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Mod: AS15 (Level 3) Revised 02/22/2010-GS11T08BJD6002**

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## C.1 Background

The Federal Acquisition Service (FAS) of the General Services Administration (GSA) provides local telecommunications services in the Washington D.C. National Capital Region (NCR) and communities of interest through the Washington Interagency Telecommunications System 2001 (WITS2001) contract. WITS2001 is a comprehensive solutions-oriented contract with Verizon and Qwest offering a wide range of telecommunications services and equipment to Government agencies in the NCR. With the contract set to expire in January 2008, FAS is replacing WITS2001 with a program known as WITS 3. WITS 3 will entail a single acquisition with multiple awards. The awards will be for a four-year base period with four one-year options.

WITS 3 will provide Government users continuity of services for local telecommunications and will serve as a stable platform for the WITS user community to migrate to Networx<sup>1</sup> based on individual agency requirements, funding availability, and timelines.

### C.1.1 The WITS Program, WITS2001 and WITS 3

The WITS program has been a success over the last 16 years. The program has evolved into the premier provider of local telecommunications services and products to Federal clients in the NCR. The current WITS2001 contract, awarded to Verizon in January 2000, offers a broad portfolio of commercial services and products at very competitive prices – including voice, data, video, customer premises equipment (CPE), and technical services. Qwest was added as a contractor in the 1<sup>st</sup> Quarter of FY06.

From its inception in 1990 serving approximately 120,000 telephone lines, WITS2001 presently provides service to the equivalent of 650,000 customer lines. The Department of Defense (DOD) comprises slightly less than half of this customer base. Other large customers include:

- Health and Human Services
- Commerce
- Agriculture
- GSA
- Environmental Protection Agency
- Department of Homeland Security

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<sup>1</sup> GSA's Networx program will provide telecommunications, networking services, and technical solutions to federal agencies – replacing the expiring FTS2001 and FTS2001 Crossover contracts and federal wireless contracts. Networx consists of two simultaneous acquisitions: Networx Universal and Networx Enterprise. Both Universal and Enterprise are broadly scoped acquisitions with a comprehensive suite of services. Awards are anticipated in March of 2007 for Networx Universal and in May of 2007 for Networx Enterprise.

WITS 3 service requirements are based, in large part, on what WITS customers are buying today. There must be no loss of service functionality and minimal disruption of service as customers transition from WITS2001 to WITS 3. Our customers are technologically sophisticated and increasingly demand new and emerging technology solutions in addition to traditional telecommunication services.

### **C.1.2 WITS 3 Contract Objectives**

The Government intends to accomplish the following objectives:

- 1. Ensure Service Continuity.** Ensure customers have access to comprehensive products and services currently available and in-demand under WITS2001.
- 2. Foster Competition.** Leverage service volume and structure acquisition to attract multiple offerors for award, drive favorable pricing, and foster competition over the life of the program.
- 3. Provide Full Service Solutions.** Make available a broad array of fully managed end-to-end solutions.
- 4. Identify Alternative Sources.** Provide customers with access to multiple competing vendors.
- 5. Integrate Modern Support Systems.** Incorporate state-of-the-art web-enabled commercial Business Support Systems (BSS) and Operational Support Systems (OSS).
- 6. Enable Convergence.** Promote migration to a converged environment through access to emerging technologies with continuous refreshment.
- 7. Grow Small Business Opportunities.** Promote small business participation.

### **C.1.3 WITS 3 Contract Scope**

#### **C.1.3.1 Authorized Users**

This contract is for the use of all Federal agencies, authorized Federal contractors, agency-sponsored universities and laboratories and, as authorized by law or regulation, state, local, and tribal Governments, and other organizations. All organizations listed in GSA Order ADM 4800.2E, Eligibility to Use GSA Sources of Supply and Services, January 3, 2000 (as updated) are eligible. The Government has the right to add authorized users at any time during the term of this contract up to the limits specified in Section H.3, Minimum Revenue Guarantee and Maximum Contract Limitation.

#### **C.1.3.2 Geographic Scope**

The WITS 3 service area currently consists of the District of Columbia, the Maryland counties of Montgomery and Prince Georges, the Virginia cities of

Alexandria, Manassas, Fairfax, and Falls Church, and the Virginia counties of Arlington, Fairfax, Loudoun, Prince William, and locations sharing a community of interest. A listing of NPA-NXXs currently served by the WITS Program is shown in Section J.3.1.

### C.1.3.3 WITS 3 Services

The Government has defined two service groups: voice services and data services along with related technical support and customer premises equipment (CPE).

- 1. Voice services are mandatory.** Offerors must propose voice services to be eligible for a WITS 3 award. Voice services are specified in a functional manner in order to allow offerors the flexibility to meet voice requirements with either traditional or emerging technologies. Offerors will have the additional flexibility to determine the extent of service coverage within the WITS 3 service area – but will be required, at a minimum, to provide service in areas they support commercially. Offerors are also encouraged to propose a complementary set of technical support services and CPE that further enhance their voice service offerings.
- 2. Data services are optional.** The Government will define and specify a set of data services. Offerors choosing to bid this service group will have the discretion to select which individual services to propose – but will be required, at a minimum, to propose those services and service area coverages that they offer commercially. If an offeror proposes a specified service, they shall meet all requirements associated with that service. Offerors are allowed the flexibility to meet the data service requirements with emerging technologies. Offerors are also encouraged to propose a complementary set of technical support services and CPE that further enhance their data service offerings.

A summary of the WITS 3 Services is provided in Table C.1-1. Offerors will also be allowed and are encouraged to propose additional commercial services and equipment – that are required to enable, enhance, or otherwise extend their service offerings and value to the Government.

WITS 3 services include local access; i.e., the connection from the offeror's office serving the customer's Service Delivery Point (SDP) that includes transmission and may include switching. WITS 3 services also include local transport, the connection between the offeror's offices serving the originating and terminating SDPs within the WITS 3 service area. Finally, WITS 3 services include IXC access, the connection between the WITS 3 network and the IXC's Point of Presence (POP). The contractor shall support IXC access by providing customer organizations the ability to choose the Government-specified Government Designated Interexchange Carrier (GDIXC) Pre-subscribed Interexchange Carrier (PIC) for long distance services.



**Table C.1-1. WITS 3 Services and Products**

| Service Group       | Services and Products   |
|---------------------|---|
| Voice Services (VS) | WITS 3 Lines<br>WITS 3 Trunks<br>CPE and Technical Support  |
| Data Services (DS)  | Circuit Switched Data Service (CSDS)<br>Dedicated Transmission Service (DTS)<br>Teleconferencing Service (TS)<br>Frame Relay Service (FRS)<br>Asynchronous Transfer Mode Service (ATMS)<br>Dark Fiber Service (DFS)<br>Gigabit Ethernet Service (GES)<br>Internet Access Service (IAS)<br>CPE and Technical Support |

Throughout the life of the contract, the contractor shall provide access to all new and emerging services that become available within the scope of the contract. As new services and features become available, the contractor shall propose their inclusion in the WITS 3 contract. If there is sufficient interest within the Government, the contract shall be modified in accordance with Section H.14, New, Improved, or Additional Services.

**C.1.4 Organization of the Statement of Work**

Section C.2 describes required telecommunications services and features, including performance and interface requirements; Section C.3 describes requirements for management and operations services; Section C.4 describes the requirements for equipment that may be acquired under this contract; Section C.5 describes transition and implementation requirements; Section C.6 describes requirements for priority service and restoration of services and facilities; and Section C.7 summarizes general management requirements.

**C.2 Telecommunications Services and Features**

Sections below set out the following:

- 1. General Service Requirements.**
- 2. Required basic capabilities service-by-service.** Basic capabilities shall be included in the base price of the service, in accordance with Section B. The contractor also may identify basic capabilities that are not specified in this RFP.
- 3. Required features service-by-service.** Features of a service are additional service functionalities that shall be provided by the offeror and

priced separately from the basic service price. The contractor may propose additional features not specified in the RFP. Such features will be evaluated for reasonableness but will not be included in the Total Evaluated Discounted Cost as described in Section M.

**4. Performance requirements service-by-service.**

**5. Interface requirements service-by-service.**

**C.2.1 General Service Requirements**

**C.2.1.1 Flexible Service Delivery Points**

The SDP is the interface point for the physical delivery of a service, one of the points at which performance parameters are measured to determine compliance with the contract, and the point used by the contractor to identify the charges for services rendered. Each SDP is defined as the combined physical, electrical, and service interface between the contractor's network and the Government's on-premises equipment, off-premises switching and transmission equipment, and other facilities, such as those provided by telephone central offices.

The Government's requirements are for services and features to the SDP. The contractor shall deliver service to the SDP, and shall be responsible for service between the Government-designated SDPs.

Agencies require flexible SDPs under the WITS 3 contract. They require freedom to select the SDP location, so that they can maintain as much control over their telecommunications infrastructure as they feel is necessary and make the best use of their assets.

The contractor shall deliver service to the agency-specified SDP location, whether it is located at the Minimum Point of Presence (MPOP) or the desktop, or whether the existing inside wiring to connect the SDP to the MPOP is satisfactory. As the required SDP location moves away from the MPOP and towards the desktop, the contractor's responsibilities increase. The contractor's maintenance and network management responsibilities will increase because they extend to the SDP. The contractor may become responsible for more of the inside wiring, more of the CPE, and more of the operational management of the service up to and including the CPE. (For example, the contractor may be requested to assume responsibility for the management of the customer's routers, LANs, and PBX (see C.4.3.4, CPE Maintenance). Contract Line Item Numbers (CLINs) are established in Section B.11 for some flexible SDP requirements. However, some agencies may expect the contractor to provide convenient "one-stop shopping."

The User-to-Network Interface (UNI) specifications for some flexible SDP requirements are described service-by-service in C.2.2.4 through C.2.10.4.

### **C.2.1.2 Inside Wiring**

The inside wiring for all orders shall be installed by the contractor as part of the basic service. For orders where the Government-defined SDP is located beyond the MPOP and the existing connection between the serving office and the SDP meets the technical requirements, the contractor shall use the existing connection at no cost. Otherwise, the contractor shall assume there is no satisfactory existing inside wiring.

For orders where the existing connection between the serving office and the SDP is tested and determined by the contractor to be unsatisfactory, the contractor shall provide notification of non-compliance in a Wiring Non-Compliance Report and propose a solution within five business days after service order acknowledgment. An unsatisfactory connection, by definition, does not allow the contractor to provide service from the WITS 3 serving office to the SDP at the performance levels specified in this section. The contractor shall demonstrate, with appropriate engineering specifications and evidence, that the existing connection is unsatisfactory.

Existing inside wiring may be owned and maintained by other contractors, the commercial building owner, or the Government. When the Government agrees with the contractor's assessment that the inside wiring is unsatisfactory, the Government may request that the contractor install or repair the inside wiring via a CLIN defined in Section B.11.1, Inside Wiring, or provide a quote to install the inside wiring on an individual-case basis. The Government will provide no-cost right of way from the MPOP to the designated SDP.

If the contractor and the Government fail to agree on an acceptable arrangement for installing the inside wiring, the Government reserves the right to use other contractors to upgrade the existing inside wiring or to install the new inside wiring. The contractor shall coordinate with the building manager, agency telecommunications manager, and the wiring contractor and may be requested to act as the Government's agent in accordance with Section G.1.3, Agent for the Government.

Inside wiring shall conform to Federal Information Processing Standards-Publications (FIPS-PUBS) 175 (Federal Building Standards for Telecommunications Pathways and Spaces), 176 (Residential and Light Commercial Telecommunications Wiring Standards), 187 (Administrative Standards for Telecommunications Infrastructure of Federal Buildings), and 195 (Federal Building Grounding and Bonding Requirements for Telecommunications). Inside wiring also shall conform to U.S. cabling and safety standards and guidelines as published by Building Industry Consulting Services Institute (BICSI) and the American National Standards Institute (ANSI)/Electronic Industry Association/Telecommunications Industries Association (EIA/TIA) 568/569/606/TSC-36/TSC-40, ANSI/National Fire Protection Association (NFPA)-70, and EIA/TIA568A.

The complete inside cable distribution system shall be labeled in accordance with ANSI/EIA/TIA 606, Administration standard for the Telecommunications

Infrastructure of Commercial Building, dated February 1993. Conductors shall be cabled so as to insure against induction in voice/data circuits.

All inside distribution cable installed under this contract shall meet the EIA/TIA/TSB-36 standard for data rates of 100 Mb/s for Category 5E. Unshielded Twisted Pair (UTP) cable shall conform to the EIA/TIA-568A, "Technical Systems Bulletin - 36 (TSB-36)," and to FIPS 174, "Federal Building Wiring Standard" for 5E cable, as appropriate, and shall be plenum rated.

The cable distribution system shall be fully tested. The cable records shall identify each cable as labeled, used cable pairs and bad cable pairs. Minimum test requirements are for opens, shorts, crosses, and split pairs on Category 5E voice cables, as appropriate. Crosstalk attenuation within the inside cable distribution system shall be in excess of 80 dB throughout the frequency range. All Category 5E cables, including connectors, shall be tested to ensure that proper installation practices were observed and that the installation meets the requirements of EIA/TIA TSB-36, "Additional Cable Specifications for Unshielded Twisted Pair Cables," and EIA/TIA TSB-40, "Additional Transmission Specifications for Unshielded Twisted Pair Connecting Hardware." These measurements shall be entered as part of the cable records. All cable records shall be available at acceptance testing and maintained thereafter in the agency's Telephone Switch Room or Main Distribution Frame (MDF) room. All future changes (used pair, failed pair, etc.) shall be posted in these records as the change occurs by the contractor. The contractor shall assure the cable meets the requirements of ANSI/ICEA S-84-608, S-85-625, Telcordia Documents as applicable, NEC-800-3 (B) and Underwriters Laboratories (UL) Section 800-3 (b).

All inside cable runs shall be installed with no splices. Outside plant cable shall be terminated within 50 feet or less of entrance into a building. When completed, inside wiring shall be terminated. As an option, the Government may require the contractor to perform a system certification of the inside wiring between Government-designated points (e.g., the MPOP and the SDP) and to document the results.

### **C.2.1.3 Local Loops**

WITS 3 VS and CSDS local access connections shall conform to the standards of Telcordia's Notes on the Networks (SR-2275).

### **C.2.1.4 Site Preparation**

Any contractor-provided equipment to be located on customer premises shall be placed in locations approved by the Government. Requests for Government-controlled space to house equipment shall be for one contiguous space and shall include a primary and an alternate for each equipment location. The contractor shall provide detailed information regarding floor space, ceiling height, electrical, environmental, and floor-loading requirements. The Government will provide space at the time of the Notice to Commence Work and will make every effort to provide

the space in the primary location but in some cases may require use of the alternate space. This approval will be on a case-by-case basis. Where available, the Government will authorize the use of a reasonable amount of space and power without charge.

Site preparation necessary for proper equipment or service operation will be provided by either the contractor or the Government, at the option of the Government. Requirements for commercial power, backup power, grounding, conduits, frames, terminals, room construction or environmental requirements shall be provided by the contractor to the ordering agency.

The contractor shall provide a firm-fixed-price quotation to accompany the site preparation specification, indicating the contractor's price for accomplishing the job. The Government will have the option of accepting the contractor's offer and reimbursing the contractor on an individual-case basis or performing the site preparation using another contractor or Government resources.

All work done by the contractor under this contract shall conform to FIPS PUBS 187 and 195, all appropriate national and local codes, and all other directives referenced within this contract, and shall conform to accepted industry installation and repair practices. All work and code compliance shall be subject to Government review and approval.

#### **C.2.1.5 On-Net and Off-Net Calls**

There are two types of WITS 3 calls, on-net and off-net. Calls from a WITS 3 SDP to other WITS 3 SDPs on the contractor's network are on-net calls. All other calls are off-net calls. WITS 3 users shall have the same geographic off-net local calling area as other non-WITS 3 telephone line users at the same location.

On-Net calls shall be included in the basic service capabilities, at no additional cost. Cost recovery for Off-Net calls shall be priced by the contractor in Section B, Table B.2-6.

The contractor shall describe qualitatively in the Technical Volume of the Proposal how the WITS 3 service area will be partitioned from one to a maximum of twenty distinct groups and why each different group is proposed.

#### **C.2.1.6 Contractor Compatibility**

The contractor, as part of the basic service, shall support the customer as necessary in testing hardware and software that interfaces with the WITS 3 network to assure that the customer's systems, services, features, and applications function as required. When a non-standard solution is required to resolve a system incompatibility, the implementation of the solution shall be negotiated on an individual-case basis with the Government.

### **C.2.1.7 Interoperability**

The contractor shall support interoperability for given service offerings so that a user of a service from one WITS 3 contractor shall be able to communicate with users of services from other WITS 3 contractors with performance equivalent to that commercially available. The GSA recognizes that different levels of interoperability (i.e., partial or full) exist commercially, particularly in the area of data networking. Interoperability shall be made available for any service that is currently commercially offered by the contractor and is interoperable with other WITS 3 contractors' service. The contractor shall notify the GSA of the details of the level of interoperability available for the service. In addition, the contractor shall make available any future service interoperability at no additional cost to the GSA when the contractor offers the interoperability for its regularly provided service commercially.

In particular, the WITS 3 network shall interface with designated telecommunications programs of the Government, including the Defense Switched Network and other GDIXCs. The WITS 3 network shall also interface with GDIXC service providers who have elected to terminate calls to Federal subscribers via the WITS 3 network. Required functionality shall include interoperability (e.g., translations, specified interfaces) with the associated service providers. The WITS 3 contractor shall recommend appropriate interface points to the Government, in consultation with each affected contractor, after contract award.

### **C.2.1.8 Numbering Plan and Dialing Plan**

The contractor shall support a uniform numbering plan for all WITS 3 buildings that conforms to the North American Numbering Plan (NANP) and is consistent with the current WITS2001 dialing plan. New services shall be accommodated within this framework. The NXX blocks that are being used by WITS 3 are identified in Section J.3.1

The contractor shall be responsible for administering changes in the NANP affecting the WITS 3 network users as soon as notification of NANP changes become available.

The contractor shall be responsible for the compatibility of the proposed numbering scheme with the numbering plan of both the GDIXC networks and the local exchange network. Current WITS2001 subscriber numbers shall be maintained. The contractor shall consult with the local exchange carrier (LEC) and the Government regarding their current or future numbering plans and make appropriate provisions in the proposed WITS 3 numbering plan. Detailed information regarding the WITS2001 numbering and dialing plans will be provided to contractors after contract award.

### **C.2.1.9 Performance**

The contractor shall be responsible for all aspects of the Quality of Service (QoS), security, interconnectivity, and interoperability of services between WITS

3 SDPs. The applicable performance parameters for each service and feature are specified service-by-service in C.2. Each performance parameter is defined in terms of the minimum acceptable level of performance for the service or feature. The contractor shall deliver services at a performance level equal to or greater than what is available commercially. Thus, if the available commercial performance parameter is more demanding than the minimum acceptable level specified in this contract, the available commercial performance parameter shall prevail.

#### **C.2.1.10 System Attributes**

The contractor shall be responsible for meeting the following general system requirements over the life of this contract:

##### **C.2.1.10.1 Reliability**

The maintainable design life of all contractor-provided components, circuits, and equipment shall be at least eight years. This will not include expendable items. The design life shall be on the basis that normal recommended maintenance procedures will be followed.

##### **C.2.1.10.2 Robustness**

The contractor's infrastructure shall be sufficiently robust that in the event of failure of any system or component, the network shall continue to function and process calls. Switching systems shall be designed with sufficient redundancy to ensure system downtime due to catastrophic failure shall be less than four hours in twenty years. Downtime consists of time required to restore the switching system. With the exception of local access connections and line cards (or equivalent functionality), there shall be no single-point failure mechanisms in the WITS 3 service provider's network.

##### **C.2.1.10.3 Warranty Period**

All equipment and components procured as a unit under this contract shall be warranted for a period not less than the time specified in the original equipment manufacturer's warranty. Repair or replacement of any item during the warranty period shall be at no cost to the Government, and the contractor shall provide substitute equipment during the period of repair. These rights shall be in addition to those provided by FAR 52.246-20 (Warranty of Services).

##### **C.2.1.10.4 Availability of Service**

WITS 3 services shall be available 24 hours a day, seven days a week. The availability of each required service shall be at least 99.5 percent at each SDP. For purposes of the WITS 3 contract, the availability shall be calculated as follows:

$$Availability = \frac{\text{Total Uptime} \times 100}{\text{Total Uptime} + \text{Total Downtime}}$$

Total uptime is the total amount of time the service is available within a one-month period. Total downtime is the total amount of time that the service is unavailable within a one-month period. Total downtime includes scheduled maintenance downtime if the service is unavailable for use.

**C.2.1.10.5 Scalability**

The contractor’s network for WITS 3 services shall be scalable within its proposed coverage area. i.e., it shall be capable of serving traffic volumes for the proposed services in excess of those projected by the Government in its Bid Model.

**C.2.1.10.6 Network Synchronization**

The WITS 3 network shall be synchronized to a common and highly accurate timing mechanism and shall be traceable back to a stratum 1 source.

The American National Standards Institute (ANSI) standard entitled "Synchronization Interface Standards for Digital Networks" released as ANSI/T1.101-1998 defines the stratum levels and minimum performance criteria. Table C.2-1 provides a summary:

**Table C.2-1. Stratum Levels and Minimum Performance Criteria**

| Stratum             | Accuracy, Adjustment Range | Pull-In-Range   | Stability                 | Time To First Frame Slip * |
|---------------------|----------------------------|---|---------------------------|----------------------------|
| 1                   | $1 \times 10^{-11}$        | N/A   | N/A                       | 72 Days                    |
| 2                   | $1.6 \times 10^{-8}$       | Must be able to synchronize to the clock with an accuracy of +/- $1.6 \times 10^{-8}$ | $1 \times 10^{-10}$ /day  | 7 Days                     |
| 3E                  | $4.6 \times 10^{-6}$       | Must be able to synchronize to the clock with an accuracy of +/- $4.6 \times 10^{-6}$ | $1 \times 10^{-8}$ /day   | 17 Hours                   |
| 3                   | $4.6 \times 10^{-6}$       | Must be able to synchronize to the clock with an accuracy of +/- $4.6 \times 10^{-6}$ | $3.7 \times 10^{-7}$ /day | 23 Minutes                 |
| SONET Minimum Clock | $20 \times 10^{-6}$        | Must be able to synchronize to the clock with an accuracy of +/- $20 \times 10^{-6}$  | Not yet specified         | Not Yet Specified          |
| 4E                  | $32 \times 10^{-6}$        | Must be able to synchronize to the clock with an accuracy of +/- $32 \times 10^{-6}$  | Same as Accuracy          | Not Yet Specified          |
| 4                   | $32 \times 10^{-6}$        | Must be able to synchronize to the clock with an accuracy of +/- $32 \times 10^{-6}$  | Same as Accuracy          | N/A                        |



\* In order to calculate the slip rate from drift, assume a frequency offset equal to the drift in 24 hours, which accumulates bit slips until 193 bits (frame) accumulate. Drift rates for various atomic and crystal oscillators are well known. However, drift rates are usually neither linear nor continually on an increase.

#### **C.2.1.11 Network Architecture**

The contractor shall implement a network architecture that delivers specified services and features throughout the WITS 3 service area, interfaces with the Public Switched Network in a manner that meets the requirements of this Statement of Work, is scalable and robust, and can serve small customers.

#### **C.2.1.12 Conformity to Standards**

Throughout Section C, references are made to standards (including interim standards, Internet Engineering Task Force [IETF], Requests for Comments [RFCs], or defacto standards) as they exist at the time of issuing this RFP. Compliance with the latest versions of these standards is expected throughout the duration of the contract. Considering the evolving nature of standards in the telecommunications industry, discussions will be held semiannually between the contractor and the Government to assess the impact of any changes in standards on the WITS 3 network. The contractor shall prepare a draft Technology Refreshment Plan (see Sections H.14 and G.2.1.16) semiannually that incorporates the understandings reached with the Government.

Service provided to the Government shall conform to the same standards as that of the contractor's commercial offerings. If the contractor implements a new or modified standard for any customer in the WITS 3 service area for a service in the WITS 3 contract, the contractor shall propose to implement the change into the WITS 3 network within six months in accordance with C.7.2, Systems Changes. If a customer organization wants conformance to a new standard earlier than the contractor's commercial plan for development, then it shall be negotiated on an individual-case basis.

Where multiple standards are cited, the order of precedence shall be as follows unless otherwise noted:

1. Federal Information Processing Standards
2. Other Federal Standards
3. Federal Telecommunications Recommendations (FTRs)
4. Industry forums (e.g., North American Integrated Services Digital Network (ISDN) Users Forum [NIUF], Frame Relay Forum, Asynchronous Transfer Mode Forum [ATMF])
5. Internet Activities Board (IAB)
6. ANSI, Electronic Industries Association [EIA], Institute for Electrical and Electronic Engineers (IEEE), Insulated Cable Engineers Association (ICEA), National Electric Code (NEC), Telecommunications Industry

Association [TIA] Telecommunications Industry Forum (TCIF), and Underwriters Laboratories (UL) standards

7. Telcordia
8. International Telecommunications Union-Telecommunications Service Sector (ITU-TSS)
9. Proprietary standards

The Government reserves the right to waive the standards requirement for any service.

### **C.2.2 Voice Services (VS) [MANDATORY]**

The following sections specify functional requirements for mandatory voice services. The technology used to provide voice services is not specified by the Government – the contractor shall set the technical approach to deliver compliant solutions. Contractors are also encouraged to propose capabilities and features in addition to those contained in this RFP.

VS shall support calling capabilities between WITS 3 SDPs as well as from any WITS 3 SDP to an IXC, Local Exchange Carrier (LEC), or CLEC POP. The contractor shall provide the following types of voice services:

1. **WITS 3 lines:** including, but is not limited to, analog and ISDN BRI lines, or their functional equivalent utilizing emerging technologies.
2. **WITS 3 access trunks:** including, but not limited to, analog, T1, T3, and ISDN Primary Rate Interface (PRI) trunks, or their functional equivalent utilizing emerging technologies.

#### **C.2.2.1 Basic Service Capabilities**

Basic capabilities shall be included in the base price of the service. Features are additional service functionalities that shall be provided by the contractor and may be priced separately from the base price of the service. Basic capabilities that are required for WITS 3 voice services are discussed in this section.

The contractor shall support connections for voice and analog data applications and shall provide analog data at the highest commercially-available data rates over the life of the contract. The services shall conform to the following standards:

1. ANSI T1.101
2. ANSI ISDN
3. ANSI SS7 standards
4. Telcordia Notes on the Networks, Issue 4, October 2000
5. All applicable Telcordia, ANSI and ITU standards
6. ITU-TE.164 as interpreted by the Industry Number Committee of ATIS

7. The contractor shall comply with all new versions, amendments, and modifications to the above documents and standards as they become applicable.
8. The contractor shall support any combination of custom ISDN lines and ISDN lines that conform to the national standard at specified Government buildings throughout the life of the contract.

As applicable, voice services shall also conform to:

1. IEEE 802.1p/q, 802.3x.
2. Internet Engineering Task Force (IETF) RFC 2132 for Dynamic Host Configuration Protocol (DHCP).
3. IETF RFC's 2916 (ENUM), 2806.
4. IETF RFC's for Internet Protocol (IP) IPv4. IPv6 as required to comply with OMB IPv6 directives.
5. ITU RFC 1349 ToS, 2474, 2475 DiffServ.
6. ITU-T E.164 as interpreted by the Industry Number Committee of Alliance for Telecommunications Industry Solutions (ATIS).
7. ITU-T G.107.
8. ITU-T G.711, G.723.x, 7.26, G.728, or G.729.x.
9. ITU-T H.248.1 (MEGACO), H.323, H.350 when and where offered commercially by the contractor.
10. ITU-T Q.700 series recommendations for Signaling System No. 7.
11. ITU-T T.30, T.37, and T.38.
12. Lightweight Directory Access Protocol (LDAP).
13. Media Gateway Control Protocol (MGCP) IETF RFC 3435 when and where offered commercially by the contractor.
14. Real-Time Transport Protocol (RTP) IETF RFC 3550.
15. Session Initiation Protocol (SIP) IETF RFC 3261 when and where offered commercially by the contractor.
16. Transmission Control Protocol (TCP) IETF RFC 793.
17. User Datagram Protocol (UDP) IETF RFC 768.

The contractor shall provide the following basic capabilities, which are listed in alphabetical order, for a WITS 3 line and a WITS 3 trunk:

1. Access to 311 service. Subscribers shall be able to obtain non-emergency service/assistance by dialing 311. The contractor shall administer the associated database.
2. Access to 911 service. Subscribers shall be able to obtain emergency service/assistance by dialing 911. The contractor shall administer the

associated database. The 311 and 911 databases shall be available at the time of the initial acceptance of WITS 3 services. The 311 and 911 databases shall continue to be housed on the Public Switched Network, and the contractor shall provide daily updates to maintain the accuracy of these databases.

3. Automatic Route Selection (ARS). Allows calls to be routed automatically in accordance with a contractor-specified routing plan that is approved by the Government.
4. Blocked Exchanges. Blocks exchanges and routes calls to a recorded announcement stating that the call cannot be completed as dialed.
5. Call Detail Records (CDRs). WITS 3 lines (but not WITS 3 trunks) require the basic capability to prepare CDRs. A CDR records certain characteristics of a telephone call, including the time and duration of the call, the called number, the calling number (when passed through), and the charge. The associated CDR Report (see Section G.2.2.1) is sent to the customer, and the contractor may charge a fee. The contractor shall identify the lowest level of call origination possible; i.e., the originating station calling number, authorization code, or trunk as appropriate. The Government considers CDR data to be sensitive information, and the contractor shall take appropriate safeguards to protect it.
6. Caller ID. Provides the basic capability of passing the calling number to the terminating station.
7. Dial Tone Denial. This basic capability, in conjunction with Priority Restoration (see C.6.4), shall enable critical personnel to make outgoing calls during conditions of severe system overload.
8. Intercepts and recorded announcements. The contractor shall provide commercially available network intercepts to recorded announcements when a call cannot be completed. At a minimum, the following intercepts to recorded announcements shall be supported:
  - a. Calls to vacant or disconnected numbers
  - b. Conference bridge busy
  - c. Trunk or common equipment failure
  - d. Misdialed numbers
  - e. Unauthorized calls
  - f. Lack of authorization code
9. Line Hunting. All subscriber lines within the system shall be assigned to either station hunt groups or individual numbers. Lines assigned to hunting groups need not be in numerical sequence. Any main station number shall be able to be assigned to any hunt group within a switching entity.

10. Off-hook time out. The basic capability of a switch to detect and react to an off-hook condition over a period of time before reception of dialing information or after call disconnect.
11. Operator assistance. The live or mechanical assistance by the service provider's operator center.
12. Primary directory listings. The primary directory listing is the customer's main billing number, which shall appear in the telephone directory published by the dominant LEC in the NCR.
13. Outgoing Trunk Group Access Denial. Allows lower-priority outgoing calls to be blocked during periods of an emergency.
14. Local Number Portability (LNP) allows the subscriber to retain his or her telephone number after changing service providers or physical location in accordance with the guidelines established by the Number Portability Administration Center (NPAC).
15. Retention of Current Telephone Number. The contractor shall ensure, to the fullest extent legally and technically possible, that any customers migrating to and from the WITS 3 Network will have the option of retaining their current telephone number.
16. ISDN BRI lines for Circuit Voice Service shall be capable of supporting zero, one or two B channels. One or two B channels and one D channel. See Section C.2.2.4.1 for further information.

**C.2.2.2 Features**

A service functionality is a quality of the service that is required by the customer, either a basic capability that is included in the base price of the service or a feature that may be priced separately from the basic price of the service. If the contractor elects not to separately price a feature, then it becomes a basic capability. Certain basic capabilities were specified in C.2.2.1. Other basic capabilities and features are described in this section and listed in Table C.2-2. A service functionality such as one-digit speed calling may be a required basic capability for one product and a feature for another. The following basic capabilities/features listed in Table C.2-2 shall be provided by the contractor:

**Table C.2-2. Definition of Required VS Basic Capabilities and Features**

| Required Basic Capability/Feature     | Definition   |
|---------------------------------------|--|
| Additional directory number           | Feature over analog and ISDN lines to provide two voice, voice/data, or two data channels utilizing two Service Profile Identifier and Directory (SPID) numbers. |
| Agency-Recorded Message Announcements | Authorized Government personnel shall be able to record message announcements within the network after authentication of user-ID and password/token.             |

| Required Basic Capability/Feature                 | Definition  |
|---|---|
| Alphanumeric dialing                              | A term pertaining to a character set that contains letters, digits, and sometimes other characters, such as punctuation marks.  |
| Alternate call directory listings                 | A feature that allows alternate numbers to be indicated under a directory listing.  |
| Authorization code                                | A code that, once entered, can permit the user to gain access to a system or service.   |
| Automatic call-back                               | Allows a user to place a call-back on a busy line. When the called station goes on-hook, the originating station is rung and, when answered, the original call is automatically placed.   |
| Automatic Route Selection                         | Allows calls to be routed automatically in accordance with a contractor-specified routing plan that is approved by the Government.  |
| Backup of ISDN PRI Shared D Channel               | Shared-D channel backup/redundancy, for PRIs with a 24B+0D configuration, which is available when the primary PRI with 23B+D is inoperative.  |
| Billing Account Codes (BAC)                       | A three-digit number that is assigned by the Government to uniquely identify agency cost centers.   |
| Blocked exchanges                                 | The process of denying access to, or use of, a facility, system, or component.  |
| Blocking caller-paid information phone numbers    | Blocks caller-paid calls from a station to an "information" or Directory Assistance number (e.g., 411).   |
| Blocking dialed Carrier Identification Code (CIC) | Blocks calls to carriers other than the pre-subscribed carrier on a per-call basis.   |
| Blocking of selected numbers                      | Blocks calls incoming from pre-determined numbers.  |
| Call consultation                                 | A feature that allows a user to alternate between a party on hold and an existing conversation.   |
| Call forward – busy                               | A feature that permits calls attempting to reach a busy station line to be redirected to a predetermined line when the called station is in use.  |
| Call forward – don't answer                       | A feature that provides for forwarding of incoming calls to a predetermined line when the called station line does not answer within a prescribed time.   |
| Call forward – variable                           | A feature that allows a user to choose to reroute incoming calls to another specified telephone number.   |
| Call forwarding – off-net                         | A feature that allows all calls destined to a station to be routed to another off-net station, designated during activation, regardless of the busy or idle state of the called station. It shall be possible for the station to activate or cancel this feature. |
| Call hold   | A feature that allows a station user to "hold" any call in progress by flashing and then dialing a "hold" code, thus freeing the line for the purpose of originating another call or returning to a previously held call.   |

| Required Basic Capability/Feature | Definition   |
|-----------------------------------|--|
| Call hunting                      | Routes incoming calls through a series of stations. If the first station is busy, the calls will be routed to the second station in the series, and so on.   |
| Call park                         | Allows a call to be parked at a directory number for retrieval by another line or trunk.   |
| Call pick-up                      | A feature that allows a station user to answer any calls directed to another station line within his or her own preset pickup group by dialing a pickup code from an idle or busy station.   |
| Call trace                        | Allows the user on any line to initiate identification of the calling party by dialing a code.   |
| Call transfer                     | A feature that allows a station user to transfer any call in progress to another station within the same system without the assistance of the attendant.   |
| Call waiting                      | A feature that allows a call to a busy station line to be held waiting while a tone signal is directed towards the busy station user. (Only the called station user shall hear this tone.)   |
| Calling number suppression        | Provides the originating user with the capability to block the station number from being passed to the terminating station. It shall be possible to enable this function either on a per-call basis or indefinitely.   |
| Class of Service (COS)            | <p>Privileges given to a particular station. The COS service functionality shall make at least 256 classes of service available to each subscriber line. Due to the diverse nature of the customers served, it shall be possible to assign a COS to each subscriber line, independent of the COS assigned to other subscriber lines; and it shall be possible to change the COS without requiring a station number change. The Government will select a variety of classes, some of which may be unique. The class of service applicable to each line will be determined by the Government at the time of the Notice to Commence Work. The contractor shall provide the following seven access level plans:</p> <ol style="list-style-type: none"> <li>1. COS 1 – Limited Service: Any ten-digit WITS 3 number served by the same WITS 3 switch as the calling number</li> <li>2. COS 2 – Standard Service: Any WITS 3 number.</li> <li>3. COS 3 – Commercial Service: COS 2 plus access to the local exchange network commercial NXXs plus Government credit card service</li> <li>4. COS 4 – Government Service: COS 3 plus access to national GDIXC service (on-net)</li> <li>5. COS 5 – Extended Service: COS 4 plus access to national FAS service (on-net and off-net)</li> <li>6. COS 6 – National Service: COS 5 plus operator-assisted (local and national) calls</li> <li>7. COS 7 – International Service: COS 6 plus access to International Direct Distance Dialing (IDDD) service</li> </ol> |

| Required Basic Capability/Feature              | Definition   |
|--|--|
| Customized group dialing plan                  | A service functionality that allows the dialing plan to be customized for a defined group of stations within the system.   |
| Customized Intercept and Recorded Announcement | A feature whereby the customer can set the recorded announcement or intercept message when a call cannot be completed.   |
| Data call setup                                | Provides three methods to set up a data call: 1) data terminal (keyboard) dialing; 2) voice terminal dialing; and 3) dedicated voice terminal.   |
| Data hot line                                  | Provides for automatic non-dial placement of a data call to an endpoint when the originator goes off-hook.   |
| Data line privacy                              | Protects analog data calls from being interrupted by any of the system's overriding or ringing features.   |
| Dial tone denial                               | Used in conjunction with Priority Treatment, enables critical personnel to make outgoing calls during conditions of severe system overload   |
| DID number block assignment and maintenance    | Assigns and maintains DID number blocks for a new DID-PBX installation.  |
| DID/DOD two way                                | This feature shall allow a central office access trunk to have both DID and DOD capabilities. Direct Inward Dialing (DID)/Direct Outward Dialing (DOD) trunks connect the customer's PBX with the WITS switch or LEC central office, are associated with a specific block of telephone numbers, and carry the customer's on-net and off-net traffic. |
| Direct Inward Dialing (DID)                    | Allows an external party to directly dial a station without the assistance of an attendant.  |
| Direct Outward Dialing (DOD)                   | Allows an internal user to call to an outside party without the assistance of an attendant.  |
| Directory Assistance                           | An information service whereby operators assist customers in obtaining the <a href="#">telephone number</a> (s) they wish to call.   |
| Distinctive ringing                            | Distinguishes between internal or DID calls based on the station ringing pattern.  |
| Dual service                                   | Allows an incoming call to ring at two locations when the primary number is dialed. One location is assigned the primary number, and the second location (usually in a different building) the secondary number.   |
| Flexible call forwarding                       | A PIN-enabled feature that allows the subscriber to forward calls to any telephone connected to the Public Switched Network.   |
| Flexible disconnect, both/either party         | Disconnects a call when either or both parties hang up.  |
| Foreign Central Office                         | A service that enables the subscriber to receive dial tone from a central office other than the subscriber's designated central office via a route that is geographically diverse from the route between the subscriber's location and their designated central office.  |



| Required Basic Capability/Feature               | Definition   |
|---|--|
| Foreign Exchange Service                        | A service that enables the subscriber to have an NPA-NXX outside the subscriber's serving area.  |
| Hot line  | Provides for the automatic non-dial placement of a call to an endpoint when the originator goes off-hook.  |
| Intercepts and recorded announcements.          | The process by which calls that cannot reach their destination are diverted to a station attendant or a recording. The contractor shall provide commercially available network intercepts to recorded announcements when a call cannot be completed. |
| Intercom dial                                   | Allows another station within an intercom group to be dialed using one or two digits.  |
| Message waiting indication                      | A visual or audible indication at a station that a message is waiting.   |
| Multiple appearance directory number            | A directory number that is assigned more than once to one or more telephone sets.  |
| Multiple Appearance Preselection and Preference | Provides multi-line appearance voice terminal users with options for placing or answering calls on selected appearance.  |
| Outgoing trunk group access denial.             | Allows lower-priority outgoing calls to be blocked during periods of an emergency.   |
| Privacy   | Prevents others from entering into a connection on a multi-appearance line.  |
| Retention of Current Telephone Number           | Ensures, to the fullest extent legally and technically possible, that any customers migrating to the WITS 3 Network will have the option of retaining their current telephone number.  |
| Shared ISDN PRI D Channel                       | A PRI configuration in which the D channel is shared (e.g., several PRIs having a 24B+ 0D configuration share a D channel).  |
| Six-way conference call                         | Allows a station user to establish a multiparty conference connection of up to six conferees including themselves, either without attendant assistance at all, or with attendant assistance only for adding trunks.                                  |
| Software reconfiguration by customer            | Allows a customer to reconfigure basic line capabilities such as blocking of selected numbers, class of service, etc. through the use of a computer terminal.  |
| Speed calling, one-digit                        | Allows a station user to reach any of a preselected group of stations by dialing single-digit codes.   |
| Speed calling, two-digit                        | Allows a station user to reach any of a preselected group of stations by dialing double-digit codes.   |
| Three-way conference calling                    | Allows a station user to establish a multiparty conference connection of up to three conferees including themselves, either without attendant assistance at all, or with attendant assistance only for adding trunks.                                |
| Tie trunk                                       | A dedicated circuit linking two PBXs.  |

| Required Basic Capability/Feature | Definition   |
|-----------------------------------|--|
| Trunk group denial                | Allows incoming, lower-priority calls to a trunk group to be blocked during periods of emergency.  |
| Vanity number                     | A directory number that can be dialed using a meaningful alphanumeric representation.  |
| Voice mail                        | <p>Voice mail shall provide the following capabilities:</p> <ol style="list-style-type: none"> <li>1. Be accessible to any station within the system that has a telephone equipped with a push-button tone pad.</li> <li>2. Automatically cue the recipient of message(s) in the voice mailbox. Message cue alerting should include, but not be limited to, a message waiting visual signal or stutter dial tone.</li> <li>3. Handle inside, as well as outside, calls on the system.</li> <li>4. Store messages automatically and forward the message at specific times designated by users.</li> <li>5. Deliver mass announcements to all or part of its users.</li> <li>6. Be accessible to any on-net or off-net station equipped with a push-button dial pad in order for the mail box owner to retrieve or change messages.</li> <li>7. Provide automated attendant functions.</li> <li>8. Provide message duration of at least 90 seconds.</li> <li>9. When providing off-premise switch-based voice service services, the contractor shall supply or interface with and support a Station Message Desk Interface (SMDI) data link to integrate a Government-owned voice mail system into its switching system.</li> <li>10. Provide at least six-minute storage for each individual voice mail box.</li> </ol> |

Basic capabilities and features are listed in Table C.2-3 for purposes of comparison. Required capabilities/features are listed against VS products. Where there is a “C” in the cell, the functionality shall be part of the basic service; where an “F” is listed, the functionality may be separately priced.

**Table C.2-3. Required VS Basic Capabilities and Features**

| Feature                               | WITS 3 Line | WITS 3 Trunk |
|---------------------------------------|-------------|--------------|
| Additional Directory Number           | F           | F            |
| Agency-recorded Message Announcements | F           | F            |
| Alternate Call Directory Listings     | F           |              |
| Automatic Call Back                   | F           |              |
| Automatic Route Selection             | C           |              |

| Feature   | WITS 3 Line | WITS 3 Trunk |
|---|-------------|--------------|
| Backup of ISDN PRI Shared D Channel               |             | F            |
| Billing Account Codes                             | C           |              |
| Blocked Exchanges                                 | C           | C            |
| Blocking of Caller Paid Information Phone Numbers |             | F            |
| Blocking of Selected Numbers                      | C           |              |
| Call Consultation                                 | C           |              |
| Call Forward – Busy                               | C           |              |
| Call Forward – Don't Answer                       | C           |              |
| Call Forward – Variable                           | C           |              |
| Call Forwarding – Off-Net                         | C           |              |
| Call Hold   | C           |              |
| Call Hunting                                      | C           |              |
| Call Park   | C           |              |
| Call Pick-Up                                      | C           |              |
| Call Trace  | C           |              |
| Call Transfer                                     | C           |              |
| Call Waiting                                      | F           |              |
| Calling Number Suppression                        | C           |              |
| Class of Service (COS)                            | C           |              |
| Customized Group Dialing Plan                     | C           |              |
| Customized Intercept and Recorded Announcement    | C           |              |
| Data Call Setup                                   | C           | C            |
| Data Hot Line                                     |             | C            |
| Data Line Privacy                                 |             | C            |
| Dial Tone Denial                                  | C           |              |
| DID Number Block Assignment and Maintenance       |             | F            |
| DID/DOD two-way                                   |             | F            |
| DID   |             | F            |
| DOD   |             | F            |
| Directory Assistance                              | F           | F            |
| Distinctive Ringing                               | F           | C            |
| Dual Service                                      | F           |              |
| Flexible Call Forwarding                          | C           |              |

| Feature                                      | WITS 3 Line | WITS 3 Trunk |
|--|-------------|--------------|
| Flexible Disconnect, Both/Either Party       |             | C            |
| Foreign Central Office                       | F           | F            |
| Foreign Exchange Service                     |             | F            |
| Hot Line                                     | C           |              |
| Intercepts and Recorded Announcements        | F           | F            |
| Intercom Dial                                | C           |              |
| Message Waiting Indication                   | C           |              |
| Multiple Appearance Directory Number         | F           |              |
| Multi-Appearance Preselection and Preference | C           |              |
| Outgoing Trunk Group Access Denial           | C           |              |
| Privacy                                      | C           |              |
| Retention of Current Telephone Number        | C           | C            |
| Shared ISDN PRI D Channel                    |             | F            |
| Six-Way Conference Call                      | F           | C            |
| Software Reconfiguration by Customer         | C           |              |
| Speed Calling, One Digit                     | C           |              |
| Speed Calling, Two Digit                     | C           |              |
| Three-Way Conference Calling                 | C           |              |
| Tie Trunk                                    |             | F            |
| Trunk Group Denial                           |             | C            |
| User Security Access                         |             | F            |
| Vanity Number                                |             | F            |
| Voice Mail                                   | F           |              |

**C.2.2.2.1 Multilevel Precedence and Preemption**

DOD requires that the WITS 3 voice services provide Multilevel Precedence and Preemption (MLPP), as defined in Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B and DOD Instruction 8100.3, Department of Defense Voice Networks, to specified WITS 3 users and on trunks connecting to the Defense Switched Network (DSN). The MLPP capability is mandatory for offerors to propose and price and optional for the Government to implement.

**C.2.2.3 Performance**

1. The transmission performance for VS shall meet the specifications below.

- a) All analog transmission parameters shall satisfy the values and ranges set forth in Telcordia Notes on the Networks, Issue 4, October 2000 (Standards: ANSI /TIA/EIA-464 for PBX trunk service and Telcordia SR-2275).
  - b) All digital transmission parameters shall satisfy the values and ranges set forth in the High-Capacity Digital Special Access Service - Transmission Parameter Limits and Interface Combinations (Standard: Telcordia TR-TSY-000754 or Telcordia GR-342-CORE)
2. The service availability shall comply with the requirements of Section C.2.1.10.4.
  3. The grade of service shall meet or exceed the objectives specified in Table C.2-4 for the Busy Season Busy Hour (BSBH). All blocking probabilities shall be calculated using the Erlang B formula.

**Table C.2-4. VS and CSDS BSBH Grade of Service Objectives**

| Type of Connection                   | Grade of Service Required       |
|--------------------------------------|---------------------------------|
| Terminating access Trunk-to-SDP      | P.01                            |
| Local exchange network to WITS 3     | P.01                            |
| GDIXC POP to WITS 3                  | P.03                            |
| Originating access SDP-to-trunk      | P.01 (after dial tone)          |
| WITS 3 to local telephone company(s) | P.01                            |
| WITS 3 to GDIXC POP                  | P.03                            |
| Dial tone delay                      | Less than 1 percent > 3 seconds |

4. The contractor shall monitor and measure switch performance of the contractor's switches using the same accepted industry reliability and quality standards and practices, such as Telcordia's GR-929 document
5. The contractor shall be cognizant of the impact of Internet access traffic, e.g. as identified in the Alliance for Telecommunications Industry Solutions (ATIS) Network Reliability Steering Committee (NRSC) Internet Team Study Report, ATIS, February 1998, and the mitigation methods identified in the ATIS TIA1.2 Working Group on Network Survivability Performance Technical Report on Reliability and Survivability Aspects of the Interactions Between the Internet and the Public Telecommunications Network, Report No. 55, October 1998.

#### **C.2.2.4 Interfaces**

##### **C.2.2.4.1 User-to-Network Interface**

The contractor shall support the following UNIs at the SDP:

1. Analog line, two-wire loop signaling at 4000 Hz bandwidth (300 to 3300 Hz) (for WITS 3 lines). Two-wire loop access circuits. (Standard: Telcordia SR-2275)
2. ISDN BRI digital line. (Standards: ANSI T1.607 and 610) BRI lines shall consist of zero, one or two B channels (64 kb/s) and one D (16 kb/s) channel. The D channel shall be capable of supporting:
  - a) Signaling only (ITU-TSS Q.931 signaling type)
  - b) Signaling and Packet Switched Service
3. Analog trunk at 4000 Hz bandwidth (300 to 3300 Hz) (for WITS 3 trunks: incoming/outgoing/two-way traffic; direct inward/outward dialing) (Standards: ANSI T1.102/103/403 and Telcordia SR-2275):
  - a) Two-wire and four-wire access circuit with Dial Pulse/Dual Tone Multi-Frequency (DP/DTMF) pulsing (Standard: Telcordia Notes on the Networks)
  - b) Signaling/supervision types:
    - i) Immediate start
    - ii) Ground start
    - iii) Loop start
    - iv) Wink start
    - v) Delay dial
    - vi) E&M types II, III, and IV (Standard: Telcordia's Notes on the Network [SR-2275])
4. Digital trunk. Incoming/outgoing/two-way traffic; direct inward/outward dialing
5. Channelized T1: 24 separate DS0 channels (56 kb/s line rate) (Standards: Telcordia Notes on the Networks [SR-2275] and ANSI/EIA T1.102/107/403.)
6. ISDN PRI trunk (23 B + D): An information-payload data rate of 1.472 Mb/s and ITU-TSS Q.931 signaling type. D channel cannot be shared by another ISDN PRI trunk. (Standards: ANSI/EIA T1.607 and 610; NIUF National ISDN-1 [Telcordia SR-NWT-001937], NIUF National ISDN-2 [Telcordia SR-NWT-002120], and NIUF National ISDN-3 [Telcordia SR-NWT-002457].)
7. ISDN PRI trunk (24 B + 0 D): An information-payload data rate of 1.536 Mb/s and ITU-TSS Q.931 signaling type. Shares a D channel with another PRI trunk. (Standards: ANSI/EIAT1.607 and 610; NIUF National ISDN-1 [Telcordia SR-NWT-001937], NIUF National ISDN-2 [Telcordia SR-NWT-002120], and NIUF National ISDN-3 [Telcordia SR-NWT-002457].)

8. Router or LAN Ethernet port: RJ-45 (Standard: IEEE 802.3)
9. Electrical: SONET STS-1 (Std: ANSI T1.105 and 106)
10. Digital: T3 Channelized (Std: Telcordia GR-499-CORE.
11. Optical: SONET OC-1 (Std: ANSI T1.105 and 106)

### **C.2.3 Circuit Switched Data Service (CSDS) or Functional Equivalent [OPTIONAL]**

The basic capabilities, features, performance, and interface requirements for CSDS are specified in the following sections.

#### **C.2.3.1 Basic Service Capabilities**

CSDS shall provide a synchronous, full-duplex, totally digital, SDP-to-SDP circuit-switched data service at a data rate of up to 1.544 Mb/s in increments of 56 kb/s or 64 kb/s. ISDN BRI lines for Circuit Switched Data shall have one or two B channels. CSDS shall conform to the following standards:

1. ANSI X3.189
2. ITU E.721
3. Applicable Telcordia and ANSI standards for digital transmission
4. ITU-TSS and EIA standards for Data Terminal Equipment (DTE)

CSDS access shall be delivered directly to subscriber's terminal equipment, including but not limited to the following types: DTE (e.g., workstation, host computer, PC, Group IV Fax, and other communicating office equipment), digital PBX, or intelligent multiplexer. The contractor shall make available 10-digit Public Switched Network (PSN) numbers for dial-in access over an ISDN access arrangement. The UNIs are defined in C.2.3.4.1.

CSDS shall provide network-derived clocking to the DTE, PBX, or multiplexer at the SDP. Once a call has been established, all bit sequences transmitted by the DTE shall be transported as data/bit transparent, maintaining data/bit sequence integrity.

CSDS services shall be available "on demand"; i.e., a subscriber will not have to schedule a call.

The following CSDS capabilities are mandatory unless indicated otherwise:

1. Uniform numbering plan:
  - a. Unique directory number for all on-net Government locations.
  - b. Same uniform numbering plan as proposed for Voice Services and which shall be integrated with the Voice Services plan (refer to C.2.1.8).
2. Authorization Codes for CSDS. Authorization codes for CSDS shall be the same as Voice Services.

3. For calls terminating to off-net locations, the bandwidth requested by the originating on-net location shall be limited to the bandwidth limitations in the PSN between the contractor's network and the called location.
4. Calling capability that does not require scheduling.
5. Provision of network-derived clocking to the DTE or PBX/Multiplexer (MUX) at the SDP.
6. Following call establishment, all bit sequences transmitted by the DTE shall be transported as data/bit transparent and shall maintain data/bit sequence integrity.
7. Categories of dialable information-payload bandwidth are as follows:
  - a. DS0 Category. The dialable bandwidth shall be DS0 (i.e., 56 Kbps and 64 Kbps) data rate.
  - b. DS1 Category. The dialable bandwidth shall be DS1 (i.e., 1.536 Mbps) data rate. [Optional]
  - c. Multirate DS0 Category. The dialable bandwidth shall be  $N \times DS0$ , where  $N = 1$  to 24. [Optional]
8. For the Multirate DS0 category, the contractor shall provide the following [Optional] :
  - a. Appropriate dialing sequence for initiating calls with different bandwidths. [Optional]
  - b. Transport of all bit sequences transmitted by the DTE as data/bit transparent after establishment of the dialing sequence. [Optional]

The following categories of dialable information-payload bandwidth are optional:

1. Multirate DS1 Category. The dialable bandwidth range shall be available from DS1 to  $N$  times DS1 data rates, where  $N$  varies from 2 to 27.
2. DS3 Category. The dialable bandwidth shall be DS3 (i.e., 43.008 Mbps) data rate.
3. SONET Level-I (i.e., OC-1) Category. The dialable information-payload bandwidth shall be SONET OC-1 (i.e., 49.536 Mbps) data rate.
4. SONET Level-II (i.e., Multirate OC-1) Category. The dialable information-payload bandwidth range shall be available from SONET OC-1 to  $N$  times OC-1 data rates, where  $N$  varies from two to three.
5. SONET Level-III (i.e., Multirate OC-3) Category. The dialable information-payload bandwidth range shall be available from SONET OC-3 to  $N$  times OC-3 data rates, where  $N$  varies from two to four. SONET OC-3 shall support information-payload data-rate of 148.608 Mbps.



**C.2.3.2 Features**

CSDS shall support the following features: multipoint (per port) and packet data on the D channel (per line).

**Table C.2-5. CSDS Features**

| ID No. | Name of Feature                                      | Description   |
|--------|--|---|
| 1      | Dial-In  | Where available commercially, the contractor shall support toll free numbers, in addition to 10-digit PSN numbers, for dial-in access from off-net locations (i.e., PSN) via ISDN access arrangement. Access to CSDS shall only be provided after verification of the authorization code entered by the user. |
| 2      | User-to-User Signaling Via ISDN D-Channel [Optional] | User-to-user signaling via ISDN D-channel during a call shall be supported in accordance with ANSI T1 and ITU-TSS standards for ISDN and SS7.   |

**C.2.3.3 Performance**

1. The transmission performance for CSDS shall satisfy the values and ranges set forth in the High-Capacity Digital Special Access Service - Transmission Parameter Limits and Interface Combinations (Standards: Telcordia GR-342-CORE and ANSI/EIA T1.510).
2. The service availability shall comply with the requirements of C.2.1.10.4.
3. The grade-of-service shall comply with the service objectives specified in table below.
4. The contractor shall monitor and measure switch performance using the same accepted industry reliability and quality standards and practices, such as Telcordia's GR-929 document.
5. The contractor shall be cognizant of the impact of Internet access traffic, e.g., as identified in the Alliance for Telecommunications Industry Solutions (ATIS) Network Reliability Steering Committee (NRSC) Internet Team Study Report, ATIS, February 1998, and the mitigation methods identified in the ATIS TIA1.2 Working Group on Network Survivability Performance Technical Report on Reliability and Survivability Aspects of the Interactions Between the Internet and the Public Telecommunications Network, Report No. 55, October 1998.

**Table C.2-6. CSDS Key Performance Indicators**

| Key Performance Indicator (KPI)              | User Type        | Performance Standard (Level/threshold) | Acceptable Quality Level (AQL) | How Measured     | Surveillance period and Method           |
|--|------------------|--|--------------------------------|------------------|--|
| Availability (POP-to-POP)                    | Routine/Critical | 0.99999                                | ≥ 0.99999                      | See Note 1 below | Monitored continuously, reported monthly |
| Availability (SDP-to-SDP)                    | Routine          | 0.996                                  | ≥ 0.996                        |                  |  |
| Post-Dialing Delay (SDP-to-SDP & POP-to-POP) | Critical         | 0.99998                                | ≥ 0.99998                      | See Note 2 below | Measured continuously, reported monthly  |
|  | Routine          | 400 ms                                 | ≤ 400 ms                       |                  |  |
| Grade of Service (GOS)                       | Routine          | P.05 (SDP-to-SDP)                      | ≤ P.05                         | See Note 3 below | Measured continuously, reported monthly  |
|  |                  | P.01 (POP-to-POP)                      | ≤ P.01                         |                  |  |
|  | Critical         | P.01 (SDP-to-SDP & POP-to-POP)         | ≤ P.01                         |                  |  |

Notes:

1. Availability is defined as the average ratio of time circuit switched data service will be available to the end user over a one month period. The circuit switched data service measurement will be an aggregate and average of CSDS outage time by site. Availability is calculated as follows:  $((\text{Hours per day} \times 60 \text{ minutes}) \times (\text{days per year}) \times (1 - \text{Availability})) / 12 \text{ months}$ ). Example:  $((24 \times 60) \times (365) \times (1 - .9999) / 12) = 4.38$  minutes per month. The voice service is considered “unavailable” if the termination is out-of-service (i.e., loses the ability to originate, complete, or terminate calls) for any period of time and is documented by trouble report.
2. Post-Dialing Delay is the delay experienced by end-user for on-net to on-net circuit switched data calls across the Networx network. Delay is measured as the interval between the end-of-dialing and the receipt of answer signal.
3. GOS is the proportion of calls that cannot be completed during the busy hour because of limits in the call handling capacity of one or more network elements (e.g., “All trunks busy” condition). For example, P.01 indicates that 1 percent of the calls not being completed (1 out of 100 calls).

**C.2.3.4 Interfaces**

**C.2.3.4.1 User Network Interfaces**

The contractor shall support the following UNIs:

1. EIA/TIA-530, at a line rate up to 1.544 Mb/s, RS366A (dialing) signaling type

2. ISDN BRI, at a line rate up to 128 kb/s, consisting of one or two B channels (64 kb/s) and one D (16 kb/s) channel. The D channel shall be capable of supporting:
  - a) Signaling only (ITU-TSS Q.931 signaling type)
  - b) Signaling and Packet Switched Service
3. Dialable DS0 at a line rate of 56 kb/s
4. Dialable fractional T1 service at line rates of  $N \times 64$  kb/s or  $N \times 56$  kb/s, where  $N = 2, 3, \dots, 24$
5. ISDN PRI trunk (23 B + D): An information-payload data rate of 1.472 Mb/s and ITU-TSS Q.931 signaling type. D channel cannot be shared by another ISDN PRI trunk. (Standards: ANSI/EIA T1.607 and 610; NIUF National ISDN-1 [Telcordia SR-NWT-001937], NIUF National ISDN-2 [Telcordia SR-NWT-002120], and NIUF National ISDN-3 [Telcordia SR-NWT-002457].)
6. ISDN PRI trunk (24 B + 0 D): An information-payload data rate of 1.536 Mb/s and ITU-TSS Q.931 signaling type. Shares a D channel with another PRI trunk. (Standards: ANSI/EIAT1.607 and 610; NIUF National ISDN-1 [Telcordia SR-NWT-001937], NIUF National ISDN-2 [Telcordia SR-NWT-002120], and NIUF National ISDN-3 [Telcordia SR-NWT-002457].)
7. ISDN PRI trunk (23 B + D): An information-payload data rate of 1.472 Mb/s and ITU-TSS Q.931 signaling type. D channel can be shared by another ISDN PRI trunk. (Standards: ANSI/EIA T1.607 and 610; NIUF National ISDN-1 [Telcordia SR-NWT-001937], NIUF National ISDN-2 [Telcordia SR-NWT-002120], and NIUF National ISDN-3 [Telcordia SR-NWT-002457].)
8. Channelized T1: 24 separate DS0 channels (56 kb/s line rate) (Standards: Telcordia Notes on the Networks and ANSI/EIA T1.102/107/403.)

The performance levels and acceptable quality level (AQL) of key performance indicators (KPIs) for Circuit Switched Data Service below are mandatory unless indicated otherwise:

**Table C.2-7. CSDS User Network Interface Types**

| UNI Type | Interface Type and Standards | Payload Data Rate                           | Signaling Type   |
|----------|------------------------------|---|------------------|
| 1        | ITU-TSS V.35                 | 56/64 Kbps; and optionally up to 1.536 Mbps | RS366A (dialing) |
| 2        | EIA RS-449                   | 56/64 Kbps; and optionally up to 1.536 Mbps | RS366A (dialing) |
| 3        | EIA RS-530                   | 56/64 Kbps; and                             | RS366A           |

| UNI Type   | Interface Type and Standards   | Payload Data Rate           | Signaling Type |
|--|--|-----------------------------|----------------|
|  |  | optionally up to 1.536 Mbps | (dialing)      |
| 4  | ISDN PRI (Multirate) (T Reference Point) (Standard: ANSI T1.607 and 610)       | Up to 1.536 Mbps            | ITU-TSS Q.931  |
| 5  | T1 (with ESF) (Std: SR-2275, and ANSI T1.102/107/403)                          | Up to 1.536 Mbps            | SS7            |
| The Following optional interfaces are in the scope of the contract |  |                             |                |
| 6  | T3 (Standard: Telcordia GR-499-CORE)   | Up to 43.008 Mbps           | SS7            |
| 7  | Removed  |                             |                |
| 8  |  |                             |                |
| 9  | SONET OC-1 (Standard: ANSI T1.105 and 106)                                     | Up to 49.536 Mbps           | SS7            |
| 10   | SONET OC-3 (Standard: ANSI T1.105 and 106)                                     | Up to 148.608 Mbps          | SS7            |
| 11   | SONET OC-12 (Standard: ANSI T1.105 and 106)                                    | Up to 594.432 Mbps          | SS7            |
| 12   | ISDN BRI (Multirate) (S and T Reference Point) (Standard: ANSI T1.607 and 610) | Up to 128 Kbps              | ITU-TSS Q.931  |
| 13   | SONET OC-48 (Standard: ANSI T1.105, ANSI T1.106, ANSI T1.117)                  | Up to 2.488 Gbps            |                |
| 14   | SONET OC-192 (Standard: ANSI T1.105, ANSI T1.106, ANSI T1.117)                 | Up to 9.953 Gbps            |                |

## C.2.4 Dedicated Transmission Service (DTS) [OPTIONAL]

The basic capabilities, features, performance, and interface requirements for DTS are specified in the following sections.

### C.2.4.1 Basic Service Capabilities

DTS shall provide dedicated transmission bandwidth between SDPs within the WITS 3 service area and between an SDP within the WITS 3 service area. The connection shall be permanently established unless a service request for modification, move, or disconnect is received. DTS shall be capable of supporting any application, such as voice, data, video, or multimedia, and shall

allow integration and aggregation of all traffic (VS, CSDS, VTS, FRS, ATMS, and IAS).

DTS shall conform to the following standards:

1. ANSI T1.102/107/403/503/510 for T1
2. Telcordia GR-499-CORE for T3
3. ANSI T1.105 and 106 for SONET
4. Telcordia GR-253-CORE for SONET
5. Telcordia SR-2275, TR-NWT-009 and TR-NWT-000335 for analog

DTS connections shall be delivered directly to the prescribed equipment, such as analog terminal equipment (e.g., analog PBX, modem), DTE (e.g., computer, Group IV fax), digital PBX, multiplexer, or Local Area Network (LAN) bridge/router.

For digital DTS at T1 rates and below, the network shall provide network-derived clocking to the connected DTE, digital PBX, intelligent multiplexer, or LAN bridge/router. The service shall provide data transport and shall be transparent to any protocol used by the DTE or bridge/router. All bit sequences transmitted by the DTE through the SDP shall be data transparent.

The following categories of DTS shall be supported:

1. Analog: 4 kilohertz (kHz) nominal bandwidth
2. Subrate DS0: Information payload data rates of 4.8, 9.6, and 19.2 kb/s
3. DS0: Information payload data rates of 56 and 64 kb/s
4. T1: Line rate of 1.544 Mb/s, which shall be used to provide channelized or unchannelized T1 service as follows:
  - a) Channelized T1: 24 separate DS0 channels of 64 kb/s where each DS0 channel may be either a clear channel or contain multiple subrate DS0 payloads
  - b) Unchannelized T1: A single 1.536 Mb/s information payload
5. Fractional T1 service at line rates of  $N \times 64$  kb/s, where  $N = 2, 3, \dots, 24$
6. T3: A line rate of 44.736 Mb/s, which may be used to provide channelized or unchannelized T3 service as follows:
  - a) Channelized T3. 28 separate Digital Signal Level 1 (DS1) channels of 1.536 Mb/s information payload rate
  - b) Unchannelized T3. A single 43.008 Mb/s payload
7. Fractional T3 service at line rates of  $N \times 1.544$  Mb/s, where  $N = 2, 3, \dots, 28$
8. OC3: This category of DTS service shall support a line rate of 155.520 Mb/s, which may be used to provide:

- a) Channelized OC3. In this mode, three separate DS3 or STS-1 channels, each with an information payload data rate of 45 Mb/s or 49.536 Mb/s, respectively, shall be supported.
  - b) Concatenated OC3c. In this mode, a single channel having an information payload data rate of 148.608 Mb/s shall be supported.
9. OC3 Dedicated SONET. In this service category, an OC3 circuit shall be provided over a SONET ring that employs either the Unidirectional Path Switched Ring (UPSR) or Bidirectional Line Switched Ring (BLSR) protection mechanisms.
10. OC12: This category of DTS service shall support a line rate of 622.080 Mb/s, which may be used to provide:
- a) Channelized OC12. In this mode, four separate OC3c channels, each with an information payload data rate of 148.608 Mb/s, shall be supported.
  - b) Concatenated OC12c. In this mode, a single channel having an information payload data rate of 594.432 Mb/s shall be supported.
11. OC12 Dedicated SONET. In this service category, an OC12 circuit shall be provided over a SONET ring that employs either the Unidirectional Path Switched Ring (UPSR) or Bidirectional Line Switched Ring (BLSR) protection mechanisms.
12. OC48. This category of DTS service shall support a single SONET OC48 channel with the information payload data rate of 2.377 Gb/s and a line rate of 2.488 Gb/s.
13. OC48 Dedicated SONET. In this service category, an OC48 circuit shall be provided over a SONET ring that employs either the Unidirectional Path Switched Ring (UPSR) or Bidirectional Line Switched Ring (BLSR) protection mechanisms.
14. OC192. This category of DTS service shall support a line rate of 9.9532 Gb/s. This service shall support a single SONET OC192 channel.
15. OC192 Dedicated SONET. In this service category, an OC192 circuit shall be provided over a SONET ring that employs either the Unidirectional Path Switched Ring (UPSR) or Bidirectional Line Switched Ring (BLSR) protection mechanisms.
16. Dense Wave Division Multiplexing (DWDM). In this service category, the contractor shall provide transmission over fiber optic systems through the multiplexing of multiple wavelengths of light. DWDM shall support the following optical data protocols including but not limited to: SONET, GigE, Fast Ethernet, and ATM. DWDM shall support the following interfaces including but not limited to: OC3, OC12, OC48, OC 192, and SONET. DWDM shall support Applied Telcordia standards for DWDM of GR-1073, GR-1312, GR2918, GR-2979, and GR3009. DWDM shall be capable of supporting ITU-T G.694.1.

#### **C.2.4.2 Features**

The following multipoint connection capabilities shall be available at DTS rates of DS0, DS1, DS3, OC3, and OC3c:

1. Branch-Off. In this mode, all points shall be treated as if in one shared medium and shall be capable of autonomously sending and receiving data at each point
  - a) Drop-and-Insert (also known as Add-Drop-Multiplexing). In this mode, previously specified channels of a channelized T1, T3, or OC3 service shall be capable of being dropped from the connection and new channels shall be capable of being inserted.
2. Service assurance shall be available at DTS rates of DS0, DS1, DS3, OC3, OC3c, OC12, OC12c, OC48 and OC192. This feature shall improve the availability of DTS circuits as specified below by using such approaches as automatic restoration and reconfiguration:
  - a) Availability: At least 99.98 percent, calculated as described in C.2.1.10.4
  - b) Trouble identification: Less than 20 minutes
  - c) Time to restore: Less than 2 hours in at least 99.95 percent of the cases
3. Route or path diversity: Providing multiple, physically separate routes for DTS circuits, including SONET-type rings. This feature shall be negotiated on an individual-case basis.
4. Route or path avoidance: Allows a customer to define a geographic location or route on the network to avoid. This feature shall be negotiated on an individual-case basis.

#### **C.2.4.3 Performance**

The DTS performance parameters for originating and terminating connections shall conform to the following specifications:

1. All analog transmission parameters shall satisfy the values and ranges set forth in Telcordia TR-NWT-335 and Sections 7.4 and 7.5, Transmission, Telcordia Notes on the Networks (SR-2275).
2. All digital transmission parameters shall satisfy the standards set forth in the High-Capacity Digital Special Access Service - Transmission Parameter Limits and Interface Combinations (Standards: Telcordia GR-342-CORE; ANSI/EIA T1.503/510 for T1, Telcordia TR-499 for T3, and ANSI/EIA Standards T1.105 for SONET OC1, OC3, OC12, OC48, and OC192 service.)

#### **C.2.4.4 Interfaces**

##### **C.2.4.4.1 User-to-Network Interface**

The contractor shall support the UNIs specified below:

1. ITU-TSS V.35 at a line rate up to 1.544 Mb/s
2. EIA-449 at a line rate up to 1.544 Mb/s
3. EIA/TIA-232 at a line rate up to 19.2 kb/s
4. EIA/TIA-530 at a line rate up to 1.544 Mb/s
5. RJ-x (e.g., RJ-11/41/45) at 4 kHz (300 to 3300 Hz)
6. T1 (with Extended Super Frame [ESF] format) at a line rate of 1.544 Mb/s and information-payload data-rate of 1.536 Mb/s. (Standards: Telcordia's Notes on the Networks [SR-2275] and GR-342-CORE; and ANSI/EIA T1.403)
7. T3 at a line rate of 44.736 Mb/s and an information-payload data-rate of 43.008 Mb/s (Standard: Telcordia TR-499)
8. SONET OC3 (Standards: ANSI/EIA T1.105 T1.106, T1.117)
9. SONET OC3c (Standards: ANSI/EIA T1.105 T1.106, T1.117)
10. SONET OC12 (Standards: ANSI/EIA T1.105, T1.106, T1.117)
11. SONET OC12c (Standards: ANSI/EIA T1.105, T1.106, T1.117)
12. SONET OC48 (Standards: ANSI/EIA T1.105, T1.106, T1.117)
13. SONET OC192 (Standards: ANSI/EIA T1.105 T1.106, T1.117)

#### **C.2.5 Teleconferencing Service (TS) [OPTIONAL]**

The contractor shall provide audio and video bridging, reservations, and conference set-up and support. Required audio and video teleconferencing equipment at the customer's premises will be provided by the customer.

##### **C.2.5.1 Video Teleconferencing Service (VTS)**

###### **C.2.5.1.1 Basic Service Capabilities**

VTS shall allow participants at different physical locations to conduct interactive dialogues and simulate face-to-face meetings using point-to-point and point-to-multipoint teleconferencing arrangements. VTS shall support two way video, one way video with interactive voice, and/or the sharing of various types of data files among VTS participants (e.g., graphic, spreadsheet, and word processing files) as an adjunct to the video teleconferencing session. In addition, audio conference add-on capability shall be available as a basic service.



The contractor shall use WITS 3 CSDS, DTS, or ATMS services to support underlying transmission requirements. All WITS 3 users shall have access to the teleconferencing bridge using WITS 3 on-net services.

Video Teleconferencing Services shall comply with the following standards as applicable: After award, the contractor may propose alternatives at no additional cost to the Government that meet or exceed the provisions of the standards listed below.

1. Federal Telecommunications Recommendations (FTR) 1080B - 2002 (hereafter referred to as FTR-1080) issued by the Technology and Standards Division of the National Communication System (NCS).
2. FTR 1080 encompasses the specifications primarily based on the following standards:
  - a) ITU-T H.320 recommendations for telephony networks.
  - b) ITU-T H.323 recommendations for packet based multi-media conferencing.
  - c) ITU-T T.120 recommendation for document conferencing.
3. IETF RFC 3261 Session Initiation Protocol (SIP)
4. The VTS shall provide the capability to support channel aggregation and bonding for multi-rate DS-0 service (64 Kbps or 56 Kbps channels).
5. The contractor shall comply with new versions, amendments, and modifications made to the above listed documents and standards when offered commercially.

The contractor shall provide VTS at transmission rates of at least 128kb/s, 384kb/s, 768kb/s, and 1.544Mb/s.

The basic capabilities of VTS include the following:

1. Bridging Capabilities. The following capabilities shall be supported:
  - a) Point-to-Point. Point-to-point connection arrangements with full-duplex video, audio, and ancillary data transmission between participating locations (including data, graphics, and video imagery files) shall be allowed. Also included under Point-to-Point is one way transmission of a basic video channel of a NTSC color video signal and one or two associated audio signals.
  - b) Multipoint. Full-duplex audio and full duplex video that consists of a "source" video channel and a "feedback" channel shared by up to 25 simultaneously participating locations shall be supported. During the conduct of a multipoint conference, the addition of a party to, or the deletion of a party from, the conference shall be indicated by a tone, verbal, or visual announcement. The type of conference, the source, and the "feedback" video channels that are to be transmitted to all

locations shall be established in the reservation. Possible conference types shall include each of the options below:

- i) Voice-activated. When a speaker from a new location crosses the volume threshold for a prescribed period of time and gains control of the second audio channel, the “feedback” video source and the second channel of ancillary data also shall switch to this new site. However, the new site’s video and ancillary data shall not switch (i.e., the new speaker shall see the video image and ancillary data of the preceding “feedback” speaker [as well as the “source” video channel] rather than a video image of himself/herself).
  - ii) Chairperson-activated. The person in control of the video teleconference sends his or her own video and selects a return video from one of the participating locations.
  - iii) Continuous Presence. VTS shall support the continuous presence of a minimum of four participating locations. This “Hollywood Squares” configuration shall be capable of being viewed simultaneously at each participating location. If the number of locations participating in the video conference exceeds the number being viewed via continuous presence, it shall be possible to select the video sources to be displayed as follows:
    - A. Via the reservation
    - B. By action of the chairperson
    - C. By scanning all of the conferees in a predetermined order
    - D. Any combination of the above
2. Conference Set-Up. The contractor shall provide a 30 minute set-up period prior to each video conference.
  3. Conference Type
    - a) “Meet-Me” Conference. Shall allow conferees to be connected by dialing the assigned telephone number(s) at the predetermined time.
    - b) Attendant-Assisted Conference. Allows the conference user to request the attendant to set-up or add conferees to the conference. Conferees shall be able to recall an attendant during a teleconference for immediate attention, such as general assistance or adding or dropping participants. A requirement for an attendant-assisted conference shall be specified in the reservation.

#### **C.2.5.1.2 Standards**

The contractor shall support the following standards as applicable. After award, the contractor may propose alternatives at no additional cost to the Government that meet or exceed the provisions of the standards listed below.

1. Federal Telecommunications Recommendations (FTR) 1080B - 2002 (hereafter referred to as FTR-1080) issued by the Technology and Standards Division of the National Communication System (NCS).
2. FTR 1080 encompasses the specifications for narrow-band audio and video teleconferencing, from 56 Kbps to 1920 Kbps, primarily based on the following standards:
  - a) ITU-T H.320 recommendations for telephony networks.
  - b) ITU-T H.323 recommendations for packet based multi-media conferencing.
  - c) ITU-T T.120 recommendation for document conferencing.
3. IETF RFC 3261 Session Initiation Protocol (SIP)
4. The VTS shall provide the capability to support channel aggregation and bonding for multi-rate DS-0 service (64 Kbps or 56 Kbps channels).
5. The contractor shall comply with new versions, amendments, and modifications made to the above listed documents and standards when offered commercially.

#### **C.2.5.1.3 Features**

VTS shall provide the following reservation and rate adaptation features:

1. Reservation Feature. This VTS feature shall permit authorized Government users to schedule teleconferences. The reservation system shall have the following capabilities:
  - a) A single point of contact with the contractor (preferably, the Customer Service Center) to schedule reservation-based video teleconferences
  - b) The ability for authorized users to schedule one or more video teleconferences by time and day of the week either as a single event or recurring event on a daily, weekly, monthly, or other periodic basis
  - c) The ability for authorized users to submit reservation requests up to one year in advance by E-Mail or fax.
  - d) The ability to store and retrieve predefined teleconferences.
  - e) The ability to create printed reports with the following information:
    - i) A directory of all locations authorized to use the VTS. Inclusion in the directory shall be with approval of the listed agencies.
    - ii) Reservation confirmation and cancellation notices.
  - f) The reservation system shall contain the following information:
    - i) Type of teleconference (e.g., video, audio)
    - ii) Name of the person scheduling the teleconference
    - iii) Organization of the person scheduling the teleconference

- iv) Telephone number of the person scheduling the teleconference
  - v) Name of an alternate contact person
  - vi) Telephone number of the alternate contact person
  - vii) Name of the contact person at participating locations
  - viii) Telephone numbers of the contact persons participating in the teleconference
  - ix) Telephone number of each conference room (at the user's discretion)
  - x) Video telephone number of each conference room (if applicable and at the user's discretion)
  - xi) Organization of each person participating in the teleconference (at the user's discretion)
  - xii) Locations of the persons participating in the teleconference (at the user's discretion)
  - xiii) Date of the teleconference
  - xiv) Time of the teleconference
  - xv) Scheduled length of the teleconference
  - xvi) Data transmission rate for each location
2. Rate Adaptation. VTS shall provide a data rate adaptation feature to allow multiple locations, with different data rate limitations, to interconnect for a video teleconference. A requirement for rate adaptation shall be specified in the reservation.

**Table C.2-8. VTS Features**

| ID Number | Name of Feature                 | Description  |
|-----------|---------------------------------|--|
| 1         | Attended Service                | Contractor shall provide call monitoring, roll call, and coordination for a VTS conference. The contractor shall greet and introduce each VTS participant. The contractor shall verify proper conference operations prior to and during the conference to help ensure a successful VTS session.  |
| 2         | Certification                   | The contractor shall provide pre-testing, registration, and certification that Agency owned equipment operates and is compatible with the contractor's VTS. In the event that the equipment is not certified, the contractor will notify the Agency of the deficiency and required changes to be operable with VTS.                              |
| 3         | Coding Conversion (Transcoding) | The contractor shall provide a coding conversion capability that permits operation between the following: <ul style="list-style-type: none"> <li>1. Codecs, all of which use the National Television Standards Committee (NTSC) video format, but none of which support the FTR 1080 and none of which use the same encoding/decoding</li> </ul> |

| ID Number | Name of Feature                       | Description  |
|-----------|---------------------------------------|--|
|           |                                       | <p>algorithm(s).</p> <p>2. Codecs, all of which use the NTSC video format, in which one or more of the codec's support the FTR 1080 and in which one or more of the codec's do not support the FTR 1080.</p> <p>At a minimum, this feature shall support the following compression algorithms as needed by the Agency: SG3/SG4, CTX, and CTX+.</p> |
| 4         | Rate Adaptation                       | The contractor shall provide a data rate adaptation capability to ensure that all VTS locations participating in a video teleconference can interconnect with each at dissimilar data rates.   |
| 5         | Security – Sensitive but Unclassified | The contractor shall provide transparent and secure VTS communications paths to support sensitive but unclassified (SBU) video communications. The security capabilities are described in the FTR1080 recommendation.  |
| 6         | Security – Classified                 | The contractor shall provide transparent and secure VTS communications paths and support video information that is categorized as classified (National Security Agency type 1 encryption) video communications. The security capabilities are described in the FTR1080 recommendation.   |

#### C.2.5.1.4 Performance

VTS shall meet the following performance requirements:

1. The encoded audio, video, and ancillary data signals that the contractor delivers as part of the VTS shall conform to the signals required by the user's codec, provided that codec conforms to FTR-1080.
2. The availability of VTS shall be at least 99.5 percent. VTS shall be available to use 24 hours a day, seven days a week.
3. If the number of requests denied during a calendar quarter is at least five percent of the number of participating locations supported during the same calendar quarter, the contractor shall increase its multipoint simultaneous user support capacity by 10 percent during the subsequent quarter.
4. The contractor shall compute the number of requested locations denied by counting the cumulative number of locations associated with each conference that could not be scheduled for a particular date and time requested. The contractor shall compute the number of locations supported by counting the cumulative number of locations associated with each conference that was held successfully.
5. Attendant assistance shall be available at any time during a video teleconference.
6. VTS shall provide users with the following service intervals:
  - a) Schedule a non-recurring multipoint or point-to-point video teleconference within 30 minutes after the advance reservation

request, provided the bridging capacity and the other required network support functions (e.g., rate adaptation) are available.

- b) When bridging capacity and other required network support functions are available, requests for a delay in the scheduled termination time of a video teleconference which is already in progress shall be granted, if the request is made at least 20 minutes before the scheduled terminating time of the video teleconference.
  - c) Permit VTS users to cancel a video teleconference up to 24 hours before the scheduled start time of the video teleconference without incurring any charge for the canceled video teleconference.
7. The contractor shall detail video teleconferencing activity in the monthly Service Performance Report described in Section G.2.1.7. Included in this report shall be the date and starting time of each conference, whether it was successfully completed, the duration of the conference, the participating locations, the number of participants at each location, and the data rates used between each participating location.

**Table C.2-9. VTS Key Performance Indicators**

| Key Performance Indicator (KPI)               | User Type        | Performance Standard (Threshold)   | Acceptable Quality Level (AQL) | How Measured |
|---|------------------|------------------------------------|--------------------------------|--------------|
| Availability                                  | Routine          | 99.5%                              | ≥ 99.5%                        | See Note 1   |
| Time to Restore                               | Without Dispatch | 4 hours                            | ≤ 4 hours                      | See Note 2   |
|   | With Dispatch    | 8 hours                            | ≤ 8 hours                      |              |
| Grade of Service (Completed Service Requests) | Routine          | 95% of VTS conference requests met | ≥ 95%                          | See Note 3   |
| Latency                                       | Routine          | 120 ms                             | ≥120 ms                        | See Note 4   |
| Jitter  | Routine          | 10 ms                              | ≥10 ms                         | See Note 5   |

Notes:

1. Availability is measured and calculated as a percentage of the total reporting interval time that VTS is operationally available to the Agency. Availability is computed by the standard formula:

$$Availability = \frac{RI(HR) - COT(HR)}{RI(HR)} \times 100$$

2. "Without Dispatch" assumes that a service technician is co-located with the equipment. "With Dispatch" assumes that travel time to the equipment location is required. The requirement for co-location of a service technician is conveyed as a component of the service order. In both cases, service restoration should take place within the respective time frames 99.95% of the time.

3. The Grade of Service (completed service requests) applies to video conferences that are reserved and confirmed. It shall be calculated as the ratio of the number of locations successfully completing a VTS call divided by the total number of locations scheduling a VTS call within a calendar month. The contractor shall compute the number of completed service requests by counting the cumulative number of locations associated with each conference that were successfully completed. The contractor shall compute the number of service requests denied by counting the cumulative number of locations associated with each VTS conference that could not be scheduled for a particular date and time requested in a calendar month. VTS calls that were disconnected and then re-established only due to the fault of the contractor would be included as a denied request.
4. Latency is the average time (round trip) for a packet to travel across the contractor's IPVTS service.
5. Jitter is the average variation or difference in the delay between received packets of an IP packet data stream from SDP to SDP. Relevant standard: IETF RFC 1889.

**C.2.5.1.5 Interfaces**

The contractor shall support the VTS interfaces specified in the subsections to follow.

**C.2.5.1.5.1 User-to-Network Interface**

The contractor shall interface with one of the WITS 3 transmission services, including:

1. ISDN BRI
2. ISDN PRI
3. T1
4. ATMS-DS1

**Table C.2-10. VTS User Network Interface Types**

| UNI Type | Interface Type and Standard   | Payload Data Rate or Bandwidth                          | Signaling Type  |
|----------|---|---|---|
| 1        | Digital Line: ISDN BRI S and T Reference Point (Std: ANSI T1.607 and 610) | Up to 128 Kbps (2x64 Kbps) and multi-rate DS-0's (px64) | ITU-TSS Q.931   |
| 2        | Digital Trunk: T1 (Std: Telcordia SR-2275 and ANSI T1.102/107/403)        | Up to 1.536 Mbps  | T1 Robbed-Bit Signaling   |
| 3        | Digital Trunk: ISDN PRI T Reference Point (Std: ANSI T1.607 and 610)      | Up to 1.536 Mbps  | ITU-TSS Q.931   |
| 5        | All IEEE 802.3 cable and connector types                                  | Up to 100 Mbps  | IEEE 802.3. IPv4 and IPv6<br>Ensure that services delivered support Federal Agencies as required to |

| UNI Type | Interface Type and Standard | Payload Data Rate or Bandwidth | Signaling Type                  |
|----------|-----------------------------|--------------------------------|---------------------------------|
|          |                             |                                | comply with OMB IPv6 directives |

1. If the Agency provides the codec and the inverse multiplexer and the contractor provides only reservation, coding conversion, and/or format conversion, the UNIs supported shall include:
  - a. ITU-TSS V.35
  - b. EIA RS-449
  - c. EIA RS-530
  - d. RJ-x (e.g., RJ-45)
  - e. Data Interface(s) (any combination of the following data interfaces shall be supported by the VTS):
    - i) EIA RS-232
    - ii) EIA RS-449
    - iii) ITU-TSS V.35
    - iv) EIA RS-530

**C.2.5.2 Audio teleconferencing Service (ATS)**

**C.2.5.2.1 Basic Service Capabilities**

The Audio Teleconferencing Service (ATS) shall enable participants to engage in a multipoint audio conference call.

ATS shall comply with the following standards, as applicable:

1. ANSI T1.101 for T1
2. ANSI T1.607 and 610 for ISDN
3. ANSI SS7, and enhanced SS7 standards for interworking [e.g., address translation] between circuit-switched network and IP network
4. Telcordia Notes on the Networks (SR-2275), currently Issue 4, October 2000
5. IETF RFC 3661 through 3665 for SIP (Session Initiation Protocol)
6. IETF RFC 3435 for MGCP (Media Control Gateway Protocol)
7. ITU-TSS H.323/225/245/248 (enhanced for VoIP)

ATS service shall be interoperable with all types of standard voice equipment. Any WITS 3 VS user shall be able to originate a call to ATS as a WITS 3 on-net call.



The basic capabilities of ATS include the following:

1. **Multipoint Bridging Capability.** The bridging capability shall allow selective two-way or one-way conversations between conferencing ports; i.e., it shall allow a subset of conferees to participate in a two-way conference while the remaining conferees are listeners only. During the conduct of a multipoint conference, the addition of a party to, or the deletion of a party from the conference shall be indicated by a tone or by a verbal announcement.
2. **Conference Set-up Capability.** The contractor shall provide the following conference set-up support services:
  - a) **User-Controlled Teleconference.** This capability shall allow authorized users to establish a teleconference by dialing a designated number to access the service. The following two automated modes of user-initiated teleconferencing capabilities shall be supported:
    - i) **Meet-Me Teleconference** - This capability shall allow each user to be connected in a teleconference by dialing a designated number and authorization code at a predetermined time or as directed by the operator. For recurring meet-me conferences, the contractor shall permit the participants to reuse the same dial access number and authorization code and allow bookings of recurring conferences in three month increments (e.g., every Monday morning at 10:00 AM for the next three months).
    - ii) **Preset Teleconference** - this capability shall allow an authorized user to activate a previously defined teleconference with associated conferees by dialing an access number followed by an authorization code. Once activated, the system shall attempt to connect the pre-designated participants.
  - b) **Attendant-Assisted Teleconference.** This capability shall allow operators to establish a teleconference. Conferees shall be able to recall an operator during a teleconference for immediate attention, such as general assistance or adding or dropping participants.

### C.2.5.2.2 Features

ATS features are identified in Table C.2-11.

**Table C.2-11. ATS Features**

| ID Number | Name of Feature         | Description  |
|-----------|-------------------------|--|
| 1         | Audio recording of call | The contractor shall allow recording of conference call into a storage-media (e.g., disc or cassette tape) for later replay.                                 |
| 2         | Access Controlled Call  | The contractor shall allow the conference leader to prevent operator from monitoring the call as well as additional/late participants from joining the call. |

| ID Number | Name of Feature                          | Description  |
|-----------|--|--|
| 3         | Language translation                     | The contractor shall provide language translation to English from other languages (e.g., Spanish) for transcription of pre-recorded audio conference.  |
| 4         | Moderator led questions and answers      | The contractor shall provide conference moderator led questions and answers only.  |
| 5         | Participant list report                  | The contractor shall provide a report of all participants in the conference.   |
| 6         | Password screening                       | The contractor shall screen password for joining a conference to authorized participants only.   |
| 7         | Replay of pre-recorded audio conference  | The contractor shall allow, under password protection, replaying of pre-recorded audio conference at a later time and shall allow remote control of the recording with keypad access to functions like pause, rewind, and fast-forward.  |
| 8         | Transcription of pre-recorded audio call | The contractor shall provide transcription of pre-recorded audio call.   |
| 9         | Temporary blocking of ports              | The contractor shall allow temporarily blocking audio conference ports in order to remove a sub-set of participants/users from the conference.   |
| 10        | Secured Audio Conference                 | The contractor shall support voice conferencing capability for sensitive voice conferences with end-user encryption to support discussions of a sensitive-but-unclassified (SBU) nature between multiple locations with protection from unauthorized interception (i.e., eavesdropping).<br>[Note. Government furnished encryption unit at the SDP will be based on commercially available encryption devices (Standard: NIST DES/AES). The contractor must synchronize encryption key of similar encryption unit(s) of the audio conference bridge before each conference.] |

There is an ATS feature, reservation, which shall permit authorized Government users to schedule audio teleconferences. The reservation system shall have the following capabilities:

1. A single point of contact with the contractor (preferably, the Customer Service Center) to schedule reservation-based audio teleconferences
2. Ability for authorized users to schedule one or more teleconferences by time and day of the week either as a single event or recurring event on a daily, weekly, monthly, or other periodic basis
3. The ability for authorized users to submit reservation requests up to one year in advance by E-Mail or fax.
4. The ability to store and retrieve predefined teleconferences.
5. The ability to create printed reports with reservation confirmation and cancellation notices.

6. The reservation system shall contain the following information:
  - a) Type of teleconference (e.g., video, audio)
  - b) Name of the person scheduling the teleconference
  - c) Organization of the person scheduling the teleconference
  - d) Telephone number of the person scheduling the teleconference
  - e) Name of an alternate contact person
  - f) Telephone number of the alternate contact person
  - g) Name of the contact person at participating locations (Attendant-assisted only)
  - h) Telephone numbers of the contact persons participating in the teleconference (Attendant assisted only)
  - i) Organization of each person participating in the teleconference (at the user's discretion)
  - j) Locations of the persons participating in the teleconference (at the user's discretion)
  - k) Date of the teleconference
  - l) Time of the teleconference
  - m) Scheduled length of the teleconference

#### **C.2.5.2.3 Performance**

ATS shall meet the following performance requirements:

1. The availability of ATS shall be at least 99.5 percent.
2. ATS shall be available 24 hours a day, seven days a week.
3. If the number of requests denied during a calendar quarter is at least five percent of the number of participating locations supported during the same calendar quarter, the contractor shall increase its multipoint simultaneous user support capacity by 10 percent during the subsequent quarter. The contractor shall compute the number of requested locations denied by counting the cumulative number of locations associated with each conference that could not be scheduled for a particular date and time requested. The contractor shall compute the number of locations supported by counting the cumulative number of locations associated with each conference that was held successfully.
4. Attendant assistance shall be available at any time during an audio teleconference.
5. Intervals. ATS shall provide users with the following service intervals:

- a) Schedule a non-recurring teleconference within 30 minutes after the advance reservation request, provided the bridging capacity and the other required network support functions are available.
  - b) When bridging capacity and other required network support functions are available, requests for a delay in the scheduled termination time of a teleconference which is already in progress shall be granted, if the request is made at least 20 minutes before the scheduled terminating time of the teleconference.
  - c) Permit ATS users to cancel an audio teleconference up to 24 hours before the scheduled start time of the teleconference without incurring any charge for the canceled teleconference.
6. The contractor shall detail audio teleconferencing activity in the monthly Service Performance Report described in Section G.2.1.7. Included in this report shall be the date and starting time of each conference, whether it was successfully completed, the duration of the conference, the participating locations, and the number of participants at each location.

**Table C.2-12. ATS Key Performance Indicators**

| Key Performance Indicator (KPI)          | Service Level    | Performance Standard (Threshold) | Acceptable Quality Level (AQL) | How Measured |
|--|------------------|----------------------------------|--------------------------------|--------------|
| Availability                             | Routine          | 99.5%                            | ≥ 99.5%                        | See Note 1   |
| Time to Restore                          | With Dispatch    | 8 hours                          | ≤ 8 hours                      | See Note 2   |
|  | Without Dispatch | 4 hours                          | ≤ 4 hours                      |              |
| GOS (Operator Assistance Response Delay) | Routine          | 54 seconds                       | ≤ 54 seconds                   | See Note 3   |

Notes:

1. ATS availability is calculated as a percentage of the total reporting interval time that ATS is operationally available to the Agency. Availability is computed by the standard formula:
 
$$Availability = \frac{RI(HR) - COT(HR)}{RI(HR)} \times 100$$
2. "Without Dispatch" assumes that a service technician is co-located with the equipment. "With Dispatch" assumes that travel time to the equipment location is required. The requirement for co-location of a service technician is conveyed as a component of the service order. In both cases, service restoration should take place within the respective time frames indicated 99.95% of the time.
3. GOS (Operator Assistance Response Delay) is the delay experienced by conference participants to receive operator assistance during a conference. Delay is measured as the interval between the end of signaling (e.g., dialing for operator assistance) and the receipt of voice response from the operator.

#### **C.2.5.2.4 Interfaces**

The contractor shall support audio connection to the conference-bridge from these services: VS, FRS (VoFR), ATM service (VoATM) and CPCS.

##### **C.2.5.2.4.1 User-to-Network Interface**

The contractor shall interface with one of the WITS 3 transmission service, including:

1. Analog Lines
2. ISDN BRI
3. ISDN PRI
4. T1

The contractor shall support audio connection to the conference-bridge from these services: VS, FRS (VoFR), ATMS (VoATM), and CPCS.

#### **C.2.6 Frame Relay Service (FRS) [OPTIONAL]**

##### **C.2.6.1 Basic Service Capabilities**

Frame Relay Service is a data communications service that connects distributed locations using data packets of varying size. The service is an unacknowledged order-preserving transfer of data units from one FRS UNI to another at rates up to 1.544 Mb/s. FRS shall be delivered directly to the user's terminal equipment, which may not provide Frame Relay-compliant frames. The service shall be provided over Permanent Virtual Circuits (PVC) between user locations.

The Government will purchase bandwidth by specifying the Committed Information Rate (CIR). The CIR is the average data rate (e.g., in bits per second) for a particular PVC that the customer selects and that the contractor shall attempt to transport without loss. The contractor shall guarantee that the order of the data units at the destination will be the same as at the source.

The service shall be delivered over a Subscriber Network Access Line (SNAL), which shall be a dedicated digital line that complies with applicable FRS UNI standards and provides a connection from the SDP to the contractor's serving office or service center.

Frame Relay Service shall comply with the following standards, as applicable, and when commercially available. After award, the contractor may propose alternatives at no additional cost to the Government that meet or exceed the provisions of the listed standards.

1. ANSI T1.606/614/617/618
2. ITU TSS I, Q, and X series recommendations for the provision of FRS and the North American adaptations of these recommendations as defined by the T1 Committee of the Alliance for Telecommunications Industry

Solutions (ATIS) (formerly the Exchange Carrier Standards Association (ECSA))

3. Frame Relay Forum implementation agreements to include:
  - a) FRF.1.2 — PVC User-to-Network Interface (UNI)
  - b) FRF.2.2 — Frame Relay Network-to-Network Interface (NNI)
  - c) FRF.3.2 — Frame Relay Multiprotocol Encapsulation
  - d) FRF.4.1 — SVC User-to-Network Interface (UNI)
  - e) FRF.5 — Frame Relay/ATM PVC Network Interworking
  - f) FRF.6.1 — Frame Relay Service Customer Network Management (MIB)
  - g) FRF.7 — Frame Relay PVC Multicast Service and Protocol Description
  - h) FRF.8.1 — Frame Relay/ATM PVC Service Interworking
  - i) FRF.9 — Data Compression over Frame Relay
  - j) FRF.10.1 — Frame Relay Network-to-Network Interface SVC
  - k) FRF.11.1 — Voice over Frame Relay
  - l) FRF.12 — Frame Relay Fragmentation
  - m) FRF.13 — Service Level Definitions
  - n) FRF.14 — Physical Layer Interface
  - o) FRF.15 — End-to-End Multilink Frame Relay
  - p) FRF.16.1 — Multilink Frame Relay UNI/NNI
  - q) FRF.17 — Frame Relay Privacy
  - r) FRF.18 — Network-to-Network FR/ATM SVC Service Interworking
  - s) FRF.19 — Frame Relay Operations, Administration and Maintenance
  - t) FRF.20 — Frame Relay IP Header Compression
4. Internet Engineering Task Force (IETF) RFCs
5. North American ISDN Users' Forum (NIUF)
6. MPLS/Frame Relay Alliance as standards become commercially available
7. All new versions, amendments, and modifications made to the above listed documents and standards when offered commercially

The basic service shall transport data units from one SNAL to one or more different SNALs while preserving the order of the data units. The contents of each delivered data unit shall be unchanged from the source to the destination(s). FRS shall consist of the following elements as part of the basic service:

1. One FRS SNAL from the customer's premises to the contractor's FRS switch. There are two SNAL types, a narrowband SNAL that operates at 56/64 kb/s and a wideband SNAL that operates at 1.536 Mb/s. The available CIRs for each SNAL type are listed in Table C.2-13:

**Table C.2-13. Available FRS CIRs**

| Service Parameter | Narrowband SNAL | Wideband SNAL                |
|-------------------|-----------------|------------------------------|
| CIR (kb/s)        | 16, 32          | 128, 192, 256, 384, 512, 768 |

2. One Permanent Virtual Circuit per SNAL
3. A customer-selected CIR for the PVC
4. Formation of the initial address map (that establishes the address of each PVC end point)
5. Unlimited usage within that portion of the WITS 3 service area served by the contractor

**C.2.6.2 Features**

The contractor shall provide the following:

1. Additional PVCs for the SNAL(s)
2. Group addresses (i.e., the ability to send to several recipients with one address)
3. A change to the customer's address map, including the group address
4. Customer network management, whereby the customer is able to monitor system performance

**Table C.2-14. FRS Features**

| ID Number | Name of Feature        | Description  |
|-----------|------------------------|--|
| 1         | Class of Service (CoS) | <p>The contractor shall support CoS. CoS provides traffic differentiation by treating packets differently based on packet importance.</p> <ol style="list-style-type: none"> <li>1. Variable Frame Rate-real time (VFRrt) – highest queuing, lowest latency.</li> <li>2. Variable Frame Rate-non real time (VFRnrt) – standard delivery, minimal loss and delay.</li> <li>3. Unspecified Frame Relay (UFR) – basic service, lowest queuing.</li> </ol> |
| 2         | Disaster Recovery PVCs | <p>The contractor shall provide pre-established PVCs to an alternate location upon notification by the Agency.</p>   |

| ID Number | Name of Feature                           | Description   |
|-----------|---|---|
| 3         | Frame-to-Internet Gateway                 | The contractor shall provide frame-to-Internet gateway services that allows users to put FR traffic and Internet connections on the same access circuit.  |
| 4         | Interworking services                     | The contractor shall provide interworking services to enable the customer's FRS to transparently access customer locations that use the following:<br><ol style="list-style-type: none"> <li>1. The contractor's ATMS (the contractor's FRS/ATMS interworking shall support both ATM VBRnrt and ATM CBR).</li> <li>2. The contractor's IP services networks, e.g., network-based IP VPN services as described in Section C.2.7.3.</li> </ol>  |
| 5         | IP-enabled FR                             | The contractor shall support IP-enabled FR.<br>The customer's interface to the network is IP over FR PVC. The PVC is terminated at service provider's edge switch/router. The contractor then routes the customer's IP traffic over its backbone network and the customer is provided any-to-any connectivity as needed.<br>If the contractor's backbone is MPLS based, IP-enabled FRS with CoS support shall be provided.<br>IP-enabled FR services allow end-users to retain the Frame Relay UNI in the access network and also serve as a migratory step toward IP. IP-enabled services also allow the provision of a full mesh network without each site having to establish separate PVCs to every other site. |
| 6         | Multilink Frame Relay (Optional)          | The contractor shall support Multilink Frame Relay (MFR).<br>MFR uses inverse multiplexing techniques to enable the bundling of several physical DS1 (or E1) lines into a single logical connection. With MFR, end-users (and service providers) can use existing network equipment and infrastructure to support more flexible access services at higher rates. [MFR is similar to Inverse Multiplexing for ATM (IMA).]  |
| 7         | Switched digital access to FRS (Optional) | The contractor shall support access via dial-up or ISDN will be at 64 Kbps, 128 Kbps, 256 Kbps, or 384 Kbps in case of outages.   |
| 8         | Voice over Frame Relay (Optional)         | The contractor shall support Voice over Frame Relay (VoFR).<br>VoFR service is enabled by the use of Frame Relay communications devices such as routers or FRADs configured with voice modules. In general, VoFR implementations utilize CIR/DE to prioritize voice over data traffic across Virtual Circuits.  |

**C.2.6.3 Performance**

The contractor shall provide the following:

Offerors shall submit data characterizing their current FRS performance in their proposal. Some of the parameters of interest to the Government, which are defined in ANSI/EIA T1.606 (Paragraph 6.1) or in ANSI/EIA T1.513, include the throughput, transit delay, information integrity, residual error rate, delivered error



frames, delivered duplicated frames, delivered out-of-sequence frames, lost frames, misdelivered frames, and premature disconnect.

**Table C.2-15. FRS Key Performance Indicators**

| Key Performance Indicator (KPI) | Service Level    | Performance Standard (Threshold) | Acceptable Quality Level (AQL) | How Measured |
|---------------------------------|------------------|----------------------------------|--------------------------------|--------------|
| GOS(Data Delivery Rate) (DDR)   | Routine          | 99.90%                           | ≥ 99.90%                       | See Note 1   |
|                                 | Critical         | 99.99%                           | ≥ 99.99%                       |              |
| Latency                         | Routine          | 120 ms                           | ≤ 120 ms                       | See Note 2   |
|                                 | Critical         | 90 ms                            | ≤ 90 ms                        |              |
| Av(PVC)                         | Routine          | 99.925%                          | ≥ 99.925%                      | See Note 3   |
| Time to Restore                 | Without Dispatch | 4 hours                          | ≤ 4 hours                      | See Note 4   |
|                                 | With Dispatch    | 8 hours                          | ≤ 8 hours                      |              |

Notes:

1. The GOS (DDR) or throughput is based upon the total number of octets accepted by the network as a percentage of total octets successfully delivered by the network on a calendar monthly basis with associated CIR > 0. Relevant standard: FRF.13.
2. Latency is the end-to-end round trip delay experienced across the Network network. It reflects the transit time across a vendor's frame relay network and is defined as "The amount of latency for octets to be carried through a frame relay network." The Internet Control Message Protocol (ICMP) test can be used to calculate packet delivery and latency. The ICMP test consists of sending a series of five test packets between Network core service aggregation points (POPs) every five minutes. The test results are analyzed to determine packet loss vs. successful delivery and speed of delivery. Relevant standards: RFC 1242 and RFC 2285.
3. PVC availability is measured end-to-end and calculated as a percentage of the total reporting interval time that the PVC is operationally available to the Agency.  
Availability is computed by the standard formula:

$$Av(PVC) = \frac{RI(HR) - COT(HR)}{RI(HR)} \times 100$$

4. "Without Dispatch" assumes that a service technician is co-located with the equipment. "With Dispatch" assumes that travel time to the equipment location is required. The requirement for co-location of a service technician is conveyed as a component of the service order. In both cases, service restoration should take place within the respective time frames indicated 99.95% of the time.

## C.2.6.4 Interfaces

### C.2.6.4.1 User-to-Network Interface

The contractor shall provide the following interfaces:

The contractor shall provide the following UNIs:

1. Narrowband: Information payload rate of 56 kb/s and 64 kb/s
2. Wideband: Information payload rate of 1.536 Mb/s

When the CPE is not FRS compliant, the Government does not expect the contractor to provide the Frame Relay Access Device (FRAD) as part of the basic service. The required conversion device shall be priced in accordance with Table B.11-7 of Section B.11.5. If a DSU/CSU is required, it shall be provided as CPE and priced in accordance with Table B.11-7, Purchase, Installation, Deinstallation, and Maintenance of CPE.

**Table C.2-16. FRS User Network Interface Types**

| UNI Type | Interface Type and Standard | Payload Data Rate or Bandwidth | Signaling or Protocol Type  |
|----------|-----------------------------|--------------------------------|---|
| 15       | EIA RS-422                  | Up to 1.536 Mbps               | Frame Relay   |
| 16       | EIA RS-422                  | Fractional T1                  | Frame Relay   |
| 17       | EIA RS-422                  | Up to 1.536 Mbps               | Asynchronous ASCII  |
| 18       | EIA RS-422                  | Up to 1.536 Mbps               | IBM BSC   |
| 19       | EIA RS-422                  | Up to 1.536 Mbps               | IBM SNA/SDLC  |
| 20       | EIA RS-422                  | Up to 1.536 Mbps               | UNISYS Poll/Select  |
| 21       | EIA RS-422                  | Up to 1.536 Mbps               | IPv4 and IPv6<br>Ensure that services delivered support Federal Agencies as required to comply with OMB IPv6 directives |
| 22       | EIA RS-449                  | Up to 1.536 Mbps               | Frame Relay   |
| 23       | EIA RS-449                  | Fractional T1                  | Frame Relay   |
| 24       | EIA RS-449                  | Up to 1.536 Mbps               | Asynchronous ASCII  |
| 25       | EIA RS-449                  | Up to 1.536 Mbps               | IBM BSC   |
| 26       | EIA RS-449                  | Up to 1.536 Mbps               | IBM SNA/SDLC  |
| 27       | EIA RS-449                  | Up to 1.536 Mbps               | UNISYS Poll/Select  |
| 28       | EIA RS-449                  | Up to 1.536 Mbps               | IPv4 and IPv6<br>Ensure that services delivered support Federal Agencies as required to comply with OMB IPv6 directives |
| 29       | EIA RS-530                  | Up to 1.536 Mbps               | Frame Relay   |
| 30       | EIA RS-530                  | Fractional T1                  | Frame Relay   |
| 31       | EIA RS-530                  | Up to 1.536 Mbps               | Asynchronous ASCII  |
| 32       | EIA RS-530                  | Up to 1.536 Mbps               | IBM BSC   |
| 33       | EIA RS-530                  | Up to 1.536 Mbps               | IBM SNA/SDLC  |
| 34       | EIA RS-530                  | Up to 1.536 Mbps               | UNISYS Poll/Select  |
| 35       | EIA RS-530                  | Up to 1.536 Mbps               | IPv4 and IPv6<br>Ensure that services delivered support Federal Agencies as required to comply with OMB IPv6 directives |
| 36       | ISDN PRI (Multirate)        | Up to 1.472 Mbps               | Frame Relay   |
| 37       | ISDN PRI (Multirate)        | Up to 1.472 Mbps               | IBM BSC   |
| 38       | ISDN PRI (Multirate)        | Up to 1.472 Mbps               | IBM SNA/SDLC  |
| 39       | ISDN PRI (Multirate)        | Up to 1.472 Mbps               | UNISYS Poll/Select  |

| UNI Type | Interface Type and Standard              | Payload Data Rate or Bandwidth | Signaling or Protocol Type  |
|----------|--|--------------------------------|---|
| 40       | ISDN PRI (Multirate)                     | Up to 1.472 Mbps               | IPv4 and IPv6<br>Ensure that services delivered support Federal Agencies as required to comply with OMB IPv6 directives |
| 41       | T3                                       | Up to 43.008 Mbps              | Frame Relay   |
| 42       | Fractional T3                            | Up to 43.008 Mbps              | Frame Relay   |
| 43       | T3                                       | Up to 43.008 Mbps              | IPv4 and IPv6<br>Ensure that services delivered support Federal Agencies as required to comply with OMB IPv6 directives |
| 44       | High Speed Serial Interface (HSSI)       | Up to STS-1 (49.536 Mbps)      | Frame Relay   |
| 45       | All IEEE 802.3 cable and connector types | Up to 43.008 Mbps              | IEEE 802.x (x=3,5)<br>IPv6/IPX/SNA/IPv4   |
| 46       | Removed                                  |                                |   |
| 47       |  |                                |   |
| 48       | ISDN BRI (Multirate)                     | Up to 128 Kbps                 | Frame Relay   |
| 49       | ISDN BRI (Multirate)                     | Up to 128 Kbps                 | Asynchronous ASCII  |
| 50       | ISDN BRI (Multirate)                     | Up to 128 Kbps                 | IBM BSC   |
| 51       | ISDN BRI (Multirate)                     | Up to 128 Kbps                 | IBM SNA/SDLC  |
| 52       | ISDN BRI (Multirate)                     | Up to 128 Kbps                 | UNISYS Poll/Select  |
| 53       | ISDN BRI (Multirate)                     | Up to 128 Kbps                 | IPv4 and IPv6<br>Ensure that services delivered support Federal Agencies as required to comply with OMB IPv6 directives |

## C.2.7 Asynchronous Transfer Mode Service (ATMS) [OPTIONAL]

### C.2.7.1 Basic Service Capabilities

ATMS shall provide moderate to high-speed digital connections between locations with specified Quality of Service requirements. ATMS shall be delivered directly to the user's terminal equipment, which may not provide an ATM-compliant digital stream. The service shall be provided over Permanent Virtual Connections (PVCs) between SDPs.

The basic service requirement is to transport and switch ATM cells from one ATM local access circuit to any other ATM local access circuit. Specifically, the basic service shall consist of:

1. At least one local access circuit from the customer's premises to the WITS 3 service center using one of the interfaces listed in Table C.2-22.
2. Two forms of bandwidth allocation, Constant Bit Rate (CBR) and Variable Bit Rate (VBR). CBR service shall be used when there is a steady flow of

information and variable delays in transmission cannot be tolerated, such as for voice applications. VBR service shall be used when the flow of information comes in bursts, as with many E-mail and LAN interconnect requirements.

3. At least one PVC shall be provided. The PVC can be either a Virtual Channel Connection (VCC) or a Virtual Path Connection (VPC). Each PVC shall have at least 64 kb/s of VBR bandwidth and be a simplex connection.
4. Unlimited usage within those portions of WITS 3 serving area served by the contractor.

The ATM service shall comply with the following standards, as applicable, and when commercially available. After award, the contractor may propose alternatives at no additional cost to the Government that meet or exceed the provisions of the listed standards.

1. ANSI T1
2. ITU TSS Recommendations
3. ATM Forum
4. Internet Engineering Task Force (IETF)
5. Frame Relay Forum (FRF) Specifications for ATM
6. Digital Subscriber Line (DSL) Forum Technical Reports for ATM
7. All new versions, amendments, and modifications made to the above listed documents and standards, when offered commercially

**Table C.2-17. Reserved**

**Table C.2-18. Reserved**

**C.2.7.2 Features**

The following features shall be available:

1. Additional simplex PVCs of the following types:
  - a) CBR Virtual Channel Connection
  - b) VBR Virtual Channel Connection
  - c) CBR Virtual Path Connection
  - d) VBR Virtual Path Connection
2. Additional VBR bandwidth in multiples of 64 kb/s.
3. Conversion of VBR bandwidth to any combination of CBR and VBR bandwidth

**Table C.2-19. ATMS Features**

| ID Number | Name of Feature                    | Description  |
|-----------|------------------------------------|--|
| 1         | Circuit Emulation Services         | <p>The contractor shall provide:</p> <ol style="list-style-type: none"> <li>1. Circuit emulation services (CES) to enable TDM traffic to be terminated and efficiently transported via the ATM network to other sites before being converted back to TDM. When using CES, the ATM network shall provide a transparent transport mechanism for G.703/G.704 facilities. Voice and other voice-band traffic are encoded on standard TDM networks using PCM, ADPCM, or other encoding and compression mechanisms. (Refer to af-vtoa-0078.000)</li> <li>2. Dynamic Bandwidth Circuit Emulation (DBCES), which is a variation of CES. DBCES transmits only when there is an active voice call and does not send a constant bit stream of cells. (Refer to af-vtoa-0085.000)</li> </ol> |
| 2         | Disaster Recovery PVCs             | <p>The contractor shall provide pre-established PVCs to an alternate location upon notification by the Agency.</p>   |
| 3         | Diversity                          | <p>The contractor shall enable the Agency to specify the following:</p> <ol style="list-style-type: none"> <li>1. ATM Switch Diversity. The contractor shall provide up to three mutually exclusive groups of ports that will not coexist on a single ATM Switch. This feature protects the Agency's ATM network in the event of failure at a contractor's ATM Switch.</li> <li>2. ATM Point-of-Presence (POP) Diversity. The contractor shall provide up to three mutually exclusive ports that will not coexist in the same ATM POP. This feature protects the Agency's ATM network in the event of failure at an ATM POP.</li> </ol>  |
| 4         | Interworking Services              | <p>The contractor shall provide interworking services for the Agency's ATMS to transparently access Agency locations that use the following:</p> <ol style="list-style-type: none"> <li>1. The contractor's FRS.</li> <li>2. The contractor's IP services networks</li> </ol>  |
| 5         | Inverse Multiplexing for ATM (IMA) | <p>The contractor shall connect from the SDP to the contractor's POP using IMA. IMA entails inverse multiplexing and demultiplexing of ATM cells in a cyclical fashion among links (nxDS1/E1) to form a higher bandwidth logical link whose rate is approximately the sum of the link rates. This is referred to as an IMA group. (Refer to af-phy-0086.001)</p>   |
| 6         | IP-enabled ATM                     | <p>The contractor shall support IP-enabled ATM. The Agency's interface to the network is IP over ATM PVC. PVCs are terminated at contractor's edge switches. The contractor's backbone network carries the traffic. The Agency is provided any-to-any connectivity as needed.</p>  |

| ID Number | Name of Feature          | Description  |
|-----------|--------------------------|--|
|           |                          | The contractor shall provide CoS traffic differentiation, which treats packets differently based on customer-assigned importance markings, i.e., specific priorities and designated queues within the service provider's network.                              |
| 7         | Point-to-Multipoint PVCs | The contractor shall support Point-to-Multipoint PVCs. Point-to-Multipoint PVCs enable end users to send one transmission to multiple locations simultaneously. Bandwidth requirements at the host are equal to the one transmission, not the aggregate total. |

### C.2.7.3 Performance

ATMS shall comply with the QoS requirements in Table C.2-20 and ANSI/EIA T1.511<sup>2</sup>. The reliability and availability of the link between the SDP and the contractor's switch for DS3 and OC3c rate signals shall conform to SONET requirements<sup>3</sup> for STS-1 in the case of a DS3 link and STS-3c for an OC3c link.

**Table C.2-20. ATMS Quality of Service Requirements**

| Service Parameter                      | CBR  | VBR   |
|--|--|---|
| Sustained Cell Rate (SCR) <sup>4</sup> | Customer-selected in increments of 64 kb/s up to the maximum speed of the access circuit       | Customer-selected in increments of 64 kb/s up to the maximum available capacity of the access circuit |
| Peak Cell Rate (PCR) <sup>5</sup>      | Customer-selected in increments of 64 kb/s up to the maximum speed of the local access circuit | 200% of SCR up to the maximum capacity of the local access circuit                                    |
| Non-conforming cells                   | Discarded  | Exceeding PCR: discarded<br>Exceeding SCR plus MBS: <sup>6</sup> Tagged and/or discarded              |

<sup>2</sup> American National Standard for Telecommunications, *B-ISDN ATM Layer Cell Transfer Performance*, American National Standards Institute, ANSI/EIA T1.511-1997. Section 5, Table 1, Access Portion.

<sup>3</sup> American National Standard for Telecommunications, *Network Performance Parameters and Objectives for Dedicated Digital Services-SONET Bit Rates*, American National Standards Institute Standard ANSI/EIA T1.514-1995. Table 2 – Long-term accuracy objectives and Table 3 - availability objectives.

<sup>4</sup> The Sustained Cell Rate (SCR) is the maximum rate at which Variable Bit Rate cells may be constantly transmitted with a high assurance that no cells will be lost. Cells transmitted within the SCR have the highest priority of the VBR traffic and will not be tagged as eligible for discard.

<sup>5</sup> The Peak Cell Rate (PCR) is the highest available rate of information transfer on a Variable Bit Rate connection and the continuous cell rate allowed for a Constant Bit Rate connection.

| Service Parameter                                  | CBR  | VBR  |
|--|--|--|
| ATM Transfer Class <sup>7</sup> , delay sensitive  | Class I service                                | Class I service                                |
| ATM Transfer Class, delay tolerant                 | Not applicable                                 | Class II service                               |
| Cell Delay Variation Tolerance (CVDT) <sup>8</sup> | DS3: 150 microseconds<br>OC3c: 50 microseconds | DS3: 150 microseconds<br>OC3c: 50 microseconds |
| Maximum Burst Size (MBS)                           | Not Applicable                                 | 100 cells                                      |

**Table C.2-21. ATMS Key Performance Indicators**

| Key Performance Indicator (KPI) |        | Service Level    | Performance Standard (Threshold) | Acceptable Quality Level (AQL) | How Measured |
|---------------------------------|--------|------------------|----------------------------------|--------------------------------|--------------|
| Av(PVC)                         |        | Routine          | 99.925%                          | ≥ 99.925%                      | See Note 1   |
| GOS(Max Cell Transfer Delay)    | CBR    | Routine          | 50 ms                            | ≤ 50 ms                        | See Note 2   |
|                                 | VBRrt  | Routine          | 55 ms                            | ≤ 55 ms                        |              |
|                                 | VBRnrt | Routine          | 60 ms                            | ≤ 60 ms                        |              |
| GOS(Max Cell Loss Ratio)        | CBR    | Routine          | 1.00E-09                         | ≤ 1.00E-09                     | See Note 3   |
|                                 | VBRnrt | Routine          | 1.00E-06                         | ≤ 1.00E-06                     |              |
|                                 | VBRrt  | Routine          | 1.00E-07                         | ≤ 1.00E-07                     |              |
| GOS(Max Cell Delay Variation)   | CBR    | Routine          | 1 ms                             | ≤ 1 ms                         | See Note 4   |
|                                 | VBRrt  | Routine          | 1.5 ms                           | ≤ 1.5 ms                       |              |
| Time to Restore                 |        | Without Dispatch | 4 hours                          | ≤ 4 hours                      | See Note 5   |
|                                 |        | With Dispatch    | 8 hours                          | ≤ 8 hours                      |              |

Notes:

1. PVC availability is measured end-to-end and calculated as a percentage of the total reporting interval time that the PVC is operationally available to the Agency.

Availability is computed by the standard

$$\text{formula: } Av(PVC) = \frac{RI(HR) - COT(HR)}{RI(HR)} \times 100$$

- 
- 6 The Maximum Burst Size (MBS) is the maximum number of cells that may be passed to the contractor's network in a single burst at a rate that exceeds the SCR but does not exceed the PCR assigned to the VBR connection.
  - 7 International Telecommunication Union, *Series I: Integrated Services Digital Network/Overall network aspects and functions - Performance Objectives*, ITU-T, I.356. Table 3/I.356.
  - 8 Cell Delay Variation Tolerance (CDVT) is the amount of variation permitted for early arrival of clusters of cells at the source access circuit. Cells exceeding the tolerance will be declared non-conformant and will be discarded.

2. GOS (Cell Transfer Delay) is the end-to-end one-way delay experienced across the Network network. It reflects the transit time across a contractor's ATM network for a specific CoS and is defined as the amount of latency for data to be carried through an ATM network. The Internet Control Message Protocol (ICMP) test can be used to calculate data delivery and latency. The ICMP test consists of sending a series of five test packets between Network core service aggregation points (POPs) every five minutes. The test results are analyzed to determine data loss vs. successful delivery and speed of delivery. Relevant standards are RFC 1242 and RFC 2285.
3. Network devices, such as switches and routers, sometimes must retain data cells in buffered queues when a link gets congested. If the link remains congested for too long, the buffered queues will overflow and data will be lost. This GOS loss can be measured with the ICMP test. Relevant standards are RFC 1242 and RFC 2285.
4. GOS (Cell Delay Variation) is a measure of the variance of cell transfer delay. High variation implies larger buffering for delay-sensitive traffic such as voice and video.
5. "Without Dispatch" assumes that a service technician is co-located with the equipment. "With Dispatch" assumes that travel time to the equipment location is required. The requirement for co-location of a service technician is conveyed as a component of the service order. In both cases, service restoration should take place within the respective time frames indicated 99.95% of the time.

## C.2.7.4 Interfaces

### C.2.7.4.1 User-to-Network Interface

The contractor's ATM service shall interface with the generic CPE types shown in Table C.2-22 that may or may not be compliant with ATM Forum specifications. When the CPE is not ATMS compliant, the required conversion device shall be priced in accordance with Table B.11-7 of Section B.11.5. If a DSU/CSU is required, it shall be provided as CPE and priced in accordance with Table B.11.7 (Purchase, Installation, Deinstallation, and Maintenance of CPE).

**Table C.2-22. ATMS User-to-Network Interface Requirements**

| UNI Type | Interface Type and Standard | Payload Data Rate or Bandwidth <sup>9</sup> | Signaling or Protocol Type <sup>10</sup> |
|----------|-----------------------------|---|--|
| 1        | ITU-TSS V.35                | Up to 1.536 Mbps                            | AAL Type 5                               |
| 2        | EIA RS-449                  | Up to 1.536 Mbps                            | AAL Type 5                               |
| 3        | EIA RS-530                  | Up to 1.536 Mbps                            | AAL Type 5                               |
| 4        | DS1                         | Up to 1.536 Mbps                            | AAL Type 1                               |
| 5        | DS1                         | Up to 1.536 Mbps                            | AAL Type 5                               |
| 6        | DS3                         | Up to 43.008 Mbps                           | AAL Type 1                               |
| 7        | DS3                         | Up to 43.008 Mbps                           | AAL Type 5                               |
| 8        | DS1                         | Up to 1.536 Mbps                            | Native Mode                              |
| 9        | DS3                         | Up to 43.008 Mbps                           | Native Mode                              |
| 10       | ITU-TSS V.35                | Up to 1.536 Mbps                            | AAL Type 3/4                             |
| 11       | EIA RS-449                  | Up to 1.536 Mbps                            | AAL Type 3/4                             |
| 12       | EIA RS-530                  | Up to 1.536 Mbps                            | AAL Type 3/4                             |

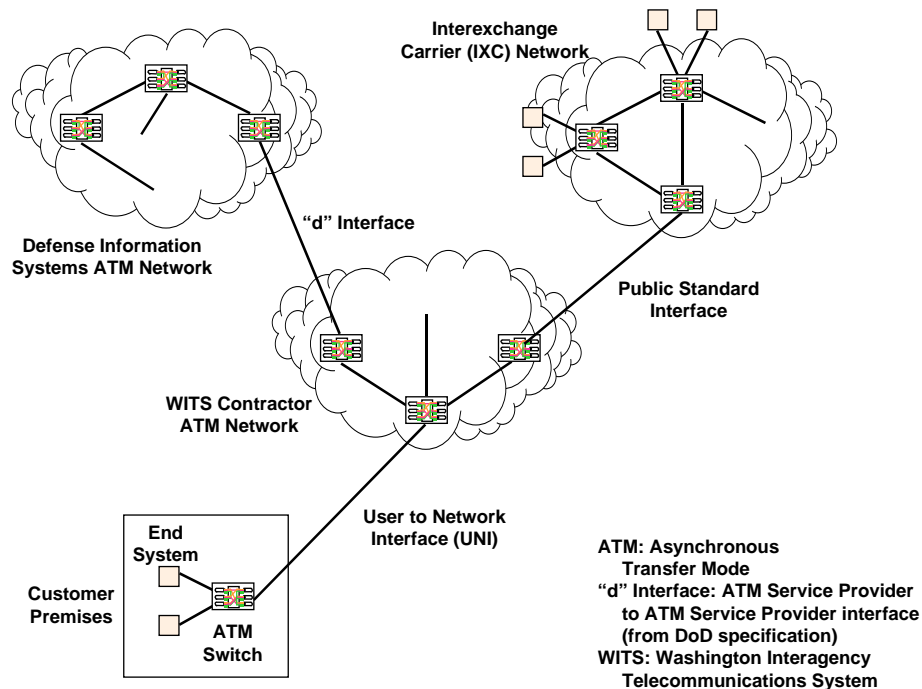
<sup>9</sup> Payload data rates include cell overhead.

<sup>10</sup> When AAL Type is specified, the contractor shall provide the ATM adaptation function. For native mode, the user traffic type will be AAL Type 1 or AAL Type 5.



| UNI Type | Interface Type and Standard        | Payload Data Rate or Bandwidth <sup>9</sup>                | Signaling or Protocol Type <sup>10</sup> |
|----------|------------------------------------|--|--|
| 13       | DS1                                | Up to 1.536 Mbps   | AAL Type 3/4                             |
| 14       | DS3                                | Up to 43.008 Mbps  | AAL Type 3/4                             |
| 15       | SONET OC-3c                        | Up to 148.608 Mbps   | AAL Type 3/4                             |
| 16       | SONET OC-12c                       | Up to 594.432 Mbps   | AAL Type 3/4                             |
| 17       | SONET OC-48c                       | Up to 2.378 Gbps   | AAL Type 5                               |
| 18       | SONET OC-48c                       | Up to 2.378 Gbps   | AAL Type 3/4                             |
| 19       | COAX                               | Up to 43.008 Mbps  | Native Mode                              |
| 20       | OC-3C                              | Up to 148.608 Mbps   | Native Mode                              |
| 21       | High Speed Serial Interface (HSSI) | Up to 43.008 Mbps  | HSSI                                     |
| 22       | HSSI                               | From 2xDS1, in multiples of DS1, up to and including 8xDS1 | HSSI                                     |

Some Department of Defense customers will require interconnection to the Defense Information Switched Network (DISN), as shown in Figure C.2-1. The contractor shall provide an interface to DISN that meets the DISN ATM specification,<sup>11,12</sup> with the exception that the OC12c physical layer is not required. Each of the DISA standards may be accessed via DISA's homepage: <http://www.disa.mil>. Note that this interface uses the Private Network-to-Network Interface (PNNI).



<sup>11</sup> Defense Information Systems Agency, *Defense Information System Network (DISN) Asynchronous Transfer Mode (ATM) System Specification (DoD DISN ATM Specification)*, 17 April 1998. Section 2.5.

<sup>12</sup> Defense Information Systems Agency, *DoD ATM Standards (version 1.0)*, 17 April 1998.

## Figure C.2-1. Connections between WITS and DISN

### C.2.8 Dark Fiber Services (DFS) [OPTIONAL]

#### C.2.8.1 Basic Service Capabilities

Agencies acquiring dark fiber services will purchase from the contractor or otherwise provide their own opto-electronics equipment. DFS shall be offered as a facility providing the Agency the unconditional right to the use of the fiber route, including capacity such as a fiber pair in a fiber-optic cable or the entire fiber-optic cable.

The following Dark Fiber Services capabilities are mandatory unless indicated otherwise:

1. Configuration Options. The contractor may support the network topologies outlined below.
  - a) Point-to-point. This configuration connects any two points in the contractor's network.
  - b) Route Diversity Ring/Single Drops. This configuration is possible when the terminating equipment provides equipment and/or line protection schemes.
  - c) [Optional] Route Diversity Ring/Dual Drops. This configuration is possible when two diverse paths are available end-to-end to prevent service interruptions caused by a failure in either in the contractor's network or at the drop's path.
  - d) [Optional] Star Configuration. This configuration allows an Agency to have a single location that functions as a hub that provides connectivity to other Agency locations.
  - e) Hybrid Configuration. The preceding four configurations can be combined to yield a custom-tailored solution.
2. Fiber Service Delivery Point (FSDP). The contractor shall regard the SDP as either the fiber patch panel where the fibers terminate at a government location or the co-location facility where the agency has installed its optronics. The contractor shall meet the following conditions when delivering DFS to an agency:
  - a) Optical Fiber. The fiber shall meet the standards specified in this section.
  - b) Fiber Count. The contractor shall provide the number of fiber strands to be delivered at the FSDP as specified by the contracting Agency.
  - c) Ducting. The contractor shall provide the number of ducts between connecting locations and the number of fiber strands running in each duct as specified by the contracting Agency.

- d) Future Growth. The contractor shall always include an additional duct running in parallel to the working duct(s) to provide room for future growth.
3. Channel Count.
- a) Deployed fibers shall be capable of supporting a minimum of 80 DWDM wavelengths or user data with spacing as specified in ITU-T G.694.1
  - b) Deployed fibers shall be capable of operating in the “C”, “L” and “S” bands.
4. Gateways. The contractor shall provide the ability to add and drop traffic via gateway locations. The following requirements shall be fulfilled by the contractors and updates on improvements or expansions shall be provided throughout the life of the contract.
- a) Gateway locations shall be equipped with external back up generators or UPS systems.
  - b) If UPS systems are provided, they shall operate for at least 8 hours without interruption.
  - c) Lock cabinet spaces shall be provided.
  - d) 24x7 access to the gateway locations shall be provided.
  - e) Gateway locations shall be equipped with surveillance and highly secured systems.
  - f) The contractor shall indicate if gateway expansion is possible.
  - g) The contractor shall indicate if gateway locations are monitored remotely.
  - h) Environmental monitoring shall be supported
5. Amplification. Fiber available to Agencies shall work with the following types of In-Line Amplifier:
- a) Erbium-doped Fiber Amplifiers (EDFA).
  - b) Raman Amplifiers.
  - c) EDFA/Raman hybrid Amplifiers.
  - d) Semiconductor Optical Amplifiers (SOA).
6. The contractor shall make available single mode and multimode fiber and identify fiber types.
7. Required Optical Characteristics are identified in Section C.2.8.5.
8. Acceptance Criteria. The contractor shall comply with the following acceptance requirements.

- a) Acceptance Testing. Acceptance Testing shall be performed as follows:
  - i. On Single Mode Fibers, end-to-end attenuation measurements shall be tested in both directions of transmission at the 1310nm and 1550nm wavelengths.
  - ii. On Multi Mode Fibers, end-to-end attenuation measurements shall be tested in both directions of transmission at the 850nm and 1300 nm wavelengths.
  - iii. Loss measurements shall be taken from both ends at applicable wavelengths as in i) and ii) above and in compliance with OFSTP-7 and OFSTP-14 as applicable or EIA/TIA-568 B
  - iv. OTDR measurements shall be performed for each fiber for length, transmission anomalies, and end-to-end attenuation.
  - v. A written report shall be issued for each cable and OTDR traces and other measurements shall be included for each fiber.
9. Service Components. DFS service components are as follows.
  - a) Trunks. Trunks are main fiber cables that may carry hundreds of fiber strands which may be shared and owned by a variety of carriers, government Agencies, universities, etc.
  - b) Laterals. Laterals are fiber cables from the Agency's premises to the nearest splice point on the cable trunk. They shall be funded by the Agency and their length may vary from a few meters to several kilometers.
    - i. The contractor shall indicate the minimum and maximum size of the lateral in fiber strands.
  - c) Building Entrances. Facilities within the Agency's premises for the termination of fibers, i.e., fiber panel terminations.

#### **C.2.8.2 Standards**

The Dark Fiber Services shall comply with the following standards, as applicable, and when commercially available. After award, the contractor may propose alternatives at no additional cost to the Government that meet or exceed the provisions of the listed standards.

1. Electronic Industry Alliance/Telecommunications Industry Association (EIA/TIA)
  - a) EIA/TIA-559, Single Mode Fiber Optic System Transmission Design
  - b) Optical Fiber System Test Procedures (OFSTPs) including:
    - i. OFSTP-2, Effective Transmitter Output Power Coupled into Single Mode Fiber Optic Cable

- ii. OFSTP-3, Fiber Optic Terminal Receiver Sensitivity and Maximum Receiver Input
  - iii. OFSTP-7, Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant
  - iv. OFSTP-14, Measurement of Optical Power Loss of Installed Multi-Mode Fiber Cable Plant
  - v. OFSTP-10, Measurement of Dispersion Power Penalty in Single Mode Systems
  - vi. OFSTP-11, Measurement of Single Reflection Power Penalty for Fiber Optic Terminal Equipment
2. Telcordia Standards
- a) GR-20-CORE, Generic Requirements for Optical Fiber and Optical Fiber Cable
  - b) GR-63-CORE, Network Equipment-Building System (NEBS), Generic Equipment Requirements
  - c) GR-253-CORE, Synchronous Optical Network (SONET) Transport Systems: Common Criteria Physical Layer
  - d) GR-326-CORE, Generic Requirements for Single Mode Connectors and Jumper Assemblies
3. American National Standards Institute (ANSI)
- a) ANSI Z136.2-1998, American National Standard for the Safe Use of Optical Fiber Communications Systems Utilizing Laser Diode and LED Sources
4. International Engineering Consortium (IEC)
- a) IEC 825-1, Safety of Laser Products, Part 1: Equipment classification, requirements and user's guide, First Edition, 1993-11
  - b) IEC 825-2, Safety of Laser Products, Part 2: Safety of optical fiber communications systems, First Edition, 1993-09  
Code of Federal Regulations (CFR)
  - c) 21 CFR 1040, Performance Standard for Laser Products
5. International Telecommunications Union (ITU-T)
- a) ITU-T G.655 (10/2000)
  - b) ITU-T G.652 (10/2000)
  - c) ITU-T G.694.1
  - d) ITU-T K.25 (02/2000)
  - e) ITU-T L.35 (10/1998)

6. Regulations and Permits – The contractor shall be responsible for all permits, easements, and rights of way, to include Host Nation agreements/approvals. The contractor shall be responsible for complying with local Government regulations.
7. All new versions, amendments, and modifications to the above documents and standards as they become applicable.
8. Code of Federal Regulations (CFR): 21 CFR 1040, Performance Standard for Laser Products.

**C.2.8.3 Features**

The following Dark Fiber Services features are mandatory unless indicated otherwise:

**Table C.2-23. DFS Features**

| ID Number | Name of Feature                  | Description  |
|-----------|----------------------------------|--|
| 1         | [Optional] Colocation Service    | Provides the ability to add/drop traffic (gateways) and to regenerate and amplify traffic where needed.  |
| 2         | [Optional] Dark Fiber Local Loop | A dark fiber connection between the Agency’s location and the contractor’s wire center or outside plant (hut or regeneration location).  |
| 3         | Multiple Duct                    | Upgrade to multiple ducts (conduits) may be specified  |
| 4         | [Optional] Off-net laterals      | Fiber cables from the Agency’s premises to the nearest splice point on the cable trunk. They shall be funded by the Agency and their length may vary from a few meters to several kilometers.  |
| 5         | Duct                             | The contractor shall support the number of ducts conduits as specified by the Agency that shall be included in the service   |
| 6         | Diverse Route Dual Drop          | The contractor shall provide two diverse paths end-to-end to prevent service interruptions caused by a failure either in the contractor’s network or at the drop’s path. A second contractor shall provide the diverse route should the Agency requires full diversity for protection unless the working link provider is able to do so. |
| 7         | Diverse Route Single Drop        | The contractor shall ensure that two diverse paths are available on the network to prevent service interruptions if a fiber on either of two paths is damaged. A Single Add/drop location/network element shall be used in this arrangement with automatic protection switching capabilities.  |
| 8         | Intercity Connectivity           | The contractor shall support a dark fiber connection between Agency’s locations in metro areas.  |

**C.2.8.4 Connectivity**

Dark Fiber Services shall connect to and interoperate with:

1. The Internet Service Provider (ISP) of their choice. When connecting their locations to (an) ISP POP(s), Agencies are responsible for providing required terminating equipment at each end.
2. Inter-Agency or intra-Agency LANs within the same vicinity. An Agency will be able to interconnect via inter-Agency or intra-Agency LAN to selected locations situated within the same metro area (i.e., city).
3. The carrier’s Long Haul or Metro networks. An Agency will be able to connect its locations(s) to the nearest carrier’s wire center, LEC wire center, Hut, POP, CLEC collocation facility, etc.
4. Provide redundant paths for their transport infrastructure and thereby enhance communications reliability.

DFS service to an Agency location shall be delivered as follows:

1. Multi-tenant buildings. The contractor shall terminate fiber(s) in the existing Fiber Distribution Panel (FDP) or the FDP specified by the Agency using connectors specified by the building’s standards.
2. Non multi-tenant buildings. The contractor shall supply the Agency with an FDP and shall terminate the fiber(s) using the contractor’s standards.

**C.2.8.5 Performance Metrics**

The performance levels and acceptable quality level (AQL) of key performance indicators (KPIs) for Dark Fiber Services (DFS) below are mandatory unless indicated otherwise:

**Table C.2-24. DFS Key Performance Indicators**

| Key Performance Indicator (KPI) |                     | Type | Performance Standard (Level/threshold) | Acceptable Quality Level (AQL)             | How Measured     | Surveillance Period and Report Schedule  |
|---------------------------------|---------------------|------|--|--|------------------|--|
| Response Time (Any Failure)     |                     | All  | 2 hours                                | 2 hours                                    | See Note 1 below | Monitored continuously, reported monthly |
| RESTORAL TIME                   | Service Degradation | All  | 4 hours                                | > 4 hour for no more than 0.4% of the time | See Note 2 below | Monitored continuously, reported monthly |
|                                 | Cable Failure       | All  | 8 hours                                | ≥ 8 hours                                  |                  |  |

| Key Performance Indicator (KPI)    |                              | Type | Performance Standard (Level/threshold) | Acceptable Quality Level (AQL)               | How Measured     | Surveillance Period and Report Schedule  |
|------------------------------------|------------------------------|------|--|--|------------------|--|
| ATTENUATION COEFFICIENT SMF        | 1550 nm                      | All  | 0.25 dB/km                             | $\leq 0.25$ dB/km at all times               | See Note 3 below | Acceptance criteria measured at delivery.  |
|                                    | 1310 nm                      | All  | 0.35 dB/km                             | $< 0.35$ dB/km at all times                  |                  |  |
| ATTENUATION COEFFICIENT MMF        | 850 nm (50/125 $\square$ m)  | All  | 2.35 dB/km                             | $\leq 0.25$ dB/km at all times               |                  |  |
|                                    | 1300 nm (50/125 $\square$ m) | All  | 0.53 dB/km                             | $\leq 0.35$ dB/km at all times               |                  |  |
| Polarization Mode Dispersion (PMD) |                              | All  | $0.1$ ps/km <sup>1/2</sup>             | $\leq 0.1$ ps/km <sup>1/2</sup> at all times | See Note 4 below | Acceptance criteria measured at delivery. Re-measure when planning to transmit at rates higher than 10 Gbps. |
| Chromatic Dispersion at 1550nm     |                              | All  | 2.0 ps/km nm                           | 2.0 ps/ km nm at all times                   | See Note 5 below | Measured when accepting the fiber and periodically as specified by Agency.                                   |
| Reflectance Events (all events)    |                              | All  | Less than 40 dB                        | $\leq 40$ dB at all times                    | See Note 6 below | Measured when accepting the fiber and periodically as required by Agency and when fiber breaks occur.        |
| <b>Connectors</b>                  |                              |      |  |  |                  |  |
| Return Loss                        |                              | All  | Less than 50 dB                        | $\leq 50$ dB at all times                    |                  | Measured when accepting the fiber and as   |
| Insertion Loss                     |                              | All  | Less than 0.5 dB                       | $\leq 0.5$ dB at all times                   |                  |  |



| Key Performance Indicator (KPI) | Type | Performance Standard (Level/threshold) | Acceptable Quality Level (AQL) | How Measured | Surveillance Period and Report Schedule               |
|---------------------------------|------|--|--------------------------------|--------------|---|
| Reflectance                     | All  | Less than 40 dB                        | ≤ 40 dB at all times           |              | required by the Agency or when performing maintenance |

Notes:

1. The Response Time is the time taken to detect a failure, provide a diagnosis to the Agency, and specify a plan of action for problem resolution.
2. Restoral Time is the time taken by the contractor to repair service degradations or cable failures. Service degradation takes place when the transmission quality falls below the level of the transmission design. In accordance with GR-253, the maximum allowable time to restore BER to an acceptable level is 10,000 seconds, which equates to 167 minutes. GSA gating time is 30 days, which represents 0.4% of the monitoring time. Cable failures occur when construction is taking place near to where the conduits are buried or when for any reason the fiber cables break.
3. Attenuation Coefficient is the attenuation per unit length with a maximum value at one of more wavelengths. In this case, wavelengths are from 1310 and 1550nm. The method used to test the attenuation coefficient of single-mode optical fiber is based on bidirectional backscattering measurements. For campus applications, MMF may be used and the attenuation coefficient per unit length is included for 850nm and 1300nm.
4. Polarization Mode Dispersion (PMD) is the term that describes the relationship between polarization and group delay. PMD can limit the highest bit rate that is achievable in a fiber optic system. The following are the most popular methods of measuring PMD: Fixed Analyzer (also called wavelength scanning), Interferometry, Pointcare arc (also called SOP), Modulation phase shift, Pulse delay, and Baseband Curve fit. The major differences in testing setups among these methods are the type of light source, means of defining spectral width, and means of tuning the wavelength. Measurement data is collected while sweeping or stepping the wavelength of the source (or receiver, depending on the method used).
5. Chromatic dispersion measurements characterize how the velocity of propagation in fiber or components changes with wavelength. This measurement is obtained by analyzing the group delay through the fiber as a function of wavelength. A wavelength tunable optical source is intensity modulated and the phase of the detected modulation signal is compared to that of the transmitted modulation. The wavelength of the tunable source is then incremented and the phase comparison is made again. By calculating how the difference between the two measurements, the group delay of the fiber is measured.
6. Reflection measurements are done using an optical time-domain reflectometer (OTDR). The OTDR injects a pulsed signal into the optical fiber and a small amount of the injected signal is reflected back (Raleigh Backscattering). By measuring the amount of backscattered signal in relation to time, signal loss in relation to fiber optic cable distance is determined.

### C.2.8.6 Interface

The interfaces for this service are the fiber terminations at the FSDP. The contractor shall identify the fiber connectors that are supported.

### **C.2.9 Internet Access Service (IAS) [OPTIONAL]**

The Government intends to use IAS to support a wide range of customer requirements, such as connecting to the global Internet, Government-wide intranets, and extranets. IAS shall allow customers to interconnect CPE using the TCP/IP protocol suite and interoperate with other Government networks, such as the GDIXC Internet Protocol Internetworking Service (IPS), Energy Sciences Network (ESNet), DISN (as needed and in accordance with security policy), and the public Internet Service Provider (ISP) networks.

Included under IAS is Broadband Internet access – often shortened to "broadband" – a high data-transmission rate connection. Broadband implementations include DSL, fiber optics and cable modem as well as wireless technologies such as 802.11 Wi-Fi, Free Space Optics (Laser), and Power Line Signaling. The International Telecommunication Union Standardization Sector (ITU-T) recommendation I.113 has defined broadband as a transmission capacity that is faster than primary rate ISDN, at 1.5 to 2 Mbit/s. The FCC definition of broadband is 200 kbit/s (0.2 Mbit/s) in one direction, and advanced broadband is at least 200 Kbit/s in both directions. The OECD has defined broadband as 256 Kbit/s in at least one direction and this bit rate is the most common baseline that is marketed as "broadband" around the world. There is, however, no specific bitrate defined by the industry. Therefore, broadband will follow the data rates defined in this Section IAS as listed below.

#### **C.2.9.1 Basic Service Capabilities**

The contractor shall provide IAS ports at the peak data rates specified by the customer and shall use appropriate WITS 3 services (e.g., dial-up VS analog data service, dial-up ISDN, DSL, DTS, FRS, or ATMS) to connect customers' SDPs to the contractor's IAS service office(s). These access circuits shall support TCP/IP-based applications that conform to the specifications of the Internet Standards (STDs) and the Request for Comments (RFCs) of the Internet Engineering Task Force (IETF). The contractor may establish a POP within the current Government-leased space when in the best interests of the Government.

The following capabilities shall be provided as part of the basic service:

1. Unlimited access to the Internet 24 hours a day, 7 days a week.
2. Two or more redundant paths from the contractor's network to the Internet, each at the level of DS3 or higher.
3. Established peering arrangements from the contractor's network to the Internet
4. Access control provided by the contractor's network to ensure that the only incoming connections to WITS 3 IAS SDPs are from authorized users.
5. Support for the Government assigned and InterNIC registered IP addresses and domain names.

6. Primary and Secondary Domain Name Service to provide an authoritative name server for the customer's IAS.

### **C.2.9.2 Features**

The contractor shall provide the following features:

1. Electronic Mail Service. The contractor shall provide and manage individual mail accounts using Simple Message Transfer Protocol (SMTP), Post Office Protocol (POP), and Internet Messaging Access Protocol (IMAP) standards. The e-mail service shall support Multipurpose Internet Mail Extension (MIME) for application-specific binary attachments.
2. Web Hosting. The contractor shall provide a Web hosting service to host Government web pages. The Web hosting service shall be accessible 24 hours per day, seven days per week.
3. Web Authoring. The contractor shall provide an hourly rate to assist the Government in the development of Web pages and services.
4. Firewall Security Service. The contractor shall provide a firewall service which shall provide a completely transparent access process, including firewalls, management tools, integrity checkers, and intruder alarms. The firewall system shall be 100% Internet compatible. Individual IAS circuits may have different requirements for the Firewall Security Service feature. Offerors may propose additional CLINs for such firewall capabilities as virus scanning, site-to-site encryption, or url/java/active-x filtering. Such features will be evaluated for reasonableness but will not be included in the Government's Total Estimated Price.
5. Border Gateway Protocol (BGP). The contractor shall provide support for the border gateway protocol for WITS 3 customers with registered Autonomous System (AS) numbers.
6. Network News Transfer Protocol (NNTP) News Feed. The contractor shall provide as a feature a Usenet news feed and shall describe the Usenet NNTP news feeds that will be provided in its technical proposal. WITS 3 customers shall be able to choose whether to access the contractor's news feed server or to have the news feeds downloaded by the contractor to the customer's server.
7. Periodic Reports. The contractor shall provide the capability to deliver special reports detailing the performance of IAS connections for individual customers in accordance with Section G.2.2. The periodic reports described in Section G.2.1.7 shall include IAS activity and shall be provided as part of the basic service.
8. Dialup backup of dedicated ports. Transmission shall be provided separately using:
  - a) VS at a rate of 56 kb/s
  - b) ISDN BRI at a peak data rate of 64 kb/s

- c) ISDN BRI at a peak data rate of 128 kb/s
- 9. Electronic Directory Service. The contractor's Electronic Directory Service feature, at a minimum, shall provide:
  - a) The e-mail address of WITS 3 IAS subscribers,
  - b) International white page directory service, and
  - c) Support of the Lightweight Directory Access Protocol (LDAP) (RFC 1588).

The Government may require the contractor to synchronize its directory with the "US Government On-Line Directories" (usgold) in the future. Therefore, the contractor's directory schema and attributes for the Directory Information Tree (DIT)/Directory Information Base (DIB) shall be cognizant of the Government Electronic Directory Design document, which may be accessed via the Internet at <http://usgold.gov/>.

- 10. Service Level Guarantee. If the customer experiences an outage of at least 30 minutes in any 24-hour period, that customer shall receive one day's service credit.

The following additional features shall support the customer's intranet service requirements:

- 1. Intranet Access Control Facilities to ensure that only authorized users are allowed on the customer's intranet.
- 2. Service Assurance. This feature shall improve the availability of the customer's intranet connections as specified below by using such approaches as automatic restoration and reconfiguration:
  - a) Availability: At least 99.5 percent, calculated as described in C.2.1.10.4
  - b) Trouble identification: Less than 20 minutes
  - c) Time to restore: Less than 2 hours

### **C.2.9.3 Performance**

- 1. The contractor's infrastructure shall support best commercial practices against unauthorized access and threats from hacker, criminal, and terrorist activities. In addition, the contractor's infrastructure security shall comply with the OMB Circular A-130, which requires adequate security commensurate with the risk and magnitude of harm resulting from the loss, misuse, or unauthorized access to or modification of information.
- 2. Customer technical support shall be provided 24 hours per day, seven days per week. Support shall be available by toll-free phone and e-mail.
- 3. The contractor shall monitor the customer's connections and traffic 24 hours per day, seven days per week.

4. Disaster Recovery. The contractor shall provide disaster recovery to ensure that the Government's IAS is restored in cases of natural or other disaster situations. The contractor shall maintain and test the disaster recovery capability and include a description in the Contingency Plan .
5. Offerors shall propose a Service Level Agreement regarding IAS in their proposal. Areas of interest to the Government include, but are not limited to, the throughput, response time, latency, rate of premature disconnects, and the service availability. The service availability shall be measured in accordance with C.2.1.10.4, and the other parameters shall be measured between any two SDPs located in the WITS 3 service area. Offerors shall submit data characterizing their current IAS performance in their proposal. For each parameter reported, the measurement approach, reporting procedure, and approach for dealing with performance shortfalls shall be described. The contractor shall negotiate a Service Level Agreement with the Government prior to contract award. The contractor also shall negotiate individual Service Level Agreements to meet agency-specific requirements if requested by the GSA ACO.

#### **C.2.9.4 Interfaces**

##### **C.2.9.4.1 Line Side interfaces**

The contractor shall provide, at a minimum, IAS ports that support the following peak data rates:

1. 56 kb/s via dial-up service
2. 64 kb/s via dial-up service
3. 128 kb/s via dial-up service
4. 56/64 kb/s
5. 128 kb/s
6. 256 kb/s
7. 512 kb/s
8. 768 kb/s
9. 1.544 Mb/s
10. 4 Mb/s
11. 10 Mb/s
12. 16 Mb/s
13. 34 Mb/s
14. 45 Mb/s
15. 100 Mb/s
16. 155 Mb/s

- 17. 622 Mb/s
- 18. 2.488 Gbps
- 19. 9.953 Gbps
- 20. Speeds in excess of those above

The different scenarios illustrated are:

1. The customer provides all the equipment at the site, including the router and DSU/CSU. The contractor's interface would have the line-side and network-side interface at the same data rate. An example would be a line-side data rate of 1.536 Mb/s and a DS1 network-side interface. The contractor would provide the dedicated line from the SDP to connect to the contractor's POP. The customer could require the ISDN dial backup feature (see Table C.2-25). The customer's router and DSU/CSU would have to establish the connection to the backup circuit and return to the primary connection once service was restored.
  - a) The contractor provides the CSU/DSU and connects to the customer's router. The SDP would be at the WAN port on the router. An example would be a peak data rate of 1.536 Mb/s and a DS1 network-side interface from the contractor's CSU/DSU. The contractor would also provide the dedicated line from the SDP to connect to the contractor's POP. The customer could require the ISDN dial backup feature. The contractor's DSU/CSU would establish the connection to use the ISDN backup and return to the primary connection once service was restored.
2. The contractor provides the router and CSU/DSU. Each SDP would be a LAN port of the contractor's router at the site. The customer's LANs and routers at the site would connect to the SDP. For example, one SDP could be 10 Mb/s 10Base-T, a second SDP could be 100 Mb/s 100Base-FX, and a third SDP could be 100 Mb/s FDDI & GIG Ethernet. Each SDP would support a particular set of users. The contractor could meet the service requirements of the different SDPs using a Frame Relay T1 with a separate CIR for each SDP.
3. The contractor provides the firewall security service feature, the router, and CSU/DSU. Each SDP would support a specific set of users with a particular security policy. The data rates and interfaces on the line-side and network-side would be similar to scenario 3 above.

#### **C.2.9.4.2 Network Side interfaces**

The contractor shall select the appropriate WITS 3 service to connect the customer's SDP to the contractor's IAS serving office and shall price these access arrangements separately. Possible network-side interfaces include, but are not limited to, those listed in Table C.2-25:

**Table C.2-25. Possible IAS Network-Side Interfaces**

| WITS 3 Service   | Network-Side Interface   | Protocol   |
|--|--|--|
| Voice Service  | Analog dialup at 56 kb/s   | Point-to-Point Protocol, IPv4<br>IPv6 Ensure that services delivered support Federal Agencies as required to comply with OMB IPv6 directives |
| Circuit Switched Data Service                                | ISDN at 64kb/s and 128 kb/s<br>ISDN dial backup at 64kb/s and 128 kb/s   | Point-to-Point Protocol, IPv4<br>IPv6 Ensure that services delivered support Federal Agencies as required to comply with OMB IPv6 directives |
| Dedicated Transmission Service                               | T1<br>T3<br>OC3c<br>OC12<br>OC48<br>OC192<br>OCxx  | IPv4 over DTS<br>IPv6 Ensure that services delivered support Federal Agencies as required to comply with OMB IPv6 directives                 |
| Frame Relay Service  | 56 kb/s with 32 kb/s CIR<br>Fractional T1 (128 kb/s with 64 kb/s CIR, 256 kb/s with 128 kb/s CIR, 512 kb/s with 256 kb/s CIR, 768 kb/s with 384 kb/s CIR)<br>T1 (1.536 Mb/s with 768 kb/s CIR) | IPv4 over FRS<br>IPv6 Ensure that services delivered support Federal Agencies as required to comply with OMB IPv6 directives                 |
| Broadband<br>(xDSL, Cable, BPL, Wireless, Free Space Optics) | 56kb/s or higher   | IPv4<br>IPv6 Ensure that services delivered support Federal Agencies as required to comply with OMB IPv6 directives                          |
| Asynchronous Transfer Mode Service                           | T1<br>T3<br>OC3c   | IPv4 over ATMS<br>IPv6 Ensure that services delivered support Federal Agencies as required to comply with OMB IPv6 directives                |

**C.2.10 Gigabit Ethernet Service (GES) [OPTIONAL]**

**C.2.10.1 Basic Service Capability**

Gigabit Ethernet Service (GES), formerly called Fiber Distributed Data Interface (FDDI Network Service [FNS]), is a high-speed data service which uses shared

fiber network to allow for the interconnection of Local Area Networks (LANs) across selected metropolitan areas. GES consists of a dedicated fiber pair from the customer's premise to the serving central office (CO) that is equipped with GES equipment. GES delivers an interface of 10Mbps, 100Mbps or 1000Mbps (GigE) from customer LANs to the shared network. The shared network utilizes FDDI, Asynchronous Transfer Mode (ATM), Gigabit Ethernet or a combination of services to transport customer data across a metropolitan area.

The Government intends to use GES Support to connect Local Area Networks (LANs) across selected Metropolitan areas. GES shall allow creation of a network able to function as a shared public network. GES shall protect data privacy by using specialized screening software that permits subscribers to access only their data.

GES basic access service shall be offered to customers whose serving central office is equipped with the contractor's GES equipment and which is less than three fiber miles from the serving central office.

GES shall provide NATIVE LAN interface of Ethernet, Fast Ethernet, and 1000Mbps (GigE). All connections within a customer domain shall use the same access method (10M/100M Ethernet, or 1000Mbps (GigE). Multiple 100M Ethernet or 1000Mbps (GigE). Ports shall be served from the same GES-serving switch per customer domain, and shall not be extended across state jurisdictions.

Ethernet Services shall comply with the following standards, as applicable. After award, the contractor may propose alternatives at no additional cost to the Government that meet or exceed the provisions of the standards listed as follows:

1. Metro Ethernet Forum (MEF)
  - a) Ethernet Services Model, Phase 1. Technical Specification, MEF 1, November 10, 2003.
  - b) Requirements and Framework for Ethernet Service Protection in Metro Ethernet Networks. Technical Specification, MEF 2, February 8, 2004.
  - c) Circuit Emulation Service Definitions, Framework and Requirements in Metro Ethernet Networks. Technical Specification, MEF 3, April 13, 2004.
2. Internet Engineering Task Force (IETF)
  - a) RFC 3069
3. International Telecommunications Union (ITU)
  - a) G.8011.1/Y.1307.1, (g.epls, g.eota) Ethernet Private Line, in progress
  - b) G.8011/Y.1307, (g.ethsrv), Ethernet over Transport – Ethernet services framework, in progress
  - c) G.8012/Y.1308 (g.eint), Ethernet UNI and Ethernet over Transport NNI, in progress



- d) G.nni, Ethernet over transport network node interface, approval targeted for May 2004
- 4. Institute of Electrical and Electronics Engineers, Inc. (IEEE)
  - a) IEEE 802.3, 1Gbps LAN PHY, 10Gbps LAN PHY, 10Gbps WAN PHY
  - b) IEEE 802.3ae, 10Gbit Ethernet 802.17, Resilient Packet Rings (RPR) – In progress
  - c) 802.1ah, Ethernet First Mile – In progress
  - d) IEEE 802.1p
  - e) IEEE 802.1q
- 5. Ethernet in the First Mile Alliance – EFM standards for providing a single approach for transmitting Ethernet over copper, fiber optic point-to-point networks and fiber optic point-to-multi-point networks are in progress, in conjunction with the IEEE.
- 6. 10 Gigabit Ethernet Alliance
- 7. All new versions, amendments, and modifications to the above documents and standards when commercially available.

#### **C.2.10.2 Performance**

GES shall meet the performance and availability objectives consistent with the current tariffs on file with DC, MD, and VA. The service availability shall comply with the requirements of C.2.1.10.4.

#### **C.2.10.3 Interface**

GES shall deliver an interface of 10 and 100 Mbps or 1000Mbps (GigE) from the customer's LAN to the shared network. The shared network shall utilize ATM, Gigabit Ethernet, or a combination to transport the customers' data across a metropolitan area. GES shall comply with interface specifications proposed by the contractor and accepted by the Government.

#### **C.2.10.4 Features**

The contractor shall provide the following feature:

- 1. Customer Service Management (CSM). Provide customers with Web-based reports. Customers can extract "read only" network traffic information regarding their networks, to assist in monitoring and managing their network performance. CSM is provided per customer domain/virtual LAN (VLAN). CSM will be provided where conditions and facilities permit. The contractor reserves the right to temporarily interrupt CSM for maintenance, software upgrades, and in emergency situations.

### **C.3 Management and Operations**

As part of the service offering, the contractor shall ensure proper management and operation of the telecommunications services it provides. The contractor shall incorporate state-of-the-art web-enabled commercial Business Support Systems (BSS) and Operational Support Systems (OSS) in accomplishing these functions. The contractor shall prepare an OSS Verification Test Plan for each OSS selected for WITS 3 support. The contractor shall conduct verification testing of its OSS in accordance with its approved OSS Verification Test Plan. The contractor shall complete verification testing within 60 calendar days after the Government approves its OSS Verification Test Plan or within 60 calendar days after the Notice to Proceed, whichever is later. The contractor shall neither issue a Service Order Confirmation nor proceed with WITS orders until it successfully completes OSS verification testing

The contractor shall provide support in the following categories:

1. Sales and marketing
2. Service ordering
3. Operations support
4. Billing/Invoicing
5. Trouble handling
6. Customer training
7. Customer Service Center support

#### **C.3.1 Sales and Marketing**

The contractor shall market, promote, and sell WITS 3 services, features, and basic capabilities to customers. The contractor shall prepare a draft Marketing Plan as part of its proposal and update it quarterly, indicating how it will work with the Government to achieve the WITS 3 contract objectives defined in Section C.1.2. The contractor shall work with the Government in setting sales goals in terms of total revenue and new service development in the next three-to-six months. The contractor shall report on a semi-annual basis in the Marketing Plan on the results achieved.

The contractor shall take the lead in marketing, promoting, and selling WITS 3 products and services; and the contractor's sales forecasts will be the basis for the WITS 3 sales goals. These sales forecasts and sales goals will be negotiated with the Government. The Government will work with the contractor to achieve the WITS 3 sales and marketing goals, although the contractor will play the primary role in day-to-day sales/marketing activities. The GSA/NCR will be the contractor's primary customer contact throughout the WITS 3 service area.

The contractor shall meet at least monthly with the GSA/NCR staff to review results and plan next steps. The contractor shall provide a list of scheduled and

potential sales meetings between the contractor and the customer. The contractor shall notify the Government of any marketing/sales meetings of emergency or political implications. The Government reserves the right to accompany the contractor on any WITS 3 customer call.

The contractor shall measure in an objective, ongoing, and statistically significant manner the level of customer satisfaction with WITS 3 service. The Marketing Plan shall:

1. Report on the level of customer satisfaction and assess any changes. Customers who may be considering a reduction in their use of WITS 3 services shall be identified.
2. Recommend specific actions to improve customer satisfaction with the WITS program.
3. Forecast growth requirements for data services and other services new to the WITS program.

The contractor shall provide a Client's Guide on a quarterly basis to help WITS 3 subscribers order services, features, CPE, and other support services and become aware of new products and services. However, if the contractor and the Government agree that no significant changes to the Client's Guide are needed, the previous version may be retained. A draft of the Client's Guide shall be included with the proposal. The contractor also shall maintain a WITS 3 home page on the Internet, using information from the Client's Guide. The Government requires one working day to review updates to the home page.

The contractor shall describe how it will avoid conflicts of interest<sup>21</sup> between its WITS 3 marketing efforts and its direct sales to Federal users in the WITS 3 service area. In particular, the contractor shall describe how it will create incentives for its sales staff to sell WITS 3 services and features to Government subscribers in the NCR rather than market its own competing services.

### **C.3.2 Service Ordering**

The WITS 3 service ordering process shall, at a minimum, support the following functions.

1. Provide service price quotes
2. Initiate service orders
3. Track service orders
4. Change service orders
5. Accept service orders
6. Disconnect service orders

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<sup>21</sup>See Section J.2 (Glossary) for a definition of "conflicts of interest."

The contractor shall provide a single, toll-free point of contact in the contractor's Customer Service Center and shall maintain the contractor's WITS 3 Web page for agencies and GSA to obtain price quotes, place service orders, track service orders, and change them, using information from the Client's Guide. The required level of support shall include home page development, design, maintenance, and regular updates of WITS 3 services, products, and pricing.

Orders may be issued under this contract from date of contract award through the expiration date of the contract. All orders issued under this contract are subject to the terms and conditions of the contract. The contract shall prevail in the event of conflict with any order. All orders issued prior to expiration of the contract shall be honored and performed by the contractor according to all terms and conditions of the contract. Copies of all service orders shall be maintained by the contractor for the length of the contract, plus three years. (The fair opportunity process that will be employed to ensure that all WITS 3 contractors receive fair consideration for a service order is addressed in Section H.21, Fair Opportunity Process.)

#### **C.3.2.1 Provide Price Quotes**

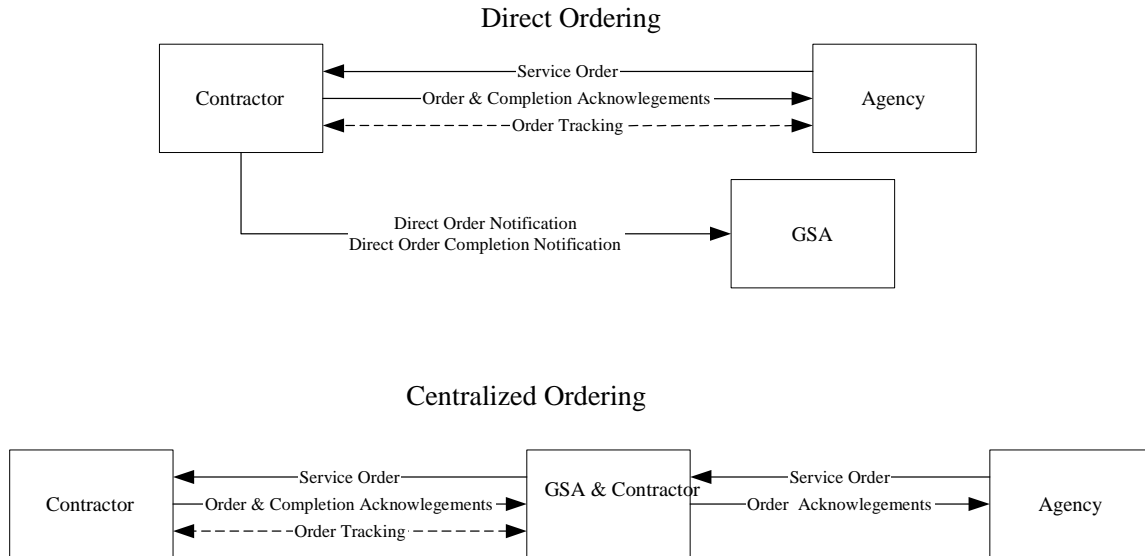
The contractor shall provide price quotes for WITS 3 services and features when requested by the customer. The price quote shall identify all recurring, non-recurring, and usage charges, the service availability date, the date when the price quote will become nonbinding, and appropriate descriptive information. The contractor shall provide the service price quote to the agency or GSA representative no later than five business days on existing CLINs after the request is made, unless a different timeframe is agreed upon between the contractor and the Government.

#### **C.3.2.2 Initiate Service Orders**

Service orders will be issued only by the Designated Agency Representative (DAR) of authorized users specified in Section H.2, Authorized Users. (Refer to G.1.1.6 and G.1.1.7 for a complete description of the responsibilities of the DAR Administrator and the DAR.) The contractor shall accept service orders to initiate, add, change, move, or disconnect service and service features. The contractor shall be responsible for directing and accomplishing all tasks associated with processing all service orders. If additional information or modification from the customer is required before service order processing can be completed, the contractor shall notify the DAR within two business days after receipt of the service order and shall specify the required information and action to be provided by the Government.

DARs will be appointed by the customer agency contracting officer or other designated entity and will be subject to the rules, regulations, and conditions promulgated and enforced by that agency. DARs will be responsible for each order, will sign and approve the order, and will be responsible for inspection and acceptance of the services ordered. After contract award, the contractor will be notified by the GSA ACO which agencies are authorized to order directly. Other

customers will place their orders through a GSA DAR (Centralized Ordering) as illustrated in Figure C.3-1. An electronic signature is required for on-line orders.



**Figure C.3-1. Centralized and Direct Ordering**

The contractor shall enable the agency or GSA DAR to submit service orders using the following media:

1. Contractor's WITS 3 Web Page
2. Electronic File transfer
3. Electronic mail
4. Facsimile

#### **C.3.2.2.1 Service Order Format**

The contractor shall propose and describe the format and content of the service order to be used by the Government. At a minimum, each order shall contain the following fields:

1. Time and date service order was submitted
2. Service order number (field is populated by the contractor after submission by the customer)
3. Agency Bureau Code - which uniquely identifies the agency
4. Billing Account Code - which uniquely identifies the agency cost center
5. Agency Hierarchy Code – which uniquely identifies to the GDIXC the line billing information.
6. Location Code - which uniquely identifies the building to be served

7. Service Delivery Point ID – location of service (field is populated by the contractor after submission by the customer)
8. Room number
9. User group order number (including priority) – which defines the Class of Service and the features that shall be assigned to the line
10. Point of contact and telephone number
11. Work description (including specific data such as classmark, equipment assigned)
12. Requested completion date
13. Status of service order (updated periodically by contractor)
14. Actual completion date and time (field is populated by the contractor following service acceptance by the customer)
15. Cost associated with service order (field is populated by the contractor after submission by the customer)
16. Identification of circuit and station line (field is populated by the contractor after submission by the customer)
17. Remarks

The contractor shall provide a means whereby GSA can gain electronic, on-line access to all service order data and agencies can gain electronic, on-line access to the agencies' own service order data. The contractor shall provide an updated description of its service ordering system, procedures, and the related ordering intervals within 30 calendar days after contract award.

After contract award, the contractor shall provide 60 calendar days' advance notice of any changes in the service order format and content and provide any necessary training to DARs.

#### **C.3.2.2.2 Service Availability Intervals**

Service orders shall be implemented within the following service availability intervals, to be provided by the contractor and offered by them, measured from the time the contractor acknowledges receipt of the service order to the time the order is accepted:

1. Standard service availability interval
2. Expedited service availability interval
3. Emergency service availability interval

The contractor shall support the Government in responding to emergencies (as determined by the Government ACO). The costs and service intervals for emergency orders shall be negotiated on an individual case basis.

Service orders requesting expedited service implementation shall take priority for completion over routine service orders submitted previously by the requesting

customer only and shall not be placed ahead of the orders of any other customer unless otherwise directed by the GSA Administrative Contracting Officer (ACO). Orders requesting emergency service implementation shall take precedence over all pending WITS 3 expedited and standard service orders.

The contractor may negotiate a service-availability date with the ACO or COR under the following conditions:

1. There is no standard service availability interval for the service or feature.
2. The DAR requests a service date before or beyond the applicable standard service-availability interval.
3. The contractor identifies equipment compatibility problems (C.2.1.6).
4. The contractor identifies inside wiring deficiencies (C.2.1.2).
5. The Government requires a Technical Engineering Assessment from the contractor due to the complexity or scope of the service order (i.e., the number of buildings, required geographic coverage, or required new technology may lead the Government to request a more detailed plan).

#### **C.3.2.3 Track Service Orders**

The contractor shall provide a means for the GSA and agency DARs to verify the status of each service order from the time the contractor acknowledges receipt of the service order to the contract expiration date. The contractor shall propose and implement an electronic mechanism for providing access to the contractor's WITS 3 service order database. Government DARs require an acknowledgment within one hour after entering a service order. (If the contractor's WITS 3 service order database is updated within one hour and the Government has access to this database, this requirement will be met.)

#### **C.3.2.4 Change Service Orders**

The Government has the right to cancel, modify, or change the due date or other parameters of a service order at any time prior to acceptance of the service order. The service order change date shall be the date the DAR provides written notice of the change order to the contractor.

#### **C.3.2.5 Accept Service Orders**

The contractor shall complete acceptance tests specified in Section E, Inspection and Acceptance, before delivering the service to the customer. The contractor shall be responsible for coordinating with any other contractors who may be involved in activating the service to ensure that everything necessary to complete the service order has been accomplished. The contractor shall verify that the service is activated and operational before delivering it to the customer. The contractor shall perform necessary adjustments or corrections to any service deficiencies, at no cost to the Government, during service activation.

When a service order is completed or partially completed, the contractor shall provide an order completion acknowledgment to the GSA or agency DAR. The

order completion acknowledgment shall include sufficient information to identify the effective service date, the SDP, Location Code, associated telephone numbers or circuit numbers, Billing Account Code, Agency Hierarchy Code, and whether the service order was partially or fully completed. (A service order is partially completed when some of the services ordered are accepted and some are not; e.g., five WITS lines out of six ordered have been accepted.)

#### **C.3.2.6 Disconnect Service Orders**

Service shall be physically terminated no earlier than 11:59 p.m. Eastern Standard Time on the service disconnect date required by the GSA or agency DAR unless otherwise coordinated. For billing purposes, service termination shall occur no later than 11:59 p.m. Eastern Standard Time on the service disconnect date required by the GSA or agency DAR.

#### **C.3.3 Operational Support Systems**

The contractor shall utilize state-of-the-art web-enabled commercial Business Support Systems and Operational Support Systems.

The following activities shall be supported by the contractor's systems:

1. Number administration
2. Moves, adds, and changes
3. Service visits
4. Operation, administration, and maintenance of GFP
5. Inventory management
6. Security services

##### **C.3.3.1 Number Administration Database**

The contractor shall maintain an on-line inventory of the telephone numbers assigned through this contract and shall update this database daily. The contractor shall ensure that the numbers assigned to the WITS 3 program are available for use when requested in accordance with FCC rulings on the period for reserving numbers. This database shall be available at the time of the initial acceptance of WITS 3 services and will be conveyed to the Government in an electronic format. The contractor shall provide updates each business day to the GDIXC service providers and give them the new WITS 3 telephone numbers and disconnect orders at least five calendar days before they are to be activated or disconnected. This update will include the Agency Hierarchy Code (AHC) which is a twenty eight digit number that is assigned by the Government to uniquely identify GDIXC billing information. In the event the service order due date is less than the standard interval, notification of the GDIXC service providers shall occur within one business day after service order acknowledgement. The contractor shall work with these service providers to maintain a current and accurate database of telephone numbers.



**C.3.3.2 Moves/Adds/Changes and Service Visits**

The contractor, as part of the basic service, shall provide the DAR with the on-line capability to request moves, adds, and changes of lines, trunks, services, features, and CPE through the WITS 3 service ordering process. Changes involving the dispatch of a technician are known as “hard” changes, and changes that may be accomplished without the dispatch of a technician are known as “soft” changes.

The contractor shall provide the means necessary to allow DARs, via a service order, to make incidental internal software reconfiguration changes related to the provision of WITS 3 services to such things as line features, classes of service, telephone numbers, and other aspects that do not require changes in the physical facilities.

The contractor, upon receipt of a service order for a move, disconnect, change of service, or other work authorized under the contract that does not require delivery of new system equipment or facilities, shall complete the work within the intervals set forth in Table C.3-1.

**Table C.3-1. Required Service Intervals for Adds/Moves/Change**

| <b>Required Completion Time after Receipt Of Order</b> |                 |                 |                               |
|--|-----------------|-----------------|-------------------------------|
| <b>Action Item</b>                                     | <b>Routine</b>  | <b>Expedite</b> | <b>Emergency</b>              |
| <b>Add/Move/Remove CPE</b>                             |                 |                 |                               |
| 10 or less per BAC per building per due date           | 5 working days  | 4 working days  | As directed by ordering agent |
| More than 10 per BAC per building per due date         | Negotiable      | Negotiable      | As directed by ordering agent |
| <b>Add/Move/Remove Local Area Network Interface</b>    |                 |                 |                               |
| 5 or less per BAC per building per due date            | 10 working days | 8 working days  | As directed by ordering agent |
| 6-10 per BAC per building per due date                 | 20 working days | 15 working days | As directed by ordering agent |
| More than 10 per BAC per building per due date         | Negotiable      | Negotiable      | As directed by ordering agent |
| <b>Add/Move/Remove Attendant Console</b>               |                 |                 |                               |
| 5 or less per BAC per building per due date            | 10 working days | 8 working days  | As directed by ordering agent |
| 6-10 per BAC per building per due date                 | 20 working days | 15 working days | As directed by ordering agent |
| More than 10 per BAC per building per due date         | Negotiable      | Negotiable      | As directed by ordering agent |
| Add/Move/Remove Subscriber Feature or Class of Service | 2 working days  | 1 working day   | As directed by ordering agent |

The contractor shall make billable service visits only in response to a customer request. That is, such service visits shall extend beyond the operations support provided by the contractor as part of the basic service. The scope of a service visit shall include, but not be limited to, implementing incidental equipment, such as telephones, workstations, and other CPE, integrating the customer’s legacy equipment and systems with the WITS 3 network, and technical support service to assist the customer with service ordering, adds/moves/changes, billing verification, number/address administration, inventory management, security management, or other operations support requirements.

**C.3.3.3 Technical Support**

The contractor is encouraged to provide technical support services that further enhance the value of its voice and data service offerings. Table C.3-2 lists a collection of general labor categories representative of the needs of WITS 3 customers. (Refer to Section J.12 for a description of the duties of each category.) The contractor shall determine which labor categories to provide and shall further set the qualifications associated with those labor categories. The contractor shall provide all offered technical support services on an hourly, monthly, and annual basis.

**Table C.3-2. Representative WITS 3 Labor Categories**

| Type of Service   |
|---|
| LAN/WAN Integrator  |
| Senior Database Analyst/Programmer                            |
| Database Analyst/Programmer                                   |
| Senior Applications Systems Analyst                           |
| Applications Systems Analyst                                  |
| Systems Engineer  |
| Voice Communications Specialist – Planning and Implementation |
| Data Communications Specialist – Planning and Implementation  |
| Organizational Development Manager                            |
| Organizational Development Specialist                         |
| Communications Analyst  |
| Senior Communications Analyst                                 |
| Cable Installer   |
| Cable Splicer   |
| Training Specialist   |
| Technical Draftsman   |
| Technical Writer/Editor                                       |
| Data Entry Operator   |
| Business Operations Manager                                   |
| Telecommunications Technician                                 |

| Type of Service  |
|--|
| Senior Telecommunications Technician                   |
| Program Manager  |
| Project Manager  |
| Senior Developer                                       |
| Senior Programmer                                      |
| Applications Project Manager                           |
| Graphics Designers                                     |
| Mid-Level Developer                                    |
| Junior Developer                                       |
| Asbestos Hazardous Materials Systems Technician        |
| Senior Asbestos Hazardous Materials Systems Technician |
| Documentation Specialist                               |
| Senior Network Systems Engineer                        |
| Senior Applications Systems Engineer                   |
| Engineering Assistant                                  |
| Call Center Project Management                         |
| Call Center Field Engineer                             |
| Call Center Application Design Engineer                |
| Wire Technician  |
| Repair Service Clerk                                   |
| Voice Mail Administrator                               |
| Voice Mail Clerk                                       |
| Special Clerk  |
| Repair Center Team Leader                              |
| Central Office Technician                              |
| Storekeeper  |
| Maintenance Administrator                              |

**C.3.3.4 Operations, Administration and Maintenance**

Operation, administration and maintenance (OA&M) work related to WITS 3 services is within the scope of the WITS 3 contract(s). Post award, the Government will define and WITS 3 contractors will be invited – as part of the fair opportunity process – to compete for orders for specific OA&M support to be performed for WITS 3 customer agencies. DOD activities at the Pentagon and Fort Belvoir are expected to be among the users ordering OA&M services. A general description of the work for the Pentagon and Ft Belvoir are provided below.

**C.3.3.4.1 Pentagon**

The contractor shall provide, at the Government’s request, OA&M support for government owned equipment such as, but not limited to, the LAN environment at the Pentagon, Command Communications Survivability Program (CCSP), SONET DWDM ring, and the Pentagon Lucent 5ESS switch. The contractor

shall maintain all switching, transmission, ancillary service, and related equipment providing WITS 3 services in a good state of repair in a manner that meets the requirements of the Original Equipment Manufacturer (OEM) or the contractor's commercial practices, whichever are more stringent.

#### **C.3.3.4.2 Fort Belvoir**

The contractor shall provide, at the Government's request, OA&M support for the current telephone and telecommunications (MSL-100) switching system, including: inside and outside plant facilities; the MSL-100 analog and digital voice services for users encompassing approximately 22,000 stations; and support for the Nortel MSL-100 switch and Remote Switching Units (RSUs). The contractor shall operate a 24 x 7 trouble desk to include emergency maintenance response and maintenance of the current provisioning system (NetPlus telephone management system developed by ACE\*COM), the OC-192 SONET Ring (linking the MSL-100 switch and the MSL-100 RSUs), and intra-LAN connectivity. The contractor shall provide service order and billing services. The contractor shall also provide services such as but not limited to: engineering, furnishing, installing, and testing inside plant, outside plant, telecommunications equipment, and LAN installation.

#### **C.3.3.5 Inventory Management**

The contractor shall propose and provide an inventory management system to track, by building and customer, the inventory of lines, equipment, services, features, telephone numbers, maintenance contractor's name and local repair number, the date of acceptance, and the dates that the warranties provided under this contract expire. The Inventory Report for all devices in service at any time during the service month shall be updated monthly, although CORs and designated DARs shall be able to retrieve the current version of the Inventory Report on demand electronically. Full inventories should be sent quarterly. Information in the contractor's Inventory Report (Section G.2.1.5) will be used by the Government to reconcile the amounts invoiced for lines, trunks, features, and CPE. The Government's inventory database will be updated at the time of the Notice to Commence Work and conveyed to the contractor in an electronic format. Full inventories shall be archived online for the full term of the contract plus two years to provide for historical baselining and research.

#### **C.3.3.6 Reserved**

#### **C.3.3.7 Security Services**

Telecommunications services provided under this contract will carry non-sensitive programmatic and administrative traffic, Sensitive But Unclassified (SBU) traffic, and higher levels of sensitive or classified traffic that have been encrypted by users. Therefore, appropriate security services are required. The contractor shall provide security services that are compatible with existing security devices and systems used by the Government. The contractor network equipment shall be certified to allow interconnection to the DSN. Initial network

software deployment as well as subsequent updates shall be accredited prior to deployment. The contractor shall implement and operate WITS 3 services and products in accordance with DOD Instruction 8500.2, DOD Instruction 5200.40, DoD Instruction 8100.3, and other Federal agency directives issued to meet the requirements of Office of Management and Budget (OMB) Circular No. A-130 - Management of Federal Information Resources. The contractor shall comply with the National Institute of Standards and Technology (NIST) Information Assurance Categories and Guidelines. In addition, the customer may request that contractors be subjected to DoD clearance procedures for physical access and data access. The contractor shall ensure that these services protect all facilities and services, portions of the contractor's network used to provide WITS 3 services, information, and information processing resources provided under this contract against threats, attacks, or failures of systems.

The contractor shall provide security within the infrastructure of the WITS 3 network against threats from hacker, criminal, and terrorist activities, consistent with commercial practice, which shall ensure availability of service, confidentiality, and data integrity of the WITS 3 transmission and switching systems, the support systems, and the databases being maintained by the contractor in support of WITS 3 services.

The contractor shall monitor potential security problems on an ongoing basis and alert WITS 3 customers (e.g., by telephone or e-mail) of threatening situations. The contractor must provide security reports showing login access records and physical access records. The contractor shall give customers the option of pre-authorizing the contractor to disable access to the Internet during a security event that the contractor deems to be serious.

The contractor shall include a *Security Plan* with the proposal that outlines the risks and the risk avoidance methodology and management that are to be implemented after contract award. The Security Plan shall address support of data integrity, confidentiality and availability and shall specifically address the contractors approach to ensuring compliance with WITS 3 security requirements. It shall be updated semiannually and shall address all aspects of security, identify major risks, and discuss how best to mitigate these risks. The Security Plan must be approved by the Government prior to acceptance of support systems or any service. Additional mandatory policy guidance is found in:

1. E-Government Act of 2002, Title III (Federal Information Security Management (FISMA)).
2. National Institute of Standards and Technology (NIST) Federal Information Processing Standards Publication (FIPS) PUB 199 – Standards for Security Categorization of Federal Information and Information Systems.
3. NIST FIPS PUB 140-2, Security Requirements for Cryptographic Modules.
4. Public Law 104-191, Health Insurance Portability & Accountability Act (HIPPA) of 1996.

### **C.3.4 Billing**

The contractor shall bill in arrears on a monthly basis. The contractor shall provide the Government two methods of billing.

1. **Centralized Billing:** The contractor shall invoice GSA and provide supporting data for payment and processing charges to all customers using centralized ordering. GSA will verify the charges and pay the centralized invoice.
2. **Direct Billing:** The contractor shall invoice each customer cost center that is using direct billing and provide supporting billing data. Each such customer will verify the invoice and directly pay the contractor.

GSA is responsible for paying the contractor only for the WITS 3 centralized invoices that charge the centralized billing user agencies or sub-agencies. GSA will not be responsible for any charges directly invoiced to any agency or sub-agency. The contractor shall be responsible for the collection of charges from directly billed agencies or sub-agencies. Although agencies will decide whether they want direct billing or centralized billing, the contractor shall be notified by the GSA ACO.

#### **C.3.4.1 Invoice Requirements**

Section J.6 defines the invoice content and format that shall be submitted by the contractor to GSA for processing in the Telecommunications Ordering & Pricing System (TOPS) billing system. All records defined and applicable shall be submitted in the same file. The file shall contain all charges for any given account. Multiple files may be submitted based on different billing cycles; however, any single customer account shall be completed within a single file. Multiple accounts may be in the same file.

The invoice requirements are as follows:

1. The contractor shall submit all centralized and direct billing invoices to the designated billing offices by the agreed dates each month.
2. The invoice format shall be capable of accommodating new services and features at no cost to the Government.
3. The contractor shall allow the Government to audit the contractor's billing process in accordance with Section G.1.5 (Quality Management Audits).
4. The contractor shall provide a single consolidated invoice for WITS 3 services to the Government (centralized billing) and each agency cost center (direct billing) each month.
5. Monthly WITS 3 charges shall include the WITS 3 Associated Government Fee(s) in accordance with Section H.25.
6. The contractor shall be capable of delivering invoices and billing verification data to GSA and agencies electronically for viewing and file transfer using the format specified in Section J.6. When requested by an

agency or GSA, the contractor shall also provide this information via CD-ROM.

7. The contractor shall itemize all mandatory state and local taxes, surcharges, and fees on the invoice in accordance with Sections H.16, State and Local Taxes and H.27, Surcharges and Fees.
8. Each invoice shall reflect all charges from the first to the last day of the billing cycle. The contractor shall charge for all services, features, and equipment within three billing cycles after the services were rendered. All charges not submitted within three billing cycles shall be borne by the contractor unless a request for extension is formally approved by the ACO.
9. The contractor shall ensure that each invoice contains all pricing components in sufficient detail to reconcile charges with completed orders or actual usage. The contractor shall ensure that all charges, credits, and debits are shown on the invoice and that no additional data are required by the Government to verify the price of a call or feature and to verify the amount of discounts, credits or debits. In calculating applicable taxes, the contractor shall not impose tax on the WITS 3 Associated Government Fee(s) (see Section H.25, WITS 3 Associated Government Fee(s)) or regulatory surcharges and fees (see Section H.27, Surcharges and Fees).
10. The contractor shall bill the Service Initiation Charge in one lump sum, indicating waived or discounted charges, on the invoice following acceptance by the Government of the service contained in the completed service order.
11. For other reimbursable charges, such as Other Direct Costs, the contractor shall ensure that the invoices reflect the contractor's actual charges for a specific service order. The Government will not pay any charges that are not agreed upon between the contractor and the DAR and that are not specifically stated in the service order.

#### **C.3.4.1.1 Reserved**

#### **C.3.4.1.2 Invoice Preparation**

As specified in Section J.6, the contractor shall prepare all invoices (for both direct and centralized billing) in accordance with the Government's Agency Bureau Code, Billing Account Code, Location Code, and Service Delivery Point ID. These codes will permit each customer to be billed for WITS 3 services actually used. The Government requires the basic capability to receive billing data in at least a four-level hierarchy (e.g., Agency Bureau Code, Billing Account Code, Location Code, and telephone number). Each invoice shall also include the service order number specified on the service order. The contractor shall make available an electronic invoice for all goods and services within 10 calendar days of the period being billed to the customer. A summary bill detail report containing the total charges by agency must accompany the invoice when

submitted. The contractor shall also make available the usage details, e.g., CDR records, within 10 calendar days following the period being billed.

#### **C.3.4.1.3 Centralized Billing**

The contractor shall submit all centralized invoices to the designated billing office at the address indicated below:

FOR CENTRALIZED BILLING CUSTOMERS

(Will be specified after contract award)

#### **C.3.4.1.4 Direct Billing**

The contractor shall submit direct bills to each authorized customer at the customer addresses indicated below:

DESIGNATED BILLING OFFICE ADDRESSES

FOR DIRECT BILLING CUSTOMERS

(Will be specified after contract award)

Within 90 calendar days after notice is given by the GSA COR, the contractor shall change a customer from centralized to direct billing, or vice versa, at no additional cost to the Government.

#### **C.3.4.1.5 Use of Credit Cards**

The contractor shall permit all authorized users (see C.1.3.1) to purchase WITS 3 products and services using Government credit cards. Otherwise, the contractor shall establish a merchant account with each of the SmartPay contractors. For more information about GSA's SmartPay program, visit the web site at [http://www.gsa.gov/Portal/gsa/ep/contentView.do?contentType=GSA\\_OVERVIEW&contentId=10141&noc=T](http://www.gsa.gov/Portal/gsa/ep/contentView.do?contentType=GSA_OVERVIEW&contentId=10141&noc=T).

#### **C.3.4.1.6 Invoice Data Retention**

The contractor shall maintain all original paid invoices and other related records for the length of the contract plus three years after the expiration of the contract. The contractor shall make this data available to Government auditors within ten business days after a formal request is received by the contractor. Archived information shall be provided in a mutually acceptable electronic format.

#### **C.3.4.1.7 Trouble or Service Outage Credits**

The contractor shall provide a mechanism for uniquely identifying service outages and allowing the Government to reconcile credits with associated outages. The contractor shall credit the affected customer as specified in Section H.12, Credits and Consideration for Failure to Provide Service to Meet Contract Requirements. Also the contractor shall provide a web-enabled tool which allows the tracking of Billing Adjustments. Within three billing cycles after resolution of the service outage, the service outage credit shall be processed



through the contractor's billing system and appear on the invoice and the Billing Adjustments Summary Report.

#### **C.3.4.1.8 Invoice Changes**

Agencies or sub-agencies that elect direct billing may request invoice changes to their invoice content or format through contract modifications via the agency ACO. Charges for invoice formats that differ from the standard WITS 3 invoice format shall be addressed on an individual-case basis. Note that any invoice changes made in response to an agency request will affect the invoice for that agency only, and will otherwise have no effect on the invoicing requirements defined herein.

#### **C.3.4.1.9 Billing Verification**

The Government requires evidence that each charge has been properly authorized and priced correctly, or it may dispute the charge. The contractor shall provide all of the supporting information needed by the Government to fully verify each WITS 3 invoice with the invoice or provide read-only access to this information in near-real time. The contractor shall provide billing verification assistance via the Customer Service Center and the WITS 3 Web page as part of the basic service. The contractor shall provide the end-user software report generation tools (e.g., to read CDRs and other billing support information) that are available to its commercial customers as part of the basic service.

#### **C.3.4.2 Billing Disputes**

The contractor shall resolve billing disputes directly with the dispute initiator unless the dispute involves the terms and conditions of the WITS 3 contract, in which case the dispute shall be resolved with the GSA ACO. The contractor shall propose a mechanism for uniquely identifying each billing dispute to permit the dispute initiator to track the status of a dispute. The contractor shall resolve billing disputes to the satisfaction of the dispute initiator within 60 calendar days following official notification from the Government. The contractor shall take a proactive lead in resolving disputes promptly with the initiator of the dispute by establishing and maintaining meaningful dialogue directed toward a prompt, fair, and equitable resolution. In cases where a resolution is not forthcoming, the contractor shall submit partial resolutions (less than the total amount in dispute) to the dispute initiator for acceptance or denial. The Government COR or the dispute initiator will respond within five business days with a proposed resolution. If either party wants to escalate the dispute to the ACO (GSA ACO for centralized billing or agency ACO for direct billing) at any time, it may do so. Disputes that are not resolved within 60 calendar days or the approved extension time shall be escalated to the ACO (GSA ACO for centralized billing and agency ACO for direct billing). Any disputes escalated to the ACO will be resolved in accordance with FAR 52.233-1 (Disputes). The contractor shall propose an automated system that can track the progress of the billing disputes.

Once a dispute is resolved, the contractor shall process the associated credit or debit within two billing cycles, making sure that the debit or credit and the associated billing dispute identifier are clearly documented in the invoice and assigned to the proper level of the invoice prescribed by the Billing Account Code.

#### **C.3.4.3 Right to Withhold Payment**

The Government reserves the right to withhold a partial or entire payment of an invoice in dispute as detailed in FAR 52.232-1.

#### **C.3.5 Trouble Handling**

Trouble handling includes the procedures for diagnosing and clearing troubles by telephone, trouble reporting, entry, tracking, analysis, priority classifications, and escalation to ensure that problems are resolved in a timely manner. By definition, a “trouble” is a report entered by the contractor or a subscriber regarding a possible failure of the WITS 3 system.

The contractor shall propose and describe a 24X7 trouble-handling process for the WITS 3 system. The scope of the trouble-handling system shall include all facilities owned or leased by the contractor, and all facilities and services that interconnect with the WITS 3 network and shall include the following functions:

1. Centralized trouble reporting.
2. Determining the cause of and correcting troubles.
3. Working cooperatively with other contractors and Government representatives to resolve problems.
4. Maintaining audit trails of trouble resolution activities.
5. Responding to subscriber inquiries regarding trouble resolution status.
6. Providing trouble escalation for normal and emergency events.
7. Monitoring trouble report management and escalation procedures.
8. Providing trouble report and performance information to customers.

##### **C.3.5.1 Trouble Reporting**

The contractor shall provide a single point of contact for trouble handling. Customers shall be able to submit trouble reports to the point of contact 24 hours a day, seven days a week. The contractor shall be able to receive trouble reports by toll-free telephone, electronic mail, facsimile, and via the World Wide Web.

The WITS 3 contractor, acting as the Government’s agent, shall be responsible for preventive and restorative maintenance and shall initiate trouble calls as necessary. GSA normally will initiate trouble calls only as a user of WITS 3 services. An exception would be when GSA is coordinating priority restoration of

WITS 3 services and facilities, as described in Section C.6 (Priority Restoration of Facilities and Services).

The contractor shall maintain audit trail of WITS 3 trouble resolution activities for the duration of the contract.

#### **C.3.5.2 Escalation Procedures**

The contractor shall propose and provide an escalation procedure, with appropriate time intervals, for each service category provided under this contract. Point of contact names, titles, telephone numbers, electronic mail address, and facsimile number shall be provided to the Procuring Contracting Officer (PCO) at contract award. Changes to the point of contact information shall be provided to the GSA and agency ACOs within one business day when changes are made.

The point of contact shall be responsible for coordinating trouble isolation and repair efforts within the contractor's organization, between other service providers who may be involved in resolving the problem, and the COTR. The point of contact shall be responsible for escalating all troubles not resolved in the required time frames. The point of contact shall stay actively involved with the trouble resolution process from start to completion.

The contractor shall resolve trouble reports on a routine and emergency basis. The trouble report will specify whether emergency or routine handling is required.

#### **C.3.5.3 Routine Restoration**

For routine trouble reports that involve a user without service, the maximum allowable time to resolve service shall be the next business day if a site visit is required or four hours if a site visit is not required unless a different clearing time objective is agreed upon by the contractor and the Government.

#### **C.3.5.4 Emergency Restoration**

Emergency restoration requirements are discussed in Section C.6 (Priority Restoration of Facilities and Services).

#### **C.3.6 Customer Training**

The contractor shall provide customer training to the following groups:

1. Contracting Officer's Technical Representatives (COTRs) and Contracting Officer's Representatives (CORs).
2. Designated Agency Representatives (DARs).
3. End-users of WITS 3 services.
4. Government trainers.
5. Government executives.

This training shall be provided as part of the basic service when a WITS 3 service or feature is being provided to a site for the first time, when a new service

is being introduced, or when a major upgrade is being implemented. The contractor shall include a draft *Customer Training Plan* in its proposal and submit a final version within 20 business days after receiving the Government's comments.

The training shall be conducted on Government premises or contractor premises or via the World Wide Web at the discretion of the Government. When the training is conducted at a contractor site, the contractor shall provide an appropriate classroom environment and all necessary equipment and support. When the training is conducted at a Government site, the Government will provide the necessary space and environmental support. The Government may inspect training facilities and may observe training being performed by the contractor to ensure compliance with the contract.

### **C.3.6.1 COR and COTR Training**

The contractor shall train designated WITS 3 COTRs and CORs to understand fully all WITS 3 services and features as part of the basic service. Class size shall be limited to a maximum of 20 students, and classes shall begin prior to cutover at a time that is acceptable to the contractor and the Government. At a minimum, each student shall receive at least 10 hours of classroom training and 10 hours of "hands-on" laboratory training so that they become proficient in performing such tasks as:

1. Using all available WITS 3 support systems.
2. Obtaining all of the contractor's data regarding WITS 3 performance on a read-only basis.
3. Obtaining price quotes for WITS 3 services and features.
4. Ordering WITS 3-related CPE from the contractor via CLINs or ODCs.
5. Placing a service order electronically to add, change, cancel, or disconnect services.
6. Adding or changing the features, calling privileges, telephone number or other line attributes than can be changed via "soft" reconfigurations.
7. Calling the contractor to the site for WITS 3-related operational support.
8. Obtaining status reports from the service order tracking system.
9. Accepting or rejecting a service order or part of a service order.
10. Reconciling a WITS 3 invoice.
11. Initiating and tracking billing disputes.
12. Placing and tracking trouble reports for routine and emergency troubles.
13. Identifying and preventing WITS 3 fraud.
14. Using the contractor's security services.

15. Obtaining and analyzing each of the WITS 3 reports described in Section G.2.

### **C.3.6.2 DAR Training**

The contractor shall train WITS 3 DARs to understand fully all WITS 3 services and features as part of the basic service. Class size shall be limited to a maximum of 20 students, and classes shall begin prior to cutover at a time that is acceptable to the contractor and the Government. At a minimum, each student shall receive at least 10 hours of classroom training and 10 hours of “hands-on” laboratory training so that they become proficient in performing such tasks as:

1. Obtaining price quotes for WITS 3 services and features.
2. Ordering WITS 3-related CPE from the contractor via CLINs or ODCs.
3. Placing a service order electronically to add, change, cancel, or disconnect services.
4. Adding or changing the features, calling privileges, telephone number or other line attributes than can be changed via “soft” reconfigurations.
5. Calling the contractor to the site for WITS 3-related operational support.
6. Obtaining status reports from the service order tracking system.
7. Accepting or rejecting a service order or part of a service order.
8. Reconciling a WITS 3 invoice.
9. Initiating and tracking billing disputes.
10. Placing and tracking trouble reports for routine and emergency troubles.
11. Identifying and preventing WITS 3 fraud.
12. Using the contractor’s security services.

### **C.3.6.3 End User Training**

The contractor is responsible for providing initial training to all end users. The contractor shall provide a minimum of two hours of classroom training and two hours of laboratory training to end users of such services who request training. Class size shall be limited to 40 students, and classes shall begin prior to cutover at a time that is acceptable to the contractor and the agency.

### **C.3.6.4 Training Government Trainers**

Government trainers will be responsible for remedial training. The contractor shall be responsible for training up to one Government trainer per agency per building. The trainer responsible for a particular site shall be trained prior to cutover at a time that is acceptable to the contractor and the Government. Class size shall be limited to a maximum of 10 students, and the length of the class shall be at least four hours. The training shall be supported by appropriate desktop reference guides, Internet-based instruction, or other appropriate media

targeted to first-time end users and users in need of remedial training. The contractor shall distribute Government-provided brochures to each Government trainer at the time of training.

### **C.3.6.5 Executive Level Training**

The contractor shall train heads of agencies and departments and senior-level staff to use WITS 3 services and provide effective oversight. At a minimum, this course shall provide an overview of the WITS 3 architecture, services, features, support systems, backup and recovery, and procedures for priority restoration of services and facilities. Class size shall be limited to a maximum of 12 students, the length of the class shall be at least two hours, and classes shall be conducted prior to cutover.

The contractor shall work with the COTRs and CORs to schedule training sessions and to arrange for appropriate facilities to conduct the training. The contractor shall accommodate requests for additional or makeup training by the Government when requested.

### **C.3.7 Customer Service Center**

The Customer Service Center shall be staffed 24 hours a day, seven days a week. Users shall be able to access the Customer Service Center by dialing a toll-free number or by accessing the contractor's WITS 3 Web page. The Customer Service Center shall be the customer's primary point of contact with the contractor for operational issues after service is accepted.

The contractor shall make customer service representatives available to users with service planning, feature assignments, service order planning, billing reconciliation, inventory control, or trouble resolution. The Customer Service Center shall operate a Help Desk to assist subscribers experiencing difficulty using WITS 3 services, features, or equipment and provide training where required. These services shall be provided as part of the basic service. Supplemental training or remedial training that is authorized by the appropriate DAR may be provided for an additional fee, in accordance with C.3.6.

The Customer Service Center shall provide technical support to users in developing applications for WITS 3 service, trouble shooting CPE interfaces, planning and implementing internetworking requirements, and addressing other technical requirements that are related to the provision of WITS 3 services and features as they arise. Technical support normally shall be provided as part of the basic service. When technical support that exceeds this base level is requested, the contractor shall act only after verifying that the visit has been authorized by the appropriate DAR.

## **C.4 Equipment**

The offeror shall provide Network Equipment and CPE CLIN lists with the proposal, based on the draft CLIN lists in Section B.11, Additional Pricing Tables. The contractor shall update these lists within 45 days after receiving the

Government's comments after contract award and semiannually thereafter, or more frequently at their discretion.

#### C.4.1 General Requirements

The contractor shall meet the following general requirements in acquiring, provisioning, operating, administering, and maintaining required equipment:

1. **COTS.** All equipment shall be commercially available "off the shelf" items requiring no further development, and shall have been fully tested or demonstrated in the commercial or Government marketplace, unless otherwise specified.
2. **Network Compatibility.** The contractor shall ensure that all network equipment and CPE ordered under this contract are compatible with the existing WITS CPE (to the extent that commercial standard interfaces and implementations exist to support such compatibility in accordance with C.2.1.6), the Government Designated Interexchange Carrier (GDIXC) network, the local exchange network, and the commercial interexchange telephone networks.
3. **CPE Orders.** GSA and agency CORs will order CPE directly from the contractor, in accordance with C.3.2, Service Ordering.
4. **Network Equipment Orders.** Most network equipment will be ordered by the Government via service orders in accordance with C.3.2. The contractor may order network equipment without prior Government approval in emergency situations in accordance with C.7.2, System Changes.
5. **Code Compliance.** All work done by the contractor under this contract shall comply with all applicable national and local codes.
6. **Equipment Marking.** All equipment purchased by the Government under this contract shall be permanently marked with the maintenance contractor's name and local repair number, the date of acceptance, and the date that the warranty ends. A copy of this information also shall be stored in the contractor's WITS 3 Inventory Management System in accordance with C.3.3.5.

#### C.4.2 Representative Equipment

The contractor is encouraged to provide CPE that further enhance the value of its voice and data service offerings. The table below lists a collection of equipment representative of the needs of WITS 3 customers. The contractor shall determine and specify equipment available for sale.

**Table C.4-2. Representative WITS 3 Equipment**

| Equipment Category/Item |
|-------------------------|
|-------------------------|

|                                    |
|------------------------------------|
| Handsets                           |
| Key Systems                        |
| PBXs                               |
| Multiplexers                       |
| ACDs                               |
| IVRs                               |
| Messaging Systems                  |
| Gateways                           |
| Wireless Equipment Systems         |
| Cable Modems                       |
| CSU & DSU                          |
| Servers                            |
| Switches                           |
| Routers                            |
| Storage Network Systems            |
| Free Space Optics Systems          |
| Power and Battery Systems          |
| Circuit Termination Equipment      |
| Ancillary Equipment                |
| Broadband over Powerline Systems   |
| LAN Systems                        |
| Voice & Video Conferencing Systems |

### **C.4.3 CPE Requirements**

The term “CPE” used throughout this RFP is generic. It is the Government’s desire for the contractor to propose a comprehensive set of CPE that supports and complements the two service categories. The contractor is encouraged to use multiple vendors to support the service categories and satisfy user requirements as appropriate. The Government recognizes that the specific model numbers and specifications for proposed equipment on the CPE list can change rapidly. Therefore, if a specific CPE model number is not available at the time of order, the contractor shall offer equivalent or greater functionality at a comparable price.

#### **C.4.3.1 Provisioning Process**

Equipment acquired under this contract shall be provisioned in accordance with the process described in C.3.2, Service Ordering.

#### **C.4.3.2 Installation**

The contractor shall furnish, install, and make operational all equipment in the type, quantity, and configuration ordered. The contractor shall provide all required installation hardware, supplies, and tools necessary to install, move, program, test, maintain, and repair all GFP or contractor-provided equipment purchased under this contract. All power supplies and equipment cabinets



installed by the contractor shall be grounded in accordance with the manufacturer's recommendations and with applicable codes. All work shall conform to accepted telephone installation and repair practices and the recommended practices of the manufacturers of the equipment and materials used.

#### **C.4.3.3 Deinstallation**

Deinstallation of equipment includes all labor, tools, and incidental parts or material necessary to accomplish equipment removal, including equipment cabling, when requested by the Government. Deinstallation of contractor-owned or leased equipment, including storage, packaging for shipment, or transportation, shall be provided by the contractor.

The Government will order any deinstallations of any equipment purchased from the contractor under this contract via a service order in accordance with C.3.2, Service Ordering.

Within five business days after receiving an agency's written request to deinstall an item of equipment that was not purchased from the contractor, the contractor may, at his option, arrange with the requesting agency to establish a completion date for examination of the equipment that has been tendered for deinstallation. The completion date for this examination shall be no later than one month after receipt of the deinstallation request except when the Government agrees to a later date. The contractor shall notify the requesting agency in writing of any equipment which is not acceptable for deinstallation under this contract and shall state in writing the reasons for the rejection. Failure to so notify the requesting agency within five business days after the agreed examination completion date shall constitute acceptance by the contractor of all equipment listed on the formal deinstallation request.

Deinstalled GFP may be designated by the GSA COTR to be used at another building or stored by the Government. Costs will be negotiated on a case-by-case basis and shall not be included in the contractor's initial proposal.

#### **C.4.3.4 CPE Maintenance**

The contractor shall maintain specified CPE. This shall include all CPE purchased from the contractor and other CPE that is in good operating condition. Equipment shall be considered to be in good operating condition only if it is performing or capable of performing all intended functions and if there are no missing or broken parts. The contractor shall also supply support for discontinued products, including, but not limited to outdated PBXs, fiber optic repeaters, and discontinued model telephone sets as long as commercial sources exist for this support.

Within five business days after receipt of an agency's written request to maintain an item of CPE or a category of CPE (which may not have been purchased from the contractor), the contractor may, at his option, arrange with the requesting agency to establish a completion date for examination of the equipment that has

been tendered for maintenance support. The completion date for examination shall be no later than one month after receipt of the maintenance request except when the Government agrees to a later date. The contractor shall notify the requesting agency in writing of any equipment that in the contractor's opinion is not in good operating condition and therefore is not acceptable for maintenance support under this contract and shall state in writing the reasons for the rejection. Failure to so notify the requesting agency within five business days after the agreed examination completion date shall constitute acceptance by the contractor of all equipment listed in the formal request. If the Government and the contractor disagree that the equipment is in good operating condition, the dispute shall be adjudicated in accordance with FAR 52.233-1.

When the contractor has examined equipment that has been tendered for maintenance support and has concluded that the equipment is conditionally acceptable pending repair, the contractor shall provide the agency with an estimate for the cost of repair. The agency will advise the contractor if the repair is authorized; and, if so, will issue a service order. If the proposed prices are rejected, the Government may obtain required maintenance services from another source or sources.

### **C.5 Transition to WITS 3**

Transition is the coordinated transfer of service from the WITS2001 contractor to a WITS 3 contract. Transition also includes the transfer of service from one WITS 3 contractor to another WITS 3 contractor and the transfer of service from the WITS 3 contract to a follow-on contract or service arrangement.

The contractor is reminded that WITS customers will choose the contract vehicle that best meets their local telecommunications requirements. The WITS 3 contract is an IDIQ arrangement. The number of subscribers that will transition to the contractor's network is unknown.

#### **C.5.1 Transition Objectives and Responsibilities**

The contractor shall be responsible for maintaining service transparency to the Government during transition to and from the WITS 3 contract by meeting all service delivery schedules and assuring that all services and features conform to contractual specifications and customer requirements. GSA will monitor the contractor's transition performance and assist in coordination between WITS clients and contractors as required.

#### **C.5.2 Transition Planning and Implementation**

The contractor shall address two forms of transition:

1. The initial transition to the contractor's WITS 3 network.
2. The transition from the contractor's WITS 3 network to a follow-on network provided by another WITS 3 contractor, a separate contract, or other

service arrangement shall be conducted as specified in Section H.34, Continuity of Services.

### **C.5.2.1 Initial Transition to the WITS 3 Network**

Project management and execution of WITS 3 transition activities will be based on Government-approved contractor-prepared plans. The following plans shall be provided by the contractor.

- 1. The Transition Management Plan (TMP).** This plan describes the contractor's general approach to the project management of transition, including the contractor's project management process, procedures, and tools for all WITS 3 transition activities. The TMP is a Government-wide plan applicable to all of the contractor's transition activities for all agencies. This plan shall be submitted with the proposal and revised 45 days after receiving the government's comments. It shall be updated as required. The TMP shall address the following areas as well as additional areas proposed by the contractor:
  - a) Management Support. The contractor shall address the billing, service ordering, trouble reporting, and customer service processes that are proposed for the transition period. The contractor shall describe these processes from the perspectives of the GSA COR, agency COR, and the subscribers.
  - b) Service and features. The contractor shall describe how all existing WITS2001 services and features will transition to the contractor's WITS 3 network in a manner that is transparent to WITS subscribers.
  - c) Interconnection plan. The contractor shall describe the interconnection arrangements between the WITS2001 and the WITS 3 networks during the transition, including the interconnection arrangements with the local exchange network, the IXCs, and Government private networks. The contractor shall describe how the service performance requirements will be met during the transition period and describe the phases of the transition.
  - d) Transition contingency plan. The contractor shall describe how service will be restored if unforeseen difficulties are encountered at any stage of the transition. The contractor shall assess the major transition risks and propose how they should be mitigated.
  - e) Project management. The contractor shall describe how the project office will be staffed and its relationship to the contractor's headquarters and with the Government. The contractor shall describe how it will keep the Government apprised of the status of the transition and describe how routine and emergency communication with the Government will be accomplished.
- 2. The Cutover Test Plan (CTP).** This plan describes the contractor's general approach to cutover testing for each service during service

installation as described here and in Section E.2.1, Cutover. The contractor shall provide all necessary test equipment, data terminals, load boxes, test cables, and any other hardware and software required for system testing. This plan shall be submitted with the proposal and revised 45 days after receiving the government's comments. It shall be updated as required. The CTP shall address the following areas as well as additional areas proposed by the contractor:

- a) The processes and procedures that will be employed for testing,
- b) The parameters to be measured, the measurement procedure, and the pass/fail criteria.

**3. The Agency-Specific Transition Plan (ASTP).** This plan identifies the contractor's project management processes, procedures, tools, and implementation scheduling specifically tailored to the transition of a customer's service requirements to the contractor's network. This plan shall be prepared by the contractor, as requested by the customer, upon notice to commence work. The ASTP shall address, on a building by building basis, the following areas as well as additional areas requested by the agency or proposed by the contractor:

1. Network map that includes the customer's address, SDP by service type, and number of lines and trunks. (The Government will provide an updated list of customer information at the time of the Notice to Commence Work.)
2. Proposed approach and physical route to connect each building to the contractor's WITS 3 network, including identification of the number and type of access lines and trunks.
3. Site specific design plan to include:
  - a) Site preparation and implementation requirements for each building.
  - b) Interim and final configuration to include hardware (type, manufacturer, model), software, special circuit arrangements, environmental and electrical requirements, equipment room layouts, Main/Intermediate Distribution Frame/riser cable diagrams (if needed), and any special design requirements.
  - c) Numbering plan and dialing plan, identifying blocks of telephone numbers, if any, that will have to change
  - d) Interface equipment for CPE, including identification and location of special systems integration requirements.
4. Installation/service implementation schedule.
5. Site-specific cutover test plan.
6. Contingency plan to restore existing services.

### **C.5.2.2 Reserved**

### **C.5.3 Transition Oversight**

For each service order, the contractor shall provide a single point of contact for service implementation. The contractor shall ensure that the point of contact, or the designated alternate, is accessible by telephone or pager during the time periods when service implementation activities are taking place. The contractor shall coordinate with the COR, customers, subcontractors, and other service providers during the service implementation. The contractor shall inform the COR when activities, including installation and cutover testing, are scheduled at a building.

The contractor shall complete the implementation of each service order within the agreed service availability date.

## **C.6 Priority Restoration of Facilities and Services**

Telecommunications requirements for service and facility restoration are based on a set of telecommunications policies and procedures that exist to ensure critical Government needs are met when an actual or potential emergency threatens the security or socio-economic structure of the United States.

### **C.6.1 Contractor COOP**

The Contractor shall have a Continuity of Operations Plan (COOP) designed to ensure continuing Contractor telecommunications support to the government in the event of natural disasters, acts of terrorism, etc. The Contractor may additionally offer support for the government's COOP as requested by the government.

### **C.6.2 Government COOP**

The government requires the ability to acquire and test communication capabilities in support of agency(s) planning and execution for COOP. COOP planning includes exercises and support of real world circumstances. COOP provisioning can use alternate operation sites outside the NCR service area (Section C1.3.2). The contractor shall adhere to, but not be limited to, PDD-NSC-67, FEMA 9230.1-PL and government agency regulations.

Sites by NPA-NXX are shown in Table J.3-1 and J.3-2 published in the WITS Hosting Center.

### **C.6.3 Emergency Restoration of WITS 3 Facilities and Services**

The contractor shall support the following requirements for restoring services during emergencies. For emergency trouble reports, the maximum allowable time to respond to a trouble report shall be two hours and the maximum allowable time to restore service shall be four consecutive hours unless a different clearing time objective is agreed upon by the contractor and the

Government. The contractor shall provide emergency restoration in response to any of the following occurrences:

1. Catastrophic failure of single or multiple switching systems
2. Catastrophic failure of single or multiple transmission systems
3. Switching locations isolated due to equipment or facilities failures
4. Loss of system access to the Local Exchange Network
5. Failure of the mated STPs or ISCPs
6. Buildings isolated due to equipment or facilities failures
7. Loss of system access to GDIXC
8. Loss of system access to the Internet
9. Disruption of service to users or circuits designated as critical by the Government
10. Traffic overloads and surges
11. Any situation under which an entire service or 20 percent of the service provided at a single location for an individual customer is disrupted for more than four hours, including disruption caused by fire, flood, explosion, civil disturbance, work stoppage, and backup power failure

If the service outage or impairment is due to a performance shortfall of any other contractor supporting the WITS 3 program, the contractor, acting as GSA's OA&M contractor in accordance with Section G.1.3, shall work with that contractor to restore service. The contractor shall monitor the network to identify outages requiring emergency restoration and commence appropriate remedial action prior to the actual submission of a trouble report. The contractor shall notify the COTR immediately when any emergency restoration action is implemented.

#### **C.6.4 Priority Restoration**

When outages occur, the contractor shall provide prioritized service restoration to station lines designated on the service order as critical by the Government. The identity and location of critical station lines may vary over the life of the contract and will be provided to the contractor by the COTR.

#### **C.6.5 Status Reports**

The contractor shall provide status reports regarding emergency and priority trouble resolution activities on an hourly basis until the trouble is resolved, or as otherwise agreed to by the COTR. The contractor shall also provide the COTRs and CORs access to a trouble report database that tracks all of the agency's troubles, and this database shall be updated at least once a day.

### C.6.6 Contingency Document Deliverable

The contractor shall provide a *Contingency Plan* as a deliverable that will be updated yearly. It will describe in detail the method by which WITS 3 services will be maintained and restored under a number of situations. It shall address damage assessment, service restoration time frames, and triggering mechanisms for implementation under a number of different scenarios. The requirements that result from this section shall not be separately priced but shall be negotiated as contract modifications on an individual case basis.

The plan must specify emergency maintenance actions to be taken by the contractor and emergency equipment replacement arrangements with suppliers or alternate service arrangements with other carriers.

At a minimum, the *Contingency Plan* shall address the emergency situations listed in C.6.3, Emergency Restoration of WITS 3 Facilities and Services, as well as the following emergency situations:

1. Fires
2. Floods
3. Explosions
4. Hurricanes
5. Civil disturbances
6. Terrorist acts
7. Strikes, work stoppages, walkouts, or other labor disputes
8. Backup power failures

The contractor shall describe its approach for meeting WITS 3 service and facility restoration requirements, including National Security/Emergency Preparedness (NS/EP – see C.6.9) requirements in its *Contingency Plan*, and shall update this within 60 calendar days after receiving the Government's comments after contract award. The plan shall address at a minimum:

1. Alternate routing plans
2. Alternative operational facilities, storage, and procedures
3. Quarterly hands on disaster recovery testing for simulation purposes (data center shutdown, full power down, etc.)
4. Biannual tabletop testing for procedures and escalation reviews.

The contractor shall update this plan for the Government annually after contract award, describing how its architecture, technical capabilities, and organizational capabilities will protect telecommunications services during emergency situations. It shall include examples of how these resources will be brought to bear during an emergency.

### **C.6.7 Network Facility Augmentation and Restoration**

The contractor shall use the following means to provide network facility augmentation and restoration during emergencies:

1. National Telecommunications Management Structure (NTMS) and Telecommunications Service Priority (TSP) System (NCS-3-1-2 and NCS-3-1-3) or any subsequent TSP replacement system for providing network management and restoration
2. Reserve and emergency power per commercial practice and use of Telecommunications Electric Service Priority (TESP) in all transmission, switching, signaling, and major facility nodes

#### **C.6.7.1 Transmission Facilities**

The contractor shall use the following means to provide transmission augmentation and restoration:

1. Rapid restoration of network transmission facilities by deployment of such techniques as a SONET self-healing architecture
2. Alternate local access connections when specifically requested by a customer

#### **C.6.7.2 Switching and Signaling Systems**

The contractor shall follow commercial practice to protect against the loss of services caused by the failure, blockage, or damage of a switching or signaling node.

### **C.6.8 Protection of Classified and Sensitive Information**

The contractor shall provide for the protection of Sensitive But Unclassified (SBU) communications. The contractor shall engineer, acquire, provision, install, operate, administer, and maintain the protection equipment at the facility locations where the contractor has proposed to install applicable equipment.

Essentially, any unclassified information related to the national defense or foreign relations of the United States, to include bits and pieces that in the aggregate would be even more revealing, that could be useful to an adversary, should be considered SBU information.

The contractor shall follow commercial practice to protect its sensitive systems. These sensitive systems include:

1. Databases for classified information
2. Critical subscribers' locations, identifications, authorization codes, and call records
3. Customer profiles
4. Computer systems that control or can control the network or services



The contractor will be provided access to classified and sensitive materials required for service restoration planning, management, and operations. That information will be in various forms, including hard copy and electronic media. The classification of the material will be identified and must be protected by the contractor in accordance with applicable industrial security regulations (National Industrial Security Program Operating Manual [NISPOM] for Safeguarding Classified Information). The level of classification will be up to and including Top Secret. The contractor shall protect unclassified sensitive information with the same level of protection required of "For Official Use Only" (FOUO) information as defined by industrial security regulations

### **C.6.9 National Security and Emergency Preparedness Information**

The contractor shall provide communications support to Government agencies under conditions described in PL93-288, NSDD-97, NSDD-145, and other applicable laws, regulations, and directives. Executive Order (EO) 12472 shall also be considered in the design and operations of services to be provided under this contract.

The contractor shall notify the agency and GSA COTRs immediately when events arise that may have major consequences to its network. This notification would be similar to the "abnormal report" currently furnished to the National Communications System (NCS). The COTR will set priorities; however, the contractor shall be solely responsible for network operations.

### **C.7 General Management**

The contractor shall ensure that required local telecommunications services are provided to subscribers in a manner that consistently meets contractual requirements. The contractor shall be responsible for the acquisition, provisioning, installation, testing, placement into service, operation, administration, and maintenance of contractor-provided equipment and services. This includes, but is not limited to, providing required services, features, and equipment at or above the performance levels specified in this Statement of Work, meeting or exceeding the sales forecast, and maintaining high levels of customer satisfaction. The contractor shall attract and maintain skilled management, technical, and sales personnel to meet WITS 3 program objectives throughout the life of the contract.

The contractor shall be responsible for the services provided by its subcontractors and shall manage and coordinate the activities of each subcontractor, including local and interexchange service providers. The contractor shall serve as the point of contact with the Government for contract administration matters, although operational contact with the Government by subcontractor personnel is not precluded.

#### **C.7.1 Organization Structure**

The contractor shall propose an organizational structure for operation, administration, and maintenance of the services provided under this contract.

The organization structure shall include personnel to serve as the point of contact to interface with the Government (GSA and agencies) on issues related to:

1. Program administration
2. Sales and marketing
3. Customer service
4. Engineering
5. Operations, Administration, and Maintenance
6. NS/EP

The contractor shall appoint qualified personnel to manage each of these areas. The contractor shall provide resumes for the following key personnel:

1. Program Manager
2. Customer Service Manager
3. Security Manager
4. Contracts Manager
5. Billing Manager

The Government reserves the right to review the performance of each of the contractor's points of contact with the Government semiannually and to discuss the results with the appropriate manager. In the event the Government identifies unsatisfactory performance, the contractor shall take steps to restore performance to a satisfactory level.

### **C.7.2 System Changes**

The contractor shall execute system changes in an orderly manner that does not disrupt WITS 3 subscribers. In the event that a major system change is planned, the contractor shall notify the Government in writing of the nature of the changes, the proposed schedule, and any anticipated operational impacts in ample time for the government to review and approve or reject the proposed changes

### **C.7.3 Support Systems**

The contractor shall employ modern support systems that incorporate state-of-the-art, web enabled, commercial Business Support Systems (BSS) and Operational Support Systems (OSS).

### **C.7.4 Network Monitoring**

The contractor shall provide proactive network monitoring capabilities through the establishment of network operations center (NOC) functionality for the WITS 3 network.

**C.7.4.1 Reserved**

**C.7.4.2 Agency Network Monitoring**

CORs and other designated Government personnel shall have electronic access to the WITS 3 service order, billing, traffic, inventory data, required reports, and any other data that are accessible to the contractor's other customers. Real-time access shall be provided, if available. The contractor shall make only the information applicable to an agency available to that agency. The format and media of the electronic access method shall be mutually acceptable to the Government and the contractor and shall be kept current via the Systems Changes procedure described in C.7.2.

**C.7.5 Physical Security and Work Area Management**

The contractor shall follow security procedures established by the Government in conjunction with building management to prevent unauthorized access to a building's telecommunications facilities (e.g., telephone closets). These security measures shall include, but not be limited to, procedures for signing in and out, escort procedures, and inspection routines. When multiple contractors share the telecommunications facility, the contractor shall work with the Government in coordinating with the other contractors and the building management to agree on procedures that ensure the security of the facility while allowing access to the facility by multiple parties.

**C.7.6 Quality Assurance Plan**

The contractor shall implement a Quality Assurance Plan that will define and describe the contractor's methods and controls that will address all services offered by the contractor. The Quality Assurance Plan shall include details relating to:

1. Acceptable quality levels
2. Delivery schedules
3. Adherence to schedules and work functions as detailed in plans provided to and approved by the Government subsequent to contract award
4. Adherence to appropriate safety codes and procedures
5. Adherence to industry recognized levels of quality workmanship and craft practices.

A draft of the Quality Assurance Plan shall be delivered with the proposal and updated within 60 calendar days after receiving the Government's comments. Thereafter, it shall be updated annually.