

CHAPTER 8

STATION ELECTRICAL POWER

8.1 GENERAL

Power requirements for technical equipment are to be furnished in the BESEP (chapter 1) for use by the electrical power design agency, NAVFAC. Power sources and system distribution are planned and designed by NAVFAC guided by the requirements of the BESEP. Although the station power may be supplied by a combination of the types shown in table 8-1, primary power is usually supplied by a commercial power company. The design of the power distribution system within the station is accomplished by grouping equipments into load categories and feeding each load category from a separate bus. The general types of load categories are shown in figure 8-1. The decision to select a commercial company to supply the station power is based upon an investigation of the company's ability to meet the requirement. Factors for determining the adequacy of a commercial power company are contained in NAVFAC DM-4—"Electrical Engineering." MIL-HDBK 411 provides considerations for use in the design, installation, and acceptance of power subsystems for Department of Defense long haul DCS communications facilities.

8-2 DEMAND LOAD

The demand load for electronic equipments is 100% of the technical load.

8.3 POWER REGULATION

The need to specify power regulation beyond normal commercial standards should be carefully evaluated. When a high degree of power regulation is required it must be carefully defined and its use must be strictly limited to the purpose intended.

8.4 NO-BREAK POWER

No-break power (Class D) is normally provided for each Communication Center and for other communication facilities on a case basis. The following general equipments/systems will be served by either Class D or floating battery power with specific equipments indicated in BESEP:

- (a) Synchronous equipment which requires lengthy manual resynchronization procedures.
- (b) The technical load of Technical Control Facilities which serve critical circuits along with the associated Patch and Test Facilities which are required to maintain operation of these critical circuits.
- (c) All AUTOVON, AUTODIN and other switches as determined by competent, operational authority. In the case of large multifunction switches such as LDMX and NAVCOMPARS, a selective use of Class D power to ensure critical service should be investigated.

Table 8-1. Station Power Sources

CLASS	TYPE	SERVICE	DISTRIBUTION LOAD	LOAD CAPACITY	LOCATION	PRIME MOVER	SPARES	FUEL STORAGE	START AND CONTROL
Off Station	Primary	Preferred total station power supply	Separated buses	125% of station demand load	Off station		Alternate service route		Synchronous control for switching to and from station power.
A	On Station Primary	Provides total station power requirement when off station power not acceptable	Separated buses	125% of station demand load	Within station boundary. 5 mi from receivers 1500 ft from comm. bldgs.	Low speed diesel 450-900 RPM	2 units, one for maintenance, one for standby	Continuous supply with 30 days on hand	Synchronous control for switching between station and class B power.
B	Auxiliary	Provides standby power to cover extended (days) outage of primary power	Separated buses	125% of demand load to which connected	Near primary substation. Adequate noise and vibration isolation.	Low speed diesel 450-900 RPM	1 unit, in standby or maintenance.	15 days refillable	Automatic starting at primary power variation of $\pm 10\%$ of design voltage or $\pm 3.33\%$ of design frequency for 5 seconds.
C	Auxiliary	Provides power on a quick start basis (10-60 sec) to cover short term outages (hrs) of primary power	1 bus up to 300 kW 120/208 volts. 1 bus up to 600 kW 277/480 volts.	125% of technical load	Adjacent to or within bldg served. Collocated with Class D.	High speed diesel 900-1800 RPM vibration isolation mounting	Not required. May provide 1 unit for maintenance.	7 days refillable	Automatic starting under same conditions as Class B above. When capable of supplying critical technical load a means to synchronize between Class D and C units is required.
D	Primary critical technical load	Provides uninterruptible (no-break) power within specified voltage and frequency tolerance	1 bus at voltage of station critical technical load.	125% of critical technical load	Same as Class C	High speed diesel 900-1800 RPM vibration isolation mounting	One unit in standby or maintenance. Emergency backup from station primary power.		Automatic synchronizing between standby and inservice unit. Automatic sensing of primary power and automatic power and automatic shifting to and from primary station power.

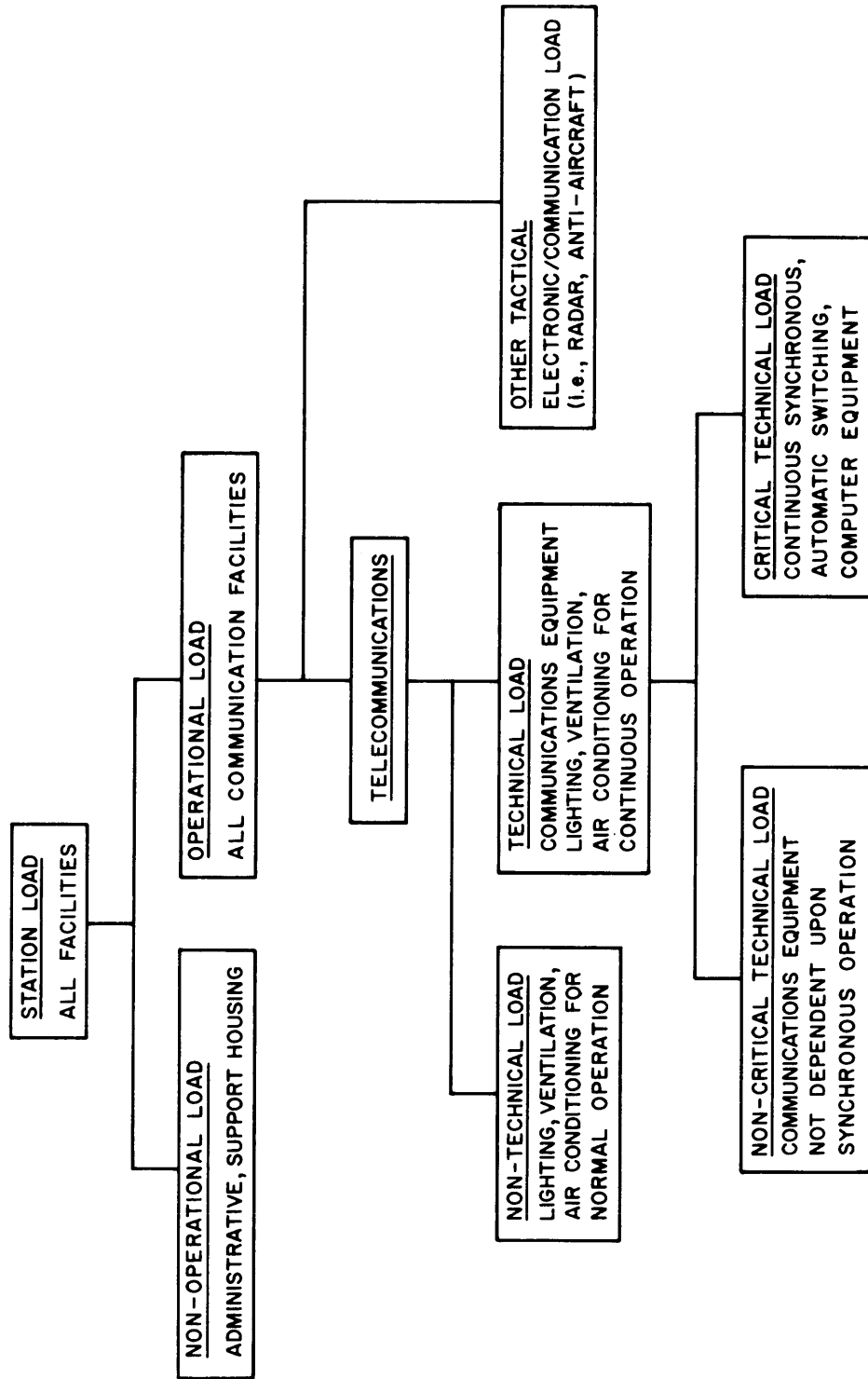


Figure 8-1. Electrical Load Categories

(d) Equipment serving critical transmission links (such as microwave) and critical circuits. The term critical refers to validated operational requirements for continuity of service in excess of that which can be provided by Class C power.

8.5 EMERGENCY POWER

Emergency power (Class C) systems are used to enable rapid restoration of power to the technical load. Class C power is usually required for each separate communications facility.

8.6 POWER CONDITIONING FOR SECURE COMMUNICATIONS

Power used to supply equipments that process Red information may require special conditioning to ensure communications security. NAVELEX Instruction 011120.1 is the controlling document governing power conditioning, and it specifies the conditions under which power feeders are to be enclosed within ferrous shielding. The BESEP should specify ferrous shielding for power feeders and special conditioning of power only as required by the effective edition of NAVELEX Instruction 011120.1.