



## DEFENSE INFORMATION SYSTEMS AGENCY

JOINT INTEROPERABILITY TEST COMMAND  
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FORT HUACHUCA, ARIZONA 85613-7051

IN REPLY  
REFER TO: Networks and Transport Division (JTE)

20 May 2004

### MEMORANDUM FOR DISTRIBUTION

**SUBJECT:** Special Interoperability Test Certification of Nortel Networks Succession Defense Switched Network (DSN) Option 51C Digital Switching System with Software Release 3.0 and Specified Patch Groups

**References:** (a) DOD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 11 January 2002  
(b) CJCSI 6212.01C, "Interoperability and Supportability of Information Technology and National Security Systems," 20 November 2003

1. References (a) and (b) establish the Defense Information Systems Agency (DISA), Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification. Additional references are provided in enclosure 1.
2. The Nortel Networks Succession DSN Option 51C Digital Switching System with software release 3.0 and specified patch groups, hereinafter referred to as the system under test (SUT), meets all of its critical interoperability requirements and is certified as interoperable for joint use within the DSN. JITC tested and certified the Nortel Networks Succession DSN Option 61C Digital Switching System with Software Release 3.0. This system is identical in software and hardware to the Succession DSN Option 51C, the sole exception being that the DSN Option 51C houses only a single processor. JITC analysis determined the Option 51C to be functionally identical to the Option 61C for interoperability certification purposes. The identified test discrepancies shown in the Certification Testing Summary (enclosure 2) that remained open after software patches were applied and regression testing was completed have a minor operational impact. The SUT was tested and met the critical interoperability requirements for joint use within the DSN for the following switch types: Private Branch Exchange (PBX) 1 and PBX 2. Although the SUT supports European interfaces, none of these interfaces were tested or certified because they do not support Military Unique Features. This certification expires upon system changes that affect interoperability, but no later than three years from the date of this memorandum.
3. This finding is based on interoperability testing conducted by the JITC in the Global Information Grid Network Test Facility, Ft. Huachuca, AZ, from 21 July through 12 September, 2003; regression testing conducted between 15 September, 2003 through 15 January, 2004; and review of vendor letters of compliance on 11 February 2004. Enclosure 2 documents the test results and describes the tested network and systems configurations. Enclosure 3 lists the specified

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Software Patch Group Identification Numbers applied to the SUT for certification. System interoperability should be verified before deployment in an operational environment that varies significantly from the test environment.

4. The interoperability summary of the SUT is indicated below in table 1. The interoperability status and criticality are listed in table 2, and the Exchange Requirements (ERs) and Functional Requirements (FRs) for each network interface are listed in table 3. The Nortel Succession switch product line offers a Voice over Internet Protocol capability, however this capability is not covered by this certification. Network Management (NM) capabilities of the SUT platform were tested in accordance with the DISA NS53 requirements as set forth in references (c) and (d). This reference requires that a switch provide NM capabilities via either Ethernet, serial (Electronic Industries Alliance (EIA)-232), or serial (X.25 or BX.25 variant). This capability is not a critical requirement for a PBX1, however the SUT meets the NM requirements through the use of serial (EIA-232) connections. This interoperability test summary is based upon evaluation of:

- a. The following network interfaces as specified in reference (e): DSN, Defense Red Switch Network Gateway, Tactical Network Gateway, North Atlantic Treaty Organization Gateway, and Public Switched Telecommunications Network or Commercial Network Gateway.
- b. The interface and signaling requirements for trunk/line interfaces, and interoperability ERs and FRs derived from references (f) and (g).
- c. The overall system interoperability performance derived from test procedures listed in reference (h).
- d. Review of Letters of Compliance submitted by Nortel Networks.

**Table 1. SUT Interoperability Summary**

Network	Critical	Status	Remarks
DSN	Yes	Certified	- Certified as a PBX1 (excludes Europe), and PBX2 - VoIP not Certified - The identified test discrepancies shown in enclosure 2 that remained open have an overall minor operational impact.
DRSN Gateway	No	Certified	
Tactical Gateway	No	Certified	
NATO Gateway	No	Not Tested	
Commercial Network Gateway	Yes	Certified	
<b>Legend:</b>			
DRSN	- Defense Red Switch Network	PBX	- Private Branch Exchange
DSN	- Defense Switched Network	SUT	- System Under Test
NATO	- North Atlantic Treaty Organization	VoIP	- Voice over Internet Protocol

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**Table 2. SUT Interoperability Status**

	<b>Trunk Interfaces</b>			
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Status</b>	<b>Remarks</b>
<b>Defense Switched Network</b>	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	Certified	Met all ERs and FRs with the following exceptions: Restoral to service from a local red alarm not met. <sup>1</sup>
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	No	Certified	Met all ERs and FRs with the following exceptions: Restoral to service from a local red alarm not met. <sup>1</sup>
	PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all critical ERs and FRs. Restoral to service from a local red alarm not met. <sup>1</sup> NI2 Protocol provides Release Complete Message in lieu of a Disconnect Message for Unavailable Resources. <sup>2</sup>
	Analog E&M Signaling Type I	No	Not Certified	Did not pass DSN preempt signals. <sup>3</sup>
	<b>Line Interfaces</b>			
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Status</b>	<b>Remarks</b>
	TPC ISDN BRI ST and U Interface Q.931	Yes	Certified	Met all critical ERs and FRs. ISDN supplemental services not met. <sup>4</sup>
	TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs. Does not support Intra-switch Call Waiting. <sup>5</sup>
	TPC 2-Wire Digital (Proprietary)	No	Certified	Met all ERs and FRs.
	<b>Network Management Interfaces</b>			
<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Status</b>	<b>Remarks</b>	
TPC EIA Asynchronous @ 9.6 kbps	No	Certified	Met all ERs and FRs.	
<b>Defense Red Switch Network Gateway</b>	<b>Trunk Interfaces</b>			
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Status</b>	<b>Remarks</b>
2-Wire Analog Loop	No	Certified	Met all ERs and FRs. <sup>6</sup>	
<b>Tactical Network Gateway</b>	<b>Trunk Interfaces</b>			
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Status</b>	<b>Remarks</b>
PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	Certified	Met all ERs and FRs.	
<b>NATO Gateway</b>	<b>Trunk Interfaces</b>			
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Status</b>	<b>Remarks</b>
	No	Not Tested		
<b>Commercial Network Gateway</b>	<b>Trunk Interfaces</b>			
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Status</b>	<b>Remarks</b>
Same Interfaces and Signaling as DSN	Yes	Certified	See note 7.	
<b>Legend:</b>				
AMI	- Alternate Mark Inversion	ITU	- International Telecommunications Union	
B8ZS	- Bipolar Eight Zero Substitution	kbps	- kilobits per second	
BRI	- Basic Rate Interface	Mbps	- Megabits per second	
CAS	- Channel Associated Signaling	NATO	- North Atlantic Treaty Organization	
DISN	- Defense Information Systems Network	NI2	- National ISDN 2	
DP	- Dial Pulse	PBX	- Private Branch Exchange	
DRSN	- Defense Red Switch Network	PCM-24	- Pulse Code Modulation 24 Channels	
DSN	- Defense Switched Network	PM	- Program Manager	
DTMF	- Dual Tone Multi-Frequency	PRI	- Primary Rate Interface	
E&M	- Ear and Mouth	Q.931	- ITU Signaling Standard for ISDN	
EIA	- Electronic Industries Alliance	SF	- Superframe	
ERs	- Exchange Requirements	ST	- ISDN BRI Four-Wire Interface	
ESF	- Extended Superframe	SUT	- System Under Test	
FRs	- Functional Requirements	T1	- Digital Transmission Link level 1 (1.544 Mbps)	
GSCR	- Generic Switching Center Requirements	TPC	- Twisted Pair Copper	
GSTP	- Generic Switch Test Plan	U	- ISDN BRI Two-Wire Interface	
ISDN	- Integrated Services Digital Network			

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**Table 2. SUT Interoperability Status (continued)**

<b>Notes:</b>	
1	SUT does not meet the GSCR exchange requirements for restoral to service from a local red alarm. SUT takes 30 seconds vice the required 10-20 seconds. Operational impact is minor.
2	ISDN T1 PRI trunkgroups using NI2 protocol send a Release Complete Message in lieu of a Disconnect Message with Cause 46 (Unavailable Resources). There is no operational impact as the calling user still receives a Blocked Precedence Announcement.
3	Analog E&M Signaling Type I did not pass the DSN preempt signals as required by the GSCR. Analog E&M Signaling Type I is not a required interface for a PBX.
4	ISDN supplemental services are currently not used in the DISN. The operational impact is none.
5	Analog instruments do not support intra-switch call waiting. The operational impact is minor.
6	Interoperability Certification of the SUT does not constitute DRSN Program Manager's (PM) approval for connectivity to the DRSN. It is the user's responsibility to request connectivity approval directly from the PM.
7	The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.

**Table 3. SUT Exchange and Functional Requirements**

<b>Defense Switched Network</b>	<b>Trunk Interfaces</b>		
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Exchange &amp; Functional Requirements</b>
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	<ul style="list-style-type: none"> <li>- MLPP</li> <li>- Hotline services<sup>1</sup></li> <li>- System Interface                             <ul style="list-style-type: none"> <li>• Non-secure Voice and Data</li> <li>• Secure Voice and Data (STU-III and STE)</li> <li>• NX56 kbps and NX64 kbps Synchronous Data (<i>TI ISDN PRI only</i>)</li> <li>• Non-secure and Secure FAX</li> <li>• VTC (<i>TI ISDN PRI only</i>)</li> <li>• Alarms</li> </ul> </li> <li>- Integrated Services Digital Network (<i>TI ISDN PRI only</i>)</li> <li>- Attendant services<sup>2</sup></li> <li>- System Administration, Measurements, and Service Standards</li> <li>- Y2K (Rollover, Valid, and Invalid Dates)</li> <li>- Screening, Zone Restriction, and DSN Access Restriction</li> <li>- Automated Message Accounting</li> <li>- Network Integration</li> <li>- ANSI T1.619a (<i>TI ISDN PRI</i>)<sup>3</sup></li> </ul>
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	No	
	PCM-24 T1 B8ZS/ESF ISDN PRI	Yes	
	Analog E&M Signaling Type I	No	
	<b>Line Interfaces</b>		
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Exchange &amp; Functional Requirements</b>
	TPC ISDN BRI ST and U Interface Q.931	Yes	<ul style="list-style-type: none"> <li>- MLPP</li> <li>- Hotline services<sup>1</sup></li> <li>- ANSI T1.619a</li> <li>- ISDN supplemental services</li> <li>- Call Treatments</li> <li>- DSN Announcements</li> <li>- Attendant services<sup>2</sup></li> <li>- VTC</li> <li>- NX56 kbps and NX64 kbps Synchronous Data</li> <li>- Non-secure Voice and Data</li> <li>- Secure Voice and Data (STE)</li> </ul>
	TPC 2-Wire analog	Yes	

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**Table 3. SUT Exchange and Functional Requirements (continued)**

	Line Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
Defense Switched Network (continued)	TPC 2-Wire Digital and Analog (Proprietary)	No	- MLPP - Hotline services <sup>1</sup> - DSN Announcements - Traffic Measurements - Attendant services <sup>2</sup> - Call Treatments - Non-secure Voice
	Network Management Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
	TPC EIA Asynchronous @ 9.6 kbps	No	- Automated Message Accounting - Traffic Measurements - Alarms - Man Machine Language
Defense Red Switch Network Gateway	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
	TPC 2-Wire analog	No	- MLPP - Secure Voice (STU-III and STE)
Tactical Network Gateway	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	- MLPP - Non-secure Voice
NATO Gateway	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
	Not tested	No	See note 5.
Commercial Network Gateway	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange & Functional Requirements
	Same Interfaces and Signaling as DSN	Yes	See note 6.
<b>Legend:</b> AMI - Alternate Mark Inversion ANSI - American National Standards Institute B8ZS - Bipolar Eight Zero Substitution BRI - Basic Rate Interface CAS - Channel Associated Signaling DP - Dial Pulse DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency E&M - Ear and Mouth EIA - Electronic Industries Alliance ESF - Extended Superframe FAX - Facsimile GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan ISDN - Integrated Services Digital Network ITU - International Telecommunications Union kbps - kilobits per second Mbps - Megabits per second MLPP - Multi-Level Precedence and Preemption NATO - North Atlantic Treaty Organization NI2 - National ISDN 2 NX56 - Data format is restricted to multiples of 56 kbps NX64 - Data format is restricted to multiples of 64 kbps PCM-24 - Pulse Code Modulation 24 Channels PRI - Primary Rate Interface Q.931 - ITU Signaling Standard for ISDN SF - Superframe Ss7 - Signaling System 7 ST - ISDN BRI Four-Wire Interface STE - Secure Terminal Equipment STU-III - Secure Telephone Unit-III SUT - System Under Test T1 - Digital Transmission Link level 1 (1.544 Mbps) T1.619a - SS7 and ISDN Signaling Standard for T1 TPC - Twisted Pair Copper U - ISDN BRI Two-Wire Interface VTC - Video Teleconferencing Y2K - Year 2000			
<b>Notes:</b> 1 SUT does not meet the GSCR exchange requirements for Hotline services. Hotline services are not a critical requirement. 2 SUT's attendant console does not support automatic recall of attendant. The operational impact is minor. 3 ISDN T1 PRI trunkgroups using NI2 protocol send a Release Complete Message in lieu of a Disconnect Message with Cause 46 (Unavailable Resources). There is no operational impact as the calling user still receives a Blocked Precedence Announcement. 4 Analog instruments do not support intra-switch call waiting. The operational impact is minor. 5 NATO interface requirements are in accordance with the GSCR paragraph 10.8. Not all switches are required to perform this function. 6 The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.			

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5. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified but Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at <https://stp.fhu.disa.mil/>. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at <http://jit.fhu.disa.mil> (NIPRNet), or <http://199.208.204.125/> (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>.

6. The JITC point of contact is Mr. John Hooper, DSN 879-5041, commercial (520) 538-5041, FAX DSN 879-4347, or e-mail to [hooperj@fhu.disa.mil](mailto:hooperj@fhu.disa.mil).

FOR THE COMMANDER:

3 Enclosures a/s

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20755-6496

Commander, Defense Information Systems Agency (DISA), ATTN: GS23 (Mr. Osman), Room  
5w23, 5275 Leesburg Pike (RTE 7), Falls Church, VA 22041

## ADDITIONAL REFERENCES

- (c) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Network Management Requirements for End Offices," 2 August 2001
- (d) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Switch Network Management Interface," 26 July 2001
- (e) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services," 23 September 2001
- (f) Defense Information Systems Agency (DISA), Joint Interoperability and Engineering Organization (JIEO), Technical Report 8249, "Defense Information Systems Network (DISN) Circuit Switched Subsystem, Defense Switched Network (DSN) Generic Switching Center Requirements (GSCR)," March 1997
- (g) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Global Network Requirements for Tandem (Standalone), Multifunction, End Office, and Small End Office Switches," 30 January 2003
- (h) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP)," 17 June 1999

## CERTIFICATION TESTING SUMMARY

- 1. SYSTEM TITLE.** Nortel Networks Succession Defense Switched Network (DSN) Option 51C Digital Switching System with Software Release 3.0 and specified Software Patch Groups listed in enclosure 3 (hereinafter referred to as the system under test [SUT]).
- 2. PROPONENT.** Defense Information Systems Agency (DISA).
- 3. PROGRAM MANAGER.** Mr. Howard Osman, GIG Combat Support Services (GS23), Room 5W23, 5275 Leesburg Pike, Falls Church, VA 22041, E-mail: Osmanh@ncr.disa.mil.
- 4. TESTERS.** Joint Interoperability Test Command (JITC), Fort Huachuca, AZ.
- 5. SYSTEM UNDER TEST DESCRIPTION.** The Nortel Networks Succession DSN Digital Switching System product line, in addition to the Option 51C, includes Options 61C, 81C, and 81CPP. These platforms utilize the same software and trunk/line card hardware as the SUT with the exception that the SUT houses a single call processor. The Option 51C offers the following features: scalable, distributed platform for growth from 16 to 1000 lines, modular client/server architecture for flexibility and scalability. Nortel Network's Succession DSN Option 51C Digital Switching System is currently in use within the Defense Switched Network (DSN) providing Private Branch Exchange (PBX) 1 switch functionality.
- 6. OPERATIONAL ARCHITECTURE.** The Generic Switching Center Requirements (GSCR) operational DSN Architecture is depicted in figure 2-1.

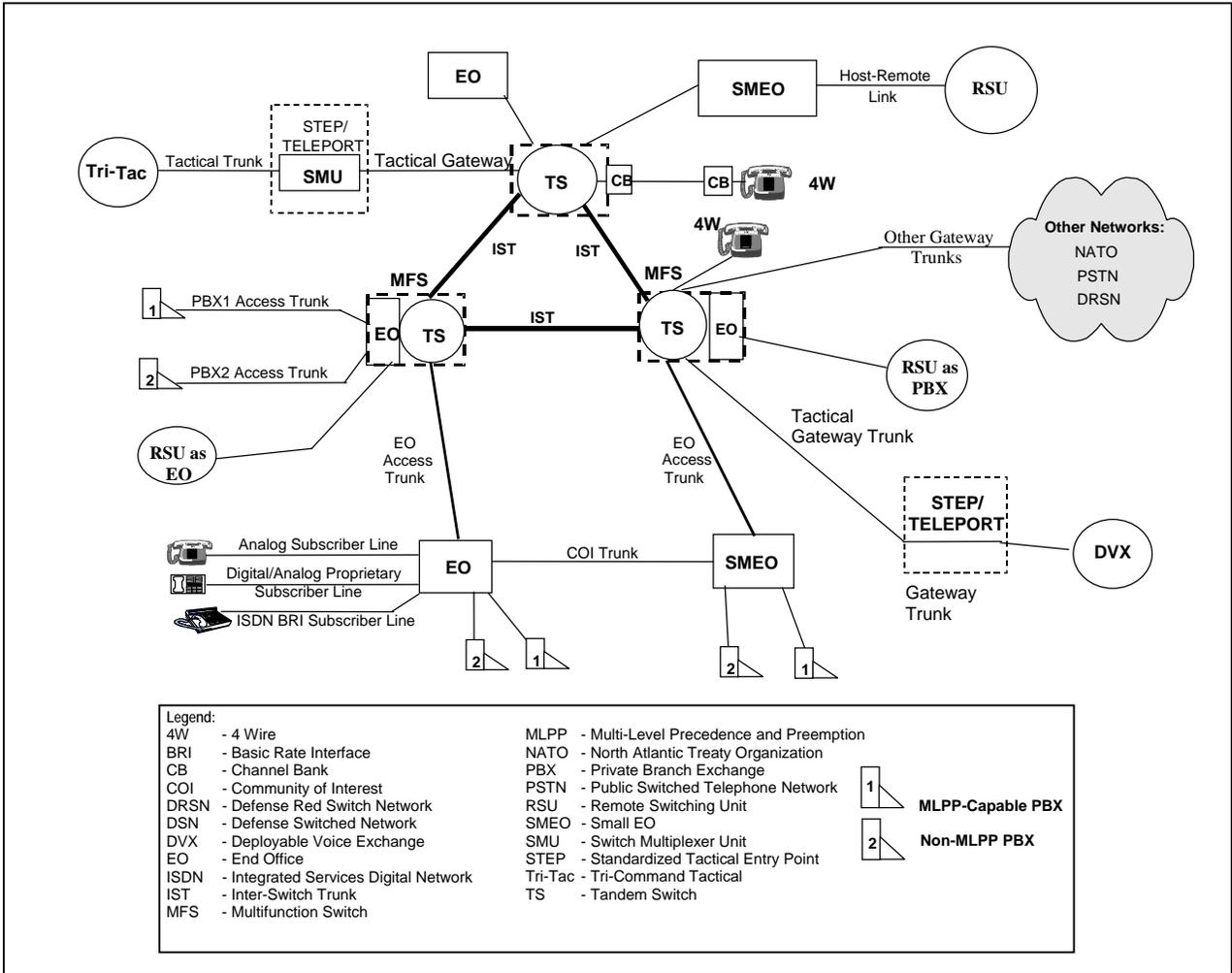


Figure 2-1. DSN Architecture

**7. REQUIRED SYSTEM INTERFACES.** This interoperability test status is based upon evaluation of the network interfaces as specified in:

a. The Chairman of the Joint Chiefs of Staff (CJCS) policy for Department of Defense voice services: DSN, Defense Red Switch Network (DRSN) Gateway, Tactical Network Gateway, North Atlantic Treaty Organization (NATO) Gateway, and Commercial Network Gateway.

b. Interface and signaling requirements for trunk, line, and network management derived from the GSCR document.

c. Interoperability Exchange Requirements (ERs) and Functional Requirements (FRs) derived from the GSCR.

d. The overall system interoperability performance derived from the Generic Switch Test Plan (GSTP).

The ERs and FRs for the CJCS network interfaces are indicated in table 2-1. The criticality and certification status of these interfaces can be found in paragraph 11. The test summary can be found in paragraph 11b.

**Table 2-1. SUT Exchange and Functional Requirements**

	Trunk Interfaces		
	Interface & Signaling	Critical	Exchange and Functional Requirements
<b>Defense Switched Network</b>	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	<ul style="list-style-type: none"> <li>- MLPP</li> <li>- Hotline services<sup>1</sup></li> <li>- System Interface               <ul style="list-style-type: none"> <li>• Non-secure Voice and Data</li> <li>• Secure Voice and Data (STU-III and STE)</li> <li>• NX56 kbps and NX64 kbps Synchronous Data (<b>T1 ISDN PRI only</b>)</li> <li>• Non-secure and Secure FAX</li> <li>• VTC (<b>T1 ISDN PRI only</b>)</li> <li>• Alarms</li> </ul> </li> <li>- Integrated Services Digital Network (<b>T1 ISDN PRI only</b>)</li> <li>- Attendant services<sup>2</sup></li> <li>- System Administration, Measurements, and Service Standards</li> <li>- Y2K (Rollover, Valid, and Invalid Dates)</li> <li>- Screening, Zone Restriction, and DSN Access Restriction</li> <li>- Automated Message Accounting</li> <li>- Network Integration</li> <li>- ANSI T1.619a (<b>T1 ISDN PRI only</b>)<sup>3</sup></li> </ul>
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	No	
	PCM-24 T1 B8ZS/ESF ISDN PRI	Yes	
	Analog E&M Signaling Type I	No	

**Table 2-1. SUT Exchange and Functional Requirements (continued)**

	<b>Line Interfaces</b>		
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Exchange and Functional Requirements</b>
<b>Defense Switched Network (continued)</b>	TPC ISDN BRI ST and U Interface Q.931	Yes	<ul style="list-style-type: none"> <li>- MLPP</li> <li>- Hotline services<sup>1</sup></li> <li>- ANSI T1.619a</li> <li>- ISDN supplemental services</li> <li>- Call Treatments</li> <li>- DSN Announcements</li> <li>- Attendant services<sup>2</sup></li> <li>- VTC</li> <li>- NX56 kbps and NX64 kbps Synchronous Data</li> <li>- Non-secure Voice and Data</li> <li>- Secure Voice and Data (STE)</li> </ul>
	TPC 2-Wire analog	Yes	<ul style="list-style-type: none"> <li>- MLPP</li> <li>- Hotline services<sup>1</sup></li> <li>- DSN Announcements</li> <li>- Traffic Measurements</li> <li>- Attendant services<sup>2</sup></li> <li>- Call Treatments<sup>4</sup></li> <li>- Non-secure Voice and Data</li> <li>- Non-secure and Secure FAX</li> <li>- Secure Voice and Data (STU-III and STE)</li> </ul>
	TPC 2-Wire Digital and Analog (Proprietary)	No	<ul style="list-style-type: none"> <li>- MLPP</li> <li>- Hotline services<sup>1</sup></li> <li>- DSN Announcements</li> <li>- Traffic Measurements</li> <li>- Attendant services<sup>2</sup></li> <li>- Call Treatments</li> <li>- Non-secure Voice</li> </ul>
	<b>Network Management Interfaces</b>		
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Exchange and Functional Requirements</b>
	TPC EIA Asynchronous @ 9.6 kbps	No	<ul style="list-style-type: none"> <li>- Automated Message Accounting</li> <li>- Traffic Measurements</li> <li>- Alarms</li> <li>- Man Machine Language</li> </ul>
<b>Defense Red Switch Network Gateway</b>	<b>Trunk Interfaces</b>		
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Exchange and Functional Requirements</b>
2-Wire Analog Loop	No	<ul style="list-style-type: none"> <li>- MLPP</li> <li>- Secure Voice</li> </ul>	
<b>Tactical Network Gateway</b>	<b>Trunk Interfaces</b>		
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Exchange and Functional Requirements</b>
PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	<ul style="list-style-type: none"> <li>- MLPP</li> <li>- Non-secure Voice</li> </ul>	

**Table 2-1. SUT Exchange and Functional Requirements (continued)**

NATO Gateway	Interface & Signaling	Critical	Exchange and Functional Requirements
		Not tested	No
Commercial Network Gateway	Interface & Signaling	Critical	Exchange and Functional Requirements
	Same Interfaces and Signaling as DSN	Yes	See note 6.

**Legend:**

AMI - Alternate Mark Inversion	GSTP - Generic Switch Test Plan	SF - Superframe
ANSI - American National Standards Institute	ISDN - Integrated Services Digital Network	SS7 - Signaling System 7
B8ZS - Bipolar Eight Zero Substitution	ITU - International Telecommunications Union	ST - ISDN BRI Four-Wire Interface
BRI - Basic Rate Interface	kbps - kilobits per second	STE - Secure Terminal Equipment
CAS - Channel Associated Signaling	Mbps - Megabits per second	STU-III - Secure Telephone Unit III
DP - Dial Pulse	MLPP - Multi-Level Precedence and Preemption	SUT - System Under Test
DSN - Defense Switched Network	NATO - North Atlantic Treaty Organization	T1 - Digital Transmission Link level 1 (1.544 Mbps)
DTMF - Dual Tone Multi-Frequency	NI2 - National ISDN 2	T1.619a - SS7 and ISDN Signaling Standard for T1
E&M - Ear and Mouth	NX56 - Data format restricted to multiples of 56 kbps	TPC - Twisted Pair Copper
EIA - Electronic Industries Alliance	NX64 - Data format restricted to multiples of 64 kbps	U - ISDN BRI Two-Wire Interface
ESF - Extended Superframe	PCM-24 - Pulse Code Modulation 24 Channels	VTC - Video Teleconferencing
FAX - Facsimile	PRI - Primary Rate Interface	Y2K - Year 2000
GSCR - Generic Switching Center Requirements	Q.931 - ITU Signaling Standard for ISDN	

**Notes:**

- SUT does not meet all the GSCR exchange requirements for Hotline services. Hotline services are not a critical requirement.
- SUT's attendant console does not support automatic recall of attendant. The operational impact is minor.
- ISDN T1 PRI trunkgroups using NI2 protocol send a Release Complete Message in lieu of a Disconnect Message with Cause 46 (Unavailable Resources). There is no operational impact as the calling user still receives a Blocked Precedence Announcement.
- Analog instruments do not meet the GSCR exchange requirements for intra-switch call waiting. The operational impact is minor.
- NATO interface requirements are in accordance with the GSCR paragraph 10.8. Not all switches are required to perform this function.
- The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.

**8. TEST NETWORK DESCRIPTION.** The SUT was tested at JITC's Global Information Grid Network Test Facility in a manner and configuration similar to that of the DSN operational environment. This test was conducted using three test configurations shown in figures 2-2 through 2-4. Testing of the system's required functions and features was conducted using the test configuration depicted in figure 2-2. Network integration testing was conducted using the test configuration depicted in figure 2-3. These figures accurately emulate the DSN operational environment. Figure 2-4 depicts the test configuration used to test the Advanced Defense Switched Network Integrated Management Support System network management required functions and features.

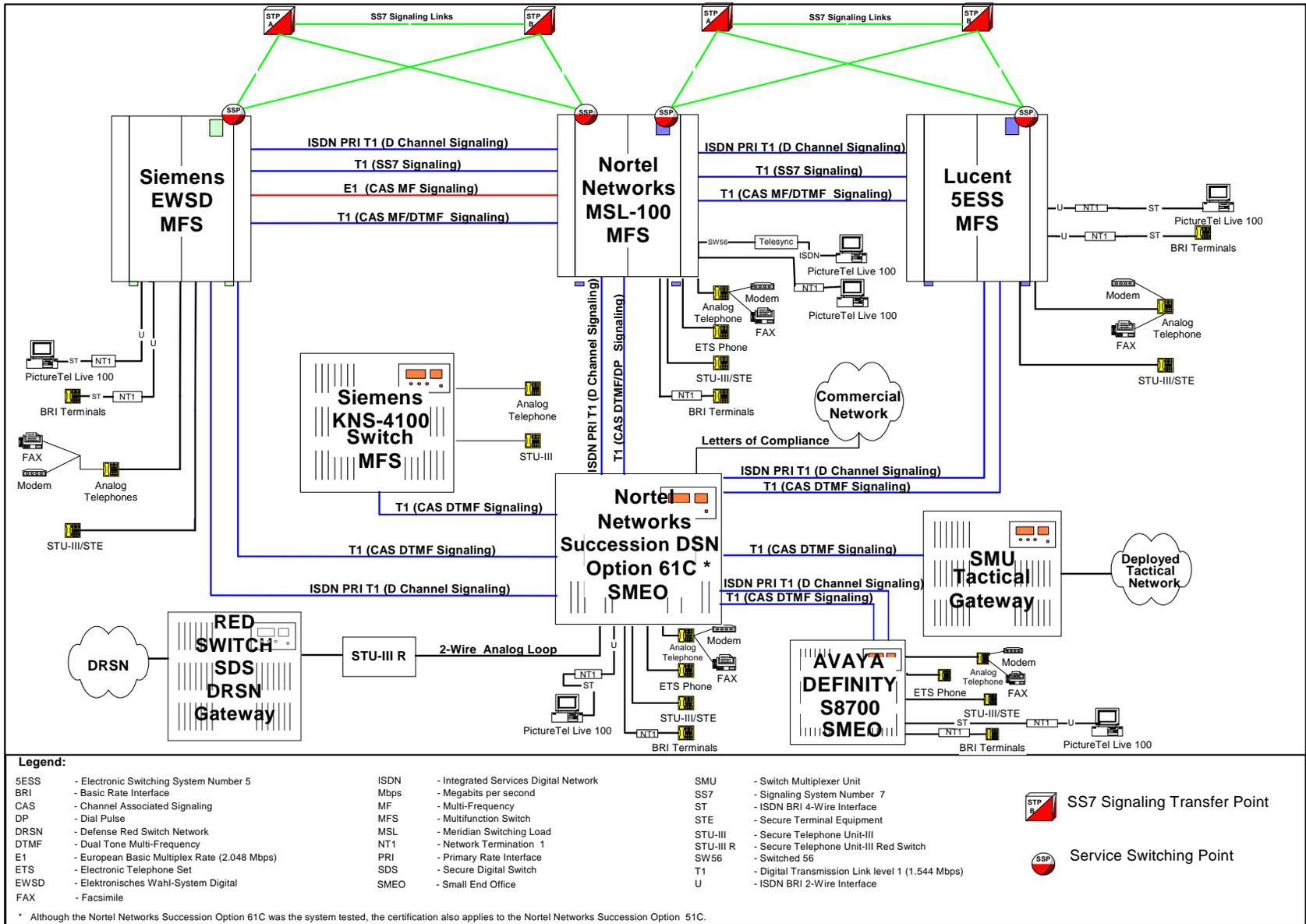


Figure 2-2. Test Configuration

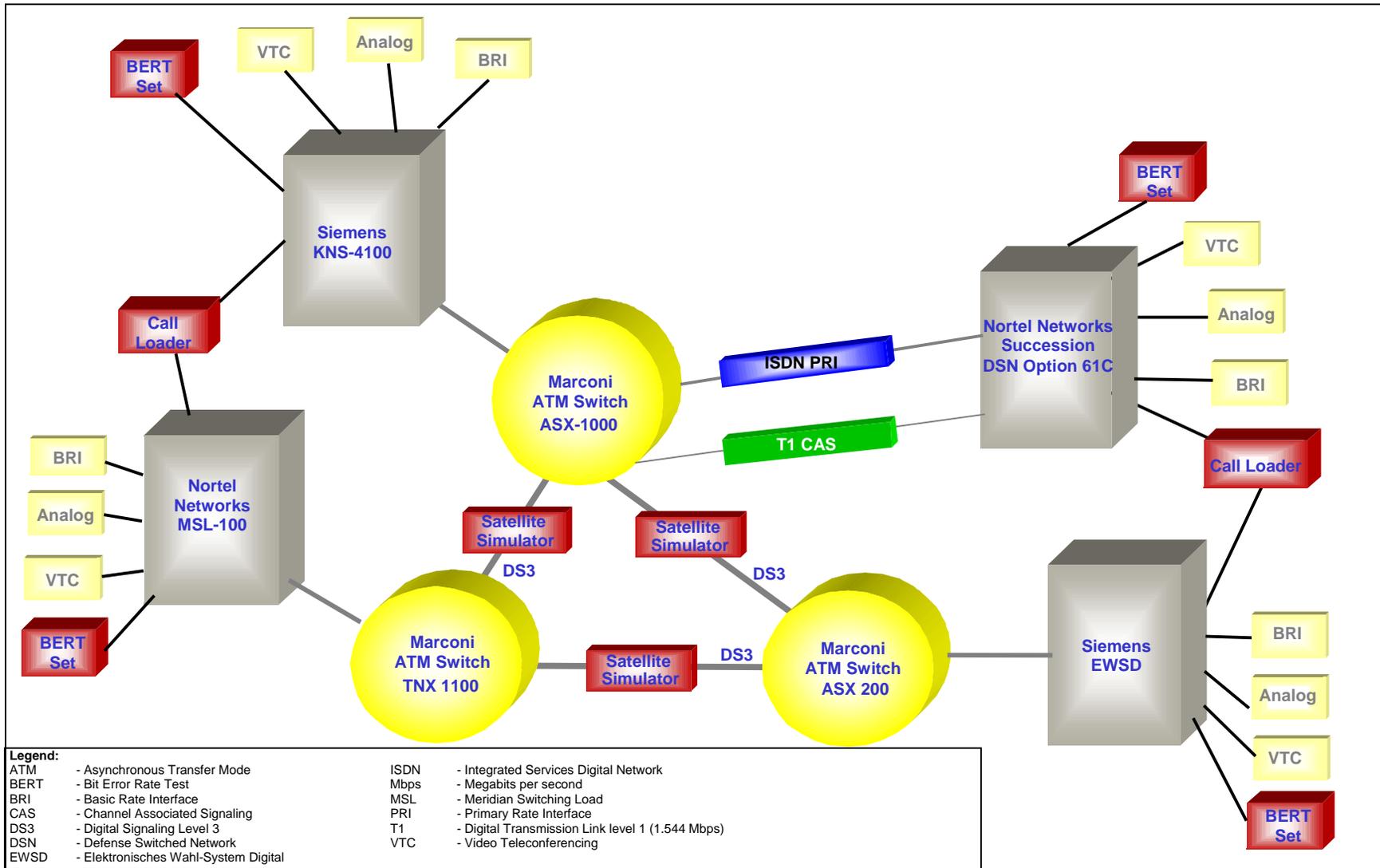
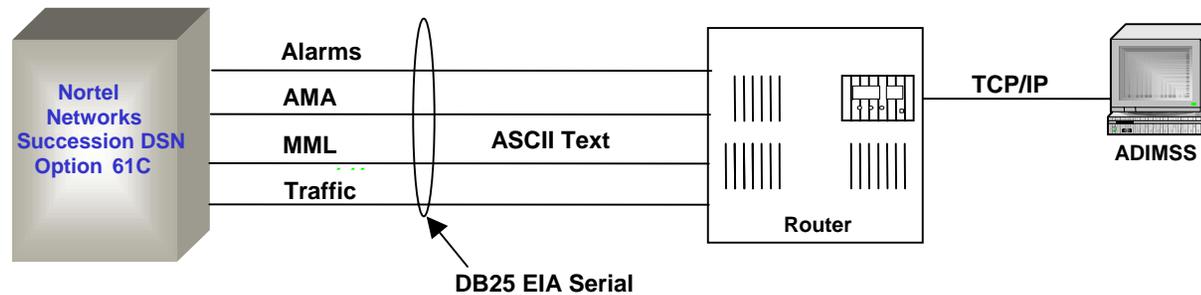


Figure 2-3. Network Integration Test Configuration



**Legend:**

- ADIMSS - Advanced Defense Switched Network Integrated Management Support System
- Alarms - Fault Management
- AMA - Automated Message Accounting (Accounting Management)
- ASCII - American Standard Code for Information Interchange
- DB - "D" describes the shape of the housing, "B" describes the size of the housing
- DSN - Defense Switched Network
- EIA - Electronic Industries Alliance
- MML - Man Machine Language (Remote access to switch)
- SUT - System Under Test
- TCP/IP - Transmission Control Protocol/Internet Protocol
- Traffic - Performance Management

**Note:**

DSN Switch Network Management Interfaces as described in reference (d) and Network Management Requirements for End Offices as described in reference (c).

**Figure 2-4. SUT Network Management System Interface**

**9. SYSTEM CONFIGURATIONS.** Table 2-2 provides the system configurations used in the test.

**Table 2-2. Tested System Configurations**

System Name	Software Release
Nortel Networks MSL-100	SE06
Nortel Networks Succession DSN Option 11C	3.0
Avaya MultiVantage S8700	R012.00.0.221.0
Nortel Networks Succession DSN Option 61C	3.0
Siemens EWSD	19d with Patch Set 39
Siemens KNS-4100	APS4V2.3
Lucent Technologies 5ESS	5E16.2
SMU 96 Tactical Gateway	RD302185
DSS Red Switch	8.03
MARCONI ATM switches	Versions 6.2 and 7.1
<b>Legend:</b> ATM - Asynchronous Transfer Mode DSN - Defense Switched Network DSS - Digital Small Switch EWSD - Elektronisches Wahl-System Digital MSL - Meridian Switching Load SMU - Switch Multiplexer Unit	

**10. TESTING LIMITATIONS.** The Nortel Networks Succession DSN Option 61C Digital Switching System was the only switch platform tested by JITC; however, the test results are applicable to the DSN Option 51C. The Nortel Networks Succession DSN Option 51C Digital Switching System employs the same software and trunk/line card hardware as the DSN Option 61C digital switch, and JITC analysis determined it to be functionally identical for certification purposes.

**11. TEST RESULTS.** Tables 2-3 through 2-8 synopsise the SUT interface ER and FR status and criticality. The identified test discrepancies shown below denote only those test discrepancies that remained open after software patches were applied and regression testing was completed. A detailed description of these discrepancies can be found in paragraph 11a.

**Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements**

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
PCM-24 T1 CAS (B8ZS/ESF) (AMI/SF) DTMF	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	No	Met
		Hotline services	Yes	II-3.2	21.3.10	No	Not Met <sup>1</sup>
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX)	No	II-4.2	10.1 through 10.12	No	Met
		Attendant services	Yes	II-7.2	2.1.3	No	Met <sup>2</sup>
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	No	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	No	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	No	Met
		AMA	No	II-14.2	8.1	No	Met
		Network Integration	No	II-20.2	10	No	Met

**Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)**

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
PCM-24 T1 CAS (B8ZS/ESF) (AMI/SF) DP IN/DTMF OUT	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	No	Met
		Hotline services	Yes	II-3.2	21.3.10	No	Not Met <sup>1</sup>
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	No	Met
		Attendant services	Yes	II-7.2	2.1.3	No	Met <sup>2</sup>
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	No	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	No	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	No	Met
		AMA	No	II-14.2	8.1	No	Met
		Network Integration	No	II-20.2	10	No	Met

**Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)**

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
PCM-24 T1 (B8ZS/ESF) ISDN PRI	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline services	Yes	II-3.2	21.3.10	No	Not Met <sup>1</sup>
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		ISDN	No	II-6.2	6.6, 21.1, 21.2, 21.3	Yes	Met
		Attendant services	Yes	II-7.2	2.1.3	No	Met <sup>2</sup>
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	No	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	No	Met
		Network Integration	No	II-20.2	10	Yes	Met
		ANSI T1.619a	No	II-6.2	21.3.1	Yes	Met <sup>3</sup>

**Table 2-3. Defense Switched Network Trunk Interface and Exchange Requirements (continued)**

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
Analog E&M Signaling Type I	Not Certified	MLPP	Yes	II-2.2	2.2.1, 5.3.4.3 through 4.9	No	Not Met <sup>4</sup>
		Hotline services	Yes	II-3.2	21.3.10	No	Not Met <sup>1</sup>
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	No	Met
		Attendant services	Yes	II-7.2	2.1.3	No	Met <sup>2</sup>
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	No	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	No	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	No	Met
		AMA	No	II-14.2	8.1	No	Met
		Network Integration	No	II-20.2	10	No	Met

Legend:

AMA - Automated Message Accounting	ESF - Extended Superframe	PCM-24 - Pulse Code Modulation – 24 channels
AMI - Alternate Mark Inversion	FAX - facsimile	PRI - Primary Rate Interface
ANSI - American National Standards Institute	FR - Functional Requirement	SF - Superframe
B&ZS - Bipolar Eight Zero Substitution	GSCR - Generic Switching Center Requirements	SS7 - Signaling System 7
CAS - Channel Associated Signaling	GSTP - Generic Switch Test Plan	SUT - System Under Test
DP - Dial Pulse	ISDN - Integrated Services Digital Network	T1 - Digital Transmission Link Level 1 (1.544 Mbps)
DSN - Defense Switched Network	Mbps - Megabits per second	T1.619a - SS7 and ISDN Signaling Standard for T1
DTMF - Dual-Tone Multi Frequency	MLPP - Multi-Level Precedence and Preemption	VTC - Video Teleconference
E&M - Ear and Mouth	NI2 - National ISDN 2	Y2K - Year 2000
ER - Exchange Requirement	Para - Paragraph	

Notes:

- SUT does not meet the GSCR exchange requirements for Hotline services. Hotline services are not a critical requirement.
- SUT's attendant console does not support automatic recall of attendant. The operational impact is minor.
- ISDN T1 PRI trunkgroups using NI2 protocol send a Release Complete Message in lieu of a Disconnect Message with Cause 46 (Unavailable Resources). There is no operational impact as the calling user still receives a Blocked Precedence Announcement.
- Did not pass DSN preempt signals. The operational impact is minor

**Table 2-4. Defense Switched Network Line Interface and Exchange Requirements**

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
TPC, ISDN BRI ST and U, Q.931	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Hotline services	Yes	II-3.2	21.3.10	No	Not Met <sup>1</sup>
		ANSI T1.619a	No	II-6.2	21.3.1	Yes	Met
		ISDN supplemental services	Yes	II-6.2	21.3	No	Not Met <sup>2</sup>
		Attendant services	Yes	II-7.2	2.1.3	No	Met <sup>3</sup>
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met
		AMA	No	II-14.2	8.1	No	Met
		DSN Announcements	No	II-19.2	5.6	Yes	Met
TPC, 2 Wire Analog	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Hotline services	Yes	II-3.2	21.3.10	No	Not Met <sup>1</sup>
		Attendant services	Yes	II-7.2	2.1.3	No	Met <sup>3</sup>
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met <sup>4</sup>
		AMA	No	II-14.2	8.1	No	Met
		DSN Announcements	No	II-19.2	5.6	Yes	Met

**Table 2-4. Defense Switched Network Line Interface and Exchange Requirements (continued)**

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
TPC 2 Wire Digital (Proprietary)	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	No	Met
		Hotline services	Yes	II-3.2	21.3.10	No	Not Met <sup>1</sup>
		Attendant services	Yes	II-7.2	2.1.3	No	Met <sup>3</sup>
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	No	Met
		AMA	No	II-14.2	8.1	No	Met
		DSN Announcements	No	II-19.2	5.6	No	Met

**Legend:**  
AMA - Automated Message Accounting  
ANSI - American National Standards Institute  
BRI - Basic Rate Interface  
DSN - Defense Switched Network  
DISN - Defense Information Systems Network  
ER - Exchange Requirements  
FR - Functional Requirements  
GSCR - Generic Switching Center Requirements  
GSTP - Generic Switch Test Plan  
ISDN - Integrated Services Digital Network  
ITU - International Telecommunications Union  
Mbps - Megabits per second  
MLPP - Multi-Level Precedence and Preemption  
Para - Paragraph  
PBX - Private Branch Exchange  
Q.931 - ITU Signaling Standard for ISDN  
SS7 - Signaling System 7  
ST - ISDN BRI 4-Wire Interface  
SUT - System Under Test  
TPC - Twisted Pair Copper  
T1 - Digital Transmission Link Level 1 (1.544 Mbps)  
T1.619a - SS7 and ISDN Signaling Standard for T1  
U - ISDN BRI 2-Wire Interface

**Notes:**  
1 The SUT does not meet all the GSCR exchange requirements for Hotline services. Hotline services are not a critical requirement.  
2 ISDN supplemental services are currently not used in the DISN. The operational impact is minor.  
3 The SUT's attendant console does not support automatic recall of attendant. The operational impact is minor.  
4 Analog instruments do not meet the GSCR exchange requirements for intra-switch call waiting. This is not a critical requirement for a PBX.

**Table 2-5. Defense Switched Network Management Interface and Exchange Requirements**

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
TPC EIA Asynchronous @ 9.6 kpbs	Certified	AMA	No	II-23.2	2.1.10, 16.1	No	Met
		Traffic Measurements	No	II-23.2	2.1.10, 16.1	No	Met
		MML	No	II-23.2	2.1.10, 16.1	No	Met
		Alarms	No	II-23.2	2.1.10, 16.1	No	Met
<b>Legend:</b> AMA - Automated Message Accounting EIA - Electronic Industries Alliance ER - Exchange Requirements FR - Functional Requirements GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan kbps - kilobits per second MML - Man Machine Language Para - Paragraph TPC - Twisted Pair Copper							

**Table 2-6. Defense Red Switch Network Gateway Interface and Exchange Requirements**

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
TPC 2-Wire analog	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Secure Voice (STU-III, STE)	No	NA	2.2.1, 5.3.4	Yes	Met
<b>Legend:</b> ER - Exchange Requirements FR - Functional Requirements GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan MLPP - Multi-Level Precedence and Preemption Para - Paragraph STE - Secure Terminal Equipment STU-III - Secure Telephone Unit-III TPC - Twisted Pair Copper							

**Table 2-7. Tactical Network Gateway Interface and Exchange Requirements**

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
PCM-24 T1 (B8ZS/ESF) (AMI/SF) DTMF	Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	No	Met
		Non-secure Voice	Yes	NA	2.2.1, 5.3.4	No	Met
<b>Legend:</b> AMI - Alternate Mark Inversion B8ZS - Bipolar Eight Zero Substitution DTMF - Dual Tone Multi-Frequency ER - Exchange Requirements ESF - Extended Superframe FR - Functional Requirements GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan Mbps - Megabits per second MLPP - Multi-Level Precedence and Preemption Para - Paragraph PCM-24 - Pulse Code Modulation 24 channels SF - Superframe T1 - Digital Transmission Link level 1 (1.544 Mbps)							

**Table 2-8. Commercial Network Gateway Interface and Exchange Requirements**

<b>Interface &amp; Signaling</b>	<b>Interface Status</b>	<b>Exchange and Functional Requirements</b>	<b>Test Discrepancies</b>	<b>GSTP Para(s)</b>	<b>GSCR Para(s)</b>	<b>Critical Yes/No</b>	<b>ER/FR Status</b>
Same Interfaces Signaling as DSN	Certified	See Note	No	See Note	See Note	Yes	Met
<p><b>Legend:</b>            DSN - Defense Switched Network            ER - Exchange Requirements            FR - Functional Requirements            GSCR - Generic Switching Center Requirements            GSTP - Generic Switch Test Plan            Para - Paragraph</p> <p><b>Note:</b> The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.</p>							

## a. Discussion

(1) **DSN.** All critical interface ERs and FRs for DSN were met. The following minor exceptions are noted:

(a) The SUT does not meet the following GSCR requirement: recovery from a local (Red) alarm within the allowed time period on a Pulse Code Modulation-24 channels (PCM-24) interface. When a PCM-24 interface on the SUT is recovering from a red alarm it takes approximately 30 seconds to recover. The GSCR requirement for recovery from a local red alarm is 15 seconds plus or minus 5 seconds. The operational impact is minor.

(b) The SUT Analog Ear and Mouth (E&M) Signaling Type I trunking is not certified. The SUT's Analog E&M trunks do not meet the GSCR requirements for DSN preempt signals. This is not a critical requirement for a PBX.

(c) The SUT does not meet the Bellcore standard for American National Standards Institute (ANSI) T1.619a Primary Rate Interface (PRI) Interface Identifier Present Value. Bellcore SR-NWT-002343 P.8-72 requires that when the Digital Signal Level 1 identified contains the data channel carrying this information element, the interface should be identified as value "0" (implicitly identified). The SUT ANSI T1.619a PRI interface sends the incorrect interface identifier, present value of "1" (explicitly identified). There was no noted discrepancy during interoperability certification testing. The operational impact is minor.

(d) The SUT's Attendant Console does not meet the following requirement: Automatic Recall of Attendant Console, "camp-on" feature as required in table 2-3 Attendant Features, GSCR para 2.1.3. The operational impact is minor.

(e) The SUT does not support route digit 5 or 6 for Hotline services. This is not a critical requirement for a PBX.

(f) The SUT does not support the following unique Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) supplemental services as specified in the respective GSCR paragraphs listed below. There are currently no switches in the DISN that support ISDN BRI supplemental services. The operational impact is minor.

- Conference Calling. GSCR Para. 21.3.2
- User-to-User Signaling. GSCR Para. 21.3.3
- Call Hold. GSCR Para. 21.3.4
- Call Waiting. GSCR Para. 21.3.5
- Normal Call Transfer. GSCR Para. 21.3.6
- Explicit Call Transfer. GSCR Para. 21.3.7
- ISDN Call Deflection. GSCR Para. 21.3.8
- Preset Conference Calling. GSCR Para. 21.3.11

(g) The SUT does not support intra-switch call waiting on analog instruments. Inter-switch precedence call waiting is supported on all instrument types on the SUT. The operational impact is minor.

(h) The SUT's Dual Rate Interface card (NT5D12AG) deactivates itself after a period of inactivity. PRI trunkgroups on the SUT that have been inactive for a period of 2 weeks or longer go into a "sleep" mode. In order to restore the trunkgroup it is necessary to physically reseal the associated Dual Rate Interface card. This is not considered to be a critical exception because the SUT's PRI trunkgroup sends a yellow alarm towards the distant node switch until it is restored. The operational impact is minor.

(i) The SUT does not meet the ANSI T1.619 1992, ANSI T1.619a 1994, standard for ISDN ANSI T1.619a PRI National ISDN 2 (NI2) protocol with unavailable resources, Blocked Precedence Announcement. The SUT's ANSI T1.619a ISDN PRI trunkgroups using NI2 protocol send a release complete message in lieu of a disconnect message with cause value 46 (unavailable resources). There was no noted discrepancy during interoperability testing with this anomaly. The operational impact is minor.

**(2) DRSN Gateway.** All interface ERs and FRs for the DRSN Gateway were met.

**(3) Tactical Network Gateway.** All interface ERs and FRs for the Tactical Network Gateway were met.

**(4) NATO Gateway.** The NATO Gateway interfaces were not tested.

**(5) Commercial Network Gateway.** The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR, with minor exceptions. Exceptions were reviewed and assessed by DISA CS23, the Development and Operational Engineering Department, and determined to have a minor operational impact.

**b. Test Summary.** The Nortel Networks Succession DSN Options 51C Digital Switching System with software release 3.0 and specified patch groups identified in enclosure 3 is certified for joint use in the DSN for the following switch types: PBX1 (except for Europe), and PBX2, in accordance with the requirements set forth in the GSCR. Minor discrepancies identified during testing and the GSCR requirements not tested will have a minor operational impact. The interoperability summary and status to include criticality for each interface is shown in tables 2-9 and 2-10.

**12. TEST AND ANALYSIS REPORT.** No detailed test report was developed per the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified but Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at <https://stp.fhu.disa.mil/>. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at <http://jit.fhu.disa.mil> (NIPRNet), or <http://199.208.204.125/> (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>.

**Table 2-9. SUT Interoperability Summary**

Network	Status	Remarks
DSN	Certified	- Certified as PBX1 (except Europe), and PBX2 - VoIP not Certified - The identified test discrepancies shown in enclosure 2 that remained open have an overall minor operational impact.
DRSN Gateway	Certified	- All requirements met.
Tactical Gateway	Certified	- All requirements met.
NATO Gateway	Not Tested	
Commercial Gateway	Certified	- All requirements met.
<b>Legend:</b>		
DRSN	- Defense Red Switch Network	PBX
DSN	- Defense Switched Network	SUT
NATO	- North Atlantic Treaty Organization	VoIP
		- Private Branch Exchange
		- System Under Test
		- Voice over Internet Protocol

**Table 2-10. SUT Interoperability Status**

Defense Switched Network	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	Certified	Met all ERs and FRs with the following exceptions: Hotline services not met. <sup>1</sup> Attendant services automatic recall not met. <sup>2</sup>
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	No	Certified	Met all ERs and FRs with the following exceptions: Hotline services not met. <sup>1</sup> Attendant services automatic recall not met. <sup>2</sup>
	PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all critical ERs and FRs. Hotline services not met. <sup>1</sup> Attendant services automatic recall not met. <sup>2</sup>
	Analog E&M Signaling Type I	No	Not Certified	Did not pass DSN preempt signals. <sup>3</sup>
	Line Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	TPC ISDN BRI ST and U Interface Q.931	Yes	Certified	Met all critical ERs and FRs. Hotline services not met. <sup>1</sup> ISDN supplemental services were not met. <sup>4</sup> Attendant services automatic recall not met. <sup>2</sup>
	TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs. Hotline services not met. <sup>1</sup> Intra-switch call waiting not supported. <sup>5</sup> Attendant services automatic recall not met. <sup>2</sup>
TPC 2-Wire Digital (Proprietary)	No	Certified	Met all ERs and FRs with the following exceptions: Hotline services not met. <sup>1</sup> Attendant services automatic recall not met. <sup>2</sup>	
Network Management Interfaces				
Interface & Signaling	Critical	Status	Remarks	
TPC EIA Asynchronous @ 9.6 kbps	No	Certified	Met all ERs and FRs.	

**Table 2-10. SUT Interoperability Status (continued)**

Defense Red Switch Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	2-Wire Analog Loop	No	Certified	Met all ERs and FRs.
Tactical Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	Certified	Met all ERs and FRs.
NATO Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
		No	Not Tested	
Commercial Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	Same Interfaces and Signaling as DSN	Yes	Certified	See note 6.

**Legend:**

AMI - Alternate Mark Inversion	GSTP - Generic Switch Test Plan
B8ZS - Bipolar Eight Zero Substitution	ISDN - Integrated Services Digital Network
BRI - Basic Rate Interface	ITU - International Telecommunications Union
CAS - Channel Associated Signaling	kbps - kilobits per second
DP - Dial Pulse	Mbps - Megabits per second
DISN - Defense Information Systems Network	NATO - North Atlantic Treaty Organization
DSN - Defense Switched Network	PCM-24 - Pulse Code Modulation 24 Channels
DTMF - Dual Tone Multi-Frequency	PRI - Primary Rate Interface
E&M - Ear and Mouth	Q.931 - ITU Signaling Standard for ISDN
EIA - Electronic Industries Alliance	SF - Superframe
ERs - Exchange Requirements	ST - ISDN BRI Four-Wire Interface
ESF - Extended Superframe	T1 - Digital Transmission Link level 1 (1.544 Mbps)
FRs - Functional Requirements	TPC - Twisted Pair Copper
GSCR - Generic Switching Center Requirements	U - ISDN BRI Two-Wire Interface

**Notes:**

- SUT does not meet all the GSCR exchange requirements for Hotline services. Hotline services are not a critical requirement.
- SUT's attendant console does not support automatic recall of attendant. The operational impact is minor.
- Analog E&M Signaling did not pass the DSN preempt signals as required by the GSCR for the four types of preemption. Analog E&M Signaling is not a critical requirement.
- ISDN supplemental services are currently not used in the DISN. The operational impact is minor.
- Intra-switch call waiting is not supported on analog instruments. The operational impact is minor.
- The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.

**Table 3-1. SUT Software Release 3.0 Patch Identification Patch List**

<b>Core Software Patch List</b>		
<b>Patch ID Number</b>	<b>CR Number</b>	<b>Description</b>
MPLR17817	Q00758895	DSN: Tandem ATVN MCDN trunk 2nd call fails after preemption
MPLR18070	Q00786849	Preemption of a partially dialed routine precedence call
MLPR18220	Q00802114	DSN: Bug 30 messages during tandem calls
MLPR18263	Q00817316	Option 11C switch reinitializes due to CDR-Q procedure
MLPR18302	Q00841477	NI2 DID Tandem to ATVN
MPLR18622	Q00888789	This patch was developed to suppress password information on the switches in LD 22.
<b>Legend:</b> ATVN - Autovon CDR-Q - Call Detail Record-Queue CR - Call Report DID - Direct Inward Dial DSN - Defense Switched Network ID - Identification ISDN - Integrated Services Digital Network LD - Overlay MCDN - Meridian Customer Defined Network MPLR - Meridian Patch Library Reference NI2 - National ISDN 2 SUT - System Under Test		