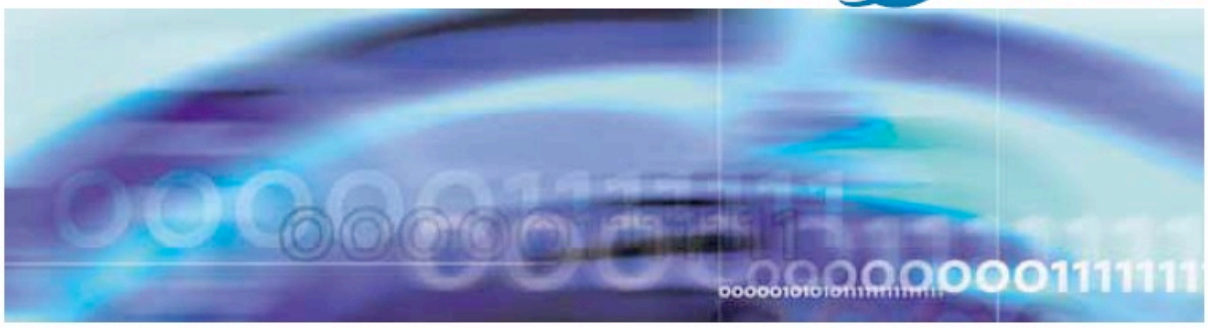

Communication Server 1000M Large System Evaluation

NN43021-300

Document status: Standard
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Communication Server 1000M Large System Evaluation

for

Summary: A system evaluation of the _____(Customer) Communication Server 1000M Large 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 1000M Large was installed following Nortel manufacturing specifications and Product Bulletin requirements.

DISTRIBUTION:

EVALUATED BY:

DATE:

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Location profile

Site Information:

Engineer: _____ Evaluation date: _____

Distributor: _____ Customer: _____
Address: _____ Address: _____

Contact: _____ Site telephone: _____
Telephone: _____ Attendees: _____
Email: _____
GNTS case#: _____

System Information:

System Serial Number: _____

	Type or Platform	Software or Firmware release	Ports or Users
CS1000M			
Amount of PBX Memory on CORE			
TM			
Call Center Server			
Call Pilot			
Call Center Web Client			

Equipment Information:

	Equipment	Quantity	Power Equipment			Quantity
Core Module:			Candeo			
CP Type:						
Network:						
Inter Group:			Rectifiers	Type:		
IPE:			UPS	Type:		
MMDU:						
Peripheral:			Rack Equipment			
Fiber Interface:			Signaling Server (ISP 1100, COTS):			
Mail :			Layer 2 Switch			
Max:			Layer 3 Switch			
CCR:						
Link:			Other:			
Signaling Server (CP PM)						
FIJI Type:			Evaluation Type:		Post Cut	

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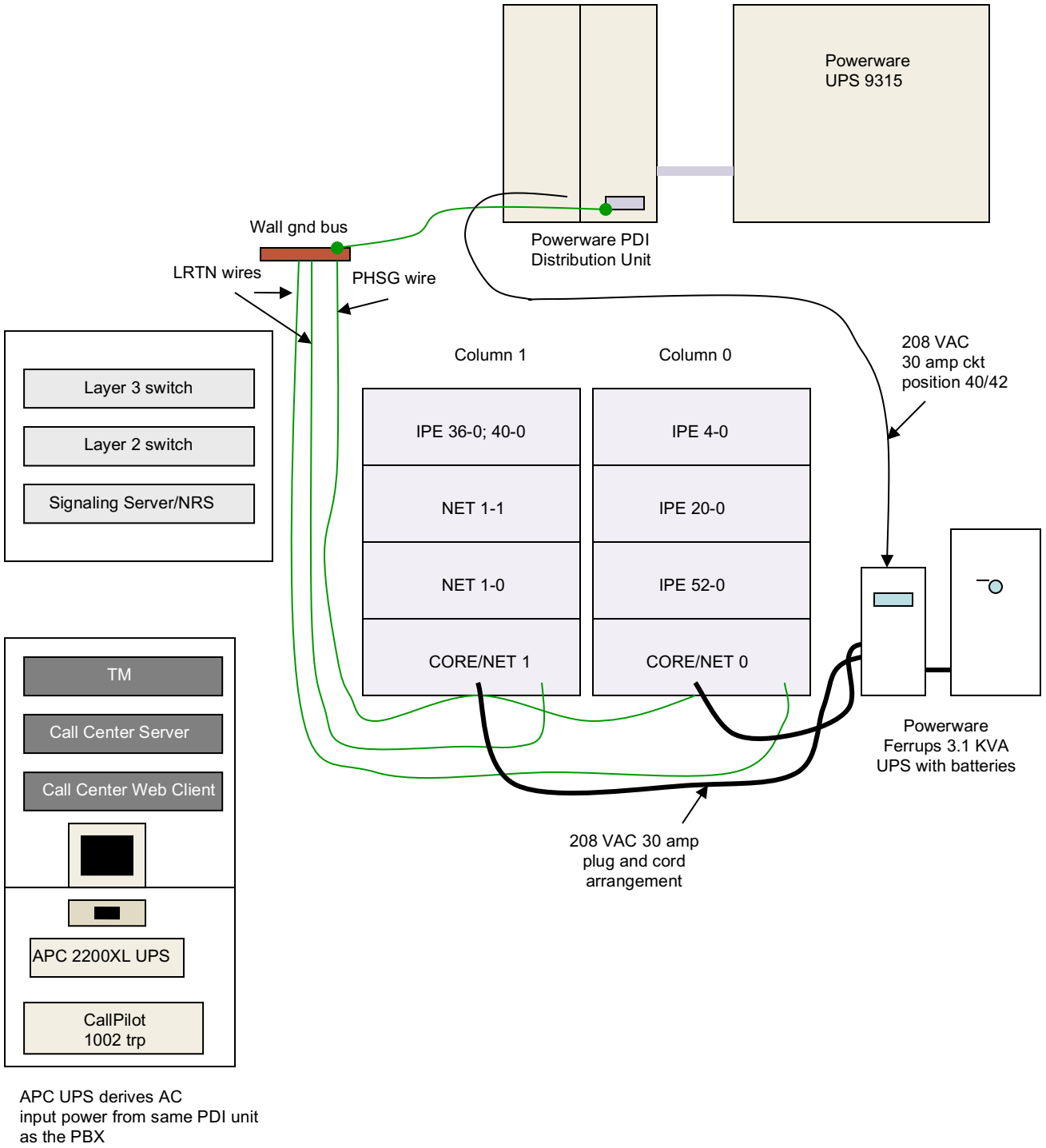
CS 1000M Large
Sample site layout



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FINDINGS AND RECOMMENDATIONS

Introduction:
The evaluation of this Nortel CS 1000M large system, located_____
was requested by _____. The request was initiated because _____
_____.
The evaluation was performed on (date) _____ and covered the areas of System environment, AC power and grounding, System power and ground battery installation, General installation, System operation, System software, Networking parameters for VoIP, CallPilot, and Call Center Server. _____ (name of company representative) was the main contact person during the evaluation process. All questions that pertain to this report can be directed to: _____.

Discrepancies and recommendations:

System environment

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

AC Power and grounding

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

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Power and ground for AC systems

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

Power and ground with rectifiers

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

Battery installation

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

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General installation

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

System operation

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

System software

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

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Networking parameters for VoIP

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

CALLPILOT

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

Call center server

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

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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 can be deemed as Critical, Major, Minor, or Recommended in nature. A system evaluation is found to be non-compliant if one Critical or two Major discrepancies are identified. Checklist weighting is not given to questions about applications products. The aim of an evaluation is to ensure installation completeness, optimize system performance and reliability, and provide a safe environment for personnel.

Further comments:

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System and site requirements

System environment

Meets Specifications Y / N

For additional information refer to:
NTP NN43021-220 *Communication Server 1000M and Meridian 1: Large System Planning and Engineering*
NTP NN43021-310 *Communication Server 1000M and Meridian 1: Large System Installation and Commissioning*

Equipment Room Environment

1. Switch room temperature is between 15° to 30°C (59° to 86°F) and does not vary by more than 5°F. A stable 22°C (72°F) is recommended.
   Temp: _____
   [Major, Critical if > 113°F (45° C) or < 50°F (10°C] _____
2. Relative humidity is 20% to 55% noncondensing. Humidity: _____
   [Major, Critical if more than 80%] _____
3. Environment does not exhibit visible signs of moisture. [Critical] _____
4. Environment is clean, relatively dust-free, and well ventilated. [Minor, Major if concrete dust] _____
5. Floor is sealed concrete, vinyl or mastic tile, or raised metal floor. [Major] _____
6. Equipment room door has a lock installed. [Minor] _____
7. An operational telephone is located in the switch room. [Major] _____
8. UEM front and rear access covers, end panels, cable channel access covers, and equipment column top and bottom grills are installed appropriately. [Major] _____
9. All pedestal blowers are operational with no excessive vibration. [Critical] _____
10. Pedestal blower filters are clean. [Minor; Major when clogged]. _____
11. The circuit packs that 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] _____
12. The equipment room is well lit. (light meter measurement of 50 to 75 ft. candles) [Recommendation] _____
13. No tripping or safety hazards exist in the equipment room. [Major] _____

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System Environment (continued)

		Meets Specifications Y / N
14.	Equipment is not located under liquid-carrying pipes. [Major]	
15.	Interiors of modules are not used as storage for such items as screws and disks. [Major]	
16.	Equipment columns are located at least 12 feet (3.660 m) away from nonshielded transformers or sources of electrostatic, electromagnetic, or radio frequency interference that produces an ELF field of more than 20 milliGauss. FCC CFR 47 Part 15 for Class A devices. [Major]	
17.	Installation is not located close to sources of EMI and RFI, such as high-voltage power lines, radar, broadcast stations, mobile communications, power tools, appliances (such as vacuum cleaners), and office business machines (such as copiers), industrial machines and ultrasonic cleaners, vehicle ignition, arc welders, dielectric heaters, and dimmer switches. [Major]	
18.	Overhead ladder rack or cable tray assemblies that are grounded to another source do not come in contact with PBX equipment columns. [Major] **See Thomas & Betts threaded rod isolators for ladder racks by Kindorf. (www.tnb.com) P/N NH-195**	
19.	There are no ceiling tiles missing in the equipment room [Minor]	
20.	Equipment is not subject to vibration from various sources. [Critical]	
21.	Ventilating openings on equipment are free of obstructions. [Major]	
22.	Equipment room is not conducive to generating electrostatic discharge (ESD) [Major]	
23.	Anti-static wrist straps, sprays, mats or a combination of these are in evidence on-site. [Recommendation]	
24.	Switch room door has a lock installed. [Minor]	
25.	No tripping or safety hazards exist in the equipment room. [Major]	
26.	For large system installations, emergency lighting is provided in the equipment room. [Recommendation]	
27.	Equipment room is protected from receiving direct sunlight. Direct sunlight is prevented from shining on electronic hardware, especially disk units and devices with light sensors. [Major]	
28.	Adequate floor space has been made available for installation, potential expansion, service, sufficient cooling, and storage. [Major]	
29.	Space in the equipment area is available for storing disks, printer paper, printouts, and daily reports. [Recommendation]	
30.	RS-232 terminal and communications devices must not exceed the 50-ft (15.24 m) cable length limit unless line drivers are utilized. [Major]	

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System Environment (continued)

Meets Specifications Y / N

Storage Area

31. There is a secure storage room for spare parts. [Recommendation] _____
32. 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] _____
33. The storage area is dust-free and away from high humidity and machinery such as electric motors of transformers. [Major] _____
34. Circuit cards that are not in use are stored in a protective antistatic bag. [Major] _____

Maintenance and Technician Area Environment

Additional space with good lighting and convenient access to the system is provided for a maintenance and technician area. [Recommendation] _____

35. A locking cabinet or storage area is in place for backup disks. [Recommendation] _____
36. The area contains a table or desk terminal, printer, or equivalent device. [Recommendation] _____
37. Maintenance workstation is equipped with a:
    - dial-up modem or network connection [Major] _____
    - Web browser [Major] _____
    - operational maintenance telephone [Major] _____
38. Observations and comments:

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AC Power and Grounding

Meets Specifications Y / N

For additional information refer to:
NTP NN43021-220 *Communication Server 1000M and Meridian 1: Large System Planning and Engineering*
National Electrical Code (NEC) Article 110, 210, 250

Note: In the absence of an Isolated Ground (IG) panel, an AC Equipment Ground (ACEG) bus in the panel serves as the single point ground source. For more information, see Product Advisory PAA-2003-314 regarding strong recommendations for Isolated Ground topologies for large systems.

AC Power Source for Meridian 1 and CS 1000 Service Panels

1. Service panel grounding facilities are properly referenced to an acceptable AC grounding source, which provides a low noise, low impedance path. [Major] _____
2. Power and ground originate from the supply service (equipment room service panel or transformer) where the ground conductor and the neutral conductor connect and are referenced to the main building ground. All power feeds contain a separate safety conductor (green wire). [Major] _____
3. The equipment service panel is located in the PBX equipment room. This service panel does not service lighting, air conditioning, heating, generators, or motors. Supply conductors are dedicated and uninterrupted from a building primary source to the dedicated equipment room service panel. [Major] _____
4. 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 become the single-point ground reference for the PBX. [Critical]
   Note: In some cases, an AC panel is not a requirement. Various UPS systems establish the same intent and purpose as the panel IG/ACEG bus. The engineer performing the evaluation must research the application and determine its intent. _____
5. The isolated ground (IG) or ACEG conductor is sized in accordance with code. (NEC 250). [Major]
   Note: Nortel recommends that the IG/ACEG conductor be the same size as the largest phase conductor. _____
6. The isolated ground (IG) or ACEG conductor runs in the same raceway (conduit) as the phase and neutral conductors (NEC 250). [Major] _____
7. The isolated ground (IG) or ACEG conductor is insulated, permanent, and continuous. (It is best to keep an IG conductor at no more than 25 ft (7.6 m) in length) (NEC 250) [Major] _____

Meridian 1/CS 1000 AC Service Panel

8. Circuit breakers are identified and labeled at the AC service panel. (NEC 110-22) [Minor] _____
9. Circuit breakers have the correct current ratings. (NEC 210-20) [Major] _____

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AC Power and Grounding (continued)

Meets Specifications Y / N

10. All recorded voltage and current levels are within the defined limits. [Critical]
    Note: A licensed electrician must obtain these results. For more information, refer to the AC Power/Ground Worksheet.
11. The workspace clearance around the AC service panel is 3 feet (.91m). (NEC 110-26) [Major]

Receptacles/ Branch Circuit Wiring

12. Receptacles and branch circuit wiring installed for -48v rectifiers or AC pedestals are wired with individual hot and IG/ACEG wires. [Major]
    Note: Each ground wire must be connected to the IG/ACEG ground bus of PBX dedicated panel. *(IEEE 1100-1992 9.10.16)*
13. All RS-232 ancillary devices connected to the PBX system I/O circuit cards are served from the same AC service panel as the -48v rectifiers or PBX power supplies, with individual hot, neutral, and isolated ground or ACEG wires. [Critical]
    Note: Protection devices such as electro-optical isolators must be installed for all RS-232 devices (for example, terminal and modem) not served from the same AC service panel as the PBX system. See: www.bb-elec.com 9SPOP2 isolator. TrippLite also makes RS-232 DB All isolators.
14. Observations and comments

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AC Power and Grounding Worksheet

Measurements

Voltage Measurements: (in RMS)	AC		MIN –MAX
Between neutral and phase A	_____	volts	
Between neutral and phase B	_____	volts	
Between neutral and phase C	_____	volts	
Between ground and phase A	_____	volts	
Between ground and phase B	_____	volts	
Between ground and phase C	_____	volts	
Between phase A and phase B	_____	volts	
Between phase A and phase C	_____	volts	
Between phase B and phase C	_____	volts	
Between neutral and ground (ACEG or IG)	_____	Vrms	
Note: PBX AC power supplies work with a voltage range of 180 to 280 VAC depending on the strapping option. DC supply range is 176 to 264VAC			
Current Measurements:	_____		MAX
Neutral conductor amps	_____	amps	
Ground conductor amps	_____	amps	
Phase A amps	_____	amps	
Phase B amps	_____	amps	
Phase C amps	_____	amps	

Note 1:

- The neutral current must 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 can signify poor or loose connections or noncontinuous grounding.
- Current flow in the grounding conductor can 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, which can deteriorate transformers over time by overheating their internal wiring. Solution: Use transformers specifically designed for harmonic loading (k-factor-rated).

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Power and Ground for AC Systems

Meets Specifications Y / N

For additional information refer to:
NTP NN43021-220 *Communication Server 1000M and Meridian 1: Large System Planning and Engineering*
National Electrical Code (NEC) Article 250

Pedestal Power & Ground Connections

1. A 208/240 VAC or compatible receptacle is provided within 8 ft (2.4m) of the PBX column pedestal (nonhardwired applications). [Major] _____
2. A system ground conductor, sized as a minimum #6 AWG, is installed from the LRE to the IG/ACEG bus in the AC panel. [Critical if missing; Major if undersized]. _____
3. A Logic Return conductor (#8AWG) is installed from the LRE (ground window) to the LR terminal of each PDU wiring terminal block. [Major] _____
4. A Personal Hazard Safety Ground conductor (#6 AWG) is installed from the AC panel IG/ACEG bus to the ground lug on the rear of the nearest pedestal. The #6 AWG conductor is then daisy-chained to the ground lugs of the remaining pedestals. [Major if missing; Minor if undersized] _____
5. Metallic conduit or other metallic structures must not come in contact with the PBX frame in IG environments. [Major] _____

Pedestal Alarm Cabling

6. The J4 alarm cable of the master XSM is connected to a UPS when provided. If multiple UPSs are installed, a J4 cable is run from each UPS to separate XSMs. [Major] _____
7. The J3 alarm cable of the master XSM is connected to the Main Distribution Frame where remote alarm connections are required for Power Fail Transfer Units and connections to MSL-1 P10 alarm cables. [Recommendation] _____

UPS Requirements

8. All UPS systems must have a ground lug (#6AWG minimum) or ground bus installed on the outside of the UPS enclosure for connection to the PBX PHSG lug. [Major]
   Note: If the UPS system is equipped with an isolation transformer, the ground lug or bus must be wired from the center tap of the transformer (The ground lug or bus allows a parallel connection to the Meridian 1/CS 1000 single-point ground source). _____
9. A UPS without an isolation transformer must power the entire PBX system. [Major]
   Note: The installation of two or more UPS units without built-in load isolation transformers to a single Meridian 1/CS 1000 is not supported by Nortel. _____

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Power and Ground for AC Systems (continued)

		Meets Specifications Y / N
10.	The UPS generates all required alarm signals interfacing with the XSM controller. [Recommendation] **Note: New UPS manufacturers that meet PB 1047-G must extend alarm functions to the PBX system monitor (XSM) J4 connector.** **Note: To activate Alarm-1 (battery discharge has reached a critical status), the UPS provides contact closure between pins 5 (Alarm- 1) and pin 6 (Alarm- 1 RTN). To activate Alarm – 2 (Begin inverter mode of operation), the UPS provides contact closure between pin 7 (Alarm- 2) and pin 8 (Alarm- 2 RTN).** [Major]	
11.	CSUs (Channel Service Units) are connected to reserve power or are span powered. [Major]	
12.	UPS cases and mounting hardware is isolated from other ground sources. [Major]	
13.	Observations and comments:	

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Power and Ground with Rectifiers

Meets Specifications Y / N

For additional information refer to:
NTP NN43021-220 *Communication Server 1000M and Meridian 1: Large System Planning and Engineering*
NTP NN43021-310 *Communication Server 1000M and Meridian 1: Large System Installation and Commissioning*
National Electrical Code (NEC) Article 300

System Power & Ground Connections

1. A system grounding conductor is sized according to Nortel Technical Publications (NTPs). A minimum of a #6 AWG is installed from the AC panel IG/ACEG bus to the rectifier common ground bus bar (V+). [Critical if missing, Major if undersized]. _____
2. A personal hazard ground conductor, minimum at #6AWG, is installed from the PBX AC panel IG/ACEG bus to the ground lug of the nearest pedestal. A #6AWG conductor is then daisy-chained to the ground lugs of the remaining pedestals. [Major if missing; Minor if undersized] _____
3. Logic Return (#8AWG) conductors are installed between the common ground (V+) bus in the DC plant control and distribution panel to the LR terminal of each PDU. [Major] _____
4. **Positive** BRTN (48V battery return) conductors are installed from the common ground bus in the DC plant control and distribution panel to the BRTN terminals located on the PDU field wiring terminal block. A minimum of one +48V return conductor is required for every two UEMs. [Major] _____
5. **Negative** BAT (-48V battery distribution) conductors are installed from the 30 amp distribution breakers in the DC plant control and distribution panel to the BAT terminals located on the PDU field wiring terminal block. A minimum of one -48V conductor is required for every two UEMs. [Major] _____

Miscellaneous Requirements

6. The main and supplemental racks, where installed, are bolted down and utilize isolation washers and pads. (System 600/48 isolation kit is #P0744873) [Major]. _____
7. All rectifiers are operational; no active alarms are present. [Major] _____
8. System control panel is operational (no alarms) and configuration thresholds are set correctly. [Major] _____
9. Negative and positive wires from the DC power distribution unit to the PBX pedestal (prior to the NT7D67 PDU) are installed in metallic conduit and the conduit is bonded at both ends. [Major]
   Note: The NT7D67 or NT4N49AA PDU assembly does not require the use of metallic raceway or conduit between the DC power source and the pedestal. _____
10. T-1 trunk CSUs (Channel Service Units) are connected to reserve power or are span powered. [Major] _____
11. All BRTN, BAT, PHSG, V+ and LR conductors are labeled at both ends. [Minor] _____

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Power and Ground with Rectifiers (continued)

Meets Specifications Y / N

12. Metallic conduit or other metallic structures do not come in contact with the DC plant frame in IG environments unless they themselves are isolated. [Major]

System 600/48

13. The start up delay for each rectifier is set for 4 seconds. [Minor] **Note: The dip switches are on the front of each rectifier and relate to the bottom four dip switches. The bottom switch is # 1.** [Minor]
14. The NT8D46 cable is installed from J4 of the master XSM to TB1 and TB2 of the 600/48. The Orange wire (alarm) is connected to the LF (no) terminal, position TB2-6. The Black wire (DCON 0) is connected to the RFA (no) terminal position TB4-8. The red, white, and green wires (DCON 1,2,3) are connected to the MAJOR (no) terminal position TB5-2. [Major]
15. A 22 AWG ground wire is connected between the positive (ground) charge bus bar and TB2-4. 22 AWG straps are installed between TB2-4 and TB4-6 and between TB4-6 and TB5-1. [Major]
16. Each rectifier in the System 600/48 is fed by a 30 amp AC input breaker. [Major]

QCA-13

17. NT8D46 cable is installed from J4 of the master XSM to the TSA terminal strip. The orange wire (alarm) is connected to TSA terminal 50 and the brown wire (trip) is connected to TSA terminal 49. [Major]

NT6D82 Lorain

18. NT8D46AV cable is installed from J4 of the XSM (column 0 CPU) to the LORAIN control panel. The orange wire (Alarm) connected to LVA2, position 7. The black wire (DCON 0/minor alarm) to MNA position 11. The red, white, and green wires (DCON 1, 2, 3/major alarm) to MJA position 9. [Major]
    Note: The trip lead is not connected because the NT6D82 is equipped with a Low or High Voltage automatic disconnect.

MFA150/MPP600

19. NT8D46AV, BV, or CV cable is installed from J4 of the XSM (CPU 0 pedestal) to TB1 and TB2 of the power plant. The Orange wire (Alarm) is connected to the LVA (no) terminal, position TB1-4. The Black wire (DCON 0) is connected to the RFA MIN (no) terminal position TB2-2. The red, white, and green wires (DCON 1,2,3) are connected to the RFA MAJ (no) terminal position TB2-4. [Major]
20. Each rectifier shelf is fed from a 208/240 VAC 50 amp slow-acting breaker. [Major]

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Power and Ground with Rectifiers (continued)

Meets Specifications Y / N

Emerson Candeo

21. The NT8D46 Alarm cable is installed from J4 of the Master XSM (Col. 0) to connector pins on J8 of the Candeo Control Panel (AP6C75 large systems) as follows: Black (DCON 0) to J8-1,Red (DCON 1) to J8-2, White (DCON 2) to J8-3, Green (DCON 3) to J8-4, and Orange (ALARM-usually low float) to J8-5. All are normally open contacts and must be a closure to ground. Common out one side of the contacts to ground. [Major] _____
22. In SP48300 systems, Black (DCON 0) terminates to pin 1, Red, White, and Green (DCON 1,2,3) to pin 2, and Orange (Alarm) to pin 3. [Major] _____
23. There is one 208/240 VAC 30 amp input circuit breaker for each power shelf. (SP48300 only). [Major] _____
24. Observations and comments:

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Battery Installation

Meets Specifications Y / N

For additional information refer to:
NTP NN43021-220 *Communication Server 1000M and Meridian 1: Large System Planning and Engineering*
NTP NN43021-310 *Communication Server 1000M and Meridian 1: Large System Installation and Commissioning*

1. Battery connections are properly secured. [Critical] _____
2. Battery conductors connected between the batteries and the associated power plant are correctly sized. [Critical] _____
3. Battery cells are floated at the manufacturer's recommended voltage. Example: Lead Acid batteries (24 cells x 2.17 = 52.08vdc) Gel Cell/Lead Calcium batteries (23 cells x 2.25 = 51.75vdc; e.g. C&D Liberty) or (24 cells x 2.25 = 54vdc) [Major] _____
4. Battery jars, cell posts, and interconnect bars do not exhibit signs of corrosion. [Major] _____
5. Jars do not exhibit signs of bulging. [Major] _____
6. Protective covers are installed over the battery jars. [Major] _____
7. The battery rack is properly secured in large installations to prevent tipping. [Major] _____
8. Room environmental requirements meet manufacturer's specifications. [Major] _____
9. Observations and comments:

Note: A battery string amp-hour rating requirement is based on an 8-hour discharge time. The following formula is used: Ahr = I X 8.5 I= system current load; 8.5= sealed cell factor*.
Example: A CS 1000 PBX has a current load of 160 DC amps. The total Amp-Hours required to operate the PBX for 8 hours theoretically is 1360 Ahr. (160 X 8.5). Consider:
1.) The 8-hour discharge duration is based on allowing cells to get down to 1.75 VDC per cell. The CS 1000 DC plants generally shut down at 43.5 VDC, long before a 24-cell string ever gets down to 42 VDC. A 23 cell string low-voltage disconnects even sooner.

Battery strings start discharging at around 48 VDC and then steadily decrease from there. It is imperative to size battery strings in order to stay within a voltage range between 44 to 48 VDC for 8 hours if it is a requirement that 2500 set users make active calls. Multiple, parallel strings can be installed to achieve this requirement. Battery cell age, maintenance, and condition are factors that can impact discharge rate.
* This factor is based on GNB Absolyte cells. Other manufacturers may be different. Float voltage is adjusted by .003 VDC for every cell for every one degree F. of change. Batteries can float at a higher voltage if the room temperature or pilot cell temperature is lower than 77°F (25°C).

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Battery Installation Worksheet

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

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

CELL VOLTAGES

	String A	String B	String C	String D
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
Totals:				

Cell Float Voltage Requirement:

Minimum	Maximum
54 VDC	

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General Installation

Meets Specifications Y / N

For additional information refer to:
NTP NN43021-220 *Communication Server 1000M and Meridian 1: Large System Planning and Engineering*
NTP NN43021-310 *Communication Server 1000M and Meridian 1: Large System Installation and Commissioning*
NTP NN43001-254 *Equipment Identification*
NTP NN43001-311 *Circuit Card: Description and Installation*
National Electrical Code (NEC) 800 Article: 11, 33, 40, 52

Circuit Packs and System Cabling

1. Circuit cards are of allowable vintage (as stated in Product Bulletins and Advisories). [Major] _____
2. All CORE, Network, IPE, I/O Cables: [Major Items]
   - Contain no kinks _____
   - Have cable ends secured with cable ties, clips, and/or screws _____
   - Can be easily removed if needed _____
   - Are tied or laced where applicable (NTRC48 Fiber Cables are not tied, laced, and they do not contain a sharp bending radius) _____
   - Are not near power or two-way radio _____
   - Are cabled to I/O Panel _____
   - Are labeled correctly (especially cables for I/O ports) _____
3. Circuit cards are locked into place. [Minor] _____
4. All MDF/IDF blocks are clearly labeled. [Major] _____
5. PBX cabling (IPE, Network, I/O, Power) is not strapped to the exterior of any conduit or raceway as a means of support. [Major] _____
6. Cabling and cross connections are installed in a neat and orderly fashion. [Major] _____
7. M2250 consoles utilize five consecutive units and are properly cross-wired with three power TNs. See console cable wh/sl, rd/or, & rd/grn pairs. PC consoles use only the wh/sl pair for power and the TNs do not have to be in consecutive order. [Major] _____
8. MICB cards are located in slots 1, 2, 3 in MG or 7, 8, 9 in MGE only. [Major] _____
9. Emergency transfer units (PFTU) are properly cross-wired to an NT8D46 cable, which then terminates to the master system monitor J3 connector. [Major] _____
10. In multiple column row configurations, EMI super-loop network cables are used between the rows (NT8D98 cables). [[Major] _____
11. No cross-group IPE segments on the same Controller 4 card. [Recommendation] _____
12. Network group modules for each group are positioned vertically in the same column versus horizontally in different columns. [Major] _____

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General Installation (continued)

Meets Specifications Y / N

13. NT8D49 spacer kits are installed correctly between column UEMs and contain inter-UEM cables. [Major]
Note: Improper installation of gasket material encircling entire spacer appears if not enough material was shipped and can jeopardize EMI shield effectiveness.
14. The MDF, DTI, SDI and other PBX system cables are connected through EMI filter connectors and run in proper channels. Cables do not bypass the I/O panel connectors and are not routed adjacent to module power supplies. [Major]
15. The total NTRC48 Fiber cable length difference between ring 0 and ring 1 is not greater than 50 feet. [Major] *(See FIJI Retrofit Bulletin PAA-2003-0048 regarding NTRB33CA FIJI; NTRB53AA Clock cards. Items 13, 14, and 15 only apply to systems with new Clocks/FIJIs)*
16. Both NTRC48 fiber cables from the FIJI 0 (Tx) connectors in Rings 0 and 1 are the same length. The same is true of the (Rx) connectors. The FIJI 0 cards are located in the CORE/NET modules. [Major]
17. NTRC48 fiber interface cables are kept as short as possible. [Major]
18. NTRB33AC/AD FIJI cards are at the latest firmware release. (Presently at rls 19) [Major]

Floppy Disks, Application Tapes, and Mail Cartridges

19. Media is not subject to rapid changes in temperature or humidity. [Major]
20. Media is kept away from strong magnetic fields. [Major]
21. System installation CDs, PCMCIA cards, and tapes are available for the PBX and Applications products in the event of severe system hardware malfunction or data corruption. [Critical]

Outside Plant Cabling and Protectors

22. Entrance cable sheath is grounded as close as possible at the point of entry to an approved ground source. [Major] [Major] (NEC 800-33; 40)
23. Splice cases are properly grounded. [Major]
24. Proper protection devices are used for Telco network or campus cables. (Carbon or Gas tube type). (NEC 800) [Major] *For more information, refer to Nortel Product Bulletin 97040 (April) revision 1 relating to protection.*
25. Protection devices are installed at both ends of a cable in a campus environment. (Silicon Avalanche/PTC Oneac 5SDP) [Major] ANSI/UL 497-1995 Specs -10V for digital sets; 48VDC for analog sets; NTP NN43001-311 Circuit Card: Description and Installation; TrippLite DNET1 Ethernet

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General Installation (continued)

Meets Specifications Y / N

26. 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. The PBX ground bus is not used directly for the source of ground for protectors. (No sharp bends- 8" radius) (NEC 800-40) [Major] _____

Multi Fiber Remote II IPE/Carrier Remote

27. The MFR II unit is either rack-mounted or permanently secured to a wall to allow for proper cooling. [Critical] _____
28. If the MFR II is AC powered, the AC source for MFR II is the same as that used for the Meridian 1/CS 1000 PBX. **Note: This application prevents a possible difference of potential. It also places the MFR II and IPE at the same means of disconnect. The best recommendation is to provide a UPS system.** [Major] _____
29. No more than two MFR II units, prior to release 3 per Product Bulletin 2002-068, are daisy-chained together to provide system monitor communication. [Major] _____
30. If an NTAK11BD Fiber Remote or Carrier Remote wall mount cabinet is used, the master XSM on the local end is optioned to communicate with the additional slave system monitor, which is in the middle of the chain. [Major] _____

Cabling and Other Considerations for VoIP Installations

31. EMI mitigating ferrite rings (NTVQ83AA) are installed on Voice Gateway Media Card (VGMC) TLAN/ELAN patch cables. [Major] _____
32. NTCW84JA connector assemblies are used for each VGMC. [Major] _____
33. CAT 5 patch cables are not installed near fluorescent lighting fixtures. [Major] _____
34. ELAN/TLAN patch cables for VGMC and Signaling Server hardware are factory made and kept at 20 ft or less. [Recommendation] _____
35. All patch cables are labeled and correlate to a network infrastructure diagram or schematic. [Minor] _____
36. Observations and comments:

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System Operation

Meets Specifications Y / N

System Diagnostics

1. LD 30 Network and Signaling Diagnostic (NWS). [Critical CE; Major Network; Minor PE] *It is critical to include LD-30. This overlay invokes switchovers of system clocks. For more information, refer to the recent Advisement on QPC471H.*
   Use PEP mplr15446 to allow overlay 30 to run but not swap system clocks because of ring problems. _____
2. LD 34 Tone and Digit Switch and Digitone Receiver (XCT & DTR)). [Major Network; Minor PE] *Check results from the daily routines*. _____
3. LD 135 CORE Diagnostic (CED). [Critical] *It is critical to include LD-135 in the daily routines.* _____
4. LD 37/137 Input/Output Diagnostic (IOD). [Critical CE; Major Network & AEM HSL & CSL] Use STAT command for TTYs, STAT XSM to check each XSM; STAT for IODU/C & MMDU, STAT ELNK in 137. _____
5. LD 38 Conference Circuit Diagnostic (CNF). [Major*] Check results from the daily routines.* _____
6. LD 39 Fiber Rings STAT Ring; STAT X X ALRM FULL; STAT FIJI X X FULL commands [Major] _____
7. LD 43 Data Dump (EDD). [Critical] *Check for successful completion of a manual data dump.* _____
8. LD 44 Software Audit (AUD). [Major] *Must be configured in BKGD of LD-17. Check for normal AUD000 messages.* _____
9. LD 45 Background Signaling and Switching Diagnostic (BSD). [Critical CE; Major Network; Minor PE] *Do not run LD-45 manually during high traffic. Check daily routines instead.* _____
10. LD 48 Status of ELAN/ESDI/AML Links. [Major] *Make sure all links that are in use are ACTIVE EMPTY.* _____
11. LD 60 Digital Trunk Diagnostic (DTI/PRI). [Major] *Use the SSCK command to check system clocks. Also check daily routines.* _____
12. LD _____ _____

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System Operation (continued)

Meets Specifications Y / N

Maintenance Items

13. Module power supplies are operational (green LEDs illuminated). [Critical] _____
14. Recommended PEPs are installed and activated in the system (PBX CORE, VGMC, and Signaling Servers). [Recommendation] _____
15. Signaling servers are operating the latest loadware. [Major] _____
16. Column alarm LEDs are not activated. [Major] _____
17. GRB, NTPs, and Backup logs are located in the switch room. **Note: Ensure appropriate level and system type of NTPs are available.** [Minor] _____
18. The PBX maintenance modem performs as expected [Major] **Note: 9600 baud CPSI ports and modems must be configured for large systems. (Option 51C thru 81 CPPII; CS 1000 1000M)** _____
19. Check firmware for all types of M3900 sets (use LD 32 FSUM command) [Recommendation] _____
20. Firmware for IP terminals is at the latest acceptable level. [Recommendation] _____

Processors

21. Verify that minimum call processor memory requirements meet GRB specifications and customer feature requirements. Option 61C- 80MB total; Opt 81C w/ less than or equal to 5 net groups- 96MB; Option 81C with >5 net groups- 112MB ; CPP II- 256 MB; CPP IV- 512 MB [Major] _____
22. Observations and comments:

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System Software

Meets Specifications Y / N

Overlay 15/21 Customer Data Block

1. SRCD (Auto Set Relocation Code) has a value programmed (0000). [Major if SPRE is 1 and no code is configured, Minor otherwise] _____

Overlay 17/22 Configuration Record

2. Daily Routine overlays defined as LD 30, 34, 38, 45, 60, 135, 137. **Note: Some locations can experience problems running overlays such as 30, 34, 45, 135, or 137. Use discretion when performing the system evaluation.** [Major] _____
3. LD 44 in background routine. [Major] _____
4. The number of call registers (NCR) within the maximum value required for each GRB. [Major] Opt 51C- 2000; Opt 61C-4000; 81 CP3/4- 10 000; CPP II/CPPIV with six or more groups- 25 000, otherwise 20 000 _____
5. XSM programmed YES, USER=MTC. [Major] _____
6. History file is defined as MTC, BUG and is set at minimum length of 60 000 characters. [Major] _____
7. Input and Output ports and circuit cards such as the QPC139, QPC841, NT8D41AA, NT8D41BA, or NT6D80 are configured as evenly as possible amongst the system network groups. [Recommendation] _____
8. ERRM is configured as ERR, BUG, AUD [Major] _____
9. PCDR is configured as no, except for hotel and motel or multitenant customers usually. [Major] _____
10. RLS IDs are configured for every D Channel (except for NI-2 interfaces) [Major] _____

Overlay 11/12/13 Digital Sets, M2250 Attendant Consoles, and Digitone Receivers

11. Switchroom phone has MTA for class of service. [Major] _____
12. Consoles powered through unused TNs are correctly programmed PWR. [Major] _____
13. Consoles are cross-wired properly and utilize consecutive units. [Major] _____
14. Circuit cards for Consoles (NT8D02) and Digitone Receivers (NT8D16) are not configured in IPE shelf card slots 0 or 1 due to high-priority messaging. [Recommendation] _____

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System Software (continued)

Meets Specifications Y / N

Overlay 97 Configuration Record 2

15. If RGTP is set at 16, minimum vintage of NT6D42CA Ring Generator is equipped. [Major]
    Note: Exceeding ringing capacity can cause intermittent overload alarms on ring generator.
16. Observations and comments:

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Networking Parameters for VoIP

		Meets Specifications Y / N
1.	A LAN/WAN assessment was 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, autonegotiate. [Major]	
3.	The port speed for ELAN related ports are configured at 10 Mb/s for Succession 3.0 systems; 100 Mb/s for CS 1000 4.0 and above systems. [Major]	
4.	The port speed for all TLAN ports on the layer 2 switch are configured for 100 Mb/s. [Major]	
5.	VGMC circuit cards in the same node are on the same TLAN subnet. [Major]	
6.	There is a minimum of one VGMC DSP resource for every four IP terminals. [Recommendation] *For nonblocking requirements one DSP per IP terminal is best.*	
7.	VGMC cards utilize different data network layer 2/3 switches to minimize points of failure. [Recommendation]	
8.	VGMC cards are configured evenly across the configured IPE loops. [Recommendation]	
9.	If multiple layer 2/3 switches are used, they are powered from different UPS systems in order to minimize single points of failure. [Recommendation]	
10.	Signaling Server (ISP 1100, CP PM, COTS)	
11.	Observations and comments:	

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CallPilot

For additional information refer to:
NTP NN44200-100 *CallPilot 4.0 Fundamentals Guide*

Meets Specifications Y / N

1. The CallPilot server (702t and 1001/1002trp rack mount) derives AC power and grounding from the same source as the host PBX. One 120 VAC 15 amp breaker is in use for each server power supply and associated ancillary devices (for example, modems and terminals). The IPE version (200i/201i) derives power from the IPE shelf where it resides. DC powered CallPilot systems derive power from a DC system that, in turn, derives its AC input power & grounding from the CS 1000 PBX AC Service Panel. [Major] _____
2. If a UPS is providing AC power and grounding for the CallPilot server, the UPS system, in turn, is powered and grounded from the CS 1000 PBX AC Service Panel. [Major] _____
3. Cables associated with the CallPilot server are installed in an orderly fashion, labeled on both ends, and fastened down completely on both ends. (This can minimize troubleshooting problems and tripping hazards.) [Recommendation] _____
4. Ensure there are no unauthorized connections to the ELAN hub. (for example, a PC used for anything other than a Nortel Application.) This embedded LAN (ELAN) is used to isolate the PBX from the customer LAN (TLAN). [Major] _____
5. The ELAN and TLAN are on different subnets. [Major] _____
6. The CallPilot server is installed in a safe, clean, well-ventilated, and easily accessible location in the equipment room. The server is away from equipment that produces strong magnetic fields. [Major] _____
7. ELAN cables from the ELAN hub or switch to the PBX CORE 0 and CORE 1 I/O panel connectors are installed. [Major] _____
8. Verify that the most up-to-date level of PBX system PEPs, CallPilot Server PEPs, and Administrator PC Software are installed. A visit to the Meridian PEP Library Web page is recommended to obtain the most current information. [Recommendation] _____
9. Ensure that both full and partial backups have been completing successfully. Schedules for full and partial backups to tape must be configured. Tapes must be stored in a secure place away from magnetic fields. Tape backup and tape rotation logs must also be administered. [Major] _____
10. Backups are not scheduled during audits (avoid 12 a.m.to 4 a.m.). [Major] _____

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CallPilot (continued)

		Meets Specifications Y / N
11.	NetBIOS Interface binding order is TLAN first, ELAN second, RAS third. [Major]	
12.	An operational RAS modem is installed on the COM1 port of the server. [Major]	
13.	pcAnywhere is configured and in ready mode on the server. [Major]	
14.	There are no mapped drives in the system. The CD-ROM drive is drive Z: [Major]	
15.	No alarms are present on the front cover of the server (does not pertain to 200i or 201i servers). [Major]	
16.	200i/201i IPE-based systems occupy two valid, consecutive card slots. [Major]	
17.	Server power supply LEDs, where applicable, are illuminated green in color. [Major]	
18.	Properly sized wires for 20 amp DC feeds are installed between the DC plant to the DC PDU (NTRE43AA), where applicable, for DC CallPilot systems. (-48V BAT, +BRTN, and Ground) [Major]	
19.	The server has an operational mouse, terminal, and keyboard. [Major]	
20.	No third party software is installed and running on the server. (Symantec Corporate Edition 7.60/8.1, McAffee Enterprise 7.0/ NetShield 4.5, eTrust Antivirus 6.0/InnoculateIT 4.53, and ServerProtect 5.58 are okay. Do not schedule during high traffic or audits. See P-2003-0151 Version 3) [Major]	
21.	Application Builder has no locked applications. [Major]	
22.	Server hard drive usage is below 90%. To check hard drive usage, go to My computer, right click on any drive, and go down to Properties. [Major]	
23.	Check for server Critical Events. [Major]	
24.	No critical CallPilot Manager alarms or events present. To check for alarms or events, go to Alarms & Events > Alarm Monitor [Major]	
25.	All channels are in an idle or active state. To check if all channels are in an idle or active state, go to Maintenance Administration > Channel Monitor. [Major]	
26.	All DSPs are in an idle or active state. To check if all DSPs are in an idle or active state, go to Maintenance Administration > Multimedia Monitor. [Major]	
27.	Observations and comments:	

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Call Center Server

Meets Specifications Y / N

1. The Call Center Server derives AC power from the same source as the host PBX, if possible. One 120 VAC 15 amp receptacle is used for each server power supply and associated ancillary devices (for example, modems and terminals). [Major]
   Note: An electro-optical isolator is required for the Call Center Server to Meridian Mail ACCESS RS-232 cable if the 120VAC receptacle on the server does not originate from the same electrical source as the PBX.
2. The data cables that comprise the ELAN are installed in an orderly way and labeled on both ends. Cables must be clear of AC cables and conduits. [Recommendation]
3. There are no unauthorized connections on the ELAN hub or switch**.** [Major]
   Note: A TM PC can be hooked up to the ELAN side.
4. The Call Center Server is installed in a safe, well-ventilated, and secure location in the equipment room. The server is kept away from equipment that produces strong magnetic fields. [Major]
5. The name and ID of the Call Center Server and the IP address for the ELAN are recorded and stored in a safe location in the equipment room, and do not conflict with the IP address of any other PCs or servers. [Major]
   Nortel recommends that a schematic of the TLAN be provided. The schematic must detail cable routing, and terminal locations. The schematic must also provide a complete listing of all IP addresses, and their use. The document must be kept in a secure location in the equipment room. Note: Only TCP/IP network protocol is supported on the TLAN.
6. DHCP is not used in the server. [Major]
7. The current level of PBX system PEPs and Call Center Server PEPs are installed. Nortel recommends a visit to the MPL/ESPL Web page to obtain the most current information. [Recommendation]
8. No third-party software is running on the server. [Major]
   Only Symantec Corporate Edition 7.60, e-Trust, and McAffee are supported by Nortel. Schedule this to run during off hours times only.
9. Antivirus software is not set to auto upon startup. [Major]
10. A screensaver is not configured on the server. [Recommendation]
11. Daylight saving mode is unchecked in the servers settings. [Recommendation]
12. Both a full and partial backup have been completed. The full backup tape has been removed from the drive and safely stored. [Major]
    Note: If left in the drive, the backup tape is overwritten and destroyed when a scheduled partial backup is attempted.

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Call Center Server (continued)

		Meets Specifications Y / N
13.	Ensure that a rotation process is used for all backup tapes. If backups are performed daily, rotate tapes to slow wear on tapes. [Major]	
14.	An operational RAS modem and pcAnywhere are installed. pcAnywhere is in a waiting state. [Major]	
15.	The TCP/IP address programmed in the Feature Report for the ELAN is the same as is programmed in Control Panel/Network for the ELAN adapter. [Major]	
16.	The ELAN and TLAN are not on the same TCP/IP Subnet. If the ELAN NIC card TCP/IP address can be pinged from an Call Center Server Client, the TCP/IP address of the ELAN and PBX must be changed to avoid possible service disruptions to the PBX from customer LAN traffic. [Major]	
17.	The Switch Name and TCP/IP address specified in Call Center Server Feature Report/Switch Information are the same as the Switch Name and TCP/IP address programmed in the PBX. This can be verified on the PBX by entering LD 137 and typing the command STAT ELNK. The PBX name and TCP/IP address match the Call Center Server Switch Name and TCP/IP address. The Switch Name is case sensitive. [Major]	
18.	The HOST NAME and COMPUTER NAME match exactly. [Major]	
19.	The COMPUTER NAME contains no spaces, dashes, or hyphens and is 6 to 15 characters in length. [Major]	
20.	All applicable CDNs, agents, and so on, are ACQUIRED by Call Center Server. [Major]	
21.	If ACCESS to the Call Center Server is used, all applicable Voice Ports are ACQUIRED by the Call Center Server. [Major]	
22.	If ACCESS is used with MMail, the software release of the Meridian Mail is a minimum of 13.14 and the node containing the ACCESS cable has a Meridian Mail MMP40 Processor that is an NT6P97AA release 20 or 22. [Major]	
23.	All Classic Client PCs, where used, work properly. Check software release. All necessary PEPs are installed, and the software is at the same level as the Call Center Server Server. [Major]	
24.	Drive E is a 24X CD-ROM drive; Drive C and D are at least 2 GB in size; Drives F to U are at least 4 GB in size. (This is a 4.2 requirement) [Major]	
25.	The paging file size on C: drive is 1.5 times the size of the system RAM size. [Major]	
26.	Observations and comments:	

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Product bulletins for vintage and release updates

Product bulletin	Affected product	Part description	Defective part #	Replacement part #	Reason for change

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