DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
1333 ISAAC HULL AVENUE
WASHINGTON NAVY YARD DC 20376-0001

IN REPLY REFER TO

NAVSEAINST 9304.1D
Ser 05Z/018

MAY 22 2007

NAVSEA INSTRUCTION 9304.1D

From: Commander, Naval Sea Systems Command

Subj: SHIPBOARD ELECTRICAL CABLE AND CABLEWAY INSPECTION AND REPORTING PROCEDURES

Ref: (a) DOD-STD-2003, -1, -2, -3, -4, -5, Electrical Plant Installation Standards Methods
(b) COMFLTFORCOMINST 4790.3, Joint Fleet Maintenance Manual
(c) NAVSEA SL720-MAN-AA-020, Technical Specification No. TS9090-310D of Feb 2004, Alterations to Ships Accomplished by Alteration Installation Teams
(d) SECNAV M-5214.1 of 31 Dec 2005, Information Requirements (Reports) Manual

Encl: (1) Minimum Qualifications for Electrical Cable Installation and Repair Onboard Navy Ships
(2) Inspection Criteria for Electrical Cables and Cableways
(3) Cableway Inspection Report Format

1. Purpose. To modify Naval Sea Systems Command (NAVSEA) technical policy and actions necessary to identify and correct shipboard electrical cable and cableway hazards.

2. Cancellation. This revision cancels NAVSEAINST 9304.1C of 14 August 95.

3. Background. A special technical review of the fire onboard USS TATTNALL (DDG 19) in January 1984 identified electrical cable installation deficiencies as the most probable cause of fire. Subsequent inspections of other ships showed that improper shipboard cable installation practices are a universal problem.

a. Over the years as ship systems have been added, modified and deleted, numerous violations of the technical requirements for proper installation of cables have occurred. Contributing factors have been:

(1) A lack of knowledge or non-enforcement of technical

requirements and installation procedures.

(2) Mechanical interference.

(3) Installation shortcuts to reduce cost or meet schedule.

(4) Poor workmanship.

(5) Insufficient attention to cable installation requirements during ship and alteration design.

(6) Temporary equipment/SHIPALTS installed for research/development evaluation.

b. Shipboard electrical cable deficiencies identified fall into three categories:

(1) Category 1, Immediate Hazard: Those items which are, or have the immediate potential to be, personnel safety hazards, electrical fire hazards, or which negate firebreak and/or containment integrity.

(2) Category 2, Potential Hazard: Those items which require corrective action to ensure continued reliable safe performance or maintain watertight/spray tight integrity but are not of immediate danger to personnel or equipment.

(3) Category 3, Non-hazardous: Those items that are not hazardous to personnel and equipment but are not in compliance with approved standard installation practices.

4. Policy. New electrical cable plans and/or installations, regardless of planning or installing activity (private or public), shall be in accordance with current NAVSEA technical requirements as set forth in reference (a). This instruction shall apply only when reference (a) is invoked in a contract or work package. Resolution of deficiencies for new electrical cable plans and/or installations shall be in accordance with the following:

a. Category 1 waivers to reference (a) will not be approved. Category 1 items are to be corrected immediately upon discovery. In the event an immediate correction to a Category 1 item cannot be achieved, corrective action must be taken to resolve the deficiency or downgrade the Immediate Hazard to a Category 2 or 3 item. Authority for Category 2 or 3 waivers shall be vested in the following manner:

(1) New Construction: SUPSHIP Chief Engineer with a copy of the approved waiver to the Cognizant NAVSEA Ship Acquisition Program Manager.

(2) Non-New Construction: Naval Shipyard Chief Engineer, or Regional Maintenance Center (RMC) Chief Engineer, or SUPSHIP Chief Engineer with a copy of the approved waiver to the ship, the cognizant Type Commander (TYCOM) and the homeport Regional Maintenance Center - Maintenance Team (RI4C-MT).

b. Shipboard Electrical Cableway Installation Inspection shall be accomplished in the following manner:

(1) For ships undergoing an industrial availability longer than 6 weeks: Shipboard electrical cable installations shall be inspected during the Pre-Overhaul Test and Inspection (POT&I) process or via a Pre-availability "Find and Fix" inspection within 12 months of the ship's availability start date. These inspections shall be accomplished via a Special Inspection Team (SIT) utilizing the inspection criteria provided in enclosure (2). The SIT shall be qualified in accordance with enclosure (1).

(a) Category 1 items identified during a POT&I will be reported to the Ship's Commanding Officer. Qualified Ship's force personnel should start immediate corrective action of Category 1 items. (Note: In the event an immediate correction to a Category 1 item cannot be achieved, action must be taken to downgrade the immediate hazard to a Category 2 or 3 item).

(b) Category 1 items identified in Find and Fix inspections shall be reported to the ship's Commanding Officer. The ship's Commanding Officer and Chief Engineer shall initiate an Immediate Plan of Action to correct all Category 1 items utilizing members of the SIT and/or qualified ships force personnel to accomplish the repairs. (Note: In the event an immediate correction to a Category 1 item cannot be achieved, action must be taken to downgrade the Immediate Hazard to a Category 2 or 3 item).

(c) Category 2 and 3 items identified in either the POT&I or Find and Fix inspections shall be reported to the ship's Commanding Officer and Chief Engineer. The Chief Engineer shall ensure that all uncorrected Category 2 and 3 items are documented in the ship's Current Ship Maintenance Plan (CSMP) and a copy of the uncorrected discrepancies is provided to the TYCOM and the ship's homeport RMC-MT.

(d) All Category 2 and 3 items identified in the CSMP are to be screened for repair and scheduled by the homeport RMC MT in the upcoming Industrial Availability (longer than 6 weeks). RMC-MT must screen all cableway repairs to a workforce qualified in accordance with enclosure (1).

(2) For ships undergoing maintenance or modernization availability, i.e., not receiving a POT&I or Find and Fix inspection within 12 months of availability start:

(a) TYCOM and homeport RMC-MT to identify and schedule a SIT (qualified in accordance with enclosure (1)) to perform an Inspect and Report inspection of all electrical cableway deficiencies immediately upon arrival for the availability. All Category 1, 2 and 3 deficiencies shall be screened for correction within the current availability.

c. Special Inspection Team (SIT) will be established to inspect and repair (as funded) shipboard cable installations. SIT members shall be qualified in accordance with enclosure (1). The following table defines the SIT'S tasking requirements for each type of cableway inspection:

SPECIAL INSPECTION TEAM - TASKING REQUIREMENTS				
Type of Cableway Inspection	Scheduling for an Inspection	Inspection Criteria:	Reporting Criteria:	Distribution of Reports
POSAI	Within 1 year of an Industrial Availability Longer Than 6 Weeks.	SIT to Inspect and report to Ship's Commanding Officer all Category 1 items. (Qualified Ships Force personnel shall be utilized for correction of all Category 1 items.)	Report to Include: a. Identity / location of all Category 1 items. b. Identity / location of all Category 2 and 3 items.	SIT: a. Provide Report to ships Commanding Officer and Chief Engineer. b. Provide copy of Report to TYCOM and Homeport RMC-MT. SHIP: Ship's Chief Engineer to add all outstanding Category 2 and 3 items to ships CSMP.
Find and Fix	Within 1 year of an Industrial Availability Longer Than 6 Weeks.	SIT to Inspect and Correct / Repair all Category 1 and 2 items. (Qualified Ships Force personnel shall be utilized to assist SIT for correction of all Category 1 and 2 items.)	Report to Include: a. Identity / location of all Category 1 and 2 items that were corrected. b. Identity / location of all Category 2 and 3 items outstanding.	SIT: a. Provide Report to ships Commanding Officer and Chief Engineer b. Provide copy of Report to TYCOM and Homeport RMC-MT. SHIP: SIT and ship's Chief Engineer to add all outstanding Category 2 and 3 items to ships CSMP.
Inspect and Report	Upon Ships Arrival on Availability Start Date.	SIT to Inspect and provide Report	Report to Include: a. Identity of all Category 1, 2 and 3 items.	SIT: a. Provide Report to ships Commanding Officer, Chief Engineer and Homeport RMC. And repair activity for inclusion in AWP. SHIP: Ship's Chief Engineer to add all outstanding Category 1, 2 and 3 items to ships CSMP.

d. Policy for Dead-ended Cable:

(1) Dead-ended cable that is not properly end-sealed (capping end of unused cable) and labeled (serialized), is a Category 1 Hazard.

(2) Dead-ended cable that is properly end-sealed and

labeled (serialized), is a Category 3 discrepancy.

(3) Cables for "Future Use" are to be properly end-sealed and labeled on both ends for the specific use. In the event the cable is not properly end-sealed and labeled, the cable is to be treated as a Category 1 Hazard.

e. Unused Cables resulting from SHIPALT/Ship Change Documents. All unused cables shall be removed in their entirety. A request for waiver, in accordance with 4.a, shall be submitted only when unused cables cannot be removed. All unused electrical cable not removed shall be disconnected from all sources of power, end-sealed in accordance with reference (a), labeled (serialized) and documented in the ship's CSMP as a Category 3 discrepancy.

f. Unused cables identified in a POT&I, are to be addressed to the appropriate TYCOM. The TYCOM should include these cables in the next extended availability Authorized Work Package (AWP), Find and Fix, remove or waive, or Inspect and Report Inspection documenting the inclusion in AWP for action/funding. All unused cable is to be entirely removed. A request for waiver shall only be submitted when unused cables cannot be removed. All unused electrical cable not removed shall be disconnected from all sources of power or verified de-energized, end-sealed and labeled, and documented in the ship's CSMP as a Category 3 discrepancy. After cable removal, vacated stuffing tubes, multiple cable penetrators (MCPs), kick pipes, etc., shall be blanked off in accordance with requirements of reference (a).

g. NAVSEA Code O4XQ is the point of contact for issues involving implementation of the electrical cableway improvement program. NAVSEA Code 05Z4 is the point of contact for technical issues involving this instruction.

5. Action. NAVSEA 04 developed cable inspection and repair training courses and qualification requirements. Training materials have been distributed and are available to Naval Shipyards, SUPSHIPs, Regional Maintenance Centers (RMCs), Ship Repair Facilities (SRFs), and Fleet organizations. It is also available to private industry upon request. Enclosure (1) sets forth the minimum training and qualification requirements for Naval Shipyards, SUPSHIPs, RMCs and ALT government personnel. It also provides the recommended training and qualification requirements for ship's force. The Fleet is requested to establish inspection and repair teams supported by ship's force

to fulfill the requirements of this instruction. When inspections are conducted in preparation for depot availabilities or arrival inspections where POT&I are not performed, qualified electrical cableway inspectors shall be inspection team members.

a. NAVSEA Ship Program Managers will ensure that the inspection requirements of paragraphs 4.b and 4.c are included in all preliminary Ship Alteration and Repair Packages (SARPs) and Overhaul Work Packages (OWPs) affected by a Ship Change Document (SCD).

b. As required by Volume VI, Chapter 28 of reference (b), the Fleet is required to establish a Cableway Assessment Program for inspection of shipboard electrical cables and to incorporate provisions for in-process and final inspections in all SARPs and OWPs. Any team qualified to the requirements herein may inspect new electrical cable plans and/or installations.

c. NAVSEA/Government Agency codes responsible for initiating, reviewing, or approving SCD (per SHIPMAIN; CFT4 - Alteration Maintenance) shall ensure that the requirements of paragraph 4 are included as part of the alteration.

d. NAVSEA/Government Agency codes responsible for cableway work accomplished by Alteration Installation Teams (AITs) shall ensure the cableway inspection reports are forwarded to the homeport RMC-MT, ship's Commanding Officer, and the Chief Engineer for entry into the ship's CSMP.

e. SUPSHIPs and RMCs with contract administration responsibilities shall:

(1) Establish a formal quality assurance program to ensure that the work done by private industry is in accordance with reference (a).

(2) Periodically audit contractor practices and conduct and document in-process and final cableway inspections to ensure compliance with NAVSEA technical requirements. All deficiencies identified during these inspections shall be recorded and tracked to ensure proper corrective action is performed.

(3) Ensure that a final electrical cableway inspection, using the criteria of enclosure (2), is conducted on the areas affected by the contract or work package prior to final ship acceptance and/or end of repair availabilities. Final cableway inspection can be accomplished by the following methods:

(a) Use the aggregate of contractor in-process inspections of completed work affected by contract requirements in conjunction with the SUPSHIP/RMC in-process inspections to ensure all work has been inspected and accepted; or

(b) Use a one-time final cableway inspection conducted by the contractor and randomly checked by SUPSHIP/RMC; or

(c) SUPSHIP/RMC performs a one-time final cableway inspection of the areas affected by the contract requirements.

(d) Provide the results of either 5e(3), (a), (b) or (c) to the cognizant NAVSEA Ship Acquisition Program Manager for new construction ships and the respective TYCOM/Homeport RMC-MT for repair availabilities.

(4) Notify ship's force in writing that cableway training is available prior to the start of electrical work within the scheduled availability work packages.

f. Naval Shipyards and RMCs installing or repairing shipboard electrical cables shall:

(1) Establish a formal electrical installation quality control (QC) program to ensure that work done is in compliance with reference (a).

(2) Conduct and document in-process and final electrical cableway inspections on the areas affected by the work package. Ensure all reported items are corrected prior to final ship acceptance and/or end of repair availability.

(3) Arrange and make available to ship's force personnel the training in enclosure (1) prior to ship's force starting electrical work within a naval shipyard or CNO scheduled availability work package (funding for training will be allocated as part of AWP).

g. Alteration Installation Teams (AITs) [as defined in reference (c)] shall:

(1) For work accomplished by AITs, the cognizant government oversight organization shall notify the homeport RMC Chief Engineer, via the RMC-MT, Naval Shipyard Chief Engineer, or SUPSHIP Chief Engineer and the ship's Commanding Officer immediately upon discovery of any Category 1 items. The ship's Commanding Officer and Chief Engineer shall initiate an Immediate

Plan of Action to correct all Category 1 items utilizing qualified personnel in accordance with enclosure (1) and/or qualified ships force personnel to accomplish the repairs.

(2) For work accomplished by AITs, the cognizant government sponsor shall adhere to the "Reporting Criteria" and "Distribution of Reports" as delineated in the Find and Fix section of 4.c, table entitled Special Inspection Team Tasking Requirements to ensure all Category 2 and 3 items are entered into the ship's CSMP.

(3) During the Regional Maintenance and Modernization Coordination Office (RMMCO) check-in process and prior to the start of work: The ALT Manager (government oversight representative) shall ensure to the Naval Supervising Authority (NSA), on jobs involving cableway installations, they have a cableway inspector on-site who is qualified in accordance enclosure (1).

h. Special Inspection Teams, referenced in 4.c, shall take the following action:

(1) For Find and Fix inspections make sure that all Category 1 deficiencies are immediately corrected, or, at a minimum, corrected to the extent they can be downgraded to a Category 2 or 3. Notify the ship's Commanding Officer and Chief Engineer of deficiencies so they can document in the ships CSMP (per 4.b.1, 4.b.2 and 4.c for corrective action at a later date). For POT&I notify the Ship's Commanding Officer and Chief Engineer, or designated representative, of Category 1 deficiencies.

(2) Ensure that all remaining deficiencies are identified to the Commanding Officer for inclusion into the ship's CSMP for correction at the next availability.

(3) Distribute a complete inspection report, enclosure (3), as specified in 4.c (Special Inspection Team - Tasking Requirements; Column "Distribution of Reports").

i. All contracting activities, including AIT Sponsors, will be responsible for the quality assurance of electrical cable installations by the organizations and vendors with which they contract, especially those contracts not administered by SUPSHIPs, RMCs, or Naval Shipyards.

6. Reports. Inspection reports required by this instruction are

exempt from reports control as defined in reference (d).

K. M. MCCOY
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MINIMUM QUALIFICATIONS FOR ELECTRICAL CABLE INSTALLATIONS AND REPAIR ON BOARD NAVY SHIPS

PART I. MINIMUN QUALIFICATION REQUIREMENTS

1. Minimum requirements for Naval Shipyard personnel are as follows:

a. All first and second line supervision involved with electrical cable installations onboard Navy ships need not be qualified as long as a qualified first and/or second level supervisor performs the completed work inspection of the installation. The qualification will consist of, as a minimum, viewing all videotapes contained in Part II of enclosure (1) and demonstrated proficiency in identifying cable deficiencies and categories to a qualified person designated by the electrical shop superintendent performs the completed work inspection of the installation.

b. All electricians involved in the actual shipboard installation and repair of shipboard electrical cables will be required to complete training modules identified in Part II of enclosure (1) and by use of a mock-up or shipboard demonstrate proficiency in each repair item. Demonstration is to be made to a fully qualified individual. (NOTE: Qualifications on individual training modules are acceptable to work that specific item.) Common skill employees can be used for modules 9 and 10 (cable banding and cable removal/installation techniques) as long as a qualified electrician is in direct control of the work being performed.

c. All shipyard personnel utilized for Quality Assurance of electrical cable installation or repair must be qualified under paragraph 1(a).

d. Automated Training Management System (ATMS) shall be used to track individual qualifications in lieu of Part III of Enclosure (1)

2. Minimum requirements for SUPSHIP personnel are as follows:

a. SUPSHIP personnel involved with the inspection or acceptance of electrical cableway work on Navy ships shall be trained using the training modules identified in Part II of enclosure (1). They shall demonstrate, to qualified personnel, proficiency in identifying cable deficiencies and deficiency

categories. The original cadre of SUPSHIP electrical cable inspection personnel may be qualified by using qualified personnel from the Naval Shipyards or Fleet maintenance activities. After qualification, the cadre of SUPSHIP personnel may then qualify other SUPSHIP personnel for inspection only.

b. Part III of enclosure (1) shall be completed and maintained for each individual trained and qualified.

3. Minimum requirements for RMCs and Government AIT personnel inspecting, installing or repairing shipboard electrical cables are as follows:

a. Personnel performing Quality Assurance inspections on electrical cableway work, performed by their maintenance activity (or contractor/vendor contracted by their activity) shall be trained using training modules identified in Part II of enclosure (1) and demonstrate proficiency in identification and proper categorizing of cable deficiencies to a fully qualified electrical inspector designated by the maintenance activity.

b. All personnel involved with electrical cable installation and repairs must be qualified in the work he or she is performing by using the respective training in Part II of enclosure (1). (NOTE: Qualifications on individual training modules are acceptable to work that specific item.)

c. Applicable sections of this enclosure shall be completed, signed by a fully qualified person in electrical cableway repair, and maintained for each individual trained and qualified.

4. Minimum requirements recommended for Ship's Force personnel:

a. All personnel responsible for Quality Assurance on electrical cable work accomplished on their ship shall be trained using training modules identified in Part II of enclosure (1) and demonstrate proficiency in identification of proper electrical cable work to a qualified person designated by the Electrical Officer.

b. All personnel involved with installation or repair of electrical cableways onboard ship shall be qualified by use of training modules identified by asterisks in Part II of enclosure (1) and demonstrate proficiency in each applicable item of repair to a fully qualified person. A qualified petty officer inspector designated by the Electrical Officer will suffice.

c. Applicable sections of this enclosure shall be completed, signed by the Electrical Officer, or designee, and maintained for each individual trained and qualified.

Part II. Summary of Training Materials (Note 1)

No.	MODULE TITLE	TIME	SAVPIN	NNSY
1	Wired for Disaster	20:00	802249DN	NE0292-84-11
2*	Stuffing Tubes	17:11	802250DN	NE0416-93-9
3*	Multicable Penetrators	27:30	802251DN	NE0466-92-01
4*	Dead Ending Cables	7:35	802252DN	NE0347-92-01
5*	Cable Splicing	19:55	802253DN	NE0385-85-02
6	Planning Cable Routes	16:00	802234DN	NE0386-92-09
7*	Chafing Rings	17:00	802255DN	NE0423-92-03
8	Hangars	14:20	802256DN	NE0424-92-01
9*	Cable Banding	22:04	802257DN	NE0892-91-10
10	Cable Removal and Installation Techniques	16:33	802258DN	NE0427-93-06
11*	Penetration of Equipment and Connection Boxes	29:00	802259DN	NE0449-92-08
12*	Cable Repairs	16:05	802260DN	NE0457-92-01
13*	Testing Cables	13:21	802261DN	NE0454-93-05
14	Inspection of Cables and Cableways	No Video		
15	Special Tools and Equipment	26:50	802262DN	NE0456-92-01

All Ship's force personnel involved with installation or repair of electrical cableways onboard ship shall be qualified by use of training modules identified by asterisks (*) in Part II of enclosure (1) and demonstrate proficiency in each applicable item of repair to a fully qualified person. A qualified petty officer inspector designated by the Electrical Officer will suffice.

Note 1: Shipyard Instructional Design Center (SIDC) in Norfolk is updating the training modules numbers. Contact SIDC if there is a problem obtaining the modules using the NNSY numbers. POC is NAVSEA SIDC Library, Code 1170, (757) 396-5803 DSN 386.

Part III. CABLEWAY QUALIFICATION SHEET

NAME: _____
LAST FIRST MI

RATE/POSITION: _____ CHECK NO. _____

ACTIVITY: _____ LOCATION SITE OF TRAINING: _____

	CERTIFIER'S SIGNATURE & CLASSROOM TRAINING DATE	CERTIFIER'S SIGNATURE & MOCK-UP DATE
1 BANDING		
A. BANDING WITH CHANNEL RUBBER		
B. BANDING WITHOUT CHANNEL RUBBER		
C. BANDING COAX CABLES		
2. TUBE PACKING		
A. HARD & SOFT PACKING		
B. RUBBER GROMMETS		
3. STUFFING TUBE BLANKING		
4. MCP ASSEMBLY AND DISASSEMBLY		
5. MCP BLANKING		
6. SPLICING		
A. SHIELDING CABLE		
B. UNSHIELDED CABLE		
C. ARMOR CABLE		
D. UNARMORED CABLE		
7. ENDSEALING CABLE		
8. CABLE JACKET REPAIR (NONARMOR & ARMOR)		
9. PACKING NYLON TUBES		
10. BLANKING NYLON TUBES		
11. BLANKING UNUSED PENETRATIONS IN EQUIPMENT		
12. DRIP PROOFING NON-WATERTIGHT CONNECTORS/EQUIPMENT		
13. INSTALLATION OF ANTICHAFING DEVICES		
14. MOUNTING EQUIPMENT		
15. CABLE INSTALLATION (ARMOR, NONARMOR, COAX)		
16. CABLE REMOVAL (ARMOR, NONARMOR, COAX)		
17. REINSTALL CABLES PULLED OUT OF CONNECTORS		
18 INSTALLATION OF STRAPS, HANGERS AND COLLARS		
19 INSTALLATION FIRE STOP MATERIAL		
20 INSTALLATION OF COVERS		
21 USE OF PROPER TOOLS FOR TASK		
22. MINOR MOCK UP (I.E. LIGHTS, POWER, COMMUNICATIONS)		
23 UNDERSTANDING OF BEND RADIUS		

QUALIFIED TO INSPECT ALL OF ABOVE (CLASSROOM ONLY) _____
Signature Rate/Position & Date

QUALIFIED TO PERFORM ALL OF ABOVE (CLASSROOM ONLY) _____
Signature Rate/Position & Date

Enclosure (1)

INSPECTION CRITERIA FOR ELECTRICAL CABLES AND CABLEWAYS

ITEM	CRITERIA	CATEGORY	BIBLIOGRAPHY ITEM SEE PAGE 5
I.	CABLES		
A.	Installation		
1.	Minimum bend radius exceeded, causing visible damage to cable.	1	b
2.	Minimum bend radius exceeded; No visible cable damage, cable rings out and meggers satisfactorily.	3	
3.	Equipment connector supporting weight of cable (more than 32 inches of cable from last support to end use equipment). (18" from shock mounted motors).	1	a
4.	Cables run on or near hot objects (steam or exhaust pipes, griddles, ovens, etc.)	1	a & c
5.	Cable run outside of hangers.	3	a
6.	Lack of slack at expansion joints.	2	a
7.	Excess slack between hangers. (Minimum distance of 6'4" between deck and cables.)	3	
8.	Excess cable slack stored in wireway.	3	
B.	Damage		
1.	Bulging, bubbling or discoloration of cable jacket (evidence of overloading, overheating or hot spots.)	1	
2.	Bulging, bubbling or discolored cable jacket; but cable rings out and meggers satisfactorily.	2	
3.	Cable chafed or cut through outer jacket only.	2	a
4.	Cable chafed or cut through, inner wire insulation damage.	1	a
5.	Cable pulled out of equipment/junction box penetrations and leads exposed	1	a & c
6.	Armored and unarmored cables in contact at an oblique angle causing chafing of unarmored jacket.	2	a

Enclosure (2)

ITEM	CRITERIA	CATEGORY	BIBLIOGRAPHY ITEM SEE PAGE 5
C.	Dead-ended		
1.	Cable dead-ended, not end sealed and labeled (serialized) properly at both ends.	1	a & c
2.	Cable for future use not properly sealed and labeled at both ends for the specific use.	1	
3.	Cable dead-ended, end sealed, and labeled (serialized) properly.	3	
D.	Spliced		
1.	Improper materials/methods used for splicing or evidence of loose joints.	1	a
2.	Splice located in bend of cable.	2	a
II.	Banding		
A.	All Cable Runs		
1.	Banding cuts cable outer jacket (banding too tight).	1	a
2.	Banding compressing outer jacket (banding too tight but not cutting jacket).	3	a
3.	Plastic tie wraps used in place of banding straps (metal banding strap required).	2	
4.	Cables secured to hanger with bailing wire or rope.	1	
5.	Bands cut and left in wireway.	2	
6.	Channel rubber not installed where required.	2	a
B.	Horizontal Cable Runs		
1.	Banding not installed at breakout hangers before and after penetrations or at change of direction of wireway.	2	a
C.	Vertical Cable Runs		
1.	No banding or loose banding (banding required on every hanger).	2	a
III.	Cableways		
A.	Cableways		
1.	Cable hangers or hardware cutting into the cable jacket.	1	a

Enclosure (2)

ITEM	CRITERIA	CATEGORY	BIBLIOGRAPHY ITEM SEE PAGE 5
2.	Improper hanger spacing required at least every 32 inches except that hangers for multiple tier overhead aluminum decks shall be spaced every 16 inches).	2	a
3.	Inadequate cableway support (hangers, hardware, tiers, or cable straps missing) or welds cracked.	2	a
4.	Overload/Overcrowded cable hangers.	3	
5.	Maximum no. of tiers exceeded.	3	a
6.	Inadequate fastener length.	3	a
7.	One-half inch clearance between cable run and hangers above or structure not provided.	2	a
8.	EMI separation	2	a
IV.	Equipment		
A.	Covers		
1.	Junction box or equipment covers loose or missing.	1	c
B.	Mounting		
1.	Cable supporting the weight of equipment (power junction boxes, lighting fixtures switch boxes, etc.)	1	a & c
2.	Missing loose or improperly installed mounting hardware on equipment.	2	a & c
C.	Cable Entrance		
1.	Watertight penetrators not utilized for entrance to watertight equipment enclosures.	1	a
2.	Drip loops, drip shields plastic sealer or bottom penetration not utilized for entrance to non-watertight drip proof equipment.	1	a
3.	Cable can be moved in and out of tube. Improperly packed or not packed.	1	a
4.	Nylon tube base loose in enclosure. (O-ring missing)	1	a
V.	DECK/BULKHEAD PENETRATIONS		
A.	Non-watertight Deck or Bulkhead Cable Penetration		
1.	No plastic sealer around cables through collars where required.	1	a & c

ITEM	CRITERIA	CATEGORY	BIBLIOGRAPHY ITEM SEE PAGE 5
2.	Chafing protection not installed at non-watertight deck or bulkhead cableway penetrations.	2	a
3.	Chafing ring overloaded.	3	
4.	Inadequate chafing protection and damage evidence.	1	a
B.	Watertight Deck or Bulkhead Cable Penetrations		
1.	No plastic sealer around cable at stuffing tubes which are exposed to the weather. Note: If plastic sealer is installed at locations other than those exposed to the weather, it is not required to be removed.	2	a
2.	Stuffing tube or kickpipe not utilized (cable installed without tube).	1	a & c
3.	Unused stuffing tube or kickpipe not plugged.	1	a
4.	Stuffing tube or kickpipe assembly incomplete (missing gland nut, packing, or pipe connector).	1	a
5.	Stuffing tube assembly incorrect (improper packing).	2	a
6.	Stuffing tube or kickpipe too large for size of cable.	3	a
7.	Multiple cable in a single stuffing tube or kickpipe.	2	a
8.	Stuffing tube or kickpipe damaged to point where complete assembly not possible (cracked welds, damaged threads, out-of-round, etc.) if firestop material is installed.	2	a
C.	Watertight Deck or Bulkhead Penetrations Utilizing Multiple Cable Penetrations (MCP)		
1.	Insert blocks, compression bolts or filler blocks missing.	1	a & c
2.	Improper size blocks used for size cable installed violating watertight integrity.	2	a
3.	Incorrect type or missing fire stop caulk used to seal armored cable through MCP blocks.	1	

BIBLIOGRAPHY ITEM

ITEM	CRITERIA	CATEGORY	SEE PAGE 5
4.	RISE type MCP not properly sealed with a soft-seal sealant (FIWA) Catalog # 80-0900 or equivalent) or missing soft-seal sealant.	1	

BIBLIOGRAPHY

ITEM	SUBJECT

a. DOD-STD-2003, -1, -2, -3, -4, -5, ELECTRICAL PLANT INSTALLATION STANDARD METHODS. (Available in hard copy from Naval Publication and Forms Center, 5801 Tabor Ave., Philadelphia, PA 19120-5099; in microfiche and aperture cards from Portsmouth Naval Shipyard, Portsmouth, NH 03801).

b. Data pertaining to ELECTRIC SHIPBOARD CABLE (Cable Comparison Handbook) MIL-HDBK-299(SH) dtd 3 April 1989 (Available from Naval Publications and Forms Center, 5801 Tabor Ave., Philadelphia, PA 19120-5099.)

c. NAVAL SHIPS' TECHNICAL MANUAL, NAVSEA S9086-KC-STM-000 Chapters 300 and 304. (Available from Naval Publications and Forms Center, 5801 Tabor Ave., Philadelphia, PA 19120-5099).

CABLEWAY INSPECTION REPORT FORMAT

DATE: _____ HULL NUMBER: _____

INSPECTED BY: _____ INSPECTING ORGANIZATION: _____

SER#	COMP	LVL	FRM	P/S	POS	TYPE	CAT	DESCRIPTION	EQUIPMENT
5	6	7	8	9	10	11	12	13	14

1. DATE - Date of Inspection
2. HULL NUMBER - Ship's Hull # (DDG-2, CV-43, FFG-7, etc.)
3. INSPECTED BY - Person or persons performing inspection
4. INSPECTING ORGANIZATION - Activity Inspector is from
5. SER # - Sequential number assigned by Inspection Team Leader
6. COMP - Name or number of compartment inspected
7. LVL - Level of ship (01, 02, 1, 2, etc.)
8. FRM - Frame number where discrepancy located
9. P/S - Port, Starboard or centerline location of compartment on ship
10. POS - Position of discrepancy (in clock format, facing bow 12 o'clock C/L of compartment)
11. TYPE - PVC, armor, low smoke, rubber, etc.
12. CAT - Category of discrepancy - 1, 2, or 3
13. DESCRIPTION - Description of discrepancy (i.e., 3 Bulkhead stuffing not blanked; cable pulled out of box connection in power panel; cable improperly dead-ended in wireway
14. EQUIPMENT - Nomenclature of equipment (i.e., Power panel 3-103-4P-E; Junction box C-MC23; 400Ms Switchboard; Lighting connection box