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IN REPLY REFER TO

3 Nov 99

From: Commander, Naval Facilities Engineering Command

Subj: INTERIM TECHNICAL GUIDANCE (ITG) FOR TELECOMMUNICATIONS CABLING SYSTEMS WITHIN CONSTRUCTION PROJECTS

Ref: (a) Department of the Navy Information Technology Standards Guidance, dtd June 1998

(b) Space and Naval Warfare Systems Command (SPAWAR) Base Level Information Infrastructure (BLII) Guidance Document Version I, dtd Nov 1998

Encl: (1) Interim Technical Guidance (ITG) Telecommunications Cabling Systems

1. Purpose. To establish planning, programming and budgeting procedures and technical criteria for subject projects, and assure consistency with Navy Information Technology (IT) infrastructure standards included in reference (a). This ITG applies to Navy and Marine Corps shorebased facilities construction and renovation projects. It applies to telecommunications cabling installations for all claimants and all funding sources.

2. Background. To support the Navy's network-centric warfighting capability, the shore telecommunications infrastructure must provide a seamless integration of global telecommunications networks to support fleet routine, tactical and training missions directly related to ships and aircraft in shore and deployed environments. We must make sure that telecommunications media, including fiber-optic and copper cabling to support connectivity between piers and shore facilities, are provided for all engineering projects. The Space and Naval Warfare Systems Command is providing shore telecommunications infrastructure improvements as part of the Base Level Information Infrastructure (BLII) program outlined in reference (b).

3. Technical Guidance. The ITG, forwarded as enclosure (1) provides the technical standards, resource and acquisition guidance for base telecommunications systems owned by the Navy. A structured cabling system is required to support the integration of Navy voice, data, video, imaging, security alarm, and fire protection systems. NAVFAC will ensure that all shorebased facilities projects include provisions for a structured cabling system. Such system must include duct and other pathways for fiber optic and copper (media) cables.

4. Funding. The procurement and installation of telecommunications switches may be funded as part of the MCON budget or from other claimant budgets. Customer terminal equipment for IT, hubs, routers, and support equipment are funded by the customer from other than construction budgets. NAVFAC components will coordinate projects and service requirements with the designated Base Communications Officer (BCO) to ensure the customer link connectivity of their voice and data networks.

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5. Coordination. This Interim Technical Guidance (ITG) has been coordinated with the NAVFACENGCOM Headquarters Codes MCD, MCP, and PWF. The ITG was also coordinated with claimants, including CINCLANTFLT, CINCPACFLT, NAVSEASYSCOM, NAVAIRSYSCOM, and CNET.

6. Actions. NAVFAC components will initiate actions to assist Navy commands to (a) identify their technical and operational requirements, and (b) plan and provide resources for facilities telecommunication cabling to support their IT/Communication requirements.

7. Points of Contact. The NAVFAC Criteria Office Special Assistant for Telecommunications, Mr. Charles Mandeville will provide assistance in clarifying NAVFAC telecommunications cabling policy and standards. He can be reached at 757-322-4208 or DSN 262-4208.

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INTERIM TECHNICAL GUIDANCE (ITG)
TELECOMMUNICATIONS CABLING SYSTEMS

1. Scope. This Interim Technical Guidance (ITG) provides the technical standards, resource, and acquisition guidance for Navy-owned base telecommunications systems. NAVFAC will provide its customers a structured telecommunications cabling system procured designed and constructed in accordance with commercial telecommunications standards and Navy criteria contained in this ITG. The Base Telecommunications Cabling Standards in paragraph 4 must be followed to ensure the connectivity of ships at piers and the shore infrastructure. The telecommunications cabling media must include fiber optic and legacy copper for compatibility with customer terminal equipment.

   The project scope must:
   a) Include a complete telecommunications cabling system to support customer network connectivity from the activity point of service to the customer work area.
   b) Incorporate IT requirements during the Project Engineering Development phases as part of the DD-1391+ development and Parametric Cost Estimate (PCE) process. The 1391+ must include an IT system requirement statement prepared by the customer, the facility planner, and the BCO, and provide separate line items on the DD 1391 for the primary telecommunications facility cabling and pathway system and for the interior building cabling and pathway system.

   Telecommunications switches may be funded with construction appropriations when customer requirements exceed the capacity and capability of existing government owned switches. The customer must document switch requirements and costs on the DD 1391 as a separate line item. The customer must also justify the requirement for a dedicated switch and program for the switch maintenance costs.

2. Base Telecommunications Cabling Standards:
   a) General: Construction project scopes shall include cabling for network connectivity between ships at piers and shore support facilities, fleet headquarters, communications centers, squadron commands. The ITG standards include technical interface requirements for outside cable plant, shore to ship pier connections, and interior cabling required for IT systems. These standards are consistent with the DON CIO standards, reference (a). Provide customers a fiber optic backbone system to support Asynchronous Transfer Mode (ATM) broadband Network operations. The fiber optic media will provide customers with the bandwidth and connectivity required meeting the DON CIO IT system architecture. Provide a legacy copper cabling to support legacy systems until fiber optic conversion devices are installed. Construction plans and specifications for complex projects shall be reviewed and approved by a Registered Communications Distribution Designer RCDD.

b) Outside Plant Standard: The base telecommunications backbone Outside Cable Plant Standard is 1310 or 1550 nanometer single-mode or 62.5/125 micron multi-mode fiber optic media with limited copper media to support legacy operations. Include at least 25% spare media capacity to allow for future growth during the 25-year facility lifetime. Install the media in a universal topology to support star, ring, or point to point topology. The outside plant shall be a loose tube fiber design installed in a permanently constructed pathway system or direct buried. Install media a minimum of 30 inches deep and below the frostline. Provide a permanent pathway, ductbank, conduit, and maintenance hole system to transport the media. Provide pull wires in empty conduits. Install media under roadways, aircraft runways, taxiways, and paved areas in a concrete encased pathway. Show location of direct burial systems on plant drawings. The materials for the backbone shall be commercially available products manufactured to the U. S. Department of Agriculture, Rural utilities Service (RUS) specifications. The RUS list of approved materials can be found at www.usda.gov/rus/telephone/1stmat/1stmat.htm. The cabling system shall comply with commercial specifications, EIA/TIA-568A, 568B, 758, and related industry standards. A minimum of 12 to 24 fiber strands shall be provided as a backbone service to each facility.

c) Pier Interface Standard: Provide an outside plant cabling system including fiber optic and legacy copper media and pathway system to weatherproof enclosure(s) on piers. The service shall include a minimum 12, maximum 24 strand fiber optic media terminated in the pier enclosure. The customer will provide the number of singlemode and multimode strands required during the project DD1391 development phase. The shore to ship receptacle may be provided as government equipment. The enclosure may also be designed to support legacy copper service in new construction piers where feasible and cost effective. Construction projects scopes shall include cabling to support fleet integrated networks and services required for fleet training and other warfighter networks. Provide fiber and legacy copper media between the pier enclosure and the activity point of connection coordinated with the activity BCO.

d) Interior Cabling Standard: Include a dedicated telecommunications room with space for terminating the backbone media and conduit system. Provide telecommunications equipment rooms and telecommunications closets as required by EIA/TIA 569. Provide a hybrid combination of fiber optic and legacy copper service to the customer workstation. The building backbone telecommunications service shall be a minimum of 12 fiber strands plus minimum copper Unshielded Twisted Pair (UTP) media for legacy systems. Cabling systems supporting classified networks shall be installed in compliance with reference (e).

Provide a horizontal cabling system including a hybrid combination of fiber and Category 5 UTP copper media. Provide media to match customer terminal equipment and workstation components. Provide a minimum horizontal media of 4 fiber strands, two to each fiber outlet, plus two 8-conductor UTP media in conduit to each customer workstation outlet. Design the work area outlet for a minimum of 2 fiber optic and 2 Category 5 UTP telecommunications outlets to support voice, data, imaging, and video teleconferencing requirements up to 100 MBPS TCP/IP. The intent is to provide a cost effective media migration to OC-12 data rate and bandwidth without media replacement.

Install interior cabling in accordance with NAVFAC Guide Specification NFGS 16710. Secure telecommunications cabling installations shall comply with reference (a).

3. Actions:
   NAVFAC components will
   1) Request Navy customers, including CINCLANTFLT, CINCPACFLT, NAVSEASYSCOM, NAVAIRSYSCOM, CNET, CNO Fleet Support Activity, CINCUSNAVEUR and others provide resources, information, and requirements documentation.
   2) Ensure programming for cabling IT services and funding for all projects programmed for FY02 and outyears. The cost of IT cabling must be included in MCON, Special Projects, and other projects funded from any customer budget. DD 1391s must include two separate line items for outside plant and inside plant media.
   3) Request the customer provide a list of telecommunications collateral equipment to be installed including hubs, routers, and terminal equipment to establish the utility interface requirements.
   4) Request that the customer participate in planning and design reviews of the project plans and specifications to confirm IT media interfaces at the customer workstations. Provide a list of terminal equipment with fiber optic or UTP media requirements.
   5) Provide technical consultation to Public Works, ROICC and other DON components.