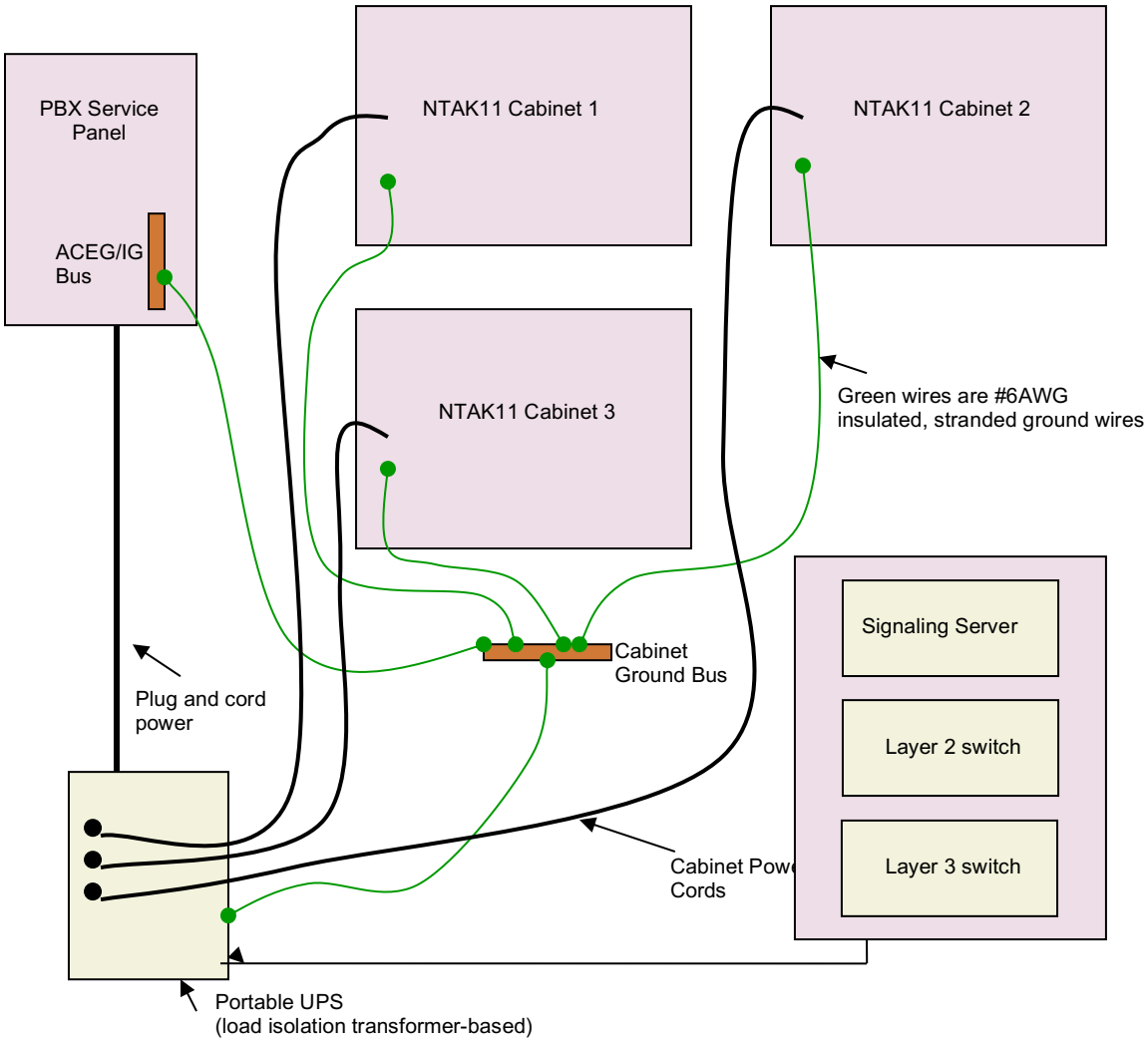
System Serial Number: XXXXX

	Type/Platform	Software Release	Ports
PBX	CS 1000 Cabinet	XX21/X.00	XXX
TM			
Call Center Server			
Call Pilot IPE			
VGMC			
Signaling Server			
Layer 2 switches			
Layer 3 switches			

Equipment Information:

	Type	Quantity	**Power Equipment**		Quantity
Cabinets :	NTAK11		UPS Type:		
Signaling Server	ISP 1100, CP PM, and COTS				
			Evaluation Type:	Post Cut	

CS 1000 Cabinet Sample Site Layout



FINDINGS AND RECOMMENDATIONS

Introduction:
The evaluation of this Nortel CS 1000 Cabinet system, located _____ _____ was requested by _____. The request was initiated because _____.
The evaluation was performed on (date) _____ and covered the areas of Equipment Room Environment, Maintenance and Technician Area Environment, Power and Grounding, System Power and Ground Connections, Power and Grounding for Systems with DC Power, Battery Installation, Cabinet Installation, Cabling Installation, System Operation, System Software, and Network Parameters for VoIP. _____ (name of company representative) was the main contact person during the evaluation process. All questions that pertain to this report may be directed to _____.

DISCREPANCIES AND RECOMMENDATIONS:

EQUIPMENT ROOM ENVIRONMENT

Item # **Findings:** **Recommendation:**	

MAINTENANCE AND TECHNICIAN AREA ENVIRONMENT

Item # **Findings:** **Recommendation:**	

POWER AND GROUNDING

Item # **Findings:** **Recommendation:**	

SYSTEM POWER AND GROUND CONNECTIONS

Item # **Findings:** **Recommendation:**	

POWER AND GROUNDING FOR SYSTEMS WITH DC POWER

Item # **Findings:** **Recommendation:**	

BATTERY INSTALLATION

Item # **Findings:** **Recommendation:**	

CABINET INSTALLATION

Item # **Findings:** **Recommendation:**	

CABLING INSTALLATION

Item # **Findings:** **Recommendation:**	

SYSTEM OPERATION

Item # **Findings:** **Recommendation:**	

SYSTEM SOFTWARE

Item # **Findings:** **Recommendation:**	

NETWORK PARAMETERS FOR VoIP

Item # **Findings:** **Recommendation:**	

CONCLUSION

NOTE: *This report is based on checklist items contained in this document. The checklist item under each subheading is answered with a "Y" or "N", signifying that it either complies or does not comply with Nortel specifications. An "N/A" means that the checklist question does not apply in this instance. The specifications are based on Nortel Practices, Product Bulletins, Product Advisories, and General Release Bulletins. Each checklist item is given a weight. The item may be deemed as "Critical, Major, Minor, or Recommended" in nature. A system evaluation is found to be "non-compliant" when one "Critical" or two "Major" discrepancies have been identified. Checklist weighting is not given to Applications products questions. The aim of an evaluation is to ensure installation completeness, optimize system performance/ reliability, and provide a safe environment for personnel.*

Further Comments:

CHECKLIST

SYSTEM AND SITE REQUIREMENTS

Equipment Room Environment

Meets Specifications Y / N

For additional information refer to:
NTP NN43011-220 Meridian 1 Small System Planning and Engineering
NTP NN43011-310 Meridian 1 Small System Installation and Commissioning

1.
   - If Cabinets are mounted side-by-side, temperature is maintained between 0° and 45° C (32° and 113° F) and does not deviate any more than 5°F within a 24 hour period. A temperature of 22°C (72°F) is recommended.
   - If Cabinets are mounted one above the other, temperature is maintained between 0° and 35° C (32° and 95° F) and does not deviate any more than 5°F within a 24 hour period. A temperature of 22°C (72°F) is recommended.

   Temperature: _____°(Indicate C or F) [Major] _____
2. Humidity is between 5% and 95% non-condensing. Humidity _____% [Major, Critical if more than 95% or less than 5%] _____
3. Environment does not show any visible signs of moisture. [Critical] _____
4. Ventilating openings on equipment are free of obstructions. [Major] _____
5. The room is clean, relatively dust-free, and well ventilated. [Minor, Major if concrete dust] _____
6. Floor is sealed concrete, vinyl, raised floor (no dust or moisture) [Major] _____
7. Equipment is located at least 12 ft (3660 mm) away from sources of electrostatic, electromagnetic, or radio frequency interference, such as power tools, appliances (such as vacuum cleaners), office business machines (such as copying machines), all electric motors, and electrical transformers. [FCC CFR 47 Part 15 for Class A devices. (<20 milliGauss ELF) [Major] _____
8. Equipment is not located under liquid-carrying pipes. [Major] _____
9. Equipment room is not conducive to generating electrostatic discharge (ESD) [Major] _____
10. Anti-static wrist straps, sprays and/or mats in evidence on site. [Recommendation] _____
11. Equipment is not exposed to excessive vibration. [Major] _____
12. Switch room door has a lock installed. [Minor] _____
13. No tripping or safety hazards exist in the equipment room. [Major] _____
14. Lighting illumination is 50 to 75 foot candles measured 76 cm (30 in.) above the equipment room floor. [Recommendation] _____

Equipment Room Environment (continued)

Meets Specifications Y / N

15. Equipment room is protected from receiving direct sunlight. Direct sunlight is prevented from shining on electronic hardware, especially disk drives. [Major] _____
16. Adequate floor space has been made available to install equipment racks, patch panels, power systems (UPS) etc. [Major] _____
17. RS-232 terminal/communications devices should not exceed the 50 foot cable length limit unless line drivers are utilized. [Major] _____
18. The storage room for spare parts is secure. [Recommendation] _____
19. If it is not possible that the site maintain the environment of the storage area exactly the same as the environment of the operating equipment, stored materials are allowed time to adjust to the equipment room environment before using them. [Major] _____
20. The storage area is dust-free and away from high humidity and machinery such as electric motors of transformers. [Major] _____
21. Cross-connect terminal or other equipment that could cause debris to fall into the ventilation slots of the system is not located above the cabinet. [Critical] _____
22. Circuit cards which are not in use are stored in a protective antistatic bag. The storage area is dust-free and away from high humidity and machinery such as electric motors or transformers. [Major] _____
23. Cabinet covers are installed. [Major] _____

Maintenance and Technician Area Environment

24. A locking cabinet or storage area is in place for backup disks [Recommendation] _____
25. The area contains a table or desk terminal, printer, or equivalent device [Recommendation] _____
26. Maintenance workstation is equipped with a/an: [Major]
    - dial-up modem or connected to the network; _____
    - web browser; _____
    - operational maintenance telephone. _____
27. Observations/Comments

Power and Grounding

For additional information refer to:
NTP NN43011-310 Meridian 1 Small System Installation and Commissioning
National Electrical Code (NEC) Article 110, 210, 250

Meets Specifications Y / N

CS 1000 Cabinet System AC Service Panel

1. In the AC-powered version of the Cabinet system, a dedicated AC service panel is used. Equipment that is not related to the PBX system is not connected to this panel. All electrical devices such as lighting, fans, motors, and air conditioning equipment are not contained in the PBX dedicated AC service panel. _____
2. If other data communications equipment is in the same rack/equipment cabinet as the PBX, each piece of equipment is powered from a grounded receptacle. The same service panel services all receptacles. _____
3. The AC supply conductors are dedicated and uninterrupted from the building primary source or transformer to the PBX main AC service panel. (This does not apply to sub panels). [Major] _____
4. Verify that an Isolated Ground (IG) or ACEG conductor is installed from MGN/ X0 to an IG or ACEG bus in the AC panel serving the PBX equipment room. This point will become the single point ground reference for the PBX. Note: In some cases an AC panel may not be a requirement. Various UPS systems will establish the same intent and purpose as the panel IG/ACEG bus. The engineer performing the evaluation should research the application and determine its intent. [Critical] _____
5. The IG/ACEG conductor is sized per code. (NEC 250). Note: It is recommended that the ACEG conductor be the same size as the largest phase conductor. [Major] _____
6. The IG/ACEG conductor runs in the same raceway (conduit) as the phase and neutral conductors (NEC 250). [Major] _____
7. The IG/ACEG conductor is insulated, permanent, and continuous (no splices). (NEC 250) [Major] _____
8. Circuit breakers are identified/labeled at the AC service panel. (NEC 110-22) [Minor] _____
9. Ensure that all voltage and current levels recorded are within the defined limits. [Critical] Note: A licensed Electrician should obtain these results. See the AC Power/Ground Worksheet _____
10. The workspace clearance around the AC service panel is 3 feet. (NEC 110-26) [Major] _____

Meets Specifications Y / N

Power and Grounding (continued)

11. All RS-232 ancillary devices connected to the system I/O circuit cards must be wired from the same AC panel as the PBX power supplies, with individual hot, neutral, and isolated/ACEG ground wires. Note: Protection devices such as electro-optical isolators must be installed for all RS-232 devices (terminal, modem, etc.) not served from the same AC service panel as the CS 1000 system. [Critical] _____

12. Power from each receptacle meets the input requirements of the Cabinet system power supply listed in the following table:

AC input requirements for each NTDK70 cabinet power supply		y/n
Voltage	Maximum rated input voltage 100-240 Volts RMS, single phase	
Frequency	50-60 Hz	
Power (I/P max)	750 VA minimum	
Receptacle Type	NEMA 5-15R for 120 Volt, 15 Amp supply NEMA 6-15R for 208/240 Volt, 15 Amp supply	

_____

Location of power receptacles

NOTE: The maximum distance between a power receptacle and the system cabinet is met in relation to the length of the power cord.

- *In North America, the power cord is 9 ft 10 in. (3000 mm).*
- *Outside North America, the power cord is 8 ft 2 in. (2490 mm).*

13. Observations/Comments

AC Power & Ground Worksheet

AC Service Panel Measurements

Note: ***If a portable UPS system is used, measurements will only be taken on the input/output voltage and the neutral-ground voltage. Percent of load must also be notated***

Voltage Measurements:	AC		MIN	MAX
Between neutral and phase A	_____	volts	105v	125v
Between neutral and phase B	_____	volts	105v	125v
Between neutral and phase C	_____	volts	105v	125v
Between ground and phase A	_____	volts	105v	125v
Between ground and phase B	_____	volts	105v	125v
Between ground and phase C	_____	volts	105v	125v
Between phase A and phase B	_____	volts	180v	250v
Between phase A and phase C	_____	volts	180v	250v
Between phase B and phase C	_____	volts	180v	250v
Between neutral and ground (ACEG)	_____	Vrms	0.0v	0.5Vrms
UPS percent of load:				
UPS input voltage:				
UPS output voltage:				
Current Measurements:	AC			MAX
Neutral conductor amps	_____	amps		See Note 1
Ground conductor amps (IG or ACEG)	_____	amps		0.5 amps
Phase A amps	_____	amps		
Phase B amps	_____	amps		
Phase C amps	_____	amps		

Note 1: The neutral current should never exceed the current in any single-phase leg.
A licensed electrician must take AC service panel measurements.
Voltage and current values must comply with NTPs.

Voltage between neutral and ground could signify poor or loose connections or non-continuous grounding.

Current flow in the grounding conductor may indicate that the neutral has been used for equipment grounding.

If currents are balanced in a three phase system and there is significant neutral current, then harmonics are present. Harmonics can deteriorate transformers over time by over heating their internal wiring. Solution: Use transformers specifically designed for harmonic loading (k-factor-rated).

System Power and Ground Connections

Meets Specifications Y / N

For additional information refer to:
NTP NN43011-310 Meridian 1 Small System Installation and Commissioning National Electrical Code (NEC) Article 250

1. The Signaling Server power cord is plugged into the rack's AC receptacle and the rack's AC receptacle is grounded to its dedicated electrical panel. [Major] _____

2. In an installation where a dedicated panel cannot provide optimal conditions, a load isolation transformer or load isolation transformer-based UPS/Line conditioner with the following characteristics is used: [Major]
   - 120/208/240 V AC input, over-current protected at primary _____
   - 120/208/240 V AC available at secondary outputs, each circuit breaker protected _____
   - primary and secondary windings are completely isolated from one another _____
   - it is approved for use locally as a stand-alone user product (CSA, UL, or other locally recognized clear markings) _____
   - it is capable of providing power to all CS 1000 components operating at the same time at full load _____
   - it is electrostatically shielded to minimize ELF fields _____

3. The method of grounding used for CS 1000 Cabinet depends on whether the same service panel powers all cabinets. This installation uses one of the following grounding scenarios: _____

   <u>Cabinet system with one or more cabinets powered by the same service panel:</u>
   For each system cabinet, a #6 AWG (#40 Metric Wire Gauge) ground wire is connected from the cabinet to the NTBK80 grounding block. The grounding block is connected to a ground source (the ground bus in the AC power service panel). _____

   <u>Cabinet system with more than one cabinet, powered by different service panels:</u>
   For each cabinet, a #6 AWG (#40 Metric Wire Gauge) ground wire is connected from the cabinet to the NTBK80 grounding block. If any cabinet cannot be powered from the same service panel, it is ground separately from the other cabinet back to the service panel that supplies it.
   Note 1: A separately grounded cabinet is grounded the same as a single-cabinet system.
   Note 2: In the UK, you can connect the grounding wire from the cabinet to an NTBK80 grounding block or through a Krone Test Jack Frame. _____

System Power and Ground Connections (continued)

Meets Specifications Y / N

4. Grounding multiple pieces of equipment in a rack/equipment Cabinet:
   Each piece of equipment in a rack/equipment cabinet is grounded. If a piece of equipment does not have a ground lug, then the whole rack/equipment cabinet is grounded.
5. The installation meets the specific grounding requirements for the area: [Major]

Germany	#8 AWG (10 mm^2) green/yellow wire
North America; other areas in Europe	Not smaller than #6 AWG (16 mm^2) at any point
UK	Two green/yellow wires no thinner than two 10 mm^2

6. A system ground conductor, sized at a minimum of a #6 AWG stranded, insulated wire is installed from the cabinet ground bus to the ACEG bus in the AC panel. Where UPS systems are employed, a #6 AWG wire can be installed from the cabinet ground bus to the grounded metallic case of the UPS using a ground lug. [Critical if missing; Major if undersized].
7. A #6 AWG insulated, stranded conductor is installed between each CS 1000 cabinet ground lug and the cabinet ground bus. [Major]
8. All grounding conductors are clearly identified/labeled. [Minor]
9. Ground connections are tagged with a clear message such as "CRITICAL CONNECTION: DO NOT REMOVE OR DISCONNECT. [Minor]
10. No telecommunications ground bus of the CS 1000 is connected to untested horizontal structural steel, water pipes, or other unreliable ground paths. [Major]
    Note: The SPG conductor from the CS 1000 Cabinet System is not connected to structural steel members or electrical conduit. This conductor is not tied to a ground source or grounded electrode that is not hard-wired to the building reference conductor.
11. The cabinet ground bus is mounted near the CS 1000 cabinets. [Major]
12. CSUs (Channel Service Units) are connected to reserve power (UPS) or are span powered. [Major]
13. Ground conductors are insulated, permanent and continuous (not spliced). [Major]
14. All terminations are easily visible and accessible for maintenance purposes. [Major]

System Power and Ground Connections (continued)

Meets Specifications Y / N

15. The impedance of the link between the ground post of the system cabinets and the SPG to which they are connected is less than 0.25 ohms. _____
16. For systems equipped with Expansion Cabinets, a separate receptacle for each cabinet is provided. Each receptacle is powered from separate branch circuits in the same service panel. _____
17. When installed on the wall, receptacles are installed within reach of the chassis or cabinet power cords. _____
18. The ground prong of each receptacle is connected by an insulated conductor to the system SPG. _____
19. If the transformer does not have an isolated secondary ground lug, the chassis ground lug of the transformer is used as the SPG. _____
20. If the transformer does not have a pluggable cord, the transformer is hardwired to an electrical panel. All wires (including grounds) are routed through a single conduit. _____
21. All ground wires are run through the same conduit as the phase conductors that serve the equipment. _____

Ancillary Equipment Power

22. Power for the ancillary equipment in the switch room is
    - powered from the same panel or transformer as the PBX
    - grounded to the same panel or transformer as the PBX
    - labeled at the panel to prevent interruption that is not authorized
    - not be controlled by a switch between the breaker and the equipment _____
23. Service receptacles for AC-powered PBX System and related equipment are:
    - rated for 120 or 240 V, 15 or 20A, 50-60 Hz, 3-pole, 3-wire, grounded
    - grounded to the same location so as to form a SPG. _____

Meets Specifications Y / N

System Power and Ground Connections (continued)

Other items

24. QUA6 Power Failure Transfer Units (PFTU) are available to transfer trunk lines during a power or system failure. [Recommendation] _____

Note: *The appropriate AC power cord kit is used for the installation as listed in the following table. (These cords connect a CS 1000 System Cabinet to a commercial AC power source.)*

Country / Region	AC Power Cord	Voltage Rating	Current Rating	Plug Type
North America	A0379412	250 V	10 A	NEMA 6-15P
Argentina	A0814961	250 V	10 A	IRAM 2073
North America	NTTK14	125 V	13 A	NEMA 5-15P
Australia/ New Zealand	NTTK15	250 V	10 A	AS3112
Europe	NTTK16	250 V	10 A	CEE(7)VII
Switzerland	NTTK17	250 V	10 A	SEV 1011
UK/Ireland	NTTK18	250 V	10 A	BS1363
Denmark	NTTK22	250 V	10 A	AFSNIT

26. Observations/Comments

Power & Grounding for Systems with DC Power

Meets Specifications Y / N

For additional information refer to:
NTP NN43011-310 Meridian 1 Small System Installation and Commissioning National Electrical Code (NEC) Article 300

1. Each cabinet in a CS 1000 Cabinet system powered solely from a DC source is equipped with an NTDK72 DC power supply and an NTAK28 Junction Box.
2. The input terminals of the NTAK28 Junction Box are connected to a clean DC power source meeting the requirements shown in the following table. [Major]

DC power requirements for each NTDK72 DC power supply

	Minimum	Nominal	Maximum
Input Range	-44 V DC	-52 V DC	-54 V DC
Noise (CMESS)	—	—	25 dBrnc
Current	—	—	12 Amps
AC Ripple	—	—	100 mv RMS

3. The minimum size of the conductors between the DC source and the Junction Box meets the requirement outlined in the following table. [Major]

Recommended wire size

Size (AWG)	Size (Metric)
6	#40
8	#35
10	#25

N4.TAK75 and NTAK76 battery unit installation

5. The battery units are installed within 0.9 m (3 ft) of the equipment cabinet. [Recommendation]
6. The battery units are installed in an open, well-ventilated area.
7. The recommended ambient room temperature where batteries are installed should be no more the 77° degrees F (25° C).
8. The boxes are properly secured to the mounting surface and the box covers are secure. [Major]

Power & Grounding for Systems with DC Power (continued)

		Meets Specifications Y / N
9.	The battery box wires and harness terminations are secure. [Major]	
10.	The dates on all battery cells match. [Recommendation]	
11.	The NTAK75 and NTAK76 breakers are in the ON position and both green LEDs light, indicating the batteries are properly installed. [Major]	
12.	The NTAK76 battery packs are connected in series, with white jumper wires between the + (red) terminal of one battery pack connected to the - (black) terminal of the next battery pack. The remaining red and black jumper cables are connected to red and black terminals of the first and fourth battery pack. The jumper cable is connected to the NTAK76 breaker panel, marked J1. ***Note:*** *The red positive (+) wire connects to the red (+) post of battery 1. The black negative (-) wire connects to the black post (-) of battery 4. All connections are secured.*	
13.	Battery conductors connected between the batteries and the associated power plant are correctly sized. [Critical]	
14.	Battery cells are floated at the manufacturer's recommended voltage. (13.5 to 13.8 for 12VDC cells; 11.25 to 11.5 for 10VDC cells) [Major]	
15.	Battery cells do not exhibit signs of corrosion. [Major]	
16.	Observations/Comments	

Battery Installation Worksheet

Manufacturer: _____ **Number of Cells per String:** _____

Type: _____ **Total String Voltage:**_____

CELL VOLTAGES

String A	String B	String C	String D
1_____	1_____	1_____	1_____
2_____	2_____	2_____	2_____
3_____	3_____	3_____	3_____
4_____	4_____	4_____	4_____
Totals:_____	Totals:_____	Totals:_____	Totals:_____

Cell Float Voltage Requirement:	Minimum	Maximum
	54 VDC	_____

Cabinet Installation

For additional information refer to:
NTP NN43011-310 Meridian 1 Small System Installation and Commissioning

		Meets Specifications Y / N
1.	The mounting surface can support at least 100 lb (45 kg).	
2.	In installations with wall-mounted systems (recommended), the cabinet is secured to a backboard consisting of 3/4-in. (20-mm) plywood, or other similar material.	
3.	The plywood backboard is securely anchored to the wall with a minimum of six of the following listed fasteners: (**Wood studs**-use #10 wood screws with a 1" embedment; **Metal studs**- use #14 sheet metal screws with a 1" embedment; **Concrete**- ¼" Ramset Dynabolt sleeve anchors) [Recommended; Critical in earthquake zones 4 &5]	
4.	System cabinets are secured with (2) #14 screws mounted near the bottom of the cabinet grates. [Major]	
5.	SDI ports on Fiber Receiver circuit cards are to be used only as maintenance ports. (No CDR, PMS, Traffic, etc.) [Major]	
6.	In installations with vertical expansion, the Expansion Cabinet is mounted above the Main Cabinet. (Nortel does not recommend vertical expansion of three or more cabinets.)	
7.	There is at least 12 in. (305 mm) between the top of a cabinet and the ceiling to ensure proper ventilation.	
8.	There is at least 10 in. (255 mm) between the bottom of the lower cabinet and the floor to prevent water damage and to allow for convectional cooling.	
9.	The cross-connect terminal is not above a cabinet. [Recommendation]	
10.	Adequate space for the battery backup unit is allowed, accounting for the cable-length limitation as determined by the choice of a wall-mounted or floor-mounted battery back-up unit.	
11.	In multi-cabinet systems incorporating remote cabinets, the maximum distance between the Main Cabinet and each Expansion Cabinet is 1.8 mi (3 km).	
12.	Circuit cards are of allowable vintage (no outstanding Product Advisories/Bulletins). [Major]	
13.	Circuit cards are locked into place. [Minor]	

Cabinet Installation (continued)

		Meets Specifications Y / N
14.	Interiors of cabinets are not used as storage for screws, disks, cable ties, etc. [Major]	

Application Tapes & Messaging System Tape Cartridges

15.	Media is not subject to rapid changes in temperature or humidity. [Major]	
16.	Media is kept away from strong magnetic fields. [Major]	
17.	Database backups are routinely performed and are readily available. [Major]	
18.	System installation CDs, PC cards are available for the PBX and Applications products in the event of severe system hardware malfunction or data corruption. [Critical]	
19.	Observations/Comments	

Cabling Installation

Meets Specifications Y / N

For additional information refer to:
NTP NN43011-310 Meridian 1 Small System Installation and Commissioning

Outside Plant Cabling and Protectors

1. Entrance cable sheath is grounded as close as possible at the point of entry to an approved ground source. [Major] (NEC 800-33; 40) _____
2. Splice cases are properly grounded. [Major] _____
3. Approved protection devices are used for Telco network and campus cables. (Carbon, Gas tube type for network cables; fast-acting, low let-through type on campus cables). (NEC 800) [Major] **See Nortel Product Bulletin 97040 (April) revision 1 relating to protection** _____
4. Protection devices are installed at both ends of a cable in a campus environment. (Silicon Avalanche type. see Oneac 5SDP; 5SAP) [Major] ANSI/UL 497-1995 Specs -10V for digital sets; 48VDC for analog sets. **See Nortel Product Bulletin 97040 (April) revision 1**
5. All protection device grounding conductors are grounded to an approved source with an appropriately sized wire. The grounding conductors must be kept as short and straight as possible. (No sharp bends- 8" radius) (NEC 800-40) [Major] _____

Cabinet Cabling

6. Power cables are installed in correct cabinet grooves, where applicable, and securely fastened. [Major] _____
7. Cabling must be installed in a neat and orderly fashion. [Major] _____
8. MDF cables are seated and secured in place using factory velcro straps. [Major] _____
9. All MDF/IDF blocks are clearly labeled. [Major] _____
10. All cables for cabinets, Call Servers, Media Gateways/Expanders, Signaling Servers (SDI, AUX, VGMC ELAN/TLAN, CE-MUX, DS-30X, and 10/100BaseT cables) and adapters are properly fastened. [Major] _____
11. Fiber optic cables are routed according to the Optic cable routing guide. [Major] _____
12. Fiber optic cables are not bent beyond a 35mm bend. (90 degree soft bend) [Major] _____
13. The excess fiber optic cable is wound loosely around the optical cable storage device. [Major] _____
14. In IP survivable 1000 Cabinet systems, excess CAT 5 cable length is wound around the storage device. [Major] _____
15. EMI mitigating ferrite rings (NTVQ83AA) are installed on Voice Gateway Media Card TLAN/ELAN patch cables. [Major] _____
16. NTCW84JA assemblies are used for each VGMC connector. [Major] _____

Cabling Installation (continued)

		Meets Specifications Y / N
17.	CAT 5 patch cables are not installed near fluorescent lighting fixtures. [Major]	
18.	ELAN/TLAN patch cables for VGMC and Signaling Server hardware are "factory made" and kept at 20 feet or less. [Recommendation]	
19.	All patch cables are labeled and correlate to a network infrastructure diagram/schematic. [Minor]	
20.	PBX cabling is not strapped to the exterior of any conduit or raceway as a means of support. [Major]	
21.	M2250 consoles utilize 5 consecutive units and are properly cross-wired with three power TNs. The "AUX" cable may be utilized to take the place of two power TNs only!! See console cable wh/sl, rd/or, & rd/grn pairs [Major]	
22.	Observations/Comments	

System Operation

X11 Software General Release Bulletin (shipped with new software)

Meets Specifications Y / N

System Diagnostics

1. LD 30 Network and Signaling Diagnostic (NWS). [Minor]
2. LD 34 Tone and Digit Switch and Digitone Receiver (TDS). [Major] Check results from the midnight routines.
3. LD 37 Input/Output Diagnostic (IOD). Use "STAT" command for TTYs [Major]
4. LD 38 Conference Circuit Diagnostic (CNF) [Major] Check results from the midnight routines.
5. LD 43 Data Dump (EDD). [Critical] Check for successful completion of a manual data dump.
6. LD 44 Software Audit (AUD). [Major] Must be configured in BKGD of Ld-17. Check for normal AUD000 messages.
7. LD 48 Status of ELAN/ Mail/ESDI Links. [Major] Make sure all AMLs that are in use are ACTIVE EMPTY.
8. LD 60 Digital Trunk Diagnostic (DTI/PRI). [Major] Use the SSCK command to check system clocks. Also check midnight routines for frame slips, CRC errors.
9. GTR, NTPs, and Backup logs are located in switch room. Note: Ensure appropriate level and system type of NTPs are available. [Minor]
10. The PBX maintenance modem/terminal server performs as expected. [Major]
11. Recommended level PEPs are installed in the system. This includes DepList PEPs for the call servers, required PEPs for Signaling Servers, and Voice Gateway Media Card PEPs. [Recommendation]
12. A PC is available on location in order to access Element Manager/NRS [Major]
13. IP sets are on the latest recommended firmware. [Recommendation]
14. Signaling Servers are load sharing (equal number of registered IP phones) [Recommendation]
15. Printouts of Signaling Server config.ini and bootp.tab files readily available. [Minor]
    pdt> cd /u/config, copy config.ini, copy bootp.tab

Memory size

16. The installation meets the minimum memory requirements for CS 1000 Release 5.5 software.

CS 1000 Release 5.5 memory requirements			
Processor	**Flash memory required**	**DRAM memory required**	**Total memory**
SSC	64 MByte	32 MByte	96 MByte

Meets Specifications Y / N

System Operation (continued)

17. The installation does not exceed the maximum call register count recommended for CS 1000 Release 5.5 software.

Recommended maximum call register counts			
	Recommended	**Memory**	**Memory**
	call register	**required**	**required**
System	**count**	**(SL-1 words)**	**(MByte)**
CS 1000	800	181 600	0.693
Note: Call registers are 227 SL-1 words long. One SL-1 word is 4 bytes.			

18. Observations/Comments

System Software

For additional information refer to:
NTP NN43001-712 Software Input Output Reference System Messages

Meets Specifications Y / N

Overlay 15/21 Customer Data Block

1. SRCD (Auto Set Relocation Code) has a value programmed (0000 is Okay). [Major if SPRE is 1, Minor if other] _____

Overlay 17/22 Configuration Record

2. Daily Routine defined as LD 34, 38, 60,137 [Major] _____
3. LD 44 in background routine. [Major] _____
4. The number of call registers (NCR) within the maximum value required per GRB documentation regarding port size and features used.
   1000- 800 call registers [Major] _____
5. 1000 LPIB and HPIB values equal 450 [Recommendation] _____
6. History File is defined as MTC, BUG and is set at minimum length of 60,000 characters. [Major] _____
7. ERRM is configured as ERR, BUG, AUD [Major] _____
8. RLS IDs are configured for each D-Channel where appropriate. [Major] _____

Overlay 11/12/13 Digital Sets / Attendant Consoles/ Digitone Receivers

9. Switchroom phone requires MTA for class of service. [Major] _____
10. Consoles powered via unused TNs are correctly programmed “PWR”. [Major] _____
11. Consoles are cross-wired properly and must utilize consecutive units. [Major] _____
12. Observations/Comments

Networking Parameters for VoIP

Meets Specifications Y / N

For additional information refer to:
NTP NN43011-220 Meridian 1 Small System Planning and Engineering
NTP NN43011-310 Meridian 1 Small System Installation and Commissioning Commissioning

1. A LAN/WAN assessment has been performed on the customer network. [Critical] _____
2. The layer 2 switch ports (Baystack 470) in place for the CS 1000 ELAN/TLAN are configured for full duplex, auto negotiate. [Major] _____
3. The port speed for ELAN related ports are configured at 10 Mbps for CS 1000 systems. [Major] _____
4. The ELAN subnet and the TLAN subnet are on separate subnets. [Major] _____
5. All applications on the ELAN subnet are on the same subnet. [Major] _____
6. The port speed for all TLAN ports on the layer 2 switch are configured for 100 Mbps [Major] _____
7. VGMC circuit cards in the same node are on the same TLAN subnet. [Major] _____
8. Minimum of one VGMC DSP resource for every TDM port (T-1 trunks, digital phones, analog phones, analog trunks, CallPilot channels). [Recommendation] For non-blocking requirements one DSP per TDM port is a best practice. _____
9. Layer 2/3 switches derive UPS power from different branch circuit sources, if possible, in order to minimize single points of failure. [Recommendation] _____
10. Signaling Server (ISP 1100, CP PM, COTS) _____
11. Observations/Comments

Product bulletins for vintage/release updates

Product Bulletin	Affected Product	Part Description	Defective Part #	Replacement Part #	Reason for Change