



DEFENSE INFORMATION SYSTEMS AGENCY

JOINT INTEROPERABILITY TEST COMMAND

2001 BRAINARD ROAD

FORT HUACHUCA, ARIZONA 85613-7051

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

7 May 04

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of Nortel Networks Succession Defense Switched Network (DSN) Options 61C and 81C Digital Switching Systems 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 61C Digital Switching System with software release 3.0 and specified patch groups listed in enclosure 3, 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. The Nortel Networks Succession DSN Option 81C Digital Switching System employs the same software and trunk/line card hardware as the Succession DSN Option 61C. JITC analysis determined Option 81C to be functionally identical to the Succession DSN 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: Small End Office (except Europe), 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 from 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. System interoperability should be

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verified before deployment in an operational environment that varies significantly from the test environment.

4. The interoperability summary of the SUT is indicated 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). These references require that a switch provide NM capabilities via either Ethernet, serial Electronic Industries Alliance (EIA), or serial (X.25 or BX.25 variant). The SUT meets the NM requirements through the use of serial (EIA) 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 SMEO (excludes Europe), PBX1, and PBX2. - VoIP not certified. - The identified test discrepancies shown in enclosure 2 that remained open have an overall minor operational impact.
DRSN Gateway	Yes	Certified	- All requirements met.
Tactical Gateway	No	Certified	- All requirements met.
NATO Gateway	No	Not Tested	
Commercial Network Gateway	Yes	Certified	- All requirements met.
Legend:			
DRSN	- Defense Red Switch Network	SMEO	- Small End Office
DSN	- Defense Switched Network	SUT	- System Under Test
NATO	- North Atlantic Treaty Organization	VoIP	- Voice over Internet Protocol
PBX	- Private Branch Exchange		

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Table 2. SUT Interoperability Status

	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
Defense Switched Network	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	Yes	Certified	Met all critical ERs and FRs. Restoral to service from a local red alarm not met. ¹
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	Yes	Certified	Met all critical ERs and FRs. Restoral to service from a local red alarm not met. ¹
	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. ¹ NI2 Protocol provides Release Complete Message in lieu of a Disconnect Message for Unavailable Resources. ²
	Analog E&M Signaling Type I	No	Not Certified	Did not pass DSN preempt signals. ³
	Line Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	TPC ISDN BRI ST and U Interface Q.931	Yes	Certified	Met all critical ERs and FRs. ISDN Supplemental Services not met. ⁴
	TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs. Does not support Intra-switch Call Waiting. ⁵
	TPC 2-Wire Digital (Proprietary)	No	Certified	Met all critical ERs and FRs.
	Network Management Interfaces			
Interface & Signaling	Critical	Status	Remarks	
TPC EIA Asynchronous @ 9.6 kbps	Yes	Certified	Met all critical ERs and FRs.	
Defense Red Switch Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
2-Wire Analog Loop	Yes	Certified	Met all critical ERs and FRs. ⁶	
Tactical Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	Certified	Met all critical 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 7.	

Legend:

AMI	- Alternate Mark Inversion	ISDN	- Integrated Services Digital Network
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	PCM-24	- Pulse Code Modulation 24 Channels
DRSN	- Defense Red Switch Network	PM	- Program Manager
DSN	- Defense Switched Network	PRI	- Primary Rate Interface
DTMF	- Dual Tone Multi-Frequency	SF	- Superframe
E&M	- Ear and Mouth	SMEO	- Small End Office
EIA	- Electronic Industries Alliance	ST	- ISDN BRI Four-Wire Interface
ERs	- Exchange Requirements	SUT	- System Under Test
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
GSTP	- Generic Switch Test Plan		

Notes:

- 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.
- 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 (BPA).
- 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 SMEO.
- ISDN Supplemental Services are currently not used in the DISN. The operational impact is none.
- Analog instruments do not support intra-switch call waiting. The operational impact is minor.
- 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.
- 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

Trunk Interfaces		
Interface & Signaling	Critical	Exchange & Functional Requirements
PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	Yes	<ul style="list-style-type: none"> - MLPP - Hotline Services¹ - System Interface <ul style="list-style-type: none"> • Non-secure Voice and Data • Secure Voice and Data (STU-III and STE) • NX56 kbps and NX64 kbps Synchronous Data <i>(T1 ISDN PRI only)</i> • Non-secure and Secure FAX • VTC <i>(T1 ISDN PRI only)</i> • Alarms - Integrated Services Digital Network <i>(T1 ISDN PRI only)</i> - Attendant Services² - System Administration, Measurements, and Service Standards - Y2K (Rollover, Valid, and Invalid Dates) - Screening, Zone Restriction, and DSN Access Restriction - Automated Message Accounting - Network Integration - ANSI T1.619a <i>(T1 ISDN PRI)</i>³
PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	Yes	
PCM-24 T1 B8ZS/ESF ISDN PRI	Yes	
Analog E&M Signaling Type I	No	
Line Interfaces		
Interface & Signaling	Critical	Exchange & Functional Requirements
TPC ISDN BRI ST and U Interface Q.931	Yes	<ul style="list-style-type: none"> - MLPP - Hotline Services¹ - ANSI T1.619a - ISDN Supplemental Services - Call Treatments - DSN Announcements - Attendant Services² - VTC - NX56 kbps and NX64 kbps Synchronous Data - Non-secure Voice and Data - Secure Voice and Data (STE)
TPC 2-Wire analog	Yes	
TPC 2-Wire Digital and Analog (Proprietary)	No	
Network Management Interfaces		
Interface & Signaling	Critical	Exchange & Functional Requirements
		<ul style="list-style-type: none"> - Automated Message Accounting - Traffic Measurements - Alarms - Man Machine Language

Defense Switched Network

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Table 3. SUT Exchange and Functional Requirements (continued)

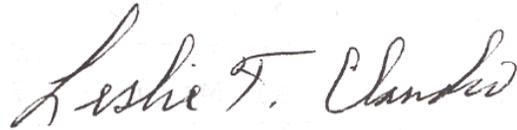
Defense Red Switch Network Gateway	Trunk Interfaces																																																																																		
	Interface & Signaling	Critical	Exchange & Functional Requirements																																																																																
	TPC 2-Wire analog	Yes	- MLPP - Secure Voice (STU-III & 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.																																																																																
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<p>Legend:</p> <table border="0"> <tr> <td>AMI</td><td>- Alternate Mark Inversion</td> <td>NATO</td><td>- North Atlantic Treaty Organization</td> </tr> <tr> <td>ANSI</td><td>- American National Standards Institute</td> <td>NI2</td><td>- National ISDN 2</td> </tr> <tr> <td>B8ZS</td><td>- Bipolar Eight Zero Substitution</td> <td>NX56</td><td>- Data format is restricted to multiples of 56K</td> </tr> <tr> <td>BRI</td><td>- Basic Rate Interface</td> <td>NX64</td><td>- Data format is restricted to multiples of 64K</td> </tr> <tr> <td>CAS</td><td>- Channel Associated Signaling</td> <td>PCM-24</td><td>- Pulse Code Modulation 24 Channels</td> </tr> <tr> <td>DP</td><td>- Dial Pulse</td> <td>PRI</td><td>- Primary Rate Interface</td> </tr> <tr> <td>DSN</td><td>- Defense Switched Network</td> <td>Q.931</td><td>- ITU Signaling Standard for ISDN</td> </tr> <tr> <td>DTMF</td><td>- Dual Tone Multi-Frequency</td> <td>SF</td><td>- Superframe</td> </tr> <tr> <td>E&M</td><td>- Ear and Mouth</td> <td>SS7</td><td>- Signaling System 7</td> </tr> <tr> <td>EIA</td><td>- Electronic Industries Alliance</td> <td>ST</td><td>- ISDN BRI Four-Wire Interface</td> </tr> <tr> <td>EKTS</td><td>- Electronic Key Telephone System</td> <td>STE</td><td>- Secure Terminal Equipment</td> </tr> <tr> <td>ESF</td><td>- Extended Superframe</td> <td>STU-III</td><td>- Secure Telephone Unit-III</td> </tr> <tr> <td>FAX</td><td>- Facsimile</td> <td>SUT</td><td>- System Under Test</td> </tr> <tr> <td>GSCR</td><td>- Generic Switching Center Requirements</td> <td>T1</td><td>- Digital Transmission Link level 1 (1.544 Mbps)</td> </tr> <tr> <td>GSTP</td><td>- Generic Switch Test Plan</td> <td>T1.619a</td><td>- SS7 and ISDN Signaling Standard for T1</td> </tr> <tr> <td>ISDN</td><td>- Integrated Services Digital Network</td> <td>TPC</td><td>- Twisted Pair Copper</td> </tr> <tr> <td>ITU</td><td>- International Telecommunications Union</td> <td>U</td><td>- ISDN BRI Two-Wire Interface</td> </tr> <tr> <td>kbps</td><td>- kilobits per second</td> <td>VTC</td><td>- Video Teleconferencing</td> </tr> <tr> <td>Mbps</td><td>- Megabits per second</td> <td>Y2K</td><td>- Year 2000</td> </tr> <tr> <td>MLPP</td><td>- Multi-Level Precedence and Preemption</td> <td></td><td></td> </tr> </table> <p>Notes:</p> <ol style="list-style-type: none"> 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 (BPA). Analog instruments do not support 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/compliance of interoperability to commercial networks was satisfied 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. 				AMI	- Alternate Mark Inversion	NATO	- North Atlantic Treaty Organization	ANSI	- American National Standards Institute	NI2	- National ISDN 2	B8ZS	- Bipolar Eight Zero Substitution	NX56	- Data format is restricted to multiples of 56K	BRI	- Basic Rate Interface	NX64	- Data format is restricted to multiples of 64K	CAS	- Channel Associated Signaling	PCM-24	- Pulse Code Modulation 24 Channels	DP	- Dial Pulse	PRI	- Primary Rate Interface	DSN	- Defense Switched Network	Q.931	- ITU Signaling Standard for ISDN	DTMF	- Dual Tone Multi-Frequency	SF	- Superframe	E&M	- Ear and Mouth	SS7	- Signaling System 7	EIA	- Electronic Industries Alliance	ST	- ISDN BRI Four-Wire Interface	EKTS	- Electronic Key Telephone System	STE	- Secure Terminal Equipment	ESF	- Extended Superframe	STU-III	- Secure Telephone Unit-III	FAX	- Facsimile	SUT	- System Under Test	GSCR	- Generic Switching Center Requirements	T1	- Digital Transmission Link level 1 (1.544 Mbps)	GSTP	- Generic Switch Test Plan	T1.619a	- SS7 and ISDN Signaling Standard for T1	ISDN	- Integrated Services Digital Network	TPC	- Twisted Pair Copper	ITU	- International Telecommunications Union	U	- ISDN BRI Two-Wire Interface	kbps	- kilobits per second	VTC	- Video Teleconferencing	Mbps	- Megabits per second	Y2K	- Year 2000	MLPP	- Multi-Level Precedence and Preemption		
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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>.

JITC Memo, JTE, Special Interoperability Test Certification of Nortel Networks Succession Defense Switched Network (DSN) Options 61C and 81C Digital Switching Systems with Software Release 3.0 and Specified Patch Groups

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.

FOR THE COMMANDER:



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3 Enclosures a/s

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20340-3342

National Security Agency, ATTN: DT, Suite 6496, 9800 Savage Road, Fort Meade, MD
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) 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) 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) 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 61C 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 61C, includes Option 81C. This platform utilizes the same software and trunk/line card hardware as the SUT and was developed to satisfy scalability requirements. JITC analysis determined the Succession DSN Option 81C identical to the SUT for interoperability purposes. The Option 61C offers the following features: scalable, distributed platform for growth from 200 to 2000 lines, modular client/server architecture for flexibility, scalability, and a redundant call processing core for extra reliability in mission-critical enterprises. Nortel Network's Succession DSN Options 61C and 81C Digital Switching Systems are currently in use within the DSN providing Small End Office (SMEO) switch functionality. The SUT was tested and met the critical interoperability requirements for joint use within the DSN for the following switch types: SMEO (except Europe), Private Branch Exchange 1 (PBX1), and PBX2.

6. OPERATIONAL ARCHITECTURE. The Generic Switching Center Requirements (GSCR) operational DSN Architecture is depicted in figure 2-1.

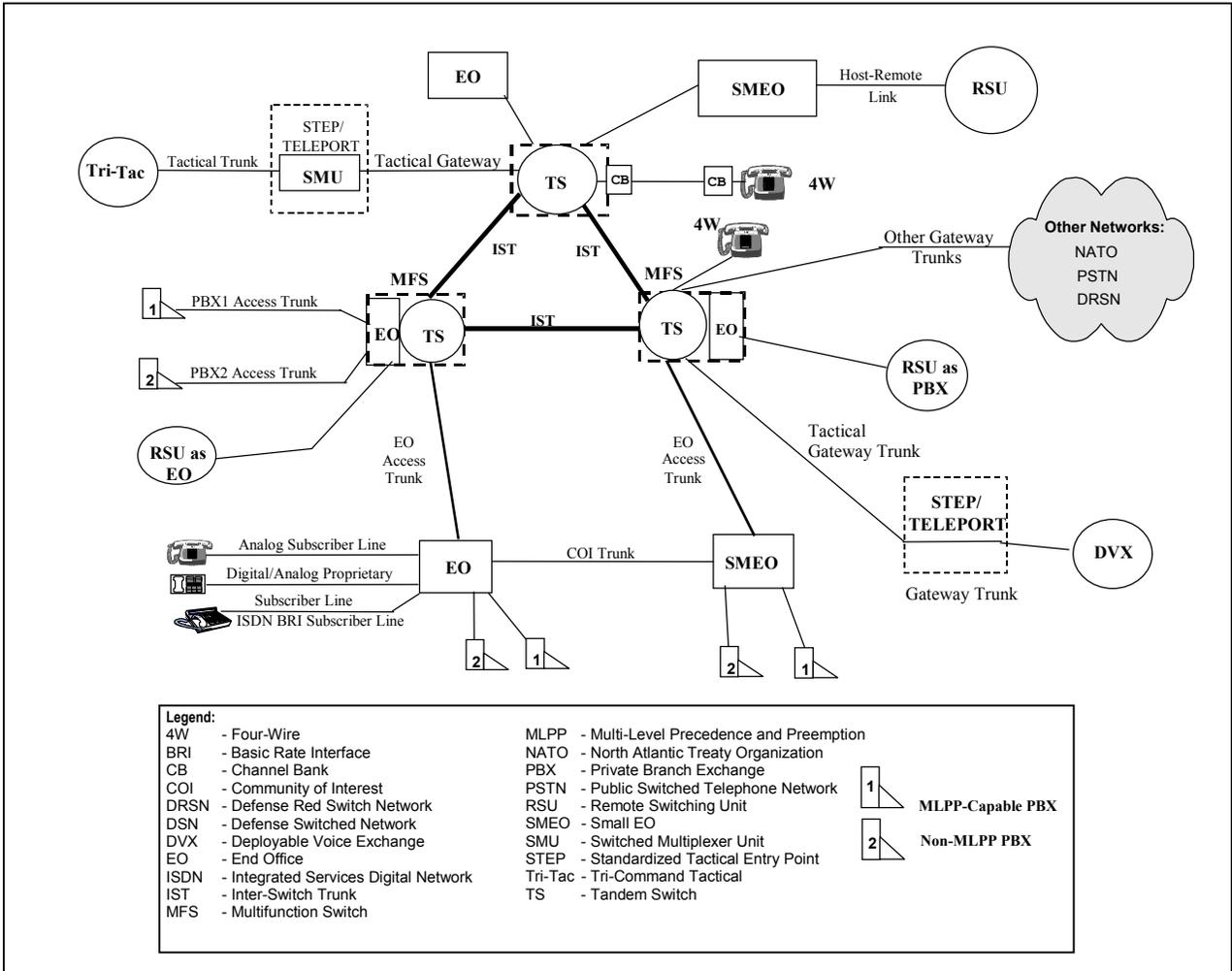


Figure 2-1. DSN Architecture

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
Defense Switched Network	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	Yes	<ul style="list-style-type: none"> - MLPP - Hotline Services¹ - System Interface <ul style="list-style-type: none"> • Non-secure Voice and Data • Secure Voice and Data (STU-III and STE) • NX56 kbps and NX64 kbps Synchronous Data (T1 ISDN PRI only) • Non-secure and Secure FAX • VTC (T1 ISDN PRI only) • Alarms
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	Yes	<ul style="list-style-type: none"> • Non-secure and Secure FAX • VTC (T1 ISDN PRI only) • Alarms
	PCM-24 T1 B8ZS/ESF ISDN PRI	Yes	<ul style="list-style-type: none"> - Integrated Services Digital Network (T1 ISDN PRI only) - Attendant Services² - System Administration, Measurements, and Service Standards - Y2K (Rollover, Valid, and Invalid Dates)
	Analog E&M Signaling Type I	No	<ul style="list-style-type: none"> - Screening, Zone Restriction, and DSN Access Restriction - Automated Message Accounting - Network Integration - ANSI T1.619a (T1 ISDN PRI only)³

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

Line Interfaces				
	Interface & Signaling	Critical	Exchange and Functional Requirements	
Defense Switched Network (continued)	TPC ISDN BRI ST and U Interface Q.931	Yes	<ul style="list-style-type: none"> - MLPP - Hotline Services¹ - ANSI T1.619a - ISDN Supplemental Services - Call Treatments - DSN Announcements - Attendant Services² - VTC - NX56 kbps and NX64 kbps Synchronous Data - Non-secure Voice and Data - Secure Voice and Data (STE) 	
	TPC 2-Wire analog	Yes	<ul style="list-style-type: none"> - MLPP - Hotline Services¹ - DSN Announcements - Traffic Measurements - Attendant Services² - Call Treatments⁴ - Non-secure Voice and Data - Non-secure and Secure FAX - Secure Voice and Data (STU-III and STE) 	
	TPC 2-Wire Digital and Analog (Proprietary)	No	<ul style="list-style-type: none"> - MLPP - Hotline Services¹ - DSN Announcements - Traffic Measurements - Attendant Services² - Call Treatments - Non-secure Voice 	
	Network Management Interfaces			
		Interface & Signaling	Critical	Exchange and Functional Requirements
		TPC EIA Asynchronous @ 9.6 kbps	Yes	<ul style="list-style-type: none"> - Automated Message Accounting - Traffic Measurements - Alarms - Man Machine Language
Defense Red Switch Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Exchange and Functional Requirements	
	2-Wire Analog Loop	Yes	<ul style="list-style-type: none"> - MLPP - Secure Voice 	
Tactical Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Exchange and Functional Requirements	
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	No	<ul style="list-style-type: none"> - MLPP - Non-secure Voice 	

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	ISDN - Integrated Services Digital Network	SS7 - Signaling System 7
ANSI - American National Standards Institute	ITU - International Telecommunications Union	ST - ISDN BRI Four-Wire Interface
B8ZS - Bipolar Eight Zero Substitution	kbps - kilobits per second	STE - Secure Terminal Equipment
BRI - Basic Rate Interface	Mbps - Megabits per second	STU-III - Secure Telephone Unit III
CAS - Channel Associated Signaling	MLPP - Multi-Level Precedence and Preemption	SUT - System Under Test
DP - Dial Pulse	NATO - North Atlantic Treaty Organization	T1 - Digital Transmission Link level 1 (1.544 Mbps)
DSN - Defense Switched Network	NI2 - National ISDN 2	T1.619a - SS7 and ISDN Signaling Standard for T1
DTMF - Dual Tone Multi-Frequency	NX56 - Data format restricted to multiples of 56K	TPC - Twisted Pair Copper
EIA - Electronic Industries Alliance	NX64 - Data format restricted to multiples of 64K	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	
GSTP - Generic Switch Test Plan	SF - Superframe	

Notes:

- SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is 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 (BPA).
- 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, which accurately emulates the DSN operational environment. Network integration testing, which accurately emulates the DSN operational environment, was conducted using the test configuration depicted in figure 2-3. 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.

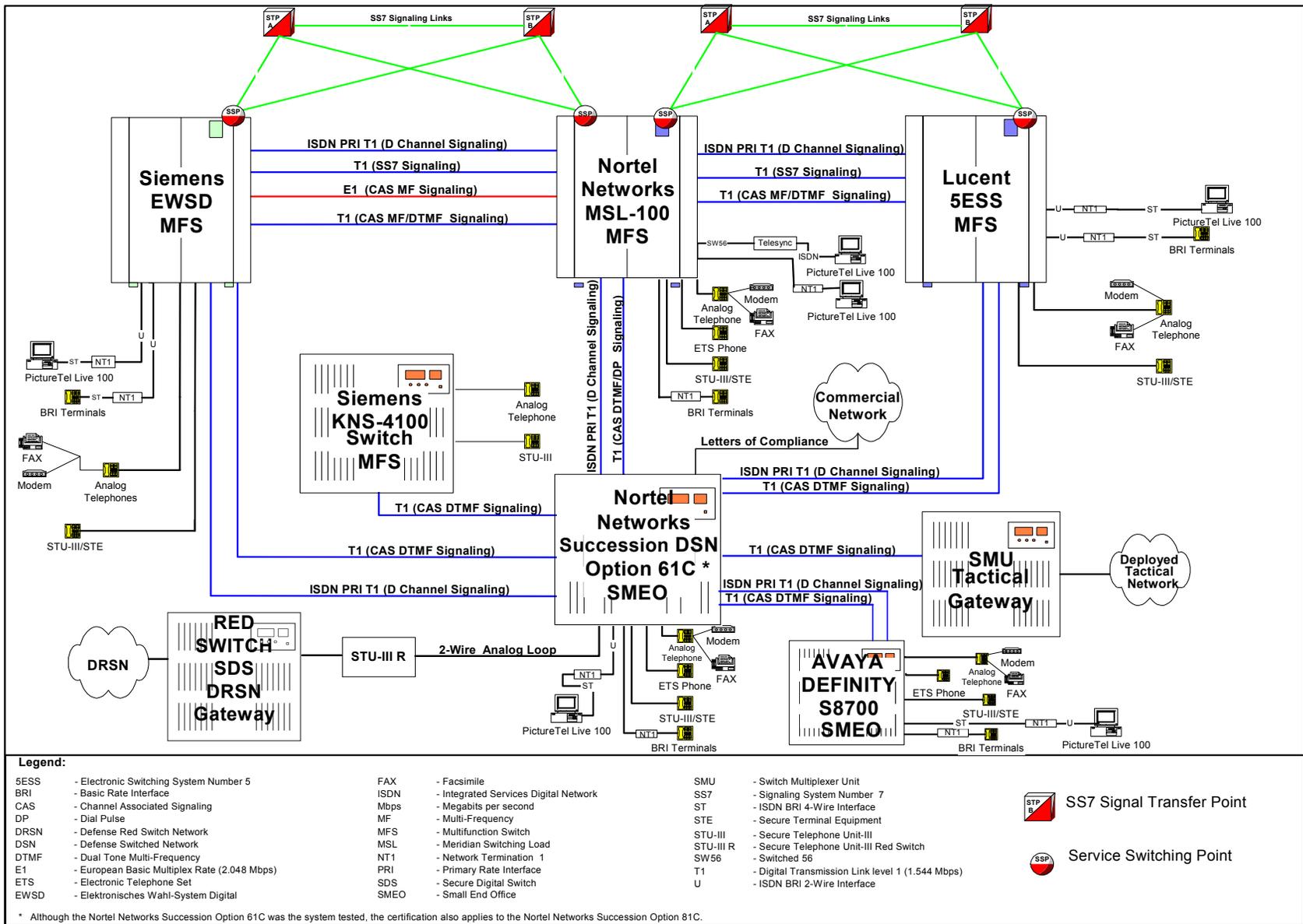


Figure 2-2. Test Configuration

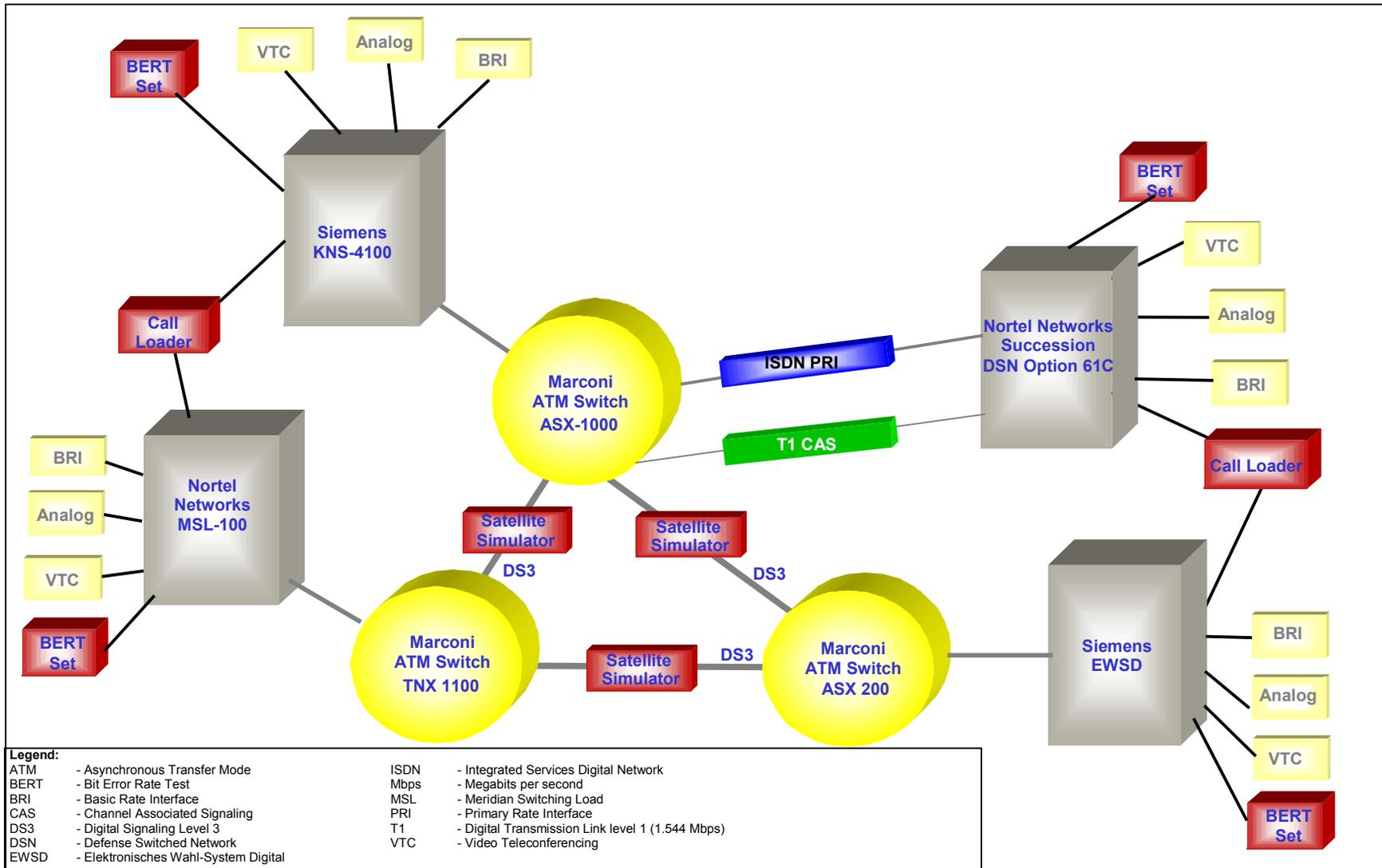
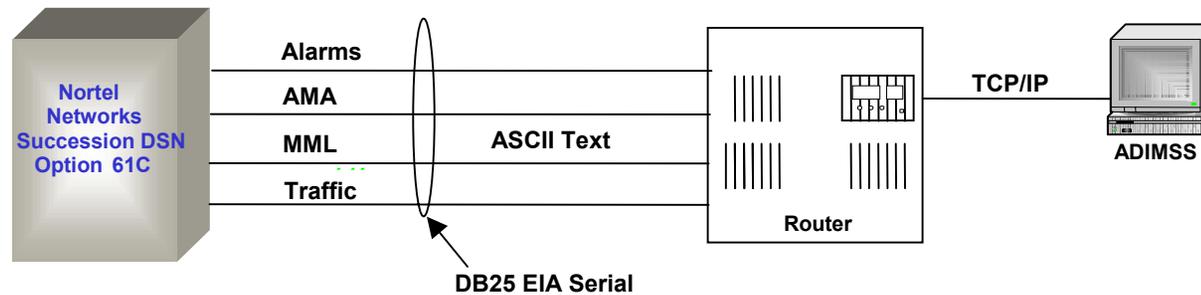


Figure 2-3. Network Integration Test Configuration



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 - Transfer 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	MSL-17
Nortel Networks Succession DSN Option 11C	3.0
Avaya MultiVantage S8700	R011x.7585.7.0.2
Nortel Networks Succession DSN Option 61C	3.0
Siemens EWSD	19d with Patch Set 32
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
Legend: 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 81C. The Nortel Networks Succession DSN Option 61C Digital Switching System employs the same software and trunk/line card hardware as the DSN Option 81C 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	Yes	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met ¹
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant Services	Yes	II-7.2	2.1.3	No	Met ²
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	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	Yes	Met
		Network Integration	No	II-20.2	10	Yes	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	Yes	Met
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met ¹
		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
		Attendant Services	Yes	II-7.2	2.1.3	No	Met ²
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	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	Yes	Met
		Network Integration	No	II-20.2	10	Yes	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 ¹
		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 ²
		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	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	Yes	Met
		Network Integration	No	II-20.2	10	Yes	Met
		ANSI T1.619a	No	II-6.2	21.3.1	Yes	Met ³

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 ⁴
		Hotline Services	Yes	II-3.2	21.3.10	No	Not Met ¹
		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 ²
		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 |
| B8ZS - 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 Teleconferencing |
| E&M - Ear and Mouth | NI2 - National ISDN 2 | Y2K - Year 2000 |
| ER - Exchange Requirement | Para - Paragraph | |

Notes:

- 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 (BPA).
- 4 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 ¹
		ANSI T1.619a	No	II-6.2	21.3.1	Yes	Met
		ISDN Supplemental Services	Yes	II-6.2	21.3	No	Not Met ²
		Attendant Services	Yes	II-7.2	2.1.3	No	Met ³
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met
		AMA	No	II-14.2	8.1	Yes	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 ¹
		Attendant Services	Yes	II-7.2	2.1.3	No	Met ³
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met ⁴
		AMA	No	II-14.2	8.1	Yes	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 ¹
		Attendant Services	Yes	II-7.2	2.1.3	No	Met ³
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	No	Met
		AMA	No	II-14.2	8.1	Yes	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 Requirement
FR - Functional Requirement
GSCR - Generic Switching Center Requirements
GSTP - Generic Switch Test Plan
ISDN - Integrated Services Digital Network
MLPP - Multi-Level Precedence and Preemption
Para - Paragraph
ST Interface - ISDN BRI 4-Wire Interface
SUT - System Under Test
TPC - Twisted Pair Copper
U Interface - ISDN BRI 2-Wire Interface

Notes:
1 The SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is 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 SMEO.

Table 2-5. Defense Switched Network 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	Yes	Met
		Traffic Measurements	No	II-23.2	2.1.10, 16.1	Yes	Met
		MML	No	II-23.2	2.1.10, 16.1	Yes	Met
		Alarms	No	II-23.2	2.1.10, 16.1	Yes	Met
Legend: AMA - Automated Message Accounting EIA - Electronic Industries Alliance ER - Exchange Requirement FR - Functional Requirement 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
Legend: ER - Exchange Requirement FR - Functional Requirement 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
Legend: AMI - Alternate Mark Inversion B8ZS - Bipolar Eight Zero Substitution DTMF - Dual Tone Multi-Frequency ER - Exchange Requirement ESF - Extended Superframe FR - Functional Requirement 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

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para(s)	GSCR Para(s)	Critical Yes/No	ER/FR Status
Same Interfaces Signaling as DSN	Certified	See Note	No	See Note	See Note	Yes	Met
<p>Legend: DSN - Defense Switched Network ER - Exchange Requirement FR - Functional Requirement GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan Para - Paragraph</p> <p>Note: The certification/compliance of interoperability to commercial networks was satisfied 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. It takes 30 seconds for a PCM-24 interface on the SUT to recover from a red alarm. 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 SMEO.

(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 of this discrepancy is minor.

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

(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 two 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 critical 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, specified in tables 2-1 through 2-15 of the GSCR, with minor exceptions. Exceptions were reviewed and assessed by DISA GS23, the Development and Operational Engineering Department, and determined to have a minor operational impact.

b. Test Summary. The Nortel Networks Succession DSN Options 61C and 81C Digital Switching Systems with software release 3.0 and specified patch groups identified in enclosure 3 are certified for joint use in the DSN for the following switch types: SMEO (except for Europe), PBX1, and PBX2, in accordance with 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 are 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 SMEO (except Europe), PBX 1, 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 critical requirements met.
Tactical Gateway	Certified	- All critical requirements met.
NATO Gateway	Not Tested	
Commercial Gateway	Certified	- All critical requirements met.
Legend:		
DRSN	- Defense Red Switch Network	SMEO
DSN	- Defense Switched Network	SUT
NATO	- North Atlantic Treaty Organization	VoIP
PBX	- Private Branch Exchange	- Small End Office
		- 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	Yes	Certified	Met all critical ERs and FRs. Hotline Services not met. ¹ Attendant Services automatic recall not met. ²
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP IN/DTMF OUT	Yes	Certified	Met all critical ERs and FRs. Hotline Services not met. ¹ Attendant Services automatic recall not met. ²
	PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all critical ERs and FRs. Hotline Services not met. ¹ Attendant Services automatic recall not met. ²
	Analog E&M Signaling Type I	No	Not Certified	Did not pass DSN preempt signals. ³
	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. ¹ ISDN Supplemental Services were not met. ⁴ Attendant Services automatic recall not met. ²
	TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs. Hotline Services not met. ¹ Intra-switch call waiting not supported. ⁵ Attendant Services automatic recall not met. ²
TPC 2-Wire Digital (Proprietary)	No	Certified	Met all critical ERs and FRs. Hotline Services not met. ¹ Attendant Services automatic recall not met. ²	
Network Management Interfaces				
Interface & Signaling	Critical	Status	Remarks	
TPC EIA Asynchronous @ 9.6 kbps	Yes	Certified	Met all critical 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	Yes	Certified	Met all critical 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 B8ZS - Bipolar Eight Zero Substitution BRI - Basic Rate Interface CAS - Channel Associated Signaling DP - Dial Pulse DISN - Defense Information Systems Network DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency E&M - Ear and Mouth EIA - Electronic Industries Alliance ERs - Exchange Requirements ESF - Extended Superframe FRs - Functional Requirements GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan ISDN - Integrated Services Digital Network kbps - kilobits per second Mbps - Megabits per second NATO - North Atlantic Treaty Organization PCM-24 - Pulse Code Modulation 24 Channels PRI - Primary Rate Interface RS - Recommended Standard SF - Superframe ST - ISDN BRI Four-Wire Interface T1 - Digital Transmission Link level 1 (1.544 Mbps) TPC - Twisted Pair Copper U - ISDN BRI Two-Wire Interface				
Notes: 1 SUT does not meet all the GSCR exchange requirements for Hotline Services. Hotline Services is not a critical requirement. 2 SUT's attendant console does not support automatic recall of attendant. The operational impact is minor. 3 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. 4 ISDN Supplemental Services are currently not used in the DISN. The operational impact is minor. 5 Intra-switch call waiting is not supported on analog instruments. The operational impact is minor. 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.				

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

Core Software Patch List		
Patch ID Number	CR Number	Description
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.
Legend: 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		