



DEFENSE INFORMATION SYSTEMS AGENCY

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IN REPLY
REFER TO: Joint Interoperability Test Command (JTE)

MEMORANDUM FOR DISTRIBUTION

7 Mar 11

SUBJECT: Special Interoperability Test Certification of L-3 Communications Maritime Communications (MarCom) Integrated Voice Communication System (IVCS) Version 7.5.2 Build 4

References: (a) DoD Directive 4630.05, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01E, "Interoperability and Supportability of Information Technology and National Security Systems," 15 December 2008
(c) through (f), see Enclosure 1

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.

2. The L-3 Communications MarCom IVCS Version 7.5.2 Build 4 is hereinafter referred to as the system under test (SUT). The SUT meets all of its critical interoperability requirements and is certified for joint use within the Defense Information System Network (DISN) for the following switch types: Private Branch Exchange (PBX) 1 and PBX 2. The SUT meets the critical interoperability requirements set forth in Reference (c), using test procedures derived from Reference (d). No other configurations, features, or functions, except those cited within this report, are certified by the JITC. This certification expires upon changes that could affect interoperability, but no later than three years from the date of Defense Information Assurance (IA)/Security Accreditation Working Group (DSAWG) accreditation.

3. This finding is based on interoperability testing, DISA adjudication of open test discrepancy reports, review of the vendor's Letters of Compliance (LoC), and DSAWG accreditation. Interoperability testing of the SUT was conducted at JITC's Global Information Grid Network Test Facility at Fort Huachuca, Arizona, from 17 May through 29 June 2010. Regression testing was conducted from 13 through 17 December 2010. DISA adjudication of outstanding test discrepancy reports was completed on 14 August 2010. Review of vendor's LoC was completed on 29 June 2010. DSAWG granted accreditation on 28 February 2011 based on the security testing completed by DISA-led IA test teams and published in a separate report, Reference (e). Enclosure 2 documents the test results and describes the tested network and system configurations.

4. The interoperability test summary of the SUT is indicated in Table 1. The PBX 1 Capability Requirements (CRs) and Feature Requirements (FRs) are listed in Table 2. This interoperability test status is based on the SUT’s ability to meet:

- a. Defense Switched Network (DSN) services for Network and Applications specified in Reference (f).
- b. PBX 1 interface and signaling requirements for trunks/lines specified in Reference (c) verified through JITC testing in accordance with Reference (d) and/or vendor submission of LoC.
- c. PBX 1 CRs/FRs specified in Reference (c) verified through JITC testing in accordance with Reference (d) and/or vendor submission of LoC.
- d. The overall system interoperability performance derived from test procedures listed in Reference (d).

Table 1. SUT Interoperability Test Summary

DSN Trunk Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 CAS (DTMF, DP)	No	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
E1 CAS (DTMF, DP)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Met all critical CRs and FRs with the following minor exception: The SUT does not support NFAS. ¹
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
DSN Line Interfaces			
Interface & Signaling	Critical	Status	Remarks
2-Wire Analog (GR-506-CORE)	Yes	Certified	Met all critical CRs and FRs.
ISDN BRI NI 1/2 (ANSI T1.619a)	No	Certified	The SUT met all critical CRs and FRs for the ISDN BRI S/T interface for data and VTC. The SUT does not support ISDN BRI U interface and it is not required for a PBX 1.
DSN Features and Capabilities			
Feature/Capability	Critical	Status	Remarks
Common Features	Yes	Certified	Met all critical CRs and FRs with the following minor exceptions: The SUT does not support Call Forward Variable. ²
Attendant	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.
Public Safety	Yes	Certified	The SUT met all critical CRs and FRs for Basic 911.
Conferencing	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.
Nailed-up Connections	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.
DSN Hotline Services	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.
MLPP	Yes	Certified	Met all critical CRs and FRs with the following minor exceptions: The SUT does not preserve the highest precedence level of the legs of a 3-way call. ³
Call Processing	Yes	Certified	Met all critical CRs and FRs.

Table 1. SUT Interoperability Test Summary (continued)

DSN Features and Capabilities (continued)				
Feature/Capability	Critical	Status	Remarks	
ISDN Services	Yes	Certified	Met all critical CRs and FRs.	
Synchronization	Yes	Certified	Met all critical CRs and FRs.	
Reliability	Yes	Certified	Met all critical CRs and FRs.	
Network Management	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.	
Security	Yes	Certified	See note 4.	
Network Gateways				
Gateway	Interface & Signaling	Critical	Status	Remarks
PSTN	T1 CAS (DTMF, DP)	No	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
	E1 CAS (DTMF, DP)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
	T1 ISDN PRI NI 1/2 (ANSI T1.607)	No	Certified	Met all critical CRs and FRs.
	E1 ISDN PRI (ITU-T Q.931)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
	Ground Start Line	Yes	Not Tested	This interface is not supported by the SUT. ⁵
NOTES:				
1 The SUT does not support NFAS on their T1 ISDN PRI NI2 interface. This was adjudicated previously by DISA on 17 December 2008 as having a minor operational impact. Furthermore, DISA, in coordination with the Joint Staff, stated their intent to modify the next update of the UCR to change NFAS for a PBX 1 from required to conditional.				
2 The SUT does not support Call Forward Variable. This was a new UCR requirement and the vendor has 18 months (until July 2010) to comply.				
3 When attempting or placing an MLPP three way conference where each leg is at a difference precedence level, the SUT does not preserve the highest precedence level of any of the call legs that are connected. However, the SUT classmarks all three members of the three way conference at the highest precedence. This has a minor operational impact.				
4 Security is tested by DISA-led Information Assurance test teams and published in a separate report, Reference (e).				
5 The SUT does not support a ground start line interface. This was adjudicated by DISA on 14 August 2010 because SUT does support loop start and its application is solely deployed on Navy Ships to support ship to shore communications.				
LEGEND:				
ANSI	American National Standards Institute	LSSGR	Local Access and Transport Area (LATA) Switching Systems Generic Requirements	
BRI	Basic Rate Interface	Mbps	Megabits per second	
CAS	Channel Associated Signaling	MLPP	Multi-Level Precedence and Preemption	
CFV	Call Forward Variable	NFAS	Non-Facility Associated Signaling	
CRs	Capability Requirements	NI 1/2	National ISDN Standard 1 or 2	
DISA	Defense Information Systems Agency	NI2	National ISDN Standard 2	
DISR	DoD Information Technology Standards Registry	OSD	Office of the Secretary of Defense	
DoD	Department of Defense	PBX 1	Private Branch Exchange 1	
DP	Dial Pulse	PRI	Primary Rate Interface	
DSN	Defense Switched Network	PSTN	Public Switched Telephone Network	
DSS1	Digital Subscriber Signaling 1	Q.931	Signaling Standard for ISDN	
DTMF	Dual Tone Multi-Frequency	Q.955.3	ISDN Signaling standard for E1 MLPP	
E1	European Basic Multiplex Rate (2.048 Mbps)	S/T	ISDN BRI 4-wire interface	
FRs	Feature Requirements	SS7	Signaling System 7	
GR	Generic Requirement	SUT	System Under Test	
GR-506-CORE	LSSGR: Signaling for Analog Interfaces	T1	Digital Transmission Link Level 1 (1.544 Mbps)	
ISDN	Integrated Services Digital Network	T1.607	ISDN Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1	
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1	
JITC	Joint Interoperability Test Command	U	ISDN BRI 2-wire interface	
LoC	Letter of Compliance	UCR	Unified Capabilities Requirements	

Table 2. PBX 1 Requirements

DSN Trunk Interfaces				
Interface	Critical	Requirements Required or Conditional	References	
T1 CAS (MFR1, DTMF, DP)	No	Trunking	<ul style="list-style-type: none"> • Direct Inward Dialing (C) • National ISDN 1/2 Primary Access (R: PRI only) • ISDN ANSI MLPP Service Capability (R: PRI only) • ITU-T ISDN Primary Access (C: E1 PRI only) • ITU-T ISDN Primary Access DSS1 MLPP (C: E1 PRI only) • Trunk Group-Remove from Service (C) • Trunk Group-Restore to Service (C) • Normal Wink Start Operations (C: CAS only) • Glare Operation (C: CAS only) • Abnormal Wink Start (C: CAS only) • Glare Resolution (C: CAS only) • Call for Service Timing (R: CAS only) • Guard Timing (R: CAS only) • Satellite Timing (C: CAS only) • Disconnect Control (C: CAS only) • Reselect and Retrial (C: CAS only) • Off-Hook Supervision Transition (C: CAS only) • Dial-Pulse Signals (C: CAS only) • DTMF Signaling (C: CAS only) • Standard Digit Format for Precedence (C: CAS only) • MFR1 2/6 Signaling (C: CAS only) • Alerting Signals and Tones (R) • DSN ISDN User-to-Network Signaling (R: PRI only) • Application (R: PRI only) • Physical Layer (R: PRI only) • Data Link Layer (R: PRI only) • Data Link Connection (R: PRI only) • Peer-to-Peer Procedures of Data-Link Layer (R: PRI only) • Layer 3 DSN User-to-Network Signaling (R: PRI only) • DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R: PRI only) • Sequence of Messages for DSN Circuit Switched Calls (R: PRI only) • Message Functional Definition and Content (R: PRI only) • General Message Format and Information Elements Coding (R: PRI only) • Supplementary Services (C: PRI only) • DSN Transmission Interface (R) • PCM-24 Digital Trunk Interface (R) • Interface Characteristics (R) • Supervisory Channel Associated Signaling (C: CAS only) • Clear Channel Capability (R) • Alarm and Restoral Requirements (R) • PCM-30 Digital Trunk Interface (Europe only) (C) • Supervisory Channel Associated Signaling (C: E1 only) • Alarm and Restoral Requirements (C: E1 only) • Interoperation of PCM-24 and PCM-30 (C) • Analog Trunk Interface (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.3.2 • UCR Section 5.2.1.3.4.1 • UCR Section 5.2.1.3.4.1.1 • UCR Section 5.2.1.3.4.2 • UCR Section 5.2.1.3.4.2.1 • UCR Section 5.2.1.5.5 • UCR Section 5.2.1.5.5 • UCR Section 5.2.4.3.3.1.1 • UCR Section 5.2.4.3.3.1.2 • UCR Section 5.2.4.3.3.2.1 • UCR Section 5.2.4.3.3.2.2 • UCR Section 5.2.4.3.5 • UCR Section 5.2.4.3.6 • UCR Section 5.2.4.3.7 • UCR Section 5.2.4.3.8 • UCR Section 5.2.4.3.9 • UCR Section 5.2.4.3.10 • UCR Section 5.2.4.4.1 • UCR Section 5.2.4.4.2 • UCR Section 5.2.4.4.2.1 • UCR Section 5.2.4.4.3 • UCR Section 5.2.4.5.1 • UCR Section 5.2.4.7.1 • UCR Section 5.2.4.7.1.1 • UCR Section 5.2.4.7.1.2 • UCR Section 5.2.4.7.1.3 • UCR Section 5.2.4.7.1.3.1 • UCR Section 5.2.4.7.1.3.2 • UCR Section 5.2.4.7.1.4 • UCR Section 5.2.4.7.1.4.2 • UCR Section 5.2.4.7.1.4.3 • UCR Section 5.2.4.7.1.4.4 • UCR Section 5.2.4.7.1.4.5 • UCR Section 5.2.4.7.1.4.6 • UCR Section 5.2.5 • UCR Section 5.2.6.1 • UCR Section 5.2.6.1.1 • UCR Section 5.2.6.1.2 • UCR Section 5.2.6.1.3 • UCR Section 5.2.6.1.4 • UCR Section 5.2.6.2 • UCR Section 5.2.6.2.1 • UCR Section 5.2.6.2.2 • UCR Section 5.2.6.3 • UCR Section 5.2.6.4
E1 CAS (MFR1, DTMF, DP)	No (Europe only)			
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes			
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)			

Table 2. PBX 1 Requirements (continued)

DSN Trunk Interfaces (continued)					
Interface	Critical	Requirements Required or Conditional		References	
T1 CAS (MFR1, DTMF, DP)	No	Voice	<ul style="list-style-type: none"> • MOS (R) • Secure calls (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C 	
E1 CAS (MFR1, DTMF, DP)	No (Europe only)	Facsimile	<ul style="list-style-type: none"> • Analog: ITU-T T.4 (R) 	<ul style="list-style-type: none"> • DISR 	
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Data	<ul style="list-style-type: none"> • Modem (VBD) (R) • 56 kbps switched data (R: PRI only) • 64 kbps switched data (R: PRI only) • NX56 synchronous BER (R: PRI only) • NX64 synchronous BER (R: PRI only) • Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • UCR Section 5.2.2.9.6 • UCR Section 5.2.2.9.6 • UCR Section 5.2.2.9.6 • CJCSI 6215.01C 	
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	VTC	<ul style="list-style-type: none"> • ITU-T H.320 (R: PRI only) 	<ul style="list-style-type: none"> • FTR 1080B-2002 	
DSN Line Interfaces					
2-Wire Analog	Yes	Access	<ul style="list-style-type: none"> • Directory Number Identification (R) • PBX Line (C) • National ISDN 1/2 Basic Access (C) • Analog Line (R) • Basic Line Test Capabilities (R) • Advanced Line Test Capabilities (C) • Loop Start Line (R: 2-Wire Analog only) • Reverse Battery (R) • Alerting Signals and Tones (R) • S/T Reference Point (ISDN BRI) (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.1.1 • UCR Section 5.2.1.3.1 • UCR Section 5.2.1.3.3 • UCR Section 5.2.1.3.5 • UCR Section 5.2.1.5.4.1.1 • UCR Section 5.2.1.5.4.1.1 • UCR Section 5.2.4.2.1 • UCR Section 5.2.4.3.1 • UCR Section 5.2.4.5.1 • UCR Section 5.2.4.7.1.2.1 	
ISDN BRI NI 1/2 (ANSI T1.619a)	No				
2-Wire Proprietary Digital	No		Voice	<ul style="list-style-type: none"> • MOS (R) • Secure Calls (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C
			Facsimile	<ul style="list-style-type: none"> • Analog: ITU-T T.4 (R) 	<ul style="list-style-type: none"> • DISR
		Data	<ul style="list-style-type: none"> • Modem (VBD) (R: 2-Wire Analog only) • Secure data (STE/SCIP) (R: 2-Wire Analog only) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C 	
		VTC	<ul style="list-style-type: none"> • ITU-T H.320 (C: BRI only) 	<ul style="list-style-type: none"> • FTR 1080B-2002 	
DSN Features & Capabilities					
Feature/ Capability	Critical	Requirements Required or Conditional		References	
Common Features	Yes	<ul style="list-style-type: none"> • Individual Lines (R) • Denied originating service (C) • Code restriction and diversion (C) • Call waiting (R) • Three-way calling (R) • Add-on transfer, conference calling, and call hold (C) • Call Transfer Individual - All calls (R) • Call Transfer - Internal Only (R) • Call Transfer - Individual - Incoming Only/Add-On Consultation Hold - Incoming Call (R) • Call Transfer - Outside (R) • Call Transfer - Add-On to Fully Restricted Station (C) • Call Transfer - Attendant (C) • Call Hold (R) • Conference Calling - Six Way Station Controlled (C) • Call Forwarding Variable (R) • Call Forward Busy Line (R) • Call Forwarding - Don't Answer - All Calls (R) • Selective Call Forwarding (C) • Call pick-up (C) • Address Translation (C) • Assured Dial Tone (R) 		<ul style="list-style-type: none"> • UCR Section 5.2.1.1.1 • UCR Section 5.2.1.1.3 • UCR Section 5.2.1.1.4 • UCR Section 5.2.1.1.5.1 • UCR Section 5.2.1.1.6 • UCR Section 5.2.1.1.7 • UCR Section 5.2.1.1.7.1 • UCR Section 5.2.1.1.7.2 • UCR Section 5.2.1.1.7.3 • UCR Section 5.2.1.1.7.4 • UCR Section 5.2.1.1.7.5 • UCR Section 5.2.1.1.7.6 • UCR Section 5.2.1.1.7.7 • UCR Section 5.2.1.1.7.8 • UCR Section 5.2.1.1.8.1 • UCR Section 5.2.1.1.8.2 • UCR Section 5.2.1.1.8.3 • UCR Section 5.2.1.1.8.4 • UCR Section 5.2.1.1.9.1 • UCR Section 5.2.1.7 • UCR Section 5.2.1.9 	
Attendant	No	<ul style="list-style-type: none"> • Attendant Features (C) 		<ul style="list-style-type: none"> • UCR Section 5.2.1.2.2 	

Table 2. PBX 1 Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	Critical	Requirements Required or Conditional	References
Public Safety	Yes	<ul style="list-style-type: none"> • Emergency Service (911) Caller (R) • Emergency Service (911) Public Safety Answering Service (C) • Enhanced Emergency Service (E911) (C) • Trace of terminating calls (C) • Outgoing call trace (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.4.1.1 • UCR Section 5.2.1.4.1.2 • UCR Section 5.2.1.4.1.3 • UCR Section 5.2.1.4.2 • UCR Section 5.2.1.4.3
Conferencing	No	<ul style="list-style-type: none"> • Preset Conferencing (C) • Meet-Me Conferencing (C) • Progressive Conferencing (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.6.1 • UCR Section 5.2.1.6.2 • UCR Section 5.2.1.6.3
Nailed-up Connections	No	<ul style="list-style-type: none"> • Nailed-Up Connections (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.8
DSN Hotline Services	No	<ul style="list-style-type: none"> • DSN Analog Hotline Service (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.12
MLPP	Yes	<ul style="list-style-type: none"> • MLPP Overview (R) • Preemption in the Network (R) • Network Facility with Lower Precedence Calls (R) • Network Facility with Equal or Higher Precedence Calls (R) • Precedence Call Diversion (R) • Channel Associated Signaling (C) • Primary Rate Interface (R) • Analog Line MLPP (R) • ISDN MLPP Basic Rate Interface (C) • ISDN Primary Rate Interface (R) • Precedence Call Waiting (R) • Call Forwarding (R) • Call Transfer (R) • Call Hold (R) • Three-Way Calling (R) • Call Pickup (C) • Conferencing (C) • Multiline Hunt Group (C) • Community of Interest (C) • MLPP Interaction with EKTS features (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.2.1.1 • UCR Section 5.2.2.2 • UCR Section 5.2.2.2.1 • UCR Section 5.2.2.2.2 • UCR Section 5.2.2.3 • UCR Section 5.2.2.4.1 • UCR Section 5.2.2.4.2 • UCR Section 5.2.2.5 • UCR Section 5.2.2.6 • UCR Section 5.2.2.7 • UCR Section 5.2.2.8.1 • UCR Section 5.2.2.8.2 • UCR Section 5.2.2.8.3 • UCR Section 5.2.2.8.4 • UCR Section 5.2.2.8.5 • UCR Section 5.2.2.8.6 • UCR Section 5.2.2.8.7.1 • UCR Section 5.2.2.8.8 • UCR Section 5.2.2.8.9 • UCR Section 5.2.2.10.1

Table 2. PBX 1 Requirements (continued)

DSN Features & Capabilities (continued)			
Feature/ Capability	Critical	Requirements Required or Conditional	References
Call Processing	Yes	<ul style="list-style-type: none"> • Call Treatments (R) • Primary and Alternate Routing (C) • E&M Lead Signaling States (C) • 4-Wire Analog User Access Lines (C) • 2-Wire User Access Lines (R) • Termination of Analog Lines (R) • DSN User Dialing (R) • Interswitch and Intraswitch Dialing (R) • Seven-Digit Dialing (R) • Ten-Digit Dialing (R) • Access Code (R) • Access Digit (R) • Precedence Digit (R) • Service Digit (R) • Route Code (R) • Area Code (R) • Switch Code (R) • Line Number (R) • Calling Name Delivery (C) • Calling Number Delivery (R) • Emergency Service 911 Conflict Resolution (R) • DSN Switch Outpulsing Digit Formats (C) • Standard Directory Number (R) • Standard Test Numbers (C) • Base Services – Abbreviated Numbers (C) • Digit Reception Requirements (R) • Screening (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.3.1 • UCR Section 5.2.3.2 • UCR Section 5.2.3.3.1 • UCR Section 5.2.3.3.2 • UCR Section 5.2.3.3.3 • UCR Section 5.2.3.3.4 • UCR Section 5.2.3.5.1.1 • UCR Section 5.2.3.5.1.1 • UCR Section 5.3.3.5.2.1 • UCR Section 5.2.3.5.2.2 • UCR Section 5.2.3.5.1.3 • UCR Section 5.2.3.5.1.3.1 • UCR Section 5.2.3.5.1.3.2 • UCR Section 5.2.3.5.1.3.3 • UCR Section 5.2.3.5.1.4 • UCR Section 5.2.3.5.1.5 • UCR Section 5.2.3.5.1.6 • UCR Section 5.2.3.5.1.7 • UCR Section 5.2.3.5.1.8.1 • UCR Section 5.2.3.5.1.8.2 • UCR Section 5.2.3.5.1.9 • UCR Section 5.2.3.5.2 • UCR Section 5.2.3.5.3 • UCR Section 5.2.3.5.4 • UCR Section 5.2.3.5.5 • UCR Section 5.2.3.5.6 • UCR Section 5.2.3.5.8
ISDN Services	Yes	<ul style="list-style-type: none"> • BRI Access, Call Control and Signaling (C) • Uniform Interface Configuration for BRIs (C) • EKTS (C) • PRI Access, Call Control and Signaling (R) • PRI Features (R) • Packet Data Features and Capabilities (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.9.2, Table 5.2.9-1 • UCR Section 5.2.9.2, Table 5.2.9-2 • UCR Section 5.2.9.3, Table 5.2.9-3 • UCR Section 5.2.9.2, Table 5.2.9-4 • UCR Section 5.2.9.2, Table 5.2.9-5 • UCR Section 5.2.9.2, Table 5.2.9-6
Synchronization	Yes	<ul style="list-style-type: none"> • Line timing mode (R) • Internal Stratum 4 (R) • Synchronization Performance Monitoring Criteria (C) • DS1 Traffic Interfaces (C) • DS0 Traffic Interconnects (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.10.1.1.2 • UCR Section 5.2.10.1.1.2.2 • UCR Section 5.2.10.2 • UCR Section 5.2.10.3 • UCR Section 5.2.10.4
Reliability	Yes	<ul style="list-style-type: none"> • System Availability (R) • Backup Power (R) • Power Components (R) • UPS Requirements (R) • UPS PBX 1 Load Capacity (R) • Backup Power (Environmental) (R) • Alarms (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.11.2 • UCR Section 5.2.11.3 • UCR Section 5.2.11.3.1 • UCR Section 5.2.11.3.2 • UCR Section 5.2.11.3.2.1 • UCR Section 5.2.11.3.3 • UCR Section 5.2.11.3.4
Network Management	No	<ul style="list-style-type: none"> • Interfaces (C) • Measurements and data generation (C) • Fault management (C) • Configuration management (C) • Accounting management (C) • Performance management (C) • Network Management controls (C) • Remote access (C) 	<ul style="list-style-type: none"> • UCR section 5.2.8.1 • UCR section 5.2.8.2 • UCR section 5.2.8.3 • UCR section 5.2.8.4 • UCR section 5.2.8.5 • UCR section 5.2.8.6 • UCR section 5.2.8.7 • UCR section 5.2.8.8
Security	Yes	<ul style="list-style-type: none"> • GR-815, STIGs, and DoDI 8510.bb (DIACAP) (R) 	<ul style="list-style-type: none"> • UCR Sections 3.2.3, 3.2.5, and 5.4.6.1

Table 2. PBX 1 Requirements (continued)

Network Gateways																																																																																																																																			
Gateway	Critical	Requirements Required or Conditional			References																																																																																																																														
PSTN (See note.)	No	Trunking	<ul style="list-style-type: none"> • Positive Identification Control (C) • On-Netting (C) • Off-Netting (C) • Ground Start Line (R) • Immediate Start (C) • Delay Dial (C) 		<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C • CJCSI 6215.01C • UCR Section 5.2.4.2.2 • UCR Section 5.2.4.3.2 • UCR Section 5.2.4.3.4 																																																																																																																														
<p>NOTE: Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP.</p> <p>LEGEND:</p> <table border="0"> <tr> <td>ANSI</td> <td>American National Standards Institute</td> <td>FTR</td> <td>Federal Telecommunications Recommendation</td> <td>PBX 1</td> <td>Private Branch Exchange 1</td> </tr> <tr> <td>BER</td> <td>Bit Error Ratio</td> <td>FTR 1080B-2002</td> <td>Video Teleconferencing Services</td> <td>PCM</td> <td>Pulse Code Modulation</td> </tr> <tr> <td>BRI</td> <td>Basic Rate Interface</td> <td></td> <td></td> <td>PCM-24</td> <td>Pulse Code Modulation - 24 Channels</td> </tr> <tr> <td>C</td> <td>Conditional</td> <td>G.711</td> <td>PCM of voice frequencies</td> <td>PCM-30</td> <td>Pulse Code Modulation - 30 Channels</td> </tr> <tr> <td>CAS</td> <td>Channel Associated Signaling</td> <td>GR</td> <td>Generic Requirement</td> <td>PRI</td> <td>Primary Rate Interface</td> </tr> <tr> <td>CJCSI</td> <td>Chairman of the Joint Chiefs of Staff Instruction</td> <td>GR-815</td> <td>Generic Requirements For Network Element/Network System (NE/NS) Security</td> <td>PSTN</td> <td>Public Switched Telephone Network</td> </tr> <tr> <td>CODEC</td> <td>Coder/Decoder</td> <td>H.320</td> <td>Standard for Narrowband VTC</td> <td>Q.955.3</td> <td>ISDN Signaling Standard for E1 MLPP</td> </tr> <tr> <td>DIACAP</td> <td>DoD Information Assurance Certification and Accreditation Process</td> <td>IEEE</td> <td>Institute of Electrical and Electronics Engineers</td> <td>R</td> <td>Required</td> </tr> <tr> <td>DISA</td> <td>Defense Information Systems Agency</td> <td>ISDN</td> <td>Integrated Services Digital Network</td> <td>S/T</td> <td>ISDN BRI four-wire interface</td> </tr> <tr> <td>DISR</td> <td>DoD IT Standards Registry</td> <td>IT</td> <td>Information Technology International</td> <td>SCIP</td> <td>Secure Communication Interoperability Protocol</td> </tr> <tr> <td>DoD</td> <td>Department of Defense</td> <td>ITU-T</td> <td>International Telecommunication Union - Telecommunication Standardization Sector</td> <td>SS7</td> <td>Signaling System 7</td> </tr> <tr> <td>DoDI</td> <td>DoD Instruction</td> <td></td> <td></td> <td>STE</td> <td>Secure Terminal Equipment</td> </tr> <tr> <td>DP</td> <td>Dial Pulse</td> <td></td> <td></td> <td>STIGs</td> <td>Security Technical Implementation Guides</td> </tr> <tr> <td>DS0</td> <td>Digital Signal Level 0 (64 kbps)</td> <td>kbps</td> <td>kilobits per second</td> <td>T.4</td> <td>Standardization of Group 3 facsimile terminals for document transmission</td> </tr> <tr> <td>DS1</td> <td>Digital Signal Level 1 (1.544 Mbps) (2.048 Mbps European)</td> <td>MFR1</td> <td>Multi-Frequency Recommendation 1</td> <td>T1</td> <td>Digital Transmission Link Level 1 (1.544 Mbps)</td> </tr> <tr> <td>DSN</td> <td>Defense Switched Network</td> <td>MLPP</td> <td>Multi-Level Precedence and Preemption</td> <td>T1.619a</td> <td>SS7 and ISDN MLPP Signaling Standard for T1</td> </tr> <tr> <td>DSS1</td> <td>Digital Subscriber Signaling 1</td> <td>MOS</td> <td>Mean Opinion Score</td> <td>UCR</td> <td>Unified Capabilities Requirements</td> </tr> <tr> <td>DTMF</td> <td>Dual Tone Multi-Frequency</td> <td>NI 1/2</td> <td>National ISDN Standard 1 or 2</td> <td>UPS</td> <td>Uninterruptible Power Supply</td> </tr> <tr> <td>E&M</td> <td>Ear and Mouth</td> <td>NX56</td> <td>Data format restricted to multiples of 56 kbps</td> <td>VBD</td> <td>Variable bit data</td> </tr> <tr> <td>E1</td> <td>European Basic Multiplex Rate (2.048 Mbps)</td> <td>NX64</td> <td>Data format restricted to multiples of 64 kbps</td> <td>VTC</td> <td>Video Teleconferencing</td> </tr> <tr> <td>EKTS</td> <td>Electronic Key Telephone System</td> <td>PBX</td> <td>Private Branch Exchange</td> <td></td> <td></td> </tr> </table>						ANSI	American National Standards Institute	FTR	Federal Telecommunications Recommendation	PBX 1	Private Branch Exchange 1	BER	Bit Error Ratio	FTR 1080B-2002	Video Teleconferencing Services	PCM	Pulse Code Modulation	BRI	Basic Rate Interface			PCM-24	Pulse Code Modulation - 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5. No detailed test report was developed in accordance with 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). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitic.fhu.disa.mil/tssi>. Due to the sensitivity of the information, the Information Assurance Accreditation Package (IAAP) that contains the approved configuration and

deployment guide must be requested directly through government civilian or uniformed military personnel from the Unified Capabilities Certification Office (UCCO), e-mail: ucco@disa.mil.

6. The JITC point of contact is Ms. Anita Mananquil, DSN 879-5164, commercial (520) 538-5164, FAX DSN 879-4347, or e-mail to anita.mananquil@disa.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 1027101.

FOR THE COMMANDER:

2 Enclosures a/s


for BRADLEY A. CLARK
Acting Chief
Battlespace Communications Portfolio

Distribution (electronic mail):

Joint Staff J-6

Joint Interoperability Test Command, Liaison, TE3/JT1

Office of Chief of Naval Operations, CNO N6F2

Headquarters U.S. Air Force, Office of Warfighting Integration & CIO, AF/XCIN (A6N)

Department of the Army, Office of the Secretary of the Army, DA-OSA CIO/G-6 ASA (ALT), SAIS-IOQ

U.S. Marine Corps MARCORSYSCOM, SIAT, MJI Division I

DOT&E, Net-Centric Systems and Naval Warfare

U.S. Coast Guard, CG-64

Defense Intelligence Agency

National Security Agency, DT

Defense Information Systems Agency, TEMC

Office of Assistant Secretary of Defense (NII)/DOD CIO

U.S. Joint Forces Command, Net-Centric Integration, Communication, and Capabilities Division, J68

Defense Information Systems Agency, GS23

ADDITIONAL REFERENCES

- (c) Office of the Assistant Secretary of Defense, "Department of Defense Unified Capabilities Requirements 2008," 22 January 2009
- (d) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006
- (e) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of L-3 Communications Maritime Communication (MarCom) Integrated Voice Communication System (IVCS) Version 7.5.2 Build 4 (Tracking Number 1027101)," 28 February 2010
- (f) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01C, "Policy for Department of Defense Voice Services with Real Time Services (RTS)," 9 November 2007

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. L-3 Communications Maritime Communications (MarCom) Integrated Voice Communication System (IVCS) Version 7.5.2 Build 4; hereinafter referred to as the System Under Test (SUT).

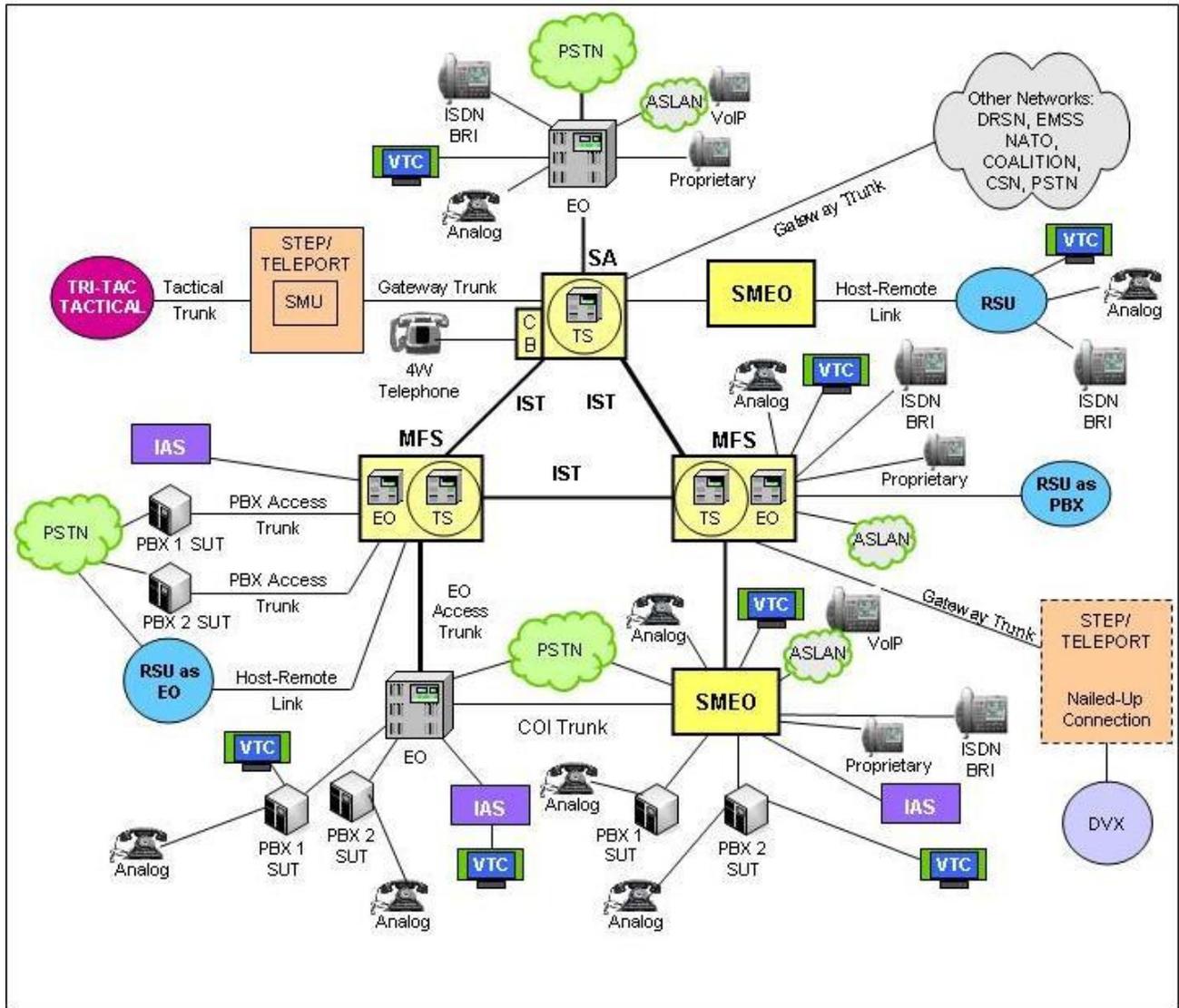
2. PROPONENT. United States Coast Guard.

3. PROGRAM MANAGER. Mr. Greg Spear, Commandant, CG-64, 2100 Second ST SW Stop 7101, Washington, DC 20593-7101, E-mail: gregory.p.spear@uscg.mil.

4. TESTER. Joint Interoperability Test Command (JITC), Fort Huachuca, Arizona.

5. SYSTEM UNDER TEST DESCRIPTION. The SUT is installed within maritime vessels to provide inter-ship communications when at sea; intra-ship communications when at sea and at port; and inter-network ship to shore communications when at port. It can provide expanded intra-ship services through interconnection of up to 4 intra-system nodes. The system provisions redundancy for all critical switching components and is managed using a closed out-of-band (OOB) private network. The closed OOB private network is confined to a single facility (i.e. ship, building) and is used exclusively for system administration, call control and connection control signaling functions. Call through-connects (Time Division Multiplex [TDM] switched interconnections supporting voice, data, tones, announcements and similar communications traffic) are not established via the OOB network. No Connections to any other local or external network exist.

6. OPERATIONAL ARCHITECTURE. The Defense Switched Network (DSN) architecture is a two-level network hierarchy consisting of DSN backbone switches and Service/Agency installation switches. Joint Staff policy and subscriber mission requirements determine which type of switch can be used at a particular location. The DSN architecture, therefore, consists of several categories of switches including PBXs. The Unified Capabilities Requirements (UCR) operational DSN Architecture is depicted in Figure 2-1. The architecture depicts the relationship of Military Department PBX 1s to the other DSN switch types.



LEGEND:

4W 4-Wire
 ASLAN Assured Services Local Area Network
 BRI Basic Rate Interface
 CB Channel Bank
 COI Community of Interest
 CSN Canadian Switch Network
 DRSN Defense Red Switch Network
 DSN Defense Switched Network
 DVX Deployable Voice Exchange
 EO End Office
 IAS Integrated Access Switch
 ISDN Integrated Services Digital Network
 IST Interswitch Trunk
 MFS Multifunction Switch

NATO North Atlantic Treaty Organization
 PBX Private Branch Exchange
 PBX 1 Private Branch Exchange 1
 PBX 2 Private Branch Exchange 2
 PSTN Public Switched Telephone Network
 RSU Remote Switching Unit
 SA Standalone
 SMEO Small End Office
 SMU Switched Multiplex Unit
 STEP Standardized Tactical Entry Point
 SUT System Under Test
 Tri-Tac Tri-Service Tactical Communications Program
 TS Tandem Switch
 VoIP Voice over Internet Protocol
 VTC Video Teleconferencing

Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. Requirements specific to PBX 1s are listed in Table 2-1. These requirements are derived from:

a. DSN services for Network and Applications specified in Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01C, "Policy for Department of Defense Voice Services with Real Time Services (RTS)", Reference (f).

b. UCR interface and signaling requirements for trunks/lines verified through JITC testing and/or vendor submission of Letters of Compliance (LoC), Reference (c).

c. UCR PBX 1 Capability Requirements (CRs) and Feature Requirements (FRs) verified through JITC testing and/or vendor submission of LoC, Reference (c).

Table 2-1. PBX 1 Requirements

DSN Trunk Interfaces				
Interface	Critical	Requirements Required or Conditional	References	
T1 CAS (MFR1, DTMF, DP)	No	Trunking	<ul style="list-style-type: none"> • Direct Inward Dialing (C) • National ISDN 1/2 Primary Access (R: PRI only) • ISDN ANSI MLPP Service Capability (R: PRI only) • ITU-T ISDN Primary Access (C: E1 PRI only) • ITU-T ISDN Primary Access DSS1 MLPP (C: E1 PRI only) • Trunk Group-Remove from Service (C) • Trunk Group-Restore to Service (C) • Normal Wink Start Operations (C: CAS only) • Glare Operation (C: CAS only) • Abnormal Wink Start (C: CAS only) • Glare Resolution (C: CAS only) • Call for Service Timing (R: CAS only) • Guard Timing (R: CAS only) • Satellite Timing (C: CAS only) • Disconnect Control (C: CAS only) • Reselect and Retrial (C: CAS only) • Off-Hook Supervision Transition (C: CAS only) • Dial-Pulse Signals (C: CAS only) • DTMF Signaling (C: CAS only) • Standard Digit Format for Precedence (C: CAS only) • MFR1 2/6 Signaling (C: CAS only) • Alerting Signals and Tones (R) • DSN ISDN User-to-Network Signaling (R: PRI only) • Application (R: PRI only) • Physical Layer (R: PRI only) • Data Link Layer (R: PRI only) • Data Link Connection (R: PRI only) • Peer-to-Peer Procedures of Data-Link Layer (R: PRI only) • Layer 3 DSN User-to-Network Signaling (R: PRI only) • DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R: PRI only) • Sequence of Messages for DSN Circuit Switched Calls (R: PRI only) • Message Functional Definition and Content (R: PRI only) • General Message Format and Information Elements Coding (R: PRI only) • Supplementary Services (C: PRI only) • DSN Transmission Interface (R) • PCM-24 Digital Trunk Interface (R) • Interface Characteristics (R) • Supervisory Channel Associated Signaling (C: CAS only) • Clear Channel Capability (R) • Alarm and Restoral Requirements (R) • PCM-30 Digital Trunk Interface (Europe only) (C) • Supervisory Channel Associated Signaling (C: E1 only) • Alarm and Restoral Requirements (C: E1 only) • Interoperation of PCM-24 and PCM-30 (C) • Analog Trunk Interface (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.3.2 • UCR Section 5.2.1.3.4.1 • UCR Section 5.2.1.3.4.1.1 • UCR Section 5.2.1.3.4.2 • UCR Section 5.2.1.3.4.2.1 • UCR Section 5.2.1.5.5 • UCR Section 5.2.1.5.5 • UCR Section 5.2.4.3.3.1.1 • UCR Section 5.2.4.3.3.1.2 • UCR Section 5.2.4.3.3.2.1 • UCR Section 5.2.4.3.3.2.2 • UCR Section 5.2.4.3.5 • UCR Section 5.2.4.3.6 • UCR Section 5.2.4.3.7 • UCR Section 5.2.4.3.8 • UCR Section 5.2.4.3.9 • UCR Section 5.2.4.3.10 • UCR Section 5.2.4.4.1 • UCR Section 5.2.4.4.2 • UCR Section 5.2.4.4.2.1 • UCR Section 5.2.4.4.3 • UCR Section 5.2.4.5.1 • UCR Section 5.2.4.7.1 • UCR Section 5.2.4.7.1.1 • UCR Section 5.2.4.7.1.2 • UCR Section 5.2.4.7.1.3 • UCR Section 5.2.4.7.1.3.1 • UCR Section 5.2.4.7.1.3.2 • UCR Section 5.2.4.7.1.4 • UCR Section 5.2.4.7.1.4.2 • UCR Section 5.2.4.7.1.4.3 • UCR Section 5.2.4.7.1.4.4 • UCR Section 5.2.4.7.1.4.5 • UCR Section 5.2.4.7.1.4.6 • UCR Section 5.2.5 • UCR Section 5.2.6.1 • UCR Section 5.2.6.1.1 • UCR Section 5.2.6.1.2 • UCR Section 5.2.6.1.3 • UCR Section 5.2.6.1.4 • UCR Section 5.2.6.2 • UCR Section 5.2.6.2.1 • UCR Section 5.2.6.2.2 • UCR Section 5.2.6.3 • UCR Section 5.2.6.4
E1 CAS (MFR1, DTMF, DP)	No (Europe only)			
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes			
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)			

Table 2. PBX 1 Requirements (continued)

DSN Trunk Interfaces (continued)					
Interface	Critical	Requirements Required or Conditional		References	
T1 CAS (MFR1, DTMF, DP)	No	Voice	<ul style="list-style-type: none"> • MOS (R) • Secure calls (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C 	
E1 CAS (MFR1, DTMF, DP)	No (Europe only)	Facsimile	<ul style="list-style-type: none"> • Analog: ITU-T T.4 (R) 	<ul style="list-style-type: none"> • DISR 	
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Data	<ul style="list-style-type: none"> • Modem (VBD) (R) • 56 kbps switched data (R: PRI only) • 64 kbps switched data (R: PRI only) • NX56 synchronous BER (R: PRI only) • NX64 synchronous BER (R: PRI only) • Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • UCR Section 5.2.2.9.6 • UCR Section 5.2.2.9.6 • UCR Section 5.2.2.9.6 • UCR Section 5.2.2.9.6 • CJCSI 6215.01C 	
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	VTC	<ul style="list-style-type: none"> • ITU-T H.320 (R: PRI only) 	<ul style="list-style-type: none"> • FTR 1080B-2002 	
DSN Line Interfaces					
2-Wire Analog	Yes	Access	<ul style="list-style-type: none"> • Directory Number Identification (R) • PBX Line (C) • National ISDN 1/2 Basic Access (C) • Analog Line (R) • Basic Line Test Capabilities (R) • Advanced Line Test Capabilities (C) • Loop Start Line (R: 2-Wire Analog only) • Reverse Battery (R) • Alerting Signals and Tones (R) • S/T Reference Point (ISDN BRI) (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.1.1 • UCR Section 5.2.1.3.1 • UCR Section 5.2.1.3.3 • UCR Section 5.2.1.3.5 • UCR Section 5.2.1.5.4.1.1 • UCR Section 5.2.1.5.4.1.1 • UCR Section 5.2.4.2.1 • UCR Section 5.2.4.3.1 • UCR Section 5.2.4.5.1 • UCR Section 5.2.4.7.1.2.1 	
ISDN BRI NI 1/2 (ANSI T1.619a)	No			<ul style="list-style-type: none"> • MOS (R) • Secure Calls (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C
2-Wire Proprietary Digital	No		Facsimile	<ul style="list-style-type: none"> • Analog: ITU-T T.4 (R) 	<ul style="list-style-type: none"> • DISR
			Data	<ul style="list-style-type: none"> • Modem (VBD) (R: 2-Wire Analog only) • Secure data (STE/SCIP) (R: 2-Wire Analog only) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C
		VTC	<ul style="list-style-type: none"> • ITU-T H.320 (C: BRI only) 	<ul style="list-style-type: none"> • FTR 1080B-2002 	
DSN Features & Capabilities					
Feature/ Capability	Critical	Requirements Required or Conditional		References	
Common Features	Yes	<ul style="list-style-type: none"> • Individual Lines (R) • Denied originating service (C) • Code restriction and diversion (C) • Call waiting (R) • Three-way calling (R) • Add-on transfer, conference calling, and call hold (C) • Call Transfer Individual - All calls (R) • Call Transfer - Internal Only (R) • Call Transfer - Individual - Incoming Only/Add-On Consultation Hold - Incoming Call (R) • Call Transfer - Outside (R) • Call Transfer - Add-On to Fully Restricted Station (C) • Call Transfer - Attendant (C) • Call Hold (R) • Conference Calling - Six Way Station Controlled (C) • Call Forwarding Variable (R) • Call Forward Busy Line (R) • Call Forwarding - Don't Answer - All Calls (R) • Selective Call Forwarding (C) • Call pick-up (C) • Address Translation (C) • Assured Dial Tone (R) 		<ul style="list-style-type: none"> • UCR Section 5.2.1.1.1 • UCR Section 5.2.1.1.3 • UCR Section 5.2.1.1.4 • UCR Section 5.2.1.1.5.1 • UCR Section 5.2.1.1.6 • UCR Section 5.2.1.1.7 • UCR Section 5.2.1.1.7.1 • UCR Section 5.2.1.1.7.2 • UCR Section 5.2.1.1.7.3 • UCR Section 5.2.1.1.7.4 • UCR Section 5.2.1.1.7.5 • UCR Section 5.2.1.1.7.6 • UCR Section 5.2.1.1.7.7 • UCR Section 5.2.1.1.7.8 • UCR Section 5.2.1.1.8.1 • UCR Section 5.2.1.1.8.2 • UCR Section 5.2.1.1.8.3 • UCR Section 5.2.1.1.8.4 • UCR Section 5.2.1.1.9.1 • UCR Section 5.2.1.7 • UCR Section 5.2.1.9 	
Attendant	No	<ul style="list-style-type: none"> • Attendant Features (C) 		<ul style="list-style-type: none"> • UCR Section 5.2.1.2.2 	

Table 2. PBX 1 Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	Critical	Requirements Required or Conditional	References
Public Safety	Yes	<ul style="list-style-type: none"> • Emergency Service (911) Caller (R) • Emergency Service (911) Public Safety Answering Service (C) • Enhanced Emergency Service (E911) (C) • Trace of terminating calls (C) • Outgoing call trace (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.4.1.1 • UCR Section 5.2.1.4.1.2 • UCR Section 5.2.1.4.1.3 • UCR Section 5.2.1.4.2 • UCR Section 5.2.1.4.3
Conferencing	No	<ul style="list-style-type: none"> • Preset Conferencing (C) • Meet-Me Conferencing (C) • Progressive Conferencing (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.6.1 • UCR Section 5.2.1.6.2 • UCR Section 5.2.1.6.3
Nailed-up Connections	No	<ul style="list-style-type: none"> • Nailed-Up Connections (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.8
DSN Hotline Services	No	<ul style="list-style-type: none"> • DSN Analog Hotline Service (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.1.12
MLPP	Yes	<ul style="list-style-type: none"> • MLPP Overview (R) • Preemption in the Network (R) • Network Facility with Lower Precedence Calls (R) • Network Facility with Equal or Higher Precedence Calls (R) • Precedence Call Diversion (R) • Channel Associated Signaling (C) • Primary Rate Interface (R) • Analog Line MLPP (R) • ISDN MLPP Basic Rate Interface (C) • ISDN Primary Rate Interface (R) • Precedence Call Waiting (R) • Call Forwarding (R) • Call Transfer (R) • Call Hold (R) • Three-Way Calling (R) • Call Pickup (C) • Conferencing (C) • Multiline Hunt Group (C) • Community of Interest (C) • MLPP Interaction with EKTS features (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.2.1.1 • UCR Section 5.2.2.2 • UCR Section 5.2.2.2.1 • UCR Section 5.2.2.2.2 • UCR Section 5.2.2.3 • UCR Section 5.2.2.4.1 • UCR Section 5.2.2.4.2 • UCR Section 5.2.2.5 • UCR Section 5.2.2.6 • UCR Section 5.2.2.7 • UCR Section 5.2.2.8.1 • UCR Section 5.2.2.8.2 • UCR Section 5.2.2.8.3 • UCR Section 5.2.2.8.4 • UCR Section 5.2.2.8.5 • UCR Section 5.2.2.8.6 • UCR Section 5.2.2.8.7.1 • UCR Section 5.2.2.8.8 • UCR Section 5.2.2.8.9 • UCR Section 5.2.2.10.1

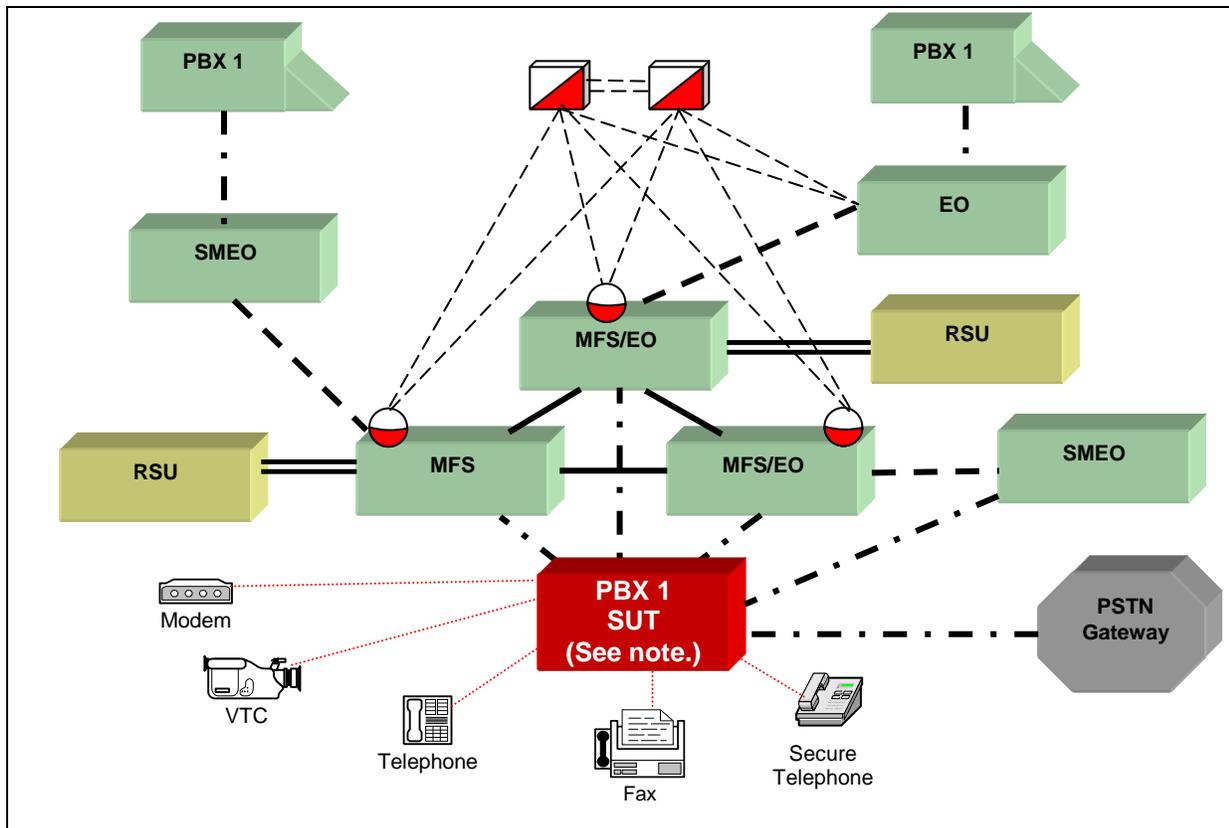
Table 2. PBX 1 Requirements (continued)

DSN Features & Capabilities (continued)			
Feature/ Capability	Critical	Requirements Required or Conditional	References
Call Processing	Yes	<ul style="list-style-type: none"> • Call Treatments (R) • Primary and Alternate Routing (C) • E&M Lead Signaling States (C) • 4-Wire Analog User Access Lines (C) • 2-Wire User Access Lines (R) • Termination of Analog Lines (R) • DSN User Dialing (R) • Interswitch and Intraswitch Dialing (R) • Seven-Digit Dialing (R) • Ten-Digit Dialing (R) • Access Code (R) • Access Digit (R) • Precedence Digit (R) • Service Digit (R) • Route Code (R) • Area Code (R) • Switch Code (R) • Line Number (R) • Calling Name Delivery (C) • Calling Number Delivery (R) • Emergency Service 911 Conflict Resolution (R) • DSN Switch Outpulsing Digit Formats (C) • Standard Directory Number (R) • Standard Test Numbers (C) • Base Services – Abbreviated Numbers (C) • Digit Reception Requirements (R) • Screening (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.3.1 • UCR Section 5.2.3.2 • UCR Section 5.2.3.3.1 • UCR Section 5.2.3.3.2 • UCR Section 5.2.3.3.3 • UCR Section 5.2.3.3.4 • UCR Section 5.2.3.5.1.1 • UCR Section 5.2.3.5.1.1.1 • UCR Section 5.3.3.5.2.1 • UCR Section 5.2.3.5.2.2 • UCR Section 5.2.3.5.1.3 • UCR Section 5.2.3.5.1.3.1 • UCR Section 5.2.3.5.1.3.2 • UCR Section 5.2.3.5.1.3.3 • UCR Section 5.2.3.5.1.4 • UCR Section 5.2.3.5.1.5 • UCR Section 5.2.3.5.1.6 • UCR Section 5.2.3.5.1.7 • UCR Section 5.2.3.5.1.8.1 • UCR Section 5.2.3.5.1.8.2 • UCR Section 5.2.3.5.1.9 • UCR Section 5.2.3.5.2 • UCR Section 5.2.3.5.3 • UCR Section 5.2.3.5.4 • UCR Section 5.2.3.5.5 • UCR Section 5.2.3.5.6 • UCR Section 5.2.3.5.8
ISDN Services	Yes	<ul style="list-style-type: none"> • BRI Access, Call Control and Signaling (C) • Uniform Interface Configuration for BRIs (C) • EKTS (C) • PRI Access, Call Control and Signaling (R) • PRI Features (R) • Packet Data Features and Capabilities (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.9.2, Table 5.2.9-1 • UCR Section 5.2.9.2, Table 5.2.9-2 • UCR Section 5.2.9.3, Table 5.2.9-3 • UCR Section 5.2.9.2, Table 5.2.9-4 • UCR Section 5.2.9.2, Table 5.2.9-5 • UCR Section 5.2.9.2, Table 5.2.9-6
Synchronization	Yes	<ul style="list-style-type: none"> • Line timing mode (R) • Internal Stratum 4 (R) • Synchronization Performance Monitoring Criteria (C) • DS1 Traffic Interfaces (C) • DS0 Traffic Interconnects (C) 	<ul style="list-style-type: none"> • UCR Section 5.2.10.1.1.2 • UCR Section 5.2.10.1.1.2.2 • UCR Section 5.2.10.2 • UCR Section 5.2.10.3 • UCR Section 5.2.10.4
Reliability	Yes	<ul style="list-style-type: none"> • System Availability (R) • Backup Power (R) • Power Components (R) • UPS Requirements (R) • UPS PBX 1 Load Capacity (R) • Backup Power (Environmental) (R) • Alarms (R) 	<ul style="list-style-type: none"> • UCR Section 5.2.11.2 • UCR Section 5.2.11.3 • UCR Section 5.2.11.3.1 • UCR Section 5.2.11.3.2 • UCR Section 5.2.11.3.2.1 • UCR Section 5.2.11.3.3 • UCR Section 5.2.11.3.4
Network Management	No	<ul style="list-style-type: none"> • Interfaces (C) • Measurements and data generation (C) • Fault management (C) • Configuration management (C) • Accounting management (C) • Performance management (C) • Network Management controls (C) • Remote access (C) 	<ul style="list-style-type: none"> • UCR section 5.2.8.1 • UCR section 5.2.8.2 • UCR section 5.2.8.3 • UCR section 5.2.8.4 • UCR section 5.2.8.5 • UCR section 5.2.8.6 • UCR section 5.2.8.7 • UCR section 5.2.8.8
Security	Yes	<ul style="list-style-type: none"> • GR-815, STIGs, and DoDI 8510.bb (DIACAP) (R) 	<ul style="list-style-type: none"> • UCR Sections 3.2.3, 3.2.5, and 5.4.6.1

Table 2. PBX 1 Requirements (continued)

Network Gateways																																																																																																																																			
Gateway	Critical	Requirements Required or Conditional			References																																																																																																																														
PSTN (See note.)	No	Trunking	<ul style="list-style-type: none"> • Positive Identification Control (C) • On-Netting (C) • Off-Netting (C) • Ground Start Line (R) • Immediate Start (C) • Delay Dial (C) 		<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C • CJCSI 6215.01C • UCR Section 5.2.4.2.2 • UCR Section 5.2.4.3.2 • UCR Section 5.2.4.3.4 																																																																																																																														
<p>NOTE: Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP.</p> <p>LEGEND:</p> <table border="0"> <tr> <td>ANSI</td> <td>American National Standards Institute</td> <td>EKTS</td> <td>Electronic Key Telephone System</td> <td>PBX 1</td> <td>Private Branch Exchange 1</td> </tr> <tr> <td>BER</td> <td>Bit Error Ratio</td> <td>FTR</td> <td>Federal Telecommunications Recommendation</td> <td>PCM</td> <td>Pulse Code Modulation</td> </tr> <tr> <td>BRI</td> <td>Basic Rate Interface</td> <td>FTR 1080B</td> <td>Video Teleconferencing Services</td> <td>PCM-24</td> <td>Pulse Code Modulation - 24 Channels</td> </tr> <tr> <td>C</td> <td>Conditional</td> <td>-2002</td> <td></td> <td>PCM-30</td> <td>Pulse Code Modulation - 30 Channels</td> </tr> <tr> <td>CAS</td> <td>Channel Associated Signaling</td> <td>G.711</td> <td>PCM of voice frequencies</td> <td>PRI</td> <td>Primary Rate Interface</td> </tr> <tr> <td>CJCSI</td> <td>Chairman of the Joint Chiefs of Staff Instruction</td> <td>GR</td> <td>Generic Requirement</td> <td>PSTN</td> <td>Public Switched Telephone Network</td> </tr> <tr> <td>CODEC</td> <td>Coder/Decoder</td> <td>GR-815</td> <td>Generic Requirements For Network Element/Network System (NE/NS) Security</td> <td>Q.955.3</td> <td>ISDN Signaling Standard for E1 MLPP</td> </tr> <tr> <td>DIACAP</td> <td>DoD Information Assurance Certification and Accreditation Process</td> <td>H.320</td> <td>Institute of Electrical and Electronics Engineers</td> <td>R</td> <td>Required</td> </tr> <tr> <td>DISA</td> <td>Defense Information Systems Agency</td> <td>IEEE</td> <td>Integrated Services Digital Network</td> <td>S/T</td> <td>ISDN BRI four-wire interface</td> </tr> <tr> <td>DISR</td> <td>DoD IT Standards Registry</td> <td>ISDN</td> <td>Information Technology</td> <td>SCIP</td> <td>Secure Communication Interoperability Protocol</td> </tr> <tr> <td>DoD</td> <td>Department of Defense</td> <td>ITU-T</td> <td>International Telecommunication Union - Telecommunication Standardization Sector</td> <td>SS7</td> <td>Signaling System 7</td> </tr> <tr> <td>DoDI</td> <td>DoD Instruction</td> <td></td> <td></td> <td>STE</td> <td>Secure Terminal Equipment</td> </tr> <tr> <td>DP</td> <td>Dial Pulse</td> <td></td> <td></td> <td>STIGs</td> <td>Security Technical Implementation Guides</td> </tr> <tr> <td>DS0</td> <td>Digital Signal Level 0 (64 kbps)</td> <td>kbps</td> <td>kilobits per second</td> <td>T.4</td> <td>Standardization of Group 3 facsimile terminals for document transmission</td> </tr> <tr> <td>DS1</td> <td>Digital Signal Level 1 (1.544 Mbps) (2.048 Mbps European)</td> <td>Mbps</td> <td>Megabits per second</td> <td>T1</td> <td>Digital Transmission Link Level 1 (1.544 Mbps)</td> </tr> <tr> <td>DSN</td> <td>Defense Switched Network</td> <td>MFR1</td> <td>Multi-Frequency Recommendation 1</td> <td>T1.619a</td> <td>SS7 and ISDN MLPP Signaling Standard for T1</td> </tr> <tr> <td>DSS1</td> <td>Digital Subscriber Signaling 1</td> <td>MOS</td> <td>Mean Opinion Score</td> <td>UCR</td> <td>Unified Capabilities Requirements</td> </tr> <tr> <td>DTMF</td> <td>Dual Tone Multi-Frequency</td> <td>NI 1/2</td> <td>National ISDN Standard 1 or 2</td> <td>UPS</td> <td>Uninterruptible Power Supply</td> </tr> <tr> <td>E&M</td> <td>Ear and Mouth</td> <td>NX56</td> <td>Data format restricted to multiples of 56 kbps</td> <td>VBD</td> <td>Variable bit data</td> </tr> <tr> <td>E1</td> <td>European Basic Multiplex Rate (2.048 Mbps)</td> <td>NX64</td> <td>Data format restricted to multiples of 64 kbps</td> <td>VTC</td> <td>Video Teleconferencing</td> </tr> <tr> <td></td> <td></td> <td>PBX</td> <td>Private Branch Exchange</td> <td></td> <td></td> </tr> </table>						ANSI	American National Standards Institute	EKTS	Electronic Key Telephone System	PBX 1	Private Branch Exchange 1	BER	Bit Error Ratio	FTR	Federal Telecommunications Recommendation	PCM	Pulse Code Modulation	BRI	Basic Rate Interface	FTR 1080B	Video Teleconferencing Services	PCM-24	Pulse Code Modulation - 24 Channels	C	Conditional	-2002		PCM-30	Pulse Code Modulation - 30 Channels	CAS	Channel Associated Signaling	G.711	PCM of voice frequencies	PRI	Primary Rate Interface	CJCSI	Chairman of the Joint Chiefs of Staff Instruction	GR	Generic Requirement	PSTN	Public Switched Telephone Network	CODEC	Coder/Decoder	GR-815	Generic Requirements For Network Element/Network System (NE/NS) Security	Q.955.3	ISDN Signaling Standard for E1 MLPP	DIACAP	DoD Information Assurance Certification and Accreditation Process	H.320	Institute of Electrical and Electronics Engineers	R	Required	DISA	Defense Information Systems Agency	IEEE	Integrated Services Digital Network	S/T	ISDN BRI four-wire interface	DISR	DoD IT Standards Registry	ISDN	Information Technology	SCIP	Secure Communication Interoperability Protocol	DoD	Department of Defense	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	SS7	Signaling System 7	DoDI	DoD Instruction			STE	Secure Terminal Equipment	DP	Dial Pulse			STIGs	Security Technical Implementation Guides	DS0	Digital Signal Level 0 (64 kbps)	kbps	kilobits per second	T.4	Standardization of Group 3 facsimile terminals for document transmission	DS1	Digital Signal Level 1 (1.544 Mbps) (2.048 Mbps European)	Mbps	Megabits per second	T1	Digital Transmission Link Level 1 (1.544 Mbps)	DSN	Defense Switched Network	MFR1	Multi-Frequency Recommendation 1	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1	DSS1	Digital Subscriber Signaling 1	MOS	Mean Opinion Score	UCR	Unified Capabilities Requirements	DTMF	Dual Tone Multi-Frequency	NI 1/2	National ISDN Standard 1 or 2	UPS	Uninterruptible Power Supply	E&M	Ear and Mouth	NX56	Data format restricted to multiples of 56 kbps	VBD	Variable bit data	E1	European Basic Multiplex Rate (2.048 Mbps)	NX64	Data format restricted to multiples of 64 kbps	VTC	Video Teleconferencing			PBX	Private Branch Exchange		
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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. Testing of the system’s required functions and features was conducted using the notional test configuration depicted in Figure 2-2. The SUT test configuration is depicted in Figure 2-3. The SUT was tested as the end-point in relation to the other switches.

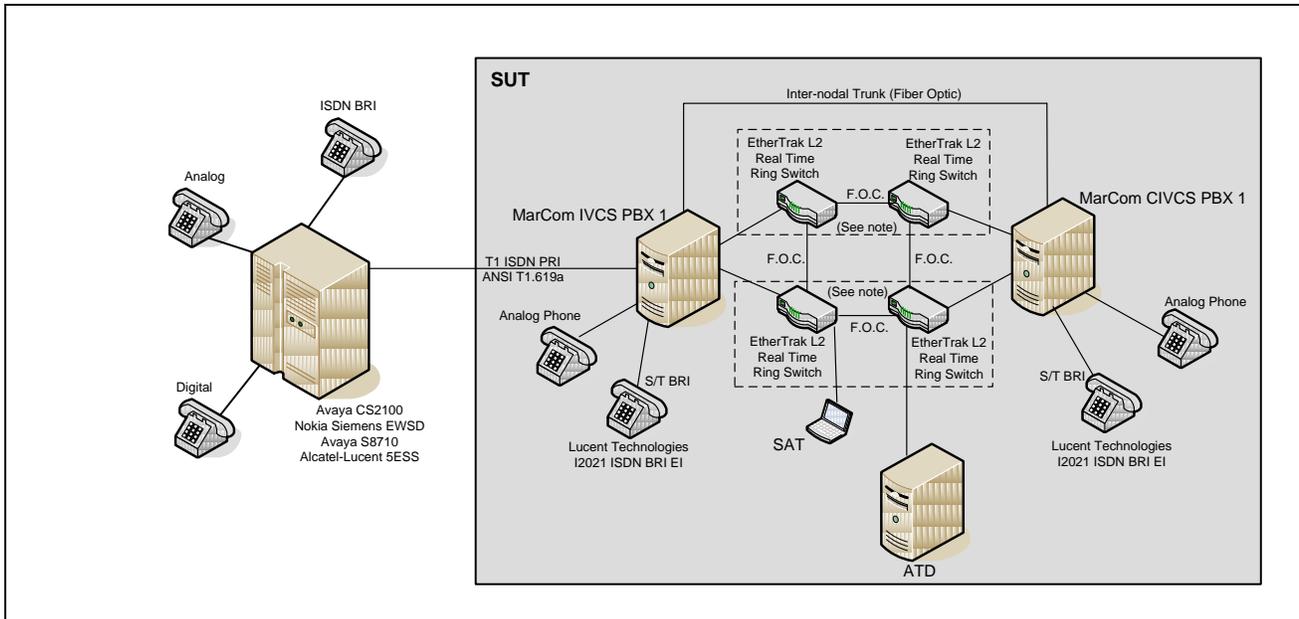


NOTE: The SUT only supports the ANSI T1.619a T1 ISDN PRI DSN interface and the T1 ISDN PRI NI2 PSTN interface.

LEGEND:

- | | | | |
|--------|--|--|--|
| 2W | 2-Wire | | SS7 Service Switching Point (SSP) |
| A-Link | Access Link (SS7) | | SS7 Signal Transfer Point (STP) |
| B-Link | Bridge Link (SS7) | | DSN Gateway Trunk |
| C-Link | Cross Link (SS7) | | DSN Interswitch Trunk (T1/E1 SS7, T1/E1 CAS, T1/E1 ISDN PRI) |
| BRI | Basic Rate Interface | | DSN Line (2W Analog, ISDN BRI S/T) |
| CAS | Channel Associated Signaling | | SS7 Links (A-Link, B-Link or C-Link) |
| DSN | Defense Switched Network | | DSN End Office Access Trunk (T1/E1 SS7, T1/E1 CAS, T1/E1 ISDN PRI) |
| E1 | European Basic Multiplex Rate (2.048 Mbps) | | PBX Access Trunk (T1/E1 SS7, T1/E1 CAS, T1/E1 ISDN PRI) See note. |
| EO | End Office | | RSU-Host Umbilical Link |
| ISDN | Integrated Services Digital Network | | |
| Mbps | Megabits per second | | |
| MFS | Multifunction Switch | | |
| PBX | Private Branch Exchange | | |
| PBX 1 | Private Branch Exchange 1 | | |
| PRI | Primary Rate Interface | | |
| PSTN | Public Switched Telephone Network | | |
| RSU | Remote Switching Unit | | |
| S/T | ISDN BRI 4-wire interface | | |
| SMEO | Small End Office | | |
| SS7 | Signaling System 7 | | |
| SUT | System Under Test | | |
| T1 | Digital Transmission Link Level 1 (1.544 Mbps) | | |
| VTC | Video Teleconferencing | | |

Figure 2-2. Notional Test Configuration



NOTE: The Interfaces between the IVCS and the CIVCS i.e. the Ethertrak L2 Real Time Ring Switch, and all F.O.C. are within the same cabinet, and they do not traverse a LAN nor exit the SUT enclave.

LEGEND:

5ESS	Class 5 Electronic Switching System	MarCom	Maritime Communications
ANSI	American National Standards Institute	Mbps	Mega-bits per second
ATD	Announcement and Tone Device	MLPP	Multi Level Precedence and Preemption
BRI	Basic Rate Interface	PBX	Private Branch Exchange
CIVCS	Compact Integrated Voice Communication System	PRI	Primary Rate Interface
CS	Communications Server	S/T	ISDN BRI 4-wire interface
EI	End Instrument	SAT	System Administration Terminal
EWSD	Elektronisches Wählsystem Digital	SS7	Signaling System Number 7
F.O.C.	Fiber Optic Cable	SUT	System Under Test
ISDN	Integrated Services Digital Network	T1	Digital Transmission Link Level 1 (1.544 Mbps)
IVCS	Integrated Voice Communication System	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
L2	Layer 2		
LAN	Local Area Network		

Figure 2-3. SUT Test Configuration

9. SYSTEM CONFIGURATIONS. Table 2-2 provides the system configurations, hardware, and software components tested with the SUT. The SUT was tested in an operationally realistic environment to determine interoperability with a complement of DSN switches noted in Table 2-2. Table 2-2 lists the DSN switches which depict the tested configuration and is not intended to identify the only switches that are certified with the SUT. The SUT is certified with switching systems listed on the UC APL that offer the same certified interfaces.

Table 2-2. Tested System Configurations

System Name		Software Release		
Avaya CS2100		Succession Enterprise (SE) 09.1		
Nokia-Siemens EWSD		19d with Patch Set 46		
Avaya S8720		Communication Manager (CM) 4.0 (R014x.00.2.732.1: Super Patch 16538)		
Alcatel-Lucent 5ESS		5E16.2 Broadcast Warning Message (BWM) 09-0002		
L-3 Communications MarCom IVCS Rel. 7.5.2 Build 4	Hardware	Card Name	Software/Firmware	
		Part Number/Name		
	SAT	NA		MS Windows XP SP3
				SAT 7.5.2.BLD4
				Symantec Endpoint Protection v11.0.4010.19
				Javajre-1_5_0_26
	Node ID 2 (IVCS)	EtherTrak L2 Real Time Ring Switch (x2)	v0105	
		CenterCom Transceiver L2 (x2)	NA	
		BRI S/T PWA and I/O /02G1460	S7.5.2.BLD2	
			FPGA Conference F63#	
		POTS Analog Trunk PWA and I/O /02K9854	P7.5.2.BLD4	
			FPGA Conference F63#	
		Digital Trunk PWA and I/O /02L1925	T7.5.2.BLD2	
			FPGA Inter-nodal G47#	
	ATD	SUN Netra X4250 Server	Common Controller (x2) K100046612-504	On Time RTOS 5.09
				CC 7.5.2.BLD3
			Power Supply	NA
				Red Hat Enterprise Linux server 5.5 Kernel 2.6.18-194 e15PAE
	Node ID 1 (CIVCS)	CC (x2) K100046612-504		atdApp 7.5.2.BLD4
			EtherTrak L2 Real Time Ring Switch (x2)	v0105
				S7.5.2.BLD2
			BRI S/T PWA and I/O /02G1465	FPGA Conference F63#
			POTS Analog Trunk PWA and I/O /02K9858	P7.5.2.BLD2
			FPGA Conference F63#	
Cisco Catalyst 3560 E Series	N/A		NA	
			On Time RTOS 5.09	
Radius Authentication Server	N/A		CC 7.5.2.BLD3	
			12.2	
			2.2.1.7	

Table 2-2. Tested System Configurations (Continued)

SUT Telephone Instruments			
Telephone type	Model (s)		Software/Firmware
Analog	Panasonic KX-TS105w		NA
LEGEND:			
5ESS	Class 5 Electronic Switching System	MarCom	Maritime Communications
Admin	Administrative	MS	Microsoft
ATD	Announcement and Tone Device	NA	Not Applicable
BLD	Build	OS	Operating System
BRI	Basic Rate Interface	POTS	Plain Old Telephone System
CC	Common Controller	PWA	Printed Wiring Assembly
CM	Communications Manager	Rel	Release
CS	Communication Server	RTOS	Real-Time Operating System
EWSD	Elektronisches Wählsystem Digital	SAT	System Administration Terminal
FPGA	Field-Programmable gate Array	SE	Succession Enterprise
ID	Identification	SP	Service Pack
I/O	Input / Output	S/T	ISDN BRI 4-wire interface
IVCS	Integrated Voice Communication System	SUT	System Under Test
L2	Layer 2	XP	Experience

10. TESTING LIMITATIONS. None.

11. TEST RESULTS

a. Discussion

(1) DSN Trunk Interfaces. The SUT met all critical CRs and FRs for the ISDN PRI National ISDN (NI) 2 (American National Standards Institute [ANSI] T1.619a) interface with the following minor exception: The SUT does not support Non-Facility Associated Signaling (NFAS) on their T1 ISDN PRI NI2 interface. This was previously adjudicated by the Defense Information Systems Agency (DISA) on 17 December 2008 as having a minor operational impact. Furthermore, DISA, in coordination with the Joint Staff, stated their intent to modify the next update of the UCR to change NFAS for a PBX 1 from required to conditional.

(2) DSN Line Interfaces. The SUT met all critical interoperability certification requirements for 2-Wire Loop Start Analog (GR-506-CORE). The SUT met all critical CRs and FRs for the ISDN Basic Rate Interface (BRI) S/T interface for data and Video Teleconferencing (VTC). The SUT does not support ISDN BRI U interface and it is not required for a PBX 1.

(3) Features and Capabilities

(a) Common Features. The SUT met all critical interoperability certification requirements for Common Features with the following minor exception: The SUT does not support Call Forward Variable. This was a new UCR requirement and the vendor has 18 months (until July 2010) to comply.

(b) Attendant. This feature is not supported by the SUT. This is not a required feature for a PBX 1.

(c) Public Safety. The SUT met all critical CRs and FRs for Basic 911.

(d) Multi-Level Precedence and Preemption (MLPP). The SUT met all critical CRs and FRs with the following minor exception: When attempting or placing an MLPP three way conference where each leg is at a difference precedence call, the SUT does not preserve the highest precedence level of any of the call legs that are connected. However, the SUT classmarks all three members of the three way conference at the highest precedence. This has a minor operational impact.

(e) Call Processing. The SUT met all critical CRs and FRs.

(f) ISDN Services. The SUT met all critical CRs and FRs.

(g) Synchronization. The SUT met all critical CRs and FRs. The SUT supports line timing mode and Internal Stratum 4 for synchronization.

(h) Reliability. The SUT met all critical CRs and FRs with the vendor's LoC.

(i) Network Management. This feature is not supported by the SUT. This is not a required feature for a PBX 1.

(j) Security. Security is tested by DISA-led Information Assurance test teams and published in a separate report, Reference (c).

(4) Network Gateway Interfaces. The SUT met all critical CRs and FRs for the ISDN PRI National ISDN (NI) 2 ANSI T1.607 interface with the following minor exception: The SUT does not support NFAS on their T1 ISDN PRI NI2 interface. This was previously adjudicated by the Defense Information Systems Agency (DISA) on 17 December 2008 as having a minor operational impact. Furthermore, DISA, in coordination with the Joint Staff, stated their intent to modify the next update of the UCR to change NFAS for a PBX 1 from required to conditional. The SUT does not support a ground start line interface. This was adjudicated by DISA on 14 August 2010 because SUT does support loop start and its application is solely deployed on Navy Ships to support ship to shore communications.

b. System Interoperability Results. The SUT is certified for joint use in the DSN as a PBX 1 and PBX 2 in accordance with the requirements set forth in the UCR. The interoperability test summary is shown in Table 2-3. The SUT Interoperability Requirements/Status is shown in Table 2-4.

Table 2-3. SUT Interoperability Test Summary

DSN Trunk Interfaces				
Interface & Signaling	Critical	Status	Remarks	
T1 CAS (DTMF, DP)	No	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.	
E1 CAS (DTMF, DP)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.	
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Met all critical CRs and FRs with the following minor exception: The SUT does not support NFAS. ¹	
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.	
DSN Line Interfaces				
Interface & Signaling	Critical	Status	Remarks	
2-Wire Analog (GR-506-CORE)	Yes	Certified	Met all critical CRs and FRs.	
ISDN BRI NI 1/2 (ANSI T1.619a)	No	Certified	The SUT met all critical CRs and FRs for the ISDN BRI S/T interface for data and VTC. The SUT does not support ISDN BRI U interface and it is not required for a PBX 1.	
DSN Features and Capabilities				
Feature/Capability	Critical	Status	Remarks	
Common Features	Yes	Certified	Met all critical CRs and FRs with the following minor exceptions: The SUT does not support Call Forward Variable. ²	
Attendant	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.	
Public Safety	Yes	Certified	The SUT met all critical CRs and FRs for Basic 911.	
Conferencing	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.	
Nailed-up Connections	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.	
DSN Hotline Services	No	Not Tested	This feature is not supported by the SUT and is not required for a PBX 1.	
MLPP	Yes	Certified	Met all critical CRs and FRs with the following minor exceptions: The SUT does not preserve the highest precedence level of the legs of a 3-way call. ³	
Call Processing	Yes	Certified	Met all critical CRs and FRs.	
Network Gateways				
Gateway	Interface & Signaling	Critical	Status	Remarks
PSTN	T1 CAS (DTMF, DP)	No	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
	E1 CAS (DTMF, DP)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
	T1 ISDN PRI NI 1/2 (ANSI T1.607)	No	Certified	Met all critical CRs and FRs.
	E1 ISDN PRI (ITU-T Q.931)	No (Europe only)	Not Tested	This interface is not supported by the SUT and is not required for a PBX 1.
	Ground Start Line	Yes	Not Tested	This interface is not supported by the SUT. ⁵

Table 2-3. SUT Interoperability Test Summary (continued)

NOTES:			
1	The SUT does not support NFAS on their T1 ISDN PRI NI2 interface. This was adjudicated previously by DISA on 17 December 2008 as having a minor operational impact. Furthermore, DISA, in coordination with the Joint Staff, stated their intent to modify the next update of the UCR to change NFAS for a PBX 1 from required to conditional.		
2	The SUT does not support Call Forward Variable. This was a new UCR requirement and the vendor has 18 months (until July 2010) to comply.		
3	When attempting or placing an MLPP three way conference where each leg is at a difference precedence level, the SUT does not preserve the highest precedence level of any of the call legs that are connected. However, the SUT classmarks all three members of the three way conference at the highest precedence. This has a minor operational impact.		
4	Security is tested by DISA-led Information Assurance test teams and published in a separate report, Reference (e).		
5	The SUT does not support a ground start line interface. This was adjudicated by DISA on 14 August 2010 because SUT does support loop start and its application is solely deployed on Navy Ships to support ship to shore communications.		
LEGEND:			
ANSI	American National Standards Institute	LSSGR	Local Access and Transport Area (LATA) Switching Systems Generic Requirements
BRI	Basic Rate Interface	Mbps	Megabits per second
CAS	Channel Associated Signaling	MLPP	Multi-Level Precedence and Preemption
CFV	Call Forward Variable	NFAS	Non-Facility Associated Signaling
CRs	Capability Requirements	NI 1/2	National ISDN Standard 1 or 2
DISA	Defense Information Systems Agency	NI2	National ISDN Standard 2
DIRS	DoD Information Technology Standards Registry	OSD	Office of the Secretary of Defense
DoD	Department of Defense	PBX 1	Private Branch Exchange 1
DP	Dial Pulse	PRI	Primary Rate Interface
DSN	Defense Switched Network	PSTN	Public Switched Telephone Network
DSS1	Digital Subscriber Signaling 1	Q.931	Signaling Standard for ISDN
DTMF	Dual Tone Multi-Frequency	Q.955.3	ISDN Signaling standard for E1 MLPP
E1	European Basic Multiplex Rate (2.048 Mbps)	S/T	ISDN BRI 4-wire interface
FRs	Feature Requirements	SS7	Signaling System 7
GR	Generic Requirement	SUT	System Under Test
GR-506-CORE	LSSGR: Signaling for Analog Interfaces	T1	Digital Transmission Link Level 1 (1.544 Mbps)
ISDN	Integrated Services Digital Network	T1.607	ISDN Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
JITC	Joint Interoperability Test Command	U	ISDN BRI 2-wire interface
LoC	Letter of Compliance	UCR	Unified Capabilities Requirements

12. TEST AND ANALYSIS REPORT. No detailed test report was developed in accordance with 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://199.208.204.226> (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>. Due to the sensitivity of the information, the Information Assurance Accreditation Package (IAAP) that contains the approved configuration and deployment guide must be requested directly through government civilian or uniformed military personnel from the Unified Capabilities Certification Office (UCCO), e-mail: ucco@disa.mil.

Table 2-5. SUT Interoperability Requirements/Status

DSN Trunk Interfaces							
Interface	Critical	Interface Status	UCR Requirement		Reference	Test Results	Remarks
T1 CAS (DTMF, DP)	No	Not Tested (See note 1.)	Trunking	Direct Inward Dialing (C)	UCR Section 5.2.1.3.2		
				Trunk Group-Remove from Service (C)	UCR Section 5.2.1.5.5		
				Trunk Group-Restore to Service (C)	UCR Section 5.2.1.5.5		
				Normal Wink Start Operations (C)	UCR Section 5.2.4.3.3.1.1		
				Glare Operation (C)	UCR Section 5.2.4.3.3.1.2		
				Abnormal Wink Start (C)	UCR Section 5.2.4.3.3.2.1		
				Glare Resolution (C)	UCR Section 5.2.4.3.3.2.2		
				Call for Service Timing (R)	UCR Section 5.2.4.3.5		
				Guard Timing (R)	UCR Section 5.2.4.3.6		
				Satellite Timing (C)	UCR Section 5.2.4.3.7		
				Disconnect Control (C)	UCR Section 5.2.4.3.8		
				Reselect and Retrial (C)	UCR Section 5.2.4.3.9		
				Off-Hook Supervision Transition (C)	UCR Section 5.2.4.3.10		
				Dial-Pulse Signals (C)	UCR Section 5.2.4.4.1		
				DTMF Signaling (C)	UCR Section 5.2.4.4.2		
				Standard Digit Format for Precedence (C)	UCR Section 5.2.4.4.2.1		
				MFR1 2/6 Signaling (C)	UCR Section 5.2.4.4.3		
				Alerting Signals and Tones (R)	UCR Section 5.2.4.5.1		
				DSN Transmission Interface (R)	UCR Section 5.2.5		
				PCM-24 Digital Trunk Interface (R)	UCR Section 5.2.6.1		
			Interface Characteristics (R)	UCR Section 5.2.6.1.1			
			Supervisory Channel Associated Signaling (C)	UCR Section 5.2.6.1.2			
			Clear Channel Capability (R)	UCR Section 5.2.6.1.3			
			Alarm and Restoral Requirements (R)	UCR Section 5.2.6.1.4			
			Interoperation of PCM-24 and PCM-30 (C)	UCR Section 5.2.6.3			
			Integrated Digital Loop Carrier (C)	UCR Section 5.2.6.5			
			Voice	MOS (R)	CJCSI 6215.01C		
				Secure calls (R)	CJCSI 6215.01C		
Facsimile	Analog: ITU-T T.4 (R)	DISR					
Data	Modem (VBD) (R)	CJCSI 6215.01C					
	Secure data (STE/SCIP) (R)	CJCSI 6215.01C					

Table 2-5. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	Critical	Interface Status	UCR Requirement		Reference	Test Results	Remarks
E1 CAS (DTMF, DP)	No (Europe only)	Not Tested (See note 1.)	Trunking	Direct Inward Dialing (C)	UCR Section 5.2.1.3.1		
				Trunk Group-Remove from Service (C)	UCR Section 5.2.1.5.5		
				Trunk Group-Restore to Service (C)	UCR Section 5.2.1.5.5		
				Normal Wink Start Operations (C)	UCR Section 5.2.4.3.3.1.1		
				Glare Operation (C)	UCR Section 5.2.4.3.3.1.2		
				Abnormal Wink Start (C)	UCR Section 5.2.4.3.3.2.1		
				Glare Resolution (C)	UCR Section 5.2.4.3.3.2.2		
				Call for Service Timing (R)	UCR Section 5.2.4.3.5		
				Guard Timing (R)	UCR Section 5.2.4.3.6		
				Satellite Timing (C)	UCR Section 5.2.4.3.7		
				Disconnect Control (C)	UCR Section 5.2.4.3.8		
				Reselect and Retrial (C)	UCR Section 5.2.4.3.9		
				Off-Hook Supervision Transition (C)	UCR Section 5.2.4.3.10		
				Dial-Pulse Signals (C)	UCR Section 5.2.4.4.1		
				DTMF Signaling (C)	UCR Section 5.2.4.4.2		
				Standard Digit Format for Precedence (C)	UCR Section 5.2.4.4.2.1		
				MFR1 2/6 Signaling (C)	UCR Section 5.2.4.4.3		
				Alerting Signals and Tones (R)	UCR Section 5.2.4.5.1		
				DSN Transmission Interface (R)	UCR Section 5.2.5		
				PCM-30 Digital Trunk Interface (C)	UCR Section 5.2.6.2		
			Interoperation of PCM-24 and PCM-30 (C)	UCR Section 5.2.6.3			
			Integrated Digital Loop Carrier (C)	UCR Section 5.2.6.5			
			Voice	MOS (R)	CJCSI 6215.01C		
				Secure calls (R)	CJCSI 6215.01C		
			Facsimile	Analog: ITU-T T.4 (R)	DISR		
			Data	Modem (VBD) (R)	CJCSI 6215.01C		
				Secure data (STE/SCIP) (R)	CJCSI 6215.01C		

Table 2-5. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	Critical	Interface Status	UCR Requirement		Reference	Test Results	Remarks
T1 ISDN PRI NI 1/2 (ANSI T1.619a)	Yes	Certified	Trunking	Direct Inward Dialing (C)	UCR Section 5.2.1.3.2	Met	
				National ISDN 1/2 Primary Access (R)	UCR Section 5.2.1.3.4.1	Met	See note 2.
				ISDN ANSI MLPP Service Capability (R)	UCR Section 5.2.1.3.4.1.1	Met	
				Trunk Group-Remove from Service (C)	UCR Section 5.2.1.5.5	Not Tested	See note 3.
				Trunk Group-Restore to Service (C)	UCR Section 5.2.1.5.5	Not Tested	See note 3.
				Call for Service Timing (R)	UCR Section 5.2.4.3.5	Met	
				Alerting Signals and Tones (R)	UCR Section 5.2.4.5.1	Met	
				DSN ISDN User-to-Network Signaling (R)	UCR Section 5.2.4.7.1.4.2	Met	
				Application (R)	UCR Section 5.2.4.7.1.1	Met	
				Physical Layer (R)	UCR Section 5.2.4.7.1.2	Met	
				Data Link Layer (R)	UCR Section 5.2.4.7.1.3	Met	
				Data Link Connection (R)	UCR Section 5.2.4.7.1.3.1	Met	
				Peer-to-Peer Procedures of Data-Link Layer (R)	UCR Section 5.2.4.7.1.3.2	Met	
				Layer 3 DSN User-to-Network Signaling (R)	UCR Section 5.2.4.7.1.4	Met	
				DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R)	UCR Section 5.2.4.7.1.4.2	Met	
				Sequence of Messages for DSN Circuit-Switched Calls (R)	UCR Section 5.2.4.7.1.4.3	Met	
				Message Functional Definition and Content (R)	UCR Section 5.2.4.7.1.4.4	Met	
				General Message Format and Information Elements Coding (R)	UCR Section 5.2.4.7.1.4.5	Met	
				Supplementary Services (C)	UCR Section 5.2.4.7.1.4.6	Not Tested	See note 3.
				DSN Transmission Interface (R)	UCR Section 5.2.5	Met	
				PCM-24 Digital Trunk Interface (R)	UCR Section 5.2.6.1	Met	
				Interface Characteristics (R)	UCR Section 5.2.6.1.1	Met	
				Clear Channel Capability (R)	UCR Section 5.2.6.1.3	Met	
			Alarm and Restoral Requirements (R)	UCR Section 5.2.6.1.4	Met		
			Interoperation of PCM-24 and PCM-30 (C)	UCR Section 5.2.6.3	Not Tested	See note 3.	
			Integrated Digital Loop Carrier (C)	UCR Section 5.2.6.5	Not Tested	See note 1.	
			Voice			MOS (R)	CJCSI 6215.01C
			Secure calls (R)	CJCSI 6215.01C	Met		
Facsimile			Analog: ITU-T T.4 (R)	DISR	Met		

Table 2-5. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	Critical	Interface Status	UCR Requirement		Reference	Test Results	Remarks
T1 ISDN PRI NI 1/2 (ANSI T1.619a) (continued)	Yes	Certified	Data	Modem (VBD) (R)	CJCSI 6215.01C	Met	
				56 kbps switched data (R: PRI only)	UCR Section 5.2.2.9.6	Met	
				64 kbps switched data (R: PRI only)	UCR Section 5.2.2.9.6	Met	
				NX56 synchronous BER (R: PRI only)	UCR Section 5.2.2.9.6	Met	
				NX64 synchronous BER (R: PRI only)	UCR Section 5.2.2.9.6	Met	
				Secure data (STE/SCIP) (R) (2W analog only)	CJCSI 6215.01C	Met	
			VTC	ITU-T H.320 (R: PRI only)	FTR 1080B-2002	Met	

Table 2-5. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	Critical	Interface Status	UCR Requirement		Reference	Test Results	Remarks
E1 ISDN PRI (ITU-T Q.955.3)	No (Europe only)	Not Tested (See note 1.)	Trunking	Direct Inward Dialing (C)	UCR Section 5.2.1.3.2		
				ITU-T ISDN Primary Access (C)	UCR Section 5.2.1.3.4.2		
				ITU-T ISDN Primary Access Digital Subscriber Signaling System Number 1 MLPP (C)	UCR Section 5.2.1.3.4.2.1		
				Trunk Group-Remove from Service (C)	UCR Section 5.2.1.5.5		
				Trunk Group-Restore to Service (C)	UCR Section 5.2.1.5.5		
				Call for Service Timing (R)	UCR Section 5.2.4.3.5		
				Disconnect Control (C)	UCR Section 5.2.4.3.8		
				Off-Hook Supervision Transition (C)	UCR Section 5.2.4.3.10		
				DSN ISDN User-to-Network Signaling (R)	UCR Section 5.2.4.7.1.4.2		
				Application (R)	UCR Section 5.2.4.7.1.1		
				Physical Layer (R)	UCR Section 5.2.4.7.1.2		
				Data Link Layer (R)	UCR Section 5.2.4.7.1.3		
				Data Link Connection (R)	UCR Section 5.2.4.7.1.3.1		
				Peer-to-Peer Procedures of Data-Link Layer (R)	UCR Section 5.2.4.7.1.3.2		
				Layer 3 DSN User-to-Network Signaling (R)	UCR Section 5.2.4.7.1.4		
				DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R)	UCR Section 5.2.4.7.1.4.2		
				Sequence of Messages for DSN Circuit-Switched Calls (R)	UCR Section 5.2.4.7.1.4.3		
				Message Functional Definition and Content (R)	UCR Section 5.2.4.7.1.4.4		
				General Message Format and Information Elements Coding (R)	UCR Section 5.2.4.7.1.4.5		
			PCM-30 Digital Trunk Interface (C)	UCR Section 5.2.6.2			
			Interoperation of PCM-24 and PCM-30 (C)	UCR Section 5.2.6.3			
			Integrated Digital Loop Carrier (C)	UCR Section 5.2.6.5			
Voice			MOS (R)	CJCSI 6215.01C			
			Secure calls (R)	CJCSI 6215.01C			

Table 2-5. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	Critical	Interface Status	UCR Requirement		Reference	Test Results	Remarks
E1 ISDN PRI (ITU-T Q.955.3) (continued)	No (Europe only)	Not Tested (See note 1.)	Facsimile	Analog: ITU-T T.4 (R)	DISR		
			Data	Modem (VBD) (R)	CJCSI 6215.01C		
				56 kbps switched data (R: PRI only)	UCR Section 5.2.2.9.6		
				64 kbps switched data (R: PRI only)	UCR Section 5.2.2.9.6		
				NX56 synchronous BER (R: PRI only)	UCR Section 5.2.2.9.6		
				NX64 synchronous BER (R: PRI only)	UCR Section 5.2.2.9.6		
				Secure data (STE/SCIP) (R)	CJCSI 6215.01C		
			VTC	ITU-T H.320 (R: PRI only)	FTR 1080B-2002		

Table 2-5. SUT Interoperability Requirements/Status (continued)

DSN Line Interfaces							
Interface	Critical	Interface Status	UCR Requirement		Reference	Test Results	Remarks
2-Wire Loop Start Analog	Yes	Certified	Access	Directory Number Identification (R)	UCR Section 5.2.1.1.1	Met	
				PBX Line (C)	UCR Section 5.2.1.3.1	Met	
				Analog Line (R)	UCR Section 5.2.1.3.5	Met	
				Basic Line Test Capabilities (R)	UCR Section 5.2.1.5.4.1.1	Met	
				Advanced Line Test Capabilities (C)	UCR Section 5.2.1.5.4.1.1	Not Tested	See note 3.
				Loop Start Line (R: 2-Wire Analog only)	UCR Section 5.2.4.2.1	Met	
				Reverse Battery (R)	UCR Section 5.2.4.3.1	Met	
			Voice	Alerting Signals and Tones (R)	UCR Section 5.2.4.5.1	Met	
				MOS (R)	CJCSI 6215.01C	Met	
			Facsimile	Secure calls (R)	CJCSI 6215.01C	Met	
				Analog: ITU-T T.4 (R)	DISR	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01C	Met	
Secure data (STE/SCIP) (R)	CJCSI 6215.01C	Met					
ISDN BRI NI 1/2 (ANSI T1.619a)	No	Certified	Access	Directory Number Identification (R)	UCR Section 5.2.1.1.1	Met	
				National ISDN 1/2 Basic Access (C)	UCR Section 5.2.1.3.3	Met	See note 4.
				Alerting Signals and Tones (R)	UCR Section 5.2.4.5.1	Met	
				S/T Reference Point (R)	UCR Section 5.2.4.7.1.2.1	Met	
			Voice	MOS (R)	CJCSI 6215.01C	Met	
				Secure calls (R)	CJCSI 6215.01C	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01C	Met	
				Secure data (STE/SCIP) (R)	CJCSI 6215.01C	Met	
VTC	ITU-T H.320 (R: BRI only)	FTR 1080B-2002	Met				
2-Wire Proprietary Digital	No	Not Tested (See note 1.)	Access	Directory Number Identification (R)	UCR Section 5.2.1.1.1		
				Alerting Signals and Tones (R)	UCR Section 5.2.4.5.1		
			Voice	MOS (R)	CJCSI 6215.01C		
				Secure calls (R)	CJCSI 6215.01C		

Table 2-5. SUT Interoperability Requirements/Status (continued)

DSN Features and Capabilities						
Feature/ Capability	Critical	Feature Status	UCR Requirement	Reference	Test Results	Remarks
Common Features	Yes	Certified	Individual Lines (R)	UCR Section 5.2.1.1.1	Met	
			Denied originating service (C)	UCR Section 5.2.1.1.3	Met	
			Code restriction and diversion (C)	UCR Section 5.2.1.1.4	Met	
			Call waiting (R)	UCR Section 5.2.1.1.5.1	Met	
			Three-way calling (R)	UCR Section 5.2.1.1.6	Met	See note 5.
			Add-on transfer, conference calling, and call hold (C)	UCR Section 5.2.1.1.7	Not Tested	See note 3.
			Call Transfer Individual - All calls (R)	UCR Section 5.2.1.1.7.1	Met	
			Call Transfer - Internal Only (R)	UCR Section 5.2.1.1.7.2	Met	
			Call Transfer - Individual - Incoming Only/Add-On Consultation Hold - Incoming Call (R)	UCR Section 5.2.1.1.7.3	Not Tested	See note 3.
			Call Transfer - Outside (R)	UCR Section 5.2.1.1.7.4	Met	
			Call Transfer - Add-On Restricted Station (C)	UCR Section 5.2.1.1.7.5	Not Tested	See note 3.
			Call Transfer - Attendant (C)	UCR Section 5.2.1.1.7.6	Not Tested	See note 3.
			Call Hold (R)	UCR Section 5.2.1.1.7.7	Met	
			Conference Calling - Six Way Station Controlled (C)	UCR Section 5.2.1.1.7.8	Not Tested	See note 3.
			Call Forwarding Variable (R)	UCR Section 5.2.1.1.8.1	Not Tested	See note 6.
			Call Forward Busy Line (R)	UCR Section 5.2.1.1.8.2	Met	
			Call Forwarding – Don't Answer – All Calls (R)	UCR Section 5.2.1.1.8.3	Met	
			Selective Call Forwarding (C)	UCR Section 5.2.1.1.8.4	Met	
			Call pick-up (C)	UCR Section 5.2.1.1.9.1	Not Tested	See note 3.
Address Translation (C)	UCR Section 5.2.1.7	Not Tested	See note 3.			
Assured Dial Tone (C)	UCR Section 5.2.1.9	Met				
Attendant	No	Not Tested	Attendant Features (C)	UCR Section 5.2.1.2.2	Not Tested	See note 3.
Public Safety	Yes	Certified	Emergency Service (911) Caller (R)	UCR Section 5.2.1.4.1.1	Met	
			Emergency Service (911) Public Safety Answering Service (C)	UCR Section 5.2.1.4.1.2	Not Tested	See note 3.
			Enhanced Emergency Service (E911) (C)	UCR Section 5.2.1.4.1.3	Not Tested	See note 3.
			Trace of terminating calls (C)	UCR Section 5.2.1.4.2	Not Tested	See note 3.
			Outgoing call trace (C)	UCR Section 5.2.1.4.3	Not Tested	See note 3.

Table 2-5. SUT Interoperability Requirements/Status (continued)

DSN Features and Capabilities						
Feature/ Capability	Critical	Feature Status	UCR Requirement	Reference	Test Results	Remarks
Conferencing	No	Not Tested	Preset Conferencing (C)	UCR Section 5.2.1.6.1	Not Tested	See note 3.
			Meet-Me Conferencing (C)	UCR Section 5.2.1.6.2	Not Tested	See note 3.
			Progressive Conferencing (C)	UCR Section 5.2.1.6.3	Not Tested	See note 3.
Nailed-up Connections	No	Not Tested	Nailed-Up Connections (C)	UCR Section 5.2.1.8	Not Tested	See note 3.
DSN Hotline Services	No	Certified	DSN Analog Hotline Service (C)	UCR Section 5.2.1.12	Not Tested	See note 3.
MLPP	Yes	Certified	MLPP Overview (R)	UCR Section 5.2.2.1.1	Met	
			Preemption in the Network (R)	UCR Section 5.2.2.2	Met	
			Network Facility with Lower Precedence Calls (R)	UCR Section 5.2.2.2.1	Met	
			Network Facility with Equal or Higher Precedence Calls (R)	UCR Section 5.2.2.2.2	Met	
			Precedence Call Diversion (R)	UCR Section 5.2.2.3	Met	
			Channel Associated Signaling (C)	UCR Section 5.2.2.4.1	Not Tested	See note 1.
			Primary Rate Interface (R)	UCR Section 5.2.2.4.2	Met	
			Analog Line MLPP (R)	UCR Section 5.2.2.5	Met	
			ISDN MLPP Basic Rate Interface (C)	UCR Section 5.2.2.6	Met	
			ISDN Primary Rate Interface (R)	UCR Section 5.2.2.7	Met	
			Precedence Call Waiting (R)	UCR Section 5.2.2.8.1	Met	
			Call Forwarding (R)	UCR Section 5.2.2.8.2	Met	
			Call Transfer (R)	UCR Section 5.2.2.8.3	Met	
			Call Hold (R)	UCR Section 5.2.2.8.4	Met	
			Three-Way Calling (R)	UCR Section 5.2.2.8.5	Met	See note 5.
			Call Pickup (C)	UCR Section 5.2.2.8.6	Not Tested	See note 3.
			Conferencing (C)	UCR Section 5.2.2.8.7.1	Not Tested	See note 3.
			Multiline Hunt Group (C)	UCR Section 5.2.2.8.8	Not Tested	See note 3.
Community of Interest (C)	UCR Section 5.2.2.8.9	Not Tested	See note 3.			
MLPP Interaction with EKTS features (C)	UCR Section 5.2.2.10.1	Not Tested	See note 3.			

Table 2-5. SUT Interoperability Requirements/Status (continued)

DSN Features and Capabilities						
Feature/ Capability	Critical	Feature Status	UCR Requirement	Reference	Test Results	Remarks
Call Processing	Yes	Certified	Call Treatments (R)	UCR Section 5.2.3.1	Met	
			Primary and Alternate Routing (C)	UCR Section 5.2.3.2	Not Tested	See note 3.
			E&M Lead Signaling States (C)	UCR Section 5.2.3.3.1	Not Tested	See note 1.
			4-Wire Analog User Access Lines (C)	UCR Section 5.2.3.3.2	Not Tested	See note 1.
			2-Wire User Access Lines (R)	UCR Section 5.2.3.3.3	Met	
			Termination of Analog Lines (R)	UCR Section 5.2.3.3.4	Met	
			DSN User Dialing (R)	UCR Section 5.2.3.5.1.1	Met	
			Interswitch and Intra-switch Dialing (R)	UCR Section 5.2.3.5.1.1	Met	
			Seven-Digit Dialing (R)	UCR Section 5.3.3.5.2.1	Met	
			Ten-Digit Dialing (R)	UCR Section 5.2.3.5.2.2	Met	
			Access Code (R)	UCR Section 5.2.3.5.1.3	Met	
			Access Digit (R)	UCR Section 5.2.3.5.1.3.1	Met	
			Precedence Digit (R)	UCR Section 5.2.3.5.1.3.2	Met	
			Service Digit (R)	UCR Section 5.2.3.5.1.3.3	Met	
			Route Code (R)	UCR Section 5.2.3.5.1.4	Not Tested	Required for CAS only.
			Area Code (R)	UCR Section 5.2.3.5.1.5	Met	
			Switch Code (R)	UCR Section 5.2.3.5.1.6	Met	
			Line Number (R)	UCR Section 5.2.3.5.1.7	Met	
			Calling Name Delivery (C)	UCR Section 5.2.3.5.1.8.1	Not Tested	See note 3.
			Calling Number Delivery (R)	UCR Section 5.2.3.5.1.8.2	Met	
			Emergency Service 911 Conflict Resolution (R)	UCR Section 5.2.3.5.1.9	Met	
			DSN Switch Outpulsing Digit Formats (C)	UCR Section 5.2.3.5.2	Met	
			Standard Directory Number (R)	UCR Section 5.2.3.5.3	Met	
			Standard Test Numbers (C)	UCR Section 5.2.3.5.4	Not Tested	See note 3.
Base Services – Abbreviated Numbers (C)	UCR Section 5.2.3.5.5	Not Tested	See note 3.			
Digit Reception Requirements (R)	UCR Section 5.2.3.5.6	Met				
Screening (C)	UCR Section 5.2.3.5.8	Not Tested	See note 3.			
ISDN Services	Yes	Certified (See note 4.)	BRI Access, Call Control and Signaling (C)	UCR Section 5.2.9.2, Table 5.2.9-1	Met	See notes 2 and 4.
			Uniform Interface Configuration for BRIs (C)	UCR Section 5.2.9.2, Table 5.2.9-2	Met	
			EKTS (C)	UCR Section 5.2.9.2, Table 5.2.9-3	Not Tested	See note 3.
			PRI Access, Call Control and Signaling (R)	UCR Section 5.2.9.2, Table 5.2.9-4	Met	
			PRI Features (R)	UCR Section 5.2.9.2, Table 5.2.9-5	Met	
			Packet Data Features and Capabilities (C)	UCR Section 5.2.9.2, Table 5.2.9-6	Not Tested	See note 3.

Table 2-5. SUT Interoperability Requirements/Status (continued)

DSN Features and Capabilities						
Feature/ Capability	Critical	Feature Status	UCR Requirement	Reference	Test Results	Remarks
Synchroniz- ation	Yes	Certified	Line timing mode (R)	UCR Section 5.2.11.2	Met	
			Internal Stratum 4 (R)	UCR Section 5.2.10.1.1.2.2	Met	
			Synchronization Performance Monitoring Criteria (C)	UCR Section 5.2.10.2	Not Tested	See note 3.
			DS1 Traffic Interfaces (C)	UCR Section 5.2.10.3	Not Tested	See note 3.
			DS0 Traffic Interconnects (C)	UCR Section 5.2.10.4	Not Tested	See note 3.
Reliability	Yes	Certified	System Availability (R)	UCR Section 5.2.11.2	Met	
			Backup Power (R)	UCR Section 5.2.11.3	Not Tested	See note 7.
			Power Components (R)	UCR Section 5.2.11.3.1	Not Tested	See note 7.
			UPS Requirements (R)	UCR Section 5.2.11.3.2	Not Tested	See note 7.
			UPS PBX 1 Load Capacity (R)	UCR Section 5.2.11.3.2.1	Not Tested	See note 7.
			Backup Power (Environmental) (R)	UCR Section 5.2.11.3.3	Not Tested	See note 7.
Network Management	No	Certified	Alarms (R)	UCR Section 5.2.11.3.4	Not Tested	See note 7.
			Interfaces (R)	UCR section 5.2.8.1	Not Tested	See note 3.
			Measurements and data generation (C)	UCR section 5.2.8.2	Not Tested	See note 3.
			Fault management (C)	UCR section 5.2.8.3	Not Tested	See note 3.
			Configuration management (C)	UCR section 5.2.8.4	Not Tested	See note 3.
			Accounting management (C)	UCR section 5.2.8.5	Not Tested	See note 3.
			Performance management (C)	UCR section 5.2.8.6	Not Tested	See note 3.
Security	Yes	Certified	Network Management controls (C)	UCR section 5.2.8.7	Not Tested	See note 3.
			Remote access (C)	UCR section 5.2.8.8	Not Tested	See note 3.
			GR-815, STIGs, and DoDI 8510.bb (DIACAP) (R)	UCR Sections 3.2.3, 3.2.5, and 5.4.6.1	Met	See note 8.

Table 2-5. SUT Interoperability Requirements/Status (continued)

Network Gateways							
Interface	Critical	Interface Status	UCR Requirement		Reference	Test Results	Remarks
PSTN	No	Certified	Trunking	Positive Identification Control (C)	CJCSI 6215.01C		
				On-Netting (C)	CJCSI 6215.01C		
				Off-Netting (C)	CJCSI 6215.01C		
				Ground Start Line (R)	UCR Section 5.2.4.2.2	Not Tested	See note 9.
				Immediate Start (C)	UCR Section 5.2.4.3.2		
				Delay Dial (C)	UCR Section 5.2.4.3.4		
<p>NOTES:</p> <p>1 This interface is not supported by the SUT and is not required for a PBX 1.</p> <p>2 The SUT does not support Non Facility Associated Signaling (NFAS) on their T1 ISDN PRI NI2 interface. This was adjudicated previously by DISA on 17 December 2008 as having a minor operation impact. Furthermore, DISA, in coordination with the Joint Staff, stated their intent to modify the next update of the UCR to change NFAS for a PBX 1 from required to conditional.</p> <p>3 This feature is not supported by the SUT and is not required for a PBX 1.</p> <p>4 The SUT met all critical CRs and FRs for the ISDN BRI S/T interface for data and VTC. The SUT does not support ISDN BRI U interface and it is not required for a PBX 1.</p> <p>5 When attempting or placing an MLPP three way conference where each leg is at a difference precedence level, the SUT does not preserve the highest precedence level of any of the call legs that are connected. However, the SUT classmarks all three members of the three way conference at the highest precedence. This has a minor operational impact.</p> <p>6 The SUT does not support Call Forward Variable. This was a new UCR requirement and the vendor has 18 months (until July 2010) to comply.</p> <p>7 This requirement is a non-testable requirement. It is the responsibility of the respective base/post/camp/station communications agency to provide this with the SUT when installed.</p> <p>8 Security is tested by DISA-led Information Assurance test teams and published in a separate report, Reference (e).</p> <p>9 The SUT does not support a ground start line interface. This was adjudicated by DISA on 14 August 2010 because SUT does support loop start and its application is solely deployed on Navy Ships to support ship to shore communications.</p>							

Table 2-5. SUT Interoperability Requirements/Status (continued)

LEGEND:					
ANSI	American National Standards Institute	FTR 1080B-2002	Video Teleconferencing Services	PBX 1	Private Branch Exchange 1
APL	Approved Products List	G.711	PCM of voice frequencies	PCM	Pulse Code Modulation
BER	Bit Error Ratio	GR	Generic Requirement	PCM-24	Pulse Code Modulation - 24 Channels
BRI	Basic Rate Interface	GR-815	Generic Requirements For Network Element/Network System (NE/NS) Security	PCM-30	Pulse Code Modulation - 30 Channels
C	Conditional			PRI	Primary Rate Interface
C2	Command and Control	H.320	Standard for Narrowband VTC	PSTN	Public Switched Telephone Network
CAS	Channel Associated Signaling	ISDN	Integrated Services Digital Network	Q.955.3	ISDN Signaling Standard for E1 MLPP
CFV	Call Forward Variable	IT	Information Technology	R	Required
CJCSI	Chairman of the Joint Chiefs of Staff Instruction	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	S/T	ISDN BRI 4-wire interface
CODEC	Coder/Decoder			SCIP	Secure Communication Interoperability Protocol
DIACAP	DoD Information Assurance Certification and Accreditation Process	JITC	Joint Interoperability Test Command	SS7	Signaling System 7
DISA	Defense Information Systems Agency	kbps	kilobits per second	STE	Secure Terminal Equipment
DISR	DoD IT Standards Registry	LoC	Letters of Compliance	STIGs	Security Technical Implementation Guides
DoD	Department of Defense	Mbps	Megabits per second	SUT	System Under Test
DoDI	Department of Defense Instruction	MFR1	Multi-Frequency Recommendation 1	T1	Digital Transmission Link Level 1 (1.544 Mbps)
DP	Dial Pulse	MLPP	Multi-Level Precedence and Preemption	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
DS0	Digital Signal Level 0 (64 kbps)	MOS	Mean Opinion Score	T.4	Standardization of Group 3 facsimile terminals for document transmission
DS1	Digital Signal Level 1 (1.544 Mbps) (2.048 Mbps European)	ms	millisecond	U	ISDN BRI 2-wire interface
DSN	Defense Switched Network	NFAS	Non Facility Associated Signaling	UC	Unified Capabilities
DTMF	Dual Tone Multi-Frequency	NI 1/2	National ISDN Standard 1 or 2	UCR	Unified Capabilities Requirements
E&M	Ear and Mouth	NI2	National ISDN Standard 2	UPS	Uninterruptible Power Supply
E1	European Basic Multiplex Rate (2.048 Mbps)	NX56	Data format restricted to multiples of 56 kbps	VBD	Variable bit data
EKTS	Electronic Key Telephone System	NX64	Data format restricted to multiples of 64 kbps	VTC	Video Teleconferencing
FTR	Federal Telecommunications Recommendation	PBX	Private Branch Exchange		