

SOLICITATION / CONTRACT / ORDER FOR COMMERCIAL ITEMS
OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24, & 30

1. REQUISITION NUMBER
 PRSAR040810
 PAGE 1 OF 14

2. CONTRACT NO. 3. AWARD/EFFECTIVE DATE 4. ORDER NUMBER 5. SOLICITATION NUMBER DTMA2B04019 6. SOLICITATION ISSUE DATE 08/19/2004

7. FOR SOLICITATION INFORMATION CALL:
 a. NAME Toni Kimbrough b. TELEPHONE NUMBER (No collect calls) (757) 441-3246 ext. 8. OFFER DUE DATE/ LOCAL TIME 09/07/2004 2:00 pm EDT

9. ISSUED BY DOT/Maritime Administration, SAR Acquisition
 Office of Acquisition, MRG-7200
 7737 Hampton Boulevard, Building 4D, Room 211
 Norfolk, VA 23505
 TEL: (757) 441-3245 ext.
 FAX: (757) 441-6080 ext.
 CODE 00092
 10. THIS ACQUISITION IS
 UNRESTRICTED
 SET ASIDE: 0.00% FOR
 SMALL BUSINESS
 HUBZONE SMALL BUSINESS
 8(A)
 NAICS: 335929
 SIZE STANDARD:
 11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED
 SEE SCHEDULE
 12. DISCOUNT TERMS
 10 days %
 20 days %
 30 days %
 days %
 13a. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700)
 13b. RATING
 14. METHOD OF SOLICITATION
 RFQ IFB RFP

15. DELIVER TO James River Reserve Fleet
 End of Harrison Road, Bldg. 2606
 Fort Eustis, VA 23604
 Attn: Robert Rohr
 CODE 7710
 16. ADMINISTERED BY DOT/Maritime Administration, SAR Acquisition
 Office of Acquisition, MRG-7200, 7737 Hampton Boulevard, Building 4D, Room 211
 Norfolk, VA 23505
 CODE 00092

17a. CONTRACTOR/OFFEROR CODE FACILITY CODE
 No Contractor Information Available
 18a. PAYMENT WILL BE MADE BY DOT/Maritime Administration, South Atlantic Region
 7737 Hampton Blvd., Bldg. 4D, Room 211
 Norfolk, VA 23505
 CODE 7400

TELEPHONE NO.
 17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER
 18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a UNLESS BLOCK BELOW IS CHECKED SEE ADDENDUM

19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES	21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
(Use Reverse and/or Attach Additional Sheets as Necessary)					

25. ACCOUNTING AND APPROPRIATION DATA 26. TOTAL AWARD AMOUNT (For Govt. Use Only)

27a. SOLICITATION INCORPORATES BY REFERENCE FAR 52.212-1, 52.212-4. FAR 52.212-3 AND 52.212-5 ARE ATTACHED. ADDENDA ARE ARE NOT ATTACHED
 27b. CONTRACT/PURCHASE ORDER INCORPORATES BY REFERENCE FAR 52.212-4. FAR 52.212-5 IS ATTACHED. ADDENDA ARE ARE NOT ATTACHED

28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED HEREIN.
 29. AWARD OF CONTRACT: REF. OFFER
 DATED YOUR OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS:

30a. SIGNATURE OF OFFEROR/CONTRACTOR 31a. UNITED STATES OF AMERICA (SIGNATURE OF CONTRACTING OFFICER)
 30b. NAME AND TITLE OF SIGNER (Type or print) 30c. DATE SIGNED 31b. NAME OF CONTRACTING OFFICER (Type or print) 31c. DATE SIGNED
 Toni R. Kimbrough

19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES	21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT

32a. QUANTITY IN COLUMN 21 HAS BEEN

RECEIVED INSPECTED ACCEPTED, AND CONFORMS TO THE CONTRACT, EXCEPT AS NOTED: _____

32b. SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE	32c. DATE	32d. PRINTED NAME AND TITLE OF AUTHORIZED GOVERNMENT REPRESENTATIVE
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32e. MAILING ADDRESS OF AUTHORIZED GOVERNMENT REPRESENTATIVE	32f. TELEPHONE NUMBER OF AUTHORIZED GOVERNMENT REPRESENTATIVE
	32g. E-MAIL OF AUTHORIZED GOVERNMENT REPRESENTATIVE

33. SHIP NUMBER <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL	34. VOUCHER NUMBER	35. AMOUNT VERIFIED CORRECT FOR	36. PAYMENT <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL	37. CHECK NUMBER
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38. S/R ACCOUNT NUMBER	39. S/R VOUCHER NUMBER	40. PAID BY
------------------------	------------------------	-------------

41a. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT	42a. RECEIVED BY <i>(Print)</i>	
41b. SIGNATURE AND TITLE OF CERTIFYING OFFICER	41c. DATE	
	42b. RECEIVED AT <i>(Location)</i>	
	42c. DATE REC'D <i>(YY/MM/DD)</i>	42d. TOTAL CONTAINERS

Line Item Summary	Document Number DTMA2B04019	Title 7600041160 15 KV Cables	Page 3 of 14
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Line Item Number	Description	Delivery Date (Start Date to End Date)	Quantity	Unit of Issue	Unit Price	Total Cost (Includes Discounts)
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0001	Provide twenty (20) 15 KV High Voltage Cable Assemblies in accordance with Statement of Work	10/22/2004	20.00	EA	\$	\$
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Ref Req No: PRSAR040810

REFERENCE REQUISITION 7600-04-1160

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COMMERCIAL CLAUSES

1 52.252-02 CLAUSES INCORPORATED BY REFERENCE

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://www.acqnet.gov/far/current/html/FARMTOC.html>

Clause	Title	Date
52.212-01	Instructions to Offerors--Commercial Items	January 2004
52.212-04	Contract Terms and Conditions--Commercial Items	October 2003

2 52.212-05 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS--COMMERCIAL ITEMS. MAY 2004

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clause, which is incorporated in this contract by reference, to implement provisions of law or Executive orders applicable to acquisitions of commercial items: 52.233-3, Protest after Award (AUG 1996) (31 U.S.C. 3553).

(b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

 X (1) 52.203-6, Restrictions on Subcontractor Sales to the Government (JUL 1995, with Alternate I (OCT 1995) (41U.S.C. 253g and 10 U.S.C. 2402).

 (2) 52.219-3, Notice of Total HUBZone Small Business Set-Aside (JAN 1999) (15 U.S.C 657a).

 (3) 52.219-4, Notice of Price Evaluation Preference for HUBZone Small Business Concerns (JAN 1999) (if the offeror elects to waive the preference, it shall so indicate in its offer) (15 U.S.C 657a).

 (4)(i) 52.219-5, Very Small Business Set-Aside (JUNE 2003) (Pub. L. 103-403, section 304, Small Business Reauthorization and Amendments Act of 1994).

 (ii) Alternate I (MAR 1999) of 52.219-5.

 (iii) Alternate II (JUNE 2003) of 52.219-5.

 (5) (i) 52.219-6, Notice of Total Small Business Set-Aside (JUNE 2003) (15 U.S.C. 644).

 (ii) Alternate I (OCT 1995) of 52.219-6.

 (iii) Alternate II (MAR 2004) of 52.219-6.

 (6) (i) 52.219-7 Notice of Partial Small Business Set-Aside (JUNE 2003) (15 U.S.C. 644).

 (ii) Alternate I (OCT 1995) of 52.219-7.

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- ___ (iii) Alternate II (MAR 2004) of 52.219-7.
- ___ (7) 52.219-8, Utilization of Small Business Concerns (MAY 2004) (15 U.S.C. 637 (d)(2) and (3)).
- ___ (8) (i) 52.219-9, Small Business Subcontracting Plan (JAN 2002) (15 U.S.C. 637(d)(4)).
- ___ (ii) Alternate I (OCT 2001) of 52.219-9.
- ___ (iii) Alternate II (OCT 2001) of 52.219-9.
- ___ (9) 52.219-14, Limitations on Subcontracting (DEC 1996) (15 U.S.C. 637(a)(14)).
- ___ (10)(i) 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns (JUNE 2003) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323) (if the offeror elects to waive the adjustment, it shall so indicate in its offer).
- (ii)___ Alternate I (JUNE 2003) of 52.219-23.
- X (11) 52.219-25, Small Disadvantaged Business Participation Program--Disadvantaged Status and Reporting (OCT 1999) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).
- X (12) 52.219-26, Small Disadvantaged Business Participation Program--Incentive Subcontracting (OCT 2000) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).
- X (13) 52.219-27, Notice of Total Service-Disabled Veteran-Owned Small Business Set-Aside (May 2004).
- X (14) 52.222-3, Convict Labor (June 2003) (E.O. 11755).
- X (15) 52.222-19, Child Labor-Cooperation with Authorities and Remedies (Jan 2004) (E.O. 13126).
- ___ (16) 52.222-21, Prohibition of Segregated Facilities (Feb 1999).
- ___ (17) 52.222-26, Equal Opportunity (Apr 2002) (E.O. 11246).
- ___ (18) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (Dec 2001) (38 U.S.C. 4212).
- ___ (19) 52.222-36, Affirmative Action for Workers with Disabilities (Jun 1998) (29 U.S.C. 793).
- ___ (20) 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (Dec 2001) (38 U.S.C. 4212).
- ___ (21)(i) 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Products (Aug 2000) (42 U.S.C. 6962(c)(3)(A)(ii)).
- ___ (ii) Alternate I (Aug 2000) of 52.223-9 (42 U.S.C. 6962(i)(2)(C)).
- ___ (22) 52.225-1, Buy American Act-Supplies (June 2003) (41 U.S.C. 10a-10d).
- ___ (23)(i) 52.225-3, Buy American Act-Free Trade Agreements-Israeli Trade Act (Jan 2004) (41 U.S.C. 10a-10d, 19 U.S.C. 3301 note, 19 U.S.C. 2112 note, Pub. L. 108-77, 108-78).
- ___ (ii) Alternate I (Jan 2004) of 52.225-3.
- ___ (iii) Alternate II (Jan 2004) of 52.225-3.
- ___ (24) 52.225-5, Trade Agreements (Jan 2004) (19 U.S.C. 2501, et seq., 19 U.S.C. 3301 note).
- ___ (25) 52.225-13, Restrictions on Certain Foreign Purchases (Dec 2003) (E.o.s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury).

___ (26) 52.225-15, Sanctioned European Union Country End Products (Feb 2000) (E.O. 12849).

___ (27) 52.225-16, Sanctioned European Union Country Services (Feb 2000) (E.O. 12849).

___ (28) 52.232-29, Terms for Financing of Purchases of Commercial Items (Feb 2002) (41 U.S.C. 255(f), 10 U.S.C. 2307(f)).

___ (29) 52.232-30, Installment Payments for Commercial Items (Oct 1995) (41 U.S.C. 255(f), 10 U.S.C. 2307(f)).

___ (30) 52.232-33, Payment by Electronic Funds Transfer-Central Contractor Registration (Oct 2003) (31 U.S.C. 3332).

X (31) 52.232-34, Payment by Electronic Funds Transfer-Other than Central Contractor Registration (May 1999) (31 U.S.C. 3332).

___ (32) 52.232-36, Payment by Third Party (May 1999) (31 U.S.C. 3332).

___ (33) 52.239-1, Privacy or Security Safeguards (Aug 1996) (5 U.S.C. 552a).

___ (34)(i) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (Apr 2003) (46 U.S.C. Appx 1241 and 10 U.S.C. 2631)..

___ (ii) Alternate I (Apr 1984) of 52.247-64.

(c) The Contractor shall comply with the FAR clauses in this paragraph (c), applicable to commercial services, that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

___ (1) 52.222-41, Service Contract Act of 1965, as Amended (MAY 1989) (41 U.S.C. 351, et seq.).

___ (2) 52.222-42, Statement of Equivalent Rates for Federal Hires (MAY 1989) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

___ (3) 52.222-43, Fair Labor Standards Act and Service Contract Act--Price Adjustment (Multiple Year and Option Contracts) (MAY 1989) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

___ (4) 52.222-44, Fair Labor Standards Act and Service Contract Act--Price Adjustment (FEB 2002) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

___ (5) 52.222-47, SCA Minimum Wages and Fringe Benefits Applicable to Successor Contract Pursuant to Predecessor Contractor Collective Bargaining Agreement (CBA) (MAY 1989) (41 U.S.C. 351, et seq.).

(d) Comptroller General Examination of Record. The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed bid, is in excess of the simplified acquisition threshold, and does not contain the clause at 52.215-2, Audit and Records--Negotiation.

(1) The Comptroller General of the United States, or an authorized representative of the Comptroller General, shall have access to and right to examine any of the Contractor's directly pertinent records involving transactions related to this contract.

(2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in FAR Subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.

(3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e) (1) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c) or (d) of this clause, the Contractor is not required to flow down any FAR clause, other than those in paragraphs (i) through (vi) of this paragraph in a subcontract for commercial items. Unless otherwise indicated below, the extent of the flow down shall be as required by the clause--

(i) 52.219-8, Utilization of Small Business Concerns (MAY 2004) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds \$500,000 (\$1,000,000 for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontractors that offer subcontracting opportunities.

(ii) 52.222-26, Equal Opportunity (APR 2002) (E.O. 11246).

(iii) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (DEC 2001) (38 U.S.C. 4212).

(iv) 52.222-36, Affirmative Action for Workers with Disabilities (JUNE 1998) (29 U.S.C. 793).

(v) 52.222-41, Service Contract Act of 1965, as Amended (MAY 1989), flow down required for all subcontracts subject to the Service Contract Act of 1965 (41 U.S.C. 351, et seq.).

(vi) 52.247-64, Preference for Privately-Owned U.S.-Flag Commercial Vessels (APR 2003) (46 U.S.C. Appx 1241 and 10 U.S.C. 2631). Flow down required in accordance with paragraph (d) of FAR clause 52.247-64.

(2) While not required, the contractor may include in its subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

3 STATEMENT OF WORK

0001. CABLE ASSEMBLY SPECIFICATION

Part 1 - General

1.1 Summary

The contractor shall provide 20 lengths of 15 kV SHD-GC cable. The cables shall be assembled into 20 separate Type "B" cables of 250 ft. length each with a male connector on one end and a female connector on the other end, installed as shown on drawing 2818-102, for Type "B" cables. Quantities and other materials noted on the drawing but not specified in this statement of work are not to be included in this procurement.

Testing of completed cable assemblies shall be in accordance with 1.5.4.1.1.f and 1.5.4.1.1.g.

This specification section includes detailed requirements for the assembly of various cables.

In general, the 15 kV SHD-GC cables shall be assembled as follows:

The cable shall consist of three (3) flexible stranded copper conductors with ethylene-propylene (EP) conductor screen, EP insulation, semiconducting EP tape covered by a coated copper braid, two (2) uncovered flexible stranded coated copper ground conductors, one (1) yellow insulated ground check conductor, two (2) shielded twisted pair cables, and rubber fillers, covered with a chlorosulfonated-polyethylene jacket. The cable shall be certified for continuous operation at 90 degrees Celsius in wet or dry locations with an operating voltage of 15 kilovolts.

Two shielded twisted pair cables shall consist of two (2) 18 AWG (minimum) conductors with maximum 2 inch lay per twist. Each shielded twisted pair cable shall have 600 V insulation, an overall foil or braided shield and a drain.

1.2 References

The publications listed below form a part of this specification to the extent referenced. The publications referred herein are by the basic designation only. The addresses of the sponsoring organizations can be found in section 01090.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

- ANSI/ASTM B8 1986 Standard Specification for Concentric-Lay-Standard Copper Conductors, Hard, Medium Hard, or Soft
- ANSI/ASTM B 33 1985 Standard Specification for Tinned Soft or Annealed Copper Wire for Electrical purposes
- ANSI/ASTM B 189 1990 Standard Specification for Lead-Coated and Lead-Alloy Coated Soft Copper Wire for Electrical Purposes

ASSOCIATION OF EDISON ILLUMINATING COMPANIES (AEIC)

- AEIC CS1 1968 Impregnated Paper Insulated. Lead Covered Cable, Solid Type, Tenth Edition
- AEIC CS6 1987 Specifications for Ethylene, Propylene, Rubber Insulated Shielded Power Cables Rated 5-69KV

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC. (IEEE)

- IEEE 48 1990 High-Voltage Alternating Current Cable Terminations
- IEEE 404 1986 Cable Joints for Use with Extruded Dielectric Cable Rated 5000 V Through 46000 V and Cable Joints for Use with Laminated Dielectric Cable Rated 2500 V Through 500,000 V

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

- NEMA TC 2 1983 Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)
- NEMA TC 9 1990 Fittings for ABS and PVC Plastic Utilities Duct for Underground Installation

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- NFPA 70 1990 National Electrical Code

UNDERWRITERS LABORATORIES INC. (UL)

- UL 6 1981 (R 1989) Rigid Metal Conduit, Ninth Edition
- UL 83 1983 (R 1989) (Bul. 1990) Thermoplastic-Insulated Wires and Cables, Ninth Edition
- UL 486A 1980 (R 1989) Wire Connectors and Soldering Lugs for Use with Copper Conductors, Seventh Edition
- UL 510 1986 (R 1986) Insulating Tape, Sixth Edition
- UL 514A 1983 (R 1990) Metallic Outlet Boxes, Seventh Edition
- UL 514B 1989 (R 1990) Fittings for Conduit and Outlet Boxes, Second Edition

INSULATED CABLE ENGINEERS ASSOCIATION

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ICEA S-19-81 1980 (R1986), Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy, Sixth Edition

ICEA S-66-524 1988, Cross-Linked Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

ICEA S-68-516 1988, Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

1.3 Reserved

1.4 Definitions

In the text of this section, the words conduit and duct are used interchangeably and have the same meaning.

1.5 Deliverables

The Contractor shall submit to the COTR the following for items furnished:

1.5.1 Manufacturer's Catalog Data

a. Medium voltage SHD-GC cable

1.5.2 Drawings

a. Medium voltage SHD-GC cable

1.5.3 Reserved

1.5.4 Statements

a. Cable terminator

(1) Thirty (30) days before making terminations on the individual lengths of cable, submit to the COTR the names of the cable terminators to be employed, together with proof of has at least three (3) years experience in terminating the type and rating of cables specified. Submit certification to the COTR for each terminator by the cable joint kit manufacturer, in the use of manufacturer's kits.

(2) Certificate of Competency for Cable Splicer/Terminator

Certification of the qualification of the cable splicer/terminator shall be submitted, for approval, 30 days before splices or terminations are to be made in medium voltage (5kV to 35kV) cables. The certification shall include the training, and experience of the individual on the specific type and classification of cable to be provided under this contract. The certification shall indicate that the individual has had three or more years recent experience splicing and terminating medium voltage cables. The certification shall also list a minimum of three (3) splices/terminations that have been in operation for more than one (1) year. In addition, the individual may be required to perform a dummy or practice splice/termination in the presence of the COTR, before being approved as a qualified cable splicer. If that additional requirement is imposed, the Contractor shall provide short sections of the approved types of cables along with the approved type of splice/termination kit, and detailed manufacturer's instructions for the cable to be spliced. The COTR reserves the right to require additional proof of competency or to reject the individual and call for certification of an alternate cable splicer.

b. Cable Connectors (terminations)

Cable connectors shall be rated for 500 amperes, 15 kilovolts, three phase. Connectors shall have electrical characteristics as follows:

a. Minimum phase to ground voltage of 8 kilovolts

- b. One (1) minute dry withstand AC rating of 45.0 kilovolts RMS
- c. Six (6) hour dry withstand AC rating of 35.0 kilovolts RMS
- d. 15 minute dry withstand AC rating of 75.0 kilovolts AVG.
- e. Corona extinction level of 11.0 kilovolts RMS
- f. Basic Impulse Level of 95 kilovolt crest.

The connector shall have three (3) power pole, one (1) ground check circuit contact, and 2 amphenol connectors (non-screw type) for two (2) twisted pair data cables. The connector shall be supplied with an interlocking cover capable of maintaining proper resistance continuity for the ground check wire and ground check monitor. The connector shall be water tight for installation on board ship decks. Provide connectors in pairs of male and female connectors.

1.5.4.1 Manufacturer's Test

Submit the manufacturers' test reports for cables as follows:

NOTE THAT ALL MANUFACTURER'S TESTS ON CABLES MUST BE SUBMITTED AND APPROVED PRIOR TO DELIVERY TO THE SITE OF THE CABLE.

1.5.4.1.1 Medium Voltage SHD-GC Cable

- a. The tolerance for outside diameters shall be plus 8% and minus 5%.
- b. Physical and aging tests on insulation and jacket shall be performed on samples of the insulation and jacket from the completed cable. Testing shall be in accordance with Part 6 of ICEA Publication No. S-19-81, NEMA Publication No. WC-3 and shall comply with the requirements outlined in this specification and the appropriate ICEA Publications.
- c. Each length of cable shall be subject to the AC and DC tests as follows: a five (5) minute AC withstand test with 27 KV shall be accomplished on the power conductors. A 15 minute DC withstand test with 70 KV shall be accomplished on the power conductors. The ground check conductor shall be tested at 3.0 KV for one (1) minute.
- d. Insulation resistance shall be measured and reported in megaohms per 1000 ft. The SIR, corrected to 60 degrees Fahrenheit, shall not be less than 30,000.
- e. The ground check conductor shall have a copper resistance test.
- f. Samples from the completed cable shall be tested in accordance with ICEA specifications. Aging requirements shall be after Air Oven Test for 168 hours at 150 degrees Celsius. Water immersion tests shall be after 24 hours water immersion at 90 degrees and after 26 weeks water immersion at 90 degrees Celsius. The insulation shall meet the following values:

1.	Tensile strength (unaged)	1100 psi, minimum at room temperature
2.	Elongation (unaged)	250% minimum at room temperature
3.	200% modulus (unaged)	800 psi, minimum at room temperature
4.	100% hot modulus (unaged)	200 psi at 130 degrees Celsius
5.	Tensile Strength (aged)	90% of unaged, minimum
6.	Elongation (aged)	85% of unaged, minimum
7.	Ozone Resistance (after 24 hours)	No cracks at 0.025 to 0.030%
8.	SIC at 80 V/mil	Maximum 3.0 (at 15.6 degrees Celsius)
9.	Power Factor at 80 V/mil,	Maximum 1.0% (at 15.6 degrees Celsius)
10.	Insulation Resistance	50,000 minimum constant (K) (15.6 degrees Celsius)
11.	SIC at 80 V/mil	3.0 maximum (24 hours water immersion)
12.	% Power Factor at 80 V/mil	1.5 maximum (24 hours water immersion)

- | | | |
|-----|-------------------------------------|---|
| 13. | SIC at 80 V/mil | 3.1 maximum (26 weeks water immersion) |
| 14. | % Power Factor at 80 V/mil | 1.5 maximum (26 weeks water immersion) |
| 15. | Stability Factor (PF at 80-40V/mil) | 0.2 max (26 weeks water immersion) |
| 16. | Water absorption | (7 days at 70 deg C) 5.0 mg/sq.in. max. |

g. Samples from the completed cable shall be tested in accordance with ICEA S-68-516, as noted below. Aging requirements shall be after Air Oven Test for 168 hours at 121 degrees Celsius and after Air Oven Test for 168 hours at 100 degrees Celsius. Oil immersion tests shall be after 18 hours in ASTM #2 oil at 121 degrees Celsius. The cable jacket shall meet the following values:

- | | | |
|-----|--|--|
| 1. | Tensile Strength | 1800 psi minimum |
| 2. | Tensile Stress at 200% elongation | 500 psi minimum |
| 3. | Elongation at rupture | 300 psi minimum |
| 4. | Set | 30% maximum |
| 5. | Tensile Strength (aged @121 deg C) | 85% minimum of unaged value |
| 6. | Elongation(aged @121 deg C) | 50% minimum of unaged value |
| 7. | Tensile Strength (aged @100 deg C) | 85% minimum of unaged value |
| 8. | Elongation(aged @100 deg C) | 65% minimum of unaged value |
| 9. | Tensile Strength (oil immersion) | 60% minimum of unaged value |
| 10. | Elongation (oil immersion) | 60% minimum of unaged value |
| 11. | Cold bend after 24 hours @ | No Cracks minus 25 deg C |
| 12. | Specific resistivity | 20,000 megaohms minimum |
| 13. | Ozone resistance after 24 hours exposure, 0.015% concentration | No Cracks |
| 14. | ICEA Vertical Flame Test (Sec. 6.19.6, Weight Deleted) | Must Pass |
| 15. | IEEE Std. 383-1974 Vertical Tray Flame Test, Completed Cable-Gas Burner Source | No propagation |
| 16. | Mechanical Water Absorption | After 20 mg/sq.in. maximum
7 days at 70 degrees |
| 17. | Oxygen Index | 30% maximum |
| 18. | Smoke Generation (specimen thickness 50 mils) | |
| | Ds-Flame Min. 275, | Non-Flaming Uncorr. max 275, |
| | Dm-Flaming 300, | Non-flaming corr. max. 300 |
| 19. | Smoke Generation (specimen thickness 100 mils) | |
| | Ds-Flame Min. 325, | Non-Flaming Uncorr. max 325, |
| | Dm-Flaming 375, | Non-flaming corr. max. 475 |

1.5.5 Reserved.

1.5.6 Certificates

- a. Medium voltage cable, submarine and SHD-GC

Part 2 - Products

2.1 Materials and Equipment

2.1.1 Power Wire and Cable

2.1.4.1 Wire and Cable Conductor Sizes

Conductor and conduit sizes indicated are for copper conductors unless otherwise noted. WIRES AND CALBES MANUFACTURED MORE THAN 12 MONTHS PRIOR TO DATE DELIVERED TO THE JRRF SHALL NOT BE USED.

- a. Conductors: All conductors shall be copper.

2.1.2 Medium Voltage Cable

2.1.2 Medium Voltage SHD-GC Cable

SHD-GC cable shall be rated for 15 KV at an insulation level of 100%. The cable assembly shall consist of three (3) flexible (rope strand) copper conductors each covered by semiconducting screen, ethylene-propylene conductor insulation, and a coated copper braid shield. The three conductors shall be assembled into a single cable assembly utilizing two (2) coated copper ground wires and an insulated ground check conductor. The assembly shall have an overall mold-cured, nylon reinforced, polyethylene jacket. The jacket shall have an overall color of orange. The cable shall meet the standards of the Mine Safety and Health Act administered by the U.S. Department of Labor and the Pennsylvania Department of Environmental Resources. Provide two twisted, shielded pairs of # 18 AWG communications wires within the submarine cable for future power monitoring. The cable shall be manufactured in accordance with ICEA Publication No. S-68-516, NEMA Publication No. WC-8 with the exception that this specification's requirements shall govern when in conflict. References shall be made to ICEA Publication S-19-81 (Fifth Edition), NEMA Publication WC-3, ICEA Publication No. S-66-524 and NEMA Publication No. WC-7. The cable shall be further assembled as follows:

a. The power conductors ground wires and ground check conductor shall be soft annealed coated copper wire stranded in accordance with ICEA S-68-516 and WC-8. The tensile, electrical, and coating properties shall comply with ASTM Specification B-33 or B-189 latest revision.

b. An extruded layer of semiconducting EPR compound with a volume resistivity not in excess of 1000 ohm meters shall be applied over the conductor. The compound shall have a minimum elongation after an air oven test at 121 degrees Celsius for 168 hours at 100% and a brittleness temperature not warmer than -50 degrees Celsius. The screen shall be clean striping from the conductor and inseparably bonded to the overlying insulation. The thickness of the extruded conductor screen shall be a minimum of 12 mils point and a minimum of 15 mils average.

c. Insulation shall be EPR, a red colored propylene elastomer. The ethylene content used in the insulation compound shall not exceed 72% by weight of the ethylene nor shall the insulation contain any polyethylene to eliminate crystalline materials. The insulation shall be formulated by the cable manufacturer in his own facility using a closed system to ensure maximum cleanness. Accurate individual control and measurement of the wall thickness of each layer of compound shall be maintained while the cable is being manufactured.

d. The wall thickness of the insulation shall be in accordance with ICEA Publication S-68-516 and shall be 0.220 inches. The minimum average wall thickness at any cross section shall not be less than 90% of the specified minimum average.

e. Over each insulated power conductor, one conducting non-metallic color legend tape shall be applied. over the conducting tape shall be a minimum # 30 AWG coated copper braid 84% minimum coverage. Braid shielding shall be in accordance with ICEA Publication No. S-68-516.

f. Two (2) ground wires of flexible coated copper in accordance with ASTM B-189 or B-33 shall have a circular mil area of both ground wires equal or greater than 50% of one power conductor as shown in ICEA /S-68-516.

g. One (1) #8 AWG ground check wire coated copper with polypropylene insulation shall be in accordance with ICEA S-68-516.

h. Two (2) shielded twisted pair cables shall each consist of two (2) 18 AWG (minimum) conductors with a maximum two (2) inch lay per twist. Each shielded twisted pair cable shall have 600 volt insulation, an overall foil or braided shield and a drain wire for the shield.

i. The shielded insulated power cable shall be cabled LH lay with rubber filler in center to minimize water from migrating along the cable. One (1) ground wire shall be placed in each of two (2) interstices, each in contact with the shielding braid. The one (1) yellow insulated ground check conductor shall be placed in the remaining interstice. Integral fill or rubber fillers shall be used to make the core substantially round. A marker shall be laid parallel to the core with the entire assembly covered by a rubber binder tape.

j. Over the cable assembly shall be an extra heavy duty reinforced orange chlorosulfonated polyethylene jacket, all jacket thicknesses shall meet the requirements of ICEA Publication No. S-68-516. The jacket shall be embossed with the name of the manufacturer, AWG size, voltage rating, and year of manufacture at two (2) foot intervals.

2.1.3 QUALITY CONTROL

a. As an exception to requirements that may be stated elsewhere in the contract, notify the COTR five (5) working days prior to each test.

b. Medium Voltage Cables

After installation, and before placing in service, perform a dc High Potential Test on cables rated above 600 volts. Medium voltage cable tests shall be performed after installation in accordance with the requirements of the appropriate "Voltage Tests After Installation" paragraphs in the particular ICEA specification for the cable involved. Adhere to precautions and limits as specified in the applicable standards. Current sensing circuits in test equipment shall measure only the leakage current associated with the cable under test, and shall not include internal leakage current of the test equipment. Perform the following test procedures and record the results for each cable test.

Record temperature and relative humidity. Do not perform tests unless weather is clear and relative humidity is below 70 percent.

Test each conductor individually with other conductors grounded. Shields shall be grounded.

Terminations shall be properly corona suppressed by guard ring, field reduction sphere, or other suitable methods.

Perform insulation resistance and continuity test prior to hi-pot test.

Apply a dc hi-pot in at least five equal increments until maximum test voltage is reached. Record a dc leakage current at each step after a constant stabilization time consistent with system charging current decay. One hundred percent voltage shall be reached in a maximum of 60 seconds.

Separable insulated connectors shall be plugged into insulated bushings.

Raise the test conductor to a maximum test voltage and hold for a total of 15 minutes. Readings of leakage current shall be recorded each minute.

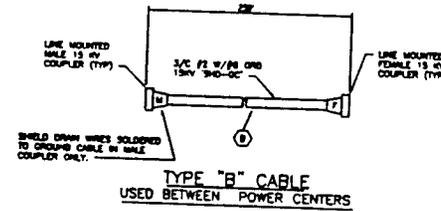
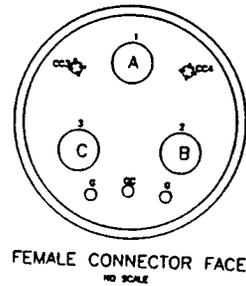
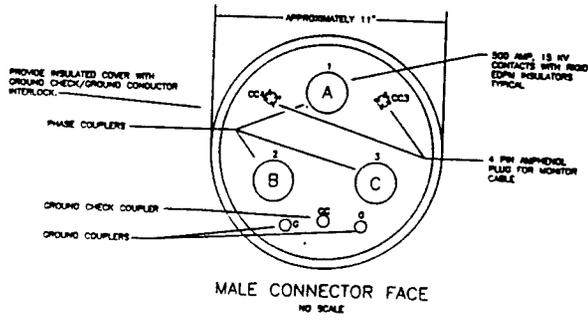
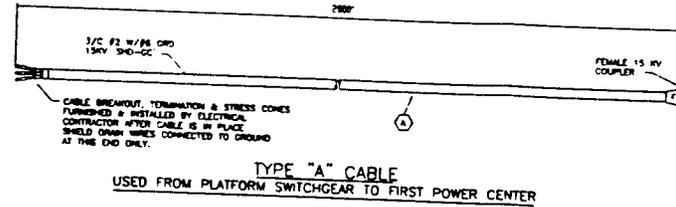
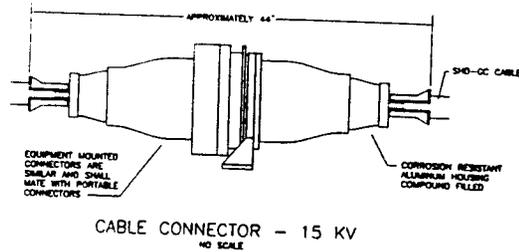
Reduce the conductor test potential to zero and apply the grounds for at least 10 minutes.

The dc test voltage shall be 53 KV.

Furnish the COTR with three (3) copies of test results.

DELIVERABLES

SECTION	SECTION DESCRIPTION			
PART	PART TITLE	DELIVER TO:	FREQUENCY	
16011	ELECTRICAL GENERAL REQUIREMENTS			
1.5.1	Catalog Data	COTR	Prior to Installation	
1.5.2	Drawings	COTR	Prior to Installation	
1.5.3	Certificates	COTR	Prior to Final Acceptance	
1.5.4	Manuals	COTR	Prior to Final Acceptance	



WHEN INSTALLING TWISTED PAIR CABLES TO AMPHENOL CONNECTORS THE PAIRS MUST BE CONNECTED IN THE SAME CONFIGURATION AS THE ORIGINAL CABLES. FIELD CHECK WITH A CONTINUITY TEST ON AN EXISTING CABLE & DE-ENERGIZED POWER CENTER (TWISTED PAIRS ARE COILED FOR FUTURE USE).

NOTE - MALE AND FEMALE COUPLERS SHALL BE IDENTICAL WITH EXISTING COUPLERS.

CONNECTORS ARE MANUFACTURED BY AOALET-PLM

LINE MOUNT CONNECTORS
MALE: 02PL15ABR // SPECIAL AMPHENOL CONNECTOR
FEMALE: 02PL15ABDR // SPECIAL AMPHENOL CONNECTOR

GEAR MOUNT CONNECTORS
MALE: 02PG15ABR // SPECIAL AMPHENOL CONNECTOR
FEMALE: 02PG15ABDR // SPECIAL AMPHENOL CONNECTOR

CABLE TYPE	CONSTRUCTION	USE	SOURCE END	LOAD END	LENGTH PER CABLE	QUANTITY
Ⓐ	3/4 #2 W/B GRD 15KV SHO-OC	WIGWAG CIRCUIT INTERRUPTER TO TRANSFORMER	STRESS CONED TERMINALS	FEMALE 15 KV COUPLER	2000 FT.	ONE
Ⓑ	3/4 #2 W/B GRD 15KV SHO-OC	BETWEEN TRANSFORMERS	MALE 15 KV COUPLER	FEMALE 15 KV COUPLER	200 FT.	FORTY
					TOTAL CABLE REQUIRED	12,000 FT.

FOR APPROVAL
QUAL-TECH ENGINEERS

<p>QUAL-TECH ENGINEERS Inc 1720 873 9273</p>		<p>DEPARTMENT OF TRANSPORTATION MARITIME ADMINISTRATION LINES RIVER RESERVE FLEET PORT CHARLES VIRGINIA TRANSFORMER PRIMARY CONNECTOR CABLES & CONNECTORS</p>	
<p>REVISIONS</p>	<p>1 FOR APPROVAL</p>	<p>DATE</p>	<p>BY</p>
<p>SCALE</p>	<p>DATE</p>	<p>BY</p>	<p>DATE</p>