COMMENTS RECEIVED FROM INDUSTRY REVIEW – 7840000

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File: 7840000 Intelligent Transportation Systems – ITS Network Devices
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Date: Wednesday, December 07, 2005
Time: 03:11:05 PM

Comments:

784-4.1 mentions a one year warranty, as all of the 780 series secifications do. Can this written one time, such as is done for signals in Article 611-5? if not, include provisions Warranty/Maintenance bond, see 611-5.1 in the spec book and/or 580-5 of the Supplemental Specifications, as examples for one.

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Elizabeth McCrary

The comments below are submitted by the District Seven ITS section of Traffic Operations. Our ITS GC assisted with the review process. Thank you,

784-2.2.1 – Device Server

Why has a requirement for encryption been added to the Device Server (and not the rest of the network) - This will severely limit availability of different manufacturers given it must also meet TS2 specs.

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Mark Burcham

1) For 784-1.2.5 Management Capability section, recommend inclusion to features that the MFES shall support Request for Coordination (RFC) 2974 Session Announcement Protocol (SAP) and RFC 2327 Session Description Protocol (SDP).

2) For 784-2.2.2 Serial Interfaces section, recommend revision to minimum of four (at least two) serial data interface and connectors to support future growth.

3) For 784-2.2.3 Network Interface section, suggest removal “or a 10/100 Base-FX connection” since MFES will most likely be located in same field cabinet or same room (TMC application) as the Device Server and the Ethernet output can be connected to the MFES. This will conserve fiber and reduce the cost of the device server.

4) For 784-2.2.3 Network Interface section, recommend inclusion of RFC 2327 Session Description Protocol (SDP).

5) For 784-2.2.3 Network Interface section, Tx [1], etc is shown, but no references are included for superscript.

6) For 784-3.2.9 Network Interface Specifications, suggest expansion of acceptable 100 Base-FX interface connection(s) to include SC, LC, and FC as indicated in MFES optical ports section 784-1.2.3.

7) For 784-3.3 Installation Requirements section, recommend revision to "shelf and/or rack-mountable" since it is typically one or the other.

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Steve Bowles 678-947-6079, sbowles@garrettcom.com

784-1.2.2 Networking Standards: Ensure that the MFES complies with the IEEE networking standards for Ethernet communications defined below, including the:

A.) **ADD**: 1000Mb Gigabit options for copper and/or fiber
Gigabit (1000 Mbps) Ethernet: IEEE 802.3z (1000Base-X), 802.3ab (1000Base-T) and GBIC

784-1.2.5 Management Capability: Ensure that the MFES supports all Layer 2 management features and certain Layer 3 features related to multicast data transmission and routing.

A.) **ADD:** Secure web management interface using SSL and TLS. The ***Secure Socket Layer (SSL)*** is protocol that enables secure communications between a server or a browser. The ***Transport Layer Security (TLS)*** is a secure transmission protocol using data encryption and authentication.

B.) **ADD:** SNMP version 3 for higher degree of security. SNMPv3 provides encrypted authentication & access security and is per RFC 2271-75.

There are three versions of SNMP defined: SNMP v1, SNMP v2 and SNMP v3. Both versions 1 and 2 have a number of features in common, but SNMPv2 offers enhancements, such as additional protocol operations. SNMP version 3 (SNMPv3) adds security and remote configuration capabilities to the previous versions. To solve the incompatible issues among different versions of SNMP, RFC 3584 defines the coexistence strategies.

C.) **ADD:** Additional security features and software management functionality to include TACACS+, Radius Server, and LACP- Link Aggregation. TACACS and Radius for secure wireless and LACP for use to aggregate multiple wireless antenna inputs to an outbound Ethernet port to maximize bandwidth and throughput.

TACACS- Terminal Access Controller Access Control System
TACACS+ protocol provides access control for routers, network access servers and other networked computing devices via one or more centralized servers. TACACS+ provides separate authentication, authorization and accounting services.

Radius Server- Remote Authentication Dial In User Service
Radius is a protocol for carrying authentication, authorization, and configuration information between a Network Access Server which desires to authenticate its links and a shared Authentication Server. RADIUS also carries accounting information between a Network Access Server and a shared Accounting Server. Radius uses UDP as the transport protocol.

LACP- Link Aggregation
The standard for this technology is IEEE 802.3ad. Link Aggregation, also called trunking or port trunking, is a technique of combining physical network links into a single logical link for increased bandwidth, achieving load balancing and increase fault tolerance. Link aggregation may be used to improve access to public networks by aggregating modem links or digital lines. Link aggregation may also be used in the enterprise network to build multigigabit backbone links between Gigabit Ethernet switches.

784-1.2.6 Mechanical Specifications:

A.) **ADD:** Modular switch for ease of field configuration and field servicing. Modularity ensures that the right port count will be achieved if the application mandates or necessitates the need for media converters or other than standard port configurations are needed. Additionally, modularity ensures that the switch can be easily upgraded over time to either Gigabit or other type of transport media. Any upgrades need to be done by the user and/or in the field.

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Mr. Bijan Behzadi, P.E., PTOE Phone #: 813-975-6733

Section 785-1.2, second sentence: The term “ahead of and behind” is not clear.

Section 785-1.3.2, second paragraph: The word “points” is too vague. Suggest using “rods” or “electrodes.”

Section 785-1.3.2, fourth paragraph: Considering the limitations of right-of-way along arterial streets (state routes), how can the minimum 40 feet spacing be met for any additional grounding electrodes given the Y configuration?

Section 785-1.3.2, fifth paragraph: The term “Bond all metal components of the ITS device subsystem” is too vague. Suggest defining the applicable elements – at least as some examples of applicable elements.

Section 785-1.3.5: It is not clear what structures/devices will require air terminals. Thought this is a design decision that must be incorporated in the specifications and plans, not all FDOT districts are treating this design requirement consistently and uniformly. Suggest standardization of minimum requirements for qualified structures and devices.

Section 785-1.4: This section heading is orphan relative to its support text. Please place this section heading in page 4.

Section 785-1.4.2: Please consider replacing the term “ahead of” with “before.”

Section 785-1.4.2: Do you mean “NEMA TS 1” or “NEMA LS 1.”’

Section 785-1.4.2: Please consider replacing the word “export” with “transmit.”

Section 785-2.2.2.2.2: Please consider adding the term “power over Ethernet” as another power option.

Section 785-2.2.3: Please specify the applicable length of cable for the specified 35 pounds weight limit.

Section 785-3.1: Please consider adding “maintaining agency” as another entity to whom the warranty should be transferable.

Section 784-4: This section and all associated subsections should be 785 instead of 784. The specs are not clear as to who will furnish the composite or other cabling between the device cabinet and device? Who will install the composite or other cabling between the device cabinet and device? Who will interconnect the composite or other cabling between the device cabinet and device to the lowering device connector that interfaces with the device? Typically, the Contractor provides the composite cable to the manufacturer of the lowering device and pole for termination with the lowering device connector and installation within the pole before the pole is erected by the Contractor. Language is needed here to ensure the device requirements for power, video, and PTZ control are considered in sizing the conductors for composite or other cabling between the device cabinet and device considering the length of the composite cable between the device and device cabinet.

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Chung Tran, FHWA

784-1.1 - Should this be 1 Giabit?

784-1.2.1 (paragraph 4) - Is this a common standard or a number that is inherent in a certain switches?

784-1.2.4 - Should this be changed to the current 1 Gigabit speed now currently available.

784-2.2.1 (paragraph 4) - Do we need to define what it means to be sniffed? Should this be anotated as version 2 for now and the latest approved version on the market?

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Jim LaBatt, Blackhawk Industries, Ind.

784-3.2.3 Format
There are three parts to MPEG2, two of which are commonly adopted by ITS vendors. These two parts are 13818-2 Elementary Stream and 13818-1 Transport Stream. Most vendors doing business in Florida, as well as other states, have been required to provide full functionality at both 13818-2 and 13818-1 to provide interoperability with other vendors. Adherence to these two specifications all but guarantees interoperability, and most specifications recently written require adherence to both 13818-2 and 13818-1. I think you should include these specifications as a requirement, especially with regard to
784-3.2.6 Interoperability. This paragraph also includes reference that the department shall consider MPEG4 and H.264. This is a very broad statement, and one that needs to be reconsidered carefully. There are 19 profiles and many implementation variants per profile for MPEG4. Also, many of these profiles are low quality and not well suited for ITS. In addition to MPEG4's 19 profiles, H.264 (MPEG4 AVC) has 3 profiles with 16
variants each, creating an interoperability nightmare. For example, MPEG4 ASP (Simple profile) is very common today, with low resolution and low cost. While MPEG4 AVC (advance video codec) is a new industry standard. MPEG4 and H.264 are identical and are both recognized in the industry as providing a high quality, lower bandwidth solution. Additionally, there is no interoperability between MPEG2 and MPEG4 encoders and decoders today, but it is expected that H.264 (MPEG4 AVC) products will be backwards compatible with MPEG2. So, I think the wording should be carefully considered on what FDOT will consider. Also, the spec reads that department may require independent certification of compliance with these specifications. What specification is certification to be measured to: MPEG2 13818-2, MPEG2 13818-1, MPEG4 (which profile and variant)?
784-3.2.5 Digital Video Decoder
The specifications states "provide a hardware-based network device OR a software application". According to earlier portions of the specifications, both hardware and software decoding should be provided. I believe this sentence should read "AND" instead of "OR".
784-3.2.5.2 Software-based Decoder
I don't know how you qualify a software decoding program to be compatible with SunGuide software, as SunGuide is its own software package. Maybe the intent herein is to specify that the manufacturer shall provide an open API/SDK and SNMP MIB's for the product, so that it can be incorporated into SunGuide.
784-3.2.6 Interoperability

As mentioned above, I would recommend referencing 13818-2 (Elementary Stream) and 13818-1.
(Transport Stream) in this portion of the specification.

784-3.2.7 Video Specifications

The lower limit of 128kbps contradicts the MPEG2 specification. Many vendors cannot provide MPEG2 below 1Mbps. Others that allow you to set the bit rate at MPEG2 to any rate as low as 128bps (iMPath, for example), the video will be virtually useless at that bit rate. Since this is an MPEG2 specification, the lower limit on bandwidth really should be 1Mbps. For applications requiring bit rates <1Mbps (ie: wireless), then MPEG4 ASP (simple profile) should be considered for such applications. While the quality is less than that of MPEG2, it will provide a useable image at the lower bit rates.

784-3.2.8 Serial Interface

This paragraph is technically fine, but could be enhanced to provide a better solution for the customer. First, the serial interfaces should be entirely independent from the video stream(s). These serial interfaces should act as true terminal services and be useable without regard to the status of the video
stream. These serial interfaces should be accessible from any other device or port on the system, and not required to be one-to-one between DVE and DVD. (ie: a computer opening a socket for a connection to a port). Second, you should specify that the serial interfaces are compatible and communicate with the Device Servers in section 784-2 of the specification. Third, you may consider the benefit of multicast data support offered by some vendors. This feature eliminates the needs for port sharing devices and makes a very clean solution.

784-3.2.9 Network Interface

The second sentence says that a DVE can have one 100-BaseFx connection. The last sentence says that any DVE's with fiber connections must provide two optical ports. Appears to contradict itself.

784.3.2.10 Front Panel Status Indicators

We don't understand the requirement for "link errors" and "transmission errors". Those are Ethernet functions which should be accommodated by the Ethernet switch, not the Video Encoder. Would recommend adding a "link status" LED which indicates connection to a network, as well as video status indicating video is connected to the encoder. However, the encoder doesn't know the status of the Ethernet transmission errors.

784-3.4.2 Environmental Testing

It is my understanding that these specifications are to be incorporated into project plans in the State of Florida. I would have to presume that the requirement to supply two units to TERL for environmental testing is a one-time certification process, and not a requirement for every project that bids in Florida.

784-4 Guaranty Provisions

There is one theme within this section that is bothersome as a manufacturer, but I can't say that I have a solution. As the end-user, I understand the reasoning behind wanting a warranty for 'n' years from date of final acceptance. However, as a manufacturer, we therein assume a liability for a non-capable, non-performing contractor. In a perfect world, a good Contractor will finish a 1 year contract in 1 year. Therefore, the manufacturer can cost a 3 year warranty for a DVE and meet the specification requirement for 2 year warranty from date of final acceptance. However, track history on Florida projects in recent years has shown that many Contractors are not finishing their projects on time. There are delays associated with hurricanes, contract disputes,

and the inability of Contractors to do the work properly. These delays can last months to years. It seems unfair for manufacturers to burden the extra warranty time when they are not at fault for the delays. Maybe the warranty can start at the original scheduled date of completion.