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From: Commander, Carderock Division, Naval Surface Warfare Center,  
Philadelphia Station, Philadelphia, PA 19112-5083

To: Commander, Naval Sea Systems Command (SEA 03J2)

Subj: CRITERIA FOR SHIPBOARD USAGE OF MILITARY FIBER OPTIC COMPONENTS, SECOND  
UPDATE

Ref: (a) NSWCCD-SSES LTR 9504 Ser 9524/255 of 21 Aug 95  
(b) NSWCCD-SSES LTR 9504 Ser 9542/07 of 2 May 1997

End: (1) CRITERIA FOR SHIPBOARD USAGE OF MILITARY FIBER OPTIC COMPONENTS of 21 Aug 97

1. This letter re-addresses the general criteria for using military fiber optic components onboard Naval ships. Military components are those which were tested to and meet a military specification, either Qualified Products List (QPL) or first article. This subject was addressed previously in references (a) and (b). Recent applications, makes necessary the need to provide more specific detail for the ST connector and optical connection at the equipment interface.

2. In general, military components are required for intercompartmental and tactical fiber optic cable plant components. Nontactical components may be commercial components, depending upon the specific application. Enclosure (1) is a summary of usage for both military and commercial fiber optic cable plant components.

3. Recently, unofficial "guidance" has circulated that MIL-C-83522/16 QPL ST connectors must be used on the fiber optic cable plant backbone and commercial ST connectors can be used on the cable drops. This guidance was provided for particular SPAWARS administrative LAN's, had to do with cable and not ST connectors and does not encompass all fiber optic cable plant networks. The following criteria is to be applied:

- a. QPL ST connectors are to be used on all fiber optic cable plant backbones.
- b. QPL ST connectors are to be used on all cable drops for tactical applications.
- c. Commercial ST connectors may be used on cable drops for nontactical applications.

4. Recently, unofficial "guidance" has circulated that MIL-C-83522/16 QPL ST connectors are not required for fiber optic equipment mounted inside shock mounted racks. Equipment includes switches, multiplexers, routers and concentrators (hubs). The following criteria is to be applied for both tactical and nontactical applications:

- a. QPL ST connectors should be used on all cable runs connected to the fiber optic cable plant backbones.
- b. Commercial ST connectors should not be mated to the QPL ST connectors with the stiffer spring constant (such as at the shock mounted rack patch panel).
- c. Commercial ST connectors may be used to mate with adapters on commercial interface cards which includes Network Interface Cards (NIC cards).
- d. ST connectors are not to be used on the cabinet exterior and for other external connections on tactical applications.

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5. Advisory: Tabs (pins) breaking off the ST adapter on commercial interface, cards. There have been reports of tabs breaking off the ST adapters on commercial interface cards that are mated with the QPL ST connectors. The following criteria should be applied when determining the suitability of mating QPL ST connectors with commercial interface cards:

- a. Commercial ST connectors are to be used for mating with plastic ST adapters on commercial interface cards (including NIC cards). The stiffer spring constant on the QPL ST connectors tend to shear off the pins on plastic ST adapters.
- b. Evaluate the compatibility of the ST adapter on any commercial interface card with a QPL ST connector. Tabs may tend to break off or wear down quickly on adapters made from materials such as softer metals.

6. Advisory: Use of commercial connectors (ST or multiple termini) at the equipment panel or cabinet. This advisory addresses separately three cases: cabinets with internal shock isolation, cabinets with external shock isolation, cabinets with no shock isolation.

- a. Cabinets with internal shock isolation: Some cabinets are specified as "shock isolated"; however, only the interior to the cabinet is shock isolated. Commercial ST connectors may be used to mate with equipment and patch panels mounted to the interior of these type "shock isolated" cabinets for tactical applications. Non-shock hardened versions of MIL-C-28876 multiple termini connectors are not to be used at the cabinet exterior for tactical applications.
- b. Cabinets with external shock isolation: Commercial ST connectors may be used to mate with equipment and patch panels mounted to the interior of these type "shock isolated" cabinets for tactical applications. Non-shock hardened versions of MIL-C-28876 multiple termini connectors may be used at the cabinet exterior for tactical applications.
- c. Cabinets with no shock isolation: Commercial ST connectors are not to be used to mate with equipment and patch panels mounted to the interior of a non-shock isolated cabinet for tactical applications. Non-shock hardened versions of MIL-C-28876 multiple termini connectors are not to be used at the cabinet exterior for tactical applications.

7. The SC connector is the only type fiber optic connection supplied with some commercial equipment, which includes switches, multiplexers, routers and concentrators (hubs). The following criteria is to be applied for SC connector use:

- a. The SC connector is to be used only at the SC adapter interface with the commercial equipment.
- b. The SC connector is not to be used to mate with commercial equipment for any tactical application unless the commercial equipment is shock isolated.
- c. The SC connector is not to be used on the cable plant, any cable runs to the fiber optic cable plant backbones or any patch panel within the panel/cabinet.
- d. The ST connector (not SC connector) is to be specified as the mating optical connection for military specified equipment.
- e. The SC connector is not supported logistically. The sponsoring activity is responsible for repairs and other support required for the SC connector.

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8. SPAWARS recommended that thermoset cable be used on the backbone and thermoplastic cable be used on cable drops for cable plants requiring thermoset cable. This recommendation may be extended to non-SPAWARS applications except where cable drops reenter cable ways.

9. NSWCCD-SSES point of contact and NAVSEA technical agent for fiber optic component QPL is E. Bluebond. He can be contacted at (215) 897-8510, Fax (215) 897-8509.

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