Appendix A Product Category Tables – Release 3.1

This document is a revision to Tables A-1 and A-2 of Appendix A of *TL 9000 Quality Management System Measurements Handbook, Release 3.0*. However, the tables shown here are subject to revision and may have changed. See the QuEST Forum web site (http://www.questforum.org/) for the latest version. The latest version shall be used in conjunction with registrations.

Suppliers shall classify their products and report measurements according to the listed product categories. The Measurement Applicability Table (Normalized Units), Table A-2, lists specific measurements that apply to each category as well as the normalized units and other information necessary for compiling measurement reports.

1. List of Tables

2. Product Category Definitions

Table A-1 contains definitions of product categories to be used by suppliers in categorizing their products.

2.1 Rules for Classification of Products

A supplier will not be required to report measurements for a given product in multiple product categories. Therefore, any product from a given supplier must be classified in exactly one product category.

1. General-purpose products (e.g., computers) will be classified by specific function (e.g., signaling) when provided as a system designed for that function. Otherwise, they will be classified in a separate category, (e.g., Common Systems-Computers) designed for the general-purpose product.

2. A product will be classified according to its primary function. For example, a digital transmission facility product with performance monitoring will be classified as a transmission product instead of an operations and maintenance product.

3. The standard for classification is the product category, not the possible uses to which the product may be put. For example, if a product classification falls in the Outside Plant category, all products that are consistent with that category will be classified as such, even if the exact same product is sometimes used in the customer premises and even if a particular supplier's product is sold primarily into the customer premises market.

2.2 Principles for Construction of the Product Category Table

a. Product categories should fall into a clearly defined hierarchy of classification.

b. There are well-established rules for classification.

c. Product categories should not be separated artificially if they can be logically aggregated.

d. Product categories should have clear definitions, which lend themselves to unambiguous interpretation.

e. For each category, the level to which measurements may be aggregated shall be defined.

f. Each product category specification shall consist of standard elements.

g. The placement of the product in the hierarchy will reflect the dominant use of the product.

Table A-1	Product Category Definitions		
Category Code	Category:	Definition:	Examples:
1	***Switching***	***Equipment for the physical or virtual interconnection of communication channels in response to a signaling system. The switching category is broadly defined to include packet or circuit switched architectures.***	
1.1	Circuit Switch	Equipment for the **termination of subscriber lines and/or trunk lines and the dynamic interconnection of these ports** or channels in a digital transmission facility. A circuit switch establishes a dedicated circuit, as opposed to a virtual circuit, in response to a signal. Stored Program Control (SPC) is the most common type of switching equipment used at end offices and tandem offices. These systems use either analog or digital switching. The switching system used must have the capability to send, receive and be actuated by signals, e.g., access line signals, or inter-office in-band or common-channel signaling. This category includes all circuit switches regardless of transmission medium, i.e., wireline, or wireless.	• End-office • Tandem • Tandem access • Remote • Service Switching Point [SSP] • Mobile Switching Center [MSC]
1.2	***Packet Switch***	***Equipment for switching or routing data on virtual, as opposed to dedicated, circuits. The service is packet switched in that the customer's data is transported as a sequence of data blocks (packets) that do not exceed a specified size. This packetization permits data from many data conversations to share a given transmission facility economically through statistical multiplexing. Such data conversations are known as virtual circuits, which are full duplex and connection-oriented.***	

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Table A-1		Product Category Definitions	
Category Code	Category:	Definition:	Examples:
1.2.1	Public Packet Switched Network (PPSN)	Equipment for the **provision** of connection-oriented, **packet-switched communication services** designed to provide economical data transport based on internationally standardized packet protocols. The packet switch is the primary switching element of the network allowing efficient connectivity to many customers. The access concentrator concentrates traffic from lower-speed access lines for more efficient packet-switch port usage and performs any necessary protocol conversion via the Packet Assembler/Disassembler (PAD) function.	• X.25 packet switch • Access concentrator / PAD
1.2.2	Access Switch	Equipment that switches **packetized data** from source to destination. This may include variable length IP (Internet Protocol) and/or fixed length ATM packets. These systems include termination of PSTN traffic.	• Access switch • ATM switch
1.2.3		Not currently used	
1.2.4	Frame Relay Switch	Switching equipment that operates at OSI Level 2 (hardware) to move variable-length **Frame Relay frames** over virtual circuits from source to destination. Data are moved without data integrity checks or flow control at up to T3 rates.	• Frame Relay Switch
2	***Signaling***	***Equipment for the provision of signaling, i.e., states applied to operate and control the component groups of a telecommunications circuit to cause it to perform its intended function. Generally speaking, there are five basic categories of "signals" commonly used in the telecommunications network. Included are supervisory signals, information signals, address signals, control signals, and alerting signals. This category includes those signaling products that function within the telecommunications network and excludes (possibly similar) products that would normally provide enhanced services outside the network, or on the customer premises such as ACD, IVR, or voice messaging systems.***	

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Table A-1		Product Category Definitions	
Category Code	Category:	Definition:	Examples:
2.1	Service Control Point (SCP)	A signaling point that functions as a **database to provide information to another SCP or Service Switching Point (SSP)**. Transaction Capabilities Application Part (TCAP) queries and responses are used to communicate with the SCP as is done for 800 Data Base Service and ABS. SCPs may support one or more services per SCP and SCPs may be deployed singularly as stand-alone nodes, as mated pairs, or as multiple replicates (more than 2) to increase their availability. SCPs, connected to STPs, are associated with applications that consist of service-specific software and a database of customer-related information. This product category includes conventional SCP equipment, plus other platforms such as service nodes, intelligent peripherals, or service resource facilities, which may combine capabilities of a SCP, SSP or that may be used to provide AIN functionality or other enhanced services within the network.	• Service Control Point • Service nodes • Service resource facilities
2.2	Signaling Transfer Point (STP)	A signaling point with the function of **transferring signaling messages** from one signaling link to another and considered exclusively from the viewpoint of the transfer. An STP is a specialized routing signaling point (SP). It is an SS7-based packet switch that transfers SS7 messages to and from other SPs and is always deployed in mated pairs for reliability. The STP uses the Message Transfer Part (MTP) and the Signaling Connection Control Part (SCCP) of the SS7 protocol to screen and route messages destined for other nodes in the SS7 network. It functions as an SS7 network routing hub, interfacing with SPs only through SS7 links and not voice or data trunks. Within the LEC CCS network structure, STPs are architecturally referred to as either Local STPs (LSTPs) or Regional STPs (RSTPs).	• Signaling Transfer Point (STP)

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Table A-1		Product Category Definitions	
Category Code	Category:	Definition:	Examples:
2.3	Home Location Register (HLR)	Equipment to provide a permanent database used in wireless applications to identify a subscriber and to contain subscriber data related to features and services. It stores information such as service profiles, location and routing information for roamers, service qualification, interface for moves, adds and changes. It communicates with other HLRs and provides access to maintenance functions such as fault information, performance data, and configuration parameters.	• Home Location Register (HLR)
3	***Transmission Systems***	***Equipment for the connection of the switched and interoffice networks with individual customers. An integral part of the distribution network is the loop that connects the customer to the local central office (CO), thus providing access to the interoffice network.***	
3.1	***Outside Plant***	***The part of the telecommunications that is physically located outside of telephone company buildings. This includes cables, supporting structures, and certain equipment items such as load coils. Microwave towers, antennas, and cable system repeaters are not considered outside plant.***	
3.1.1	***Transmission Medium***	***Fiber optic cable, metallic cable, or other physical medium for the transmission of analog or digital communications.***	
3.1.1.1	***Metallic Products***	***Metallic as opposed to optical or wireless transmission media.***	
3.1.1.1.1	Metallic Conductor Cable	Metallic pairs of conductors housed in a protective cable	• Metallic cable • Central office coaxial cable • Hybrid coaxial/twisted pair drop
3.1.1.1.2	Metallic Connectors	Devices used to terminate a metallic cable.	• Coaxial connectors • Coaxial distribution connectors
3.1.1.2	***Fiber Optic Cable Products***	***Optical, as opposed to metallic or wireless transmission media.***	

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Category Code	Category:	Definition:	Examples:
3.1.1.2.1	Fiber Optic Cable	Cables wherein light is propagated and any associated covering.	• Loose tube cable • Single Tube Bundled Cables • Single Tube Ribbon Cables • Tight Buffered Cables • Indoor Fiber Optic Cables
3.1.1.2.2	Optical Connectors	Device used to terminate an optical cable	• Optical connectors (e.g. SC, ST, MT etc.) • Connectorized cable assemblies, e.g., optical fiber ribbon fanouts
3.1.1.3	***Transmission Sub-systems***	***Sub-systems embedded in the transmission medium other than cable or connectors***	
3.1.1.3.1	Active Sub-systems	Active sub-systems containing electronics	• Coaxial drop amplifiers • Fiber optic data links
3.1.1.3.2	Passive Optical Sub-systems	Optical sub-systems containing no electronics. This includes passive optical modules containing two or more individual passive optical sub-systems or systems.	• Passive Wavelength Division Multiplexer [WDM] • Add drop multiplexers • Combined Couplers/splitters/filters
3.1.1.3.3	Ancillary Sub-Systems	Other transmission sub-systems not specifically covered in other transmission component categories. Typically passive.	• Surge protectors • Bonding and grounding hardware or ground wire • Taps
3.1.2	***Physical Structure***	***Physical structures for the support of telephone transmission media.***	

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Category Code	Category:	Definition:	Examples:
3.1.2.1	Enclosures	Enclosures for network equipment located in the outside plant.	• Fiber optic splice enclosures • ONU enclosures • Organizer assemblies • Seal assemblies • Controlled environment vaults • Pedestals
3.1.2.2	Support structures	Products for the physical support of transmission media or enclosures.	• Telephone poles • Microwave / radio towers
3.1.2.3	Conduits	Channels for the containment of optical fiber or metallic cable.	• Innerduct • Multi-bore conduit • PVC pipe
3.2	***Transport Equipment***	***Equipment located in the central office or at the customer premises, but inside the network demarcation point, for the transmission of digital or analog communication over transmission media. This product category includes equipment for terminating, interconnecting, and multiplexing communications circuits.***	
3.2.1	***Cross Connect Systems***	***Equipment to provide a physical termination point for physical cables and individual conductors. They can be manual or automated, metallic or optical. Cross-connect systems, such as distributing frames, Digital Signal Cross Connects (DSXs) and Fiber Distributing Frames (FDFs) provide the following basic functions: cross-connection of network distribution facilities and equipment in the central office, electrical protection for conductive media, test access, temporary disconnection, and termination points for facilities and equipment.***	

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Table A-1	Product Category Definitions		
Category Code	Category:	Definition:	Examples:
3.2.1.1	Manual Cross Connect Systems	Equipment to provide a physical termination point for physical cables and individual conductors where changes in connections are performed manually. These can be metallic or optical systems such as distributing frames or Fiber Distributing Frames (FDFs) provide the following basic functions: cross-connection of network distribution facilities and equipment in the central office, electrical protection for conductive media, test access, temporary disconnection, and termination points for facilities and equipment.	• Digital Signal Cross Connect Panel (DSX) • Fiber Distribution Frame (FDF) • Feeder Distribution Interface (FDI)
3.2.1.2	Digital Cross Connect Systems	Equipment to provide a physical termination point for physical cables and individual conductors where changes in connections are performed electronically. These can be metallic or optical systems such as digital cross connect systems (DCS) that provide cross-connection of network distribution facilities and equipment in the central office, electrical protection for conductive media, test access, temporary disconnection, and termination points for facilities and equipment.	• Digital Cross-connect System (DCS) • Electronic DSX • Active Optical DSX
3.2.2	***Carrier Systems / Multiplexers***	***Equipment for transmitting multiple communication channels over a single transmission facility. This category includes equipment for transmission over interoffice trunks, for example, from central to remote offices.***	
3.2.2.1	***Interoffice / Long Haul***	***Equipment for transmission between central offices, between exchanges, or between carriers, as opposed to transmission between an end office and a remote location, typical of a loop carrier.***	
3.2.2.1.1	Metallic Carrier System	**Carrier** system that uses metallic transmission medium.	• Analog carrier (N-, L- carrier) • D4, D5 digital carrier
3.2.2.1.2	***Optical Carrier System***	***Carrier system that uses optical transmission medium.***	

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Category Code	Category:	Definition:	Examples:
3.2.2.1.2.1	SONET / SDH Transport Systems	Fully featured **digital transmission** system employing optical medium	• OC-3, 12, 48, or 192 SONET equipment configurable as linear or ring. • Similar for STM-x SDH equipment
3.2.2.1.2.2	WDM / DWDM / Optical Amplification	Shelf level systems used for multiplexing, de-multiplexing, or amplification of **optical signals.** Lack the built in protection, electrical conversion and other features of a SONET Transport System.	• Wavelength Division Multiplexer [WDM] • Dense Wavelength Division Multiplexer [DWDM]
3.2.2.1.3	Microwave	Carrier system that employs fixed **microwave transmission**.	• 6, 8, 11, or 18 gigahertz microwave radio
3.2.2.2	Loop Carrier	Equipment for deploying multiple **voice or digital channels** over fewer physical channels than would be otherwise required (a "pair gain" function). Loop carriers are typically digital systems that employ time-domain multiplexing (TDM) but may include analog systems as well. Loop carrier systems consist of a Central Office Terminal (COT) located near the switching system, a Remote Terminal (RT) located near the customer to be served and a transmission facility connecting the COT to the RT. Individual communications circuits (such as POTS and Foreign Exchange [FX]) are accepted as separate inputs at the COT (RT), time-division multiplexed (in a digital loop carrier) by the loop carrier system and reproduced at the RT (COT). There is an analog-to-digital (A/D) conversion of analog inputs to the DLC and these signals, which are carried digitally within the DLC, undergo a digital-to-analog (D / A) conversion when output at the COT or RT. The transmission facility used by a loop carrier may be metallic cable pairs, repeated metallic cable pairs, or optical fibers.	• Digital loop carrier (DLC) • Universal digital loop carrier (UDLC) • SLC remote terminal • Integrated digital loop carrier • Analog loop carrier

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Category Code	Category:	Definition:	Examples:
3.2.3	Line Terminating Equipment / Distributing Frames	Equipment to provide the termination point for voice-grade and voice-grade compatible facilities and equipment in a central office. It is composed of protectors, connectors and terminal strips or blocks. Distributing frames are categorized as either conventional or modular.	• Tall conventional distributing frames • Low-Profile Conventional Distribution Frames (LPCDFs) • Conventional protector frames • Combined Main Distributing Frame (CMDF) • Subscriber Main Distributing Frame (SMDF) • Trunk Main Distributing Frame (TMDF) • Intermediate Distributing Frame (IDF) • Tie-Pair Distributing Frame (TPDF). • Office repeater bays
3.2.4	Digital Subscriber Line (DSL)	Equipment for the transport of high-speed digital data on the embedded copper plant. DSL typically will operate over nonrepeatered, POTS-like, conditioned unloaded loops out to CSA ranges. This product category includes central office and remote units, regenerators or range extenders, and supporting equipment.	• ISDN • HDSL • ADSL • DDS
3.3	***Wireless Transmission***	***Equipment for analog or digital transmission to the subscriber unique to wireless services. This category does not include interoffice or long haul wireless carrier systems such as long haul microwave transmission***	

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Category Code	Category:	Definition:	Examples:
3.3.1	Base Station Equipment	Equipment that provides the **interface between wireless systems and the Public Switched Telephone Network (PSTN).** It provides, for example, electrical signaling isolation as well as switching, routing, billing, and features capabilities. It provides subsystems for vocoding and selecting hand off decision.	• BSC • BSS
3.3.2	Base Transceiver System (BTS)	Equipment that provides the **radio link to the mobile subscribers**. It is connected to the BSC though a backhaul interface between the BSC and BTS for both vocoded and overhead packet traffic. This includes terminals and repeaters.	• BTS • Wireless Repeaters
3.3.3	Pilot Beacon Unit (PBU)	Equipment whose primary purpose is to **transmit an ANSI J-STD-008 Pilot channel and ANSI J- STD-008 Sync channel and a partial ANSI J-STD-008 Paging channel.** The PBU is intended to notify a mobile unit of a change in CDMA coverage and can be used to assist in the execution of cellular CDMA-AMPS and inter-frequency CDMA-CDMA hand-off. It is designed with the capability for extended temperature and environmental operation ranges.	• Pilot Beacon Unit (PBU)
3.4	***Packet Network***	***Equipment for the transport of information in data packets or for interfacing between packet and PSTN networks. This product category is for carrier grade equipment intended to provide quality of service equal to traditional telecommunications network quality. It is not intended for computer grade LAN/WAN equipment.***	
3.4.1	Packet Network Element	Equipment to transport data and signaling messages between Voice Over Packet Network Elements. These may support Internet Protocol (IP) routed flows and/or ATM virtual connections. The Call Connection Agent uses an IP or an ATM interface to the packet NE for the transport of signaling information and to control traffic.	• Packet Network Element

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Category Code	Category:	Definition:	Examples:
3.4.2	Trunk Gateway	Systems that terminate circuit switched trunks in the PSTN and virtual circuits in the packet network providing functions such as packetization. These systems do not provide resource management functions for the trunks that they terminate. These do have the capability to set up and manage transport connections through the core network when instructed by the Call Connection Agent (CCA). These systems are associated with a specific CCA that provided it with the necessary call control instructions.	• Trunk gateway
3.4.3	Access Gateway	This equipment supports the line side interface to a packet network backbone. It provides access to the packet network for traditional PSTN devices such as standard telephones and PBX systems. The systems are associated with a specific Call Connection Agent (CCA) that provides the necessary call control instructions. On receiving the appropriate commands from the CCA, the access gateway provides functions such as audible ringing, power ringing, and miscellaneous tones. These systems have the functionality to set up a transport connection through the core packet network when instructed by the CCA.	• Access gateway
3.4.4	Service and Network Controller	Equipment that combines a Call Connection Agent (CCA), signaling gateway (SG) and possibly a service agent into one system. The CCA provides the necessary call processing functionality to support voice traffic on the core packet network including call control commands and communication with Billing systems. The SG interconnects the packet network to the PSTN signaling network. It terminates SS7 links from the PSTN CCS networks and thus provides the MTP Level 1 and Level 2 functionality. The SG communicates with the CCA to support the end to end signaling for calls with the PSTN. Each SG is associated with a specific CCA. A service agent supports supplementary services and generates TCAP messages to interact with Service Control Points for intelligent network services such as 800 and Local Number Portability.	• Service and Network Controller (SNC)

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Category Code	Category:	Definition:	Examples:
3.4.5	Routers	Equipment that **routes packetized data** from source to destination. This may include variable length IP (Internet Protocol) and/or fixed length ATM packets. This equipment is connected to multiple physical packet networks and routes or delivers packets between the networks. Routing generally uses software algorithms to optimize one or a combination of data-transport "measurements" such as delay, the use of reliable paths, "hops" between servers, etc. Routers typically do not include termination of PSTN traffic.	• IP Router
4	***Operations & Maintenance***	***Equipment and systems for the management, upkeep, diagnosis and repair of the communications network.***	
4.1	***Test Systems***	***Equipment to support testing of the network. This category includes permanently installed equipment used to provide a centralized test capability or local test access, as opposed to portable equipment, as might be carried by a craftsperson.***	
4.1.1	Test Access Equipment	Equipment to provide test access to transmission circuits. Test access equipment is in series with the customer circuit at all times and therefore directly affects the circuit reliability. This equipment is designed with transmission equipment issues in mind. This equipment may have analog and perhaps a variety of digital (i.e., T1, E1) types.	• In line test equipment
4.1.2	Test Equipment, Embedded	Equipment to perform tests on transmission circuits. This equipment is designed with transmission equipment issues in mind. Test equipment is NOT generally in series with the customer circuit and may be connected to a variety of access equipment and network elements with integral access features. This equipment may have analog and perhaps a variety of digital (i.e., T1, E1) types. Failure of this equipment doesn't bring down customer circuits; however, it inhibits the ability to maintain the network and to restore lost service.	• Monitoring equipment • Parallel test equipment
4.1.3	Test Support Software	Computer software that runs on a general purpose computer (office environment) and perhaps the maintenance network that the computer uses to **communicate with the CO access and test equipment.**	• Network test software

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Category Code	Category:	Definition:	Examples:
4.2	***Operations Support Systems***	***Systems that provide TMN (Telecommunication Management Network) compliant, flexible, scaleable, and interoperable solutions to automate service activation, service assurance, and network capacity management processes to worldwide existing and emerging network services and equipment providers.***	
4.2.1	On Line Critical	Real time **network management systems**, demanding high availability, typically 24 hours a day and 7 days per week.	• Network traffic management • Surveillance of 911 • Fire alarms
4.2.2	On Line Non-critical	Real time **network management systems** with lower availability demands than on line critical systems.	• Provisioning • Dispatch • Maintenance
4.2.3	Off Line	Traditional **business systems** that are run off line sometimes in batch mode, typically overnight, and do not have high availability expectations.	• Inventory • Billing records • Service creation platform
4.3	Ancillary Operations and Maintenance	**Tools, test equipment,** and other **specialized products** used to support the operations and maintenance of the communications network but not part of the permanent network	• Optical splicers • Single fiber fusion splicers • Mass fiber fusion splicers • Mechanical splicers • Portable test equipment • Optical connector tools • Cleavers
5	***Common Systems***	***Any of a variety of specialized generic, shared equipment to support network elements. Common systems include power systems and the Network Equipment-Building System (NEBS) that provides space and environmental support for network elements. These systems are located in central offices and remote building locations.***	

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5.1	Synchronization	Equipment for operating digital systems at a common clock rate **(frequency synchronization).** This category includes primary reference sources and other timing signal generators that produce a timing signal traceable to UTC.	• Stratum 1, 2, 3E domestic, TNC, LNC and Type 1 International • GPS timing receivers, cesium, loran, or CDMA RF pilot timing reference generators.
5.2	General Purpose Computers	A category reserved for computer complexes (one or more interconnected machines) that perform **general business function**s for a TSP but that do not provide any telephony transmission or storage service to subscribers or other TSP customers, or that may provide such services, but are not sold to the service provider as part of a system designed exclusively for that purpose. The purposes to which such machines may be put include but are not limited to: • Accounting systems • Billing systems • Legal systems • Ordering systems • Business Information systems • HR functions • Engineering and support functions • Marketing and Sales functions	• Terminals • PCs • Workstations • Mini, mid, mainframes

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5.3	Power Systems	Equipment for the provision of **power to network equipmen**t. Power systems provide two principal functions: the conversion of the commercial AC power source to DC voltages required by the network equipment and the generation and distribution of emergency (reserve) power when the commercial power is interrupted. This category also includes the ringing plant, a redundant plant that supplies the ringing voltage, frequency, tones, and interrupter patterns	• AC rectifiers/battery chargers • Battery systems • Uninterruptible Power Supplies (UPS) • DC to AC inverters • DC to DC bulk converters • AC and DC switch gear • Ring generator • Power distribution panels
6	***Customer Premise***	***Equipment installed beyond the network demarcation point. Although commonly installed on the subscriber's premises, equipment with essentially identical function installed in the service provider's facility may also be classified as customer premises equipment.***	
6.1	***Enhanced Services Platforms***	***Systems that provide an environment in which service-specific application programs can execute and an infrastructure by which those application programs can provide enhanced services. Although each enhanced services platform has a corresponding service creation environment, that creation environment is sometimes packaged separately and may execute on a different platform.***	
6.1.1	Interactive Voice Response (IVR) Platforms	Equipment used to allow menu **navigation and information retrieval**, often from legacy databases external to the IVR platform itself.	• Interactive Voice Response IVR
6.1.2	Messaging Platforms	Equipment for **storage and retrieval of voice and/or fax messages**	• Voice mail systems

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Note 3 **Bolded text in the product category definition indicates the primary function of the product category. This is the function to use for outage measurements.**

Table A-1	Product Category Definitions		
Category Code	Category:	Definition:	Examples:
6.1.3	Multi-Application Platforms	Equipment that provides an environment rich in capabilities so that multiple, possible disparate **services** can be provided concurrently.	• Unified/Universal Messaging (system providing a subscriber the means, from a given device, to manipulate messages originated on like or different devices. Such devices include, but are not limited to, conventional telephone handsets, wireless handsets, PC terminals, fax machines, and email)
6.2	***Terminal Equipment***	***Equipment connected to the network demarcation point that provides a service to the subscriber. Terminal equipment includes telephone sets, whether wireline, cordless, cellular, PCS, or other voice terminals, fax machines, answering machines, modems, data service units (DSUs), or ISDN terminal adapters.***	
6.2.1	***Voice Terminals***	***Conventional, wireless, cellular, PCS, or other voice terminal equipment.***	
6.2.1.1	Wireline Telephone Sets	Telephone sets connected to conventional wireline (POTS) circuits.	• POTS telephone sets • Cordless telephones
6.2.1.2	Wireless Subscriber User Terminals	The subscriber user terminal made to transmit and receive voice and/or data communication using Telecommunication Infrastructure equipment not requiring hard lines as a means of transport. User terminals may be of any functional technology available for public use.	• Wireless single mode user terminal • Wireless mobile user terminal • Wireless stationary user terminal • Wireless multi-mode user terminal • Wireless multi-purpose user terminal • Wireless Global user terminal

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Table A-1		Product Category Definitions	
Category Code	Category:	Definition:	Examples:
6.2.2	Fax equipment	Equipment for sending or receiving facsimile (fax) over conventional voice-grade lines.	• Stand alone fax machines • Combined fax/printers/copiers
6.2.3	Data Modems	Equipment for digital communications over voice-grade lines	• DSL modem • V.90 modem
6.2.4	Digital Data Service Units	Equipment for the interconnection of data terminal equipment (DTE) with a digital communications service. Such equipment typically provides a network interface and one or more DTE interfaces and may be configurable.	• DDS CSU / DSU • ISDN CSU / DSU • IDSN terminal adapter • T1 CSU DSU
6.3	Automatic Call Distribution (ACD) Systems	Equipment for the **distribution of incoming calls** to any of a number of destinations based on some programmed logic. ACD systems are typically used in Customer Support service or sales centers.	• Automatic Call Distribution ACD system
6.4	Private Branch Exchange (PBX)	Equipment to provide **circuit switched voice and fax communications** services, optimized for medium to large sized customer sites. Now is evolving to utilize ATM and IP networks and support multimedia communications.	• Private Branch Exchange (PBX)
6.5	Small Communications System (Key Telephone System)	Equipment to provide circuit **switched voice and FAX communications services**, optimized from small to medium sized customer sites. This is now evolving to utilize IP networks.	• Electronic Key System

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Table A-1	Product Category Definitions		
Category Code	Category:	Definition:	Examples:
7	***Services***	***In addition to purchasing tangible hardware/software products, customers may also acquire service from an organization. Services include activities such as network engineering, installation and commissioning, product maintenance, network operation, etc. where the organization is responsible for the conduct of the activity in accordance with customer defined requirements. Services may be thought of as the result generated by activities at the interface between the supplier and the customer and by supplier internal activities to meet the customer needs.*** ***NOTES:*** ***1. The interface between the customer and the supplier may be represented by personnel or equipment,*** ***2. Customer activities at the interface with the supplier may be essential to the service delivery,*** ***3. Delivery or use of tangible products may form part of the service delivery,*** ***4. A service may be linked with the manufacture and supply of tangible product, and*** ***5. A contracted service is one where a legal agreement is reached either by the customer or the organization with a third party to provide a service. Contracted services are services offered for sale to companies outside of the organization's company or its subsidiaries.***	
7.1	Installation Service	Contracted service to position, configure, and/or adjust a product.	• New equipment installation • Expansion installation • Upgrade installation
7.2	***Engineering Service***	***Contracted service to provide engineering activities.***	

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Table A-1		Product Category Definitions	
Category Code	Category:	Definition:	Examples:
7.2.1	Network Engineering Service	Contracted service to provide engineering activities such as the layout, configuration, positioning, connecting, and adjusting of product modules to create a system. This activity may also include the writing of associated engineering documentation.	• Network or site engineering
7.2.2	Software Development Service	Contracted service to develop and/or test software programs or sub-routines	• Contracted software development
7.3	Maintenance Service	Contracted service to maintain customer's equipment and/or systems. These services are limited to activities typically considered part of the Telco's standard maintenance efforts such as NOC operations, PIC center operations, network field maintenance activities, etc. These exclude warranty and standard maintenance activities performed in support of a particular product by the product OEM.	• Network Operations Center (NOC) • Field maintenance • System troubleshooting • FRU replacement
7.4	Repair Service	Contracted service to repair customer's equipment and/or systems	• Repair of returned FRUs or systems
7.5	Customer Support Service	Contracted service to process customer requests. This service may include call answering, response to general inquiries, information requests, and information sharing. When the customer support service center also handles product problem reports, those problem reports shall be included in the appropriate product category measurements and not in this category.	• Call Center • Web-based support • Dispatch Centers
7.6	***Purchasing Services***	***Services for the procurement of material, equipment and services***	
7.6.1	Procurement Services	Contracted services for the procurement of reuse and new equipment.	• Refurbishment/retest
7.6.2	Sourcing/Purchasing Services	Services provided by internal organizations for the procurement of products on behalf of their parent organizations. These activities may include preparation of contracts, product and/or supplier qualification, and ongoing supplier management.	• Purchasing department • Supply chain organization
7.7	Logistical Services	Contracted service for the distribution of equipment between the organization and customer. This typically includes strictly warehousing and/or transportation.	• Warehousing • Transportation

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Table A-1		Product Category Definitions	
Category Code	Category:	Definition:	Examples:
7.8		Reserved for future use	
7.9	General Support Service	Contracted service that is not included in another product category.	
8	***Components and Subassemblies***	***Individual components or assemblies provided for use in telecommunications systems excluding those already covered by a specific product category in another product family. These items would typically be used by other suppliers and not sold directly to service providers except as replacement parts.***	
8.1	Components	Individual self-contained active or passive devices without separable parts not included in another product category	• Crystals • ASICs • Relays • TECS • Bare PCBs
8.2	***Electronic Assemblies***	***A device made up of a number of components for use in a telecommunications system. This device is a portion of the completed system, but would not make up the entire system.***	
8.2.1	Simple	Less than 11 components or 49 solder connections excluding connectors	• VCXOs • Bandpass filters • MW circulators
8.2.2	Medium Complexity	More than 10 components or 48 solder connections but less than 51 components or 241 solder connections excluding connectors.	• Multi die hybrids • DC/DC converter “bricks”
8.2.3	High Complexity	More than 50 components or 240 solder connections but less than 501 components or 2401 solder connections excluding connectors	• Medium sized printed circuit assemblies • Backplane assemblies
8.2.4	Very High Complexity	More than 500 components or 2400 solder connections excluding connectors	• Single board computers

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Table A-1		Product Category Definitions	
Category Code	Category:	Definition:	Examples:
8.3	Cable Assemblies	Internal and/or external connectorized metallic or fiber optic cable assemblies	• Telco • D-Sub • Coax • Harnesses
8.4	Electromechanical Subassemblies	Devices or assemblies that are mechanical or electrical-mechanical in nature. Typically, the electromechanical assemblies will contain PCBAs, backplanes, cables and/or cable assemblies. These assemblies may be complex and could include fully equipped and populated racks or enclosures.	• Fan assembly • Rack assemblies • Cabinets • Equipment shelves
8.5	***Optical Fiber & Devices***	***This category of products includes optical fiber utilized in the manufacture of telecommunications cabling media and devices, opto-electronics components modules and subassemblies deployed in optical networks and ancillary electronic devices. They are used specifically to support the functioning of optical networks and are typically supplied to optical cablers or optical equipment system integrators. They are generally not sold directly to telecommunication service organizations.***	
8.5.1	Optical Fiber	A filament of transparent dielectric material, usually glass or plastic and usually circular in cross section that guides light.	• Single Mode Fiber • Multimode Fiber
8.5.2	***Optical Devices***	***Devices that are used specifically to support the functioning of optical networks***	
8.5.2.1	Optoelectronic Devices	A device that is responsive to, or that emits or modifies electro-magnetic radiation, in the visible, infrared, and/or ultraviolet spectral regions. JEDEC Standard No. JESD 77-B 2/2000	• Lasers (VCSELs, LEDs, DFBs, FP) • Laser Diodes • Photodetectors • Photo Diodes • OSAs (ROSAs and TOSAs)

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Table A-1	Product Category Definitions		
Category Code	Category:	Definition:	Examples:
8.5.2.2	Passive Optical Devices	A class of optical devices that either channels or filters an optical signal among ports in a non-variable predetermined fashion. It does not contain an optical source, detector or optoelectronic transducer of any kind and does not require external power. TIA/EIA 6200000 of 12/94 or Telcordia 1209	• Isolators • Filters • Splitters • Mirrors • Lenses • Passive multiplexer • Passive demultiplexer
8.5.2.3	Optical Subassemblies	Stand-alone or "drop-in" products that perform a complete optical operation and may contain passive and/or optoelectronic devices. These subassemblies will generally contain passive optical devices (8.5.2.1), active optical devices (8.5.2.2) and/or other types of components such as heaters, TECS, and standard electronic devices (8.1). These subassemblies are then used as part of an electronic assembly (8.2.x).	• Optical Transmitter • Optical Transceivers • Optical Receiver • External Modulator (Packaged with a Laser) • Fiber Optic Amplifiers/EDFAs • Repeaters • Transponders • Optical MEMs
8.6	***Software Components and Tools***	***Software programs, routines or sub-routines for use within other software programs or systems or for use in the development of other programs or systems.***	
8.6.1	Component Software	Software programs, routines or sub-routines sold for use in other software programs or systems.	• Protocol stacks • Operating systems • Sort routines • Database programs • Interface programs • Drivers

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Table A-1	Product Category Definitions		
Category Code	Category:	Definition:	Examples:
8.6.2	Software Development Tools	Software programs for use in the development or testing of other programs or systems.	• Compilers • Configuration Management • Problem Tracing and Management • Complexity Measurement Tools • Web Site Tools • Multimedia Tools • Static Analysis Tools • Simulators • Measurement Tools • Code coverage tools • Porting and conversion tools/services

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3. Measurement Applicability Table (Normalized Units)

3.1 Measurements Without Normalization Factors

The measurements Fix Response Time (FRT), Overdue Fix Responsiveness (OFR), and On-Time Delivery (OTD) are applicable and required for ALL product categories, with the exception of OTD for Customer Support Service (category 7.5) where resolution time is the service quality measurement. These measurements (FRT, OFR and OTD) do not require product specific normalization. In the interest of saving space, they are not listed in the following table but data must be submitted for each of these three measurements for all products. Use the following table to determine the normalization units and applicability of the rest of the measurements.

3.2 Other Rules and References

Where the normalization factor is traffic capacity based, such as DS1, OC-1, DSL or Terminations, the calculation shall be based on the true useable traffic capacity. Equipment within the system used to provide protection for the main traffic path shall not be included, as it does not add useable capacity to the system.

Software measurements are based on the three most dominant releases.

% = 100 x Quantity Defective / Total Quantity. “%” is applicable to "Software Only" measurements.

“NA” means the measurement is not applicable for the product category.

“None” means that no common normalization factor has been identified for the product category; however, data shall be submitted for the measurement.

The column headings in Table A-2 are general descriptions covering several sub-measurements in some cases. For cross-references to the detailed descriptions of the measurements elsewhere in this document, find measurement/ sub-measurement symbols in Table A-5 Measurement Summary Listing.

3.3 Measurement Summary Listing

Table A-5 is a listing of the measurements included in this handbook with the symbols used in data reporting, the applicability to hardware, software, and/or services (H, S, V), and a reference to the table in this handbook with data reporting details. The symbols listed here are referenced by the normalization unit and applicability table to clarify the general descriptions used as column headings

Table A-2 Measurement Applicability Table (Normalized Units)

Product Category		*Hardware and Common Hardware Software*				*Software Only (Per Applicable Option)*			
Code	Description	Downtime Performance H, S	Outage Frequency H, S	Return Rate H	Problem Reports H,S	Corrective Patch Quality	Feature Patch Quality	Software Update Quality	Release Application Aborts
TL 9000 Measurement Symbols (see Table A-5)		SO2; SO4;	SO1;SO3;	RR (all)	NPR (all)	CPQ (all)	FPQ (all)	SWU (all)	RAA (all)
RQMS Alternative Symbols (see Table A-5)		r,h,DPMs,c	r,h,OFMs,c		IPR (all)	DPQ (all)	DFP (all)	DSU (all)	RAQ (all)
1	***Switching***								
1.1h	Circuit Switch – all non-remotes including host systems	System	System	Termination	System	%	%	%	%
1.1r	Circuit Switch – remotes only	System	System	NA	NA	NA	NA	NA	NA
Note:	All organizations registering in 1.1 shall report data for 1.1h and 1.1r in one data submission. If there are no remote applications for their particular product, then "N/A" shall be entered in the 1.1r data. Data for measurements indicated "NA" for 1.1r is to be reported in combination with the host data in 1.1h.								
1.2	***Packet Switch***								
1.2.1	Public Packet Switched Network (PPSN)	System	System	Termination	System	%	%	%	%
1.2.2	Access Switch	System	System	Termination	System	%	%	%	%
1.2.3	Not currently used								
1.2.4	Frame Relay Switch	System	System	Termination	System	%	%	%	%
2	***Signaling***								
2.1	Service Control Point (SCP)	System	System	System	System	%	%	%	%
2.2	Signaling Transfer Point (STP)	System	System	System	System	%	%	%	%
2.3	Home Location Register (HLR)	System	System	System	System	%	%	%	%
3	***Transmission***								
3.1	***Outside Plant***								
3.1.1	***Transmission Medium***								

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Note 4 **If the normalization factor contains the word "shipped", then the quantity shipped in the 12 months ending prior to the month being reported shall be used.**

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RQMS Alternative Symbols (see Table A-5)		r,h,DPMs,c	r,h,OFMs,c		IPR (all)	DPQ (all)	DFP (all)	DSU (all)	RAQ (all)
3.1.1.1	***Metallic Products***								
3.1.1.1.1	Metallic Conductor Cable	NA	NA	NA	None	NA	NA	NA	NA
3.1.1.1.2	Metallic Connectors	NA	NA	NA	Units shipped	NA	NA	NA	NA
3.1.1.2	***Fiber Optic Cable Products***								
3.1.1.2.1	Fiber Optic Cable	NA	NA	NA	None	NA	NA	NA	NA
3.1.1.2.2	Optical connectors	NA	NA	NA	Units shipped	NA	NA	NA	NA
3.1.1.3	***Transmission Sub-systems***								
3.1.1.3.1	Active Sub-systems	NA	NA	Unit	Unit	NA	NA	NA	NA
3.1.1.3.2	Passive Optical Sub-systems	NA	NA	Unit	Unit	NA	NA	NA	NA
3.1.1.3.3	Ancillary Sub-systems	NA	NA	Unit	Unit	NA	NA	NA	NA
3.1.2	***Physical Structure***								
3.1.2.1	Enclosures	NA	NA	Unit	Units shipped	NA	NA	NA	NA
3.1.2.2	Support Structures	NA	NA	Unit	Units shipped	NA	NA	NA	NA
3.1.2.3	Conduits	NA	NA	Unit	Meters shipped	NA	NA	NA	NA
3.2	***Transport Equipment***								
3.2.1	***Cross Connect Systems***								
3.2.1.1	Manual Cross Connect Systems	NA	NA	DS1	System	NA	NA	NA	NA
3.2.1.2	Digital Cross Connect Systems	DS1	DS1	DS1	System	%	%	%	%

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RQMS Alternative Symbols (see Table A-5)		r,h,DPMs,c	r,h,OFMs,c		IPR (all)	DPQ (all)	DFP (all)	DSU (all)	RAQ (all)
3.2.2	***Carrier Systems/Multiplexers***								
3.2.2.1	***Interoffice/Long Haul***								
3.2.2.1.1	Metallic Carrier System	DS1	DS1	DS1	System	%	%	%	%
3.2.2.1.2	***Optical Carrier System***								
3.2.2.1.2.1	SONET/SDH Transport Systems	OC-1	OC-1	OC-1	Network Element	%	%	%	%
3.2.2.1.2.2	WDM/DWDM/Optical Amplification	Network Element	Network Element	Network Element	Network Element	%	%	%	%
3.2.2.1.3	Microwave	DS1	DS1	DS1	Network Element	%	%	%	%
3.2.2.2	Loop Carrier	DS1	DS1	DS1	DS1	%	%	%	%
3.2.3	Line Terminating Equipment/Distributing Frames	NA	NA	Termination	Termination	%	%	%	%
3.2.4	Digital Subscriber Line (DSL)	DSL	DSL	DSL	DSL	%	%	%	%
3.3	***Wireless Transmission***								
3.3.1	Base Station Equipment	System	System	Unit	System	%	%	%	%
3.3.2	Base Transceiver System (BTS)	System	System	Unit	System	%	%	%	%
3.3.3	Pilot Beacon Unit (PBU)	System	System	Unit	System	%	%	%	%
3.4	***Packet Network***								
3.4.1	Packet Network Element	System	System	System	System	%	%	%	%

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RQMS Alternative Symbols (see Table A-5)		r,h,DPMs,c	r,h,OFMs,c		IPR (all)	DPQ (all)	DFP (all)	DSU (all)	RAQ (all)
3.4.2	Trunk Gateway	System	System	System	System	%	%	%	%
3.4.3	Access Gateway	System	System	System	System	%	%	%	%
3.4.4	Service and Network Controller	System	System	System	System	%	%	%	%
3.4.5	Routers	System	System	System	System	%	%	%	%
4	***Operations & Maintenance***								
4.1	***Test Systems***								
4.1.1	Test Access Equipment	NA	NA	Unit	System	%	%	%	%
4.1.2	Test Equipment, Embedded	NA	NA	Unit	System	%	%	%	%
4.1.3	Test Support Software	System	System	NA	System	%	%	%	%
4.2	***Operations Support Systems***								
4.2.1	On Line Critical	System	System	System	System	%	%	%	%
4.2.2	On Line Non-Critical	System	System	System	System	%	%	%	%
4.2.3	Off Line	System	System	System	System	%	%	%	%
4.3	Ancillary Operations and Maintenance	NA	NA	NA	None	NA	NA	NA	NA
5	***Common Systems***								
5.1	Synchronization	System	System	System	System	NA	NA	NA	NA
5.2	General Purpose Computers	System	System	System	System	%	%	%	%
5.3	Power Systems	System	System	Unit	System	NA	NA	NA	NA

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RQMS Alternative Symbols (see Table A-5)		r,h,DPMs,c	r,h,OFMs,c		IPR (all)	DPQ (all)	DFP (all)	DSU (all)	RAQ (all)
6	***Customer Premises***								
6.1	***Enhanced Services Platforms***								
6.1.1	Interactive Voice Response (IVR) Platforms	System	System	System	System	%	%	%	%
6.1.2	Messaging Platforms	System	System	System	System	%	%	%	%
6.1.3	Multi-Application Platforms	System	System	System	System	%	%	%	%
6.2	***Terminal Equipment***								
6.2.1	***Voice Terminals***								
6.2.1.1	Wireline Telephone Sets	NA	NA	Unit	Units shipped	%	%	%	%
6.2.1.2	Wireless Subscriber User Terminals	NA	NA	Unit	Units shipped	%	%	%	%
6.2.2	Fax Equipment	NA	NA	Unit	Units shipped	%	%	%	%
6.2.3	Data Modems	NA	NA	Unit	Units shipped	%	%	%	%
6.2.4	Digital Data Service Units	NA	NA	Unit	Units shipped	%	%	%	%
6.3	Automatic Call Distribution (ACD) Systems	System	System	System	System	%	%	%	%
6.4	Private Branch Exchange (PBX)	System	System	System	System	%	%	%	%
6.5	Small Communications System (Key Telephone System)	System	System	System	System	%	%	%	%

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Note 3 **Product Categories listed in RED and *italicized* will be used for possible Data Aggregation only. Measurements must be submitted per the lower Product Category listing.**
Note 4 **If the normalization factor contains the word "shipped", then the quantity shipped in the 12 months ending prior to the month being reported shall be used.**

Table A-2 Measurement Applicability Table (Normalization Units)				
Product Category		*Applicability and Normalization Units for Services*		
Code	Description	Service Problem Reports	Service Quality	Return Rate
TL 9000 Measurement Symbols (see Table A-5)		NPR (all)	SQ	RR (all)
RQMS Alternative Symbols (see Table A-5)		NA	NA	
7	***Services***			
7.1	Installation Service	Job	Audits	NA
7.2	***Engineering Service***			
7.2.1	Network Engineering Service	Job	NA	NA
7.2.2	Software Development Service	Contract	NA	NA
7.3	Maintenance Service	Units maintained	Maintenance Visits	NA
7.4	Repair Service	Units repaired	Units repaired	NA
7.5	Customer Support Service	Support requests	Support Requests	NA
7.6	***Purchasing Services***			
7.6.1	Procurement Services	Unit	NA	Unit
7.6.2	Sourcing/Purchasing Services	Contract	Transactions	NA
7.7	Logistical Services	Unit	NA	NA
7.8	Reserved for future use			
7.9	General Support Service	Unit	Transactions	NA

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Table A-2 Measurement Applicability Table (Normalized Units)

Product Category		*Hardware and Common Hardware Software*				*Software Only*			
Code	Description	Downtime Performance H, S	Outage Frequency H, S	Return Rate H	Problem Reports H,S	Corrective Patch Quality	Feature Patch Quality	Software Update Quality	Release Application Aborts
TL 9000 Measurement Symbols (see Table A-5)		SO2; SO4;	SO1;SO3;	RR (all)	NPR (all)	CPQ (all)	FPQ (all)	SWU (all)	RAA (all)
RQMS Alternative Symbols (see Table A-5)		r,h,DPMs,c_	r,h,OFMs,c		IPR (all)	DPQ (all)	DFP (all)	DSU (all)	RAQ (all)
8	***Components and Subassemblies***	***The hardware /software problem report severity definitions and response time objectives are not applicable to the product categories in Product Family 8. Problem reports on products in these categories should be treated the same as service problem reports for NPR, FRT, and OFR reporting.***							
8.1	Components	NA	NA	NA	Units shipped	NA	NA	NA	NA
	Important information for the categories noted.	***Products in the following six categories (8.2.x, 8.3, and 8.4) are provided by two types of organizations. These are: a) Organizations that design and develop the product for general sale on the open market. The activities of these organizations will include full support of the product before and after the sale b) Contract manufacturing organizations that build these products for another company. The receiving company is responsible for support of the product. Indication of which type applies (a or b) shall be included in the data submitted to the MRS for these six product categories.***							
8.2	***Electronic Assemblies***								
8.2.1 a&b	Simple	NA	NA	Unit	Units shipped	NA	NA	NA	NA
8.2.2 a&b	Medium Complexity	NA	NA	Unit	Units shipped	NA	NA	NA	NA
8.2.3 a&b	High Complexity	NA	NA	Unit	Units shipped	NA	NA	NA	NA
8.2.4 a&b	Very High Complexity	NA	NA	Unit	Units shipped	NA	NA	NA	NA
8.3 a&b	Cable Assemblies	NA	NA	Unit	Units shipped	NA	NA	NA	NA
8.4 a&b	Electromechanical Assemblies	NA	NA	Unit	Units shipped	NA	NA	NA	NA
8.5	***Optical Fiber and Devices***								

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Table A-2 Measurement Applicability Table (Normalized Units)

Product Category		*Hardware and Common Hardware Software*				*Software Only*			
Code	Description	Downtime Performance H, S	Outage Frequency H, S	Return Rate H	Problem Reports H,S	Corrective Patch Quality	Feature Patch Quality	Software Update Quality	Release Application Aborts
TL 9000 Measurement Symbols (see Table A-5)		SO2; SO4;	SO1;SO3;	RR (all)	NPR (all)	CPQ (all)	FPQ (all)	SWU (all)	RAA (all)
RQMS Alternative Symbols (see Table A-5)		r,h,DPMs,c_	r,h,OFMs,c		IPR (all)	DPQ (all)	DFP (all)	DSU (all)	RAQ (all)
8.5.1	Optical Fiber	NA	NA	NA	None	NA	NA	NA	NA
8.5.2	***Optical Devices***								
8.5.2.1	Opto-electronic Devices	NA	NA	Unit	Units shipped	NA	NA	NA	NA
8.5.2.2	Passive Optical Devices	NA	NA	Unit	Units shipped	NA	NA	NA	NA
8.5.2.3	Optical Subassemblies	NA	NA	Unit	Units shipped	NA	NA	NA	NA
8.6	***Software Components and Tools***								
8.6.1	Component Software	NA	NA	NA	Unit	%	%	%	%
8.6.2	Software Development Tools	NA	NA	NA	System	%	%	%	%

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