



DEPARTMENT OF THE NAVY

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NAVSUPPACT NAPLES INSTRUCTION 5100.16

From: Commanding Officer, U.S. Naval Support Activity, Naples, Italy

Subj: ELECTRICAL SAFETY PROGRAM

Ref: (a) CNIC M-5100.1, Chapter 34
(b) OPNAV M-5100.23H, Chapter 35
(c) OPNAVINST 3500.39D
(d) 29 CFR 1910.333(c)
(e) 29 CFR 1910.335
(f) NFPA 70

Encl: (1) NAVSUPPACT Naples Electrical Safety Program

1. Purpose. To establish standards and procedures for implementing the Electrical Safety Program at U.S. Naval Support Activity (NAVSUPPACT), Naples, Italy.

2. Scope and Applicability. This instruction applies to all personnel who may come in contact with electrical devices or associated environments. The procedures and core elements described in the enclosure establish the minimum criteria for all Electrical Safety Programs on NAVSUPPACT Naples installations. Departments and personnel assigned to NAVSUPPACT Naples must use this program to meet Department of the Navy (DoN) Electrical Safety Program compliance requirements. Any supported command that requires, but does not have, an Electrical Safety Program will develop their own or can adopt this program. Reference (b) will be used as guide when creating a site-specific program or policy. Failure to comply with these provisions may result in personnel injury, and/or be subject to disciplinary action under the Uniform Code of Military Justice (UCMJ) or adverse administrative action.

3. Action. Compliance with this program is effective immediately.

4. Records Management

a. Records created as a result of this instruction, regardless of format or media, must be maintained and dispositioned per the records disposition schedules located on the Department of the Navy Assistant for Administration, Directives and Records Management Division portal page at: <https://portal.secnav.navy.mil/orgs/DUSNM/DONAA/DRM/Records-and-Information-Management/Approved%20Record%20Schedules/Forms/AllItems.aspx>.

7 Jan 25

b. For questions concerning the management of records related to this instruction or the records disposition schedules, please contact the local records manager or the OPNAV Records Management Program (DNS-16).

5. Review and Effective Date. Per OPNAVINST 5215.17A, NAVSUPPACT Naples will review this instruction annually on the anniversary of its effective date to ensure applicability, currency, and consistency with Federal, Department of Defense, Secretary of the Navy, and Navy policy and statutory authority using OPNAV 5215/40 Review of Instruction. This Instruction will be in effect for 10 years unless revised or cancelled in the interim and will be reissued by the 10-year anniversary date if it still required, unless it meets one of the exceptions in OPNAVINST 5215.17A, paragraph 9. Otherwise, if the instruction is no longer required, it will be processed for cancellation as soon as the need for cancellation is known following the guidance in OPNAV Manual 5215.1 of May 2016.

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J. L. RANDAZZO

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7 Jan 25

NAVSUPPACT Naples Electrical Safety Program

1. Background. The primary goal of the NAVSUPPACT Naples Electrical Safety Program is to prevent mishaps, injuries, and property damage via safe electrical practices. This is accomplished through a comprehensive and dynamic electrical safety program that applies risk management and mitigation strategies in support of force preservation, optimization, and operational readiness. The NAVSUPPACT Naples Electrical Safety Program is provided as a guide to assist workers in complying with the requirements of reference (b), as well as additional germane information. This program is not intended to supersede the requirements of the standards set in the references (a through f). Commands adopting this program will adjust and tailor their program to meet specific command conditions and requirements.

2. Responsibility. Safety is a measure of how invested we are in our mission and our shipmates. Leaders at every level must endeavor to ensure their personnel are consummate professionals in order to effectively and safely operate in all we do, both on and off duty. Compliance with the references safeguards against complacency and deviant or risky behavior. Personal responsibility and accountability play a key role towards prevention of mishaps, especially with respect to electrical related mishaps.

a. Commanding Officers and Officers in Charge aboard NAVSUPPACT Naples will develop and implement an electrical safety program in accordance with the references and guidance in this instruction.

b. NAVSUPPACT Naples Safety Office will provide an annual risk assessment and requisite workplace inspection(s) to identify electrical hazards for tenant and supported commands. The Safety Office will assist commands in the implementation of their electrical safety programs.

3. Discussion

a. The NAVSUPPACT Naples Electrical Safety Program is designed to provide an awareness of potential electrical hazards for persons who occasionally work in an environment involving the presence of electrical energy to include electrical devices, tools, and equipment. The involvement of electrically driven devices or power during operations is recognized as a potential workplace hazard which may expose employees to electric shock, burns, fires, and explosions. Electrical-related mishaps generally result from a combination of three causal factors: work involving unsafe equipment and installation; unsafe work environments; and unsafe work practices. The first two factors are considered unsafe conditions. Inadequate maintenance can cause equipment, or its installation that were originally deemed safe, to deteriorate resulting in an unsafe condition. Unsafe electric equipment can be identified, for example, by the presence of faulty insulation, improper grounding, loose connections, defective parts, ground faults in equipment, unguarded live parts, and underrated equipment. The work environment can also be a contributory factor to electrical mishaps in a number of ways. Environments containing flammable vapors, liquids, or gases; areas containing corrosive atmospheres; and wet and damp locations are environments potentially affecting electrical safety parameters.

7 Jan 25

b. In order to ensure compliance with industry guidelines, this program incorporates key requirements from the Occupational Safety and Health Administration (OSHA) and National Fire Protection Association (NFPA) Standards for Electrical Safety in the workplace. The NAVSUPPACT Naples Safety Office will provide a workplace inspection at least once a year in to identify electrical hazards. The NAVSUPPACT Naples Zone Inspection Program also provides an assessment of general workplace hazards on an annual basis to include electrical safety.

4. General Requirements. The Electrical Safety Program will be an integral part of the command, unit, or activity's Safety Management System (SMS).

a. The Electrical Safety Program will include all of the elements needed to provide the requisite guidance to employees to include the following:

(1) Electrical safety is incorporated in design, contracts, and procurement of electrically powered equipment.

(2) Training is updated and current.

(3) Procedures for working within the limited approach boundary of energized electrical conductors or parts operating at 30 volts or more that guide worker actions.

(4) Work processes are reviewed to ensure procedures are changed when necessary.

(5) Personal protective equipment (PPE) is available and used for different work tasks.

(6) Processes that identify and monitor equipment and maintenance requirements are audited on a periodic basis.

(7) Electrical safety requirements are included in acquisition of new facilities, tools, etc.

(8) Electrical safety expertise is provided towards the investigation of electrical mishaps or near-miss events.

b. The Electrical Safety Program will identify the hazard and risk evaluation procedure(s) to be used before work is started within the limited approach boundary for energized circuits operating at 30 volts or more, or where an electrical hazard exists.

5. Electrical Guidelines

a. Electrical equipment will be installed per reference (c).

b. Electrical equipment will be operated following the Underwriters Laboratory (UL) listing guidance, and the manufacturer's instructions or technical manuals.

7 Jan 25

c. Maintenance will be performed on electrical equipment following the manufacturer's instructions and technical manual instructions.

d. Specific instructions and precautions will be applied for equipment found in workplaces.

e. Adapters to plug 3-prong electrical plugs into 2-prong receptacles are prohibited. These defeat the electrical grounding circuit and can create a shock and fire hazard.

f. Use extension cords only when necessary, and only on a temporary basis not to exceed 90 days. Basic electrical cord practices are as follows:

(1) When disconnecting extension cords, pull the plug body rather than the cord itself. Pulling on the cord damages the conductors and the terminals within the plug.

(2) Use only 3-wire extension cords for appliances and power tools with 3-prong plugs. Never remove the third (round or U-shaped) grounding prong that is a safety feature designed to reduce the risk of shock and/or electrocution. Appliances, refrigerators, microwave ovens, and space heaters will be plugged directly into wall outlets, and never into an extension cord or power strip/surge protector.

(3) Stringing of extension cords, surge protectors, or uninterruptible power supplies (i.e., daisy chain), or going from one cord to several (i.e., tree branching) is prohibited unless approved by local safety authority.

(4) Do not use extension cords to raise and lower equipment.

(5) Do not plug extension cords into plug strips or surge protectors.

(6) Do not run extension cords through walls, ceilings, floors, doors, or windows. Do not conceal extension cords behind walls, dropped ceilings, or floors.

(7) Do not place extension cords where they will be walked on or run over by equipment. If extension cords must be placed in travel lanes, they will be protected via housings, bridges, or covers approved for such use.

g. Extension cords, portable cords, plug-connected equipment, and flexible cord sets will be visually inspected before use. Inspections will focus on external defects (e.g., loose parts, deformed and missing pins, or damage to outer jacket or insulation), and evidence of possible internal damage (e.g., pinched or crushed outer jacket). Portable cord, plug-connected equipment, and flexible cord sets which remain connected once they are put in place, and are not exposed to damage, need not be visually inspected until they are relocated. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item will be removed from service. No employee may use the damaged item until repairs and tests necessary to render the equipment safe have been made by a qualified electrician.

7 Jan 25

h. Multi-receptacle surge protectors are typically rated for a total of 15 amperes. The total ampere load to be plugged into a 15-ampere rated surge protector must not exceed 12 amperes.

i. Ground fault circuit interrupters (GFCI) operational practices are as follows:

(1) All GFCI protected outlets will be installed as required by the National Electrical Code (NEC).

(2) Periodic testing with a GFCI tester is recommended to ensure the GFCI is functioning at the correct electrical current levels. Replace defective GFCI receptacles.

(3) A GFCI is required for receptacles, tools, and equipment in wet or damp locations including exposure to outdoor environments. A portable GFCI will be used when a permanently installed GFCI receptacle is not available.

j. Portable electric space heaters are high-wattage appliances that have the potential to overload circuits and/or cords. The local command, unit, or activity will establish a policy on portable electric heaters and will include the following at a minimum:

(1) The space heater will be certified by a testing laboratory. Look for the Underwriter's Laboratory (UL) or Communauté Européenne (CE) marking on the label.

(2) The space heater will have a safety tilt switch. To check, tip the heater over when it is running. It should cut off immediately.

(3) Do not operate a space heater suspected of being damaged. Before use, inspect the heater, cord, and plug for damage. Follow all operation and maintenance instructions.

(4) Do not leave the space heater operating while unattended or while sleeping.

(5) Keep combustible material such as beds, sofas, curtains, papers, and clothes at least 3 feet (0.9 meters) from the front, sides, and rear of the space heater.

(6) Be sure the space heater plug fits tightly into the wall outlet. If not, do not use the outlet to power the heater.

(7) During use, check frequently to determine if the heater plug or cord, wall outlet, or faceplate is hot. If so, discontinue use of the space heater and have a qualified electrician check and replace the plug or faulty wall outlet(s) if necessary. If the cord is hot, disconnect the heater and have it inspected by an authorized repair person.

(8) Do not power the space heater with an extension cord or power strip.

(9) Ensure that the heater is placed on a stable, level surface, and located where it will not be knocked over. Keep space heaters out of the way of foot traffic, and never block an exit.

7 Jan 25

(10) Always keep electric heaters away from water, and do not touch an electric space heater if skin or clothing is wet.

(11) In older buildings, consult with supporting facility electricians to determine if the building wiring can support the additional load of portable electric heaters.

k. Requirements for Temporary Wiring. The installation of temporary electrical power and lighting of 600 volts or less to include flexible cords, cables, and extension cords will only be used during renovation, maintenance, repair, or experimental work. The duration for temporary wiring used for decorative lighting for special events and similar purposes may not exceed 90 days. Unplug all electrical decorations when the work area is unoccupied.

6. Electrical Work Principles

a. General work principles to consider to avoid electrical-related injuries:

(1) Assume all conductors are energized or “live” until tested.

(2) Safety-related work practices will be used while persons are exposed to electrical hazards from electrical conductors or circuit parts can become energized. Specific safety-related work practices must be consistent with the nature and extent of the associated electrical hazard.

b. Work in wet or damp work locations (i.e., areas surrounded by or near water or other liquids) should not be performed unless it is absolutely critical. If the case, electrical work will be postponed until the liquid can be cleaned up. The following special precautions will be incorporated while performing work in damp locations:

(1) Only use electrical cords that have GFCIs.

(2) Place a dry barrier over any wet or damp work surface.

(3) Remove standing water before beginning work.

c. All electrical wiring and equipment must be of an approved type listed by a nationally recognized testing laboratory (i.e., UL or CE) for the specific application for which it is to be used.

7. Electrically Safe Work Condition

a. The normal condition required for performance of electrical work is an electrically safe working condition. Energized electrical conductors and circuit parts to which personnel might be exposed will be put into an electrically safe work condition before work is performed, if personnel are within the limited approach boundary (arc flash), or if there is an interaction with the equipment where conductors are exposed.

7 Jan 25

b. Before work has commenced, the qualified person must ascertain whether any part of an electric power circuit (exposed or concealed) is located such that the performance of work could bring any person, tool, or machine into physical or electrical contact with it. A reminder that some equipment has more than one source of power that requires opening multiple breakers or switches and/or removing multiple fuses.

c. Steps to establish an electrically safe work condition:

(1) De-energize the circuit and equipment. The circuit and equipment to be worked on must be disconnected from all electric energy sources. Control circuit devices, such as pushbuttons, selector switches, and interlocks will not be used as the sole means for de-energizing circuits or equipment. Stored electric energy will be released prior to work.

(2) Authorized personnel will apply a lock or tag to the disconnecting means using the control of hazardous energy procedures per reference (b).

(3) Verify the de-energized condition. Use appropriate test equipment to test the circuit elements and electrical parts of equipment to which personnel will be exposed. Verify that the circuit elements and equipment parts are de-energized.

8. Energized Work

a. A qualified worker can perform work on or near exposed energized conductors or circuit parts under these conditions:

(1) De-energizing the conductors or equipment could result in an increased hazard.

(2) De-energizing the conductors or equipment could require a complete shut-down of an essential process.

(3) The work to be done is not feasible in a de-energized state due to equipment design or operational limitations.

b. Work on energized electrical equipment, when not placed into an electrically safe work condition, requires an energized electrical work permit approval by the Commanding Officer (CO), Officer in Charge, or in their absence the Command Duty Officer. The CO or Officer in Charge may designate in writing a senior manager to approve energized work permits. Permits that cover routine work tasks to be performed by trained and qualified personnel can be written to cover a long period of time. For example, if the worker is trained and wearing the necessary PPE, a permit might be issued for three months to replace a fuse that involves an exposed energized electrical conductor.

c. Work permits will include but are not limited to:

(1) A description of the circuit and equipment to be worked on and its location.

7 Jan 25

- (2) Justification why the work must be performed in an energized state.
 - (3) A description of safe work practices to be employed.
 - (4) Results of the shock analysis.
 - (5) Determination of shock protection boundaries.
 - (6) Results of the arc flash hazard analysis.
 - (7) The necessary personal protective equipment.
 - (8) Means employed to restrict the access of unqualified persons from the work area.
 - (9) Evidence of completion of a job briefing including a discussion of job specific hazards.
- d. An energized electrical work permit is not required for the following instances. However, all of the appropriate electrical safety practices do apply.
- (1) Performing a voltage verification to establish an electrically safe working condition.
 - (2) Testing, troubleshooting, and voltage measuring where:
 - (a) There are no exposed energized electrical circuits or parts, and
 - (b) There is no interaction with the equipment that would increase the likelihood of an arc flash.

9. Training

a. Training requirements will apply to all personnel who may encounter an electrical hazard. The training will include:

- (1) Hazards: what electrical hazards exist in the workplace, how each electrical hazard affects the human body, determination of the degree of each hazard, and how exposure to each electrical hazard might exist in each step of the work task.
- (2) Safety related work practices: how to minimize risk by body position, determination and selection of required PPE, how to inspect PPE, and what electrical safety program Standard Operating Procedures must be implemented (i.e., determine limited, restricted and prohibited).
- (3) Emergency assistance: how to request emergency assistance, how to render emergency first aid responder techniques if duties warrant such training, how to determine approach boundaries, and how to recognize symptoms of electrical shock and electrical shock trauma.

7 Jan 25

b. Training should include classroom or on-the-job as well as actual performance of work under the supervision of qualified persons. The degree of training will be determined by the employee's associated work tasks

c. A qualified person (i.e., those permitted to work on or near exposed energized parts), will be trained and familiar with the following at a minimum:

(1) The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.

(2) The skills and techniques necessary to determine the nominal voltage of exposed live parts.

(3) The clearance distances specified in Code of Federal Regulation (CFR) 1910.333(c) and the corresponding voltages to which the qualified person will be exposed.

d. For a person to be considered qualified, they must have the craft training necessary to be knowledgeable in the operation of the equipment associated with the work task or the specific work method.

10. Personal Protective Equipment

a. When a worker is operating within the Arc Flash Protection Boundary he or she must wear arc-rated clothing and other PPE, as required, by the job task.

(1) Arc-rated clothing will be worn wherever there is possible exposure to an electric arc flash above the threshold incident energy level for a second degree burn.

(2) PPE used for protection from the thermal hazards associated with an arcing fault must be arc-rated.

(3) The garment manufacturer's instructions for arc-rated clothing washing, laundering, and maintenance must be followed.

b. Workers will wear non-conductive head protection when there is a hazard for a head injury from electric shock or burns due to contact with energized electrical conductors, circuit parts, or from flying objects resulting from an electrical explosion.

c. Workers must wear protective eyewear, footwear, and hand/arm protection which conform to applicable American Society for Testing and Materials, and the American National Standards Institute. Properly tested rubber insulating gloves will be rated for the voltage for which the gloves will be exposed.

d. Workers will use insulated tools and/or handling equipment when working inside the Limited Approach Boundary of exposed energized electrical conductors or circuit parts where tools or handling equipment might make accidental contact. 29 CFR 1910.335 Sub. Electrical

7 Jan 25

and NFPA 70 National Electrical Code provide further information for tasks that require insulated tools

e. Personnel will be adequately trained to administer first aid and cardiopulmonary resuscitation.