# SECTION 26 05 13
# MEDIUM-VOLTAGE CABLES

## PART 1 - GENERAL

### 1.1 DESCRIPTION

A. This section specifies the furnishing, installation and connection of the high voltage cables.

### 1.2 RELATED WORK

A. Bedding of conduits: Section 31 20 00, EARTH MOVING.

B. General electrical requirement and items that are common to more than one section of Division 26: Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

C. Conduits for high voltage cables: Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS.

D. Requirements for personnel safety and to provide a low impedance path for possible ground fault currents: Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.

### 1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES and Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

B. Shop Drawings:

1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.
2. Include splice and termination kit information prior to purchase and installation.
3. Provide cable minimum bend radius, and flammability data.

C. Samples:

1. After approval and prior to installation, furnish the COR with a 300 mm (12 inches) length of each type and size of wire and cable along with the tag from the coils or reels from which the samples were taken. The sample shall contain the manufacturer’s markings.

D. Certifications:

1. Factory test reports: Prior to installation of the cables, deliver four copies of the manufacturers certified NEMA WC 71 or WC 74, standard factory test reports to the COR. Certified copies of test

data shall show conformance with the referenced standards and shall be approved prior to delivery of cable.

2. Field Test Reports: Test Reports on the following shall be in accordance with the paragraph entitled “Field Tests for High Voltage Cables” and include the following tests:
   a. High Potential Tests
   b. Dielectric Absorption Tests
   c. Radiographic Tests

   After testing, submit four certified copies of each of the graphs specified under field testing, to the COR. Adequate information shall be included identifying the cable locations, types, voltage rating and sizes.
3. Splices and terminations, after having been installed and tested, deliver four copies of a certificate by the Contractor to the COR which includes the following:
   a. A statement that the materials, detail drawings and printed instructions used, are those contained in the kits approved for this contract.
   b. A statement that each splice and each termination was completely installed without any overnight interruption.
   c. A statement that field made splices and terminations conform to the following requirements:
      1) Pencil the cable insulation precisely.
      2) Connector installations:
         a) Use tools that are designed for the connectors being installed.
         b) Round and smooth the installed connectors to minimize localized voltage stressing of the insulating materials.
      3) Remove contaminants from all surfaces within the splices and terminations before installing the insulating materials.
      4) Solder block throughout stranded grounding wires that will penetrate the splicing and terminating materials.
      5) Use mirrors to observe the installation of materials on the backsides of the splices and terminations.
      6) Eliminate air voids throughout the splices and terminations.
      7) Stretch each layer of tape properly during installation.

d. List all of the materials purchased and installed for the splices and terminations for this contract including the material descriptions, manufacturer's names, catalog numbers and total quantities.

E. Power Company Approval: Prior to construction, obtain written approval from the power company that will supply electrical service for the following items:

1. Service entrance cables. Obtain the power company’s written approval on the submittal papers for the cables before submitting them for VA approval.
2. Employees who will splice and terminate the service entrance cables.

F. Installer Approval:

1. Employees who install the splices and terminations and test the cables shall have not less than five years of experience splicing and terminating cables which are equal to those being spliced and terminated, including experience with the materials in the kits.
2. Furnish satisfactory proof of such experience for each employee who splices or terminates the cables.

G. Cable Voltage Ratings

1. Medium voltage power cables shall include multiple and single-conductor cable rated as follows:
   a) 5000 Volts shall be used on 4160 3-phase 60hz distribution systems.
   b) 15000 volts shall be used on 12,470, 13,200 and 13,800V 3 phase 60hz distribution systems.

H. Shipment:

1. Cable shall be shipped on reels such that cable will be protected from mechanical injury. Each end of each length of cable shall be hermetically sealed and securely attached to the reel.

**1.4 APPLICABLE PUBLICATIONS**

A. Publications listed below (including amendments, addenda, revisions, supplements and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by the designation only:

1. American Society for Testing and Materials (ASTM):

B3-2001.....Standard Specification for Soft or Annealed Copper Wire

B. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
386-95 (R2001).....Separable Insulated Connector Systems for Power Distribution Systems above 600 V
400.2-2005.....Guide for Field Testing of Shielded Power Cable Systems
404-2000.....Extruded and Laminated Dielectric Shielded Cable Joints Rated 2500-500,000 Volts

C. National Electrical Manufacturers Association (NEMA):
WC 71-1999.....Standard for Non-Shielded Cables Rated 2001-5000 Volts for Use in the Distribution of Electrical Energy (ICEA S-96-659)
WC 74-2000.....5-46 KV Shielded Power Cable for Use in the Transmission and Distribution of Electrical Energy (ICEA S-93-969)

D. National Fire Protection Association (NFPA):
70-2005.....National Electrical Code (NEC)

E. Underwriters Laboratories (UL):
1072-2006 ..... Medium-Voltage Power Cables

**PART 2- PRODUCTS**

**2.1 MATERIAL HIGH VOLTAGE CABLE**

A. High voltage cable shall be in accordance with the NEC and NEMA WC71, WC74 and UL 1072.

B. Shall be single conductor stranded copper conforming to ASTM B3.

C. Insulation:
1. Insulation level shall be 133 percent.
2. Types of insulation:
a. Cable type abbreviation, EPR: Ethylene propylene rubber insulation shall be thermosetting, light and heat stabilized.
b. Cable type abbreviation, CCLP: Polyethylene insulation shall be thermosetting, light and heat stabilized, chemically crosslinked.
c. In wet locations, anti-tree CCLP or EPR shall be used.
d. Cable type abbreviation, XLPE cross-linked polyethylene insulated shielded shall be thermosetting, light and heat stabilized chemically cross-linked.

D. Conductors and insulation shall be wrapped separately with semiconducting tape.

E. Insulation shall be wrapped with non-magnetic, metallic shielding except for cables for series type lighting systems.
F. Heavy duty, overall protective jackets of chlorosulphonated polyethylene, neoprene or polyvinyl chloride shall enclose every cable.
G. Cable temperature ratings for continuous operation, emergency overload operation and short circuit operation shall be not less than the NEC, NEMA WC71 or NEMA WC74 Standard for the respective cable.
H. Manufacturer's name and other pertinent information shall be marked or molded clearly on the overall outside surface of the jackets, or incorporated on marker tapes within the cables at reasonable intervals.

**2.2 MATERIAL, SPLICES AND TERMINATIONS**

A. The materials shall be compatible with the conductors, insulations and protective jackets on the cables and wires.
B. The splices shall insulate and protect the conductors not less than the insulation and protective jackets on the cables and wires that protect the conductors. In locations where moisture might be present, the splices shall be watertight. In manholes and handholes the splices shall be submersible.
C. Splicing and Terminating Fittings: Shall be in accordance with IEEE 386, 404.
   1. Shall be heavy duty, pressure type fittings, which will assure satisfactory performance of the connections under conditions of temperature cycling and magnetic forces from available short circuit currents.
   2. The fittings shall be suitably designed and the proper size for the cables and wires being spliced and terminated. Terminations to bus shall be with two hole lugs.
   3. Where the Government determines that unsatisfactory fittings have been installed, contractor shall replace the unsatisfactory installations with approved fittings at no additional cost to the Government.
D. Splicing and Terminating Kits:
   1. General:
      a. Shall be assembled by the manufacturer or supplier of the materials and shall be packaged for individual splices and terminations or for groups of splices and terminations.

b. Shall consist of materials designed for the cables being spliced and terminated and shall be suitable for the prevailing environmental conditions.
c. Shall include detail drawings and printed instructions for each type of splice and termination being installed, as prepared by the manufacturers of the materials in the kits.
d. Detail drawings, and printed instructions shall indicate the cable type, voltage rating, manufacturer's name and catalog numbers for the materials indicated.
e. Voltage ratings for the splices and terminations shall be not less than the voltage ratings for the cables on which they are being installed.
f. Shall include shielding and stress cone materials.

2. Taped splices and terminations with insulating and semi-conducting rubber tapes shall withstand 200 percent elongation without cracking, rupturing or reducing their electric and self-bonding characteristics by more than 5 percent.
3. Epoxy resin kits shall be as follows:
   a. Compatible with the cable insulations and jackets and make the splices watertight and submersible.
   b. Thermosetting and generate its own heat so that external fire or heat will not be required.
   c. Set solid and cure in approximately 60 minutes in 21 degree C (70 degree F) ambient temperature.
   d. Not deteriorate when subjected to oil, water, gases, salt water, sewage and fungus.
   e. Furnished in pre-measured quantities, sized for each splice and each termination, with two resin components in an easy mixing plastic bag which will permit mixing the resin without entrapping air or contaminants. Other methods of packaging and mixing the epoxy resin components will be considered for approval, provided they include adequate safeguards to assure precise proportioning of the resin components and to prevent entrapping air and contaminants.
   f. Use snap-together, longitudinally-split, interlocking seam, transplant mold bodies or taped frameworks, injection fittings

and injection gun or pouring equipment. Completely fill voids within the splices and terminations.

E. Pre-molded Rubber Splices and Terminations:

1. Splices and terminations shall be in accordance with IEEE 386, and 404.
2. Pre-molded rubber devices shall have a minimum of 3 mm (0.125 inch) semi-conductive shield material covering the entire housing. Test each rubber part prior to shipment from the factory.
3. Grounding of metallic shields shall be accomplished by a solderless connector enclosed in a watertight rubber housing covering the entire assembly. The grounding device and splice or terminator shall be of same manufacturer to insure electrical integrity of the shielded parts.
4. The pre-molded parts shall be suitable for indoor, outdoor, submersible, or direct-burial applications.

**2.3 MATERIAL, FIREPROOFING TAPE**

A. The tape shall consist of a flexible, conformable fabric of organic composition coated one side with flame-retardant elastomer.

B. The tape shall be self-extinguishing and shall not support combustion. It shall be arc proof and fireproof.

C. The tape shall not deteriorate when subjected to water, gases, salt water, sewage, or fungus. It shall be resistant to sunlight and ultraviolet light.

D. The finished application shall withstand a 200 ampere arc for not less than 30 seconds.

E. Securing tape: Shall be glass cloth electrical tape not less than 0.18 mm (7 mils) thick, and 19 mm (3/4 inch) wide.

**2.4 MATERIAL, WARNING TAPE**

A. The tape shall be standard, 76 mm (3 inch) wide, 4-Mil polyethylene detectable type with aluminum backing.

B. The tape shall be red with black letters indicating “CAUTION BURIED ELECTRIC LINE BELOW”.

**PART 3 - EXECUTION**

**3.1 INSTALLATION, HIGH VOLTAGE CABLE**

A. Installation shall be in accordance with the NEC, and as shown on the drawings.

B. Contractor shall ensure that radii of bends fittings, cable risers, and other conditions are suitable for the cable and conform with the recommendations of the cable manufacturer.

C. Cable shall be installed in underground duct banks, in conduit above and below grade; inside buildings, on insulator hooks; on racks in wall and ceiling mounted cable trays in utility tunnels and manholes; and by direct burial.

D. Cables shall be secured with heavy duty cable ties in existing or new trays mounted horizontally, where cable rests on tray bottom.

E. Cables shall be secured with PVC coated metallic non-metallic cable clamps, straps, hangers, or other approved supporting devices to tunnel walls, ceilings, and in new or existing cable trays mounted vertically, where tray bottom is in a vertical plane.

F. Contractor shall ensure that all cable tray is properly secured and supported prior to installing new armored cable. Contractor shall add new permanent and/or temporary tray support devices as required to preclude cable tray failure during cable pulling or after cable is installed.

G. Cable or conductors of a primary distribution system shall be rejected when installed openly in cable trays or openly racked along interior walls; in the same raceway or conduit with AC/DC control circuits or ac power circuits operating at less than 600 volts; or in a manner allowing cable to support its own weight.

H. Use suitable lubricating compounds on the cables and wires to prevent damage to them during pulling-in. Provide compounds that are not injurious to the cable and wire jackets and do not harden or become adhesive.

I. Splice the cables and wires only in manholes and accessible junction boxes. Ground shields in accordance with Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.

J. In manholes, trenches and vaults install the cables on suitable porcelain insulators with steel cables racks. Ground cable racks in accordance with Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.

K. In manholes, underground raceways and other outdoors locations:

1. Seal the cable ends prior to pulling them in to prevent the entry of moisture.

2. For ethylene propylene rubber and polyethylene insulated cables, use bags of epoxy resin that are not less than 6 mm (1/4 inch) larger in diameter than the overall diameter of the cable. Clean each end of each cable before installing the epoxy resin over it.

**3.2 PROTECTION DURING SPLICING OPERATIONS**

A. Blowers shall be provided to force fresh air into manholes or confined areas where free movement or circulation of air is obstructed. Waterproof protective coverings shall be available on the work site to provide protection against moisture while a splice is being made. Pumps shall be used to keep manholes dry during splicing operations. Under no conditions shall a splice or termination be made with the interior of a cable exposed to moisture. Conductor insulation paper shall be moisture-tested before the splice is made. A manhole ring at least 150 mm (6 inches) above ground shall be used around the manhole entrance to keep surface water from entering the manhole. Unused ducts shall be plugged and water seepage through ducts in use shall be stopped before the splice is started.

**3.3 PULLING CABLES IN DUCTS, MANHOLES AND UTILITY TUNNELS**

A. Medium-voltage cables shall be pulled into ducts and utility tunnels with equipment designed for this purpose, including power-driven winch, cable-feeding flexible tube guide, cable grips, and lubricants. A sufficient number of trained personnel and equipment shall be employed to ensure the careful and proper installation of the cable.

B. Cable reel shall be set up at the side of the manhole or tunnel hatch opening and above the duct or hatch level, allowing the cable to enter through the opening without reverse bending. Flexible tube guide shall be installed through the opening in a manner that will prevent the cable from rubbing on the edges of any structural member.

C. Pulling force for a cable grip on lead-sheathed cable shall not exceed manufacturer’s recommendation. A dynamometer shall be used in the pulling line to ensure that the pulling force is not exceeded. Pulling force for a nonmetallic-sheathed cable shall not exceed the smaller of 4400 Newton (1,000 pounds) or a value computed from the following equation:

TM = 0.008 X N X CM

Where: TM = maximum allowable pulling tension in Newton pounds

N = number of conductors in the cable
CM = cross-sectional area of each conductor in square millimeter circular mils.

D. Cable shall be unreeled from the top of the reel. Payout shall be carefully controlled. Cable to be pulled shall be attached through a swivel to the main pulling wire by means of a pulling eye with suitable cable grip permitted only on cables less than 60 mm (200-feet) long and less than 50 mm (2 inches) in diameter.

E. Woven-wire cable grips shall be used to grip the cable end when pulling small cables and short straight lengths of heavier cables.

F. Pulling eyes shall be attached to the cable conductors to prevent damage to the cable structure.

G. Pulling eyes and cable grips shall be used together for nonmetallic sheathed cables to prevent damage to the cable structure.

H. Cables shall be liberally coated with a suitable cable-pulling lubricant as it enters the tube guide or duct. Grease and oil lubricants shall be used only on lead-sheathed cables. Nonmetallic sheathed cables shall be covered with wire-pulling compounds when required which have no deleterious effects on the cable. Rollers, sheaves, or tube guides around which the cable is pulled shall conform to the minimum bending radius of the cable.

I. Cables shall be pulled into ducts at a reasonable speed not in excess of maximum permissible pulling tension specified by the cable manufacturer. Cable pulling using a vehicle shall not be permitted. Pulling operations shall be stopped immediately with any indication of binding or obstruction and shall not be resumed until such difficulty is corrected. Sufficient slack shall be provided for free movement of cable due to expansion or contraction.

J. Cable splices made up in manholes or utility tunnels shall be firmly supported on cable racks as indicated. No cable splices shall be pulled in ducts. Cable ends shall overlap at the ends of a section to provide sufficient undamaged cable for splicing. Cables to be spliced in manholes or utility tunnels shall overlap the centerline of the proposed joint by not less than 600 mm (2 feet).

K. Cables cut in the field shall have the cut ends immediately sealed to prevent entrance of moisture. Nonleaded cables shall be sealed with rubber tape wrapped down to 75 mm (3 inches) from the cable end.

Rubber tape shall be cover-wrapped with polyvinylchloride tape. Lead-Covered cables shall be sealed with wiping metal making a firm bond with the end of the sheath or with a disk of lead fitted over the end and wiped to the sheath.

**3.4 INSTALLATION, SPLICES AND TERMINATIONS**

A. Install the materials as recommended by their manufacturer including special precautions pertaining to air temperature during installation.

B. Cross-Linked Polyethylene (XLPE), Ethylene Propylene Rubber and Polyethylene Insulated Cables:

1. Cables rated 5000 volts or less: Install epoxy resin splices and terminations, or pre-molded rubber splices and terminations.
2. Cables rated more than 5000 volts: Install taped splices and terminations, or pre-molded rubber splices and terminations.

C. Installation shall be accomplished by qualified personnel trained to accomplish high voltage equipment installations. All instructions of the manufacturer shall be followed in detail.

D. Splices shall be made in manholes or tunnels except where cable terminations are specifically indicated. Splicing and terminating of cables shall be expedited to minimize exposure and cable deterioration.

E. Cables shall be terminated in potheads. Dry terminations with medium voltage pennants, preformed, and hand wrapped stress cones may be used for terminating cables. Potheads shall be provided with adequate means for making external connections to the cable conductors of single or multiple conductor cables; protecting the cable insulation against moisture, oil, or other contaminant; physically protecting and supporting cables, and maintaining the insulation level of the cable.

F. Pothead terminations shall be field fabricated from termination kits supplied by and in accordance with the pothead manufacturer’s recommendations for the type, size, and electrical characteristics of the cable.

G. Installation shall include built-up or prefabricated heat or cold shrink stress-relief cones at the terminals of all shielded cables and at the terminals of single-conductor lead-covered cables rated 15 kV and above, ungrounded.

H. Cable splices shall be field fabricated from splicing kits supplied by and in accordance with cable manufacturer’s recommendations for the

type, size, and electrical characteristics of the cable specified. Cable splices in manholes shall be located midway between cable racks on walls of manholes and supported with cable arms at approximately the same elevation as the enclosing duct.

I. Cable splices in the tunnel that are not installed in cable trays shall be installed on cable racks or by other approved methods that will minimize physical stress on the splice connections. Splices shall be supported at approximately the same elevation as the installed cable except where space limitations or existing cable length limitations make this method impractical or impossible.

J. Universal demountable splices shall be supported in such manner so as to minimize physical stress on the splice connections. Each cable end termination shall be supported using a pair of saddle type supports under the cable end termination and/or cable with a minimum 300 mm (12 inches) and a maximum 750 mm (30 inches) separation between the supports. Cable end termination and cable shall be secured to the supports in such a manner as to prevent movement of termination or cable at the support. Saddle type supports shall be installed on galvanized steel framing channel anchored to the wall or securely fastened to the cable tray or installed by other approved methods.

**3.5 SINGLE-CONDUCTOR POTHEADS**

A. Single-conductor potheads shall be the hermetically sealed cap-nut type and shall be suitable for the type, size, and electrical characteristics of the cable specified. Potheads shall consist of cast bodies, bushings, cable connectors, lugs, and entrance fittings.

B. Pothead bodies shall be metal castings with mounting brackets, when required, pipe plugs for filling and vent holes, and machined flanged surface for cable-entrance fitting. Bodies shall be cast iron for cables up to 130 $mm^2$ (250 kc mils) 250 amperes, and cast aluminum bronze nonmagnetic metal casting for cable of larger size and higher current ratings.

C. Bushings shall be glazed wet-process electrical porcelain insulators, factory assembled and hermetically sealed to the pothead body.

D. Cable connectors shall be high-conductivity copper accurately machined and threaded for internal and external electrical connections. Cross-sectional and contract areas shall be adequate to carry the full-load current rating of the conductors. Cable connectors shall be solder type

with gasket seal between the connector and bushing.

E. Potheads shall be completely filled, leaving no gaps or voids, with an insulating compound suitable for the type of cable, insulation, voltage rating, and ambient operating temperatures in accordance with the pothead manufacturer’s recommendations. Pothead parts that do not carry current shall be grounded.

**3.6 INSTALLATION, FIREPROOFING**

A. Cover all power cables located in manholes, handholes and junction boxes with arc proof and fireproof tape.

B. Apply the tape in a single layer, one-half lapped or as recommended by the manufacturer. Install the tape with the coated side towards the cable and extend it not less than 25 mm (one inch) into each duct.

C. Secure the tape in place by a random wrap of glass cloth tape.

**3.7 FEEDER IDENTIFICATION**

A. In each manhole and pullbox install permanent tags on each circuit's cables and wires to clearly designate their circuit identification and voltage. In manholes the tags shall be the embossed brass type and shall also show the cable type and voltage rating. Position the tags so they will be easy to read after the fireproofing is installed.

**3.8 FIELD TESTS FOR HIGH VOLTAGE CABLE**

A. New Cable:

1. Acceptance tests shall be performed on new and service aged PE XLPE, PVC and paper cables in accordance with IEEE 400.2 and as specified herein.
2. Test new cable after installation, splices, and terminations have been made, but before connection to equipment and existing cable.
3. Test equipment, labor and technical personnel shall be provided as necessary to perform the electrical acceptance tests. Arranges shall be made to have tests witnessed by the COR.

B. Service Age Cable:

1. Maintenance tests shall be performed on service-aged cable interconnected to new cable. See test voltages below.
2. After new cable test and connection to an existing cable, test the interconnected cable. Disconnect cable from all equipment that might be damaged by the test voltages.

C. Dielectric Absorption Test: Both new and service aged power cable shall be completely isolated from extraneous electrical connections at cable terminations and joints. Safety precautions shall be observed. Each cable shall be given a full dielectric – absorption test with a 5000v insulation resistance test set. Test shall be applied for a long enough time to charge the cable. Readings shall be recorded every 15 seconds during the first 3 minutes of test and at 1 minute intervals thereafter. Test shall continue until three equal readings 1 minute apart are obtained. Minimum readings shall be 200 megohms at an ambient temperature 20 degrees C (68 degrees F). Readings taken at other temperatures shall be corrected accordingly.

D. High Potential Test: High potential test shall not be applied to the XLPE new or service aged cables. All other cables shall be subjected to the test but only upon successful dielectric absorption test.

1. Leakage current test shall be by high potential dc step voltage method.
2. High potential test shall measure the leakage current from each conductor to the insulation shield. Use corona shields, guard rings, taping, mason jars, or plastic bags to prevent corona current from influencing the readings. Unprepared cable shield ends shall be trimmed back 25 mm (1 inch) or more for each 10 kV of test voltage. Upon the successful completion of the high potential test on new and service aged PE CCLP, PC PVC cables a second dielectric test will be run on the HV cable system to ensure the cables have not been damaged by the hi-pot test

E. Safety Precautions:

1. Exercise suitable and adequate safety measures prior to, during, and after the high potential tests, including placing warning signs and preventing people and equipment from being exposed to the test voltages.

F. Test Voltages:

1. New shielded EPR and CCLP cable dc test voltages shall be as follows:

| Rated Circuit Voltage Phase-to-Phase Volt | Wire Size AWG or MCM | Test Voltage KV |
|---|---|---|
| 2001-5000 | 8-1000 | 25 |
| 5001-8000 | 6-1000 | 35 |
| 8001-15000 | 2-1000 | 65 |
| 15001-25001 | 1-1000 | 100 |
| 25001-28000 | 1-1000 | - |
| 28001-35000 | 1/0-1000 | - |

2. Existing cable of all types interconnected to a new cable shall be tested at 1.7 times the existing cable rated voltage (maintenance test).

G. High Potential Test Method:

1. Apply voltage in approximately 8 to 10 equal steps.
2. Raise the voltage slowly between steps.
3. At the end of each step, allow the charging currents to decay, and time the interval of decay.
4. Read the leakage current and plot a curve of leakage currents versus test voltage on graph paper as the test progresses. Read the leakage current at the same time interval for each voltage step.
5. Stop the test if leakage currents increase excessively or a "knee" appears in the curve before maximum test voltage is reached.
   a. For new cable, repair or replace the cable and repeat the test.
   b. For existing cable interconnected to new cable, notify the COR for further instructions.
6. Upon reaching maximum test voltage, hold the voltage for five minutes. Read the leakage current at 30 second intervals and plot a curve of leakage current versus time on the same graph paper as the step voltage curve. Stop the test if leakage current starts to rise, or decreases and again starts to rise. Leakage current should decrease and stabilize for good cable.
7. Terminate test and allow sufficient discharge time before testing the next conductor.

H. Test Data: Test data shall be recorded and shall include identification of cable and location, megohm readings versus time, leakage current readings versus time, and cable temperature versus time.

I. Final Acceptance: Final acceptance shall depend upon the satisfactory performance of the cable under test. No cable shall be energized until recorded test data have been approved by the COR. Final test reports shall be provided to the COR. Reports shall have a cover letter/sheet clearly marked with the System name, Date, and the words “Final Test Report” Forward to the COR for inclusion in the Maintenance Database.

J. Radiographic Tests: Radiographic tests shall be performed on all potheads at the discretion of the COR to determine if voids exist in the pothead. Unacceptable terminations shall be reworked at no additional expense to the Government.

K. The contractor shall furnish the instruments, materials and labor for these tests.

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