UTILITIES & ENERGY SERVICES
TEXAS A&M UNIVERSITY

# Design Standard

# Medium-Voltage Electrical Service & Distribution

**This standard was revised on May 16, 2017, and the latest changes are underlined. Please refer to Part 4 of this standard for full revision history.**

## PART 1 - OPERATING CHARACTERISTICS

**1.01** The medium-voltage electrical service and distribution system that serves Texas A&M is owned by the university and is operated as an electric utility system in the manner by which power is distributed and utilized at the point of delivery. The operating characteristics, grounding, load connections, utilization voltages, and short-circuit current available at the point of service vary. This information is summarized in the following table:

**Texas A&M University**
**Electric Utility Distribution System Characteristics**

| Item | Information / Description |
|---|---|
| Nominal Voltage | 12.47 kV, 3-phase, 4-wire, delta / low-resistance-grounded wye, 60Hz |
| Grounding | Low-resistance-grounded wye |
| Load Connections | ΔY Delta-Y |
| Elec. Utility Co. / Provider | TAMU Utilities & Energy Services |

## PART 2 - DESIGN GUIDANCE

**2.01** Confirm the available short-circuit current at the point of service or connection to the existing utility source from the manager of UES Electrical Services.

*Note: For projects that require one or more medium-voltage transformers to supply low-voltage power to a building or facility, it is generally acceptable to assume for design purposes, in the calculation of maximum short-circuit current, that the utility source has an infinite bus impedance relative to the secondary windings of each medium-voltage transformer supplied from it. Refer to IEEE 242, Section 2.7 for additional information and guidance on the calculation of short-circuit values.*

**2.02** Medium-voltage distribution circuits in the well-developed areas of a campus generally consist of multiple single-conductor insulated copper conductors routed in a multi-duct underground ductbank/manhole system with radial and

looped circuits switched manually via sectionalizing switchgear (underground or above ground medium voltage switches).

**2.03** The switchgear supply power from the campus utility distribution system "grid" to the primary windings of one or more medium-voltage transformers located within the project site through an extension of the underground ductbank/manhole system.

**2.04** Major loads in such areas may have dedicated radial feeders from utility substations. Distribution circuits in less developed areas typically provide electrical services to individual buildings and other permanent structures radially from aerial conductors; however, the installation of permanent overhead distribution is not permitted for new construction at any campus. Any new proposed aerial lines will require UES approval and depending on location, approval by the Council for the Built Environment.

**2.05** The portion of the utility distribution system supplying a typical TAMU project originates at the point of service or connection to the existing campus-owned utility supply line via switchgear and terminates at the primary windings of the medium- voltage transformer(s) that serve(s) the project load at a lower utilization voltage.

**2.06** Depending on the magnitude of the load and the level of reliable normal power required for the project, one or both of the switches positions may be used to supply the building or buildings from one or two service transformers.

**2.07** Smaller buildings that do not require more than an average level of service reliability are usually served by a single transformer via one radial feeder from the switchgear, in which case the other switch may be reserved as a spare to supply temporary backup power to the building.

**2.08** Buildings that require two service transformers, either because of a high demand load and/or a requirement for a high level of service reliability, are most often served by two radial feeders that each emanate from one of the two switch positions.

**2.09** Additional alternatives for supplying one or more buildings from the utility distribution system are possible because TAMU standards require that all medium-voltage transformers be provided with loop/dual-feed primary bushings.

**2.10** Unless noted otherwise in the project-specific Program of Requirements (POR), any modifications necessary to extend or upgrade the campus utility distribution system to supply electrical service to a new project or project site must be fully funded by that project. Therefore, all utility distribution system components including cables, duct banks, manholes, switchgear, service

transformers, equipment pads, and similar construction items necessary to support or contain utility system components must be furnished and installed by the Construction Contractor selected for each project.

## PART 3 - MINIMUM CLEARANCE REQUIREMENTS

**3.01** No structures or facilities are to be built or placed underneath existing or new overhead utility lines or on top of existing or new electrical manholes and duct banks. [1]

**3.02** The project is required to maintain a minimum clearance of 20 feet from the closest point of any existing underground or overhead electric utility infrastructure. Ten feet of clearance is required in front of transformer and switch doors. [1]

**3.03** The project shall bear all costs associated with electric utility infrastructure modifications required to maintain minimum clearances defined above. [1]

**3.04** Assistance in locating existing electric utility infrastructure on a proposed project site can be obtained from the Technical Services group at Utilities and Energy Services at 979-862-4604. [1]

**3.05** Written approval from Utilities and Energy Services is required for any waiver from these minimum clearance requirements. [1]

## PART 4 - REVISION HISTORY

| Revision # | Date | Location | Brief Description |
|---|---|---|---|
| 1 | 5/16/2017 | Part 3 | Minimum clearance requirements added to standard. |