

SECTION 010110  
MEDICAL CENTER REQUIREMENTS

PART 1 GENERAL

1.0 GENERAL INTENTION: This section pertains to station policy for construction projects performed at the Veterans Affairs Medical Center, Butler, Pennsylvania. Safety and health concerns are taken seriously at this facility. Both our staff and yours are expected to strictly adhere to the regulations and requirements. This is exceedingly important, since we must be primarily concerned for the safety of our patients. In this regard, OSHA Standards may protect worker safety and health, but they have minimal benefit for protecting the safety and health of our patients, due primarily to their differing medical conditions. Review this information as orientation with your personnel performing work on site. Where the requirements as outlined in this and section 01010 are differing, the more stringent shall apply.

2.0 REQUIREMENTS

A. Security:

1. Secure all construction areas, especially mechanical and electrical rooms against entry of unauthorized individuals including patients.
2. Notify the COTR for permission to work after hours and weekends. Standard work hours for the medical center are Monday - Friday, 8:00 a.m. to 4:30 p.m. The ten(10) holidays observed by the Federal Government are:
  - New Years Day
  - Martin Luther Kings Birthday
  - Presidents Day
  - Memorial Day
  - Independence Day
  - Labor Day
  - Columbus Day
  - Veterans Day
  - Thanksgiving Day
  - Christmas

\*\*\* and any other day specifically declared by the President of the United States to be a national holiday.

B. Key Security:

1. Only a limited number of keys will be issued to the contractor.
2. If the Contractor loses a key, all areas that are keyed to that key will be rekeyed at the Contractor's expense at a charge of \$50 per key and \$50 per change, and all new keys required to be issued will be completed at the Contractor's expense.
3. Ensure all doors leading to and from construction are either monitored or locked to prevent access to the area from unauthorized persons.

C. General Safety:

1. Follow all federal, state and local safety and health regulations.
  2. Maintain safety in the construction site/area in accordance with the provisions of the contract which includes the OSHA Regulations, National Electrical Codes. NFPA 70, National Electric Code and NFPA 101, Life Safety Code. Work in a safe manner and take all proper precautions while performing your work. Extra precautions shall be taken when working around persons occupying the building during construction.
  3. Provide Personal Preventive Equipment (PPE) for your employees.
  4. Post appropriate signs in specific hazardous areas.
  5. Keep tools, ladders, etc. away from patients to prevent injuries.
- D. Safety
1. Safety Inspections: the professional Occupational Safety & Health staff at this facility will perform Safety inspections of all contract operations. Written reports of unsafe practices or conditions will be reported to the Contracting Officers Technical Representative (COTR) and Contracting Officer for immediate attention and resolution.
  2. Onsite Supervisor shall conduct his own weekly safety inspection of construction areas. Form shall be available from COTR. These shall be turned in weekly.
  3. Prior to start of project the designated onsite supervisor shall complete the competent person interview worksheet form #3010v.1 (OCT. 2007)
- E. Fire Alarms:
1. The fire alarm system connects all buildings at this facility, and is activated by various heat, duct, manual pull stations, and smoke sensors. Manual pull stations are provided at each entrance. Please survey the area in which you are working to locate the manual pull stations.
  2. If in the event of a fire alarm sounding, you are to remain in your area, unless medical center personnel (Safety, Nursing or Engineering) instruct otherwise or unless a fire situation is in your area, in which case you should immediately evacuate.
  3. Any work involving the fire protection systems will require written permission to proceed from the COTR and Fire Department. **DO NOT tamper with or otherwise disturb any fire alarm system components without prior written permission. To do so without written permission will result in an adverse action.**
- F. Hazardous Materials:
1. Many of the operations you are scheduled to perform may involve the use of hazardous materials. Prior to locating hazardous materials on site, all Material Safety Data Sheets will be submitted through the COTR for evaluation by the Environmental Protection Specialist.
  2. Storage of hazardous materials within buildings will be minimal with only enough on hand to perform daily work tasks. Flammable materials will either be removed from buildings at the end of the workshift or stored in approved flammable storage containers.
  3. Care must be taken to assure adequate ventilation to remove vapors of hazardous materials in use. Many of the patients being cared for in the facility are susceptible to environmental contaminants, even when odors seem minimal. You will isolate those areas where vapors are produced and ventilate the most extent possible to

reduce the number of complaints.

G. Airborne Dust Control During Construction:

1. Generation of dust is of major concern within staff and especially in patient occupied buildings. Where operations involve the generation of dust, all efforts will be directed at reducing airborne generated dust to the lowest level feasible. This may be accomplished by a number of methods. These include misting the area with water, or use of tools attached to high efficiency particulate air (HEPA) filtering vacuums. Where large amounts of materials may be disturbed, resulting in airborne dust, establishment of full ceiling to floor plastic barriers may be required.
2. Classification of Jobs
  - a. CLASS I - Includes but is not limited to minor disturbances involving plumbing, electrical, carpentry, and ductwork, and minor aesthetic improvements.
  - b. CLASS II - (projects require barrier precautions) - Includes but is not limited to construction of new walls, construction of new rooms, major utility changes, major equipment installation, demolition of wallboards, plaster, ceramic tiles or ceiling and floor tiles, removal of windows, removal of casework, etc.

H. Class I Procedures

1. CLASS I: Mist (with water) work surfaces to control dust while cutting. Alternatively a high efficiency particulate air vacuum (HEPA) can be used by positioning the vacuum next to the equipment at the use site.
2. Tape doors for activities that produce large amounts of dust and block off and seal air vents.
3. Cover holes/openings (penetrations), in walls, ceiling, floors or door, which can not be patched or fixed within 4 hours. Only approved fire rated materials will be used to fill holes in fire/smoke walls.
4. Comply with the OSHA regulations regarding noise and vapor containment.
5. Cleanup and disposal: Construction waste must be contained before transport using plastic bags and/or covered transport receptacle and/or cart and tape covering.
6. Wet mop and/or HEPA vacuum before leaving work area.
7. Place dust mats at entrance and exit of work area and clean or change daily to prevent tracking of dust into occupied areas.
8. After work completion, remove covering from air vents.

I. CLASS II (Post Construction Warning Signs)

1. Same procedures as Class I - however, use of a HEPA vacuum is mandatory.
2. Construct all dust barriers before construction begins per the following instructions: For single rooms, seal door/frame with tape and plastic. The sheet should be divided vertically with a knife. Flaps should be taped on either side of the single sheet to create a flapped entrance.
3. For larger areas, install an airtight (fire retardant) plastic barrier that extends from floor to ceiling or sealed to prevent dust and debris from escaping. Seal all seams with duct tape.

install barrier partitions to stop movement of air and debris penetrating ceiling envelopes, chases and/or ceiling spaces. Construct entrance with a double flap of plastic to prevent escape of debris; or, if elevator shafts or stairways are within the field of construction, install solid barriers.

J. Contact with Asbestos Containing Materials

1. Due to the age of our buildings, many contain asbestos containing materials (ACM). Primary ACM uses in the medical center includes floor tile, mastic, piping and HVAC insulation. The medical center has performed a comprehensive asbestos survey and has identified accessible ACM. Some areas contain damaged asbestos and should not be accessed without prior abatement.
2. The most common type of ACM insulation you may encounter includes thermal system insulation (TSI) and floor tile. ACM TSI is generally covered with a cloth wrap or lagging and the asbestos substrate generally appear white in color. **DO NOT SAND, DRILL, GOUGE, OR OTHERWISE DISTURB THIS TYPE OF INSULATION.** Contractors disturbing or releasing asbestos containing materials will be liable for all damages and cleanup costs.
3. Where disturbance of asbestos is likely, it has been addressed in the contract for removal. If contact with the presence of asbestos is presented, stop all work in the immediate area and immediately contact the COTR or Environmental Protection Specialist to make necessary arrangements for removal.
4. In some areas, asbestos insulation has been identified on elbows between fiberglass piping insulation as patching materials among the fiberglass insulation. Fiberglass insulation used in this facility is usually yellow or pink in color, wrapped either by cloth or paper lagging.
5. To protect and ensure all your employees are aware that asbestos containing materials have been used in the construction of this facility, you are required to have them review this section and complete the awareness statement included as Attachment A. Once this documentation has been signed by all employees, forward to the COTR for documentation.
6. A complete assessment of asbestos materials and conditions are available for viewing by contacting the facility Environmental Protection Specialist at extension 5508. Prior to performing work above any ceiling or starting in a new area, consult with the COTR concerning existing conditions of ACM.
7. Some of the areas in the facility are identified as restricted areas due to condition of ACM. These are readily labeled. **DO NOT ENTER THESE AREAS** unless first contacting the COTR. Entry requirements to these areas are awareness of the hazards, proper protective clothing (coveralls and respirators), and personal monitoring in accordance with OSHA requirements.
8. Submit contractor asbestos awareness statements for all persons working on the site prior to commencing work.

K. Environmental Protection:

1. It may help you to be aware of the seriousness which the environmental protection requirements of each contract are regarded. Adherence to these requirements is subject to continuing scrutiny from the community and backed by severe penalties, such as fines and incarceration. These environmental

requirements will be strictly enforced.

2. **NO** hazardous materials will be disposed of on Government property. All waste will be hauled off-site or disposed in contractor owned and operated waste removal containers.
3. A copy of all waste manifests for special or hazardous wastes will be forwarded to the COTR. Environmental requirements will be strictly enforced.

L. Permit Required Confined Spaces:

1. Contractors performing work on this facility will follow all requirements outlined in OSHA Standards, 29 CFR 1910.146 for working in confined spaces. There are numerous permit required confined spaces on this facility. These spaces have been identified. Some spaces have been posted, but the majority have not due to their configuration. A complete listing of these areas is located in the Fire Department.
2. Confined spaces are areas which are large enough to be entered, have limited egress/exit potential, and are not designed for permanent human occupancy. If you encounter any space which meets this definition, if it is a suspected confined space, please contact the COTR for a listing of these spaces.
3. Contractors performing work in confined spaces are responsible for compliance with all applicable standards and regulations.

M. Housekeeping:

1. Protect patients and VA personnel in occupied areas from the hazards of dust, noise, construction debris and material associated with a construction environment. Keep work area clear, clean and free of loose debris, construction materials and partially installed work which would create a safety hazard or interfere with VA personnel duties and traffic.
2. Wet mop occupied areas clean and remove any accumulation of dust/debris from cutting or drilling from any surface at the end of each workday.
3. Make every effort to keep dust and noise to a minimum at all times. Take special precautions to protect VA equipment from damage including excessive dust.
4. Maintain clear access to mechanical, electrical devices, equipment and main corridors. This will ensure access to existing systems in the event of an emergency.
5. Clean area of all construction debris and dust upon completion of demolition and/or renovation.
6. During construction operations, keep existing finishes protected from damage. Cover and protect all carpets during construction. Any carpets or surfaces damaged as a result of construction activities will be replaced at the contractor expense.

N. Hot Work Permits:

1. Any hot work operations including cutting, welding, thermal welding, brazing, soldering, grinding, thermal spraying, thawing pipes or any other similar activity, will require a Hot Work Permit to be obtained by the Contractor from the Fire Department. The Contractor will be responsible for conforming to all Medical Center regulations, policies and procedures concerning Hot Work Permits as outlined below:
  - a. Prior to the performance of hot work in patient-occupied buildings, a request for a Hot Work Permit will be made to the

- Fire Department (extension 5055).
- b. The COTR will inspect the area and ensure that the requirements of NFPA 241 and OSHA standards have been satisfied. The Hot Work Permit will be granted and will be posted in the immediate area of the work.
  - c. The Hot Work Permit will apply only to the location identified on the permit. If additional areas involve hot work, additional permits must be requested.
  - d. Upon completion of all hot work, the COTR will be notified by the responsible individual to perform a re-inspection of the area.
2. Do not use any of the extinguishers in the medical center for standby purpose while conducting hot work. Contractors are required to supply their own Class ABC extinguishers. Medical center extinguishers are only to be used in the event of a fire.
- O. Emergency Medical Services: Emergency medical services for stabilization purposes are available for contractors at this facility. For medical emergencies, dial 255 when inside any building. Report the nature of the emergency and location. The operator will dispatch in-house personnel or coordinate an outside emergency assistance based on the nature of the emergency.
- P. Use of Government Owned Material and Equipment:: Use of Government owned material and equipment is PROHIBITED.
- Q. Superintendent Communications:: At all times during the performance of this contract, the Contractors Superintendent is to be available by portable cellular phone. At the beginning of the contract and prior to beginning any construction, supply the COTR with the telephone number for the superintendent.
- R. Parking: Contractor employees shall be assigned a parking area during the preconstruction meeting..
- S. Traffic:
1. Traffic hazards are minimal at this facility. Drivers should be particularly concerned with pedestrian traffic.
  2. Seat belt use is mandatory on the station.
  3. Federal police officers maintain a 24-hour patrol of the area.
- T. Contractor's Trailers: Contractor's trailers shall be located at the area assigned. All utility connections to the trailer shall be installed at the contractor expense. Their removal is required upon completion of the contract, unless approved by the COTR to leave in place.
- U. Smoking: No smoking is permitted in buildings or around hazardous areas. Any smoking inside a government building is subject to a fine without warning.
- W. Fluorescent (PCB Containing) Fixtures: All fluorescent lighting fixtures being removed as part of this project are to have their ballasts removed and turned over to the VAMC Environmental Protection Specialist for disposal. All other components of the lighting fixture are to be disposed of by the Contractor.
- X. Road Closures: For any work requiring closure of a road or parking

lot, a request for closure will be made in writing at least 5 days in advance for approval by the COTR and Fire Department. Contractor requiring road closures will complete a permit and forward to the COTR for authorization by the Fire Department. Permits will be issued for no longer than 1 week. Work lasting longer than 1 week will be authorized by multiple permits.

- Y. Water Source Connection: Contractors shall supply and install a backflow prevention device at all connection points to a VA supplied water source. Backflow prevention device shall be a Reduce Pressure Watts Series 009 or approved equivalent.

---END---



**PERMIT  
FOR CUTTING AND WELDING  
WITH PORTABLE GAS OR ARC EQUIPMENT**

VA Project No:

\_\_\_\_\_

Name of Contractor's Firm:

\_\_\_\_\_

Date:

\_\_\_\_\_

\_\_\_\_\_

Building/Location:

\_\_\_\_\_

Work To Be Done:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Any Special Precautions:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Fire Watch Required:  Yes  No

The location where the work is to be performed has been examined, necessary precautions have been taken, and permission is granted for this work.

Signed

\_\_\_\_\_  
(Fire Department Official Authorizing

Hot Work)

Permit Expires: \_\_\_\_\_ (Date)

Time Hot Work Started: \_\_\_\_\_ Time Hot Work Completed:

\_\_\_\_\_

FINAL CHECK-UP

VA Butler Healthcare  
Butler, PA

Repair Steam Lines  
529-13-103

Work area and all adjacent areas to which sparks and heat might have spread (including floors above and below and on opposite sides of walls) were inspected 30 minutes after the work was completed and were found firesafe.

Signed

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(Contractor's Fire Watch)

(Form - Page 1 of 2)

ATTENTION

Before approving any cutting and welding permit, the contractor's authorized representative or their appointee shall inspect the work area and confirm that precautions have been taken to prevent fire in accordance with NFPA Standard No. 51B.

Interim Life Safety Measures/Precautions

- Sprinklers are in service where installed
- Cutting and welding equipment in good repair
- Within 10 meters (30 feet); floors swept clean of combustible, no combustible material or flammable liquids, all wall and floor openings covered, and covers suspended beneath work to collect sparks
- When working on enclosed equipment and in confined space, equipment and area is free of flammable vapors
- Fire watch provided during and 30 minutes after operation (60 minutes for torch applied roofing operations)
- Portable fire extinguisher with adequate rating available in the immediate vicinity
- Standpipe system in service where installed
- Protection of any sprinkler heads when hot work is in close proximity
- Smoking prohibited in immediate vicinity
- Non-combustible shields provided when hot work is done near combustible walls, partitions, floors, roofs
- Prohibition of hot work on pipes contacting combustible walls
- Personnel trained in use of equipment including portable fire extinguishers and sounding a fire alarm
- Final check-up conducted after 30 minutes

(Form - Page 2 of 2)

**PERMIT  
FOR ROAD CLOSURE**

VA Project No: \_\_\_\_\_ Date of  
Request: \_\_\_\_\_

Name of Contractor's Firm:  
\_\_\_\_\_

Date(s) of Requested Closure \_\_\_\_\_ Time(s) of Requested  
Closure: \_\_\_\_\_

Location Description:  
\_\_\_\_\_

Work To Be Done:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Protection Required: (To be completed by COTR)

- Solid barricade with flashing lights to guard excavation site
- Warning cones and/or construction barrier tape
- Construction fencing
- Flag/attendant for directing traffic
- Cover excavation site with steel sheet to permit traffic flow after administrative work hours.
- Other (Describe)

COTR

CONCURRENCE: \_\_\_\_\_ DATE \_\_\_\_\_  
\_\_\_\_\_

FIRE DEPARTMENT

APPROVAL: \_\_\_\_\_ DATE \_\_\_\_\_

(Fire Department Officer approving permit will contact on duty Police Officer to inform of closure)

Original copy to be maintained in the Fire Department until completion of work. Once completed, return original to Planning & Development for filing.

#### ELECTRICAL POWER DISTRIBUTION SYSTEM

**1. PURPOSE:** This Veterans Health Administration (VHA) Directive provides guidance on policy regarding the installation, operation, testing, and maintenance of the Electrical Power Distribution System at VHA facilities.

#### **2. BACKGROUND**

a. VHA and the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) have adopted the National Fire Protection Association (NFPA), National Electrical Code (NFPA 70), Recommended Practice for Electrical Equipment Maintenance (NFPA 70B), Standard for Electrical Safety Requirements for Employee Workplaces (NFPA 70E), Standard for Health Care Facilities (NFPA 99), and Life Safety Code (NFPA 101) as the basis for the requirements of the design, installation, operation, testing, and maintenance of the Electrical Power Distribution System at VHA facilities.

b. JCAHO's Environment of Care (EC) standards require written Utility Systems Operational Plans. The Electrical Utility System Operational Plan must assure reliability, control risks, reduce failures, and train users/operators of the Electrical Power Distribution System.

c. Occupational Safety and Health Requirements (OSHA) – Part 1910 Subpart J – The control of hazardous energy (lockout/tagout) (1910.147), Occupational Safety and Health Requirements Part 1910 Subpart S – Electrical (1910.301 – 1910.399), and Safety and Health Regulations for Construction Part 1926 Subpart K – Electrical (1926.400 – 1926.499) must apply.

d. Working on energized electrical equipment is inherently dangerous to patients, staff, visitors, and VHA property. Such actions, if unplanned or poorly executed, can result in disruption of operations, injuries, loss of life and/or property.

**3. POLICY:** It is VHA policy that the Electrical Power Distribution System must operate in a safe, reliable, and efficient manner, recognizing its importance and potential danger; and is in compliance with JCAHO, OSHA, and NFPA electrical standards.

#### **4. ACTION**

a. **Network Director.** The Network Director is responsible for ensuring that installation, operation, testing, and maintenance of the Electrical Power Distribution System meets or exceeds JCAHO and NFPA requirements, that all work on this system complies with OSHA standards, and that appropriate resources are provided to assure compliance.

#### **THIS VHA DIRECTIVE EXPIRES OCTOBER 31, 2011**

b. **Facility Director.** The facility Director is responsible for ensuring that:

(1) Only qualified senior staff at the facility and/or qualified electrical contract professionals are authorized to execute any design, installation, operation, testing, and maintenance of the Electrical Power Distribution System in accordance with JCAHO and NFPA requirements and that all work on these systems is compliant with OSHA standards.

(2) Appropriate actions are taken to correct deficiencies found in the Electrical Power Distribution System.

(3) A management system is developed and implemented so that work on energized equipment does not take place without the facility Director's prior knowledge and approval.

(4) All electrical work is executed with all proximate energized circuits de-energized. It is the intent of this directive to make planned electrical system shutdowns for maintenance/repair the standard operating procedure, not the exception.

(5) Written procedures are established to prepare the medical center for a planned electrical outage. The procedures must take into account the worst case of risk to patients, staff, visitors, and VHA property. When a planned electrical outage cannot be accomplished, the following requirements are mandatory for working on energized circuit:

(a) Full and proper protective equipment (PPE) is available and worn by the qualified electricians (i.e., certified and tested insulating material to cover exposed energized electrical components, certified and tested insulated tools). **NOTE:** Refer to the NFPA 70E, and General Safety Guidebook for guidance on the appropriate PPE.

(b) Qualified electricians are provided with flame-retardant clothing for work at the proximity of energized electrical equipment.

(c) Before initiating work, a specific work plan is developed and a peer review of the plan documented.

1. The work plan must include: procedures to be used on and near the energized electrical equipment, barriers to be installed, safety equipment to be provided, and exit paths to be accessed.

2. An Energized Circuit Work Permit must be obtained from the Safety Office.

3. Any energized electrical work plan must have the prior knowledge, and approval of the Medical Center Director. **NOTE:** However, the Chief of Engineering Service may approve energized electrical work plan for Branch Circuits, from the final overcurrent protecting devices to the outlets, that do not serve the critical patient care areas, such as Surgery Rooms, Critical Care, Intensive Care, Dialysis Units, Isolation Rooms, Catherization Laboratories, Emergency Rooms, or Supply, Processing, and Distribution (SPD) rooms.

(6) An Electrical Distribution Operational Plan (EDOP) is developed which meets, or exceeds JCAHO, OSHA, and NFPA requirements.

(7) EDOP is approved.

(8) The Electrical Power Distribution System is supplied by a source of power from the Utility Power Company (UPC). A second independent source from the UPC, referred to as utility redundant feed, should be considered only when utility power reliability is proven to be questionable or it can be justified as cost effective.

(9) Where there are two sources of power supplies (Primary and Redundant Feeds) coming from the UPC, a test is coordinated with the UPC to maintain the tie-circuit breaker, or transfer switch for such system every 36-months.

(10) That where required by NFPA 70, NFPA 99, and NFPA 101, an Essential Electrical System (EES) is provided for each building.

(a) EES consists of alternate source of power, all connected electrical power distribution systems, and ancillary equipment.

(b) The EES must have a minimum of two independent sources of power: a normal source generally supplying electrical power to the entire Electrical Power Distribution System, and one or more alternate sources for use when the normal source of power is interrupted. The alternate source must be one or more low voltage (600 volts or less) emergency generator(s) located on the facility property. **NOTE:** *When the alternate source requirements are sufficiently small, a stored energy (battery) supplied source may be considered.*

(11) The EES, including all related components, such as Automatic Transfer Switches and emergency generators, is inspected weekly.

(12) The EES, including all related components, is exercised under load at least monthly, for a minimum of 30 minutes, in accordance with the requirements of NFPA 99 and NFPA 110.

(13) A test of the EES is planned and executed every 36 months that lasts for 4 hours continuously, in accordance with the requirements of NFPA 99 and NFPA 110. **NOTE:** *All risks to the patients, staff, visitors, and VHA property must be mitigated with proper planning.*

(a) This test must meet two objectives:

1. EES Response - a thorough test of the EES initiated by a loss of utility normal power.

2. Facility Staff Response - a thorough test of the medical center staff's ability to operate while restricted only to the EES.

(b) This test requires coordination with the local UPC. The main electrical switch, owned by the local UPC that serves the medical center, must be opened to simulate a total electrical power outage. This switch is to remain opened for a minimum of 4 hours continuously. During this time, the facility's staff must test, inspect and record the operation of the EES, including all related components. Deficiencies found in the EES shall be recorded, and corrected immediately.

(c) This test may be incorporated into the JCAHO required facility-wide disaster drills. Moreover, an unscheduled facility power outage of at least 4 hours continuous duration may be documented and considered the equivalent of the EES test, providing that all requirements listed in preceding subparagraph 4b(13)(b) are met.

(d) Individual medical centers with a significant rate of staff turnover, absence of key staff during the most recent test, significant incidents during the most recent test, significant modifications to the Electrical Power Distribution System, significant modifications or seasonal variation to the electrical loads, may consider more frequent testing of the EES.

(e) Testing, maintenance, and exercising of the EES, including all related components, must be executed to meet the requirements of NFPA 99 and NFPA 110, whichever is more stringent.

(14) Transformers, including all related components, are inspected, tested, and maintained every 36-months. The following is a minimum list of items to be inspected, tested, and maintained:

(a) Transformers of 500 kiloVoltAmps (kVA) or larger shall be cleaned exteriorly, inspected for sign of overheating with an infra-red thermal detecting equipment, and inspected for any damages to the housing, connection points, or insulation.

(b) Liquid cooled transformers must have the cooling liquid tested and replaced, when tests indicate that the liquid no longer meets manufacturer's specification. The liquid must be re-filled to meet the manufacturer's specification.

(c) Dry type transformers must be thoroughly cleaned exteriorly, and inspected for overheating with an infra-red thermal detecting equipment.

(15) Electrical equipment (including, but not limited to switchgears, switchboards, distribution panels, motor control centers, and all related components) is inspected, tested, maintained, and/or calibrated every 36-months. All work must be documented.

(a) Use lint-free rags to clean conductors, contact points between the circuit breakers and main buss bars, buss bars and interior of the electrical equipment. Use a vacuum cleaner to remove large debris; compressed air is not to be used for this purpose. Visually inspect for sign(s) of overheating, misaligned contacts, damaged insulation, or loose lugs.

- (b) Lubricate all moving parts with manufacturer's approved lubricants.
- (c) Test and exercise circuit breakers located in switchgears, switchboard, and distribution panels to ensure operation under overload, and short circuit conditions.
- (d) Test ground fault protection devices for proper function if they are installed in the Electrical Power Distribution System.
- (e) Inspect and tighten ground connections. Test ground resistance for the entire facility grounding system.
- (f) Identify the hot spots in the electrical equipment by using an infra-red thermal detecting equipment. Tighten problem connections to meet equipment manufacturers' specification using a torque wrench or other approved devices.
- (g) Calibrate and maintain adjustable protective relays.
- (h) Test all control systems equipment for proper operation after maintenance is performed and before placing them back in normal service.

**NOTE:** Subparagraphs 4b(15)(c), (d), (e), (g), and (h) are typically done by qualified electrical contract professionals who specialize in electrical testing. For the Statement of Work, go to the web site at:

<http://vaww.ceosh.medva.gov/sow>. *ElectPowDistSysTesting.Doc*

(16) All work related to the inspection, testing, maintenance, and calibration is documented, and filed appropriately with copies going to the Network Director.

#### 5. REFERENCES

- a. NFPA 70, Latest Edition.
- b. NFPA 70B, Latest Edition.
- c. NFPA 70E, Latest Edition.
- d. NFPA 99, Latest Edition.
- e. NFPA 101, Latest Edition.
- f. JCAHO Accreditation Manual for Hospitals, Latest Edition.
- g. OSHA - Occupational Safety and Health Requirements Part 1910 Subpart J - The control of hazardous energy (lockout/tagout) (1910.147).

h. OSHA - Occupational Safety and Health Requirements Part 1910 Subpart S - Electrical (1910.301 - 1910.399).

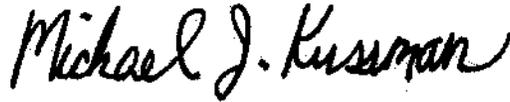
i. OSHA - Safety and Health Regulations for Construction Part 1926 Subpart K - Electrical (1926.400 - 1926.499).

j. Statement of Work - Maintenance and Testing of the Electrical Power Distribution System. see website at: <http://vaww.ceosh.med.va.gov/sow/ElectPowDistSysTesting.Doc>

k. CEOSH - General Safety Guidebook, Latest Edition. see website at: <http://vaww.ceosh.med.va.gov/Guidebooks/GenSafety/gensafety.htm>

**6. FOLLOW-UP RESPONSIBILITIES:** The Director, Healthcare Engineering Office (10NB), is responsible for the content of this Directive. Questions may be referred to 202-2735644.

**7. RESCISSIONS:** None. This VHA Directive expires October 31, 2011.



Michael J. Kussman, MD, MS, MACP  
Acting Under Secretary for  
Health

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