



DEFENSE INFORMATION SYSTEMS AGENCY

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

18 Jul 08

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of Avaya G3CSI (ProLogix) with Software Release Communication Manager (CM) 3.0 (R013i.00.0.340.5: Patch 8893.1.0.7)

References: (a) DOD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01D, "Interoperability and Supportability of Information Technology and National Security Systems," 8 March 2006
(c) through (e), 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 Avaya G3CSI (ProLogix) with Software Release CM 3.0 (R013i.00.0.340.5: Patch 8893.1.0.7) is hereinafter referred to as the system under test (SUT). The SUT met all of its critical interoperability requirements and is certified as interoperable for joint use within the Defense Switched Network (DSN) as a Private Branch Exchange (PBX) 1 and PBX 2. The identified test discrepancies shown in the Certification Testing Summary (enclosure 2), which remained open after software patches were applied and regression testing was completed, have an overall minor operational impact. The Avaya switch product line offers a Remote Switch Unit (RSU) capability referred to as the Survivable Remote Processor Expansion Port Network. Testing was performed on this capability; however, it did not meet the minimum critical requirements. Therefore, the RSU is not certified by JITC nor authorized for use within the DSN by the Program Management Office (PMO). No other configurations, features, or functions, except those cited within this report, are certified by the JITC, or authorized by the PMO for use within the DSN. This certification expires upon changes that could affect interoperability, but no later than three years from the date of this memorandum.

3. This certification is based on interoperability testing and review of the vendor's Letters of Compliance (LoC). Interoperability testing was conducted by the JITC at the Global Information Grid Network Test Facility, Fort Huachuca, Arizona, from 18 May through 5 August 2005. Review of the SUT test data for comparison to the Unified Capabilities Requirements (UCR) requirements was completed on 31 March 2008. Regression testing to verify new software patches and new requirements was conducted from 24 March through 4 April 2008. Review of the vendor's LoC was completed on 25 June 2008. Testing was conducted in an environment

that emulates the DSN. Enclosure 2 documents the test results and describes the tested network and system configurations.

4. The interoperability summary of the SUT is indicated in table 1. The Capability Requirements (CRs) and Feature Requirements (FRs) for the DSN are listed in table 2. This interoperability test status is based upon evaluation of:

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

Table 1. SUT Interoperability Test Summary

DSN Trunk Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 CAS (DTMF, MFR1, DP)	No	Certified	Met all CRs and FRs with the following minor exceptions: The SUT acknowledges a wink start signal beyond the maximum 350 ms. ¹
E1 CAS (DTMF, MFR1, DP)	No (Europe only)	Certified	Met all CRs and FRs.
T1 ISDN PRI NI 1/2 (ANSI T1. 619a)	Yes	Certified	Met all CRs and FRs.
E1 ISDN PRI	No (Europe only)	Not Tested	E1 PRI is supported by the SUT; however it was not tested. The SUT E1 PRI interface is therefore not certified by JITC, or authorized for use by the DSN PMO for use within the DSN. This is not a required interface for a PBX 1.
DSN Line Interfaces			
Interface & Signaling	Critical	Status	Remarks
2-Wire Analog (GR-506-CORE)	Yes	Certified	Met all CRs and FRs with the following minor exceptions: The SUT does not support the correct length of PNT. ² The SUT does not support the exact distinctive ring cadence for precedence above ROUTINE calls. ³
ISDN BRI NI 1/2	No	Certified	Met all CRs and FRs with the following minor exceptions: The SUT does not support the correct length of PNT. ² The SUT does not support the exact distinctive ring cadence for precedence above ROUTINE calls. ³
2-Wire Proprietary Digital	No	Certified	Met all CRs and FRs with the following minor exceptions: The SUT does not support the correct length of PNT. ² The SUT does not support the exact distinctive ring cadence for precedence above ROUTINE calls. ³
Voicemail			
Interface	Critical	Status	Remarks
2-Wire Proprietary Digital	No	Certified	Met all CRs and FRs.

Table 1. SUT Interoperability Test Summary (continued)

DSN Features and Capabilities				
Features and Capabilities	Critical	Status	Remarks	
Common Features	No	Certified	Met all critical CRs and FRs with the following minor exceptions: The SUT does not support priority call pickup with calls above ROUTINE ⁴ and does not allow the two legs of a three-way call to be established at different precedence levels. ⁵	
Attendant	No	Not Tested	This feature is not supported. Since this is not a required feature for a PBX 1, there is no operational impact.	
Public Safety	No	Certified	Met all critical CRs and FRs.	
Preset Conferencing	No	Not Tested	This feature is not supported. Since this is not a required feature for a PBX 1, there is no operational impact. See note 6.	
Nailed-up Connections	No	Not Tested	This feature is not supported. Since this is not a required feature for a PBX 1, there is no operational impact.	
DSN Hotline Services	No	Certified	Met all CRs and FRs.	
MLPP	Yes	Certified	Met all CRs and FRs.	
Call Processing	Yes	Certified	Met all CRs and FRs.	
ISDN Services (EKTS)	No	Certified	Met all CRs and FRs.	
Synchronization	Yes	Certified	Met all CRs and FRs.	
Reliability	Yes	Certified	Met all CRs and FRs.	
Security	Yes	See note 7.	See note 7.	
Network Gateways				
Gateway	Interface & Signaling	Critical	Status	Remarks
PSTN	T1 CAS (DTMF, DP, MFR1)	No	Certified	Met all CRs and FRs.
	E1 CAS (DTMF, DP, MFR1)	No (Europe only)	Certified	Met all CRs and FRs
	T1 ISDN PRI NI 1/2 (ANSI T1.607)	No	Certified	Met all CRs and FRs.
	E1 ISDN PRI	No (Europe only)	Not Tested	E1 PRI is supported by the SUT; however it was not tested. The SUT E1 PRI interface is therefore not certified by JITC, or authorized for use by the DSN PMO for use within the DSN. This is not a required interface for a PBX 1.
	Ground Start Line	Yes	Certified	Met all CRs and FRs.
LEGEND:				
ANSI	- American National Standards Institute		Mbps	- Megabits per second
BRI	- Basic Rate Interface		MFR1	- Multifrequency Recommendation 1
CAS	- Channel Associated Signaling		MLPP	- Multi-Level Precedence and Preemption
CRs	- Capability Requirements		ms	- milliseconds
DP	- Dial Pulse		NI 1/2	- National ISDN Standard 1 or 2
DSN	- Defense Switched Network		PBX 1	- Private Branch Exchange 1
DSS1	- Digital Subscriber Signaling 1		PMO	- Program Management Office
DTMF	- Dual Tone Multi-Frequency		PNT	- Preemption Notification Tone
E1	- European Basic Multiplex Rate (2.048 Mbps)		PRI	- Primary Rate Interface
EKTS	- Electronic Key Telephone System		PSTN	- Public Switched Telephone Network
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
JITC	- Joint Interoperability Test Command		T1.619a	- SS7 and ISDN MLPP Signaling Standard For T1
LSSGR	- Local Access and Transport Area (LATA) Switching System Generic Requirements		UCR	- Unified Capabilities Requirements

JITC Memo, JTE, Special Interoperability Test Certification of Avaya G3CSI (ProLogix) with Software Release Communication Manager (CM) 3.0 (R013i.00.0.340.5: Patch 8893.1.0.7)

Table 1. SUT Interoperability Test Summary (continued)

NOTES:	
1	The SUT acknowledges a wink start signal beyond the 350 ms maximum (up to 395 ms). Since switching systems generate wink start signals between 140-290 ms, there is no operational impact.
2	The SUT does not support the correct length of PNT when an active call is directly preempted. A three second PNT is sent to the party being preempted instead of sending PNT until the preempted party goes on hook. A three second PNT is adequate to notify the user the call is preempted and the higher precedence call is connected when the preempted user hangs up. Therefore, there is no operational impact.
3	The SUT does not support the correct distinctive ring cadence in accordance with the UCR for precedence above ROUTINE calls placed via a trunk. Since the precedence ring cadence can be distinguished from a ROUTINE ring cadence there is no operational impact.
4	The SUT does not support priority call pickup with precedence calls above ROUTINE. When a precedence call above ROUTINE is ringing in a call pickup group and a ROUTINE call is also ringing in the same call pickup group, the SUT randomly picks which call to pickup when the feature is activated. Since the higher precedence call is diverted to an alternate directory number if unanswered, the operational impact is minor.
5	The SUT does not support the classmarking of the two legs of a three-way call at different precedence levels. This is due to the fact that the SUT connects all three parties to a single time slot. Instead, the SUT classmarks all the parties at the highest precedence. Since the three-way call is classmarked at the highest precedence level of each leg there is no operational impact.
6	Preset Conferencing is not supported. Since this is not a required feature for a PBX 1, there is no operational impact. The SUT does; however, support an eight party "blast" conference. The SUT met all CRs and FRs for this conferencing capability. When a conferee is preempted or hangs up all remaining conferees received a conference notification tone. In addition, the SUT has the ability to program the conference with various precedence level calls for each leg of the conference. When this occurs, the SUT correctly classmarks all legs at the highest precedence of each leg.
7	Security is tested by DISA-led Information Assurance test teams and published in a separate report.

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"> • PBX Line (C) • Direct Inward Dialing (C) • National ISDN 1/2 Primary Access (R) • ISDN ANSI MLPP Service Capability (R) • ITU-T ISDN Primary Access (C) • ITU-T ISDN Primary Access Digital Subscriber Signaling System Number 1 MLPP (C) • Immediate Start (C) • Normal Wink Start Operations (C) • Glare Operation (C) • Abnormal Wink Start (C) • Glare Resolution (C) • Dial Delay (C) • Call for Service Timing (R) • Guard Timing (R) • Satellite Timing (C) • Disconnect Control (C) • Reselect and Retrial (C) • Off-Hook Supervision Transition (C) • Dial-Pulse Signals (C) • DTMF Signaling (C) • Standard Digit Format for Precedence (C) • MFR1 2/6 Signaling (C) • Alerting Signals and Tones (R) • DSN ISDN User-to-Network Signaling (R) 	<ul style="list-style-type: none"> • UCR Section 2.3.1 • UCR Section 2.3.2 • UCR Section 2.3.4.1 • UCR Section 2.3.4.1.1 • UCR Section 2.3.4.2 • UCR Section 2.3.4.2.1 • UCR Section 5.3.2 • UCR Section 5.3.3.1.1 • UCR Section 5.3.3.1.2 • UCR Section 5.3.3.2.1 • UCR Section 5.3.3.2.2 • UCR Section 5.3.4 • UCR Section 5.3.5 • UCR Section 5.3.6 • UCR Section 5.3.7 • UCR Section 5.3.8 • UCR Section 5.3.9 • UCR Section 5.3.10 • UCR Section 5.4.1 • UCR Section 5.4.2 • UCR Section 5.4.2.1 • UCR Section 5.4.3 • UCR Section 5.5 • UCR Section 5.7.1 	
E1 CAS (MFR1, DTMF, DP)	No (Europe only)			<ul style="list-style-type: none"> • Application (R) • Physical Layer (R) • S/T Reference Point (R) • Data Link Layer (R) • Data Link Connection (R) • Peer-to-Peer Procedures of Data-Link Layer (R) • Layer 3 DSN User-to-Network Signaling (R) • DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R) • Sequence of Messages for DSN Circuit-Switched Calls (R) • Message Functional Definition and Content (R) • General Message Format and Information Elements Coding (R) • Supplementary Services (C) • PCM-24 Digital Trunk Interface (R) • Interface Characteristics (R) • Supervisory Channel Associated Signaling (C) • Clear Channel Capability (R) • Alarm and Restoral Requirements (R) • PCM-30 Digital Trunk Interface (C) • Interoperation of PCM-24 and PCM-30 (C) • Analog Trunk Interface (C) • Integrated Digital Loop Carrier (C) • Trunk Group-Remove from Service (C) • Trunk Group-Restore to Service (C) 	<ul style="list-style-type: none"> • UCR Section 5.7.1.1 • UCR Section 5.7.1.2 • UCR Section 5.7.1.2.1 • UCR Section 5.7.1.3 • UCR Section 5.7.1.3.1 • UCR Section 5.7.1.3.2 • UCR Section 5.7.1.4 • UCR Section 5.7.1.4.2 • UCR Section 5.7.1.4.3 • UCR Section 5.7.1.4.4 • UCR Section 5.7.1.4.5 • UCR Section 5.7.1.4.6 • UCR Section 7.1 • UCR Section 7.1.1 • UCR Section 7.1.2 • UCR Section 7.1.3 • UCR Section 7.1.4 • UCR Section 7.2 • UCR Section 7.3 • UCR Section 7.4 • UCR Section 7.5 • UCR Section 2.5.5 • UCR Section 2.5.6
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 3.10 • UCR Section 3.10 • UCR Section 3.10 • UCR Section 3.10 • 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) • 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) 	<ul style="list-style-type: none"> • UCR Section 2.1.1 • UCR Section 2.3.3 • UCR Section 2.3.5 • UCR Section 2.5.4.1.1 • UCR Section 2.5.4.1.2 • UCR Section 5.2.1 • UCR Section 5.3.1 • UCR Section 5.5
ISDN BRI NI 1/2 (ANSI T1.619a)	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
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) • Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C
		VTC	<ul style="list-style-type: none"> • ITU-T H.320 (R: BRI only) 	<ul style="list-style-type: none"> • FTR 1080B-2002
DSN Features & Capabilities				
Feature/ Capability	Critical	Requirements Required or Conditional		References
Common Features	No	<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 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 (C) 		<ul style="list-style-type: none"> • UCR Section 2.1.1 • UCR Section 2.1.3 • UCR Section 2.1.4 • UCR Section 2.1.5 • UCR Section 2.1.6 • UCR Section 2.1.7 • UCR Section 2.1.7.1 • UCR Section 2.1.7.2 • UCR Section 2.1.7.3 • UCR Section 2.1.7.4 • UCR Section 2.1.7.5 • UCR Section 2.1.7.6 • UCR Section 2.1.7.7 • UCR Section 2.1.7.8 • UCR Section 2.1.8.1 • UCR Section 2.1.8.2 • UCR Section 2.1.8.3 • UCR Section 2.1.8.4 • UCR Section 2.1.9 • UCR Section 2.7 • UCR Section 2.9
Attendant	No	<ul style="list-style-type: none"> • Attendant Features (C) 		<ul style="list-style-type: none"> • UCR Section 2.2

Table 2. PBX 1 Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	Critical	Requirements Required or Conditional	References
Public Safety	No	<ul style="list-style-type: none"> • Emergency Service (911) Caller (R) • Emergency Service (911) Public Safety Answering Service (R) • Enhanced Emergency Service (E911) (C) • Trace of terminating calls (C) • Outgoing call trace (C) 	<ul style="list-style-type: none"> • UCR Section 2.4.1.1 • UCR Section 2.4.1.2 • UCR Section 2.4.1.3 • UCR Section 2.4.2 • UCR Section 2.4.3
Preset Conferencing	No	<ul style="list-style-type: none"> • Preset Conferencing (C) • Meet-Me Conferencing (R) • Progressive Conferencing (C) 	<ul style="list-style-type: none"> • UCR Section 2.6 • UCR Section 2.6.2 • UCR Section 2.6.3
Nailed-up Connections	No	<ul style="list-style-type: none"> • Nailed-Up Connections (C) 	<ul style="list-style-type: none"> • UCR Section 2.8
DSN Hotline Services	No	<ul style="list-style-type: none"> • DSN Analog Hotline Service (C) 	<ul style="list-style-type: none"> • UCR Section 2.12
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 3.1 • UCR Section 3.2 • UCR Section 3.2.1 • UCR Section 3.2.2 • UCR Section 3.3 • UCR Section 3.4.1 • UCR Section 3.4.2 • UCR Section 3.5 • UCR Section 3.6 • UCR Section 3.7 • UCR Section 3.8.1 • UCR Section 3.8.2 • UCR Section 3.8.3 • UCR Section 3.8.4 • UCR Section 3.8.5 • UCR Section 3.8.6 • UCR Section 3.8.7 • UCR Section 3.8.8 • UCR Section 3.8.9 • UCR Section 3.11
Call Processing	Yes	<ul style="list-style-type: none"> • Call Treatments (R) • Primary and Alternate Routine (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 4.1 • UCR Section 4.2 • UCR Section 4.3.1 • UCR Section 4.3.2 • UCR Section 4.3.3 • UCR Section 4.3.4 • UCR Section 4.5.1.1 • UCR Section 4.5.1.2 • UCR Section 4.5.1.2.1 • UCR Section 4.5.1.2.2 • UCR Section 4.5.1.3 • UCR Section 4.5.1.3.1 • UCR Section 4.5.1.3.2 • UCR Section 4.5.1.3.3 • UCR Section 4.5.1.4 • UCR Section 4.5.1.5 • UCR Section 4.5.1.6 • UCR Section 4.5.1.7 • UCR Section 4.5.1.8.1 • UCR Section 4.5.1.8.2 • UCR Section 4.5.1.9 • UCR Section 4.5.2 • UCR Section 4.5.3 • UCR Section 4.5.4 • UCR Section 4.5.5 • UCR Section 4.5.6 • UCR Section 4.5.8

Table 2. PBX 1 Requirements (continued)

DSN Features & Capabilities (continued)					
Feature/ Capability	Critical	Requirements Required or Conditional		References	
ISDN Services	No	<ul style="list-style-type: none"> • BRI Access, Call Control and Signaling (C) • Uniform Interface Configuration for BRIs (C) • Electronic Key Telephone Systems (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 10, table 10-1 • UCR Section 10, table 10-2 • UCR Section 10, table 10-3 • UCR Section 10, table 10-4 • UCR Section 10, table 10-5 • UCR Section 10, table 10-6 	
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 11.1.1.2 • UCR Section 11.1.2.2 • UCR Section 11.2 • UCR Section 11.3 • UCR Section 11.4 	
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 12.2 • UCR Section 12.3 • UCR Section 12.3.1 • UCR Section 12.3.2 • UCR Section 12.3.2.2 • UCR Section 12.3.3 • UCR Section 12.3.4 	
Security	Yes	<ul style="list-style-type: none"> • GR-815, STIGs, and DoDI 8510.bb (DIACAP) (R) 		<ul style="list-style-type: none"> • UCR Section 13 	
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) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C • CJCSI 6215.01C • UCR Section 5.2.2 	
LEGEND:					
ANSI	- American National Standards Institute	FTR 1080B-2002	- Video Teleconferencing Services	PCM-30	- Pulse Code Modulation - 30 Channels
App.	- Appendix	GR	- Generic Requirement	PRI	- Primary Rate Interface
BER	- Bit Error Ratio	GR-815	- Generic Requirements For Network Element/Network System (NE/NS) Security	PSTN	- Public Switched Telephone Network
BRI	- Basic Rate Interface		- Standard for Narrowband VTC	Q.955.3	- ISDN Signaling Standard for E1 MLPP
C	- Conditional	H.320	- Integrated Services Digital Network	R	- Required
CAS	- Channel Associated Signaling	ISDN	- Information Technology	S/T	- ISDN BRI 4-wire interface
CJCSI	- Chairman of the Joint Chiefs of Staff Instruction	ITU-T	- International Telecommunication Union-Telecommunication Standardization Sector	SS7	- Signaling System 7
DS0	- Digital Signal Level 0 (64 kbps)		- kilobits per second	STE	- Secure Terminal Equipment
DS1	- Digital Signal Level 1 (1.544 Mbps) (2.048 Mbps European)	kbps	- Megabits per second	STIGs	- Security Technical Implementation Guides
DIACAP	- DoD Information Assurance Certification and Accreditation Process	MFR1	- Multi-Frequency Recommendation 1	STU-III	- Secure Telephone Unit -3rd generation
DISR	- DoD IT Standards Registry	MLPP	- Multi-Level Precedence and Preemption	T1	- Digital Transmission Link Level 1 (1.544 Mbps)
DoD	- Department of Defense	MOS	- Mean Opinion Score	T1.619a	- SS7 and ISDN MLPP Signaling Standard for T1
DP	- Dial Pulse	NI 1/2	- National ISDN 1 or 2	T.4	- Standardization of Group 3 facsimile terminals for document transmission
DSN	- Defense Switched Network	NX56	- Data format restricted to multiples of 56 kbps	UCR	- Unified Capabilities Requirements
DTMF	- Dual Tone Multi-Frequency	NX64	- Data format restricted to multiples of 64 kbps	UPS	- Uninterruptible Power Supply
E1	- European Basic Multiplex Rate (2.048 Mbps)	PBX	- Private Branch Exchange	VBD	- Variable bit data
FTR	- Federal Telecommunications Recommendation	PBX 1	- Private Branch Exchange 1	VTC	- Video Teleconferencing
		PCM-24	- Pulse Code Modulation - 24 Channels		

NOTE: Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP.

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

JITC Memo, JTE, Special Interoperability Test Certification of Avaya G3CSI (ProLogix) with Software Release Communication Manager (CM) 3.0 (R013i.00.0.340.5: Patch 8893.1.0.7)

references are on the JITC Joint Interoperability Tool (JIT) at <http://jit.fhu.disa.mil> (NIPRNet), or <http://199.208.204.125> (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>.

6. The JITC point of contact is Mr. Joseph Roby, DSN 879-0507, commercial (520) 538-0507, FAX DSN 879-4347, or e-mail to joseph.robby@disa.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 0708002.

FOR THE COMMANDER:



RICHARD A. MEADOR
Chief
Battlespace Communications Portfolio

2 Enclosures a/s

JITC Memo, JTE, Special Interoperability Test Certification of Avaya G3CSI (ProLogix) with Software Release Communication Manager (CM) 3.0 (R013i.00.0.340.5: Patch 8893.1.0.7)

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U.S. Marine Corps MARCORSSYSCOM, 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) 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
- (d) Defense Information Systems Agency, "Department of Defense Networks Unified Capabilities Requirements," 21 December 2007
- (e) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006

CERTIFICATION TESTING SUMMARY

- 1. SYSTEM TITLE.** Avaya G3CSI (ProLogix) with Software Release Communication Manager (CM) 3.0 (R013i.00.0.340.5: Patch 8893.1.0.7), hereinafter referred to as the System Under Test (SUT).
- 2. PROPONENT.** United States Air Force (USAF) Air Combat Command (ACC).
- 3. PROGRAM MANAGER.** Captain Reginald Smith, A6OK, 180 Benedict Avenue, Suite 201, Langley, Virginia 23665, E-mail: reginald.smith@langley.af.mil.
- 4. TESTER.** Joint Interoperability Test Command (JITC), Fort Huachuca, Arizona.
- 5. SYSTEM UNDER TEST DESCRIPTION.** The SUT is a compact digital telecommunications system that provides user- and system-management, intelligent call routing, application integration, and enterprise communication networking. The SUT has the maximum capacity of 900 ports. It supports a maximum of 500 lines and 400 trunks. The SUT provides call processing business applications such as voice messaging, shared voice mail, small call center-networking capabilities, and expert systems for remote diagnostics and self-healing. The Avaya switch product line offers a Remote Switch Unit (RSU) capability referred to as the Survivable Remote Processor Expansion Port Network. Testing was performed on this capability; however, it did not meet the minimum critical requirements. Therefore, the RSU is not certified by JITC nor authorized for use within the Defense Switched Network (DSN) by the Program Management Office (PMO).
- 6. OPERATIONAL ARCHITECTURE.** The 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.

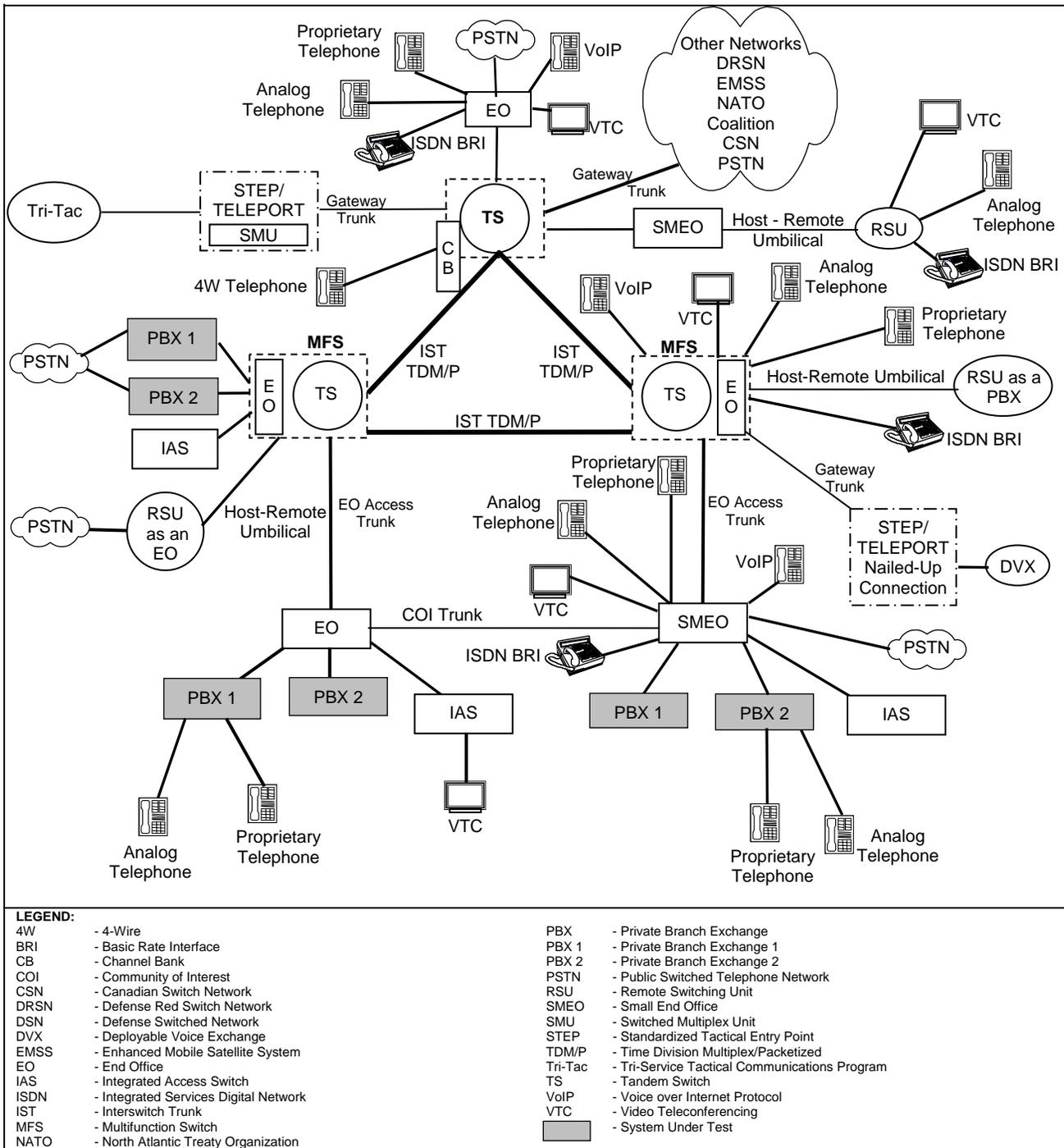


Figure 2-1. DSN Architecture

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)."

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

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

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"> • PBX Line (C) • Direct Inward Dialing (C) • National ISDN 1/2 Primary Access (R) • ISDN ANSI MLPP Service Capability (R) • ITU-T ISDN Primary Access (C) • ITU-T ISDN Primary Access Digital Subscriber Signaling System Number 1 MLPP (C) • Immediate Start (C) • Normal Wink Start Operations (C) • Glare Operation (C) • Abnormal Wink Start (C) • Glare Resolution (C) • Dial Delay (C) • Call for Service Timing (R) • Guard Timing (R) • Satellite Timing (C) • Disconnect Control (C) • Reselect and Retrial (C) • Off-Hook Supervision Transition (C) • Dial-Pulse Signals (C) • DTMF Signaling (C) • Standard Digit Format for Precedence (C) • MFR1 2/6 Signaling (C) • Alerting Signals and Tones (R) • DSN ISDN User-to-Network Signaling (R) • Application (R) • Physical Layer (R) • S/T Reference Point (R) • Data Link Layer (R) • Data Link Connection (R) • Peer-to-Peer Procedures of Data-Link Layer (R) • Layer 3 DSN User-to-Network Signaling (R) • DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R) • Sequence of Messages for DSN Circuit-Switched Calls (R) • Message Functional Definition and Content (R) • General Message Format and Information Elements Coding (R) • Supplementary Services (C) • PCM-24 Digital Trunk Interface (R) • Interface Characteristics (R) • Supervisory Channel Associated Signaling (C) • Clear Channel Capability (R) • Alarm and Restoral Requirements (R) • PCM-30 Digital Trunk Interface (C) • Interoperation of PCM-24 and PCM-30 (C) • Analog Trunk Interface (C) • Integrated Digital Loop Carrier (C) • Trunk Group-Remove from Service (C) • Trunk Group-Restore to Service (C) 	<ul style="list-style-type: none"> • UCR Section 2.3.1 • UCR Section 2.3.2 • UCR Section 2.3.4.1 • UCR Section 2.3.4.1.1 • UCR Section 2.3.4.2 • UCR Section 2.3.4.2.1 • UCR Section 5.3.2 • UCR Section 5.3.3.1.1 • UCR Section 5.3.3.1.2 • UCR Section 5.3.3.2.1 • UCR Section 5.3.3.2.2 • UCR Section 5.3.4 • UCR Section 5.3.5 • UCR Section 5.3.6 • UCR Section 5.3.7 • UCR Section 5.3.8 • UCR Section 5.3.9 • UCR Section 5.3.10 • UCR Section 5.4.1 • UCR Section 5.4.2 • UCR Section 5.4.2.1 • UCR Section 5.4.3 • UCR Section 5.5 • UCR Section 5.7.1 • UCR Section 5.7.1.1 • UCR Section 5.7.1.2 • UCR Section 5.7.1.2.1 • UCR Section 5.7.1.3 • UCR Section 5.7.1.3.1 • UCR Section 5.7.1.3.2 • UCR Section 5.7.1.4 • UCR Section 5.7.1.4.2 • UCR Section 5.7.1.4.3 • UCR Section 5.7.1.4.4 • UCR Section 5.7.1.4.5 • UCR Section 5.7.1.4.6 • UCR Section 7.1 • UCR Section 7.1.1 • UCR Section 7.1.2 • UCR Section 7.1.3 • UCR Section 7.1.4 • UCR Section 7.2 • UCR Section 7.3 • UCR Section 7.4 • UCR Section 7.5 • UCR Section 2.5.5 • UCR Section 2.5.6 	
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 2-1. 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 3.10 • UCR Section 3.10 • UCR Section 3.10 • UCR Section 3.10 • 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) • 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) 	<ul style="list-style-type: none"> • UCR Section 2.1.1 • UCR Section 2.3.3 • UCR Section 2.3.5 • UCR Section 2.5.4.1.1 • UCR Section 2.5.4.1.2 • UCR Section 5.2.1 • UCR Section 5.3.1 • UCR Section 5.5
ISDN BRI NI 1/2 (ANSI T1.619a)	No		Voice	<ul style="list-style-type: none"> • MOS (R) • Secure Calls (R)
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) • Secure data (STE/STU-III) (R) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C
		VTC	<ul style="list-style-type: none"> • ITU-T H.320 (R: BRI only) 	<ul style="list-style-type: none"> • FTR 1080B-2002
DSN Features & Capabilities				
Feature/ Capability	Critical	Requirements Required or Conditional		References
Common Features	No	<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 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 (C) 		<ul style="list-style-type: none"> • UCR Section 2.1.1 • UCR Section 2.1.3 • UCR Section 2.1.4 • UCR Section 2.1.5 • UCR Section 2.1.6 • UCR Section 2.1.7 • UCR Section 2.1.7.1 • UCR Section 2.1.7.2 • UCR Section 2.1.7.3 • UCR Section 2.1.7.4 • UCR Section 2.1.7.5 • UCR Section 2.1.7.6 • UCR Section 2.1.7.7 • UCR Section 2.1.7.8 • UCR Section 2.1.8.1 • UCR Section 2.1.8.2 • UCR Section 2.1.8.3 • UCR Section 2.1.8.4 • UCR Section 2.1.9 • UCR Section 2.7 • UCR Section 2.9
Attendant	No	<ul style="list-style-type: none"> • Attendant Features (C) 		<ul style="list-style-type: none"> • UCR Section 2.2

Table 2-1. PBX 1 Requirements (continued)

DSN Features & Capabilities			
Feature/ Capability	Critical	Requirements Required or Conditional	References
Public Safety	No	<ul style="list-style-type: none"> • Emergency Service (911) Caller (R) • Emergency Service (911) Public Safety Answering Service (R) • Enhanced Emergency Service (E911) (C) • Trace of terminating calls (C) • Outgoing call trace (C) 	<ul style="list-style-type: none"> • UCR Section 2.4.1.1 • UCR Section 2.4.1.2 • UCR Section 2.4.1.3 • UCR Section 2.4.2 • UCR Section 2.4.3
Preset Conferencing	No	<ul style="list-style-type: none"> • Preset Conferencing (C) • Meet-Me Conferencing (R) • Progressive Conferencing (C) 	<ul style="list-style-type: none"> • UCR Section 2.6 • UCR Section 2.6.2 • UCR Section 2.6.3
Nailed-up Connections	No	<ul style="list-style-type: none"> • Nailed-Up Connections (C) 	<ul style="list-style-type: none"> • UCR Section 2.8
DSN Hotline Services	No	<ul style="list-style-type: none"> • DSN Analog Hotline Service (C) 	<ul style="list-style-type: none"> • UCR Section 2.12
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 3.1 • UCR Section 3.2 • UCR Section 3.2.1 • UCR Section 3.2.2 • UCR Section 3.3 • UCR Section 3.4.1 • UCR Section 3.4.2 • UCR Section 3.5 • UCR Section 3.6 • UCR Section 3.7 • UCR Section 3.8.1 • UCR Section 3.8.2 • UCR Section 3.8.3 • UCR Section 3.8.4 • UCR Section 3.8.5 • UCR Section 3.8.6 • UCR Section 3.8.7 • UCR Section 3.8.8 • UCR Section 3.8.9 • UCR Section 3.11
Call Processing	Yes	<ul style="list-style-type: none"> • Call Treatments (R) • Primary and Alternate Routine (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 4.1 • UCR Section 4.2 • UCR Section 4.3.1 • UCR Section 4.3.2 • UCR Section 4.3.3 • UCR Section 4.3.4 • UCR Section 4.5.1.1 • UCR Section 4.5.1.2 • UCR Section 4.5.1.2.1 • UCR Section 4.5.1.2.2 • UCR Section 4.5.1.3 • UCR Section 4.5.1.3.1 • UCR Section 4.5.1.3.2 • UCR Section 4.5.1.3.3 • UCR Section 4.5.1.4 • UCR Section 4.5.1.5 • UCR Section 4.5.1.6 • UCR Section 4.5.1.7 • UCR Section 4.5.1.8.1 • UCR Section 4.5.1.8.2 • UCR Section 4.5.1.9 • UCR Section 4.5.2 • UCR Section 4.5.3 • UCR Section 4.5.4 • UCR Section 4.5.5 • UCR Section 4.5.6 • UCR Section 4.5.8

Table 2-1. PBX 1 Requirements (continued)

DSN Features & Capabilities (continued)				
Feature/ Capability	Critical	Requirements Required or Conditional		References
ISDN Services	No	<ul style="list-style-type: none"> • BRI Access, Call Control and Signaling (C) • Uniform Interface Configuration for BRIs (C) • Electronic Key Telephone Systems (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 10, table 10-1 • UCR Section 10, table 10-2 • UCR Section 10, table 10-3 • UCR Section 10, table 10-4 • UCR Section 10, table 10-5 • UCR Section 10, table 10-6
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 11.1.1.2 • UCR Section 11.1.2.2 • UCR Section 11.2 • UCR Section 11.3 • UCR Section 11.4
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 12.2 • UCR Section 12.3 • UCR Section 12.3.1 • UCR Section 12.3.2 • UCR Section 12.3.2.2 • UCR Section 12.3.3 • UCR Section 12.3.4
Security	Yes	<ul style="list-style-type: none"> • GR-815, STIGs, and DoDI 8510.bb (DIACAP) (R) 		<ul style="list-style-type: none"> • UCR Section 13
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) 	<ul style="list-style-type: none"> • CJCSI 6215.01C • CJCSI 6215.01C • CJCSI 6215.01C • UCR Section 5.2.2
LEGEND:				
ANSI - American National Standards Institute	FTR 1080B-2002 - Video Teleconferencing Services	PCM-30 - Pulse Code Modulation - 30 Channels		
App. - Appendix	GR - Generic Requirement	PRI - Primary Rate Interface		
BER - Bit Error Ratio	GR-815 - Generic Requirements For Network Element/Network System (NE/NS) Security	PSTN - Public Switched Telephone Network		
BRI - Basic Rate Interface	H.320 - Standard for Narrowband VTC	Q.955.3 - ISDN Signaling Standard for E1 MLPP		
C - Conditional	ISDN - Integrated Services Digital Network	R - Required		
CAS - Channel Associated Signaling	IT - Information Technology	S/T - ISDN BRI 4- wire interface		
CJCSI - Chairman of the Joint Chiefs of Staff Instruction	ITU-T - International Telecommunication Union-Telecommunication Standardization Sector	SS7 - Signaling System 7		
DS0 - Digital Signal Level 0 (64 kbps)	kbps - kilobits per second	STE - Secure Terminal Equipment		
DS1 - Digital Signal Level 1 (1.544 Mbps) (2.048 Mbps European)	Mbps - Megabits per second	STIGs - Security Technical Implementation Guides		
DIACAP - DoD Information Assurance Certification and Accreditation Process	MFR1 - Multi-Frequency Recommendation 1	STU-III - Secure Telephone Unit -3rd generation		
DISR - DoD IT Standards Registry	MLPP - Multi-Level Precedence and Preemption	T1 - Digital Transmission Link Level 1 (1.544 Mbps)		
DoD - Department of Defense	MOS - Mean Opinion Score	T1.619a - SS7 and ISDN MLPP Signaling Standard for T1		
DP - Dial Pulse	NI 1/2 - National ISDN 1 or 2	T.4 - Standardization of Group 3 facsimile terminals for document transmission		
DSN - Defense Switched Network	NX56 - Data format restricted to multiples of 56 kbps	UCR - Unified Capabilities Requirements		
DTMF - Dual Tone Multi-Frequency	NX64 - Data format restricted to multiples of 64 kbps	UPS - Uninterruptible Power Supply		
E1 - European Basic Multiplex Rate (2.048 Mbps)	PBX - Private Branch Exchange	VBD - Variable bit data		
FTR - Federal Telecommunications Recommendation	PBX 1 - Private Branch Exchange 1	VTC - Video Teleconferencing		
	PCM-24 - Pulse Code Modulation - 24 Channels			

NOTE: Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP.

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 test configuration depicted in figure 2-2. The SUT was tested as the end-point in relation to the other switches.

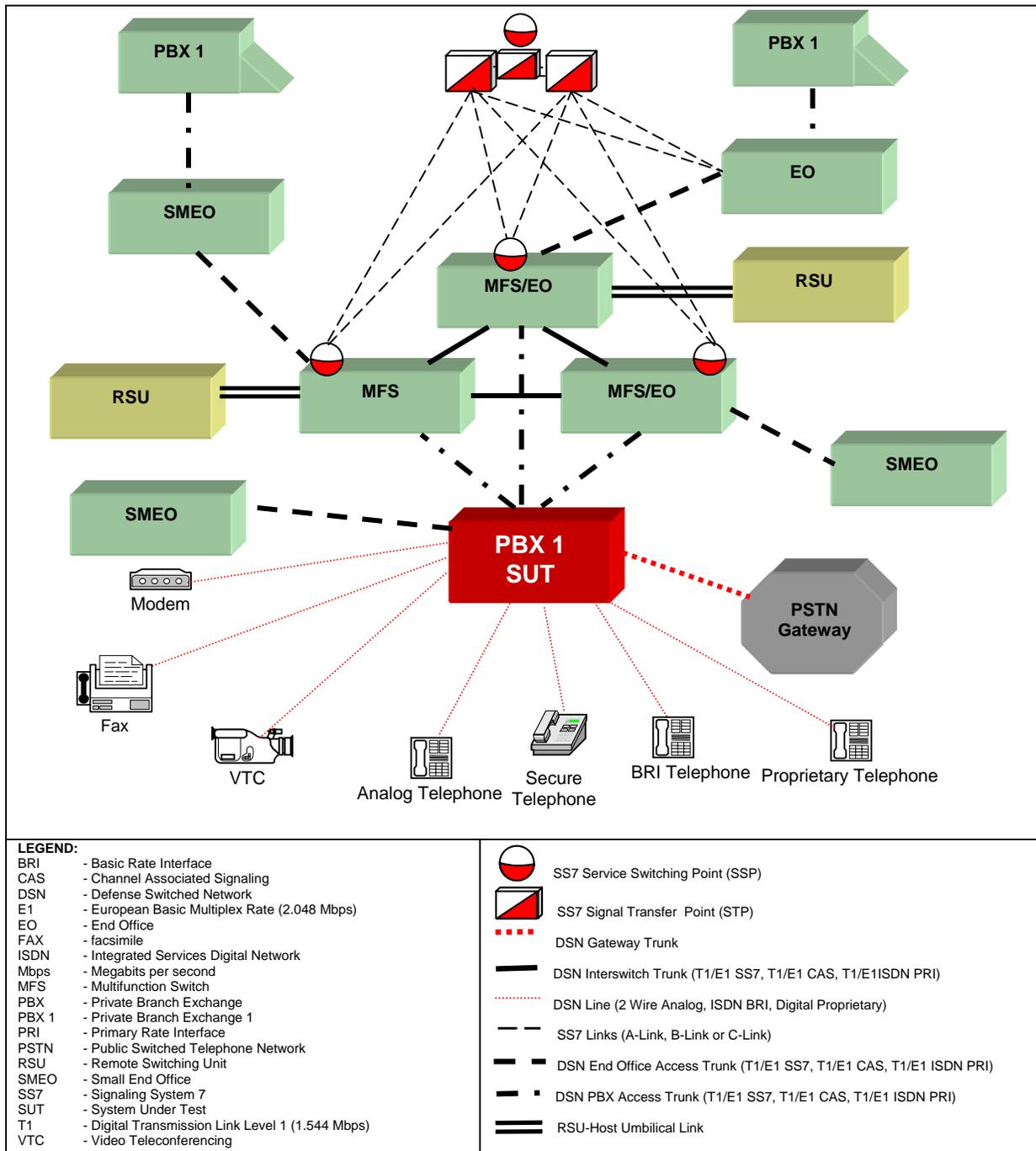


Figure 2-2. Test Configuration

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 DSN Approved Products List (APL) that offer the same certified interfaces.

Table 2-2. Tested System Configurations

System Name	Software Release																			
Nortel CS2100 (MFS, EO)	Succession Enterprise (SE) 09.1																			
Nortel CS1000M Single Group (SMEO)	DSN 4.5W																			
Avaya S8710 (SMEO)	Communication Manager (CM) 4.0 (R014x.00.2.731.7: Super Patch 14419)																			
Siemens EWSD (MFS, EO)	19d with Patch Set 46																			
Alcatel-Lucent 5ESS (MFS, EO)	5E16.2 Broadcast Warning Message (BWM) 07-0003																			
Tekelec Eagle® STP with Software Release	35.6.1-56.52.0																			
Nortel Networks Broad Band STP	8.0.12.16E																			
Avaya G3CSI, ProLogix	Hardware	Vintage																		
<p align="center">SUT CM 3.0 (R013i.00.0.340.5: Patch 8893.1.0.7)</p>	Processor TN2402	000004																		
	Maintenance TN771D	000007																		
	Tone Clock Card TN2182C	000004																		
	IP Media Processor Board TN2302AP	HW13 FW102																		
	Announcement Card TN750C	000013																		
	Control LAN Card TN799DP	HW01 FW131																		
	Analog Card TN793B	000006																		
	DS1 Interface Card TN464HP	HW00 FW117																		
	DS1 Interface Card TN464GP	HW06 FW017																		
	BRI Line Card TN556D	000001																		
	DS1 Interface Card TN2464BP	HW05 FW017																		
	Digital Line Card TN2224B	000003																		
	Telephones																			
	Interface Type	Models/Software																		
	2-Wire Analog	Panasonic KX-TS15-W																		
2-Wire Digital	Avaya 8510D and 8510B																			
2-Wire Digital Proprietary	Avaya 6416D+M and 6402																			
ISDN BRI	Avaya 8510T																			
ISDN BRI	Tone Commander phones with Release 01.07.22: 6210U, 6210T, 6220U, 6220T, and 6220T TSG																			
<p>LEGEND:</p> <table border="0"> <tr> <td>5ESS - Class 5 Electronic Switching System</td> <td>IP - Internet Protocol</td> </tr> <tr> <td>BRI - Basic Rate Interface</td> <td>ISDN - Integrated Services Digital Network</td> </tr> <tr> <td>CM - Communication Manager</td> <td>LAN - Local Area Network</td> </tr> <tr> <td>DS1 - Digital Signal Level 1 (1.544 Mbps North American) (2.048 Mbps European)</td> <td>Mbps - Megabits per second</td> </tr> <tr> <td>DSN - Defense Switched Network</td> <td>MFS - Multifunction Switch</td> </tr> <tr> <td>EO - End Office</td> <td>SE - Succession Enterprise</td> </tr> <tr> <td>EWSD - Elektronisches Wählsystem Digital</td> <td>SMEO - Small End Office</td> </tr> <tr> <td>FW - Firmware</td> <td>STP - Signal Transfer Point</td> </tr> <tr> <td>HW - Hardware</td> <td>SUT - System Under Test</td> </tr> </table>			5ESS - Class 5 Electronic Switching System	IP - Internet Protocol	BRI - Basic Rate Interface	ISDN - Integrated Services Digital Network	CM - Communication Manager	LAN - Local Area Network	DS1 - Digital Signal Level 1 (1.544 Mbps North American) (2.048 Mbps European)	Mbps - Megabits per second	DSN - Defense Switched Network	MFS - Multifunction Switch	EO - End Office	SE - Succession Enterprise	EWSD - Elektronisches Wählsystem Digital	SMEO - Small End Office	FW - Firmware	STP - Signal Transfer Point	HW - Hardware	SUT - System Under Test
5ESS - Class 5 Electronic Switching System	IP - Internet Protocol																			
BRI - Basic Rate Interface	ISDN - Integrated Services Digital Network																			
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FW - Firmware	STP - Signal Transfer Point																			
HW - Hardware	SUT - System Under Test																			

10. TESTING LIMITATIONS. None.

11. TEST RESULTS

a. Discussion

(1) DSN Trunk Interfaces. The SUT met all critical interoperability certification requirements for the following DSN Trunk Interfaces. Digital Transmission Link Level 1 (T1) Channel Associated Signal (CAS), European Basic Multiplex Rate (E1) CAS, T1 Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI). The following minor exception is noted:

The SUT acknowledges a wink start signal beyond the 350 ms maximum (up to 395 ms). Since switching systems generate wink start signals between 140-290 ms there is no operational impact.

(2) DSN Line Interfaces. The SUT met all critical interoperability certification requirements for the following DSN Line Interfaces: 2-wire analog, ISDN Basic Rate Interface (BRI), and 2-wire proprietary digital. The following minor exceptions are noted:

(a) The SUT does not support the correct length of PNT when an active call is directly preempted. A three second PNT is sent to the party being preempted instead of sending PNT until the preempted party goes on hook. A three second PNT is adequate to notify the user is preempted and the higher precedence call is connected when the preempted user hands up. Therefore, there is no operational impact.

(b) The SUT does not support the correct distinctive ring cadence in accordance with the UCR for precedence above ROUTINE calls placed via a trunk. Since the precedence ring cadence can be distinguished from a ROUTINE ring cadence there is no operational impact.

(3) Features and Capabilities. The SUT met all critical interoperability certification requirements for Features and Capabilities.

(a) Common Features. The SUT met all CRs and FRs with the following minor exceptions:

1. The SUT does not support priority call pickup with precedence calls above ROUTINE. When a precedence call above ROUTINE is ringing in a call pickup group and a ROUTINE call is also ringing in the same call pickup group, the SUT randomly picks which call to pickup when the feature is activated. Since the higher precedence call is diverted to an alternate directory number if unanswered, the operational impact is minor.

2. The SUT does not support the classmarking of the two legs of a three-way call at different precedence levels. This is due to the fact that the SUT connects all three parties to a single time slot. Instead, the SUT classmarks all the parties at the highest precedence. Since the three-way call is classmarked at the highest precedence level of each leg there is no operational impact.

(b) Attendant. This feature is not supported. Since this is not a required feature for a PBX 1, there is no operational impact.

(c) Public Safety. Met all CRs and FRs.

(d) Preset Conferencing. This feature is not supported. Since this is not a required feature for a PBX 1, there is no operational impact. The SUT does; however, support an eight party “blast” conference. The SUT met all CRs and FRs for this conferencing capability. When a conferee is preempted or hangs up all remaining conferees received a conference notification tone. In addition, the SUT has the ability to program the conference with various precedence level calls for each leg of the conference. When this occurs, the SUT correctly classmarks all legs at the highest precedence of each leg.

(e) Nailed-up Connections. This feature is not supported. Since this is not a required feature for a PBX 1, there is no operational impact.

(f) DSN Hotline Services. Met all CRs and FRs.

(g) MLPP. Met all CRs and FRs.

(h) Call Processing. Met all CRs and FRs.

(i) ISDN Services Electronic Key Telephone System. Met all CRs and FRs.

(j) Synchronization. Met all CRs and FRs. The SUT meets the requirement with line timing mode and an internal stratum 4 level clock.

(k) Reliability. Met all CRs and FRs. This was verified through the vendor’s LoC.

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

(4) Network Gateways. The SUT met all critical interoperability certification requirements for Network Gateways. The certified interfaces for the Public Switched Telephone Network are T1 CAS, E1 CAS, T1 ISDN PRI, and Ground Start.

b. System Interoperability Results. The SUT with Software Release Version CM 3.0 (R013i.00.0.340.5: Patch 8893.1.0.7) 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 Avaya switch product line offers an RSU capability referred to as the Survivable Remote Processor Expansion Port Network. Testing was performed on this capability; however, it did not meet the minimum critical requirements. Therefore, the RSU is not certified by JITC nor

authorized for use within the DSN by the PMO. The interoperability test summary is shown in table 2-3 and the detailed interoperability test status is shown table 2-4.

Table 2-3. SUT Interoperability Test Summary

DSN Trunk Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 CAS (DTMF, MFR1, DP)	No	Certified	Met all CRs and FRs with the following minor exceptions: The SUT acknowledges a wink start signal beyond the maximum 350 ms. ¹
E1 CAS (DTMF, MFR1, DP)	No (Europe only)	Certified	Met all CRs and FRs.
T1 ISDN PRI NI 1/2 (ANSI T1. 619a)	Yes	Certified	Met all CRs and FRs.
E1 ISDN PRI	No (Europe only)	Not Tested	E1 PRI is supported by the SUT; however it was not tested. The SUT E1 PRI interface is therefore not certified by JITC, or authorized for use by the DSN PMO for use within the DSN. This is not a required interface for a PBX 1.
DSN Line Interfaces			
Interface & Signaling	Critical	Status	Remarks
2-Wire Analog (GR-506-CORE)	Yes	Certified	Met all CRs and FRs with the following minor exceptions: The SUT does not support the correct length of PNT. ² The SUT does not support the exact distinctive ring cadence for precedence above ROUTINE calls. ³
ISDN BRI NI 1/2	No	Certified	Met all CRs and FRs with the following minor exceptions: The SUT does not support the correct length of PNT. ² The SUT does not support the exact distinctive ring cadence for precedence above ROUTINE calls. ³
2-Wire Proprietary Digital	No	Certified	Met all CRs and FRs with the following minor exceptions: The SUT does not support the correct length of PNT. ² The SUT does not support the exact distinctive ring cadence for precedence above ROUTINE calls. ³
Voicemail			
Interface	Critical	Status	Remarks
2-Wire Proprietary Digital	No	Certified	Met all CRs and FRs.
DSN Features and Capabilities			
Features and Capabilities	Critical	Status	Remarks
Common Features	No	Certified	Met all critical CRs and FRs with the following minor exceptions: The SUT does not support priority call pickup with calls above ROUTINE ⁴ and does not allow the two legs of a three-way call to be established at different precedence levels. ⁵
Attendant	No	Not Tested	This feature is not supported. Since this is not a required feature for a PBX 1, there is no operational impact.
Public Safety	No	Certified	Met all critical CRs and FRs.
Preset Conferencing	No	Not Tested	This feature is not supported. Since this is not a required feature for a PBX 1, there is no operational impact. See note 6.
Nailed-up Connections	No	Not Tested	This feature is not supported. Since this is not a required feature for a PBX 1, there is no operational impact.
DSN Hotline Services	No	Certified	Met all CRs and FRs.
MLPP	Yes	Certified	Met all CRs and FRs.
Call Processing	Yes	Certified	Met all CRs and FRs.
ISDN Services (EKTS)	No	Certified	Met all CRs and FRs.
Synchronization	Yes	Certified	Met all CRs and FRs.
Reliability	Yes	Certified	Met all CRs and FRs.
Security	Yes	See note 7.	See note 7.

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

Network Gateways				
Gateway	Interface & Signaling	Critical	Status	Remarks
PSTN	T1 CAS (DTMF, DP, MFR1)	No	Certified	Met all CRs and FRs.
	E1 CAS (DTMF, DP, MFR1)	No (Europe only)	Certified	Met all CRs and FRs
	T1 ISDN PRI NI 1/2 (ANSI T1.607)	No	Certified	Met all CRs and FRs.
	E1 ISDN PRI	No (Europe only)	Not Tested	E1 PRI is supported by the SUT; however it was not tested. The SUT E1 PRI interface is therefore not certified by JITC, or authorized for use by the DSN PMO for use within the DSN. This is not a required interface for a PBX 1.
	Ground Start Line	Yes	Certified	Met all CRs and FRs.
LEGEND: ANSI - American National Standards Institute BRI - Basic Rate Interface CAS - Channel Associated Signaling CRs - Capability Requirements DISA - Defense Information Systems Agency DP - Dial Pulse DSN - Defense Switched Network DSS1 - Digital Subscriber Signaling 1 DTMF - Dual Tone Multi-Frequency E1 - European Basic Multiplex Rate (2.048 Mbps) EKTS - Electronic Key Telephone System FRs - Feature Requirements GR - Generic Requirement GR-506-CORE - LSSGR: Signaling for Analog Interfaces ISDN - Integrated Services Digital Network JITC - Joint Interoperability Test Command LSSGR - Local Access and Transport Area (LATA) Switching System Generic Requirements Mbps - Megabits per second MFR1 - Multifrequency Recommendation 1 MLPP - Multi-Level Precedence and Preemption ms - milliseconds NI 1/2 - National ISDN Standard 1 or 2 PBX 1 - Private Branch Exchange 1 PMO - Program Management Office PNT - Preemption Notification Tone PRI - Primary Rate Interface PSTN - Public Switched Telephone Network SS7 - Signaling System 7 SUT - System Under Test T1 - Digital Transmission Link Level 1 (1.544 Mbps) T1.607 - ISDN Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1 T1.619a - SS7 and ISDN MLPP Signaling Standard For T1 UCR - Unified Capabilities Requirements NOTES: 1 The SUT acknowledges a wink start signal beyond the 350 ms maximum (up to 395 ms). Since switching systems generate wink start signals between 140-290 ms, there is no operational impact. 2 The SUT does not support the correct length of PNT when an active call is directly preempted. A three second PNT is sent to the party being preempted instead of sending PNT until the preempted party goes on hook. A three second PNT is adequate to notify the user the call is preempted and the higher precedence call is connected when the preempted user hangs up. Therefore, there is no operational impact. 3 The SUT does not support the correct distinctive ring cadence in accordance with the UCR for precedence above ROUTINE calls placed via a trunk. Since the precedence ring cadence can be distinguished from a ROUTINE ring cadence there is no operational impact. 4 The SUT does not support priority call pickup with precedence calls above ROUTINE. When a precedence call above ROUTINE is ringing in a call pickup group and a ROUTINE call is also ringing in the same call pickup group, the SUT randomly picks which call to pickup when the feature is activated. Since the higher precedence call is diverted to an alternate directory number if unanswered, the operational impact is minor. 5 The SUT does not support the classmarking of the two legs of a three-way call at different precedence levels. This is due to the fact that the SUT connects all three parties to a single time slot. Instead, the SUT classmarks all the parties at the highest precedence. Since the three-way call is classmarked at the highest precedence level of each leg there is no operational impact. 6 Preset Conferencing is not supported. Since this is not a required feature for a PBX 1, there is no operational impact. The SUT does; however, support an eight party "blast" conference. The SUT met all CRs and FRs for this conferencing capability. When a conferee is preempted or hangs up all remaining conferees received a conference notification tone. In addition, the SUT has the ability to program the conference with various precedence level calls for each leg of the conference. When this occurs, the SUT correctly classmarks all legs at the highest precedence of each leg. 7 Security is tested by DISA-led Information Assurance test teams and published in a separate report.				

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://199.208.204.125> (SIPRNet). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>.

Table 2-4. SUT Interoperability Requirements/Status

DSN Trunk Interfaces							
Interface	Critical	Interface Status	UCR Requirement	Reference	Test Results	Remarks	
T1 CAS (MFR1, DTMF, DP)	No	Certified	Trunking	PBX Line (C)	UCR Section 2.3.1	Met	
				Direct Inward Dialing (C)	UCR Section 2.3.2	Met	
				Line Signaling (R)	UCR Section 5.2	Met	
				Immediate Start (C)	UCR Section 5.3.2	Not Tested	See note 1.
				Normal Wink Start Operations (C)	UCR Section 5.3.3.1.1	Met	
				Glare Operation (C)	UCR Section 5.3.3.1.2	Met	
				Abnormal Wink Start (C)	UCR Section 5.3.3.2.1	Met	See note 2.
				Glare Resolution (C)	UCR Section 5.3.3.2.2	Met	
				Dial Delay (C)	UCR Section 5.3.4	Not Tested	See note 1.
				Call for Service Timing (R)	UCR Section 5.3.5	Met	
				Guard Timing (R)	UCR Section 5.3.6	Met	
				Satellite Timing (C)	UCR Section 5.3.7	Met	
				Disconnect Control (C)	UCR Section 5.3.8	Met	
				Reselect and Retrial (C)	UCR Section 5.3.9	Met	
				Off-Hook Supervision Transition (C)	UCR Section 5.3.10	Met	
				Dial-Pulse Signals (C)	UCR Section 5.4.1	Met	
				DTMF Signaling (C)	UCR Section 5.4.2	Met	
				Standard Digit Format for Precedence (C)	UCR Section 5.4.2.1	Met	
				MFR1 2/6 Signaling (C)	UCR Section 5.4.3	Met	
				Alerting Signals and Tones (R)	UCR Section 5.5	Met	
				Layer 3 DSN User-to-Network Signaling (R)	UCR Section 5.7.1.4	Met	
				DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R)	UCR Section 5.7.1.4.2	Met	
				Sequence of Messages for DSN Circuit-Switched Calls (R)	UCR Section 5.7.1.4.3	Met	
				Message Functional Definition and Content (R)	UCR Section 5.7.1.4.4	Met	
				General Message Format and Information Elements Coding (R)	UCR Section 5.7.1.4.5	Met	
				PCM-24 Digital Trunk Interface (R)	UCR Section 7.1	Met	
Interface Characteristics (R)	UCR Section 7.1.1	Met					
Supervisory Channel Associated Signaling (C)	UCR Section 7.1.2	Met					
Clear Channel Capability (R)	UCR Section 7.1.3	Met					
Alarm and Restoral Requirements (R)	UCR Section 7.1.4	Met					
Interoperation of PCM-24 and PCM-30 (C)	UCR Section 7.3	Met					
Integrated Digital Loop Carrier (C)	UCR Section 7.5	Not Tested	See note 3.				

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	Critical	Interface Status	UCR Requirement		Reference	Test Results	Remarks
T1 CAS (MFR1, DTMF, DP) (continued)	No	Certified	Trunking (continued)	Trunk Group-Remove from Service (C)	UCR Section 2.5.5	Met	
				Trunk Group-Restore to Service (C)	UCR Section 2.5.6	Met	
			Voice	MOS (R)	CJCSI 6215.01C	Met	
				Secure calls (R)	CJCSI 6215.01C	Met	
			Facsimile	Analog: ITU-T T.4 (R)	DISR	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01C	Met	
				56 kbps switched data (R: PRI only)	UCR Section 3.10	Met	
				NX56 synchronous BER (R: PRI only)	UCR Section 3.10	Met	
				Secure data (STE/STU-III) (R)	CJCSI 6215.01C	Met	

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Trunk Interfaces							
Interface	Critical	Interface Status	UCR Requirement		Reference	Test Results	Remarks
E1 CAS (MFR1, DTMF, DP)	No (Europe only)	Certified	Trunking	PBX Line (C)	UCR Section 2.3.1	Met	
				Direct Inward Dialing (C)	UCR Section 2.3.2	Met	
				Line Signaling (R)	UCR Section 5.2	Met	
				Immediate Start (C)	UCR Section 5.3.2	Not Tested	See note 1.
				Normal Wink Start Operations (C)	UCR Section 5.3.3.1.1	Met	
				Glare Operation (C)	UCR Section 5.3.3.1.2	Met	
				Wink Start (C)	UCR Section 5.3.3.2.1	Met	See note 2.
				Glare Resolution (C)	UCR Section 5.3.3.2.2	Met	
				Dial Delay (C)	UCR Section 5.3.4	Not Tested	See note 1.
				Call for Service Timing (R)	UCR Section 5.3.5	Met	
				Guard Timing (R)	UCR Section 5.3.6	Met	
				Satellite Timing (C)	UCR Section 5.3.7	Met	
				Disconnect Control (C)	UCR Section 5.3.8	Met	
				Reselect and Retrial (C)	UCR Section 5.3.9	Met	
				Off-Hook Supervision Transition (C)	UCR Section 5.3.10	Met	
				Dial-Pulse Signals (C)	UCR Section 5.4.1	Met	
				DTMF Signaling (C)	UCR Section 5.4.2	Met	
				Standard Digit Format for Precedence (C)	UCR Section 5.4.2.1	Met	
				Multifrequency (MF (R1) 2/6 Signaling (C)	UCR Section 5.4.3	Met	
				Alerting Signals and Tones (R)	UCR Section 5.5	Met	
				PCM-30 Digital Trunk Interface (C)	UCR Section 7.2	Met	
				Interoperation of PCM-24 and PCM-30 (C)	UCR Section 7.3	Met	
				Integrated Digital Loop Carrier (C)	UCR Section 7.5	Not Tested	See note 3.
			Trunk Group-Remove from Service (C)	UCR Section 2.5.5	Met		
			Trunk Group-Restore to Service (C)	UCR Section 2.5.6	Met		
			Voice	MOS (R)	CJCSI 6215.01C	Met	
				Secure calls (R)	CJCSI 6215.01C	Met	
			Facsimile	Analog: ITU-T T.4 (R)	DISR	Met	
				Modem (VBD) (R)	CJCSI 6215.01C	Met	
			Data	56 kbps switched data (R: PRI only)	UCR Section 3.10	Met	
				64 kbps switched data (R: PRI only)	UCR Section 3.10	Met	
				NX56 synchronous BER (R: PRI only)	UCR Section 3.10	Met	
NX64 synchronous BER (R: PRI only)	UCR Section 3.10	Met					
Secure data (STE/STU-III) (R)	CJCSI 6215.01C	Met					

Table 2-4. 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	PBX Line (C)	UCR Section 2.3.1	Met	
				Direct Inward Dialing (C)	UCR Section 2.3.2	Met	
				National ISDN 1/2 Primary Access (R)	UCR Section 2.3.4.1	Met	
				ISDN ANSI MLPP Service Capability (R)	UCR Section 2.3.4.1.1	Met	
				Call for Service Timing (R)	UCR Section 5.3.5	Met	
				Disconnect Control (C)	UCR Section 5.3.8	Met	
				Off-Hook Supervision Transition (C)	UCR Section 5.3.10	Met	
				Alerting Signals and Tones (R)	UCR Section 5.5	Met	
				DSN ISDN User-to-Network Signaling (R)	UCR Section 5.7.1	Met	
				Application (R)	UCR Section 5.7.1.1	Met	
				Physical Layer (R)	UCR Section 5.7.1.2	Met	
				S/T Reference Point (R)	UCR Section 5.7.2.1	Met	
				Data Link Layer (R)	UCR Section 5.7.1.3	Met	
				Data Link Connection (R)	UCR Section 5.7.1.3.1	Met	
				Peer-to-Peer Procedures of Data-Link Layer (R)	UCR Section 5.7.1.3.2	Met	
				Layer 3 DSN User-to-Network Signaling (R)	UCR Section 5.7.1.4	Met	
				DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R)	UCR Section 5.7.1.4.2	Met	
				Sequence of Messages for DSN Circuit-Switched Calls (R)	UCR Section 5.7.1.4.3	Met	
				Message Functional Definition and Content (R)	UCR Section 5.7.1.4.4	Met	
				General Message Format and Information Elements Coding (R)	UCR Section 5.7.1.4.5	Met	
				Supplementary Services (C)	UCR Section 5.7.1.4.6	Not Tested	See note 3.
				PCM-24 Digital Trunk Interface (R)	UCR Section 7.1	Met	
				Interface Characteristics (R)	UCR Section 7.1.1	Met	
				Clear Channel Capability (R)	UCR Section 7.1.3	Met	
			Alarm and Restoral Requirements (R)	UCR Section 7.1.4	Met		
			Interoperation of PCM-24 and PCM-30 (C)	UCR Section 7.3	Met		
			Integrated Digital Loop Carrier (C)	UCR Section 7.5	Met		
Trunk Group-Remove from Service (C)	UCR Section 2.5.5	Met					
Trunk Group-Restore to Service (C)	UCR Section 2.5.6	Met					
Voice							
MOS (R)	CJCSI 6215.01C	Met					
Secure calls (R)	CJCSI 6215.01C	Met					
Facsimile							
Analog: ITU-T T.4 (R)	DISR	Met					

Table 2-4. 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 3.10	Met	
				64 kbps switched data (R: PRI only)	UCR Section 3.10	Met	
				NX56 synchronous BER (R: PRI only)	UCR Section 3.10	Met	
				NX64 synchronous BER (R: PRI only)	UCR Section 3.10	Met	
				Secure data (STE/STU-III) (R)	CJCSI 6215.01C	Met	
			VTC	ITU-T H.320 (R: PRI only)	FTR 1080B-2002	Met	

Table 2-4. 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 4.)	Trunking	PBX Line (C)	UCR Section 2.3.1		
				Direct Inward Dialing (C)	UCR Section 2.3.2		
				ITU-T ISDN Primary Access (C)	UCR Section 2.3.4.2		
				ITU-T ISDN Primary Access Digital Subscriber Signaling System Number 1 MLPP (C)	UCR Section 2.3.4.2.1		
				Call for Service Timing (R)	UCR Section 5.3.5		
				Disconnect Control (C)	UCR Section 5.3.8		
				Off-Hook Supervision Transition (C)	UCR Section 5.3.10		
				DSN ISDN User-to-Network Signaling (R)	UCR Section 5.7.1		
				Application (R)	UCR Section 5.7.1.1		
				Physical Layer (R)	UCR Section 5.7.1.2		
				S/T Reference Point (R)	UCR Section 5.7.2.1		
				Data Link Layer (R)	UCR Section 5.7.1.3		
				Data Link Connection (R)	UCR Section 5.7.1.3.1		
				Peer-to-Peer Procedures of Data-Link Layer (R)	UCR Section 5.7.1.3.2		
				Layer 3 DSN User-to-Network Signaling (R)	UCR Section 5.7.1.4		
				DSN User-to-Network Signaling for Circuit-Switched Bearer Services (R)	UCR Section 5.7.1.4.2		
				Sequence of Messages for DSN Circuit-Switched Calls (R)	UCR Section 5.7.1.4.3		
				Message Functional Definition and Content (R)	UCR Section 5.7.1.4.4		
				General Message Format and Information Elements Coding (R)	UCR Section 5.7.1.4.5		
				Supplementary Services (C)	UCR Section 5.7.1.4.6		
			PCM-30 Digital Trunk Interface (C)	UCR Section 7.2			
			Interoperation of PCM-24 and PCM-30 (C)	UCR Section 7.3			
			Integrated Digital Loop Carrier (C)	UCR Section 7.5			
Trunk Group-Remove from Service (C)	UCR Section 2.5.5						
Trunk Group-Restore to Service (C)	UCR Section 2.5.6						
Voice			MOS (R)	CJCSI 6215.01C			
			Secure calls (R)	CJCSI 6215.01C			

Table 2-4. 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 4.)	Facsimile	Analog: ITU-T T.4 (R)	DISR		
			Data	Modem (VBD) (R)	CJCSI 6215.01C		
				56 kbps switched data (R: PRI only)	UCR Section 3.10		
				64 kbps switched data (R: PRI only)	UCR Section 3.10		
				NX56 synchronous BER (R: PRI only)	UCR Section 3.10		
				NX64 synchronous BER (R: PRI only)	UCR Section 3.10		
				Secure data (STE/STU-III) (R)	CJCSI 6215.01C		
			VTC	ITU-T H.320 (R: PRI only)	FTR 1080B-2002		

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Line Interfaces							
Interface	Critical	Interface Status	UCR Requirement		Reference	Test Results	Remarks
2-Wire Analog	Yes	Certified	Access	Directory Number Identification (R)	UCR Section 2.1.1	Met	
				Analog Line (R)	UCR Section 2.3.5	Met	
				Basic Line Test Capabilities (R)	UCR Section 2.5.4.1.1	Met	
				Advanced Line Test Capabilities (C)	UCR Section 2.5.4.1.2	Not Tested	See note 3.
				Loop Start Line (R: 2-Wire Analog only)	UCR Section 5.2.1	Met	
				Reverse Battery (R)	UCR Section 5.3.1	Met	
				Alerting Signals and Tones (R)	UCR Section 5.5	Met	See note 5.
			Voice	MOS (R)	CJCSI 6215.01C	Met	
				Secure calls (R)	CJCSI 6215.01C	Met	
			Facsimile	Analog: ITU-T T.4 (R)	DISR	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01C	Met	
Secure data (STE/STU-III) (R)	CJCSI 6215.01C	Met					
ISDN BRI NI 1/2 (ANSI T1.619a)	No	Certified	Access	Directory Number Identification (R)	UCR Section 2.1.1	Met	
				National ISDN 1/2 Basic Access (C)	UCR Section 2.3.3	Met	
				Alerting Signals and Tones (R)	UCR Section 5.5	Met	See note 5.
			Voice	MOS (R)	CJCSI 6215.01C	Met	
				Secure calls (R)	CJCSI 6215.01C	Met	
			Facsimile	Analog: ITU-T T.4 (R)	DISR	Met	
			Data	Modem (VBD) (R)	CJCSI 6215.01C	Met	
Secure data (STE/STU-III) (R)	CJCSI 6215.01C	Met					
VTC	ITU-T H.320 (R: BRI only)	FTR 1080B-2002	Met				
2-Wire Proprietary Digital	No	Certified	Access	Directory Number Identification (R)	UCR Section 2.1.1	Met	
				Alerting Signals and Tones (R)	UCR Section 5.5	Met	See note 5.
			Voice	MOS (R)	CJCSI 6215.01C	Met	
				Secure calls (R)	CJCSI 6215.01C	Met	

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Features and Capabilities						
Feature/ Capability	Critical	Feature Status	UCR Requirement	Reference	Test Results	Remarks
Common Features	No	Certified	Individual Lines (R)	UCR Section 2.1.1	Met	
			Denied originating service (C)	UCR Section 2.1.3	Not Tested	See note 3.
			Code restriction and diversion (C)	UCR Section 2.1.4	Met	
			Call waiting (R)	UCR Section 2.1.5	Met	
			Three-way calling (R)	UCR Section 2.1.6	Met	See note 6.
			Add-on transfer, conference calling, and call hold (C)	UCR Section 2.1.7	Met	
			Call Transfer Individual – All calls (R)	UCR Section 2.1.7.1	Met	
			Call Transfer - Internal Only (R)	UCR Section 2.1.7.2	Met	
			Call Transfer – Individual – Incoming Only/Add-On Consultation Hold – Incoming Call (R)	UCR Section 2.1.7.3	Met	
			Call Transfer – Outside (R)	UCR Section 2.1.7.4	Met	
			Call Transfer – Add-On Restricted Station (C)	UCR Section 2.1.7.5	Not Tested	See note 3.
			Call Transfer – Attendant (C)	UCR Section 2.1.7.6	Not Tested	See note 3.
			Call Hold (R)	UCR Section 2.1.7.7	Met	
			Conference Calling – Six Way Station Controlled (C)	UCR Section 2.1.7.8	Met	
			Call forwarding Variable (R)	UCR Section 2.1.8.1	Met	
			Call Forward Busy Line (R)	UCR Section 2.1.8.2	Met	
			Call Forwarding – Don't Answer – All Calls (R)	UCR Section 2.1.8.3	Met	
			Selective Call Forwarding (C)	UCR Section 2.1.8.4	Not Tested	See note 3.
			Call pick-up (C)	UCR Section 2.1.9	Met	See note 7.
Address Translation (C)	UCR Section 2.7	Met				
Assured Dial Tone (C)	UCR Section 2.9	Not Tested	See note 3.			
Attendant	No	Not Tested	Attendant Features (C)	UCR Section 2.2	Not Tested	See note 8.
Public Safety	No	Certified	Emergency Service (911) Caller (R)	UCR Section 2.4.1.1	Met	
			Emergency Service (911) Public Safety Answering Service (R)	UCR Section 2.4.1.2	Not Tested	See note 3.
			Enhanced Emergency Service (E911) (C)	UCR Section 2.4.1.3	Not Tested	See note 3.
			Trace of terminating calls (C)	UCR Section 2.4.2	Met	
			Outgoing call trace (C)	UCR Section 2.4.3	Met	
Preset Conferencing	No	Not Tested	Preset Conferencing (C)	UCR Section 2.6	See note 9.	See note 9.
			Meet-Me Conferencing (R)	UCR Section 2.6.2	Not Tested	See note 3.
			Progressive Conferencing (C)	UCR Section 2.6.3	Met	
Nailed-up Connections	No	Not Tested	Nailed-Up Connections (C)	UCR Section 2.8	Not Tested	See note 3.
DSN Hotline Services	No	Certified	DSN Analog Hotline Service (C)	UCR Section 2.12	Met	

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Features and Capabilities						
Feature/ Capability	Critical	Feature Status	UCR Requirement	Reference	Test Results	Remarks
MLPP	Yes	Certified	MLPP Overview (R)	UCR Section 3.1	Met	See note 10.
			Preemption in the Network (R)	UCR Section 3.2	Met	
			Network Facility with Lower Precedence Calls (R)	UCR Section 3.2.1	Met	
			Network Facility with Equal or Higher Precedence Calls (R)	UCR Section 3.2.2	Met	
			Precedence Call Diversion (R)	UCR Section 3.3	Met	
			Channel Associated Signaling (C)	UCR Section 3.4.1	Met	
			Primary Rate Interface (R)	UCR Section 3.4.2	Met	
			Analog Line MLPP (R)	UCR Section 3.5	Met	
			ISDN MLPP Basic Rate Interface (C)	UCR Section 3.6	Met	
			ISDN Primary Rate Interface (R)	UCR Section 3.7	Met	
			Precedence Call Waiting (R)	UCR Section 3.8.1	Met	
			Call Forwarding (R)	UCR Section 3.8.2	Met	
			Call Transfer (R)	UCR Section 3.8.3	Met	
			Call Hold (R)	UCR Section 3.8.4	Met	
			Three-Way Calling (R)	UCR Section 3.8.5	Met	
			Call Pickup (C)	UCR Section 3.8.6	Met	
			Conferencing (C)	UCR Section 3.8.7	Met	
			Multiline Hunt Group (C)	UCR Section 3.8.8	Met	
			Community of Interest (C)	UCR Section 3.8.9	Not Tested	See note 3.
MLPP Interaction with EKTS features (C)	UCR Section 3.11	Met				
Call Processing	Yes	Certified	Call Treatments (R)	UCR Section 4.1	Met	
			Primary and Alternate Routine (C)	UCR Section 4.2	Met	
			E&M Lead Signaling States (C)	UCR Section 4.3.1	Not Tested	See note 8.
			4-Wire Analog User Access Lines (C)	UCR Section 4.3.2	Not Tested	See note 8.
			2-Wire User Access Lines (R)	UCR Section 4.3.3	Met	
			Termination of Analog Lines (R)	UCR Section 4.3.4	Met	
			DSN User Dialing (R)	UCR Section 4.5.1.1	Met	
			Interswitch and Intraswitch Dialing (R)	UCR Section 4.5.1.2	Met	
			Seven-Digit Dialing (R)	UCR Section 4.5.1.2.1	Met	
			Ten-Digit Dialing (R)	UCR Section 4.5.1.2.2	Met	
			Access Code (R)	UCR Section 4.5.1.3	Met	
			Access Digit (R)	UCR Section 4.5.1.3.1	Met	
			Precedence Digit (R)	UCR Section 4.5.1.3.2	Met	

Table 2-4. SUT Interoperability Requirements/Status (continued)

DSN Features and Capabilities						
Feature/ Capability	Critical	Feature Status	UCR Requirement	Reference	Test Results	Remarks
Call Processing (continued)	Yes	Certified	Service Digit (R)	UCR Section 4.5.1.3.3	Met	
			Route Code (R)	UCR Section 4.5.1.4	Met	
			Area Code (R)	UCR Section 4.5.1.5	Met	
			Switch Code (R)	UCR Section 4.5.1.6	Met	
			Line Number (R)	UCR Section 4.5.1.7	Met	
			Calling Name Delivery (C)	UCR Section 4.5.1.8.1	Not Tested	See note 3.
			Calling Number Delivery (R)	UCR Section 4.5.1.8.2	Not Tested	See note 11.
			Emergency Service 911 Conflict Resolution (R)	UCR Section 4.5.1.9	Met	
			DSN Switch Outpulsing Digit Formats (C)	UCR Section 4.5.2	Met	
			Standard Directory Number (R)	UCR Section 4.5.3	Met	
			Standard Test Numbers (C)	UCR Section 4.5.4	Met	
			Base Services – Abbreviated Numbers (C)	UCR Section 4.5.5	Met	
			Digit Reception Requirements (R)	UCR Section 4.5.6	Met	
			Screening (C)	UCR Section 4.5.8	Met	
ISDN Services	No	Certified	BRI Access, Call Control and Signaling (C)	UCR Section 10, table 10-1	Met	
			Uniform Interface Configuration for BRIs (C)	UCR Section 10, table 10-2	Met	
			Electronic Key Telephone Systems (EKTS) (C)	UCR Section 10, table 10-3	Met	
			PRI Access, Call Control and Signaling (R)	UCR Section 10, table 10-4	Met	
			PRI Features (R)	UCR Section 10, table 10-5	Met	
			Packet Data Features and Capabilities (C)	UCR Section 10, table 10-6	Not Tested	See note 12.
Synchroniz- ation	Yes	Certified	Line timing mode (R)	UCR Section 11.1.1.2	Met	
			Internal Stratum 4 (R)	UCR Section 11.1.2.2	Met	
			Synchronization Performance Monitoring Criteria (C)	UCR Section 11.2	Not Tested	See note 3.
			DS1 Traffic Interfaces (C)	UCR Section 11.3	Not Tested	See note 3.
			DS0 Traffic Interconnects (C)	UCR Section 11.4	Not Tested	See note 3.
Reliability	Yes	Certified	System Availability (R)	UCR Section 12.2	Met	
			Backup Power (R)	UCR Section 12.3	Not Tested	See note 13.
			Power Components (R)	UCR Section 12.3.1	Not Tested	See note 13.
			UPS Requirements (R)	UCR Section 12.3.2	Not Tested	See note 13.
			UPS PBX 1 Load Capacity (R)	UCR Section 12.3.2.2	Not Tested	See note 13.
			Backup Power (Environmental) (R)	UCR Section 12.3.3	Not Tested	See note 13.
			Alarms (R)	UCR Section 12.3.4	Not Tested	See note 13.
Security	Yes	See note 14.	GR-815, STIGs, and DoDI 8510.bb (DIACAP) (R)	UCR Section 13	See note 14.	See note 14.

Table 2-4. SUT Interoperability Requirements/Status (continued)

Network Gateways							
Interface	Critical	Interface Status	UCR Requirement		Reference	Test Results	Remarks
PSTN (See note 15.)	No	Certified	Trunking	Positive Identification Control (C)	CJCSI 6215.01C	Met	
				On-Netting (C)	CJCSI 6215.01C	Met	
				Off-Netting (C)	CJCSI 6215.01C	Met	
				Ground Start Line (R)	UCR Section 5.2.2	Met	
LEGEND: ANSI - American National Standards Institute App. - Appendix BER - Bit Error Ratio BRI - Basic Rate Interface C - Conditional CAS - Channel Associated Signaling CJCSI - Chairman of the Joint Chiefs of Staff Instruction DIACAP - DoD Information Assurance Certification and Accreditation Process DISA - Defense Information Systems Agency DISR - DoD IT Standards Registry DoD - Department of Defense DoD - Department of Defense DP - Dial Pulse DRSN - Defense Red Switch Network DS0 - Digital Signal Level 0 (64 kbps) DS1 - Digital Signal Level 1 (1.544 Mbps) (2.048 Mbps European) DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency E1 - European Basic Multiplex Rate (2.048 Mbps) FTR - Federal Telecommunications Recommendation FTR 1080B-2002 - Video Teleconferencing Services GR - Generic Requirement GR-815 - Generic Requirements For Network Element/Network System (NE/NS) Security H.320 - Standard for Narrowband VTC ISDN - Integrated Services Digital Network IT - Information Technology ITU-T - International Telecommunication Union- Telecommunication Standardization Sector kbps - kilobits per second Mbps - Megabits per second MFR1 - Multi-Frequency Recommendation 1 MLPP - Multi-Level Precedence and Preemption MOS - Mean Opinion Score ms - millisecond NI 1/2 - National ISDN 1 or 2 NX56 - Data format restricted to multiples of 56 kbps NX64 - Data format restricted to multiples of 64 kbps PBX - Private Branch Exchange PBX 1 - Private Branch Exchange 1 PCM-24 - Pulse Code Modulation - 24 Channels PCM-30 - Pulse Code Modulation - 30 Channels PM - Program Manager PNT - Preemption Notification Tone PRI - Primary Rate Interface PSTN - Public Switched Telephone Network Q.955.3 - ISDN Signaling Standard for E1 MLPP R - Required S/T - ISDN BRI 4- wire interface SS7 - Signaling System 7 STE - Secure Terminal Equipment STIGs - Security Technical Implementation Guides STU-III - Secure Telephone Unit -3rd generation SUT - System Under Test T1 - Digital Transmission Link Level 1 (1.544 Mbps) T1.619a - SS7 and ISDN MLPP Signaling Standard for T1 T.4 - Standardization of Group 3 facsimile terminals for document transmission UCR - Unified Capabilities Requirements UPS - Uninterruptible Power Supply VBD - Variable bit data VTC - Video Teleconferencing							
NOTES: 1 The SUT offers this capability; however it does not support MLPP and is not covered under this certification. 2 The SUT acknowledges a wink start signal beyond the 350 ms maximum (up to 395 ms). Since switching systems generate wink start signals between 140-290 ms, there is no operational impact. 3 The SUT does not offer this feature/capability. Since this feature/capability is not required for a PBX 1, there is no operational impact. 4 The SUT does not support this interface with MLPP (ITU-T Q.955.3). Since this is not a required interface for a PBX 1, there is no operational impact. 5 The SUT does not support the correct distinctive ring cadence in accordance with the UCR for precedence above ROUTINE calls placed via a trunk. Since the precedence ring cadence can be distinguished from a ROUTINE ring cadence there is no operational impact. 6 The SUT does not support the classmarking of the two legs of a three-way call at different precedence levels. This is due to the fact that the SUT connects all three parties to a single time slot. Instead, the SUT classmarks all the parties at the highest precedence. Since the three-way call is classmarked at the highest precedence level of each leg there is no operational impact. 7 The SUT does not support priority call pickup with precedence calls above ROUTINE. When a precedence call above ROUTINE is ringing in a call pickup group and a ROUTINE call is also ringing in the same call pickup group, the SUT randomly picks which call to pickup when the feature is activated. Since the higher precedence call is diverted to an alternate directory number if unanswered, the operational impact is minor. 8 This feature/capability is offered by the SUT; however, it was not tested. Since this is not a required feature/capability for a PBX 1, there is no operational impact. 9 Preset Conferencing is not supported. Since this is not a required feature for a PBX 1, there is no operational impact. The SUT does; however, support an eight party "blast" conference. The SUT met all CRs and FRs for this conferencing capability. When a conferee is preempted or hangs up all remaining conferees received a conference notification tone. In addition, the SUT has the ability to program the conference with various precedence level calls for each leg of the conference. When this occurs, the SUT correctly classmarks all legs at the highest precedence of each leg. 10 The SUT does not support the correct length of PNT when an active call is directly preempted. A three second PNT is sent to the party being preempted instead of sending PNT until the preempted party goes on hook. A three second PNT is adequate to notify the user the call is preempted and the higher precedence call is connected when the preempted user hangs up. Therefore, there is no operational impact. 11 This is a new requirement. The vendor has 18 months (until July 2009) to develop this requirement. 12 The SUT offers this feature/capability; however it was not tested. Since this is not a required feature/capability for a PBX 1, there is no operational impact. 13 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. 14 Security is tested by DISA-led Information Assurance test teams and published in a separate report. 15 Voice, facsimile, data, and VTC service requirements for PSTN are identical to DSN with the exception of MLPP.							