

**Changes to UCR 2008, Change 2, Section 5.1, Requirements Categories and Language  
and 5.2, Customer Premise Equipment and Legacy Interfaces**

| <b>SECTION</b> | <b>CORRECTION</b>   | <b>EFFECTIVE DATE</b> |
|----------------|---|-----------------------|
| 5.2            | Added text previously found in UCR 2008 and removed references back to UCR 2008.  |                       |
| 5.2            | Removed the following “retired” TDM-based sections that appeared in UCR 2008, Change 1; Echo Cancellers, DSN Switch SONET digital Trunk Interface, Video Teleconferencing , Integrated Access Switch, Softphones. |                       |

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## **SECTION 5**

### **UNIFIED CAPABILITIES PRODUCT REQUIREMENTS**

#### **5.1 REQUIREMENTS CATEGORIES AND LANGUAGE**

Section 5 of UCR identifies the minimum functional and performance requirements for products to be placed on the UC APL. Requirements are specified in terms of two categories: Minimum requirements and Conditional requirements.

##### **5.1.1 Minimum Requirements**

Minimum requirements are features and capabilities considered necessary for a particular product to support warfighter missions in the DoD. These features and capabilities will require certification before introduction into the DISN.

##### **5.1.2 Conditional Requirements**

Conditional requirements are features and capabilities that are not considered critical for DoD mission support based on DoD policies. Nevertheless, it is recognized that such features do have utility for some users or for specific operations. To ensure interoperability and consistency of the Assured Services (AS) across all platforms, these features and capabilities are specified with set parameters. If these features and capabilities are provided, the UC product shall perform and meet the requirements as identified in the UCR.

##### **5.1.3 Operational Control over Features and Capabilities**

Some features and capabilities are dependent on permission for implementation control.

Vendors shall provide features and functions in accordance with Telcordia Technologies, the Internet Engineering Task Force (IETF), and/or other commercial standards unless specifically altered (i.e., added, modified, or deleted) by the UCR. Also, those features and functions that are not specified in Telcordia Technologies, IETF, and/or other commercial standards shall be optionally either parameter(s) and/or software controlled whenever practical, especially if the UCR requirement used is conditional, to either permit or not use.

The permission to use these features and capabilities may come from DoD policy, service CIO policy, and/or installation Commander decision and shall not be limited by the vendor.

Vendors shall include identification of the industry standards and specifications that their OAM&P products and services comply.

#### **5.1.4 General Requirement Language**

The word “REQUIRED” or the term “MUST” or “SHALL” means the definition is an absolute requirement of the product.

The word “CONDITIONAL” or the term “MAY” means an item is optional.

The phrase “MUST NOT” or “SHALL NOT” means the definition is an absolute prohibition of the item.

The word “RECOMMENDED” means the reference is given as guidance and is not a testable requirement.

The phrase “THE NETWORK,” referenced in Telcordia Technologies *Local Access and Transport Area (LATA) Switching Systems Generic Requirements (LSSGR)*, shall mean the DSN network.

#### **5.1.5 AS-SIP Requirement Adheres to IETF Specification Language**

The AS-SIP requirement of the UCR is built on IETF Requests for Comment (RFCs). The AS-SIP requirement therefore adheres to the IETF terminology that uses terms or key words including: “MUST,” “MUST NOT,” “REQUIRED,” “SHALL,” “SHALL NOT,” “SHOULD,” “SHOULD NOT,” “RECOMMENDED,” “NOT RECOMMENDED,” “MAY,” and “OPTIONAL.” These terms indicate requirement levels for compliant SIP implementations and are to be interpreted as described in IETF BCP 14, RFC 2119.

## 5.2 CUSTOMER PREMISE EQUIPMENT AND LEGACY INTERFACES

Circuit-switched/TDM products will no longer be tested for APL status. Once their existing 3-year APL status expires, they will be placed on the retired APL list. Exceptions to this policy will be submitted through the appropriate channels for ASD(NII) consideration. TDM products and systems will continue to be allowed to operate in the network until replaced by IP products.

### 5.2.1 Customer Premise Equipment Requirements

#### 5.2.1.1 *General Description*

A wide variety of customer premises equipment (CPE) manufactured and sold by many sources was connected to the line (subscriber) side of a DSN switching center. Such varieties include industry “ANSI-ETSI Standards” based digital and analog devices and non-standards based proprietary digital devices. During the transition period between TDM and IP-based technologies, some locations may have a requirement to interface the legacy CPE to an LSC. As a result, most LSC vendors provide an optional Integrated Access Device (IAD) to permit the use of CPE until it is replaced.

The CPE devices may include answering machines, voice mail, automated call distributors, proprietary telephone sets, standards-based telephone sets, facsimile machines, voice band modems, ISDN network termination 1 (NT1) devices and terminal adapters (TAs), and certain devices that are deemed mandatory for local or host nation telecommunications network compliance (i.e., 911 emergency service).

#### 5.2.1.2 *Requirements*

All CPE devices covered by this section are required to meet the following requirements:

1. **[Conditional]** All CPE devices that support MLPP shall do so in accordance with the requirements listed in Section 5.3.2.31.3, Multilevel Precedence and Preemption, and shall not affect the DSN interface features and functions associated with line supervision and control.
2. **[Required]** All DSN CPE, as a minimum, must meet the requirements of Part 15 and Part 68 of the FCC Rules and Regulations, and the Administrative Council for Terminal Attachments (ACTA).

## Section 5.2 – Customer Premise Equipment and Legacy Interfaces

3. **[Conditional]** A device(s) that supports autoanswer shall have an “autoanswer” mode feature allowing the autoanswer mode to be set to a “time” more than the equivalency of four ROUTINE precedence ring intervals in accordance with Section 5.3.2.31.3, Multilevel Precedence and Preemption, before “answer” supervision is provided.
4. **[Conditional]** Devices that are required to support precedence calls above ROUTINE precedence shall respond properly to an incoming alerting (ringing) precedence call cadence as described in Section 5.3.2.6.1.1.1, UC Ringing Tones, Cadences, and Information Signals.
5. **[Conditional]** A device(s) that can “out dial” DTMF and/or DP digits (automatic and/or manual) shall comply with the requirements as specified in Telcordia Technologies GR-506-CORE, *LSSGR: Signaling for Analog Interfaces*, Issue 1, June 1996, paragraph 10 and be capable of outpulsing and interpretation of DTMF digits on outgoing or two-way trunks as specified in Telcordia Technologies GR-506-CORE, *LSSGR: Signaling for Analog Interfaces*, Issue 1, June 1996, paragraph 15, and Table 5.2.1.2-1.

**Table 5.2.1.2-1. DTMF Generation and Reception from Users and Trunks**

| Low Group Frequencies   |        | HIGH GROUP FREQUENCIES<br>NOMINAL FREQUENCY IN Hz |         |         |         |
|-------------------------|--------|---|---------|---------|---------|
|                         |        | 1209 Hz   | 1336 Hz | 1477 Hz | 1633 Hz |
| Nominal Frequency in Hz | 697 Hz | 1   | 2       | 3       | FO (A)  |
|                         | 770 Hz | 4   | 5       | 6       | F (B)   |
|                         | 852 Hz | 7   | 8       | 9       | I (C)   |
|                         | 941 Hz | *   | 0       | A or #  | P (D)   |

6. **[Conditional]** Modems and facsimile machines shall be compatible with ITU and Telcordia standards, as applicable.
7. **[Conditional]** Facsimile devices, as a minimum, shall meet the requirements in accordance with applicable DISR standards.
8. **[Conditional]** If Configuration Management and/or Fault Management are/is provided by the CPE device so that it can be managed by the ADIMSS or other management systems, then the management information shall be provided by one or more of the following serial or Ethernet interfaces:
  - a. Serial interfaces shall be in accordance with one of the following standards:
    - (1) ITU-T Recommendation V.35
    - (2) TIA-232-F
    - (3) EIA-449-1



## (4) TIA-530-A

b. Ethernet interfaces shall be in accordance with IEEE 802.3-2002.

9. **[Conditional]** As a minimum, the 911 and the E911 (tandem) emergency service shall have the capability to “hold” the originating subscriber or caller from releasing the call via the switch supervision interaction for line and trunk control by the “called-party” feature, in accordance with Telcordia Technologies GR-529-CORE. Additionally, the FCC regulations regarding 911 and E911 must be considered.

#### 5.2.1.2.1 2-Wire Analog Instruments and Devices

The CPE(s) that connect to the LSC using a 2-wire analog interface (i.e., analog single-line instrument, fax, modem, answering machine, voice mail, automated call distributor) shall meet the following requirement:

**[Required]** All 2-wire analog devices shall conform to the requirements of TIA/EIA-470-B.

#### 5.2.1.2.2 2-Wire Digital Instruments and Devices

The CPE(s) that connect to the LSC using a 2-wire digital interface (i.e., digital single or multiline proprietary instrument, fax, modem, ISDN BRI devices including 911 emergency services) shall meet the following requirements:

1. **[Conditional]** The CPE(s) that use loop signaling shall conform to the requirements of TIA/EIA-470-B.
2. **[Conditional]** The CPE(s) that connect at the ISDN BRI “U” interface shall conform to ANSI T1.601-1999.

#### 5.2.1.2.3 4-Wire Digital Instruments and Devices

**[Conditional]** The CPE(s) that connect at the ISDN BRI “S” or “T” interface shall conform to ANSI T1.605-1991 (R1999).

#### 5.2.1.2.4 ISDN Terminal Adapter

The general function of a Terminal Adapter (TA) is to adapt terminals with non-ISDN standard interfaces (e.g., X-series and V-series interfaces) to ISDN standard user-network interfaces. The TA shall adapt to, connect to, and/or be part of a data-type terminal. The TA connects terminal equipment (TE2), such as a computer, fax machine, LAN, and telephone set, to one or more B channels and passes along digital signals to the ISDN external line. A TA need not be a separate

unit but could be contained within the TE or integrated with the NT1 into a single box. Terminal adapter(s) shall meet the following requirements:

1. **[Required]** The TA shall be able to connect a non-ISDN terminal (TE2) to one or both of the B channels of an ISDN connection and establish a viable ISDN connection with a terminal at the distant end.
2. **[Required]** The TA shall meet its necessary requirements regardless of whether it is implemented as a stand-alone device or as a device integrated with either the TE2 it supports or the NT1 that connects it to the network.
3. **[Required]** The TA shall be compatible with national ISDN NI-1/2 to include both S/T and U interfaces for Integrated Services Digital Network (ISDN) Basic Access. Requirements for this feature shall be in accordance with Telcordia Technologies references SR-NWT-002120, SR-NWT-002343, and TR-NWT-001268.

The MLPP service capability requirements for this interface shall be in accordance with American National Standards Institute (ANSI) T1.619-1992 (R1999) and ANSI T1.619a-1994 (R1999), “Multi-Level Precedence and Preemption (MLPP) Service, ISDN Supplementary Service Description.”

4. **[Conditional]** The TA shall provide loopback capability in accordance with ITU Recommendation V.54.
5. **[Conditional]** The TA shall support inverse multiplexing in accordance with ITU Recommendation H.244, and conform to Federal Telecommunications Recommendation (FTR) 1080B-2002, when connected to TE2 equipment.
6. **[Required]** The TA shall provide one or more of the following interfaces:
  - a. EIA-366-A
  - b. EIA-449-1
  - c. TIA-530-A
  - d. ITU-T Recommendation V.35

#### *5.2.1.2.5 Automated Receiving Devices*

Automated Receiving Devices (ARDs) are a family of automated devices, which are CPE or NEs that attaches to the receiving end of a telephone call. Typical ARDs will have an automatic call distribution front-end, which could be as simple as a queue that handles incoming calls on a first-come, first-serve basis. The ARDs that are more complex can be full function Automatic Call Distributors (ACDs) that include predetermined schemes and route calls based on routing criteria

and, quite often, database handling instructions. Once in queue, if the call is not answered in a specified amount of time and if the caller had not terminated the call, ARDs can terminate the call also, or send the call to another location. Usually, ARDs invoke a network carrier based “take back and transfer” to the alternative location. Generally, ARDs do not originate calls to the network.

The ARDs can have different names. The following are some typical devices included in this family:

- ACD
- Voice messaging system
- Automatic announcer
- Event notification system
- Automated attendant
- Morale, welfare, and recreation (MWR) call systems
- Call center system

The ARDs shall meet the following minimum requirements:

1. **[Required]** The ARD interfacing to the LSC shall provide at least one of the following interface types:
  - a. A 2-wire interface as specified in [Section 5.2.1.2.1](#), 2-Wire Analog Instruments and Devices, and/or [Section 5.2.1.2.2](#), 2-Wire Digital Instruments and Devices.
  - b. A 4-wire interface as specified in [Section 5.2.1.2.3](#), 4-Wire Digital Instruments and Devices.
  - c. A PCM-24 channel digital interface with a 1.544 Mbps T1 bit stream configured in either the D3/D4 (Super Frame) framing format or the D5 Extended Super Frame (ESF) framing format. D5 is also referred to as Extended Frame (EF). The same framing format shall be used in both directions of transmission. Voice signals shall be encoded in the 8-bit  $\mu$  (255 quantized values) pulse code modulation (PCM) encoding law. Supervisory and dial pulse (DP) signals shall utilize the A and B bits of the D3/D4 format or the A, B, C, and D bits of the D5 format for pre-CCS7 configurations. Voice channel address in-band signaling shall be provided on individual channels. The D5 format shall be the preferred and system “goal” digital framing format and shall be provided in accordance with MIL-STD-187-700. The DS1 24 channel standard interface shall be as specified in ANSI T1.102, “Digital Hierarchy – Electrical Interfaces.”

- d. PCM-30 digital interfaces at a data rate of 2.048 Mbps. The PCM-30 interfaces shall meet the requirements of ITU-T Recommendation G.703 and ITU-T Recommendation G.732. Voice signals in the PCM-30 framing format shall utilize the A-law encoding technique in accordance with ITU-T Recommendation G.772 (REV), “*Protected Monitoring Points on Digital Transmission Systems.*”

#### **5.2.1.2.6 Remote Access**

These requirements are for calls attempting to access or leave the DSN via an ARD.

1. **[Required]** The Remote Access feature shall meet the overall requirements of an ARD (Section 5.2.1.2.5, Automated Receiving Devices).
2. **[Required]** The ARD shall receive calls, provide an alerting message or tone to alert the caller to dial additional digits, and screen those digits to permit or restrict extending the call (Telcordia Technologies SR-504, Section 02-01-0150).
3. **[Required]** The ARD shall use a caller-provided personal identification number (PIN) and/or authorization (Auth) code (a minimum of five digits for either with a failure of three attempts will result in a disconnect) and/or a system-provided ANI. Any combination of screening features may be used to screen incoming callers for access permission and call extension control. This feature either can be enabled or disabled by an administrator.
4. **[Required]** The ARD shall verify that the ANI and/or PIN or Auth code is not already in use on another call, thus preventing unauthorized use of the ANI and/or PIN or Auth code. This feature can be either enabled or disabled by an administrator.

### **5.2.2 DoD Secure Communications Devices**

#### **5.2.2.1 General Description**

This section describes the requirements that will be used to certify DoD Secure Communications Devices (DSCDs) when directly connected to or otherwise traversing the DSN, the PSTN, or the DRSN Gateway to or from the DSN.

This section applies to the secure mode operation of any DSCD that either directly connects to the DSN, the PSTN, or the DRSN Gateway, or traverses these networks in the course of conducting a secure communications session, regardless of where the telephone call originates or terminates. The certification test environment for DSCDs shall include configurations that realistically simulate fixed networks (i.e., DSN, DRSN via the DSN Gateway, PSTN) and deployed networks, such as DVX systems and other configurations as defined by the Executive Agent for Theater Joint Tactical Networks, or any combination thereof.

### 5.2.2.2 Requirements

The JITC will validate all the features and capabilities of a DSCD device, to include voice, data, and facsimile transmission.

1. **[Required: STE Enabled DSCD, FNBDT/SCIP Enabled DSCD]** The enabled DSCD shall be only those that are Type Approved by NSA and are listed on the NSA Secure Product web site. Each DSCD must support at least one NSA-approved secure protocol. If the DSCD supports more than one secure protocol, it must meet all the requirements for at least one of the secure protocols, and must minimally support the other protocols that are provided on the DSCD.
2. **[Required: STE Enabled DSCD, FNBDT/SCIP Enabled DSCD]** The DSCD devices that use a 2-wire analog or BRI interface shall meet the EI requirements as specified in Section 5.2.1, Customer Premises Equipment Requirements. The DSCD devices that use an IP interface shall meet the EI requirements as specified in Section 5.3.2, Assured Services Requirements.
3. **[Required: STE Enabled DSCD, FNBDT/SCIP Enabled DSCD]** A DSCD device that supports one of the required signaling modes shall interoperate with and establish secure sessions with other compatible devices with at least an 85 percent secure call completion rate.
4. **[Required: STE Enabled DSCD, FNBDT/SCIP Enabled DSCD]** The DSCD shall be capable of using the protocol(s) provided to establish a secure session within 60 seconds and must maintain secure communications for the duration of the secure portion of the call.
5. **[Required: STE Enabled DSCD, FNBDT/SCIP Enabled DSCD]** The DSCD shall operate in a network that has an E2E latency of up to 600 milliseconds.
6. **[Required: STE Enabled DSCD, FNBDT/SCIP Enabled DSCD]** The DSCD shall achieve and maintain a secure voice connection with a minimum MOS of 3.0.
7. **[Required: STE Enabled DSCD, FNBDT/SCIP Enabled DSCD]** Once connected to the rekey center, the DSCD shall obtain a new key and properly process that new key with a 95 percent rekey completion rate.
8. **[Conditional: STE Enabled DSCD, FNBDT/SCIP Enabled DSCD]** The DSCDs that establish secure sessions on a Continuously Variable Slope Delta (CVSD) switch and terminate on a CVSD switch, without ever traversing or otherwise interacting with the DSN, DRSN, or PSTN must do so with a 50 percent completion rate.

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9. **[Conditional: FNBDT/SCIP enabled DSCD]** The DSCDs that establish secure sessions on IP networks using FNBDT/SCIP shall satisfy all the end point requirements described SCIP-215 and SCIP-216.
10. **[Conditional: STE and FNBDT/SCIP Enabled DSCD]** The DSCD devices shall support a minimum data rate and facsimile transmission rate of 9.6 kbps.