



Procedure Statement

Per understanding with the Ohio Department of Commerce Division of Industrial Compliance (ODIC), Facilities Operations and Development's (FOD) Utilities Division is the authority having jurisdiction (AHJ) for Columbus campus primary electrical service distribution system. This procedure defines the internal FOD review and AHJ inspection procedures necessary to manage the risk associated with Primary Electrical Service construction work. The goal of this procedure is to ensure that new primary electrical service construction meets the safety and reliability requirements defined in the university's Building Design Standards and applicable State and National Codes.

Compliance with this procedure is a required component of the mitigation strategy to the risks that improperly installed electrical systems pose, namely (a) injury or fatality to staff, contractors, students, or visitors and (b) electrical service interruptions to critical Wexner Medical Center, research, animal care, student housing, and other university operations. Risks inherent to construction activities will be addressed in the FOD Construction Risk Assessment Process Guidelines. Risks associated with Building Operation or Utility outages after occupancy are addressed in the [What if Risk Assessment for Utility Changes](#).

Definitions

1. AHJ – Authority Having Jurisdiction
2. BDS - Building Design Standards of The Ohio State University (fod.osu.edu/bds)
3. FDC - The Design and Construction group of the university's Facilities Operations and Development department.
4. Laterals - Electrical distribution cable installed to distribute power from the Primary Circuit Feeder (Pair) to the incoming switches on the Primary Select Switch for each building.
5. Loadways - Electrical Distribution cable installed to distribute power from the load side switches on the Primary Select Switch to the building transformers.
6. ODIC - Ohio Department of Commerce Division of Industrial Compliance
7. Primary Circuit Feeder Pair (Mains) - Reactor Limited 13.2 kV electrical distribution circuits installed in underground duct-banks to distribute power to multiple buildings from a central substation location.
8. Primary Disconnect Switch - The fused disconnect switch applied to the high voltage side of the Primary Transformer and used to isolate the primary transformer from the Loadway cable.
9. Primary Select Switch - The switch in the electrical distribution system used for Primary Circuit Feeder alignment and building isolation.
10. Primary Service (Connection) - The electrical connection to the university electrical distribution system. It covers from the Primary Circuit Feeder Pair to the Secondary Main Circuit breakers.



11. Primary Transformer - The 13.2 kV transformer provided to power the individual building loads at low voltage levels (480 or 208 VAC)
12. Qualified Technical Personnel - A person with the training and experience to perform electrical testing as defined by the National Electric Testing Association (NETA).
13. Secondary Mains - The fault interrupting circuit breaker or fused disconnect device powering the building switchgear from the load side of the building Primary Transformer.

Requirements

This procedure applies to any facility supplied power from the main campus system. It does not address building emergency power requirements or provisions for standby electrical service.

Facilities supplied power from the university 13.2 kV distribution system shall be fed from one (preferred) circuit of a feeder pair through a Primary Select switch. This switch shall be equipped with an automatic transfer feature capable of detecting circuit failure and transferring facility loads over to the remaining (alternate) feeder circuit. Assignment of preferred and alternate feeder circuit and the decision to enable the automatic transfer feature are the province and responsibility of the university's Utilities High Voltage Services (UTHVS). The decision to enable automatic transfer or provide alternate connections to the 13.2 kV distribution shall be based on distribution system capacity, feeder capacity, and the intended use of the facility.

All portions of the Primary Service to any facility connected to and powered from the Ohio State Medium Voltage Distribution System (13.2 kV) shall conform to the university's Building Design Standards as stipulated in Division 33 of that document and further clarified or defined in documents referenced therein. Primary Service to such facilities is under the control and at the discretion of the university's Utilities High Voltage Services as AHJ for electrical systems, 600 V and above. The Design Authority (Project Architect/Engineer) shall consult on the design intent with UTHVS regarding the sizing and configuration of the primary service. UTHVS, in consultation with the facility Design Authority, shall establish the required Primary Selective switch configuration for each Primary Service during schematic design and before design development based upon a careful evaluation of building service requirements and what is appropriate for the campus power system.

All on-site sources of electrical generation (emergency, standby, photovoltaic, or other) shall be designed to avoid accidental back feeding into the 13.2 kV Primary system. Switching, control, and protection of distributed generation shall be reviewed, inspected, and approved by UTHVS. Download [Utilities Distributed Generation Checklist](#).

ODIC, as AHJ for building electrical systems below 600 V, performs electrical inspections for new construction downstream of new primary service connections.

Primary Service Connections are subject to inspection and denial of services for any non-conforming or substandard installation in accordance with published requirements. UTHVS shall place the security of the Power System, safety, and continuity of service for the university as a whole over the preferences or operational concerns of any one facility or complex of facilities.



Responsibilities

- A. Utilities High Voltage Services (UTHVS)
1. UTHVS shall review and concur on relay protection and fuse coordination settings and the documentation of such. Protection and coordination settings shall meet BDS requirements before construction documents are approved.
 2. UTHVS, as part of their installation compliance inspection process, shall inspect all vaults, manholes, duct bank, and conduit installation work before and during pouring of the encasing concrete.
 3. UTHVS shall inspect Primary Service before the new facility's connection to the university's medium voltage distribution system. The inspection shall include all portions of the medium voltage circuits, circuit connections, switching devices, and connected equipment, such as primary transformers, disconnect switches, fuses, bus work, high side metering, and surge arrestors. The inspection shall extend to the secondary main disconnect device(s), their control, protective functions, settings, ratings, and application. Two Primary Service Connect Checklists (Construction, Permanent) are considered part of this procedure and are available for download: [Construction Power Checklist](#) [Permanent Power Checklist](#)
 4. UTHVS shall review the inspection results and authorize service if the installation meets the appropriate standards and no substandard practices, workmanship, or non-conforming conditions are discovered. The existence of an approved service authorization shall not relieve the equipment manufacturer or installation contractor of their warranty responsibilities, nor shall it relieve the Architect Engineer of their design responsibilities to insure that secondary connected loads do not exceed the primary system capacities and characteristics (e.g., cable ampacity, transformer impedance, relay coordination, etc.).
 5. UTHVS shall perform all primary switching operations on the Medium Voltage System and equipment. This includes all switching associated with primary service disconnect, commissioning, initial service connection and post commissioning facility operation.
 6. UTHVS will not energize any temporary service or permanent building service without a signed Ohio Department of Commerce Division of Industrial Compliance Electrical Inspection green sticker affixed to the secondary side meter face. This green sticker shall have the State of Ohio's inspector's signature on it and shall have been placed on the electrical meter by the State of Ohio Electrical Inspector.
- B. Design and Construction (FDC)
1. FDC shall communicate this Procedure and the requirements herein to the Design Authority and the Construction Contractors for FDC-managed projects.
 2. FDC shall coordinate design requirements with the customer(s), Design Authority, and UTHVS.
- C. Design Authority (Project Architect/Engineer)
1. The Design Authority for a new or renovated facility shall provide medium voltage primary circuitry protection, dielectric and system test requirements, and switching capabilities acceptable to UTHVS. The operation of this circuitry shall be tested or otherwise demonstrated and commissioned by the project with the supervision and facilitation of UTHVS, so UTHVS can substantiate its determination that the installation meets requirements and is acceptable before placing the primary service circuits into service.
 2. The Design Authority for a new or refurbished facility shall provide secondary Main to Primary fuse coordination. Secondary side faults shall be detected and cleared by the secondary Main



breaker or a downstream device early enough to avoid Primary Transformer fuse operation or degradation.

3. The Design Authority for the facility shall be required to produce documentation, including fault current calculations, relay, and fuse current-time characteristics and equipment fault ratings to demonstrate to UTHVS that appropriate protection and switching/interrupting capability, selectivity, and coordination exists on the secondary side of the Primary Distribution Transformers. Secondary Main circuit breakers, switching, and protective devices shall have been installed, inspected, and tested in accordance with NETA requirements by qualified technical personnel. All protective device settings and equipment ratings shall have been reviewed and approved by a Registered Professional Engineer accountable to the university.

D. Construction Contractors

1. The Contractor shall maintain and make available documentation, including equipment specifications, purchase requisitions, bills of lading, and manufacturer's drawings adequate to demonstrate to university representatives that all materials and supplies used on the 13.2 kV system installation meet BDS standards.
2. Contractor shall maintain and make available to university representatives the certifications and qualifications of all contractor personnel involved in performing Medium Voltage terminations and splices.
3. The Contractor shall provide a minimum 2-week advance notification of their intention to pour concrete duct bank, with confirming notification given to UTHVS and the Project Manager four hours before the pour. Pouring shall not proceed without UTHVS representative present for inspection and approval. Documented notification shall be provided to the Project Manager and UTHVS via e-mail or fax.
4. The Contractor shall obtain and have on-site the review of all required State of Ohio building permits.
5. The Contractor shall have the temporary service or permanent building service inspected by the State of Ohio Department of Commerce Division of Industrial Compliance Electrical Inspector and shall have approved electrical permits signed by the State electrical inspector before energizing by OSU UTHVS.

Resources

For questions and consultation, contact the Senior Director of Utilities (614-292-4509), Utilities Technical Director (614-247-2489), or Manager of High Voltage (614-247-2103).