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Attachment 3
NETWORK ELEMENTS

NETWORK ELEMENTS

Section 1. Introduction

1.1 USWC shall provide unbundled Network Elements in accordance with this Agreement, the Act and FCC Rules and Regulations. The price for each Network Element is set forth in Attachment 1 of this Agreement. Except as otherwise set forth in this Attachment, MCIm may order Network Elements as of the Effective Date of this Agreement.

1.1.1 USWC agrees to make available the following unbundled Network Elements which are addressed in more detail in later sections of this Attachment: (a) local loop, (b) local and tandem switches (including all vertical switching features provided by such switches), (c) interoffice transmission facilities, (d) network interface devices, (e) unbundled signaling, including signaling links, STPs, and access to and call-related database facilities (SCPs) via the STP signaling and call-related database facilities, (f) operations support systems functions, and (g) operator and directory assistance facilities. Additional network elements requested by MCIm shall be requested through the Bona Fide Request Process.

Section 2. Unbundled Network Elements

2.1 USWC shall offer Network Elements to MCIm on an unbundled basis on rates, terms and conditions that are just, reasonable and non-discriminatory in accordance with the terms and conditions of this Agreement.

2.2 USWC shall permit MCIm to connect MCIm's facilities or facilities provided to MCIm by third parties with each of USWC's unbundled Network Elements at any technically feasible point designated by MCIm.

2.3 MCIm may use one or more Network Elements to provide any feature, function, capability or service option that such Network Element(s) is capable of providing or any feature, function, capability or service option described in the technical references identified herein, or as may otherwise be determined by MCIm.

2.3.1 MCIm may, at its option, designate any technically feasible method of access to unbundled elements, including access methods currently or previously in use by USWC.

2.4 USWC shall offer each Network Element individually and in combination with any other Network Element or Network Elements in order to permit MCIm to provide Telecommunications Services to its subscribers. MCIm may purchase unbundled Network Elements without restriction as to how those elements may be rebundled.

2.5 For each Network Element, USWC shall provide a demarcation point (*e.g.*, at a Digital Signal Cross Connect, Light Guide Cross Connect panel or a Main Distribution Frame) and, if necessary, access to such demarcation point, which MCIm agrees is suitable. Where USWC provides combined Network Elements at MCIm's direction, however no demarcation point shall exist between such contiguous Network Elements.

2.6 This Attachment describes the initial set of Unbundled Network Elements which MCIm and USWC have identified as of the Effective Date:

Loop
Network Interface Device
~~Distribution~~
Local Switching
Operator Systems
Common Transport
Dedicated Transport
Signaling Link Transport
Signaling Transfer Points
Service Control Points/Databases
Tandem Switching
~~911~~
Directory Assistance
Operations Support Systems
Digital Cross Connects

2.7 MCIm and USWC agree that the Network Elements identified in this Attachment are not all possible Network Elements.

2.8 MCIm may identify additional or revised Network Elements as necessary to provide Telecommunications Services to its subscribers, to improve network or service efficiencies or to accommodate changing technologies, subscriber demand or other requirements.

2.9 MCIm will request such additional Network Elements in accordance with the Bona Fide Request Process described in the General Section of this Agreement. Additionally, if USWC provides any Network Element not identified in this Agreement, to itself, to its own subscribers, to a USWC Affiliate or to any other entity, USWC shall make available the same Network Element to MCIm on terms and conditions no less favorable to MCIm than those provided to itself or to any other Person.

Section 3. Standards for Network Elements

3.1 Each Network Element shall be furnished at a service level equal to or better than the requirements set forth in the technical references identified herein for each such Network Element, as well as any performance or other requirements, identified in this Attachment, subject to Section 2.3.1 of the General Section of this Agreement.

3.2 If one or more of the requirements set forth in this Agreement are in conflict, MCIm shall elect which requirement shall apply.

3.2.1 USWC shall provide to MCIm, upon request, engineering, design, performance and other network data sufficient for MCIm to determine that the requirements of this Section 3 are being met. In the event that such data indicates that the requirements set forth herein are not being met, USWC shall, within ten (10) days, cure any design, performance or other deficiency and provide new data sufficient for MCIm to determine that such deficiencies have been cured.

3.2.2 USWC agrees to work cooperatively with MCIm to provide Network Elements that will meet MCIm's needs in providing Telecommunications Services to its subscribers.

3.3 Unless otherwise requested by MCIm, each Network Element or any Combination thereof and the connections between Network Elements provided by USWC to MCIm shall be made available to MCIm at any technically feasible point, that is equal to or better than the manner in which USWC provides such Network Elements, Combinations and connections to itself, USWC's own subscribers, to a USWC Affiliate or to any other entity.

Description of Various~~Unbundled~~ Elements Within the Network

Section 4. Loop

4.1 Definition

4.1.1 A Loop is a transmission facility between a distribution frame [cross-connect], or its equivalent, in a USWC central office or wire center, and the network interface device at a subscriber's premises, to which MCIm granted exclusive use. This includes, but is not limited to, two-wire and four-wire analog voice-grade loops, and two-wire and four-wire loops conditioned to transmit the digital signals needed to provide ISDN, ADSL, HDSL, and DS-1-level signals. A Loop may be composed of the following components:

Loop Concentrator / Multiplexer
Loop Feeder
Network Interface Device (NID)
Distribution

4.1.1.1 MCIm may purchase on an unbundled basis the following: Loop and NID~~, NID, and Distribution~~. MCIm may use the Bona Fide Request Process set forth in Section 24 of the General Section of this Agreement to request unbundling of Loop Concentrator/Multiplexer, Loop Feeder and Distribution. In addition, if MCIm seeks to provide advanced digital services requiring conditioning features beyond those provided in the Interconnection Tariff, it shall utilize the BFR process to obtain such conditioned loops.

4.1.2 If USWC uses Integrated Digital Loop Carrier (DLCs) systems to provide the local loop, USWC will make alternate arrangements, equal in quality, to permit MCIm to order a contiguous unbundled local loop~~ at no additional cost to MCIm.~~ These arrangements may, at USWC's option, include the following: providing MCIm with copper facilities or universal DLC acceptable to MCIm, deploy Virtual Remote Terminals, allowing MCIm to purchase the entire Integrated DLC, or converting integrated DLCs to non-integrated systems.

4.2. Technical Requirements

Subdivided to each component as detailed below.

4.3 Interface Requirements

Subdivided to each component as detailed below.

4.4 Loop Components

4.4.1 Loop Concentrator/Multiplexer

4.4.1.1 Definition:

4.4.1.1.1 The Loop Concentrator/Multiplexer is the Network Element that: (a) aggregates lower bit rate or bandwidth signals to higher bit rate or bandwidth signals (multiplexing); (b) disaggregates higher bit rate or bandwidth signals to lower bit rate or bandwidth signals (demultiplexing); (c) aggregates a specified number of signals or channels to fewer channels (concentrating); (d) performs signal conversion, including encoding of signals (*e.g.*, analog to digital and digital to analog signal conversion); and (e) in some instances performs electrical to optical (E/O) conversion.

4.4.1.1.2 The Loop Concentrator/Multiplexer function may be provided through a Digital Loop Carrier (DLC) system, channel bank, multiplexer or other equipment at which traffic is encoded and decoded, multiplexed and demultiplexed, or concentrated.

4.4.1.2 Technical Requirements

4.4.1.2.1 The Loop Concentrator/Multiplexer shall be capable of performing its functions on the signals for the following services as needed by MCIm to provide end-to-end service capability to its subscriber, including, but not limited to:

4.4.1.2.1.1 two-wire & four-wire analog voice grade loops;

4.4.1.2.1.2 two-wire & four-wire loops that are conditioned to transmit the digital signals needed to provide services such as ISDN, ADSL, HDSL, and DS-1-level signals;

4.4.1.2.1.3 4-wire digital data (2.4Kbps through 64Kbps and n times 64Kbps (where n < 24);

4.4.1.2.1.4 DS-3 rate private lines; and

4.4.1.2.1.5 Optical SONET rate private lines.

4.4.1.2.2 The Loop Concentrator/Multiplexer shall perform the following functions as appropriate:

4.4.1.2.2.1 analog to digital signal conversion of both incoming and outgoing (upstream and downstream) analog signals;

4.4.1.2.2.2 multiplexing of the individual digital signals up to higher transmission bit rate signals (*e.g.*, DS-0, DS-1, DS-3, or optical SONET rates) for transport to the USWC central office through the Loop Feeder; and

4.4.1.2.2.3 concentration of end-user subscriber signals onto fewer channels of a Loop Feeder (the concentration ratio shall be as specified from time to time by MCIm).

4.4.1.2.3 MCIm may request USWC shall provide power for the Loop Concentrator/Multiplexer, through a non-interruptible source if the function is performed in a central office, or

from a commercial AC power source with battery backup if the equipment is located outside a central office. Such power shall also adhere to the requirements stated herein.

4.4.1.2.4 The Loop Concentrator/Multiplexer shall be provided to MCIm in accordance with the following Technical References:

4.4.1.2.4.1 Bellcore TR-NWT-000057, Functional Criteria for Digital Loop Carrier Systems, Issue 2, January 1993.

4.4.1.2.4.2 Bellcore TR-NWT-000393, Generic Requirements for ISDN Basic Access Digital Subscriber Lines.

4.4.1.2.4.3 ANSI T1.106 - 1988, American National Standard for Telecommunications - Digital Hierarchy - Optical Interface Specifications (Single Mode).

4.4.1.2.4.4 ANSI T1.105-1995, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Basic Description including Multiplex Structure, Rates and Formats.

4.4.1.2.4.5 ANSI T1.102-1993, American National Standard for Telecommunications - Digital Hierarchy - Electrical Interfaces.

4.4.1.2.4.6 ANSI T1.403-1989, American National Standard for Telecommunications - Carrier to Subscriber Installation, DS-1 Metallic Interface Specification.

4.4.1.2.4.7 Bellcore GR-253-CORE, Synchronous Optical Network Systems (SONET), Common Generic Criteria.

4.4.1.2.4.8 Bellcore TR-TSY-000008, Digital Interface Between the SLC 96 Digital Loop Carrier System and a Local Digital Switch, Issue 2, August 1987.

4.4.1.2.4.9 Bellcore TR-NWT-000303, Integrated Digital Loop Carrier System Generic Requirements, Objectives and Interface, Issue 2, December 1992; Rev. 1, December 1993; Supplement 1, December 1993.

4.4.1.2.4.10 Bellcore TR-TSY-000673, Operations Systems Interface for an IDLC System, (LSSGR) FSD 20-02-2100, Issue 1, September 1989.

4.4.1.2.4.11 Bellcore Integrated Digital Loop Carrier System Generic Requirements, Objectives and Interface, GR-303-CORE, Issue 1, September 1995.

4.4.1.3 Requirements for an Intelligent Loop Concentrator/ Multiplexer

4.4.1.3.1 In addition to the basic functions described above for the Loop Concentrator/Multiplexer, the Intelligent Loop Concentrator/Multiplexer (IC/M) shall provide facility grooming, facility test functions, format conversion and signaling conversion as appropriate.

4.4.1.3.2 The underlying equipment that provides such IC/M function shall continuously monitor protected circuit packs and redundant common equipment.

4.4.1.3.3 The underlying equipment that provides such IC/M function shall automatically switch to a protection circuit pack on detection of a failure or degradation of normal operation.

4.4.1.3.4 The underlying equipment that provides such IC/M function shall be equipped with a redundant power supply or a battery back-up.

4.4.1.3.5 MCIm may request USWC shall provide MCIm with real time performance monitoring and alarm data on IC/M elements that may affect MCIm's traffic. This includes IC/M hardware alarm data and facility alarm data on the underlying device that provides such IC/M function.

4.4.1.3.6 MCIm may request USWC shall provide MCIm with real time ability to initiate tests on the underlying device that provides such IC/M function integrated test equipment as well as other integrated functionality for routine testing and fault isolation.

4.4.1.4 Interface Requirements

4.4.1.4.1 The Loop Concentrator/Multiplexer shall meet the following interface requirements, as appropriate for the configuration that MCIm designates:

4.4.1.4.2 The Loop Concentrator/Multiplexer shall provide an analog voice frequency copper twisted pair interface at the serving wire center, as described in the references in Section 4.4.1.2.4 of this Attachment.

4.4.1.4.3 The Loop Concentrator/Multiplexer shall provide digital 4-wire electrical interfaces at the serving wire center, as described in the references in Section 4.4.1.2.4 of this Attachment.

4.4.1.4.4 The Loop Concentrator/Multiplexer shall provide optical SONET interfaces at rates of OC-3, OC-12, OC-48, and OC-N, N as described in the references in Section 4.4.1.2.4 of this Attachment.

4.4.1.4.5 The Loop Concentrator/Multiplexer shall provide the Bellcore TR-303 DS-1 level interface at the serving wire center. Loop Concentrator/ Multiplexer shall provide Bellcore TR-08 modes 1&2 DS-1 interfaces when designated by MCIm. Such interface requirements are specified in the references in Section 4.4.1.2.4 of this Attachment.

4.4.1.5 The Intelligent Loop Concentrator/Multiplexer shall be provided to MCIm in accordance with the Technical References set forth in Sections 4.4.1.2.4.8 through 4.4.1.2.4.11 of this Attachment.

4.4.2 Loop Feeder

4.4.2.1 Definition:

4.4.2.1.1 The Loop Feeder is the Network Element that provides connectivity between: (a) a Feeder Distribution Interface (FDI) associated with Loop Distribution and a termination point appropriate for the media in a central office, or (b) a Loop Concentrator/Multiplexer provided in a remote terminal and a termination point appropriate for the media in a central office. Pursuant to the BFR process or at such time as the loop is further unbundled into separate network elements

including the FDI, USWC shall provide MCIm physical access to the FDI, and the right to connect, the Loop Feeder to the FDI.

4.4.2.1.2 The physical medium of the Loop Feeder may be copper twisted pair, or single or multi-mode fiber or other technologies as designated by MCIm. In certain cases, MCIm will require a copper twisted pair loop even in instances where the medium of the Loop Feeder for services that USWC offers is other than a copper facility. In such cases, special construction charges may apply to the MCIm request.

4.4.2.2 Requirements for Loop Feeder

4.4.2.2.1 The Loop Feeder shall be capable of transmitting analog voice frequency, basic rate ISDN, digital data, or analog radio frequency signals, as appropriate.

4.4.2.2.2 USWC shall provide appropriate power for all active elements in the Loop Feeder. USWC will provide appropriate power from a central office source, or from a commercial AC source with rectifiers for AC to DC conversion and 8-hour battery back-up when the equipment is located in an outside plant Remote Terminal (RT).

4.4.2.3 Additional Requirements for Special Copper Loop Feeder Medium

In addition to requirements set forth in Section 4.2 above, MCIm may require USWC to provide copper twisted pair Loop Feeder which is unfettered by any intervening equipment (*e.g.*, filters, load coils, and range extenders), so that MCIm can use these Loop Feeders for a variety of services by attaching appropriate terminal equipment at the ends.

4.4.2.4 Additional Technical Requirements for DS-1 Conditioned Loop Feeder

In addition to the requirements set forth in Section 4.4.2.2 above, MCIm may designate that the Loop Feeder be conditioned to transport a DS-1 signal. The requirements for such transport are defined in the references below in Section 4.4.2.6.

4.4.2.5 Additional Technical Requirements for Optical Loop Feeder

In addition to the requirements set forth in Section 4.4.2.2 above, MCIm may designate that Loop Feeder will transport DS-3 and OCn (where n is defined in the technical reference in Section 4.4.1.2.4.4 of this Attachment). The requirements for such transport are defined in the references below in Section 4.4.2.6.

4.4.2.6 USWC shall offer Loop Feeder in accordance with the requirements set forth in the following Technical References:

4.4.2.6.1 Bellcore Technical Requirement TR-NWT-000499, Issue 5, December 1993, section 7 for DS-1 interfaces.

4.4.2.6.2 Bellcore TR-NWT-000057, Functional Criteria for Digital Loop Carrier Systems, Issue 2, January 1993.

4.4.2.6.3 Bellcore TR-NWT-000393, Generic Requirements for ISDN Basic Access Digital Subscriber Lines.

4.4.2.6.4 ANSI T1.106-1988, American National Standard for Telecommunications - Digital Hierarchy - Optical Interface Specifications (Single Mode).

4.4.2.6.5 ANSI T1.105-1995, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Basic Description including Multiplex Structure, Rates and Formats.

4.4.2.6.6 ANSI T1.102-1993, American National Standard for Telecommunications - Digital Hierarchy - Electrical Interfaces.

4.4.2.6.7 ANSI T1.403-1989, American National Standard for Telecommunications - Carrier to Subscriber Installation, DS-1 Metallic Interface Specification.

4.4.2.6.8 Bellcore GR-253-CORE, Synchronous Optical Network Systems (SONET), Common Generic Criteria.

4.4.2.7 Interface Requirements

4.4.2.7.1 The Loop Feeder point of termination (POT) within a USWC central office will be as follows:

4.4.2.7.1.1 Copper twisted pairs shall terminate on the MDF;

4.4.2.7.1.2 DS-1 Loop Feeder shall terminate on a DSX1, DCS1/0 or DCS3/1; and

4.4.2.7.1.3 Fiber Optic cable shall terminate on a LGX.

4.4.2.7.2 Loop Feeder shall be equal to or better than each of the applicable interface requirements set forth in the following technical references:

4.4.2.7.2.1 Bellcore TR-TSY-000008, Digital Interface Between the SLC 96 Digital Loop Carrier System and a Local Digital Switch, Issue 2, August 1987.

4.4.2.7.2.2 Bellcore TR-NWT-000303, Integrated Digital Loop Carrier System Generic Requirements, Objectives and Interface, Issue 2, December 19921- Rev. 1, December 1993-1 Supplement 1, December 1993.

4.4.2.7.2.3 Bellcore Integrated Digital Loop Carrier System Generic Requirements, Objectives and Interface, GR-303-CORE, Issue 1, September 1995.

Section 5. Network Interface Device

5.1 Definition:

5.1.1 The Network Interface Device (NID) is a single-line termination device or that portion of a multiple-line termination device required to terminate a single line or circuit. The function of the

NID is to establish the network demarcation point between a carrier and its subscriber. The NID features two (2) independent chambers or divisions which separate the service provider's network from the subscriber's inside wiring. Each chamber or division contains the appropriate connection points or posts to which the service provider, and the subscriber each make their connections. MCIm may connect its loops to the USWC NID where spare capacity exists. Alternatively a MCIm may request placement of a larger NID.

5.1.2 MCIm may connect its NID to USWC's NID. Alternatively, where an installed NID is the same type as normally used on a single family dwelling, MCIm may gain access to the USWC NID. Either form of access to the USWC NID is subject to the availability of spare capacity. Where spare capacity does not exist, MCIm may request placement of a larger NID. Hook-up to, or installation of, a USWC NID shall be USWC's responsibility.

5.1.3 With respect to multiple-line termination devices, MCIm shall specify the quantity of NIDs it requires within such device.

5.1.4 Figure 1 shows a schematic of a NID.

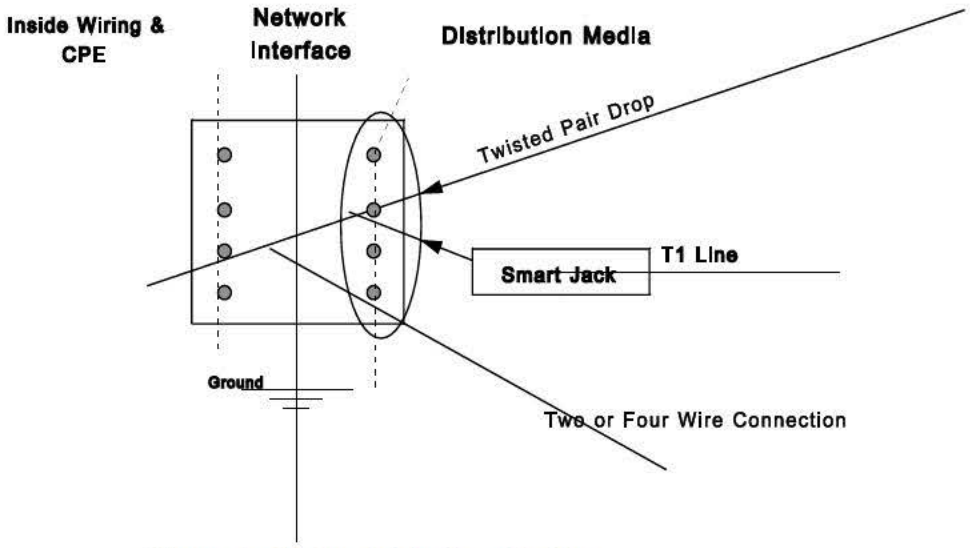


Figure 1 - Network Interface Device

5.2 Technical Requirements

5.2.1 The Network Interface Device shall provide a clean, accessible point of connection for the inside wiring and for the Distribution Media and/or cross connect to MCIm's NID and shall maintain a connection to ground that meets the requirements set forth below.

5.2.2 The NID shall be capable of transferring electrical analog or digital signals between the subscriber's inside wiring and the Distribution Media and/or cross connect to MCIm's NID.

5.2.3 All NID posts or connecting points shall be in place, secure, usable and free of any rust or corrosion. The protective ground connection shall exist and be properly installed. The ground wire shall be free of rust or corrosion and have continuity relative to ground.

5.2.4 The NID shall be capable of withstanding all normal local environmental variations.

5.2.5 Where the NID is not located in a larger, secure cabinet or closet, the NID shall be protected from physical vandalism. The NID shall be physically accessible to MCIm designated personnel. In cases where entrance to the subscriber premises is required to give access to the NID, MCIm shall obtain entrance permission directly from the subscriber.

5.2.6 USWC shall offer the NID together with, and separately from the Distribution Media component of Loop Distribution.

5.3 Interface Requirements

5.3.1 The NID shall be the interface to subscribers' premises wiring for all loop technologies.

5.3.2 The NID shall be equal to or better than all of the industry standards for NIDs set forth in the following technical references:

5.3.2.1 Bellcore Technical Advisory TA-TSY-000120 "Subscriber Premises or Network Ground Wire";

5.3.2.2 Bellcore Generic Requirement GR-49-CORE "Generic Requirements for Outdoor Telephone Network Interface Devices";

5.3.2.3 Bellcore Technical Requirement TR-NWT-00239 "Indoor Telephone Network Interfaces";

5.3.2.4 Bellcore Technical Requirement TR-NWT-000937 "Generic Requirements for Outdoor and Indoor Building Entrance"; and

5.3.2.5 Bellcore Technical Requirement TR-NWT-0001 33 "Generic Requirements for Network Inside Wiring."

Section 6. Distribution

6.1 Definition:

6.1.1 Distribution provides connectivity between the NID component of Loop Distribution and the terminal block on the subscriber-side of a Feeder Distribution Interface (FDI). The FDI is a device that terminates the Distribution Media and the Loop Feeder, and cross-connects them in order to provide a continuous transmission path between the NID and a telephone company central office. There are three (3) basic types of feeder-distribution connection: (a) multiple (splicing of multiple distribution pairs onto one (1) feeder pair); (b) dedicated (“home run”); and (c) interfaced (“cross-connected”). While older plant uses multiple and dedicated methods, newer plant and all plant that uses DLC or other pair-gain technology uses the interfaced connection method. The feeder-distribution interface (FDI) in the interfaced design makes

use of a manual cross-connection, typically housed inside an outside plant 0device (“green box”) or in a vault or manhole.

6.1.2 The Distribution may be copper twisted pair, coax cable, single or multi-mode fiber optic cable or other technologies. A combination that includes two (2) or more of these media is also possible. In certain cases, MCIm shall require a copper twisted pair Distribution even in instances where the Distribution for services that USWC offers is other than a copper facility. In such cases, special construction charges may apply to the MCIm request.

6.2 Requirements for All Distribution

6.2.1 Distribution shall be capable of transmitting signals for the following services requested by MCIm:

6.2.1.1 Two-wire & four-wire analog voice grade loops; and

6.2.1.2 Two-wire & four-wire loops that are conditioned to transmit the digital signals needed to provide services such as ISDN, ADSL, HDSL, and DS-1-level signals.

6.2.2 Distribution shall transmit all signaling messages or tones. Where the Distribution includes any active elements that terminate any of the signaling messages or tones, these messages or tones shall be reproduced by the Distribution at the interfaces to an adjacent Network Element in a format that maintains the integrity of the signaling messages or tones.

6.2.3 Distribution shall support functions associated with provisioning, maintenance and testing of the Distribution itself, as well as provide necessary access to provisioning, maintenance and testing functions for Network Elements to which it is associated.

6.2.4 Where possible, Distribution shall provide performance monitoring of the Distribution itself, as well as provide necessary access for performance monitoring for Network Elements to which it is associated.

6.2.5 Under reasonable application of design criteria for the chosen medium, dDistribution shall be equal to or better than all of the applicable requirements set forth in the following technical references:

6.2.5.1 Bellcore TR-TSY-000057, "Functional Criteria for Digital Loop Carrier Systems"; and

6.2.5.2 Bellcore TR-NWT-000393, "Generic Requirements for ISDN Basic Access Digital Subscriber Lines."

~~6.2.6 USWC shall provide MCIm with physical access to, and the right to connect to, the FDI.~~

~~6.2.7 USWC shall offer Distribution together with, and separately from, the NID component of Loop Distribution.~~

6.3 Additional Requirements for Special Copper Distribution

In addition to Distribution that supports the requirements in Section 6.2 above, MCIm may designate Distribution to be copper twisted pair which are unfettered by any intervening equipment (*e.g.*, filters, load coils, range extenders) so that MCIm can use these loops for a variety of services by attaching appropriate terminal equipment at the ends.

6.4 Additional Requirements for Fiber Distribution

Fiber optic cable Distribution shall be capable of transmitting signals for the following services in addition to the ones under Section 6.2.1 above:

6.4.1 DS-3 rate private line service;

6.4.2 Optical SONET OCn rate private lines (where n is defined in the technical reference in Section 4.4.1.2.4.4 above; and

6.4.3 Analog Radio Frequency based services (*e.g.*, Cable Television (CATV)).

6.5 Additional Requirements for Coaxial Cable Distribution

Coaxial Cable (coax) Distribution shall be capable of transmitting signals for the following services in addition to the ones under Section 6.2.1 above:

6.5.1 Broadband data, either one way or bi-directional, symmetric or asymmetric, at rates between 1.5 Mb/s and 45 Mb/s; and

6.5.2 Analog Radio Frequency based services (*e.g.*, CATV).

6.6 Interface Requirements

6.6.1 Signal transfers between the Distribution and the NID and an adjacent Network Element shall have levels of degradation that are within the performance requirements set forth in Section 15.2 of this Attachment 3.

6.6.2 Distribution shall be equal to or better than each of the applicable interface requirements set forth in the following technical references:

6.6.2.1 Bellcore TR-NWT-000049, "Generic Requirements for Outdoor Telephone Network Interface Devices," issued December 1,1994;

6.6.2.2 Bellcore TR-NWT-000057, "Functional Criteria for Digital Loop Carrier Systems," issued January 2, 1993;

6.6.2.3 Bellcore TR-NWT-000393, “Generic Requirements for ISDN Basic Access Digital Subscriber Lines”; and

6.6.2.4 Bellcore TR-NWT-000253, SONET Transport Systems: Common Criteria (A module of TSGR, FR-NWT-000440), Issue 2, December 1991.

Section 7. Local Switching

7.1 Definition:

7.1.1 Local Switching is the Network Element that provides the functionality required to connect the appropriate lines or trunks wired to the Main Distributing Frame (MDF) or Digital Cross Connect (DSX) panel to a desired line or trunk. The desired connection path for each call type will vary by subscriber and will be specified by MCIm as a routing scenario that will be implemented in advance as part of or after the purchase of the unbundled local switching. Such functionality shall include all of the features, functions and capabilities that the underlying USWC switch providing such Local Switching function is capable of providing, including, but not limited to: line signaling and signaling software, digit reception, dialed number translations, call screening, routing, recording, call supervision, dial tone, switching, telephone number provisioning, announcements, calling features and capabilities (including call processing), Centrex, or Centrex-like services, Automatic Call Distributor (ACD), Carrier pre-subscription (*e.g.*, long distance carrier, intraLATA toll), Carrier Identification Code (CIC) portability capabilities, testing and other operational features inherent to the switch and switch software. The Local Switching function also provides access to transport, signaling (ISDN User Part (ISUP) and Transaction Capabilities Application Part (TCAP), and platforms such as adjuncts, Public Safety Systems (911), operator services, directory services and Advanced Intelligent Network (AIN). Remote Switching Module functionality is included in the Local Switching function. Local Switching shall also be capable of routing local, intraLATA, interLATA, calls to international subscriber's preferred carrier, call features (*e.g.*, call forwarding) and Centrex capabilities. Local Switching, including the ability to route to MCIm's transport facilities, dedicated facilities and systems, shall be unbundled from all other unbundled Network Elements, *i.e.*, Operator Systems, Common Transport, and Dedicated Transport. In conjunction with unbundled local switching and in accordance with FCC rules and regulations, the local switching element includes access to all of its capabilities, including vertical features. When MCIm is purchasing local switching from USWC, USWC will provide access via the STP to call related databases used in AIN services, including the Local Information Data Base ('LIDB'), Toll Free Calling ('800/888') and Local Number Portability (LNP') Databases.

7.1.1.1 MCIm may obtain discrete switching features and functions not listed in USWC's Interconnection Tariff through the BFR process.

7.2. Technical Requirements

7.2.1 Local Switching shall be equal to or better than the requirements for Local Switching set forth in Bellcore's Local Switching Systems General Requirements (FR-NWT-000064).

7.2.1.1 USWC shall route calls to the appropriate trunk or lines for call origination or termination.

7.2.1.2 USWC shall route calls on a per line or per screening class basis to: (a) USWC platforms providing Network Elements or additional requirements, (b) MCIm designated platforms, or (c) third-party platforms.

7.2.1.3 Where technically feasible, USWC shall provide recorded announcements as designated by MCIm and call progress tones to alert callers of call progress and disposition.

7.2.1.4 USWC shall change a subscriber from USWC's services to MCIm's services without loss of feature functionality, unless expressly agreed otherwise by MCIm.

7.2.1.5 USWC shall perform routine testing (*e.g.*, Mechanized Loop Tests (MLT) and test calls such as 105, 107 and 108 type calls) and fault isolation on a schedule designated by MCIm.

7.2.1.6 USWC shall repair and restore any equipment or any other maintainable component that may adversely impact MCIm's use of unbundled Local Switching.

7.2.1.7 USWC shall control congestion points such as mass calling events, and network routing abnormalities, using capabilities such as Automatic Call Gapping, Automatic Congestion Control and Network Routing Overflow. Application of such control shall be competitively neutral and not favor any user of unbundled switching or USWC.

7.2.1.8 USWC shall perform manual call trace as designated by MCIm and permit subscriber originated call trace.

7.2.1.9 USWC shall record all billable events, involving usage of the element, and send the appropriate recording data to MCIm as outlined in Attachment 8.

7.2.1.10 For Local Switching used as 911 Tandems, USWC shall allow interconnection from MCIm local switching elements and USWC shall route the calls to the appropriate Public Safety Access Point (PSAP).

7.2.1.11 Where USWC provides the following special services, it shall provide to MCIm:

7.2.1.11.1 Essential Service Lines;

7.2.1.11.2 Telephone Service Prioritization;

7.2.1.11.3 related services for handicapped;

7.2.1.11.4 soft dial tone where required by law. Where USWC provides soft dial tone, it shall do so on a competitively-neutral basis; and

7.2.1.11.5 any other service required by law or regulation.

7.2.1.12 USWC shall provide Switching Service Point (SSP) capabilities and signaling software to interconnect the signaling links destined to the Signaling Transfer Point Switch (STPs). In the event that Local Switching is provided out of a switch without SS7 capability, the Tandem shall provide this capability as discussed in the section on Tandem Switching. These capabilities shall adhere to Bellcore specifications TCAP (GR-1432-CORE), ISUP (GR-905-CORE), Call Management (GR-1429-CORE), Switched Fractional DS-1 (GR-1357-CORE), Toll Free Service (GR-1428-CORE), Calling Name (GR-1597-CORE), Line Information Database (GR-954-CORE), and Advanced Intelligent Network (GR-2863-CORE).

7.2.1.13 USWC shall provide interfaces to adjuncts through industry standard and Bellcore interfaces. These adjuncts may include, but are not limited to, Service Node, Service Circuit Node, Voice Mail and Automatic Call Distributors. Examples of existing interfaces are ANSI ISDN standards Q.931 and Q.932.

7.2.1.14 Upon MCIm's request, USWC shall provide performance data regarding an MCIm subscriber line, traffic characteristics or other measurable elements to MCIm on a nondiscriminatory basis. ~~, upon MCIm's request.~~

7.2.1.15 USWC shall make available to MCIm~~offer~~ all technically feasible Local Switching features and, in providing such features, do so at parity to those provided by USWC to itself or any other Person. Such feature offerings shall include, but are not limited to:

7.2.1.15.1 Basic and primary rate ISDN;

7.2.1.15.2 Residential features;

7.2.1.15.3 Custom Local Area Signaling Services (CLASS/LASS);

7.2.1.15.4 Custom Calling Features; and

7.2.1.15.5 Centrex (including equivalent administrative capabilities, such as subscriber accessible reconfiguration and detailed message recording); and

7.2.1.15.6 Advanced Intelligent Network ("AIN") triggers supporting MCIm and USWC service applications, in USWC's SCPs. USWC shall offer to MCIm all AIN triggers currently available to USWC for offering AIN-based services in accordance with applicable technical references:

7.2.1.15.6.1 Off-Hook Immediate;

7.2.1.15.6.2 Off-Hook Delay;

7.2.1.15.6.3 Private EAMF Trunk;

7.2.1.15.6.4 Shared Interoffice Trunk (EAMF, SS7);

7.2.1.15.6.5 Termination Attempt;

7.2.1.15.6.6 3/6/10;

7.2.1.15.6.7 N11;

7.2.1.15.6.8 Feature Code Dialing;

7.2.1.15.6.9 Custom Dialing Plan(s) including 555 services; and

7.2.1.15.6.10 Automatic Route Selection.

If MCIm desires specific unbundling of AIN triggers or incorporation of its SCP within the USWC SS7 network, such requests shall be handled through the BFR process.

7.2.1.16 USWC shall assign each MCIm subscriber line the class of service designated by MCIm (*e.g.*, using line class codes or other switch specific provisioning methods) and shall route directory assistance calls from MCIm subscribers as directed by MCIm at MCIm's option. This includes each of the following call types:

7.2.1.16.1 O+/O- calls;

7.2.1.16.2 911 calls;

7.2.1.16.3 411/DA calls;

7.2.1.16.4 InterLATA calls specific to PIC or regardless of PIC;

7.2.1.16.5 IntraLATA calls specific to PIC or regardless of PIC;

7.2.1.16.6 Toll Free calls, prior to database query;

7.1.2.16.7 Call forwarding of any type supported on the switch, to a line or a trunk;

7.1.2.16.8 Any other customized routing that may be supported by the USWC switch;

7.2.1.17 USWC shall assign each MCIm subscriber line the class of services designated by MCIm (*e.g.*, using line class codes or other switch specific provisioning methods) and shall route operator calls from MCIm subscribers as directed by MCIm at MCIm's option. For example, USWC may translate 0- and 0+ intraLATA traffic, and route the call through appropriate trunks to an MCIm Operator Services Position System (OSPS). Calls from Local Switching must pass the ANI-II digits unchanged.

7.2.1.18 If an MCIm subscriber subscribes to MCIm provided voice mail and messaging services, USWC shall redirect incoming calls to the MCIm system based upon presubscribed service arrangements (*e.g.*, busy, don't answer, number of rings). In addition, USWC shall provide a Standard Message Desk Interface-Enhanced (SMDI-E) interface to the MCIm system. USWC shall support the Inter-switch Voice Messaging Service (IVMS) capability.

7.2.1.19 Local Switching shall be offered in accordance with the requirements of the following technical references and their future releases:

7.2.1.19.1 GR-1298-CORE, AIN Switching System Generic Requirements;

7.2.1.19.2 GR-1299-CORE, AIN Switch-Service Control Point (SCP)/Adjunct Interface Generic Requirements;

7.2.1.19.3 TR-NWT-001284, AIN 0.1 Switching System Generic Requirements;

7.2.1.19.4 SR-NWT-002247, AIN Release 1 Update.

7.2.2 Interface Requirements:

7.2.2.1 USWC shall provide the following interfaces to loops:

7.2.2.1.1 Standard Tip/Ring interface including loopstart or groundstart, on-hook signaling (*e.g.*, for calling number, calling name and message waiting lamp);

7.2.2.1.2 If technically feasible, and consistent with state and federal regulations, c~~C~~oin phone signaling;

7.2.2.1.3 Basic Rate Interface ISDN adhering to ANSI standards Q.931, Q.932 and appropriate Bellcore Technical Requirements;

7.2.2.1.4 Two-wire analog interface to PBX including reverse battery, E&M, wink start and DID;

7.2.2.1.5 Four-wire analog interface to PBX including reverse battery, E&M, wink start and DID;

7.2.2.1.6 Four-wire DS-1 interface to PBX or subscriber provided equipment (*e.g.*, computers and voice response systems);

7.2.2.1.7 Primary Rate ISDN to PBX adhering to ANSI standards Q.931, Q.932 and appropriate Bellcore Technical Requirements;

7.2.2.1.8 Switched Fractional DS-1 with capabilities to configure Nx64 channels (where N = 1 to 24); and

7.2.2.1.9 Loops adhering to Bellcore TR-NWT-08 and TR-NWT-303 specifications to interconnect Digital Loop Carriers.

7.2.2.2 USWC shall provide access to the following, but not limited to:

7.2.2.2.1 SS7 Signaling Network or Multi-Frequency trunking, if requested by MCIm;

7.2.2.2.2 Interface to MCIm operator services systems or Operator Services through appropriate trunk interconnections for the system;

7.2.2.2.3 Interface to MCIm directory assistance services through the MCIm switched network or to Directory Services through the appropriate trunk interconnections for the system; and

7.2.2.2.4 950 access or other MCIm required access to interexchange carriers as requested through appropriate trunk interfaces.

7.2.3 Customized routing

7.2.3.1 Description

Customized routing will enable MCIm to direct particular classes of calls to particular outgoing trunks based upon line class codes. MCIm may use customized routing to direct its customers' calls to 411, 555-1212, 0+ or 0-, to its own operator services platform directory assistance platform.

7.2.3.2 Limitations

Because there is a limitation in the technical feasibility of offering custom routing beyond the capacity of the 1A ESS switch, custom routing will be offered to competitors on a first-come, first-served basis.

7.3 Integrated Services Digital Network (ISDN)

7.3.1 Integrated Services Digital Network (ISDN) is defined in two variations. The first variation is Basic Rate ISDN (BRI). BRI consists of 2 Bearer (B) Channels and one Data (D) Channel. The second variation is Primary Rate ISDN (PRI). PRI consists of 23 B Channels and one D Channel. Both BRI and PRI B Channels may be used for voice, Circuit Switched Data (CSD) or Packet Switched Data (PSD). The BRI D Channel may be used for call related signaling, non-call related signaling or packet switched data. The PRI D Channel may be used for call related signaling.

7.3.2 Technical Requirements — ISDN

7.3.2.1 USWC shall offer Data Switching providing ISDN that, at a minimum:

7.3.2.1.1 provides integrated Packet handling capabilities;

7.3.2.1.2 allows for full 2B+D Channel functionality for BRI; and

7.3.2.1.3 allows for full 23B+D Channel functionality for PRI.

7.3.2.1.4 Each B Channel shall allow for voice, 64 Kbps CSD, and PSD of 128 logical channels at minimum speeds of 19 Kbps throughput of each logical channel up to the total capacity of the B Channel.

7.3.2.1.5 Each B Channel shall provide capabilities for alternate voice and data on a per call basis.

7.3.2.1.6 The BRI D Channel shall allow for call associated signaling, non-call associated signaling and PSD of 16 logical channels at minimum speeds of 9.6 Kbps throughput of each logical channel up to the total capacity of the D channel.

7.3.2.1.7 The PRI D Channel shall allow for call associated signaling.

7.3.3 Interface Requirements — ISDN

7.3.3.1 USWC shall provide the BRI U interface using 2-wire copper loops in accordance with TR-NWT-000393, January 1991, Generic Requirements for ISDN Basic Access Digital Subscriber Lines.

7.3.3.2 USWC shall provide the BRI interface using Digital Subscriber Loops adhering to Bellcore TR-NWT-303 specifications to interconnect Digital Loop Carriers.

7.3.3.3 USWC shall offer PSD interfaces adhering to the X.25, X.75 and X.75' ANSI and Bellcore requirements.

7.3.3.4 USWC shall offer PSD trunk interfaces operating at 56 Kbps.

Section 8. Transport

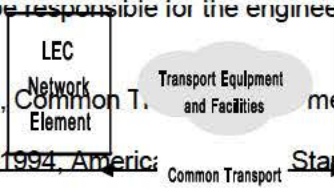
USWC will provide unbundled access to shared transmission facilities between end offices and the tandem switch. Further, USWC will provide unbundled access to dedicated transmission facilities between its Central Offices or between such offices and those of competing carriers. This includes, at a minimum, interoffice facilities between end offices, IXC POPs, end offices or tandems of USWC, and the end offices of USWC and requesting carriers. In addition, USWC will provide all technically feasible transmission capabilities, such as DS-1, DS-3, and Optical Carrier levels (*e.g.* OC-3/12/48/96) that MCIm could use to provide Telecommunications Services.

Section 9. Common Transport

9.1 Definition:

Common Transport is an interoffice transmission path between USWC Network Elements (illustrated in Figure 2) shared by carriers. Where USWC Network Elements are connected by intra-office wiring, such wiring is provided as a part of the Network Elements and is not Common Transport. USWC shall offer Common Transport as of the Effective Date of this Agreement, at DS-0, DS-1, DS-3, STS-1 or higher transmission bit rate circuits. Common Transport consists of USWC inter-office transport facilities and is distinct and separate from local switching.

Figure 2



9.2 Technical Requirements

9.2.1 USWC shall be responsible for the engineering, provisioning and maintenance of the underlying equ

9.2.2 At a minimum, Common T[illegible] meet all of the requirements set forth in the following technic

9.2.3 ANSI T1.101-1994, Americ[illegible] Standard for Telecommunications - Synchronization Interface

9.2.3.1 ANSI T1.102-1993, American National Standard for Telecommunications - Digital Hierarchy - Electrical Interfaces;

9.2.3.2 ANSI T1.102.01-199x, American National Standard for Telecommunications - Digital Hierarchy - VT1.5;

9.2.3.3 ANSI T1.105-1995, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Basic Description including Multiplex Structure, Rates and Formats;

9.2.3.4 ANSI T1.105.01-1995, American National Standard for Telecommunications - Synchronous Optical Network (SONET) Automatic Protection Switching;

9.2.3.5 ANSI T1.105.02-1995, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Payload Mappings;

9.2.3.6 ANSI T1.105.03-1994, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Jitter at Network Interfaces;

9.2.3.7 NSI T1.105.03a-1995, American National Standard for Telecommunications - Synchronous Optical Network (SONET)-Jitter at Network Interfaces - DS-1 Supplement;

9.2.3.8 ANSI T1.105.05-1994, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Tandem Connection;

9.2.3.9 ANSI T1.105.06-199x, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Physical Layer Specifications;

9.2.3.10 ANSI T1.105.07-199x, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Sub STS-1 Interface Rates and Formats;

9.2.3.11 ANSI T1.105.09-199x, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Network Element Timing and Synchronization;

9.2.3.12 ANSI T1.106-1988, American National Standard for Telecommunications - Digital Hierarchy - Optical Interface Specifications (Single Mode);

9.2.3.13 ANSI T1.107-1988, American National Standard for Telecommunications - Digital Hierarchy - Formats Specifications;

9.2.3.14 ANSI T1.107a-1990 -American National Standard for Telecommunications - Digital Hierarchy - Supplement to Formats Specifications (DS-3 Format Applications);

9.2.3.15 ANSI T1.107b-1991 -American National Standard for Telecommunications - Digital Hierarchy - Supplement to Formats Specifications;

9.2.3.16 ANSI T1.117-1991, American National Standard for Telecommunications - Digital Hierarchy - Optical Interface Specifications (SONET) (Single Mode - Short Reach);

9.2.3.17 ANSI T1.403-1989, Carrier to Subscriber Installation, DS-1 Metallic Interface Specification;

9.2.3.18 ANSI T1.404-1994, Network-to-Subscriber Installation - DS-3 Metallic Interface Specification;

9.2.3.19 ITU Recommendation G.707, Network node interface for the synchronous digital hierarchy (SDH);

9.2.3.20 ITU Recommendation G.704, Synchronous frame structures used at 1544, 6312, 2048, 8488 and 44736 kbit/s hierarchical levels;

9.2.3.21 Bellcore FR-440 and TR-NWT-000499, Transport Systems Generic Requirements (TSGR): Common Requirements;

9.2.3.22 Bellcore GR-820-CORE, Generic Transmission Surveillance: DS-1 & DS-3 Performance;

9.2.3.23 Bellcore GR-253-CORE, Synchronous Optical Network Systems (SONET); Common Generic Criteria;

9.2.3.24 Bellcore TR-NWT 000507, Transmission, Section 7, Issue 5 (Bellcore, December 1993) (A module of LSSGR, FR-NWT-000064.);

9.2.3.25 Bellcore TR-NWT-000776, Network Interface Description for ISDN Subscriber Access;

9.2.3.26 Bellcore TR-INS-000342, High-Capacity Digital Special Access Service-Transmission Parameter Limits and Interface Combinations, Issue 1 February 1991;

9.2.3.27 Bellcore ST-TEC-000052, Telecommunications Transmission Engineering Textbook, Volume 2: Facilities, Third Edition, Issue I May 1989; and

9.2.3.28 Bellcore ST-TEC-000051, Telecommunications Transmission Engineering Textbook Volume 1: Principles, Third Edition. Issue 1 August 1987.

Section 10. Dedicated Transport

10.1 Definition

10.1.1 Dedicated Transport is an interoffice transmission path between MCIm designated locations to which MCIm is granted exclusive use. Such locations may include USWC central offices or other locations, MCIm network components, other carrier network components, or subscriber premises. Dedicated Transport is depicted below in Figure 3.

Figure 3

10.1.2 USWC shall offer Dedicated Transport in each of the following manners:

10.1.2.1 As capacity on a shared facility;

10.1.2.2 As a circuit (*e.g.*, DS-1, DS-3, STS-1) dedicated to MCIm; and

10.1.2.3 As a system (*i.e.*, the equipment and facilities used to provide Dedicated Transport such as SONET ring) dedicated to MCIm.

10.1.3 When Dedicated Transport is provided as a circuit or as capacity on a shared facility, it shall include (as appropriate):

10.1.3.1 Multiplexing functionality;

10.1.3.2 Grooming functionality; and

10.1.3.3 Redundant equipment and facilities necessary to support protection and restoration.

10.1.4 When Dedicated Transport is provided as a system it shall include:

10.1.4.1 Transmission equipment such as multiplexers, line terminating equipment, amplifiers and regenerators;

10.1.4.2 Inter-office transmission facilities such as optical fiber, dark fiber, copper twisted pair and coaxial cable;

10.1.4.3 Redundant equipment and facilities necessary to support protection and restoration; and

10.1.4.4 Dedicated Transport includes the Digital Cross-Connect System (DCS) functionality as an option. DCS is described below in Section 10.5.

10.2 Technical Requirements

This Section sets forth technical requirements for all Dedicated Transport.

10.2.1 When USWC provides Dedicated Transport as a circuit or a system, the entire designated transmission circuit or system (*e.g.*, DS-1, DS-3, STS-1) shall be dedicated to MCIm designated traffic.

10.2.2 USWC shall offer Dedicated Transport using currently available technologies including, but not limited to, DS-1 and DS-3 transport systems, SONET (or SDH) Bi-directional Line Switched Rings, SONET (or SDH) Unidirectional Path Switched Rings, and SONET (or SDH) point-to-point transport systems (including linear add-drop systems), at all available transmission bit rates.

10.2.3 When requested by MCIm, Dedicated Transport shall provide physical diversity. Physical diversity means that two (2) circuits are provisioned in such a way that no single failure of facilities or equipment will cause a failure on both circuits.

10.2.4 When physical diversity is requested by MCIm, USWC shall provide the maximum feasible physical separation between transmission paths for all facilities and equipment (unless otherwise agreed by MCIm).

10.2.5 Upon MCIm's request, USWC shall provide real time and continuous remote access to performance monitoring and alarm data affecting, or potentially affecting, MCIm's traffic.

10.2.6 USWC shall offer the following interface transmission rates for Dedicated Transport:

10.2.6.1 DS-1 (Extended SuperFrame - ESF/B8ZS, D4, and unframed applications shall be provided);

10.2.6.2 DS-3 (C-bit Parity, M13, and unframed applications shall be provided);

10.2.6.3 SONET standard interface rates in accordance with ANSI T1.105 and ANSI T1.105.07 and physical interfaces per ANSI T1.106.06 (including referenced interfaces). In particular, VT1.5 based STS-1s will be the interface at an MCIm service node; and

10.2.6.4 Where available, SDH Standard interface rates in accordance with International Telecommunications Union (ITU) Recommendation G.707 and Plesiochronous Digital Hierarchy (PDH) rates per ITU Recommendation G.704.

10.2.7 USWC shall provide cross-office wiring up to a suitable Point of Termination (POT) between Dedicated Transport and MCIm designated equipment. USWC shall provide the following equipment for the physical POT:

10.2.7.1 DSX1 for DS-1s or VT1.5s;

10.2.7.2 DSX3 for DS-3s or STS-1s; and

10.2.7.3 LGX for optical signals (*e.g.*, OC-3 and OC-12).

10.2.8 For Dedicated Transport provided as a system, USWC shall design the system (including, but not limited to, facility routing and termination points) according to MCIm specifications.

10.2.9 Upon MCIm's request, USWC shall provide MCIm with electronic provisioning control of an MCIm specified Dedicated Transport.

10.2.10 USWC shall offer Dedicated Transport together with and separately from DCS.

10.3 Technical Requirements for Dedicated Transport Using SONET Technology

This Section sets forth additional technical requirements for Dedicated Transport using SONET technology including rings, point-to-point systems, and linear add-drop systems.

10.3.1 All SONET Dedicated Transport provided as a system shall:

10.3.1.1 Be synchronized from both a primary Stratum 1 level timing source;

10.3.1.2 Where technically feasible, provide SONET standard interfaces which properly interwork with SONET standard equipment from other vendors, including, but not limited to, SONET standard Section, Line and Path performance monitoring, maintenance signals, alarms, and data channels;

10.3.1.3 Provide Data Communications Channel (DCC) or equivalent connectivity through the SONET transport system. Dedicated Transport provided over a SONET transport system shall be capable of routing DCC messages between MCIm and SONET network components connected to the Dedicated Transport. For example, if MCIm leases a SONET ring from USWC, that ring shall support DCC message routing between MCIm and SONET network components connected to the ring; and

10.3.1.4 Adhere to the~~support the following~~ performance requirements for each circuit (STS-1, DS-1, DS-3, etc.) Errored Seconds and Severely Errored Seconds as specified in the technical references, where Errored and Severely Errored Seconds are defined in the technical reference at Section 10.4.5, unless such requirements are specifically stated in Commission rules, which then take precedence.:

~~10.3.1.4.1 no more than ten (10) Errored Seconds Per Day (Errored Seconds are defined in the technical reference at Section 10.4.5); and~~

~~10.3.1.4.2 no more than one (1) Severely Errored Second Per Day (Severely Errored Seconds are defined in the technical reference at Section 10.4.5).~~

10.3.2 SONET rings shall:

10.3.2.1 Be provisioned on physically diverse fiber optic cables (including separate building entrances where available and diversely routed intraoffice wiring). "Diversely routed" shall be interpreted as the maximum feasible physical separation between transmission paths, unless otherwise agreed by MCIm;

10.3.2.2 Support dual ring interworking per SONET Standards;

10.3.2.3 Provide the necessary redundancy in optics, electronics and transmission paths (including intra-office wiring) such that no single failure will cause a service interruption;

10.3.2.4 Where available, provide the ability to disable ring protection switching at MCIm's direction (selective protection lock-out). This requirement applies to line switched rings only;

10.3.2.5 Where available, provide the ability to use the protection channels to carry traffic (extra traffic). This requirement applies to line switched rings only;

10.3.2.6 Provide 50 millisecond restoration unless a ring protection delay is set to accommodate dual ring interworking schemes;

10.3.2.7 Where available, have settable ring protection switching thresholds that shall be set in accordance with MCIm's specifications;.

10.3.2.8 Where available, provide revertive protection switching with a settable wait to restore delay with a default setting of five (5) minutes. This requirement applies to line switched rings only;

10.3.2.9 Provide non-revertive protection switching. This requirement applies to path switched rings only; and

10.3.2.10 Adhere to the ~~following~~ availability requirements as specified in the technical references, where availability is defined in the technical reference set forth in Section 10.4.5, unless such requirements are specifically stated under Commission rules, which then take precedence:

~~10.3.2.10.1 no more than 0.25 minutes of unavailability month; and~~

~~10.3.2.10.2 no more than 0.5 minutes of unavailability per year.~~

10.4 At a minimum, Dedicated Transport shall meet each of the requirements set forth in Section 9.2.3 and in the following technical references.

10.4.1 ANSI T1.105.04-1995, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Data Communication Channel Protocols and Architectures;

10.4.2 ANSI T1.119-1994, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Operations, Administration, Maintenance, and Provisioning (OAM&P) Communications;

10.4.3 ANSI T1.119.01-1995, American National Standard for Telecommunications - Synchronous Optical Network (SONET) Operations, Administration, Maintenance, and Provisioning (OAM&P) Communications Protection Switching Fragment;

10.4.4 ANSI T1.119.02-199x, American National Standard for Telecommunications - Synchronous Optical Network (SONET) Operations, Administration, Maintenance, and Provisioning (OAM&P) Communications Performance Monitoring Fragment; and

10.4.5 ANSI T1.231-1993 -American National Standard for Telecommunications - Digital Hierarchy - Layer 1 In-Service Digital Transmission Performance Monitoring.

10.5 Digital Cross-Connect System (DCS)

10.5.1 Definition:

10.5.1.1 DCS is a function which provides automated cross connection of Digital Signal level 0 (DS-0) or higher transmission bit rate digital channels within physical interface facilities. Types of DCSs include, but are not limited to, DCS 1/0s, DCS 3/1s, and DCS 3/3s, where the nomenclature 1/0 denotes interfaces typically at the DS-1 rate or greater with cross-connection typically at the DS-0 rate. This same nomenclature, at the appropriate rate substitution, extends to the other types of DCSs specifically cited as 3/1 and 3/3. Types of DCSs that cross-connect Synchronous Transport Signal level 1 (STS-1) or other Synchronous Optical Network (SONET) signals (*e.g.*, STS-3) are also DCSs, although not denoted by this same type of nomenclature. DCS may provide the functionality of more than one of the aforementioned DCS types (*e.g.*, DCS 3/3/1 which combines functionality of DCS 3/3 and DCS 3/1). For such DCSs, the requirements will be, at least, the aggregation of requirements on the "component" DCSs.

10.5.1.2 In locations where automated cross connection capability does not exist, a Digital Signal Cross-Connect (DSX) or light guide cross-connect patch panels and D4 channel banks or other DS-0 and above multiplexing equipment used to provide the function of a manual cross connection will be made available.

10.5.1.3 Interconnection between a DSX or LGX, to a switch, another cross-connect, or other service platform device, is included as part of DCS.

10.6 DCS Technical Requirements

10.6.1 DCS shall provide completed end-to-end cross connection of the channels designated by MCIm.

10.6.2 DCS shall perform facility grooming, multipoint bridging, one-way broadcast, two-way broadcast and facility test functions, where technically feasible.

10.6.3 DCS shall provide multiplexing, format conversion, signaling conversion or other functions, where technically feasible.

10.6.4 The end-to-end cross connection assignment shall be input to the underlying device used to provide DCS from an operator at a terminal or via an intermediate system. The cross connection assignment shall remain in effect whether or not the circuit is in use.

10.6.5 USWC shall continue to administer and maintain DCS.

10.6.6 Where available, USWC shall provide various types of Digital Cross-Connect Systems including:

10.6.6.1 DS-0 cross-connects (typically termed DCS 1/0);

10.6.6.2 DS-1/VT1.5 (Virtual Tributaries at the 1.5Mbps rate) cross-connects (typically termed DCS 3/1);

10.6.6.3 DS-3 cross-connects (typically termed DCS 3/3);

10.6.6.4 STS-1 cross-connects; and

10.6.6.5 Other technically feasible cross-connects designated by MCIm.

10.6.7 USWC shall provide immediate and continuous configuration and reconfiguration of the channels between the physical interfaces (*i.e.*, USWC shall establish the processes to implement cross connects on demand, or, at MCIm's option, permit MCIm to control of such configurations and reconfigurations).

10.6.8 USWC shall provide scheduled configuration and reconfiguration of the channels between the physical interfaces (*i.e.*, USWC shall establish the processes to implement cross connects on the schedule designated by MCIm, or, at MCIm's option, permit MCIm to control such configurations and reconfigurations).

10.6.9 Where technically feasible, DCS shall continuously monitor protected circuit packs and redundant common equipment.

10.6.10 Where technically feasible, DCS shall automatically switch to a protection circuit pack on detection of a failure or degradation of normal operation.

10.6.11 DCS shall be equipped with a redundant power supply or a battery back-up.

10.6.12 USWC shall make available to MCIm spare facilities and equipment necessary for provisioning repairs and for meeting MCIm's maintenance standards as specified in the Provisioning and Maintenance sections.

10.6.13 At MCIm's option, USWC shall provide MCIm with real time performance monitoring and alarm data on the signals and the components of the underlying equipment used to provide DCS that actually impact or might impact MCIm's services. For example, this may include hardware alarm data and facility alarm data on a DS-3 in which an MCIm DS-1 is traversing.

~~10.6.14 At MCIm's option, USWC shall provide MCIm with real time ability to initiate tests on integrated equipment used to test the signals and the underlying equipment used to provide DCS, as well as other integrated functionality for routine testing and fault isolation.~~

10.6.1415 Where available, DCS shall provide SONET to asynchronous gateway functionality (*e.g.*, STS-1 to DS-1 or STS-1 to DS-3).

10.6.1516 Where available, DCS shall perform optical to electrical conversion where the underlying equipment used to provide DCS contains optical interfaces or terminations (*e.g.*, Optical Carrier level 3, *i.e.*, OC-3, interfaces on a DCS 3/1).

10.6.1617 Where available, DCS shall have SONET ring terminal functionality where the underlying equipment used to provide DCS acts as a terminal on a SONET ring.

10.6.1718 DCS shall provide multipoint bridging of multiple channels to other DCSs. MCIm may designate multipoint bridging to be one-way broadcast from a single master to multiple tributaries, or two-way broadcast between a single master and multiple tributaries.

10.6.1819 DCS shall multiplex lower speed channels onto a higher speed interface and demultiplex higher speed channels onto lower speed interfaces as designated by MCIm.

10.7 DCS Interface Requirements

10.7.1 USWC shall provide physical interfaces on DS-0, DS-1, and VT1.5 channel cross-connect devices at the DS-1 rate or higher. In all such cases, these interfaces shall be in compliance with applicable Bellcore, ANSI, ITU, and MCIm standards.

10.7.2 USWC shall provide physical interfaces on DS-3 channel cross-connect devices at the DS-3 rate or higher. In all such cases, these interfaces shall be in compliance with applicable Bellcore, ANSI, ITU, and MCIm standards.

10.7.3 USWC shall provide physical interfaces on STS-1 cross-connect devices at the OC-3 rate or higher. In all such cases, these interfaces shall be in compliance with applicable Bellcore, ANSI, ITU, and MCIm standards.

10.7.4 Interfaces on all other cross-connect devices shall be in compliance with applicable Bellcore, ANSI, ITU, and MCIm standards.

10.8 DCS shall, at a minimum, meet all the requirements set forth in the following technical references:

10.8.1 ANSI T1.102-1993, American National Standard for Telecommunications - Digital Hierarchy - Electrical Interfaces;

10.8.2 ANSI T1.102.01-199x, American National Standard for Telecommunications - Digital Hierarchy - VT1.5;

10.8.3 ANSI T1.105-1995, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Basic Description including Multiplex Structure, Rates and Formats;

10.8.4 ANSI T1.105.03-1994, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Jitter at Network Interfaces;

10.8.5 ANSI T1.105.03a-1995, American National Standard for Telecommunications - Synchronous Optical Network (SONET): Jitter at Network Interfaces - DS-1 Supplement;

10.8.6 ANSI T1.105.06-199x, American National Standard for Telecommunications - Synchronous Optical Network (SONET) - Physical Layer Specifications;

10.8.7 ANSI T1.106-1988, American National Standard for Telecommunications - Digital Hierarchy - Optical Interface Specifications (Single Mode);

10.8.8 ANSI T1.107-1988, American National Standard for Telecommunications - Digital Hierarchy - Formats Specifications;

10.8.9 ANSI T1.107a-1990, American National Standard for Telecommunications - Digital Hierarchy - Supplement to Formats Specifications (DS-3 Format Applications);

10.8.10 ANSI T1.107b-1991, American National Standard for Telecommunications - Digital Hierarchy - Supplement to Formats Specifications;

10.8.11 ANSI T1.117-1991, American National Standard for Telecommunications - Digital Hierarchy - Optical Interface Specifications (SONET) (Single Mode - Short Reach);

10.8.12 ANSI T1.403-1989, Carrier to Subscriber Installation, DS-1 Metallic Interface Specification:

10.8.13 ANSI T1.404-1994, Network-to-Subscriber Installation - DS-3 Metallic Interface Specification;

10.8.14 ITU Recommendation G.707, Network node interface for the synchronous digital hierarchy (SDH);

10.8.15 ITU Recommendation G.704, Synchronous frame structures used at 1544, 6312, 2048, 8488 and 44736 kbit/s hierarchical levels;

10.8.16 FR-440 and TR-NWT-000499, Transport Systems Generic Requirements (TSGR): Common Requirements;

10.8.17 GR-820-CORE, Generic Transmission Surveillance: DS-1 & DS-3 Performance;

10.8.18 GR-253-CORE, Synchronous Optical Network Systems (SONET); Common Generic Criteria; and

10.8.19 TR-NWT-000776, Network Interface Description for ISDN Subscriber Access.

Section 11. Signaling Link Transport

11.1 Definition:

Signaling Link Transport is a set of two (2) or four (4) dedicated 56 Kbps transmission paths between MCIm-designated Signaling Points of Interconnection (SPOI) that provides appropriate physical diversity and a cross connect at a USWC STP site.

11.2 Technical Requirements

11.2.1 Signaling Link Transport shall consist of full duplex mode 56 Kbps transmission paths.

11.2.2 Of the various options available, Signaling Link Transport shall perform in the following two ways:

11.2.2.1 As an "A-link" which is a connection between a switch or SCP and a home Signaling Transfer Point Switch (STPs) pair; and

11.2.2.2 As a "D-link" which is a connection between two STPs pairs in different company networks (*e.g.*, between two STPs pairs for two Competitive Local Exchange Carriers (CLECs)).

11.2.3 Signaling Link Transport shall consist of two (2) or more signaling link layers as follows:

11.2.3.1 An A-link layer shall consist of two (2) links; and

11.2.3.2 A D-link layer shall consist of four (4) links.

11.2.4 A signaling link layer shall satisfy an unavailability (down-time) performance objective as specified in the technical references unless such requirement is specifically stated under Commission rules, which then take precedence~~such that~~:

~~11.2.4.1 there shall be no more than two (2) minutes down time per year for an A-link layer, and~~

~~11.2.4.2 there shall be negligible (less than two (2) seconds) down time per year for a D-link layer.~~

11.2.5 Where available, a signaling link layer shall satisfy interoffice and intraoffice diversity of facilities and equipment, such that:

11.2.5.1 No single failure of facilities or equipment causes the failure of both links in an A-link layer (*i.e.*, the links should be provided on a minimum of two separate physical paths end-to-end); and

11.2.5.2 No two (2) concurrent failures of facilities or equipment shall cause the failure of all four (4) links in a D-link layer (*i.e.*, the links should be provided on a minimum of three (3) separate physical paths end-to-end).

11~~12~~.2.6 For requested link layers, USWC will provide MCIm with the level of diversity available.

11.3 Interface Requirements

11.3.1 There shall be a DS-1 (1.544 Mbps) interface at the MCIm-designated SPOIs. Each 56 Kbps transmission path shall appear as a DS-0 channel within the DS-1 interface.

Section 12. Signaling Transfer Points (STPs)

12.1 Definition:

Signaling Transfer Points (STPs) provide functionality that enable the exchange of SS7 messages among and between switching elements, database elements and signaling transfer points. Figure 4 depicts Signaling Transfer Points.

12.2 Technical Requirements

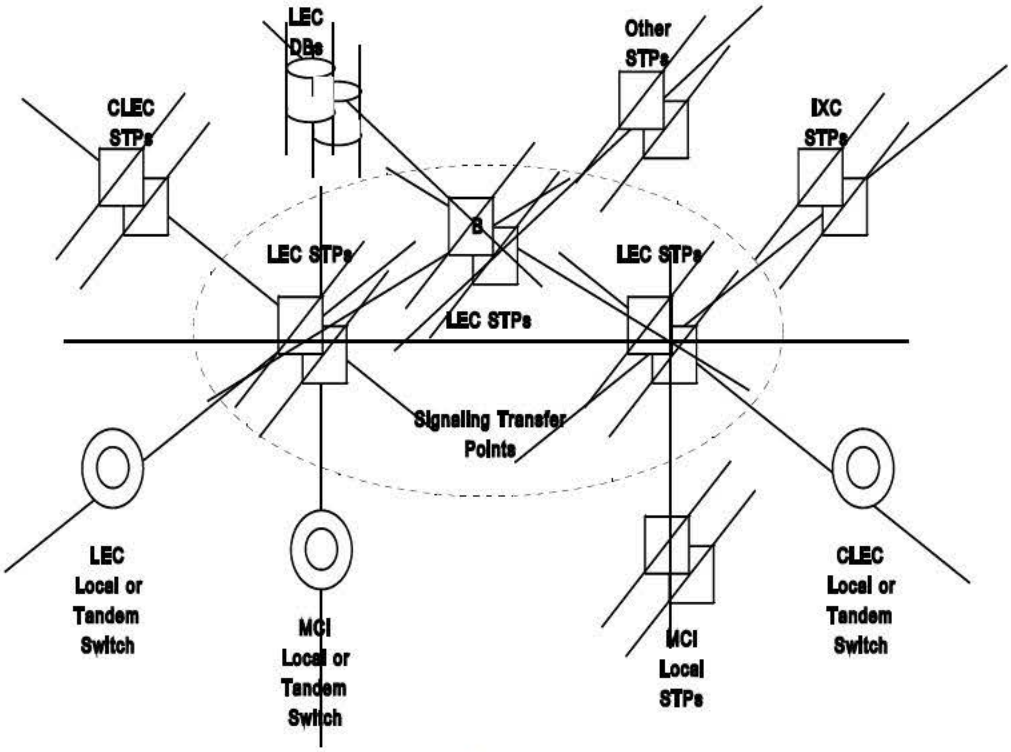


Figure 4

12.2.1 STPs shall provide access to all other Network Elements connected to the USWC SS7 network. These include:

12.2.1.1 USWC Local Switching or Tandem Switching;

12.2.1.2 USWC Service Control Points/DataBases;

12.2.1.3 Third-party local or tandem switching systems; and

12.2.1.4 Third-party-provided STPs.

12.2.2 The connectivity provided by STPs shall fully support the functions of all other Network Elements connected to USWC's SS7 network. This explicitly includes the use of USWC's SS7 network to convey messages which neither originate nor terminate at a signaling end point directly connected to the USWC SS7 network (*i.e.*, transit messages). When the USWC SS7 network is used to convey transit messages, there shall be no alteration of the Integrated Services Digital Network User Part (ISDNUP) or Transaction Capabilities Application Part (TCAP) user data that constitutes the content of the message.

12.2.3 If a USWC tandem switch routes calling traffic, based on dialed or translated digits, on SS7 trunks between an MCIm local switch and third party local switch, USWC's SS7 network shall

convey the TCAP messages that are necessary to provide Call Management features (Automatic Callback, Automatic Recall, and Screening List Editing) between the MCIm local STPs and the STPs providing connectivity with the third party local switch, even if the third party local switch is not directly connected to USWC's STPs.

12.2.4 STPs shall provide all functions of the MTP as specified in ANSI T1.111 (Reference 12.5.2). This includes:

12.2.4.1 Signaling Data Link functions, as specified in ANSI T1.111.2;

12.2.4.2 Signaling Link functions, as specified in ANSI T1.111.3; and

12.2.4.3 Signaling Network Management functions, as specified in ANSI T1.111.4.

12.2.5 STPs shall provide all functions of the SCCP necessary for Class 0 (basic connectionless) service, as specified in ANSI T1.112 (Reference 12.5.4). In particular, this includes Global Title Translation (GTT) and SCCP Management procedures, as specified in T1.112.4.

12.2.6 In cases where the destination signaling point is a USWC local or tandem switching system or data base, or is an MCIm or third party local or tandem switching system directly connected to USWC's SS7 network, USWC STPs shall perform final GTT of messages to the destination and SCCP Subsystem Management of the destination. In all other cases, STPs shall perform intermediate GTT of messages to a gateway pair of STPs in an SS7 network connected with the USWC SS7 network and shall not perform SCCP Subsystem Management of the destination.

12.2.7 STPs shall also provide the capability to route SCCP messages based on ISNI, as specified in ANSI T1.118 (Reference 12.5.7), when this capability becomes available on USWC STPs.

12.2.8 STPs shall provide all functions of the OMAP commonly provided by STPs, as specified in the reference in Section 12.5.6. This includes:

12.2.8.1 MTP Routing Verification Test (MRVT); and

12.2.8.2 SCCP Routing Verification Test (SRVT).

12.2.9 In cases where the destination signaling point is a USWC local or tandem switching system or DB, or is an MCIm or third party local or tandem switching system directly connected to the USWC SS7 network, STPs shall perform MRVT and SRVT to the destination signaling point. In all other cases, STPs shall perform MRVT and SRVT to a gateway pair of STPs in an SS7 network connected with the USWC SS7 network. This requirement shall be superseded by the specifications for Internetwork MRVT and SRVT if and when these become approved ANSI standards and available capabilities of USWC STPs.

12.2.10 STPs shall be equal to or better than the following performance requirements:

12.2.10.1 MTP Performance, as specified in ANSI T1.111.6; and

12.2.10.2 SCCP Performance, as specified in ANSI T1.112.5.

12.3 Interface Requirements

12.3.1 USWC shall provide the following STPs options to connect MCIm or MCIm-designated local switching systems or STPs to the USWC SS7 network:

12.3.1.1 An A-link interface from MCIm local switching systems; and

12.3.2 Each type of interface shall be provided by one or more sets (layers) of signaling links, as follows:

12.3.2.1 An A-link layer shall consist of two (2) links, as depicted in Figure 5~~6~~.

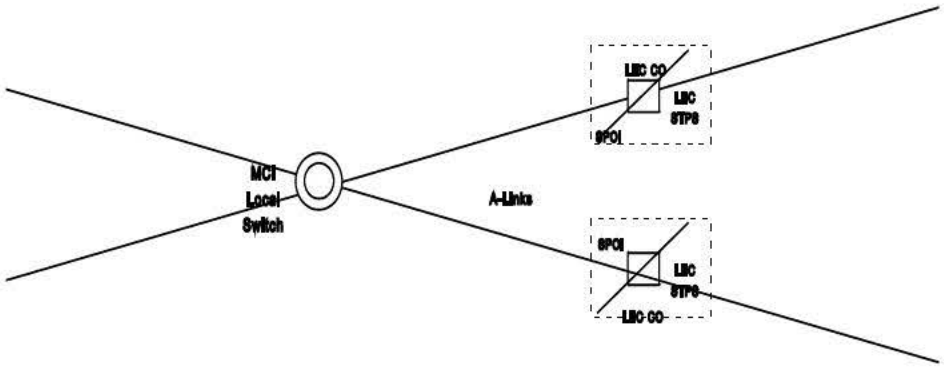


Figure 5~~6~~. A-Link Interface

12.3.3 The Signaling Point of Interconnection (SPOI) for each link shall be located at a cross-connect element, such as a DSX-1, in the Central Office (CO) where the USWC STPs is located. There shall be a DS-1 or higher rate transport interface at each of the SPOIs. Each signaling link shall appear as a DS-0 channel within the DS-1 or higher rate interface. USWC shall offer higher rate DS-1 signaling for interconnecting MCIm local switching systems or STPs with USWC STPs as soon as these become approved ANSI standards and available capabilities of USWC STPs.

12.3.4 USWC shall provide MTP and SCCP protocol interfaces that shall conform to all sections relevant to the MTP or SCCP in the following specifications:

12.3.4.1 Bellcore GR-905-CORE, Common Channel Signaling Network Interface Specification (CCSNIS) Supporting Network Interconnection, Message Transfer Part (MTP), and Integrated Services Digital Network User Part (ISDNUP); and

12.3.4.2 Bellcore GR-1432-CORE, CCS Network Interface Specification (CCSNIS) Supporting Signaling Connection Control Part (SCCP) and Transaction Capabilities Application Part (TCAP).

12.4 Message Screening

12.4.1 USWC shall set message screening parameters so as to accept messages from MCIm local or tandem switching systems destined to any signaling point in the USWC SS7 network with which the MCIm switching system has a legitimate signaling relation.

12.4.2 USWC shall set message screening parameters so as to accept messages from MCIm local or tandem switching systems destined to any signaling point or network interconnected to the USWC SS7 network with which the MCIm switching system has a legitimate signaling relation.

12.4.3 USWC shall set message screening parameters so as to accept messages destined to an MCIm local or tandem switching system from any signaling point or network interconnected to the USWC SS7 network with which the MCIm switching system has a legitimate signaling relation.

12.4.4 USWC shall set message screening parameters so as to accept and send messages destined to an MCIm SCP from any signaling point or network interconnected to the USWC SS7 network with which the MCIm SCP has a legitimate signaling relation.

12.5 STP Requirements

12.5.1 STPs shall be equal to or better than all of the requirements for STPs set forth in the following technical references:

12.5.2 ANSI T1.111-1992 American National Standard for Telecommunications - Signaling System Number 7 (SS7) - Message Transfer Part (MTP);

12.5.3 ANSI T1.111A-1994 American National Standard for Telecommunications - Signaling System Number 7 (SS7) - Message Transfer Part (MTP) Supplement;

12.5.4 ANSI T1.112-1992 American National, Standard for Telecommunications - Signaling System Number 7 (SS7) - Signaling Connection Control Part (SCCP);

12.5.5 ANSI T1.115-1990 American National Standard for Telecommunications - Signaling System Number 7 (SS7) - Monitoring and Measurements for Networks;

12.5.6 ANSI T1.116-1990 American National Standard for Telecommunications - Signaling System Number 7 (SS7) - Operations, Maintenance and Administration Part (OMAP);

12.5.7 ANSI T1.118-1992 American National Standard for Telecommunications - Signaling System Number 7 (SS7) - Intermediate Signaling Network Identification (ISNI);

12.5.8 Bellcore GR-905-CORE, Common Channel Signaling Network Interface Specification (CCSNIS) Supporting Network Interconnection, Message Transfer Part (MTP), and Integrated Services Digital Network User Part (ISDNUP); and

12.5.9 Bellcore GR-1432-CORE, CCS Network Interface Specification (CCSNIS) Supporting Signaling Connection Control Part (SCCP) and Transaction Capabilities Application Part (TCAP).

Section 13. Service Control Points/Databases

13.1 Definition:

13.1.1 Databases are the Network Elements that provide the functionality for storage of, access to, and manipulation of information required to offer a particular service and/or capability. Databases include, but are not limited to: Number Portability, LIDB, Toll Free Number Database, Automatic Location Identification/Data Management System, and AIN.

13.1.2 A Service Control Point (SCP) is a specific type of Database Network Element functionality deployed in a Signaling System 7 (SS7) network that executes service application logic in response to SS7 queries sent to it by a switching system also connected to the SS7 network. SCPs also provide operational interfaces to allow for provisioning, administration and maintenance of subscriber data and service application data. (*e.g.*, a toll free database stores subscriber record data that provides information necessary to route toll free calls).

13.2 Technical Requirements for SCPs/Databases

Requirements for SCPs/Databases within this Section 13 address storage of information, access to information (*e.g.* signaling protocols, response times), and administration of information (*e.g.*, provisioning, administration, and maintenance). All SCPs/Databases shall be provided to MCIm in accordance with the following requirements, except where any such requirement is superseded by specific requirements set forth in Subsections 13.3 through 13.7:

13.2.1 USWC shall provide physical interconnection to SCPs through the USWC designated STPs using SS7 network and protocols, as specified in Section 12 of this Attachment, with TCAP as the application layer protocol.

13.2.2 Regional SCP pairs shall be available pursuant to applicable technical reference documents.

13.2.3 USWC shall provide to MCIm database provisioning consistent with the provisioning requirements of this Agreement (*e.g.*, data required, edits, acknowledgments, data format and transmission medium and notification of order completion).

13.2.4 The operational interface provided by USWC shall complete database transactions (*i.e.*, add, modify, delete) for MCIm subscriber records stored in USWC databases at parity with which USWC provisions its own subscriber records.

13.2.5 USWC shall provide database maintenance consistent with the maintenance requirements as specified in this Agreement (*e.g.*, notification of USWC network affecting events, testing, dispatch schedule and measurement and exception reports).

13.2.6 When and where available, USWC shall provide billing and recording information to track database usage consistent with connectivity billing and recording requirements as specified in this Agreement (*e.g.*, recorded message format and content, timeliness of feed, data format and transmission medium).

13.2.7 USWC shall provide SCPs/Databases in accordance with the physical security requirements specified in this Agreement.

13.2.8 USWC shall provide SCPs/Databases in accordance with the logical security requirements specified in this Agreement.

13.3 Number Portability Database

13.3.1 Definition:

The Number Portability (NP) database supplies routing numbers for calls involving numbers that have been ported from one local service provider to another. NP database functionality shall also include Global Title Translations (GTT) for calls involving ported numbers even if USWC provides GTT functionality in another Network Element. This subsection 13.3 supplements the requirements of Subsections 13.2 and 13.7. USWC shall provide the Number Portability Database in accordance with the following:

13.3.2 Requirements

13.3.2.1 USWC shall make USWC NP database available for MCIm switches to query to obtain the appropriate routing number on calls to ported numbers or the industry specified indication that the number is not ported for non-ported numbers in NPA-NXXs that are opened to portability. The specified indication will also be provided when the NPA-NXX is not open to portability.

13.3.2.2 Query responses shall provide such additional information, for example, Service Provider identification, as may be specified in the NP implementation in the relevant regulatory jurisdiction.

13.3.2.3 USWC shall provide GTT for CLASS or LIDB queries routed to the USWC network by MCIm switches. USWC database or other Network Element shall perform the GTT function and route the query to the appropriate switch or LIDB accordingly.

13.3.2.4 The NP database shall provide such other functionality as has been specified in the regulatory jurisdiction in which portability has been implemented.

13.3.2.5 Unavailability of the NP database query and GTT applications shall not exceed four (4) minutes per year.

13.3.2.6 The USWC NP database shall respond to a query within 125 msec. of receipt of the query.

13.3.3 Interface Requirements

13.3.3.1 USWC shall interconnect the signaling interface between the MCIm or other local switch and the NP database using the TCAP protocol as specified in the technical reference in subsection 13.7.1, together with the signaling network interface as specified in the technical reference in subsection 13.7.2, and such further requirements (*e.g.*, AIN or IN protocols) as may be specified by regulatory or other bodies responsible for implementation of number portability.

13.4 Line Information Database (LIDB)

This Subsection 13.4 defines and sets forth additional requirements for the Line Information Database. This Subsection 13.4 supplements the requirements of Subsections 13.2 and 13.7.

13.4.1 Definition:

The Line Information Database (LIDB) is a transaction-oriented database accessible through Common Channel Signaling (CCS) networks. It contains records associated with subscriber Line Numbers and Special Billing Numbers (in accordance with the requirements in the technical reference in Section 13.7.5). LIDB accepts queries from other Network Elements, or MCIm's network, and provides appropriate responses. The query originator need not be the owner of LIDB data. LIDB queries include functions such as screening billed numbers that provides the ability to accept Collect or Third Number Billing calls and validation of Telephone Line Number based non-proprietary calling cards. The interface for the LIDB functionality is the interface between the USWC CCS network and other CCS networks. LIDB also interfaces to administrative systems. The administrative system interface provides Work Centers with an interface to LIDB for functions such as provisioning, auditing of data, access to LIDB measurements and reports.

13.4.2 Technical Requirements

13.4.2.1 Prior to the availability of a long-term solution for Number Portability, USWC shall enable MCIm to store in USWC's LIDB any subscriber Line Number or Special Billing Number record (in accordance with the technical reference in Section 13.7.5), whether ported or not, for which the NPA-NXX or NXX-0/lXX Group is supported by that LIDB.

13.4.2.2 Prior to the availability of a long-term solution for Number Portability, USWC shall enable MCIm to store in USWC's LIDB any subscriber Line Number or Special Billing Number (in accordance with the technical reference in subsection 13.7.5) record, whether ported or not, and NPA-NXX and NXX-0/lXX Group Records, belonging to an NPA-NXX or NXX-0/1 XX owned by MCIm.

13.4.2.3 Subsequent to the availability of a long-term solution for Number Portability, USWC shall enable MCIm to store in USWC's LIDB any subscriber Line Number or Special Billing Number (in accordance with the technical reference in subsection 13.7.5) record, whether ported or not, regardless of the number's NPA-NXX or NXX-0/lXX.

13.4.2.4 USWC shall perform the following LIDB functions (*i.e.*, processing of the following query types as defined in the technical reference in subsection 13.7.5) for MCIm's subscriber records in LIDB:

13.4.2.4.1 Billed Number Screening (provides information such as whether the Billed Number may accept Collect or Third Number Billing calls); and

13.4.2.4.2 Calling Card Validation; and

13.4.2.4.3 Originating Line Screening (OLNS), when available.

13.4.2.5 USWC shall process MCIm's subscriber records in LIDB at least at parity with USWC subscriber records, with respect to other LIDB functions (as defined in the technical reference in Section 13.5). USWC shall indicate to MCIm what additional functions (if any) are performed by LIDB in its

network. Within sixty (60) days after the Effective Date of this Agreement the Parties shall develop an interim procedure to process MCIm subscriber records.

13.4.2.6 Within two (2) weeks after a request by MCIm, USWC shall provide MCIm with a list of the subscriber data items which MCIm would have to provide in order to support each required LIDB function. The list shall indicate which data items are essential to LIDB function, and which are required only to support certain services. For each data item, the list shall show the data formats, the acceptable values of the data item and the meaning of those values.

13.4.2.7 USWC shall provide LIDB performance in accordance with Section 13.6.5 of this Attachment.

13.4.2.8 Unless directed otherwise by MCIm, in the event end user subscribers change their local service provider, USWC shall maintain subscriber data (for line numbers, card numbers, and for any other types of data maintained in LIDB) so that such subscribers shall not experience any interruption of service due to the lack of such maintenance of subscriber data.

13.4.2.9 All additions, updates and deletions of MCIm data to the LIDB shall be solely at the direction of MCIm.

13.4.2.10 USWC shall provide priority updates to LIDB for MCIm data upon MCIm's request (*e.g.*, to support fraud protection).

13.4.2.11 When available, USWC shall provide MCIm the capability to directly obtain, through an electronic interface, reports of all MCIm data in LIDB. Within sixty (60) days after the Effective Date of this Agreement the Parties shall develop an interim process to meet the requirements of this Section.

13.4.2.12 USWC shall provide LIDB such that, once data is input and verified as complete in the load process, the percentage of MCIm subscriber records missing from LIBD shall be no more than that for subscribers of USWC or its affiliates or as specified in the technical references, whichever percentage is lower. If this requirement is specifically stated in Commission rules, that requirement shall take precedence.~~no more than 0.01% of MCIm subscriber records will be missing from LIDB,~~ as measured by MCIm audits. Any discrepancies shall be jointly resolved between the Parties.

13.4.2.13 USWC shall perform backup and recovery of all of MCIm's data in LIDB as frequently as USWC performs backup and recovery for itself and any other Person, including sending to LIDB all changes made since the date of the most recent backup copy. Backup will be performed weekly. When needed, recovery will take place within twenty-four (24) hours.

13.4.2.14 USWC shall provide to MCIm access to LIDB measurements and reports at least at parity with the capability USWC has for its own subscriber records and that USWC provides to any other Person. Such access shall be electronic. Within sixty (60) days after the Effective Date of this Agreement the Parties shall develop an interim process to meet the requirements of this Section.

13.4.2.15 USWC shall provide MCIm with LIDB reports of data which are missing or contain errors, as well as any misroute errors, within the same time period as USWC provides such reports to itself. Within sixty (60) days after the Effective Date of this Agreement the Parties shall develop an interim process to meet the requirements of this Section.

13.4.2.16 USWC shall prevent any access to or use of MCIm data in LIDB by USWC personnel or by any other party not authorized by MCIm in writing.

13.4.2.17 If and when technically feasible, USWC shall provide MCIm performance of the LIDB Data Screening function, which allows a LIDB to completely or partially deny specific query originators access to LIDB data owned by specific data owners, (in accordance with the technical reference in Section 13.7.5) for Subscriber Data that is part of an NPA-NXX or NXX-0/lXX wholly or partially owned by MCIm at least at parity with USWC Subscriber Data. USWC shall obtain from MCIm the screening information associated with LIDB Data Screening of MCIm data in accordance with this requirement.

13.4.2.1817 The parties agree to investigate technical feasibility of variable LIDB database screening to accomplish the requirements of Section 13.4.2.20 above.

13.4.2.1918 USWC shall accept queries to LIDB associated with MCIm subscriber records, and shall return responses in accordance with the requirements of this Section 13.

13.4.2.2019 USWC shall provide mean processing time at the LIDB ~~within 0.50 seconds under normal conditions as defined in the technical reference in Section 13.7.5.~~

~~13.4.2.20 USWC shall provide processing time at the LIDB within one (1) second~~ and for 99% of all messages, as well as round-trip response times for 99.9% of all LIBD queries as specified in the technical references, unless such requirements are specifically stated under Commission rules, which then take precedence, under normal conditions as defined in the technical reference in Section 13.7.5.

~~13.4.2.21 USWC shall provide 99.9 % of all LIDB queries in a round trip response within two (2) seconds.~~

13.4.2.2122 USWC shall provide LIDB performance that complies with the ~~following~~ standards as specified in the technical references, unless such requirement is specifically stated under Commission rules (which then take precedence) for the following measurements
.:

13.4.2.2122.1 Minimum acceptable percentage of~~There shall be at least a 99.9%~~ reply rate to all query attempts.

13.4.2.2122.2 ~~-~~Maximum acceptable percentage of q~~Q~~ueries timing~~shall time~~ out at LIDB. ~~no more than 0.1% of the time.~~

13.4.2.2122.3 ~~-~~Maximum acceptable percentage of d~~D~~ata in LIDB replies having~~shall have at no more than two percent (2%)~~ unexpected data values, for all queries to LIDB.

13.4.2.2122.4 ~~-~~ Maximum acceptable percentage ~~No more than 0.01%~~ of all LIDB queries returning~~shall return~~ a missing subscriber record.

13.4.2.2122.5 ~~-~~Maximum acceptable number of allowable~~There shall be no~~ defects in LIDB Data Screening of responses.

13.4.2.2122.6 ~~-~~Maximum acceptable percentage of g~~G~~roup troubles occurring for~~shall occur for no more than one percent (1%) of~~ LIDB queries. Group troubles include:

13.4.2.2122.6.1 Missing Group - when reply is returned "vacant" but there is no active record for the 6-digit NPA-NXX group.

13.4.2.2122.6.2 Vacant Code - when a 6-digit code is active but is not assigned to any subscriber on that code.

13.4.2.2122.6.3 Non-Participating Group and Unavailable Network Resource - should be identified in the LARG (LIDB Access Routing Guide) so MCIm does not pay access for queries that will be denied in LIDB.

13.4.3 Interface Requirements

USWC shall offer LIDB in accordance with the requirements of this Subsection 13.4.3.

13.4.3.1 The interface to LIDB shall be in accordance with the technical reference in Section 13.7.3.

13.4.3.2 The CCS interface to LIDB shall be the standard interface described in Section 13.7.3.

13.4.3.3 The LIDB Data Base interpretation of the ANSI-TCAP messages shall comply with the technical reference in Section 13.7.4. Global Title Translation shall be maintained in the signaling network in order to support signaling network routing to the LIDB.

13.5 Toll Free Number Database

The Toll Free Number Database is a SCP that provides functionality necessary for toll free (*e.g.*, 800 and 888) number services by providing routing information and additional vertical features during call set-up in response to queries from SSPs. This Section 13.5 supplements the requirements of Section 13.2 and 13.7. USWC shall provide the Toll Free Number Database in accordance with the following:

13.5.1 Technical Requirements

13.5.1.1 USWC shall make the USWC Toll Free Number database available, through its STPs, for MCIm to query from MCIm's designated switch, including USWC unbundled local switching.

13.5.1.2 The Toll Free Number Database shall return carrier identification and, where applicable, the queried toll free number, translated numbers and instructions as it would in response to a query from a USWC switch.

13.5.2 Interface Requirements

The signaling interface between the MCIm or other local switch and the Toll-Free Number database shall use the TCAP protocol as specified in the technical reference in Section 13.7.1, together with the signaling network interface as specified in the technical reference in Sections 13.7.2 and 13.7.6.

13.6 SCPs/Databases shall be equal to or better than all of the requirements for SCPs/Databases set forth in the following technical references:

13.6.1 GR-246-CORE, Bell Communications Research Specification of Signaling System Number 7, ISSUE 1 (Bellcore, December 1990);

13.6.2 GR-1432-CORE, CCS Network Interface Specification (CCSNIS) Supporting Signaling Connection Control Part (SCCP) and Transaction Capabilities Application Part (TCAP). (Bellcore, March 1994);

13.6.3 GR-954-CORE, CCS Network Interface Specification (CCSNIS) Supporting Line Information Database (LIDB) Service 6, Issue 1, Rev. 1 (Bellcore, October 1995);

13.6.4 GR-1149-CORE, OSSGR Section 10: System Interfaces, Issue 1 (Bellcore, October 1995) (Replaces TR-NWT-001149);

13.6.5 GR-1158-CORE, OSSGR Section 22.3: Line Information Database 6, Issue (Bellcore, October 1995);

13.6.6 GR-1428-CORE, CCS Network Interface Specification (CCSNIS) Supporting Toll Free Service (Bellcore, May 1995); and

13.6.7 "Bellcore Special Report SR-TSV-002275, IBOC Notes on the LEC Networks - Signaling".

13.7 Advanced Intelligent Network (AIN) Access, Service Creation Environment and Service Management System (SCE/SMS) Advanced Intelligent Network Access

13.7.1 USWC shall provide access to any and all USWC service applications resident in USWC's SCP. Such access may be from MCIm's switch or USWC's unbundled local switch.

13.7.2 SCE/SMS AIN Access shall provide MCIm the ability to create service applications in the USWC SCE and deploy those applications via the USWC SMS to the USWC SCP. This interconnection arrangement shall provide MCIm access to the USWC development environment and administrative system in a manner at least at parity with USWC's ability to deliver its own AIN-based services. SCE AIN Access is the development of service applications within the USWC Service Creation Environment capability. SMS AIN Access is the provisioning of service applications via the USWC Service Management System capability. AIN trigger provisioning will be accomplished through the USWC local unbundled switching. See Figure 6~~7~~ below.

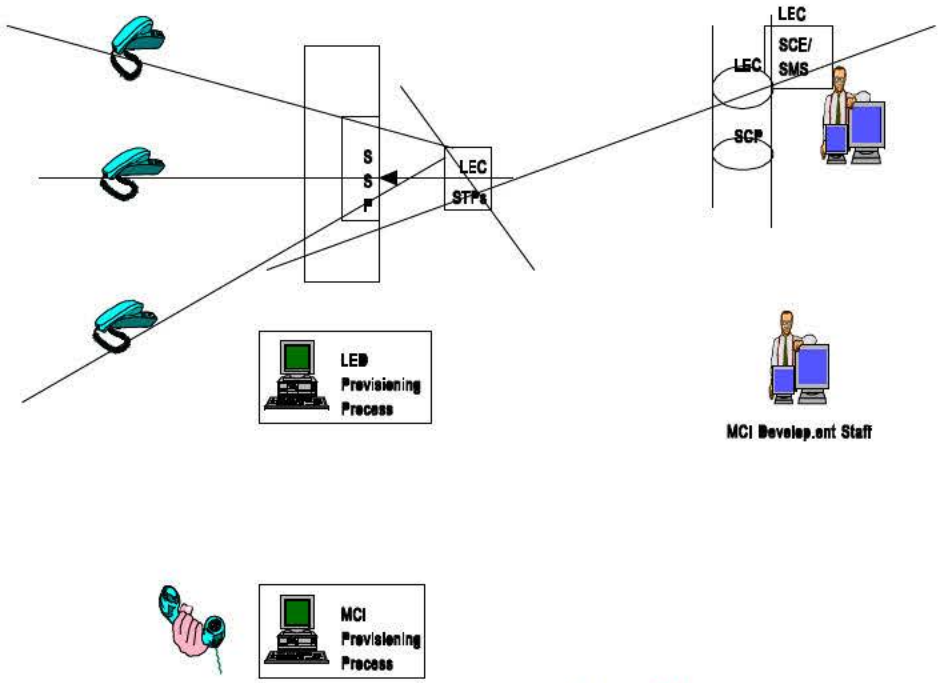


Figure 6~~7~~

13.7.3 Services Available. USWC shall make SCE hardware, software, testing and technical support (*e.g.*, technical contacts, system administrator) resources available to MCIm. Scheduling of SCE resources shall allow MCIm at least equal priority to USWC.

13.7.4 Multi-user Access. The USWC SCE/SMS shall allow for multi-user access with proper source code management and other logical security functions.

13.7.5 Partitioning. The USWC SCP shall partition and protect MCIm service logic and data from unauthorized SMS capability and SCE capability access, execution or other types of compromise.

13.7.6 Training and Documentation. USWC shall provide training and documentation for MCIm development staff only in cases in which such training or documentation is not reasonably available from another source. If training or documentation is required in accordance with this section, it will be provided in a manner at least at parity with that provided by USWC to its development staff. Training will be conducted at a mutually agreed upon location.

13.7.7 Access Environment. When MCIm selects SCE/SMS AIN Access, USWC shall provide for a secure, controlled access environment on-site as well as via mutually agreed upon remote data connections (*e.g.*, dial up, LAN, WAN).

13.7.8 Data Exchange. When MCIm selects SMS AIN Access, USWC shall allow MCIm to download data forms and/or tables to the USWC SCP, via the USWC SMS capability, in the same fashion as USWC downloads such forms and/or tables for itself.

13.7.9 Certification Testing. SCE Access is performed in an off-line environment. Services created by MCIm will require certification testing by USWC before the services can be provisioned in the network via SMS Access. The scheduling of USWC certification testing resources for new MCIm services will be jointly coordinated and prioritized between USWC and MCIm. MCIm testing requirements will be given equal priority with both USWC and other provider's requirements. In most circumstances, such testing will be completed within sixty (60) days from the date the application is submitted by MCIm to USWC for certification. In circumstances involving complex applications requiring additional time for testing, USWC may request additional time and MCIm will not unreasonably withhold approval of such request.

13.7.10 Access Standard. SCPs/Databases shall offer SCE/SMS AIN Access in accordance with the requirements of GR-1280-CORE, AIN Service Control Point (SCP) Generic Requirements.

Section 14. Tandem Switching

USWC will provide a tandem switching element ("Tandem Switching") on an unbundled basis. The tandem switch element includes the facilities connecting the trunk distribution frames to the switch, and all the functions of the switch itself, including those facilities that establish a temporary transmission path between two other switches. The definition of the tandem switching element also includes the functions centralized in tandems rather than in separate end office switches, such as call recording, the routing of calls to Operator Services, and signaling conversion functions.

14.1 Definition

Tandem Switching is the function that establishes a communications path between two switching offices through a third switching office (the tandem switch) including, but not limited to MCIm, USWC, independent telephone companies, IXCs and wireless carriers.

14.2 Technical Requirements

14.2.1 Tandem Switching shall have the same capabilities or equivalent capabilities as those described in Bell Communications Research TR-TSY-000540 Issue 2R2, Tandem Supplement, 6/l/90. The requirements for Tandem Switching include, but are not limited to, the following:

14.2.1.1 Tandem Switching shall provide signaling to establish a tandem connection;

14.2.1.2 Tandem Switching shall provide screening (digit analysis) and routing as designated by MCIm;

14.2.1.3 Where technically feasible, Tandem Switching shall provide recording of all billable events designated by MCIm;

14.2.1.4 Tandem Switching shall provide Advanced Intelligent Network triggers supporting AIN features;

14.2.1.5 Tandem Switching shall provide connectivity to Operator Systems as designated by MCIm;

14.2.1.6 Tandem Switching shall provide access to toll free number portability database as designated by MCIm;

14.2.1.7 Tandem Switching shall allow the passing of all functions associated with traffic for all trunk interconnection discussed under the "Network Interconnection" section of this Agreement (*e.g.*, SS7, MF, DTMF, Dial Pulse, PRI-ISDN, DID, and CAMA-ANI (if appropriate for 911));

14.2.1.8 Tandem Switching shall provide connectivity to PSAPs where 911 solutions are deployed and the tandem is used for 911; and

14.2.1.9 Tandem Switching shall provide connectivity to transit traffic to and from other carriers.

14.2.2 Tandem Switching shall accept connections (including the necessary signaling and trunking interconnections) between end offices, other tandems, IECs, ICOs, CAPs and CLEC switches.

14.2.3 Tandem Switching shall provide local tandeming functionality between two end offices including two (2) offices belonging to different CLEC's (*e.g.*, between an MCIm end office and the end office of another CLEC).

14.2.4 Tandem Switching shall preserve CLASS/LASS features and Caller ID as traffic is processed. Additional signaling information and requirements are provided in Section 12 of this Attachment.

14.2.5 Tandem Switching shall record billable events and send them to the area billing centers designated by MCIm. Billing requirements are specified in Attachment 8 of this Agreement.

14.2.6 USWC shall perform routine testing and fault isolation on the underlying switch that is providing Tandem Switching and all its interconnections. When requested by MCIm, the results and reports of the testing shall be made immediately available to MCIm.

14.2.7 When requested by MCIm, USWC shall provide performance data regarding traffic characteristics or other measurable elements to MCIm for review.

14.2.8 Tandem Switching shall control congestion using capabilities such as Automatic Congestion Control and Network Routing Overflow. Congestion control provided or imposed on MCIm traffic shall be at parity with controls being provided or imposed on USWC traffic (*e.g.*, USWC shall not block MCIm traffic and leave its own traffic unaffected or less affected).

14.2.9 Tandem Switching shall route calls to USWC or MCIm endpoints or platforms (*e.g.*, operator services and PSAPs) on a per call basis as designated by MCIm. Detailed primary and overflow routing plans for all interfaces available within the USWC switching network shall be mutually agreed to by MCIm and USWC. Such plans shall meet MCIm requirements for routing calls through the local network.

14.2.10 Tandem Switching shall process originating toll-free traffic received from an MCIm local switch.

14.2.11 In support of AIN triggers and features, Tandem Switching shall provide SSP capabilities when these capabilities are not available from the Local Switching Network Element.

14.2.12 The Local Switching and Tandem Switching functions may be combined in an office. If this is done, both Local Switching and Tandem switching shall provide all of the functionality required of each of those Network Elements in this Agreement.

14.3 Interface Requirements

14.3.1 Tandem Switching shall provide interconnection to the E911 PSAP where the underlying Tandem is acting as the E911 Tandem.

14.3.2 Tandem Switching shall interconnect, with direct trunks, to all carriers with which USWC interconnects.

14.3.3 USWC shall provide all signaling necessary to provide Tandem Switching with no loss of feature functionality.

14.3.4 Tandem Switching shall interconnect with MCIm's switch, using two-way trunks, for traffic that is transiting via the USWC network to interLATA or intraLATA carriers. At MCIm's request, Tandem Switching shall record and keep records of traffic for billing.

14.3.5 At MCIm's request, Tandem Switching shall provide overflow routing of traffic from a given trunk group or groups onto another trunk group or groups according to the methodology designated by MCIm.

14.4 Tandem Switching shall meet or exceed (*i.e.*, be more favorable to MCIm) each of the requirements for Tandem Switching set forth in the following technical references:

14.4.1 Bell Communications Research TR-TSY-000540 Issue 2R2, Tandem Supplement,, June 1, 1990;

14.4.2 GR-905-CORE covering CCSNIS;

14.4.3 GR-1429-CORE for call management features; and

14.4.4 GR-2863-CORE and GR-2902-CORE covering CCS AIN interconnection.

Section 15. Additional Requirements

This Section 15 of Attachment 3 sets forth the additional requirements for unbundled Network Elements which USWC agrees to offer to MCIm under this Agreement.

15.1 Cooperative Testing

15.1.1 Definition:

Cooperative Testing means that USWC shall cooperate with MCIm upon request, or as needed, to: (a) ensure that the Network Elements and Ancillary Functions and additional requirements being provided to MCIm by USWC are in compliance with the requirements of this Agreement, (b) test the overall functionality of various Network Elements and Ancillary Functions provided by USWC to MCIm in combination with each other or in combination with other equipment and facilities provided by MCIm or third parties, and (c) ensure that all operational interfaces and processes are in place and functioning properly

and efficiently for the provisioning and maintenance of Network Elements and Ancillary Functions and so that all appropriate billing data can be provided to MCIm.

15.1.2 Requirements

Within forty-five (45) days of the Effective Date of this Agreement, MCIm and USWC will agree upon a process to resolve technical issues relating to interconnection of MCIm's network to USWC's network and Network Elements and Ancillary Functions. The agreed upon process shall include procedures for escalating disputes and unresolved issues up through higher levels of each company's management. If MCIm and USWC do not reach agreement on such a process within forty-five(45) days of the Effective Date, any issues that have not been resolved by the parties with respect to such process shall be submitted to the procedures set forth in Section 24 of the General Section of this Agreement unless both parties agree to extend the time to reach agreement on such issues.

15.1.2.1 USWC shall provide MCIm access for testing at any interface between a USWC Network Element or combinations and MCIm equipment or facilities. Such test access shall be sufficient to ensure that the applicable requirements can be tested by MCIm. This access shall be available seven (7) days per week, twenty-four (24) hours per day.

15.1.2.2 MCIm may test any interfaces, Network Elements or Ancillary Functions and additional requirements provided by USWC pursuant to this Agreement.

15.1.2.3 USWC shall provide engineering data as requested by MCIm for the loop components as set forth in Sections 2, 3, and 4 of this Attachment which MCIm may desire to test. Such data shall include equipment engineering and cable specifications, signaling and transmission path data.

15.1.2.4 The Parties shall establish a process to provide engineering/office support information on unbundled Network Elements (*e.g.*, central office layout and design records and drawings, system engineering and other applicable documentation) pertaining to a Network Element or Ancillary Function or the underlying equipment that is then providing a Network Element or Ancillary Function to MCIm.

15.1.2.5 Upon request from MCIm, USWC shall provide to MCIm upon request, all applicable test results, from USWC testing activities on a Network Element or Ancillary Function or Additional Requirement or the underlying equipment providing a Network Element or Ancillary Function or Additional Requirements. MCIm may review such testing results and may notify USWC of any deficiencies that are detected.

15.1.2.6 USWC shall temporarily provision MCIm designated Local Switching features for testing. Within sixty (60) days of the Effective Date of this Agreement, MCIm and USWC shall mutually agree on the procedures to be established between USWC and MCIm to expedite such provisioning processes for feature testing.

15.1.2.7 Upon MCIm's request, USWC shall make available technical support to meet with MCIm representatives to provide required support for Cooperative Testing. USWC shall define the process to gain access to such technical support.

15.1.2.8 Dedicated Transport and Loop Feeder may experience alarm conditions due to in-progress tests. USWC shall notify MCIm upon removal of such facilities from service.

15.1.2.9 The Parties shall give notice ~~USWC shall get acceptance from MCIm~~ prior to conducting tests or maintenance procedures on Network Elements or Ancillary Functions or on the underlying equipment that is then providing a Network Element or Ancillary Function, that may cause a service interruption or degradation of service.

15.1.2.10 The Parties~~USWC~~ shall provide a single point of contact ~~to MCIm~~ that is available seven (7) days per week, twenty-four (24) hours per day for trouble status, sectionalization, resolution, escalation and closure. Such staff shall be adequately skilled to allow expeditious problem resolution.

15.1.2.11 USWC shall provide to MCIm electronic access to 105 responders, 100-type test lines, or 102-type test lines associated with any circuits under test.

15.1.2.12 MCIm and USWC shall complete Cooperative Testing in accordance with the procedures set forth in Attachment 8.

15.1.2.13 USWC shall participate in Cooperative Testing requested by MCIm whenever it is deemed necessary by MCIm to insure service performance, reliability and subscriber serviceability.

15.1.2.15 MCIm may accept or reject the Network Element ordered by MCIm if, upon completion of cooperative acceptance testing, the tested Network Element does not meet the requirements stated herein.

15.2 Performance

15.2.1 Scope

This Section addresses performance requirements for Network Elements and Ancillary Functions to provide local service. It includes requirements for the reliability and availability of Network Elements and Ancillary Functions, and quality parameters such as transmission quality (analog and digital), and speed (or delay). In addition, an overview of service performance requirements is given.

15.2.1.1 The General Performance Requirements in this Section apply to all aspects of Network Elements and Ancillary Functions. Additional requirements are given in this performance section and in the individual Network Elements sections.

15.2.1.2 USWC shall work cooperatively with MCIm to determine appropriate performance allocations across Network Elements.

15.2.2 USWC shall provide real-time, remote data access to performance monitoring and alarm data on events affecting (or potentially affecting) MCIm's traffic.

15.2.3 USWC shall provide performance equal to or better than all of the requirements set forth in the following technical references:

15.2.3.1 Bell Communications Research, Inc. Documents

15.2.3.1.1 FR-64, LATA Switching Systems Generic Requirements (LSSGR). This document contains 117 Technical References and Generic Requirements. Sections provide

the requirements for local switching systems (also referred to as end offices) that serve subscribers' lines. Some modules of the LSSGR are also referenced separately in this document.

15.2.3.1.2 TR-NWT-000499, Issue 5, Rev 1, April 1992, Transport Systems Generic Requirements (TSGR): Common Requirements.

15.2.3.1.3 TR-NWT-000418, Issue 2, December 1992, Generic Reliability Assurance Requirements For Fiber Optic Transport Systems.

15.2.3.1.4 TR-NWT-000057, Issue 2, January 1993, Functional Criteria for Digital Loop Carriers Systems.

15.2.3.1.5 TR-NWT-000507, Issue 5, December 1993, LSSGR - Transmission, Section 7.

15.2.3.1.6 GR-303-CORE, Issue 1, September 1995, Integrated Digital Loop Carrier System Generic Requirements, Objectives, and Interface.

15.2.3.1.7 GR-334-CORE, Issue 1, June 1994, Switched Access Service: Transmission Parameter Limits and Interface Combinations.

15.2.3.1.8 TR-NWT-000335, Issue 3, May 1993, Voice Grade Special Access Services - Transmission Parameter Limits and Interface Combinations.

15.2.3.1.9 TR-TSY-000529, Issue 2, July 1987, Public Safety - LSSGR.

15.2.3.1.10 GR-1158-CORE, Issue 2, October 1995, OSSGR Section 22.3: Line Information Database.

15.2.3.1.11 TR-TSY-000511, Issue 2, July 1987, Service Standards, a Module (Section 11) of LATA Switching Systems Generic Requirements (LSSGR, FR-NWT-000064).

15.2.3.1.12 TR-NWT-000393, January 1991, Generic Requirements for ISDN Basic Access Digital Subscriber Lines.

15.2.3.1.13 TR-NWT-000909, December 1991, Generic Requirements and Objectives for Fiber In The Loop Systems.

15.2.3.1.14 TR-NWT-000505, Issue 3, May 1991, LSSGR Section 5, Call Processing.

15.2.3.1.15 FR-NWT-000271, 1993, Operator Services Systems Generic Requirements (OSSGR).

15.2.3.1.16 TR-NWT-001156, Issue 2, July 1993, OSSGR Operator Services Systems Generic Requirements, Section 21, Operator Subsystem.

15.2.3.1.17 SR-TSY-001 171, Issue 1, January 1989, Methods and Procedures for System Reliability Analysis.

15.2.3.1.18 Bellcore Telecommunications Transmission Engineering 3rd ed., 1990.

15.2.3.2 ANSI Standards

15.2.3.2.1 ANSI T1.512-1994, Network Performance - Point-to-Point Voice-Grade Special Access Network Voiceband Data Transmission Objectives.

15.2.3.2.2 ANSI T1.506-1990, Network Performance - Transmission Specifications for Switched Exchange Access Network.

15.2.3.2.3 ANSI T1.508-1992, Telecommunications - Network Performance - Loss Plan for Evolving Digital Networks. Also supplement T1.508a-1993.

15.2.3.2.4 ANSI T1.101-1994, Digital Synchronization Network Plan.

15.2.3.3 TIA/EIA Standards

15.2.3.3.1 Requirements not specifically addressed here shall be found in the documents listed in Electronic Industries Association/Telecommunications Industries Association Standards and Engineering Publications.

15.2.3.3.2 TIA/EIA TSB-37A, Telephone Network Transmission Model for Evaluating Modem Performance.

15.2.3.3.3 TIA/EIA TSB-38, Test Procedure for Evaluation of 2-wire 4 kHz Voiceband Duplex Modems.

15.2.3.4 IEEE Standards

15.2.3.4.1 IEEE Standard 743-1984, IEEE Standard Methods and Equipment for Measuring Transmission Characteristics of Analog Voice Frequency Circuits.

15.2.3.4.2 ANSI/IEEE Standard 820-1984, Telephone Loop Performance Characteristics.

15.2.4 Services and Capabilities

15.2.4.1 All Network Elements shall provide performance sufficient, in combination with other Network Elements, to provide the following applications in accordance with the requirements of this document:

15.2.4.1.1 All types of voice services;

15.2.4.1.2 All types of voice-band data modem connections up to and including 28.8 Kbps V-34;

15.2.4.1.3 All types of FAX transmissions up to and including 14.4 Kbps group 3;

15.2.4.1.4 All CLASS/LASS features; and

15.2.4.1.5 All Operator Systems.

15.2.4.2 The following capabilities shall be provided as applicable:

15.2.4.2.1 ISDN BRI

15.2.4.2.2 ISDN PRI

15.2.4.2.3 Switched Digital Data

15.2.4.2.4 Non-Switched Digital Data

15.2.4.2.5 Any types of Video applications that a subscriber may order

15.2.4.2.6 Any Coin Services the subscriber may order

15.2.4.2.7 Frame Relay and ATM

15.2.4.2.8 Private Line Services

15.2.5 Specific Performance Requirements for Network Elements and Ancillary Functions

15.2.5.1 The following Sections itemize certain important performance parameters for Network Elements and Ancillary Functions that are considered significant to MCIm. USWC shall provide performance equal to or better than all of the requirements set forth in this Section. ~~Unless noted otherwise, requirements and objectives are given in terms of specific limits. This means that a~~ All tests (acceptance and ongoing performance) shall meet the limit(s) to satisfy the requirement.

15.2.5.1.1 The specific limits or benchmarks for the requirements or objectives of the performance parameters cited in this Section are as found in the technical references listed or cited in this Attachment unless such requirements are specifically cited in Commission rules. In that instance, the limits shall be as defined in the rules.

15.2.5.2 Performance Allocation

15.2.5.2.1 Transmission path impairments may be classified as either analog or digital, and will depend on the nature of the signal transmitted across the Network Element. Analog impairments are introduced on any analog portion of the loop, typically between the NID portion of Loop Distribution and the analog to digital (A/D) conversion, and are usually correlated with the length of the physical plant. Digital impairments are introduced by A/D conversion and by interfaces between digital Network Elements. In addition, noise can be introduced by either analog transmission or the A/D conversion.

~~15.2.5.3 Loop Combination Architecture Constraints~~

~~15.2.5.3.1 The following constraints will limit not only the variety of Loop Combination architectures that may be considered, but also the architectures USWC may consider to deliver any Ancillary Function or Network Element. These constraints apply to the entire path between the NID portion of Loop Distribution and the USWC switch. Any exceptions to these restrictions shall be specifically requested or approved by MCIm in writing.~~

~~15.2.5.3.1.1 No more than 1 A-D conversion.~~

~~15.2.5.3.1.2 No more than 1, 2-to-4 wire hybrid.~~

~~15.2.5.3.1.3 No voice compression.~~

~~15.2.5.3.1.4 No echo canceled or suppressers.~~

~~15.2.5.3.1.5 One digital loss pad per PBX.~~

~~15.2.5.3.1.6 No digital gain.~~

~~15.2.5.3.1.7 No additional equipment that might significantly increase intermodulation distortion.~~

15.2.5.34 Transmission Impairments

15.2.5.34.1 Analog Impairments

15.2.5.34.1.1 Analog impairments are those introduced on portions of the end-to-end circuit on which communications signals are transmitted in analog format. These portions of the transmission path would typically be between NID and an A/D conversion, most commonly on the metallic loop. The performance on the analog portion of a circuit is typically inversely proportional to the length of that circuit.

15.2.5.34.1.2 Loss

15.2.5.34.1.2.1 Electrical loss is measured using a 1004 Hz 0.0 DB one Milliwatt 900 ohm test tone. On-and-off-hook loss for an individual line as measured between the NID and the switch plus the mean loss value for all lines are measurements for this performance parameter.

~~15.2.5.4.1.2.2 Off-hook electrical loss between the NID and the switch shall be no more than 8.0 dB for any line, and the mean value for all lines shall be 3.5 dB ±0.5 dB. On-hook electrical loss between the NID and the switch shall be no more than 4.0 dB above the off-hook electrical loss for any line.~~

15.2.5.34.1.3 Idle Channel Circuit Noise

15.2.5.34.1.3.1 Idle channel circuit noise (C-message) is added by analog facilities, by the A/D conversion of signals, by digital processing equipment (*e.g.*, echo cancelers, digital loss pads), robbed bit signaling, and errors on digital facilities.

~~15.2.5.4.1.3.2 Idle channel circuit noise shall be less than or equal to 18 dBrnC.~~

15.2.5.34.1.4 Talker Echo

15.2.5.34.1.4.1 The primary source of echo is improper impedance-matching at the 2-to-4 wire hybrid in the USWC network. The impact on subscriber perception is a function of both echo return loss and delay.

~~15.2.5.4.1.4.2 Echo Return Loss (ERL) shall be greater than 26 dB to a standard termination (900 ohms, 2.16 1Fd), and greater than 14 dB to a telephone set off hook. Singing Return Loss (SRL) shall be greater than 2l dB to a standard termination, and greater than 11 dB to a telephone set off hook.~~

15.2.5.34.1.5 Listener Echo

Listener echo is a double reflection of a transmitted signal at two different impedance mismatches in the end-to-end connection. While in extreme cases it can degrade voice transmission performance, listener echo is primarily an issue for voiceband data. The requirements on Talker Echo shall apply to Listener Echo.

15.2.5.34.1.6 Propagation and Processing Delay

15.2.5.34.1.6.1 Propagation delay is the delay involved in transmitting information from one location to another. It is caused by processing delays of equipment in the network and delays associated with traveling across transmission facilities.

15.2.5.34.1.6.2 USWC shall cooperate with MCIm to limit total service propagation and processing delay to levels at parity with that within the USWC local network.

15.2.5.34.1.7 Signal-to-Noise Ratio

15.2.5.34.1.7.1 The Signal-to-Noise Ratio (S/N) is a critical parameter in determining voiceband data performance. It is typically measured with a 1004 Hz tone.

~~15.2.5.4.1.7.2 USWC must provide on the Loop Combination a signal to noise ratio of at least 37 dB between the NID and the end office.~~

15.2.5.34.1.8 C-Notched Noise

The requirements for Signal-to-Noise Ratio shall apply to C-Notched Noise.

15.2.5.34.1.9 Attenuation Distortion

15.2.5.34~~.~~1.9.1 Attenuation distortion, also known as frequency distortion or gain slope, measures the variations in loss at different frequencies across

the voice frequency spectrum (200 Hz - 3400 Hz). It is measured by subtracting the loss at 1004 Hz from the loss at the frequency of interest.

~~15.2.5.4.1.9.2 Attenuation distortion from the NID to the switch shall be within the range ±0.5 dB for frequencies between 304 and 3004 Hz; from the switch to NID attenuation distortion shall be within the range ±0.5 dB for frequencies between 204 Hz and 3004 Hz. In addition, attenuation distortion shall remain within the range +1 dB/ 3 dB for frequencies between 200 Hz and 3500 Hz.~~

15.2.5.34.1.10 –Envelope Delay Distortion

15.2.5.34.1.10.1 Envelope Delay Distortion (EDD) measures the difference in transit time of signals at different frequencies. EDD is measured relative to the transit time of a 1704 Hz tone, and is given in microseconds. EDD is used as an approximation of the group delay of the channel.

~~15.2.5.4.1.10.2 EDD shall be: 1704 Hz to 604 Hz ≤ 350 1sec.; 1704 Hz to 2804 Hz ≤ 195 1sec.; 1704 Hz to 204 Hz ≤ 580 1sec.; 1704 Hz to 3404 Hz ≤ 400 1sec.~~

15.2.5.34.1.11 –Phase Jitter

15.2.5.34.1.11.1 Phase jitter measures the unwanted angular modulation of a signal. It is caused by noise or the actual modulation of the signal by another unwanted signal. It displaces the zero crossings of a signal. It is measured in terms of peak-to-peak deviations of a 1004 Hz tone from its nominal zero crossings, and in a particular frequency band (200-300 HZ and either 4-300 Hz or 2-300 Hz). Phase jitter impacts voiceband data performance and can make modems more susceptible to other impairments, including noise.

~~15.2.5.4.1.11.2 From the NID to the interexchange carrier point of termination, phase jitter shall be < 1.5° point to point in the 0-300 Hz band, and < 1.8° point to point in the 4-300 Hz band.~~

15.2.5.34.1.12 Amplitude Jitter

15.2.5.34.1.12.1 Amplitude jitter is any deviation of the peak value of a 1004 Hz signal from its nominal value. Excessive amounts can impair voiceband data performance. It is primarily caused by noise but can also be caused by phase jitter, gain hits, or single frequency interference.

~~15.2.5.4.1.12.2 In NID interexchange carrier point of termination, ≤ 2.5% of amplitude jitter is permitted in the 20-300 Hz band and ≤ 2.9% in the 4-300 Hz band.~~

15.2.5.34.1.13 Intermodulation Distortion

15.2.5.34.1.13.1 Intermodulation distortion (IMD) measures non-linear distortions of a signal. It compares the power of harmonic tones to the power of the transmitted tones. It is measured for both the 2nd and 3rd harmonics of the transmitted tones. IMD is caused by compression or clipping and can impair voiceband data performance.

~~15.2.5.4.1.13.2 Both 2nd and 3rd order IMD between the NID and end office must be > 52 dB.~~

15.2.5.34.1.14 Impulse Noise

15.2.5.34.1.14.1 Impulse noise is a sudden and large increase in noise on a channel for a short duration of time. Impulse noise is measured as a count of the number of times a noise threshold is exceeded during a given time period (typically 5 or 15 minutes). It is caused by protection switching, maintenance activities, electromechanical switching systems, digital transmission errors, and line coding mismatches. Impulse noise sounds like clicking noises or static on voice connections. Impulse noise impairs voiceband data performance.

~~15.2.5.4.1.14.2 The NID to interexchange carrier point of termination portions of connections shall introduce no impulse noise events within 6 dB of the received signal power on 93% of all 15 minute connections. In addition, there shall be no more than one (1) impulse noise event within 6 dB of the received signal power during any 30 minute period.~~

15.2.5.34.1.15 Phase Hits

15.2.5.34.1.15.1 Phase hits are a sudden change in the phase of a signal lasting at least 4 msec. Phase hits are measured using a threshold which indicates how much the phase of the signal has changed with respect to its nominal phase. Phase hits are caused by protection switching and slips or other synchronization errors. Phase hits can impair voiceband data performance.

~~15.2.5.4.1.15.2 Between the NID and interexchange carrier point of termination, 99.75% of all 15-minute connections shall have no phase hits exceeding 10°. In addition, there shall be no more than one (1) phase hit exceeding 10° in any 30 minute period.~~

15.2.5.34.1.16 Gain Hits

15.2.5.34.1.16.1 Gain hits are sudden changes in the level of a signal that last at least 4 msec. Gain hits are measured against a threshold of typically 2-5 dB relative to the signal's nominal level. Gain hits are usually caused by protection switches and can impair voiceband data performance.

~~15.2.5.4.1.16.2 Between the NID and the interexchange carrier point of termination, 99.5% of all 15 minute connections shall have no gain hits exceeding 3 dB. In addition, there shall be no more than one (1) gain hit exceeding 3 dB in any 30 minute period.~~

15.2.5.34.1.17 Dropouts

15.2.5.34.1.17.1 Dropouts are drops in the level of a signal of 12 dB or more for at least 4 msec. They are caused by protection switching events, radio fading, and conditions causing digital carrier systems to lose frame. Dropouts are critical for voiceband data performance but, if severe enough, will also affect voice quality.

~~15.2.5.4.1.17.2 Between the NID and the interexchange carrier point of termination, 99.9% of all 15 minute connections shall have no dropouts and in addition, no connection shall suffer more than one (1) dropout in any 60 minute period.~~

15.2.5.34.1.18 Frequency Shift

15.2.5.34.1.18.1 Frequency shift measures any frequency changes that occur when a signal is transmitted across a channel. It is typically measured using a 1004 Hz tone. Frequency shift has very little impact on voice or voiceband data performance; however, round-trip frequency shifts can affect the ability of echo cancelers to remain converged.

~~15.2.5.4.1.18.2 No more than 0.2 Hz frequency shift shall be on any connection. In addition, 99.5% of all calls shall have frequency shift < 0.1 Hz.~~

15.2.5.34.1.19 Crosstalk

15.2.5.34.1.19.1 Crosstalk is the presence of signals from other telephone connections on a circuit. Crosstalk can be either intelligible, when speech from other connections can be heard and understood, or unintelligible. Crosstalk is caused by inter-channel interference on the transmission system. Crosstalk is difficult to measure; it requires correlating signals on different circuits or using human listeners to identify its presence. Trouble reports may be used to estimate the probability of crosstalk.

~~15.2.5.4.1.19.2 99% of Loop Combinations shall have probability ≤ 0.1% of experiencing crosstalk exceeding -65 dBm0.~~

15.2.5.34.1.20 Clipping

15.2.5.34.1.20.1 Clipping occurs when part of a transmitted signal is dropped and does not reach the receiving portion on a connection. It can be caused by Digital Speech Interpolation (DSI) equipment used in Digital Circuit Multiplication Systems (DCMS) which increase the amount of traffic that transmission facilities carry, and by echo cancelers or echo suppressers.

~~15.2.5.4.1.20.2 No clipping incidents shall occur on any call.~~

15.2.5.34.2 Digital Impairments

Digital impairments occur in the signal wherever it is transmitted in digital format. These errors are usually introduced upon conversion of the signal from analog to digital, as well as at interfaces between digital components. While many digital impairments have little impact on subjective voice quality, they can impact voiceband data performance.

15.2.5.34.2.1 Signal Correlated Distortion

15.2.5.34.2.1.1 Signal correlated distortion (SCD) is unwanted noise or distortion introduced into a signal through the conversion of a signal from analog to digital format or through digital processing that changes the transmitted signal. SCD affects performance when a sign is being transmitted. The primary sources of SCD are signal encoders, echo cancelers, digital loss pads, and robbed bit signaling. SCD affects both voice and voiceband data performance.

15.2.5.34.2.1.2 The NID-to-end-office connection shall normally allow:

15.2.5.34.2.1.2.1 A maximum of 1 A/D conversion, using 64 Kbps 1-law (1=255) PCM;

15.2.5.34.2.1.2.2 No voice compression;

15.2.5.34.2.1.2.3 No echo cancellation; and

15.2.5.34.2.1.2.4 Robbed bit signaling only if SS7 or ISDN are not used.

15.2.5.34.2.2 Slips

15.2.5.34.2.2.1 Slips occur when a frame of digital data is either deleted or repeated because of differences in the clocks used to synchronize digital facilities. Slips sound like clicks or pops on voice calls and have major impact on voiceband data performance.

~~15.2.5.4.2.2.2 The NID to interexchange carrier point of termination portion of connections shall have fewer than 0.45 slips every twenty four (24) hours on average.~~

15.2.5.34.2.3 Digital Timing Jitter and Wander

15.2.5.34.2.3.1 Digital timing jitter is the unwanted phase modulation of digital signals at rates above 10 Hz. Wander is the unwanted phase modulation of digital signals at rates below 10 Hz. Digital timing jitter is caused by imperfections in the timing recovery process of repeaters and the stuffing synchronization process used by multiplexer/demultiplexers. Wander is caused by slowly varying changes in digital signal phase due to clock frequency offset and drift, changes in propagation delay of terrestrial facilities due to temperature changes and changes in the distance of satellites from the earth. These events have a major impact on voiceband data performance.

~~15.2.5.4.2.3.2 The maximum digital timing jitter allowed in the 10 Hz to 8 kHz frequency band at any network interface or any terminal equipment in the network is 5 Unit Intervals (UI). The maximum digital timing jitter allowed in the 8 kHz to 40 kHz frequency band is 0.1 UI. The objective for wander is less than 28 UI at any network interface or terminal equipment.~~

15.2.5.34.2.4 DS-1 Errored Seconds

15.2.5.34.2.4.1 An Errored Second (ES) on a DS-1 facility is any second during which at least 1 bit is in error. The impact of an ES on performance depends on

the number of errors that occur during a second. Typically, voice performance is not significantly impacted by ES but they can cause errors in voiceband data transmissions.

~~15.2.5.4.2.4.2 Each USWC network shall have less than 20 ESs per 24 hour period.~~

15.2.5.34.2.5 DS-1 Severely Errored Seconds

15.2.5.34.2.5.1 A Severely Errored Second (SES) is any second during which a DS-1 has an error rate exceeding 0.001. An SES can be caused by a loss of framing, a slip, or a protection switch. SESs have impacts on both voice and voiceband data performance. For voice, a SES will sound like a burst of noise or static. SESs that occur during a voiceband data transmission cause a significant burst of errors and can cause modems to retrain.

~~15.2.5.4.2.5.2 The digital portion of each NID to POP connection shall have less than 2 SESs per 24 hour period.~~

15.2.5.34.2.6 Short Failure Events

15.2.5.34.2.6.1 A Short Failure Event (SFE) is a Loss of Frame (LOF) event of less than two minutes' duration. An LOF event is declared when, on detection of a Loss of Signal (LOS) or Out-of-Frame (OOF), a rise-slope-type integration process starts that declares a LOF after 2.5±0.5 sec. of continuous LOS or OOF. If the LOS or OOF is intermittent the integration process shall decay at a slope of 1/5 the rise slope during the period when the signal is normal. Thus, if the ratio of a LOS or OOF to a normal signal is greater than 1/2, a LOF will be declared. A LOS condition shall be declared when the Network Channel Terminating Equipment has determined that 175±75 successive pulse positions with no pulses of either positive or negative polarity have occurred. An OOF condition shall be declared when either Network equipment or Digital Terminal Equipment detects errors in the framing pattern.

~~15.2.5.4.2.6.2 There shall be fewer than one (1) SFE per month.~~

15.2.5.45 Service Availability and Reliability

Availability refers to the time period during which the service is up and usable for its intended purpose. Reliability refers to the probability that a task will be completed successfully, given that it is successfully begun.

15.2.5.45.1 Blocked Calls

15.2.45.5.1.1 Blocking is the fraction of call origination attempts denied service during a stated measurement period. Blocking occurs because of competition for limited resources within the network.

~~15.2.5.5.1.2 For intraLATA toll service and local exchange service, the blocking level from originating (NID) to terminating NID shall not exceed 1% in any hour, except under conditions of service disruption. For access to or egress from a long distance network, the blocking rate shall not exceed 0.5% in any hour.~~

15.2.5.45.2 Downtime

Downtime is the period of time that a system is in a failed state. Average downtime per year for subscriber Loop Combinations and individual lines, end office switches, individual and groups of trunks, and remote terminals are included in the performance parameters for this measurement.

~~15.2.5.5.2.1 The average downtime for all subscriber Loop Combinations shall be less than forty nine (49) minutes per year. The maximum downtime for 99% of all subscriber Loop Combinations shall be less than seventy four (74) minutes per year.~~

~~15.2.5.5.2.2 The average downtime for an end office switch shall be less than three (3) minutes per year. The average downtime for individual trunks shall be less than twenty eight(28) minutes per year. The average downtime for digital trunk groups shall be less than twenty (20) minutes per year. The average downtime for an individual line appearance at the switch shall be less than twenty eight (28) minutes per year. The average downtime for a Remote Terminal (RT) shall be less than seventeen (17) minutes per year. The average downtime for an individual line on a Remote Terminal (RT) shall be less than thirteen (13) minutes per year.~~

~~15.2.5.5.2.3 The mean time to repair (MTTR) of any equipment at an attended site shall be less than three (3) hours. The mean time to repair (MTTR) of any equipment at an unattended site shall be less than four (4) hours. 95% of all repairs to the network interface (NID) shall be completed within twenty four (24) hours.~~

~~15.2.5.5.2.4 There shall be no downtime due to power failures at the switch.~~

~~15.2.5.5.2.5 The probability of a stable call being cut off shall be less than twenty (20) cutoffs per one million 1 minute calls.~~

~~15.2.5.5.2.6 The rate of ineffective machine attempts at the end office shall be less than 0.0005 (5 failures per 10,000 call attempts).~~

15.2.5.~~4~~5.2.~~1~~7 USWC shall meet all requirements for private line services in TR-NWT-000335, ANSI T1.512-1994.

15.2.5.~~4~~5.3 Dial Tone Delay

15.2.5.~~4~~5.3.1 ~~–~~Dial-Tone Delay is the time period between a subscriber off-hook and the receipt of dial tone from an originating end office. Dial-Tone Delay has a significant effect on subscriber opinion of service quality.

~~15.2.5.5.3.2 The average dial-tone delay shall not exceed 1.5% of calls delayed more than three (3) seconds. At most 20% of calls during the high day busy hour (HDBH) shall experience dial tone delay greater than three (3) seconds.~~

15.2.5.~~4~~5.4 Dial Tone Removal

15.2.5.~~4~~5.4.1 Dial tone removal is the time between recognition of the first address digit to the removal of dial tone on the line.

~~15.2.5.5.4.2 The maximum dial tone removal interval shall be ≤500 milliseconds.~~

15.2.5.~~4~~5.5 Post Dial Delay

15.2.5.~~4~~5.5.1 Post Dial Delay (PDD) is the amount of time a caller must wait after entering or dialing the last digit of a Destination Telephone Number (DTN) before hearing a valid audible network response. The PDD for an end user is measured from the time the caller has pressed or dialed the last digit of a DTN until receipt of an audible network response.

15.2.5.~~4~~5.5.2 The requirements given reflect an end-to-end CCS7 protocol for MCIm end users. Where a mixture of CCS7 and inband (MF) signaling protocols are employed, an increase in the PDD can be expected.

15.2.5.~~4~~5.5.2.1 PDD 1 - A - Intra LSO

15.2.5.~~4~~5.5.2.1.1 ~~–~~Intra-LSO calls do not employ external signaling protocols. The PDD for intra-LSO calls flows are dependent upon the processor cycle time and traffic load conditions. This PDD is assumed to be between subscribers on the same LSO, between the Remote Switch Modules (RSMs) on the same Host, or between an RSM and Host subscribers.

~~15.2.5.5.5.2.1.2 The objective for intra-LSO PDD is less than 310 milliseconds for 50% of all calls and less than 460 milliseconds for 95% of all calls.~~

15.2.5.~~4~~5.5.2.2 PDD1 ~~–~~-~~–~~B~~–~~-~~–~~LSO to Another Local LSO

15.2.5.~~4~~5.5.2.2.1 ~~–~~The signaling protocols from an LSO to another LSO are assumed to employ out-of-band Common Channel Signaling System 7 (CCS7) format. Local calls, that is, calls from an LSO to another LSO are assumed to have no more than one (1) pair of Signaling Transfer Point Switches (STPs) and no more than one (1) data base dip.

~~15.2.5.5.5.2.2.2 This PDD is expected to be better than the MCI Long Distance objective with an average PDD of ≤ 8.70 seconds with 95% <1.34 seconds.~~

15.2.5.~~4~~5.5.2.3 PDD1 - C - MCIm LSO to Other LSO

15.2.5.~~4~~5.5.2.3.1 ~~–~~Calls from an MCIm LSO to other LSOs are dependent upon the interface agreements between MCIm and the LSO service provider and may employ CCS7, inband (MF) or a combination of both protocols.

15.2.5.~~4~~5.5.2.3.2 ~~–Calls from an MCIm LSO to another LSO via the Public Switched Telecommunications Network (PSTN), using end to end CCS7 signaling protocols, can expect to meet the MCIm PDD objectives of an average of 2.0 seconds with 95% in <2.5 seconds. Calls from an MCIm LSO via the PSTN to LSOs outside the local service area are assumed to use CCS7 signaling protocols to the MCIm switch.~~ The egress signaling

protocols from the MCI Switched Network to the many different local telephone company service providers however does not necessarily utilize CCS7 signaling. There are three basic egress signaling configuration. They are:

15.2.5.45.5.2.3.2.1 –Network Inter-Connect, CCS7 between MCIm and the local telephone company.

15.2.5.45.5.2.3.2.2 –Inband Multifrequency (MF) signaling protocols without a USWC egress tandem in the connection.

15.2.5.45.5.2.3.2.3 –Inband MF signaling protocols with a USWC egress tandem in the connection.

15.2.5.4.4.6.5.2.3.2.3.1 Calls from an MCIm LSO to other LSOs outside the local service area are assumed to have multiple STPs for 1+ traffic in the access and PSTN portion of the connection. The egress from the PSTN for 1+ traffic is again dependent upon the interface agreements in that service area and may consist of CCS7 or inband MF protocols.

~~15.2.4.6.5.2.3.2.3.2 Calls from an MCIm's LSO to another MCIm LSO with a mixture of CCS7 or all inband signaling protocols are expected to receive PDDs on the average of 2.9 seconds with 95% in <6.5 seconds.~~

15.2.5.45.5.2.4 –Impact of Number Portability (NP)

If a call forwarding option is used as an interim solution for NP, the delay due to additional switching in the local access shall not exceed 0.4 seconds (95th percentile) in addition to the PDDs described above.

15.2.5.45.5.2.5 –Custom Local Area Subscriber Services (CLASS)

CLASS^{SM} features such as Calling Name Delivery can contribute to the PDD of a call. This delay is caused by the additional time (USWC option) before the ringing interval commences. This default delay is three (3) seconds. Optional settings are available in one (1) second intervals from one (1) to six (6) seconds. Calls to DTNs that have CLASS^{SM} features, particularly with calling name delivery, can expect to experience from 1 to 6 seconds (3 seconds default) of additional PDD compared to the PDDs shown for PDD1-C. MCI will specify optimal settings.

15.2.5.45.5.2.6 –Partial Dial Timing

15.2.5.45.5.2.6.1 –The interval between each information digit from a subscriber's line, until the LSO or switching system has determined that the digit string is incomplete.

~~15.2.5.5.5.2.6.2 For subscriber lines, partial dial timing shall be >16 seconds and <24 seconds. For trunks, inband signaling time-out shall be ≥5 seconds and <20 seconds.~~

15.2.5.56 –Local Switching

USWC shall provide performance equal to or better than the requirements for Local Switching set forth in Bellcore LSSGR TR-TSY-000511. Post dial delay for connections to MCIm local operator services shall be no worse than Operator Services provided by USWC. Additionally, post dial delay from the Operator Services to destination numbers shall be no worse than that provided by USWC. Post dial delay for connections to MCIm local directory services shall be no worse than directory services provided by USWC. Additionally, post dial delay from the directory system to destination numbers shall be no worse than that provided by USWC.

15.2.5.6~~7~~ Operator Systems

Operator System connections shall comply with the requirements for the Loop Combination, Local Switching, Operator Service, and Directory Assistance Service requirements.

15.2.5.7~~8~~ Common Transport

Specific requirements for this Network Element or Ancillary Function are in the Common Transport section. In all cases the performance of this Network Element shall meet the general requirements stated in "General Performance Requirements". Allocation of impairments shall be negotiated between MCIm and USWC consistent with sound engineering principles.

15.2.5.8~~9~~ Dedicated Transport

Specific requirements for this Network Element are in the Dedicated Transport section. In all cases the performance of this Network Element shall meet the general requirements stated in "General Performance Requirements". Allocation of impairments shall be negotiated between MCIm and USWC consistent with sound engineering principles.

15.2.5.9~~10~~ Signaling Transfer Points

Specific requirements for this Network Element are in the Signaling Transfer Points section. In all cases the performance of this Network Element shall meet the general requirements stated in "General Performance Requirements". Allocation of impairments shall be negotiated between MCIm and USWC.

15.2.5.10~~11~~ Signaling Link Transport

Specific requirements for this Network Element are in the Signaling Link Transport section. In all cases the performance of this Network Element shall meet the general requirements stated in "General Performance Requirements". Allocation of impairments shall be negotiated between MCIm and USWC consistent with sound engineering principles.

15.2.5.11~~12~~ SCPs/Databases

The performance requirements for databases (NP, LIDB, E911, etc.) vary depending or the database and the applications it supports. Database-specific performance requirements are included in the sections addressing individual Network Elements and in applicable Bellcore documents. In all cases, the query response time, availability, accuracy, updating capabilities, and

other performance parameters shall at least be at parity with those services as provided to USWC or other subscribers.

15.2.5.1213 –Tandem Switching

Specific requirements for this Network Element are in the Tandem Switching section. In all cases the performance of this Network Element shall meet the general requirements stated in "General Performance Requirements". Allocation of impairments shall be negotiated between MCIm and USWC consistent with sound engineering principles.

15.2.6 –Test and Verification

15.2.6.1 –USWC shall permit MCIm to confirm acceptable performance of any Network Element.

15.2.6.1.1 –At MCIm's request, USWC will provide access to the Network Element sufficient for MCIm to test the performance of that Network Element to MCIm's satisfaction.

15.2.6.1.2 –At MCIm's request, USWC will perform tests to confirm acceptable performance and provide MCIm with documentation of test procedures and results acceptable to MCIm.

15.3 Protection, Restoration, and Disaster Recovery

See Attachment 8.

15.4 Synchronization

15.4.1 Definition:

Synchronization is the function which keeps all digital equipment in a communications network operating at the same average frequency. With respect to digital transmission, information is coded into discrete pulses. When these pulses are transmitted through a digital communications network, all synchronous Network Elements are traceable to a stable and accurate timing source. Network synchronization is accomplished by timing all synchronous Network Elements in the network to a stratum 1 source so that transmission from these network points have the same average line rate.

15.4.2 –Technical Requirements

The following requirements are applicable to the case where USWC provides synchronization to equipment that MCIm owns and operates within a USWC location. In addition, these requirements apply to synchronous equipment that is owned by USWC and is used to provide a Network Element to MCIm.

15.4.2.1 –The synchronization of clocks within digital networks is divided into two parts: intra-building and inter-building. Within a building, a single clock is designated as the Building Integrated Timing Supply (BITS), which provides all of the DS-1 and DS-0 synchronization references required by other clocks in such building. This is referred to as intra-building synchronization.

The BITS receives synchronization references from remotely located BITS. Synchronization of BITS between buildings is referred to as inter-building synchronization.

15.4.2.2 To implement a network synchronization plan, clocks within digital networks are divided into four stratum levels. All clocks in strata 2, 3, and 4 are synchronized to a stratum 1 clock, that is, they are traceable to a stratum 1 clock. A traceable reference is a reference that can be traced back through some number of clocks to a stratum 1 source. Clocks in different strata are distinguished by their free running accuracy or by their stability during trouble conditions such as the loss of all synchronization references.

15.4.2.2.1 Intra-Building

15.4.2.2.1.1 Within a building, there may be different kinds of equipment that require synchronization at the DS-1 and DS-0 rates. Synchronization at the DS-1 rate is accomplished by the frequency synchronizing presence of buffer stores at various DS-1 transmission interfaces. Synchronization at the DS-0 rate is accomplished by using a composite clock signal that phase synchronizes the clocks. Equipment requiring DS-0 synchronization frequently does not have adequate buffer storage to accommodate the phase variations among different equipment. Control of phase variations to an acceptable level is accomplished by externally timing all interconnecting DS-0 circuits to a single clock source and by limiting the interconnection of DS-0 equipment to less than 1,500 cable feet. Therefore, a BITS shall provide DS-1 and composite clock signals when the appropriate composite signal is a 64-kHz 5/8th duty cycle, return to zero with a bipolar violation every eighth pulse (B8RZ).

15.4.2.2.2 Inter-Building

15.4.2.2.2.1 USWC shall provide inter-building synchronization at the DS-1 rate, and the BITS shall accept the primary and secondary synchronization links from BITS in other buildings. From hierarchical considerations, the BITS shall be the highest stratum clock within the building and USWC shall provide operations capabilities (this includes, but is not limited to: synchronization reference provisioning; synchronization reference status inquiries; timing mode status inquiries; and alarm conditions).

15.4.3 Synchronization Distribution Requirements

15.4.3.1 Central office BITS shall contain redundant clocks meeting or exceeding the requirements for a stratum 2 clock as specified in ANSI T1.101-1994 and Bellcore TR-NWT-001244 Clocks for the Synchronized Network: Common Genetic Criteria.

15.4.3.2 Central office BITS shall be powered by primary and backup power sources.

15.4.3.3 If both reference inputs to the BITS are interrupted or in a degraded mode (meaning off frequency greater than twice the minimum accuracy of the BITS, loss of frame, excessive bit errors, or in Alarm Indication Signal), then the stratum clock in the BITS shall provide the necessary bridge in timing to allow the network to operate without a frame repetition or deletion (slip free) with better performance than one (1) frame repetition or deletion (slip) per week.

15.4.3.4 DS-1s multiplexed into a SONET synchronous payload envelope within an STS-n (where n is defined in ANSI T1.105-1995) signal shall not be used as reference facilities for network synchronization.

15.4.3.5 The total number of Network Elements cascaded from the stratum 1 source shall be minimized.

15.4.3.6 A Network Element shall receive the synchronization reference signal only from another Network Element that contains a clock of equivalent or superior quality (stratum level).

15.4.3.7 USWC shall select for synchronization those facilities shown to have the greatest degree of availability (absence of outages).

15.4.3.8 Where possible, all primary and secondary synchronization facilities shall be physically diverse (this means the maximum feasible physical separation of synchronization equipment and cabling).

15.4.3.9 No timing loops shall be formed in any combination of primary and secondary facilities.

15.4.3.10 USWC shall continuously monitor the BITS for synchronization related failures or degradation.

15.4.3.11 USWC shall continuously monitor all equipment transporting synchronization facilities for synchronization related failures or degradation.

15.4.3.12 For non-SONET equipment, USWC shall provide synchronization facilities which, at a minimum, comply with the standards set forth in ANSI T1.101-1994.

15.4.3.13 For SONET equipment, USWC shall provide synchronization facilities that have time deviation (TDEV) for integration times greater than 0.05 seconds and less than or equal to ten (10) seconds, and for~~that is less than or equal to ten (10) nanoseconds. TDEV, in nanoseconds, for~~ integration times greater than ten (10) seconds and less than 1000 seconds, in accordance with the specified technical references.~~shall be less than 3.1623 times the square root of the integration time.~~

15.5 SS7 Network Interconnection

15.5.1 Definition:

Figure 7~~8~~ depicts Signaling System 7 (SS7) Network Inter-connection. SS7 Network Interconnection is the interconnection of MCIm local Signaling Transfer Point (STPs) with USWC STPs. This interconnection provides connectivity that enables the exchange of SS7 messages among USWC switching systems and databases (DBs), MCIm local or tandem switching systems, and other third-party switching systems directly connected to the USWC SS7 network.

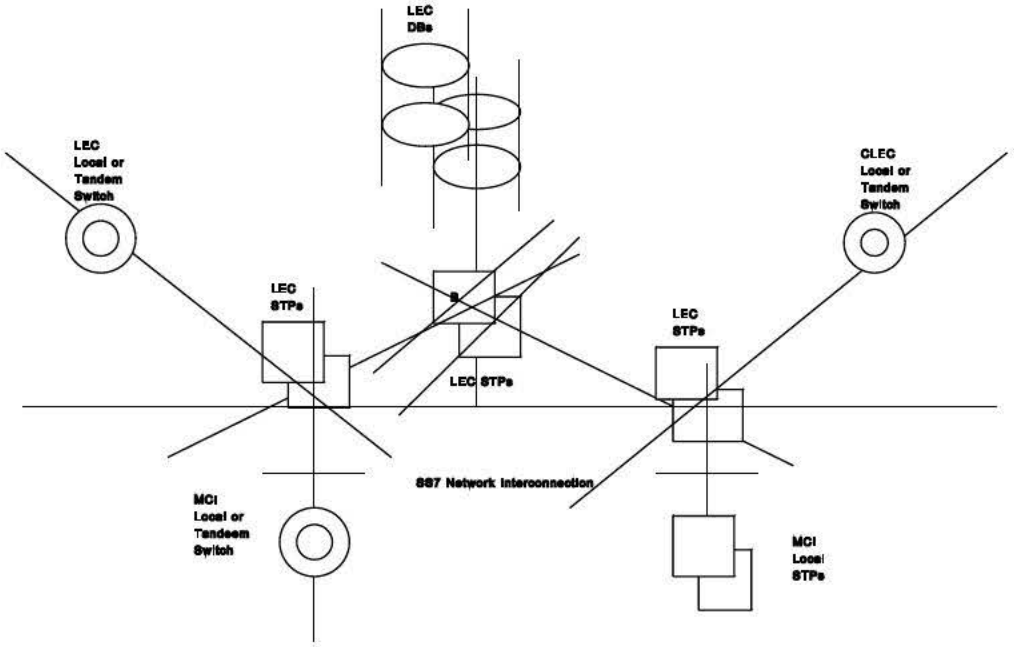


Figure 78. SS7 Network Interconnection

15.5.2 Technical Requirements

15.5.2.1 SS7 Network Interconnection shall provide connectivity to all components of the USWC SS7 network. These include:

15.5.2.1.1 USWC local or tandem switching systems;

15.5.2.1.2 USWC DBs; and

15.5.2.1.3 Other third-party local or tandem switching systems.

15.5.2.2 The connectivity provided by SS7 Network Interconnection shall fully support the functions of USWC switching systems and DBs and MCIm or other third-party switching systems with A-link access to the USWC SS7 network.

15.5.2.3 In particular, Figure 88 depicts a circumstance where SS7 Network Interconnection shall provide transport for certain types of Transaction Capabilities Application Part (TCAP) messages. If traffic is routed based on dialed or translated digits between an MCIm local switching system and a USWC or other third-party local switching system, either directly or via a USWC tandem switching system, then it is a requirement that the USWC SS7 network convey via SS7 Network Interconnection the TCAP messages necessary to provide Call Management services (Automatic Callback, Automatic Recall, and Screening List Editing) between the MCIm local STPs and the USWC or other third-party STPs.

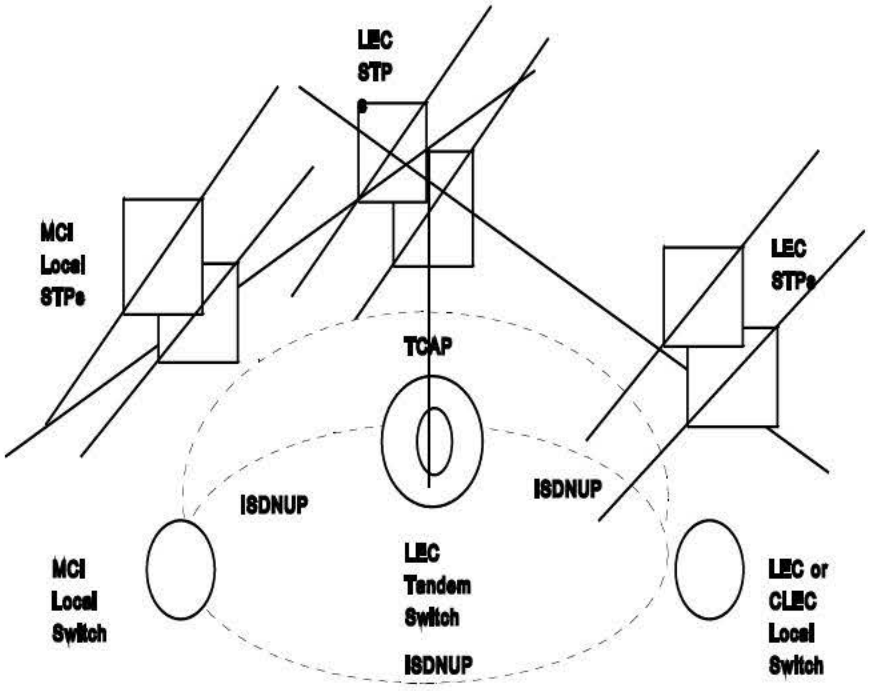


FIGURE 89. Interswitch TCAP Signaling for SS7 Network Interconnection

15.5.2.4 When the capability to route messages based on Intermediate Signaling Network Identifier (ISNI) is generally available on USWC STPs, the USWC SS7 Network shall also convey TCAP messages using SS7 Network Interconnection in similar circumstances where the USWC switch routes traffic based on a Carrier Identification Code (CIC).

15.5.2.5 SS7 Network Interconnection shall provide all functions of the MTP as specified in ANSI T1. 111 (Reference 12.5.2). This includes:

15.5.2.5.1 Signaling Data Link functions, as specified in ANSI T1.111.2;

15.5.2.5.2 Signaling Link functions, as specified in ANSI T1.111.3; and

15.5.2.5.3 Signaling Network Management functions, as specified in ANSI T1.111.4.

15.5.2.6 SS7 Network Interconnection shall provide all functions of the SCCP necessary for Class 0 (basic connectionless) service, as specified in ANSI T1.112 (Reference 12.5.4). In particular, this includes Global Title Translation (GTT) and SCCP Management procedures, as specified in T1.112.4.

15.5.2.7 Where the destination signaling point is a USWC switching system or DB, or is another third-party local or tandem switching system directly connected to the USWC SS7 network, SS7 Network Interconnection shall include final GTT of messages to the destination and SCCP Subsystem Management of the destination.

15.5.2.8 Where the destination signaling point is an MCIm local or tandem switching system, SS7 Network Interconnection shall include intermediate GTT of messages to a gateway pair of MCIm local STPs, and shall not include SCCP Subsystem Management of the destination.

15.5.2.9 SS7 Network Interconnection shall provide all functions of the Integrated Services Digital Network User Part (ISDNUP), as specified in ANSI T1.113.

15.5.2.10 SS7 Network Interconnection shall provide all functions of the TCAP, as specified in ANSI T1.114.

15.5.2.11 If and when Internetwork MTP Routing Verification Test (MRVT) and SCCP Routing Verification Test (SRVT) become approved ANSI standards and available capabilities of USWC STPs, SS7 Network Interconnection shall provide these functions of the OMAP.

15.5.2.12 SS7 Network Interconnection shall be equal to or better than the following performance requirements:

15.5.2.12.1 MTP Performance, as specified in ANSI T1.111.6;

15.5.2.12.2 SCCP Performance, as specified in ANSI T1.112.5; and

15.5.2.12.3 ISDNUP Performance, as specified in ANSI T1.113.5.

15.5.3 Interface Requirements

15.5.3.1 USWC shall offer the following SS7 Network Interconnection options to connect MCIm or MCIm-designated STPs to the USWC SS7 network:

15.5.3.1.1 D-link interface from MCIm STPs.

15.5.3.2 Each interface shall be provided by one or more sets (layers) of signaling links, as follows:

15.5.3.2.1 A D-link layer shall consist of four links, as depicted in Figure ~~9~~10.

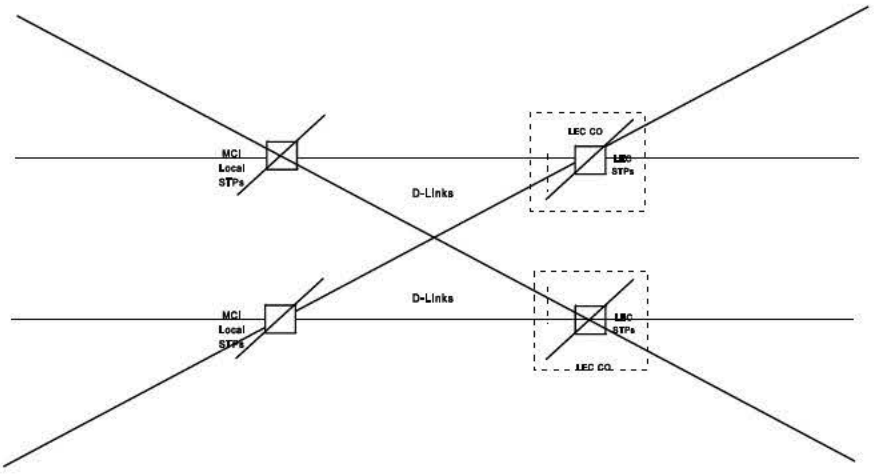


FIGURE 910. D-LINK Interface

15.5.3.3 The Signaling Point of Interconnection (SPOI) for each link shall be located at a cross-connect element, including, but not limited to, a DSX-1, in the Central Office (CO) where the USWC STPs is located. There shall be a DS-1 or higher rate transport interface at each of the SPOIs. Each signaling link shall appear as a DS-0 channel within the DS-1 or higher rate interface. USWC shall offer higher rate DS-1 signaling links for interconnecting MCIm local switching systems or STPs with USWC STPs as soon as these become approved ANSI standards and available capabilities of USWC STPs.

15.5.3.3.1 In each LATA, there will be two (2) signaling points of interconnection (SPOIs). The requirement for two (2) SPOIs is driven by the critical importance attached by all parties to signaling link diversity.

15.5.3.3.2 Each party will designate one (1) of the two (2) SPOIs in the LATA. A SPOI can be any existing reasonable and efficient cross connect point in the LATA.

15.5.3.3.3 Each signaling link requires a port on each party's STP.

15.5.3.4 The USWC CO shall provide intraoffice diversity between the SPOIs and the USWC STPs, so that no single failure of intraoffice facilities or equipment shall cause the failure of both D-links in a layer connecting to a USWC STPs.

15.5.3.5 The protocol interface requirements for SS7 Network Interconnection include the MTP, ISDNUP, SCCP and TCAP. These protocol interfaces shall conform to the following specifications:

15.5.3.5.1 Bellcore GR-905-CORE, Common Channel Signaling Network Interface Specification (CCSNIS) Supporting Network Interconnection, Message Transfer Part (MTP), and Integrated Services Digital network User Part (ISDNUP);

15.5.3.5.2 –Bellcore GR-1428-CORE, CCS Network Interface Specification (CCSNIS) Supporting Toll Free Service;

15.5.3.5.3 –Bellcore GR-1429-CORE, CCS Network Interface Specification (CCSNIS) Supporting Call Management Services; and

15.5.3.5.4 –Bellcore GR-1432-CORE, CCS Network Interface Specification (CCSNIS) Supporting Signaling Connection Control Part (SCCP) and Transaction Capabilities Application Part (TCAP).

15.5.3.~~6~~5 –To the extent technically feasible, USWC shall set message screening parameters to block accept messages from MCIm local or tandem switching systems destined to any signaling point in the USWC SS7 network with which the MCIm switching system has a legitimate signaling relation.

15.5.4 –SS7 Network Interconnection shall be equal to or better than all of the requirements for SS7 Network Interconnection set forth in the following technical references:

15.5.4.1 ANSI T1.110-1992 American National Standard Telecommunications Signaling System Number 7 (SS7) - General Information;

15.5.4.2 ANSI T1.111-1992 American National Standard for Telecommunications - Signaling System Number 7 (SS7) - Message Transfer Part (MTP);

15.5.4.3 ANSI T1.111A-1994 American National Standard for Telecommunications - Signaling System Number 7 (SS7) - Message Transfer Part (MTP) Supplement;

15.5.4.4 ANSI T1.112-1992 American National Standard for Telecommunications - Signaling System Number 7 (SS7) - Signaling Connection Control Part (SCCP);

15.5.4.5 ANSI T1.113-1995 American National Standard for Telecommunications - Signaling System Number 7 (SS7) - Integrated Services Digital Network (ISDN) User Part;

15.5.4.6 ANSI T1.114-1992 American National Standard for Telecommunications - Signaling System Number 7 (SS7) - Transaction Capabilities Application Part (TCAP);

15.5.4.7 ANSI T1.115-1990 American National Standard for Telecommunications - Signaling System Number 7 (SS7) - Monitoring and Measurements for Networks;

15.5.4.8 ANSI T1.116-1990 American National Standard for Telecommunications - Signaling System Number 7 (SS7) - Operations, Maintenance and Administration Part (OMAP);

15.5.4.9 ANSI T1.118-1992 American National Standard for Telecommunications - Signaling System Number 7 (SS7) - Intermediate Signaling Network Identification (ISNI);

15.5.4.10 Bellcore GR-905-CORE, Common Channel Signaling Network Interface Specification (CCSNIS) Supporting Network Interconnection, Message Transfer Part (MTP), and Integrated Services Digital Network User Part (ISDNUP);

15.5.4.11 Bellcore GR-954-CORE, CCS Network Interface Specification (CCSNIS) Supporting Line Information Database (LIDB) Service;

15.5.4.12 Bellcore GR-1428-CORE, CCS Network Interface Specification (CCSNIS) Supporting Toll Free Service;

15.5.4.13 Bellcore GR-1429-CORE, CCS Network Interface Specification (CCSNIS) Supporting Call Management Services; and

15.5.4.14 Bellcore GR-1432-CORE, CCS Network Interface Specification (CCSNIS) Supporting Signaling Connection Control Part (SCCP) and Transaction Capabilities Application Part (TCAP).

15.6 Network Interconnection

See Attachment 4, Section 15.

Section 16. Operator Systems

See Attachment 8, Section 7.1.2, Directory Assistance Service and Section 7.1.3, Operator Service.

Section 17. Basic 911 and E911

See Attachment 8, Section 7.1.1 911, General Requirements, and Section 7.2.1 911, System Interface and Exchanges.

Section 18. Directory Assistance Data

See Attachment 8, Section 7.1.6, Directory Assistance Data General Requirements and Section 7.2.2, Directory Assistance Data Interfaces and Exchanges.

Section 19. Operational Support Systems

See Attachment 8, various sections.