Optional Information

Name of School: Date of Inspection:

Vocational Program/Course/Room: Signature of Inspector:

Electrical – General Requirements

Self Inspection Checklist

Guidelines: This checklist covers regulations issued by the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) under the general industry standards subpart S - 29 CFR 1910.303; 1910.305; and 1910.335 and the construction standards subpart K - 29 CFR 1926.403 and 1926.405 which were adopted by reference. It also includes regulations issued by the New Jersey Department of Community Affairs under the Uniform Fire Code (N.J.A.C. 5:70) and the New Jersey Department of Education (N.J.A.C. 6A:26-6.2). The Uniform Fire Code has adopted the model code of the Building Officials and Code Administrators International, Inc. known as the "BOCA National Fire Prevention Code/1996" by reference. It applies to all electrical use systems.

This checklist does not cover: installations in ships, watercraft, railway rolling stock, aircraft, or automotive vehicles other than mobile homes and recreational vehicles.

Definitions of terms appearing below in italicized font are provided at the end of the checklist to help you understand some of the questions.

This checklist does not address voltages greater than 600 volts (nominal). For these voltages, consult the OSHA regulations.

Examination, Installation, and Use of Equipment — Please Circle

1. Are instructional spaces provided with sufficient outlets to satisfy the programs needs with not less than two duplex outlets remotely located? [N.J.A.C. 6A:26-6.2(f)3] — Y N N/A DK

Comments/Corrective Action

2. Are only *approved* conductors and equipment used for electrical installations? [N.J.A.C. 5:70-3.2(a)1{F-310.7} and 29 CFR 1910.303(a)] — Y N N/A DK

Note: Conductors and equipment must be listed or labeled by a recognized testing laboratory, such as Factory Mutual (FM).

3. Is equipment used and installed in accordance with instructions on listing or label? [N.J.A.C. 5:70-3.2(a)1{F310.7}, 29 CFR 1910.303(b)(2) and 1926.403(b)(2)]
Y N N/A DK

4. Is electrical equipment free from recognized hazards that are likely to cause death or serious physical harm to students and teachers? [N.J.A.C. 5:70- 3.2(a)1{F-310.1}, and 29 CFR 1910.303(b)(1) and 1926.403(b)(1)]
Y N N/A DK

Note**:** This paragraph was the most frequently cited violation in 1989 in vocational facilities. Violations included: male plugs had fiber insulators and were not dead fronted; metal junction boxes were being used on extension cords; metal junction boxes were being used on the ends of pendants; receptacles were loose in their mountings; there were open light sockets exposing live parts; an electric outlet strip had an open neutral reading when tested with a circuit analyzer; on/off switch boxes for fans were not secured to the wall; heavy items were hanging from the lighting fixtures; floor mounted receptacles were loose in their mountings; receptacles were broken; and electric cords were frayed, loose, and had exposed wires.

5. Are multi-plug adaptors, such as cube adaptors and un-fused plug strips, prohibited? [N.J.A.C. 5:70-3.2(a)1{F-310.4}] Y N N/A DK
Comments/Corrective Action:

6. Are junction boxes covered? [N.J.A.C. 5:70-3.2(a)1{F- 310.4}] Y N N/A DK

7. Are electrical motors free of excessive accumulations of oil, dirt, waste and debris? [N.J.A.C. 5:70-3.2(a)1{F-310.8}] Y N N/A DK

8. Are unused fixtures, circuits, wiring and electrical devices or fixtures removed or properly secured in place? [N.J.A.C. 5:70-3.2(a)1{F-310.9}] Y N N/A DK

Splices

9. Are conductors spliced or joined by using suitable devices or by brazing, welding or soldering with a fusible metal or alloy? [29 CFR 1910.303(c) and 1926.403(e)]
Y N N/A DK

10. Are soldered splices first joined so as to be mechanically and electrically secure and then soldered? [29 CFR 1910.303(c) and 1926.403(e)] Y N N/A DK

11. Are splices, joints and free ends of conductors covered with adequate insulation? [N.J.A.C. 5:70-3.2(a)1{F-310.6}, 29 CFR 1910.303(c) and 1926.403(e)]
Y N N/A DK

Arcing Parts

12. Are the parts of electrical equipment which ordinarily produce arcs, sparks, flames or molten metal enclosed or separated and isolated from all combustible material? [29 CFR 1910.303(d) and 1926.403(f)] Y N N/A DK

Marking

13. Is electrical equipment marked with the manufacturer's identity? [29 CFR 1910.303(e) and 1926.403(g)] Y N N/A DK

Comments/Corrective Action:

14. Is electrical equipment marked with the voltage, current, wattage or other ratings as necessary? [29 CFR 1910.303(e) and 1926.403(g)] Y N N/A DK

15 Are the markings durable enough to withstand the working environment? [29 CFR 1910.303(e) and 1926.403(g)] Y N N/A DK

Identification of *Disconnecting Means* and Circuits

16. Is each *disconnecting means* for motors and appliances legibly marked to indicate its purpose, unless located and arranged so the purpose is evident? [29 CFR1910.303(f) and 1926.403(h)] Y N N/A DK

17. Is each *service, feeder* and *branch circuit* at its *disconnecting means* or over-current device legibly marked to indicate its purpose, unless located and arranged so the purpose is evident? [29 CFR 1910.303(f) and 1926.403(h)] Y N N/A DK

Note: Circuit breaker panels should be marked to clearly indicate the purpose of each circuit breaker.
Note: Circuit breakers applied in compliance with series combination ratings should be legibly marked in the field to indicate so. [NFPA / NEC 70 110.22(B)]

600 Volts, Nominal, or Less Working Space about Electric Equipment

18. Is access and working space provided around electrical equipment to provide ready and safe operation and maintenance? [29 CFR 1910.303(g)(1) and 1926.403(i)] Y N N/A DK

Comments/Corrective Action:

19. Are sufficient work clearances (see note) maintained around equipment operating at 600 volts or less? [N.J.A.C. 5:703.2(a)1{F-310.3}, 29 CFR 1910.303(g)(1)(i) and 1926.403(i)(1)(i)]
Y N N/A DK

Note: Working distances around electrical equipment varies according to the nominal voltage to the ground, exposed live parts and year equipment was installed. These distances vary from 2.5 to 4 feet. Consult the OSHA regulations for details.

20. Are *required* working spaces around electrical equipment kept free of stored materials? [29 CFR 1910.303(g)(1)(ii) and 1926.403(i)(1)(ii)] Y N N/A DK

21. When there are live parts normally exposed on the front of switchboards or motor control centers, is the working space in front of such equipment greater than or equal to 3 feet? [29 CFR 1910.303(g)(1)(iv) and 1926.403(i)(1)(iv)]
Y N N/A DK

22. Is illumination provided for all working spaces around service equipment, switchboards, panel boards and motor control centers installed indoors? [N.J.A.C. 5:70-3.2(a)1{F310.1} and 29 CFR 1910.303(g)(1)(v)] Y N N/A DK

23. Is there a minimum head-room of 6 feet, 6 inches of working space about service equipment, switchboards, panel boards, or control centers? Also, where the electrical equipment exceeds 6 feet 6 inches, the minimum headroom shall not be less than the height of the equipment. [29 CFR 1910.303(g)(1)(vi) and 1926.403(i)(1)(v); NFPA / NEC 70 110.26(E)]
Y N N/A DK

Comments/Corrective Action:

600 Volts, Nominal, or Less Guarding of Live Parts

24. Are live parts of electrical equipment operating at 50 volts or more guarded against accidental contact by *approved* cabinets, or other forms of *approved* enclosures? [29 CFR 1910.303(g)(2)(i) and 1926.403(i)(2)(i)] Y N N/A DK

Note: Splices should be in junction boxes or other proper enclosures. The requirement to guard the particular live part is not applicable in any of the following situations:

(a) when the live part is located in a room, vault, or similar enclosure that is Accessible only to *qualified persons.*

(b) when permanent, substantial partitions or screens are arranged so that only *qualified persons* will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.

(c) when the live part is located in a suitable balcony, gallery, or platform so Elevated and arranged as to exclude unqualified persons.

(d) when the live part is elevated 8 feet or more above the floor or other working surface.

Comments/Corrective Action:

25. In areas where electrical equipment would be exposed to physical damage, are the enclosures or guards so arranged and of such strength to prevent such damage? [29 CFR 1910.303(g)(2)(ii) and 1926.403(i)(2)(ii)] Y N N/A DK

Note: Incandescent and fluorescent light bulbs should be guarded if subject to physical damage. Light fixtures should have protective plates.

26. Are entrances to rooms or other guarded locations containing exposed live parts Marked with conspicuous warning signs forbidding unqualified persons to enter? [29 CFR 1910.303(g)(2)(iii) and 1926.403(i)(2)(iii)] Y N N/A DK

27. When normally enclosed live parts are exposed for maintenance and repair, are they guarded to protect unqualified persons from contact? [29 CFR 1910.335(a)(2)(ii)] Y N N/A DK

28. Are safety signs, safety symbols, or accident prevention tags used where necessary to warn students/teachers about electrical hazards? [29 CFR Y N N/A DK

Wiring Methods - General Requirements

29. Are metal *raceways*, cable armor, and other metal enclosures for conductors metallically joined together into a continuous electric conductor including connections to all boxes, fittings, and cabinets as to provide effective electrical continuity? [29 CFR 1910.305(a)(1)(i) and 1926.405(a)(1)(i)] Y N N/A DK

Comments/Corrective Action:

30. Is wiring in ducts used to transport dust, flammable vapors and exhaust from commercial- type cooking equipment prohibited? [29 CFR 1910.305(a)(1)(ii) and 1926.405(a)(1)(ii)] Y N N/A DK

Wiring Methods - Cable Trays

31. Are only acceptable types of cables used in cable trays? [29 CFR 1910.305(a)(3)(i)]
Y N N/A DK

Note: Consult 29 CFR 1910.305(a)(3)(i) for complete list of acceptable types of cables.

32. Are cable tray systems prohibited in hoist ways or where subjected to severe physical damage? [29 CFR 1910.305(a)(3)(ii)] Y N N/A DK

Energy Storage Systems (ESS): Partitions, Working Spaces, Illumination and Egress

33. Is a disconnecting means provided for all ungrounded conductors derived from an ESS? Is it readily accessible and located within sight of the ESS? [NEC 70 706.7(A)]
Y N N/A DK

34. Where ESS and output terminals are more than 1.5m (5 ft.) from connected equipment, or where the circuits from these terminals pass through a wall or partition: [NFPA / NEC 70 706.7(E)]

i) Is a disconnecting means provided at the ESS end of the circuit?
Y N N/A DK

ii) Is a second disconnecting means located at the connected equipment installed where the disconnecting means required by (i) above is not within sight of the connected equipment? Y N N/A DK

35. Is the working space measured from the edge of the ESS modules, battery cabinets, racks or trays? For battery racks, is there a minimum clearance of 25mm (1 in.) between a cell container and any wall or structure on the side not requiring access for maintenance? [NFPA / NEC 706.10(C)]
Y N N/A DK

Note: ESS modules, battery cabinets, racks or trays shall be permitted to contact adjacent walls or structure, provided the battery shelf has a free air space for not less than 90 per cent of its length. Pre-engineered and self-contained ESS shall be permitted to have working space between components within the system in accordance with the manufacturer's recommendations and listing of the system.

36. Is illumination provided for working spaces associated with ESS and their equipment and components? [NFPA / NEC 70 706.10(E)] Y N N/A DK

Note: Additional *luminaires* shall not be required where the work space is illuminated by an adjacent light source. The location of the *luminaires* shall not do either of the following:

i) Expose personnel to energized systems components while performing maintenance on the *luminaires* in the system space

ii) Create a hazard to the system or system components upon failure of *luminaire*

37. Are personnel doors intended for entrance to and egress from rooms designated as ESS open in the direction of egress and equipped with listed panic hardware? [NFPA / NEC 70 706.10(D)] Y N N/A DK

Definitions:

Approved means acceptable to the authority enforcing this checklist. The authority enforcing this checklist is the New Jersey Department of the Labor and the New Jersey Department of Education.

Approved for the purpose means determined by a nationally recognized testing laboratory, inspection agency or other organization concerned with the product evaluation as part of its listing and labeling program.

Branch circuit means the circuit conductors between the final over current device protecting the circuit and the outlet(s).

Disconnecting means refers to a device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

Energy storage systems mean one or more components assembled together capable of storing energy for use at a future time. They include but not limited to batteries, capacitors, and kinetic energy devices (e.g. flywheels and compressed air). These systems can have ac or dc output for utilization and can include inverters and converters to change stored energy into electrical energy.

Feeder means all circuit conductors between the service equipment, or the generator switchboard of an isolated plant, and the final branch-circuit over current device.

Luminaire means a lighting fixture.

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Qualified person means one familiar with the construction and operation of the equipment and the hazards involved. Whether an employee is considered to be a "qualified person" depends upon various circumstances in the workplace. It is possible and, in fact, likely for an individual to be considered "qualified" with regard to certain equipment in the workplace, but "unqualified" as to other equipment. A person who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person is considered to be a qualified person for the performance of those duties.

Raceway means a channel designed expressly for holding wires, cables, or busbars, with additional functions as permitted. Raceways may be of metal or insulating materials, and the term includes rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquid tight flexible metal conduit, flexible metallic tubing, flexible metal conduit, electrical metallic tubing, under floor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, wireways, and busways.

Service means the conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.