

# Tab 4 Technical Standards



*(b) Technical standards.*

*(1) ASCII and Baudot. TRS shall be capable of communicating with ASCII and Baudot format, at any speed generally in use.*

Relay Iowa is capable of receiving and transmitting using Voice, Turbo Code, ASCII or Baudot formats, at any speed generally in use. All equipment is compatible with industry-wide standards. The modems used by Relay Iowa can auto-detect the difference between ASCII and Baudot signals within the same modem so that each call is connected correctly. Relay Iowa furnishes all necessary telecommunications equipment and software to be capable of communicating with all voice, Baudot and ASCII calls at the correct Baud rate. The workstations and switching mechanisms used by Relay Iowa are flexible enough to process other formats as they become available to relay users.

Relay Iowa provides Turbo Code, a proprietary alternate protocol developed by Ultratec which allows faster typing speeds and interrupt capability. This alternative protocol is discussed in detail in Appendix A as well as Internet Relay.

*(2) Speed of answer.*

*(i) TRS providers shall ensure adequate TRS facility staffing to provide callers with efficient access under projected calling volumes, so that the probability of a busy response due to CA unavailability shall be functionally equivalent to what a voice caller would experience in attempting to reach a party through the voice telephone network.*

*(ii) TRS facilities shall, except during network failure, answer 85% of all calls within 10 seconds by any method which results in the caller's call immediately being placed, not put in a queue or on hold. The ten seconds begins at the time the call is delivered to the TRS facility's network. A TRS facility shall ensure that adequate network facilities shall be used in conjunction with TRS so that under projected calling volume the probability of a busy response due to loop trunk congestion shall be functionally equivalent to what a voice caller would experience in attempting to reach a party through the voice telephone network.*

*(A) The call is considered delivered when the TRS facility's equipment accepts the call from the local exchange carrier (LEC) and the public switched network actually delivers the call to the TRS facility.*

*(B) Abandoned calls shall be included in the speed-of-answer calculation.*

*(C) A TRS provider's compliance with this rule shall be measured on a daily basis.*

*(D) The system shall be designed to a P.01 standard.*

Relay Iowa provides adequate staffing to provide callers with efficient access to the relay. The probability of a busy response due to Communication Assistant unavailability is functionally

equivalent to what a voice caller would experience in attempting to reach a party through the voice telephone network.

Except during network failure, Relay Iowa **answers** eighty-seven percent (87%) of all calls within 10 seconds and has a daily answer time of less than 6.9 seconds, which results in the caller's call immediately being placed, not put in a queue or on hold on a daily basis for the State of Iowa. Relay Iowa begins measuring Average Answer time from the moment a relay call arrives at its relay switch (i.e. in the TRS center's network). As soon as Relay Iowa's equipment accepts the call from the LEC and the public switched network delivers the call to the TRS center, Relay Iowa starts its call detail record to capture answer time data.

The State of Iowa has contract provisions in place to assess its relay provider performance penalties if these answer seconds are not maintained. Hamilton is meeting this standard today for the State of Iowa.

The Relay Iowa is designed to a P.01 standard. No more than one call in 100 receives a busy signal when calling the relay center at the busiest hour. Relay Iowa has never come close to 1 call in 100 receiving a busy signal. There has been no blockage at the Relay Iowa switch points because its incoming network capacity is well in excess of any peak load requirements.

Relay Iowa designed its systems to prevent blockage. Relay Iowa's switch is a high-speed, stand-alone, non-blocking digital switching matrix. The system is fully redundant to insure quality and reliable performance, making blockage or any downtime nearly impossible. The system auto-detects any problems and moves to the secondary system immediately if necessary.

Another measure Relay Iowa has taken to prevent blocking is to use networks that make use of SONET survivability technology. All of the networks controlled by Relay Iowa - from the point a relay user picks up the phone in their home or business, through the relay and then back to the other phone being called - are redundant and can survive fiber cuts and other such outages. This allows Relay Iowa to maintain its zero percent blockage rate.

Relay Iowa measures, records and reports its answer performance and blockage rate information to the Iowa Utilities Board and abides by the FCC rules (i.e. a LEC shall provide the call attempt and the rates of calls blocked between the LEC and the relay center upon request).

*(E) A LEC shall provide the call attempt rates and the rates of calls blocked between the LEC and the TRS facility to relay administrators and TRS providers upon request.*

*(iii) Speed of answer requirements for VRS providers are phased-in as follows: by January 1, 2006, VRS providers must answer 80% of all calls within 180 seconds, measured on a monthly basis; by July 1, 2006, VRS providers must answer 80% of all calls within 150 seconds, measured on a monthly basis; and by January 1, 2007, VRS providers must answer 80% of all calls within 120 seconds, measured on a monthly basis. Abandoned calls shall be included in the VRS speed of answer calculation.*

Relay Iowa will abide by the FCC rules (i.e. a LEC shall provide the call attempt and the rates of calls blocked between the LEC and the relay center upon request). Hamilton answers 80% of all

VRS calls within 120 seconds, this includes abandoned calls.

*(3) Equal access to interexchange carriers. TRS users shall have access to their chosen interexchange carrier through the TRS, and to all other operator services, to the same extent that such access is provided to voice users.*

Relay Iowa provides relay users with access to the interexchange carrier of their choice through the TRS, and to all other operator services, to the same extent that such access is provided to voice users. Interlata and intralata long distance toll charges are recorded and billed by the relay user's carrier of choice in the same manner as the carrier bills that customer for long distance calls made without the relay. On each interlata and intralata call, Relay Iowa forwards the appropriate information digits (identifying the call as a relay call), calling number and called number as part of the call information so that the long distance company can bill the customer at correct functionally equivalent rate through their normal billing mechanisms. Calling card or credit card billing is handled in the same manner. Relay Iowa has provisioned the necessary trunks at each of its relay switching tandems for all long distance companies participating in equal access so that they can receive Relay Iowa relay traffic. Relay Iowa offers equal access to all carriers who choose to participate.

When a call has been defined as a long distance call, Relay Iowa sends this call to its relay switching tandem. The correct carrier code is sent with each call so that the tandem sends the call to the customer's carrier. Each call is identified as a relay call. If a relay user has signed up with his/her carrier of choice for a "relay" discount, the carrier will bill the call as a relay call and pass on any discounts. Relay users will receive one bill from their carrier of choice just like they do for all of their direct calls. Relay Iowa explains this type of billing arrangement through all Outreach and Customer Service activities, in newsletters, relay materials, etc. so that relay users understand how to select a carrier and find the best long distance rates.

Relay Iowa provides relay users with access to all other Operator Services to the same extent that such access is provided to voice users. Operator services are handled in the same manner as explained above. All operator assisted calls are sent to the customers' carrier of choice for processing and billing.

The type of arrangement explained above gives the control to the relay user. The relay user can pick their carrier of choice, receive one bill for all of their calls, and the relay user can shop for the best rates, just like they do today for calls not made through the relay. The relay user can continue to work with one carrier and the relay remains invisible.

Relay Iowa has developed a customer profile program based on the relay users' ANI that provides automatic connection to the carrier of choice for both interlata and intralata calls made by the relay user. Relay users complete a customer profile with their carrier information and Relay Iowa adds this information to its database. On each subsequent relay call relay users are automatically connected to their carrier of choice. Relay users can also notify the Communication Assistant of their carrier of choice when making a long distance relay call. In the event a relay user elects to change his/her carrier of choice, the Communication Assistant is able to do so. The Communication Assistant will also explain carrier of choice to a relay user when asked.

Relay Iowa offers 1010 dialing through the relay. This service is functionally equivalent to using 1010 services when not placing calls through the relay. In addition to 1010 dial-around, Hamilton has 50 interexchange carriers available on its platform.

In order to obtain new carriers on its platform, Relay Iowa contacts all carriers that are requested by Iowa relay users to see if they will participate in relay equal access. Relay Iowa then works diligently through ordering and testing phases with that carrier to ensure that the carrier becomes available to Iowa relay users. Hamilton maintains a list of participating long distance carriers for Iowa Relay and makes this information available to relay users.

#### *(4) TRS facilities.*

*(i) TRS shall operate every day, 24 hours a day. Relay services that are not mandated by this Commission need not be provided every day, 24 hours a day, except VRS.*

The Relay Iowa provides telecommunications relay service 24 hours a day, 7 days a week.

*(ii) TRS shall have redundancy features functionally equivalent to the equipment in normal central offices, including uninterruptible power for emergency use.*

The facility used by Relay Iowa has the needed redundancy in switching mechanisms and telecommunication facilities to ensure operation 24 hours a day. Relay Iowa is operated from Hamilton's Relay facility located in Middleton, Wisconsin. Relay Iowa calls automatically overflow during peak volume times and during any failure of switching or telecommunications facilities to other centers operated by the Relay Iowa relay provider. This ensures continuous operation of the Relay Iowa.

### **Switching System**

Relay Iowa makes use of an Excel telecommunications switch. The GS-2000 is a programmable, non-blocking switching system that supports a wide range of digital telephony services. Its open, modular architecture and programmable interfaces allow for simplified and cost-effective application development. The GS-2000 supports up to 2,048 ports in a single high-density system. Its components include a matrix CPU, network interface cards, Digital Signal Processing service cards and SS7 packet engine cards. The GS-2000 adapts to all standard network and line interfaces, including T1, E1, J1, and ISDN PRI.

The InterCall Switch Operating System (ISOS) was developed in response to the need to quickly develop applications on the Excel Inc. programmable switching platforms.

The ISOS can simply be loaded on a UNIX host, and plugged into the switch to offer basic tandem type switching capabilities including routing and call detail records. The ISOS is a fully operational basic switch and has great flexibility. Relay Iowa took advantage of this flexibility and has customized many relay functions in the ISOS operating system.

A new relay workstation application was developed to take advantage of the power and flexibility of the ISOS operating system. It provides a high level of Communication Assistant control processing with complete flexibility to connect any type of call protocol to any other type of call protocol. A database was developed to maintain a profile of each caller to speed up call connections and to provide information for tailored call processing.

**The switching systems used by Relay Iowa contain a fully redundant central processing unit on hot standby with automatic failover.** This is to ensure that no calls are dropped due to technical failure. It also has a redundant power supply on hot standby. Backup control and database servers are also on hot standby with automatic failover. Relay Iowa maintains an inventory of spare critical components for the switching system onsite to ensure that the required levels of service are met (listed below).

The switch used by Relay Iowa is a high-speed, stand-alone, non-blocking digital switching matrix. The system is fully redundant to insure quality, reliable performance. The system utilizes a standard T1 interface that enables it to be linked to other digital switches. All cards and power supplies within the system are redundant which gives us the flexibility to switch from one side of the switch to the other to perform updates or to troubleshoot without interrupting call processing. The system is set up to automatically access the secondary operating system on the switch with no human intervention. The system auto-detects any problems and moves to the secondary system immediately if necessary.

The on-sight switching system spare equipment includes:

- D4 channel bank
- All required channel bank cards
- T1 CSU packs
- Switch T-1 card
- Switch conference card

If one of the switching systems used by Relay Iowa cannot be returned to service by transferring control to redundant equipment, the calls automatically will overflow to another relay center supported by another switching system. The switching systems used by Relay Iowa are designed to provide a very high level of operational security with two fully redundant processors and power supplies in each switch. Each fully redundant control system, which includes keyboard, monitor and printer capabilities, are used to control and monitor each of the switching systems. **The control systems provide online system monitoring and real-time programming capabilities that will not take the system off-line and the ability to perform preventative maintenance or repair while the system is online.** Remote capabilities are also provided so the system can be remotely monitored, reconfigured or controlled as necessary. All of this is provided to insure the required levels of service are always met.

The backup power supply system fully complies with and exceeds the requirements for uninterruptible power. An uninterruptible power source with full battery backup is available to operate the Relay Iowa at full capacity for extended periods of time. **Relay Iowa also has**

**automatically activated generator back-up capabilities allowing it to provide relay service for days and weeks at a time during power outages.**

This power system supports the switch system and its peripherals, switch room and CA work site emergency lights and system alarms, CA consoles/terminals, Call Detail Recording, Supervisory and traffic monitoring consoles, Customer Service and administrative phone and voice mail systems, and building security systems.

Relay Iowa's provider maintains auxiliary power sources for nine central offices in addition to all its relay centers. All of Hamilton's back-up power systems are comparable to central office auxiliary power sources in terms of time and capacity. Please Appendix C for Hamilton's Disaster Recovery Plan.

Hamilton transmits conversations between TTY and voice callers in real time.

Previously in section (2) of this Tab is a detailed description of how the network facilities used by Relay Iowa are provisioned so that under projected calling volume, the probability of a busy response due to loop trunk congestion is functionally equivalent to what a voice caller would experience in attempting to reach a party through the voice telephone network.

The amount of telecommunications facilities needed to operate Relay Iowa (i.e. traffic volumes and load usage) are calculated in the same manner as Hamilton calculates the amount of telecommunications facilities needed to operate its local telephone company, ensuring functional equivalence to the voice network. Relay Iowa has virtually zero busy response due to telecommunication facility congestion. This is because Hamilton installs more telecommunications facility capacity than required for the projected calling volumes.

*(5) Technology. No regulation set forth in this subpart is intended to discourage or impair the development of improved technology that fosters the availability of telecommunications to person with disabilities. TRS facilities are permitted to use SS7 technology or any other type of similar technology to enhance the functional equivalency and quality of TRS. TRS facilities that utilize SS7 technology shall be subject to the Calling Party Telephone Number rules set forth at 47 CFR 64.1600 et seq.*

Using flexible software and hardware (i.e. common equipment frames, standard T1 interfaces, windows NT servers, UNIX operating System, etc.) where components can easily be modified in order to accommodate new technology, **the platform used by Relay Iowa is ideal for today's rapidly changing technologically advanced environment.** Relay Iowa's provider can quickly add new features and make changes based on the input from relay users and from our internal evaluations. Relay Iowa's provider takes advantage of innovations and technological improvements to enhance the State of Iowa's relay service.

The InterCall Switch Operating System (ISOS) was developed in response to the need to quickly develop applications on the Excel, Inc. programmable switching platforms. The ISOS can simply be loaded on a UNIX host, and plugged into the LNX to offer basic tandem type switching capabilities including routing and call detail records. The ISOS is a fully operational basic switch and has the flexibility to add to the application. Relay Iowa's provider took

advantage of this flexibility and has customized many relay functions in the ISOS operating system.

A relay workstation application was developed to take advantage of the power and flexibility of the ISOS operating system. It provides a high level of Communication Assistant control processing with complete flexibility to connect any type of call protocol to any other type of call protocol. A database was developed to maintain a profile of each caller to speed up call connections and to provide information for tailored call processing.

As a telecommunications company, Relay Iowa's provider is on the leading edge of new technology. Hamilton is an Internet provider, cable television provider, computer supplier and a general telecommunications provider. There are new advances in these areas every day. Hamilton is constantly watching for opportunities to use the technological advances in these areas in relay. Hamilton keeps the Iowa Utilities Board informed about any new types of technology that become available.

Relay Iowa relies on user feedback a great deal to set its technological development priorities. Relay Iowa is also involved in several industry groups to stay abreast of the latest FCC activities, user needs, and developing technology.

### **Signaling System Seven (SS7)**

**The relay platform used by Relay Iowa has made use of SS7 signaling since February 2002.**

The Relay platforms have been retrofitted to deliver Caller ID in the same manner that these services are delivered today in the public switched network (i.e. Relay Iowa provides true Caller ID service where the actual information of the calling party (not the relay center number) appears on the called party's Caller ID box).

Please see Tab 6 for listing of the current technology provided by Hamilton that exceeds the above minimum standards and for a description of the types of technology that Relay Iowa believes will be added to its relay platform during the next certification period.

*(6) Caller ID. When a TRS facility is able to transmit any calling party identifying information to the public network, the TRS facility must pass through, to the called party, at least one of the following: the number of the TRS facility, 711, or the 10-digit number of the calling party.*

### **True Caller ID**

**Through the use of SS7 signaling Relay Iowa provides true Caller ID service where the actual information of the calling party (not the relay center number) appears on the called party's Caller ID box. Relay Iowa provides this information on all call types and on all carriers. Relay Iowa brings true functional equivalence to Iowa Caller ID relay users.**

Relay Iowa receives and passes calling line identification information, **including blocking information** from all users calling through the relay service. If the Caller ID block indicator is enabled on the call when Relay Iowa receives it, the relay caller's number is not passed on to the called party. The call blocking information passes through automatically to the called party with

no relay intervention. The relay user has complete control over blocking information with their local phone company.

**With advanced SS7 technology, Caller ID information is automatically delivered to a 911 emergency center just as if the relay user had called 911 direct. As the FCC desires, Relay Iowa is making use of SS7 technology to facilitate the seamless transfer of caller information to a PSAP.**