

# Redundant Power Supply

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System Planning

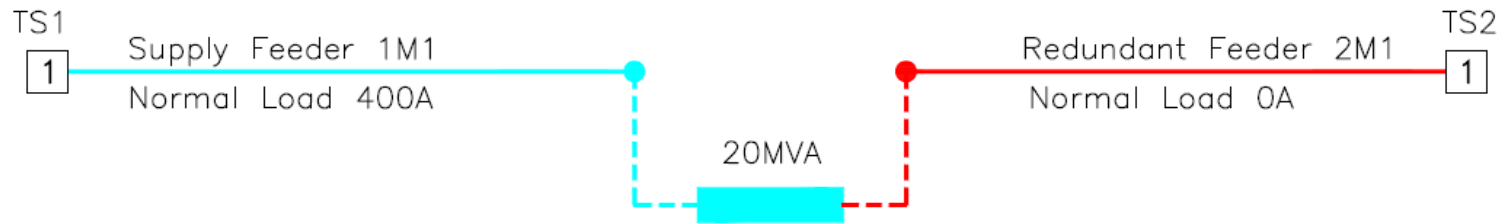
# Redundant Power Supply

- Some large customers seek enhanced reliability through supply alternatives:
  - Load displacement – equipment installed by the customer at the customer's site
  - Redundant power supply – customer requests access to supply from two different supply points with availability at all times.
- Redundant power supply requires a customer's facility to be supplied two supply points.
  - Each of the power supply points will have the normal capacity capable of supplying the entire facility on its own – allows for full redundancy even if one power supply point goes down.
  - Alternatively, the site may be powered at half capacity by 2 supply points and if one is powered off, the facility will still be powered at full capacity

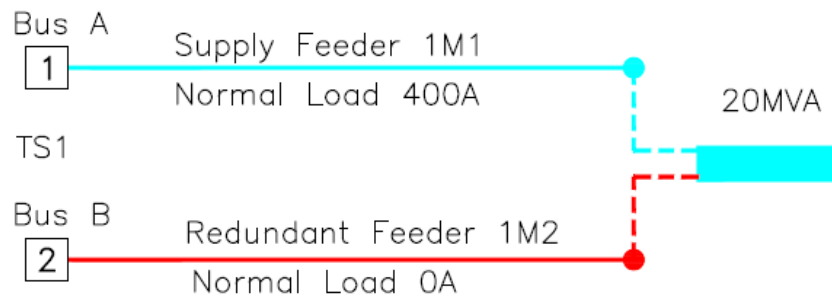
# Redundant Supply Schematics

Redundant supply plan for 20MVA load supplied by 27.6kV feeders that have a normal capacity of 20MVA.

## 1. Redundant Supply from Different Stations



## 2. Redundant Supply from the Same Station



# Utility Concerns

- The capacity is **guaranteed to the customer at all times.**
  - The utility has to reserve the station and feeder capacity and therefore is not able to reassign the capacity by connecting any other customer to the redundant supply.
- The utility cannot recover the costs associated with the redundant capacity.
  - For example, revenues are recovered for 20MVA load, while there is 40MVA capacity guaranteed to the facility.





# Redundant Supply Customer Requirements

- Load Displacement customers need continuing service for the portion of usage that is not provided by the onsite generator, as well as service for periods of scheduled or unscheduled outages.
- Redundant Supply customers are “full requirements” customers, as they receive all of their electricity from the utility or via the grid.
- Redundant Supply customers typically would require substantially larger contingency reserves to serve load during outages.
- Utility’s system must be designed to accommodate the customer’s potential coincident peak demand. This creates a risk of stranded assets.

# Rate Design Considerations

- Electricity rates should allow utilities to recover the cost from the customers who use more electricity, and who may value reliability more. If costs are not recovered from these customers, these costs will otherwise be borne by all other customer classes.
- Electricity rates should be consistent with the customer-related, demand-related and energy-related costs per unit, as determined by a utility's cost allocation model.
- Provision of redundant supply carries fixed and variable costs for utilities:
  - **Fixed Component:** these customers should pay a share of the fixed capacity cost of the assets that are available to them, as utilities incur large fixed costs of having available capacity to service these customers.
  - **Variable Component:** utilities must design system assuming that potential coincident peak demand (secondary supply point) is equal to the actual demand that is met by the first supply point. As such, demand-related costs associated with redundant supply are equal to the demand-related costs for actual supply.