Communications Electrician (3686)
Task List (2024)

1. Maintains, repairs, installs, configures, troubleshoots, tests, and inspects the following types of equipment or systems using test equipment such as data analyzers, network testers, electrical meters, spectrum analyzers, etc. in order to keep them in proper working order:

    a. Dispatch systems, microwave and radio communications, transmitters/receivers, and antennas
    b. Telephony instruments, Voice Over Internet Protocol (VOIP), trace wiring, and voicemail systems
    c. Supervisory Control and Data Acquisition (SCADA), Channel banks/Digital Access Cross Connect System (DACS) and Remote Terminal Unit (RTU)
    d. Data network systems (Local Area Networks (LANs), Wide-Area Networks (WANs), Wireless Access Points (WAP), cloud, fiber optics, Switch Optical Network(SONET), routers, switches, Uninterruptible power supplies (UPS), and routers),network and cloud management systems, and data transmission systems.
    e. Mobile data systems and terminal

2. Locates issues in equipment and circuits using hand tools, power tools, and electronic test equipment such as computers, transmission level and frequency meters, return loss measuring equipment, data transmission test equipment, pulse generators, communications service monitor, analyzers, oscilloscopes, signal tracers, signal/sweep generators, in order to repair various communications systems.

3. Notifies supervisor orally, visually through hand signals and signage or through written communication of unsafe working conditions such as exposed wiring, asbestos, lead contaminants, and other hazardous materials.

4. Constructs, assembles and fabricates test panels, relay racks, and communications equipment such as switches, fiber optic patch panels, and Cat-6 cables in communication sites and vehicles by using various hand and power tools such as toners, punch-down tools, two paired wire, etc., in order to maintain and ensure operability and functionality of the communications systems.

5. Modifies, relocates, reterminates, tests, certifies and performs preventative maintenance on communications systems such as radio and radio microwave systems, fiber optic panels, and electronic equipment in order to conform to new standards, rules, and laws (i.e. the Federal Communications Commission (FCC), the Federal Aviation Administration (FAA), the California Division of Occupational Safety and Health (Cal OSHA), the Electronic Industries Alliance (EIA), and the Telecommunications Industry Association (TIA)) and meet changing needs of a communications system.

6. Completes written reports (e.g. work management system), forms, drawings and emails of work in order to document system configurations and maintenance history.

7. Creates and updates communications equipment locations and cable records as required manually or electronically (e.g. AutoCad, backup files) in order to document system configuration.

8. Drives an automobile, truck, or snow vehicle to perform work at hilltop communications sites and remote areas.

9. Receives service requests such as moves, adds and changes (MAC) from users, orally or by written communications, and evaluates, recommends or refers service requests in order to make repairs and changes to systems or communications equipment.

10. Maintains, repairs, installs, troubleshoots and replaces equipment such as power amplifiers, transceivers, receivers, cabling, splice cases, routers and switches located at heights where ladders and aerial lifts are required in order to maintain and ensure operability and functionality of the communications systems.

11. Documents work performed in order to ensure that work is in compliance with regulatory agencies such as the Federal Communications Commission (FCC), the Federal Aviation Administration (FAA), the California Division of Occupational Safety and Health (Cal OSHA), City, and departmental rules and regulations by keeping and updating electronic and manual logs, and as-built documentation.

12. Tests and configures newly installed, repaired, or updated equipment such as radio, radio microwave, network switches, routers and phone equipment to ensure that it functions properly and conforms to specifications using test equipment and observation.

13. Analyze test configuration readings from system alarms and trouble reports to assess and determine equipment repair needs.

14. Inspects, replaces, and repairs antenna systems to ensure proper working conditions by using specialized equipment such as Time Domain Reflectometers (TDR), Voltage Standing Wave Ratio (VSWR) meters, Frequency Generators and cable testers and analyzers.

15. Coordinates the service of contractors for the installation or repair of communications systems and equipment, including coordination of work schedules, performance records, verification, and evaluation of work performed.

16. Works in hazardous locations with potentially hazardous tools, power tools, equipment, and materials such as fiber optics, exposed electrical wires, and radio frequency radiation.

Radio Communications

17. Test radio equipment functions and parameters such as signal strength and audio quality, transmission capacity, interference, and signal delay using equipment such as communications service analyzers/monitors, oscilloscopes, circuit analyzers, frequency meters, watt meters, and spectrum analyzers in order to maintain and ensure operability and functionality of the communications system.

18. Installs, configures, programs, tests, adjusts, and repairs fixed and mobile radio equipment systems such as P25 trunking and conventional two-way radios using Customer Service Management (CSM) and test equipment.

19. Examines, tests and troubleshoots malfunctioning radio equipment and faulty power sources to locate defects such as loose connections, broken wires, or defective components, using schematic diagrams and test equipment.

20. Tests, adjusts, configures, and performs preventative maintenance on receivers and transmitters to system specifications and the Federal Communications Commission (FCC) regulations using radio test equipment.

21. Mounts antennas and radio equipment on transmission towers or vehicles by hoisting, lifting, or carrying such equipment and using engineering drawings or instructions from the manufacturer.

22. Investigates radio and television interference caused by power transmission lines to comply with Federal Communications Commission (FCC) rules and regulations using frequency monitoring devices, spectrum analyzers, network based testers and antennas.

Data and Voice Network

23. Troubleshoots, maintains, repairs, or replaces faulty equipment such as defective and damaged voice sets, copper or fiber optic cables, and associated equipment in order to maintain and ensure operability and functionality of the communications system.

24. Programs, troubleshoots, installs, repairs, and performs routine adds, moves, and changes (MACs) to Voice Over Internet Protocol (VOIP) and voicemail systems using punch-down tools, toners, network analyzers and cable testers.

25. Analyzes and troubleshoots IP networks using simple network management protocol (SNMP), network management systems, wireless scanners and portable network analysis, and troubleshooting tools such as T-carrier testers, power meters, Optical Time Domain Reflectometers (OTDR), laptops, cable testers, cloud based software and packet analyzers in order to construct, maintain, and/or troubleshoot IP networks.

26. Identifies and recommends areas of operation that need upgraded equipment such as routers, switches, uninterruptible power supply (UPS), wireless access points (WAP), fiber optic, and copper cabling through operability/functionality tests such as Optical Time Domain Reflectometers (OTDR), meter tests, signal level tests, and other system specific testing equipment, visual inspection, feedback from the users, and analysis of trouble tickets.

27. Installs, troubleshoots, maintains and configures routers, switches, wireless access points, UPS power supplies, and fiber optic transport systems such as Switch Optical Network (SONET) equipment using network test equipment, tools, and laptops.

28. Terminates, tests and certifies copper or fiber optic cables and installs fiber and copper patch panels using punch-down tools and splice kits in order to install test and repair networks.

29. Monitors, inspects, and performs preventative maintenance on all data, voice and wireless networking devices throughout the City using network analyzers and other network tools.

Security and Audio/Video

30. Maintains, repairs, installs, configures, tests, and inspects the following types of equipment or systems using cable testers, network analyzers, video monitors, audio speakers and toners:

    a. Video (Security cameras (IP), Process control, CATV/MATV, IPTV and Information display systems) and VMS (Video Management Systems)
    b. Audio/Video systems (public address, audio/video processors and matrix switching, emergency notification systems)
    c. Access control and monitoring system (ACAMS)
    d. Intrusion and Panic alarm systems
    e. Environmental alarms, temperature alarms, humidity alarms and water level alarms