SINGLE-LINE DIAGRAMS

Electrical Engineering Services

BENEFITS

Manage Power Distribution and Ensure Compliance

Power distribution systems are complex electrical networks of energy composed of many intricate elements that can malfunction in an instant. If your facility is like most, equipment and loads are continually added or removed in small increments, constantly changing your electrical infrastructure. The net effect of these changes is not always apparent until some part of the system becomes overloaded or exhibits other problems. Many times circuits are added without appropriate modifications of the standard settings on the associated upstream circuit breakers. Regardless of which protective devices you use, they must be coordinated with regard to their time/current curves and with each other. The single-line diagram provides the road map to enable proper protection and system reliability.

Benefits

- Highlights potential risks before a problem occurs
- Ensures critical response plans work effectively
- Keeps facility compliant with code regulations
- Ensures optimum system performance, efficiency, and safety

Establish your road map for reliability

The single-line diagram is the first step to understanding and correcting any issues that may exist with your electrical infrastructure. An effective single-line diagram clearly shows how the main components of the electrical system are connected, including redundant equipment and available spares. It shows a correct power distribution path from the incoming power source to each downstream load. This includes the ratings and sizes of each piece of electrical equipment, their circuit conductors, and their protective devices. With an up-to-date single-line diagram, you can properly and safely maintain your equipment and ensure compliance with industry regulations including NFPA 70E. Whether your data center is new or existing, the single-line diagram becomes your lifeline when responding to an emergency and helps coordinate all future testing.

Our single-line diagram services include:

- Site survey
- Single-line diagram development
- Single-line diagram review and update
- Compliance and safety check

Site Survey

Performing an on-site survey of your electrical system is the first step to creating or updating a single-line diagram. Trained Vertiv™ technicians collect information to determine the elements that need to be deleted or added in the overall schematic. Doing this creates a building block of knowledge. Once the survey is complete, our team will create a new, professional single-line diagram for your records. The site survey services are as follows:

- Inventory all equipment
- Confirm all loads connected to emergency/standby feeders
- Verify potential single-points of failure
- Evaluate overall system design and determine whether the system can be maintained without shutdown
- Verify that a process to maintain up-to-date drawings is in place
- Update customer-provided single-line diagrams and provide an AutoCAD formatted version
- Provide a report of findings with any recommended actions

Single-Line Diagram Development

The single-line diagram is the blueprint for electrical system analysis. It is the first step in preparing a critical response plan, allowing you to become thoroughly familiar with the electrical distribution system layout and design in your data center. A typical diagram will include:

- Incoming lines showing voltage and size
- Incoming main fuses, potheads, cutouts, switches, and main/tie breakers
- Power transformers (rating, winding connection, and grounding means)
- Feeder breakers and fused switches
- Relays (function, use and type)
- Current and/or potential transformers with size, type and ratio
- Control transformers
- All main cable and wire runs with their associated isolating switches and potheads (size and length of run)
- All substations, including integral relays and main panels with total load of each feeder and each substation
- Critical equipment voltage and size (UPS, battery, generator, power distribution, transfer switch, computer room air conditioning)

Single-Line Diagram Review and Update

Following a site survey, Vertiv engineers will update existing single-line diagrams or complete electrical system drawings as needed. This update will incorporate any changes to the infrastructure, note load changes, add missing components, and correct inaccurate information.

Compliance and Safety Check

Many electrical systems transform over time causing concern for safety issues. That's why NFPA 70E requires an accurate single-line diagram for each facility. Our staff of highly trained professionals put their end-to-end data center expertise and knowledge of electrical industry code regulations to use to ensure compliance and safeguard your business.

Summary

If your critical facility is like most, your electrical infrastructure is continually changing. Your single-line diagram should change with it. Ensuring your single-line diagram is current and maintained in a legible condition is a requirement from the National Fire Protection Association (NFPA). Simply put, it is essential for electrical safety in the workplace. By having an accurate single-line diagram you enable proper protection and system reliability.

Ordering Information

To learn more about this service and other Vertiv solutions, visit VertivCo.com or call 1-800-543-2378.

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