Electrical Systems – General Requirements

Location:

Audited by:

Date:

Item # Repair Date .

Check the box under Y for "yes" or N for "no" to determine if each item is within compliance.

<u>Y</u> <u>N</u>		<u>Y</u> <u>N</u>		
	 Is electric equipment free from recognized hazards that are likely to cause death or serious physical harm to employees? 1910.303(b)(1) Is listed or labeled equipment installed and 		11. Are internal parts of electrical equipment, including busbars, wiring terminals, insu- lators, and other surfaces, not damaged or contaminated by foreign materials such as paint, plaster, cleaners, abrasive, or corro-	
	 Is listed of labeled equipment installed and used in accordance with any instructions included in the listing or labeling? 1910.303(b)(2) 		sive residues? 1910.303(b)(7)(iii) 12. Are there no damaged parts that may adversely affect safe operation or mechan-	
	 Are completed wiring installations free from short circuits and from grounds? 1910.303(b)(3) 		ical strength of the equipment, such as parts that are broken, bent, cut, or deterio- rated by corrosion, chemical action, or overheating? 1910.303(b)(7)(iv)	
	4. Does equipment intended to interrupt cur- rent at fault levels have an interrupting rat- ing sufficient for the nominal circuit voltage and the current that is available at the line terminals of the equipment? 1910.303(b)(4)		13. Is electric equipment that depends on the natural circulation of air and convection principles for cooling of exposed surfaces installed so that room airflow over such surfaces is not prevented by walls or by	
	5. Does equipment intended to interrupt cur- rent at other than fault levels have an inter- rupting rating at nominal circuit voltage		adjacent installed equipment? 1910.303(b)(8)(ii)	
	sufficient for the current that must be interrupted? 1910.303(b)(4)6. Unless identified for use in the operating		14. For equipment designed for floor mount- ing, is clearance between top surfaces and adjacent surfaces provided to dissipate ris-	
	environment, are no conductors or equip- ment located in damp or wet locations, where exposed to gases, fumes, vapors, liq- uids, or other agents that have a deteriorat- ing effect on the conductors or equipment or where exposed to excessive tempera-		ing warm air? 1910.303(b)(8)(ii) 15. Is electric equipment provided with venti- lating openings installed so that walls or other obstructions do not prevent the free circulation of air through the equipment? 1910.303(b)(8)(iii)	
	tures? 1910.303(b)(6)	Elect	rical connections	
	7. Is electric equipment installed in a neat and workmanlike manner? 1910.303(b)(7)		16. Are devices such as pressure terminal or pressure splicing connectors and soldering	
	8. Are unused openings in boxes, raceways, auxiliary gutters, cabinets, equipment cases, or housings effectively closed to afford pro- tection substantially equivalent to the wall of the equipment? 1910.303(b)(7)(i)		lugs identified for the material of the con- ductor and properly installed and used? 1910.303(c)(1)(i)	
			17. Are conductors of dissimilar metal not intermixed in a terminal or splicing con-	
	9. Are conductors racked to provide ready and safe access in underground and subsurface enclosures that persons enter for installation and maintenance? 1910.303(b)(7)(ii)		nector where physical contact occurs between dissimilar conductors (such as copper and aluminum, copper and copper- clad aluminum, or aluminum and copper-	
	 Is electric equipment firmly secured to the surface on which it is mounted? 1910.303(b)(8)(i) 		clad aluminum) unless the device is identi- fied for the purpose and conditions of use? 1910.303(c)(1)(ii)	
		-		

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Y <u>N Marking</u>

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- □ □ 18. Are materials such as solder, fluxes, □ □ 27. Is electric equipment not used unless marked with the manufacturer's name, inhibitors, and compounds, where trademark, or other descriptive marking by employed, suitable for use and of a type that will not adversely affect the conducwhich the organization responsible for the tors, installation, or equipment? product may be identified and other mark-1910.303(c)(1)(iii) ings giving voltage, current, wattage, or other ratings as necessary? **□ □** 19. Is there a good connection of conductors 1910.303(e)(1)(ii) to terminal parts without damaging the conductors by means of pressure connec-**Q Q** 28. Is the marking of sufficient durability to withstand the environment involved? tors (including set-screw type), solder lugs, or splices to flexible 1910.303(e)(2) leads?1910.303(c)(2)(i) **Q Q** 29. Is each disconnecting means for motors and appliances legibly marked to indicate □ □ 20. Are No. 10 or smaller conductors connectits purpose, unless located and arranged so ed by means of wire binding screws or the purpose is evident? 1910.303(f)(1) studs and nuts having upturned lugs or equivalent? 1910.303(c)(2)(i) **3**0. Is each service, feeder, and branch circuit. □ □ 21. Are terminals for more than one conductor at its disconnecting means or overcurrent device, legibly marked to indicate its purand terminals used to connect aluminum pose, unless located and arranged so the identified? 1910.303(c)(2)(ii) purpose is evident? 1910.303(f)(2) **Splices** □ □ 31. Is each disconnecting mean capable of **Q Q** 22. Are conductors spliced or joined with being locked in the open position? splicing devices identified for the use or 1910.303(f)(4) by brazing, welding, or soldering with a □ □ 32. Where circuit breakers or fuses are applied fusible metal or alloy? 1910.303(c)(3)(i) in compliance with the series combination □ □ 23. Are soldered splices first spliced or joined ratings marked on the equipment by the to be mechanically and electrically secure manufacturer, are the equipment enclowithout solder and then soldered? sures legibly marked in the field to indi-1910.303(c)(3)(i)cate that the equipment has been applied with a series combination rating? □ □ 24. Are all splices and joints and the free ends 1910.303(f)(5)(i) of conductors covered with an insulation equivalent to that of the conductors or \Box \Box 33. Is the marking readily visible and does it with an insulating device identified for the state "Caution -- Series Combination purpose? 1910.303(c)(3)(i) System Rated_____Amperes. Identified Replacement Component Required?" □ □ 25. Are wire connectors or splicing means 1910.303(f)(5)(ii) installed on conductors for direct burial listed for such use? 1910.303(c)(3)(ii) 600 volts or less □ □ 26. Are parts of electric equipment that in \Box \Box 34. Is there sufficient access and working ordinary operation produce arcs, sparks, space provided and maintained about all flames, or molten metal enclosed or sepaelectric equipment to permit ready and rated and isolated from all combustible safe operation and maintenance of such material? 1910.303(d) equipment? 1910.303(g)(1)
- Notes:

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VN

<u>Y</u> <u>N</u>		<u>Y</u> <u>N</u>	
	 35. For working space for equipment that is likely to require examination, adjustment, servicing, or maintenance while energized, is the depth of the working space in the direction of access to live parts not less than indicated in Table S-1? 1910.303(g)(1)(i)(A) 36. Are distances measured from the live parts if they are exposed or from the enclosure front or opening if they are enclosed? 	 □ 44. For equipment rated 1200 amperes or more and over 1.83 m (6.0 ft) wide, containing overcurrent devices, switching devices, or control devices, is there one entrance not less than 610 mm (24 in.) wide and 1.98 m (6.5 ft) high at each end of the working space, except where the location permits a continuous and unobstructed way of exit travel, one means of exit is permitted? 1910.303(g)(1)(iv) & 	
	 1910.303(g)(1)(i)(A) 37. For working space for equipment that is likely to require examination, adjustment, servicing, or maintenance while energized, is the width of the working space in front of the electric equipment the width of the equipment or 762 mm (30 in.), whichever is greater? 1910.303(g)(1)(i)(B) 	 (g)(1)(iv)(A) 45. For equipment rated 1200 amperes or more and over 1.83 m (6.0 ft) wide, containing overcurrent devices, switching devices, or control devices, is there one entrance not less than 610 mm (24 in.) wide and 1.98 m (6.5 ft) high at each end of the working space? (Exception: Where the working space is doubled, only one entrance to the working space is required, 	
	 38. In all cases, does the working space permit at least a 90-degree opening of equipment doors or hinged panels? 1910.303(g)(1)(i)(B) 	however, the entrance must be located so that the edge of the entrance nearest the equipment is the minimum clear distance given in Table S-1 away from such equip-	
	39. Is the work space clear and extend from the grade, floor, or platform? 1910.303(g)(1)(i)(C)	 ment.) 1910.303(g)(1)(iv) & (g)(1)(iv)(B) 46. Is illumination provided for all working spaces about service equipment, switch- 	
	40. Does the other equipment associated with the electrical installation and located above or below the electric equipment extend not more than 153 mm (6 in.) beyond the front of the electric equip- ment? 1910.303(g)(1)(i)(C)	 boards, panelboards, and motor control centers installed indoors? 1910.303(g)(1)(v) 47. In electric equipment rooms, is the illumination by a means other than only automatic means? 1910.303(g)(1)(v) 	
	41. Is the working space not used for storage?	 48. Is the minimum headroom of working spaces about service equipment, switch-boards, panelboards, or motor control centers for installations built before August 13, 2007, 1.91 m (6.25 ft)? 1910.303(g)(1)(vi)(A) 	
	43. Is at least one entrance of sufficient area provided to give access to the working space about electric equipment?	 49. Are sitchboards, panelboards, and distribution boards installed for the control of light and power circuits, and motor control centers located in dedicated spaces and protected from damage? 1910.303(g)(1)(vii) 	

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<u>Y</u> <u>N</u>

<u>Y</u> <u>N</u> □ □ 57. Are live parts of electric equipment operat- \Box \Box 50. Is the minimum headroom of working ing at 50 volts or more guarded against spaces about service equipment, switchaccidental contact by use of approved cabboards, panelboards, or motor control centers for installations built on or after inets or other forms of approved enclo-August 13, 2007, 1.98 m (6.5 ft), except sures or by location in a room, vault, or when electrical equipment exceeds 1.98 m similar enclosure that is accessible only to qualified persons, by suitable permanent, (6.5 ft) in height, is the minimum headroom not less than the height of the equipsubstantial partitions or screens arranged ment? 1910.303(g)(1)(vi)(B) so that only qualified persons will have access to the space within reach of the live □ □ 51. For indoor installation, is the space equal parts, by placement on a suitable balcony, to the width and depth of the equipment gallery, or platform so elevated and otherand extending from the floor to a height of wise located as to prevent access by 1.83 m (6.0 ft) above the equipment or to unqualified persons or by elevation of 2.44 the structural ceiling, whichever is lower, m (8.0 ft) or more above the floor or other dedicated to the electrical installation? working surface? 1910.303(g)(2)(i)(A), □ □ 52. Unless isolated from equipment by height (g)(2)(i)(B), (g)(2)(i)(C) & (g)(2)(i)(D)or physical enclosures or covers that will \Box \Box 58. In locations where electric equipment is afford adequate mechanical protection likely to be exposed to physical damage, from vehicular traffic or accidental contact are enclosures or guards arranged and by unauthorized personnel, is piping, strong enough to prevent such damage? ducts, or equipment foreign to the electri-1910.303(g)(2)(ii) cal installation not located in this area? 1910.303(g)(1)(vii)(A)(1) □ □ 59. Are entrances to rooms and other guarded locations containing exposed live parts □ □ 53. For indoor installation, is the space equal marked with conspicuous warning signs to the width and depth of the equipment forbidding unqualified persons to enter? kept clear of foreign systems unless pro-1910.303(g)(2)(iii) tection is provided to avoid damage from Over 600 volts condensation, leaks, or breaks in such foreign systems? 1910.303(g)(1)(vii)(A)(2) \Box \Box 60. Are electrical installations in a vault. \Box \Box 54. Does this area extend from the top of the room, or closet or in an area surrounded electric equipment to the structural ceilby a wall, screen, or fence, access to ing? 1910.303(g)(1)(vii)(A)(2) which is controlled by lock and key or other approved means, considered to be □ □ 55. Is outdoor electric equipment installed in accessible to qualified persons only? suitable enclosures and protected from 1910.303(h)(2)(i) accidental contact by unauthorized personnel, or by vehicular traffic, or by acciden-□ □ 61. For installations other than outdoor tal spillage or leakage from piping sysenclosed equipment accessible to unqualitems? 1910.303(g)(1)(vii)(B) fied employees, is a wall, screen, or fence used to enclose an outdoor electrical **G 56**. Is architectural appurtenance or other installation to deter access by persons who equipment prohibited from being located are not qualified? 1910.303(h)(2)(ii) in the working space? 1910.303(g)(1)(vii)(B)

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<u>Y</u> <u>N</u>

- 62. Are fences not less than 2.13 m (7.0 ft) in height or made of a combination of 1.80 m (6.0 ft) or more of fence fabric and a 305-mm (1-ft) or more extension utilizing three or more strands of barbed wire or equivalent? 1910.303(h)(2)(ii)
- □ □ 63. For indoor installations that are accessible to other than qualified persons, are the installations made with metal-enclosed equipment or enclosed in a vault or in an area to which access is controlled by a lock? 1910.303(h)(2)(iii)(A)
- G4. For indoor installations that are accessible to other than qualified persons, are metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment marked with appropriate caution signs? 1910.303(h)(2)(iii)(B)
- G5. For indoor installations that are accessible to other than qualified persons, are openings in ventilated dry-type transformers and similar openings in other equipment designed so that foreign objects inserted through these openings will be deflected from energized parts? 1910.303(h)(2)(iii)(C)
- □ □ 66. Are outdoor electrical installations having exposed live parts accessible to qualified persons only? 1910.303(h)(2)(iv)
- □ □ 67. For outdoor enclosed equipment accessible to unqualified employees, are ventilating or similar openings in equipment designed that foreign objects inserted through these openings will be deflected from energized parts? 1910.303(h)(2)(v)(A)
- 68. For outdoor enclosed equipment accessible to unqualified employees, when exposed to physical damage from vehicular traffic, are suitable guards provided? 1910.303(h)(2)(v)(B)

<u>Y</u> <u>N</u>

- 69. Are nonmetallic or metal-enclosed equipment located outdoors and accessible to the general public designed so that exposed nuts or bolts cannot be readily removed, permitting access to live parts? 1910.303(h)(2)(v)(C)
 70. Where nonmetallic or metal-enclosed equipment is accessible to the general public and the bottom of the enclosure is less than 2.44 m (8.0 ft) above the floor or grade level, is the enclosure door or hinged cover kept locked? 1910.303(h)(2)(v)(D)
 71. Where nonmetallic or metal-enclosed
 - 71. Where nonmetallic or metal-enclosed equipment is accessible to the general public and the bottom of the enclosure is less than 2.44 m (8.0 ft) above the floor or grade level, is the enclosure door or hinged cover kept locked except for underground box covers that weigh over 45.4 kg (100 pounds), doors and covers of enclosures used solely as pull boxes, splice boxes, or junction boxes when locked, bolted, or screwed on? 1910.303(h)(2)(v)(E)
- □ □ 72. Is sufficient space provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment? 1910.303(h)(3)
- □ 73. Where energized parts are exposed, is the minimum clear work space not less than 1.98 m (6.5 ft) high (measured vertically from the floor or platform) or less than 914 mm (3.0 ft) wide (measured parallel to the equipment)? 1910.303(h)(3)
- □ □ 74. Is the work space adequate to permit at least a 90-degree opening of doors or hinged panels? 1910.303(h)(3)
- 75. Is at least one entrance not less than 610 mm (24 in.) wide and 1.98 m (6.5 ft) high provided to give access to the working space about electric equipment? 1910.303(h)(4)(i)

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<u>Y</u> <u>N</u>

Notes:

<u>Y</u> <u>N</u> □ □ 83. Are switches or other equipment operating **D D** 76. On switchboard and control panels at 600 volts, nominal, or less, and serving exceeding 1.83 m (6.0 ft) in width, is there only equipment within the high-voltage one entrance at each end of such boards unless the location of the switchboards and vault, room, or enclosure installed in the high-voltage enclosure, room, or vault if control panels permits a continuous and unobstructed way of exit travel, or unless accessible to qualified persons only? 1910.303(h)(5)(ii) the work space is doubled? 1910.303(h)(4)(i)(A) □ □ 84. For entrances to buildings, rooms, or \Box \Box 77. Where one entrance to the working space enclosures containing exposed live parts or exposed conductors operating at over 600 is permitted, is the entrance located so that volts, nominal, are the entrances kept the edge of the entrance nearest the locked unless they are under the observaswitchboards and control panels is at least tion of a qualified person at all times? the minimum clear distance given in Table 1910.303(h)(5)(iii)(A) S-2 away from such equipment? 1910.303(h)(4)(i)(B) □ □ 85. For entrances to buildings, rooms, or \Box \Box 78. Where bare energized parts at any voltage enclosures containing exposed live parts or or insulated energized parts above 600 exposed conductors operating at over 600 volts, nominal, to ground are located adjavolts, nominal, are permanent and conspicuous warning signs provided, reading cent to such entrance, are they suitably "DANGER -- HIGH VOLTAGE -- KEEP guarded? 1910.303(h)(4)(i)(C) OUT?" 1910.303(h)(5)(iii)(B) **79**. Are permanent ladders or stairways pro-□ □ 86. For entrances to buildings, rooms, or vided to give safe access to the working enclosures containing exposed live parts or space around electric equipment installed on platforms, balconies, mezzanine floors, exposed conductors operating at over 600 or in attic or roof rooms or spaces? volts, nominal, is illumination provided for all working spaces about electric equip-1910.303(h)(4)(ii) ment? 1910.303(h)(5)(iv) **Q Q** 80. Is the minimum clear working space in the direction of access to live parts of electric □ □ 87. For entrances to buildings, rooms, or enclosures containing exposed live parts or equipment not less than specified in Table exposed conductors operating at over 600 S-2? 1910.303(h)(5)(i) volts, nominal, are the lighting outlets □ □ 81. Are distances measured from the live arranged so that persons changing lamps parts, if they are exposed, or from the or making repairs on the lighting system enclosure front or opening, if they are will not be endangered by live parts or enclosed? 1910.303(h)(5)(i) other equipment? 1910.303(h)(5)(iv)(A) □ □ 82. If switches, cutouts, or other equipment □ □ 88. For entrances to buildings, rooms, or operating at 600 volts, nominal, or less, enclosures containing exposed live parts or are installed in a room or enclosure where exposed conductors operating at over 600 there are exposed live parts or exposed volts, nominal, are the points of control wiring operating at over 600 volts, nomilocated so that persons are prevented from nal, is the high-voltage equipment effeccontacting any live part or moving part of tively separated from the space occupied the equipment while turning on the lights? by the low-voltage equipment by a suit-1910.303(h)(5)(iv)(B) able partition, fence, or screen? 1910.303(h)(5)(ii)

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- 89. For entrances to buildings, rooms, or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal, are unguarded live parts above working space maintained at elevations not less than specified in Table S-3? 1910.303(h)(5)(v)
- 90. For entrances to buildings, rooms, or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal, are pipes or ducts that are foreign to the electrical installation and that require periodic maintenance or whose malfunction would endanger the operation of the electrical system not located in the vicinity of service equipment, metal-enclosed power switchgear, or industrial control assemblies? 1910.303(h)(5)(vi)
- 91. Is protection provided where necessary to avoid damage from condensation leaks and breaks in such foreign systems? 1910.303(h)(5)(vi)

