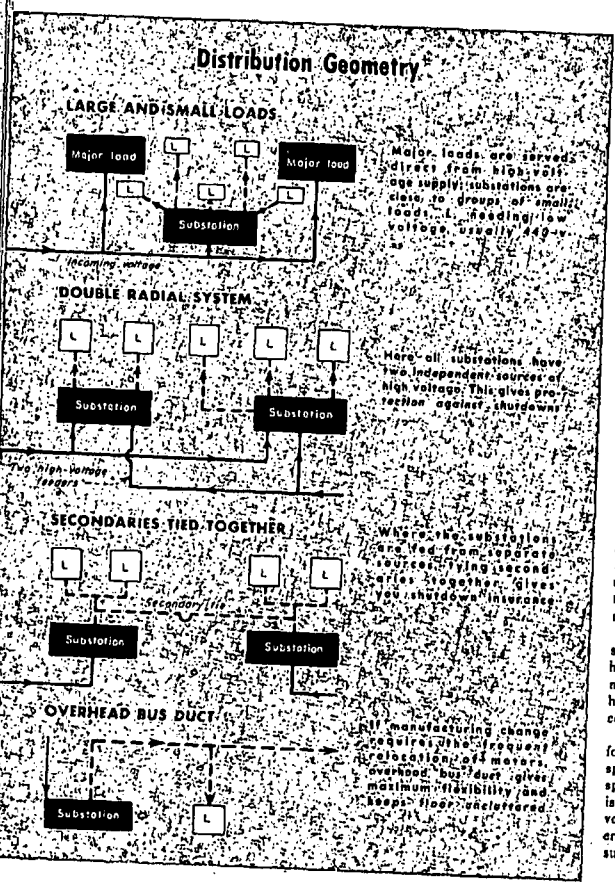
Electrical Distribution and Application

- Survey your plant electrical loads
- Group similar loads for economical layout
- Use modern voltages and distribution arrangements
- Build protection into all parts of your system



Every sound electrical modernization program starts with a load survey. That means finding out the present size of each load and when and where it occurs. And it means estimating the same for future years.

Study the geometry of the load. Some ways to handle heavy horsepower drives separately from lighter equipment. Consider feeding the heavier loads at high voltage directly from the primary substation. *Often* the small low-voltage loads can be conveniently grouped and *fed from* secondary substations.

Still keeping things of a kind together, try to separate "jumpy" and intermittent loads *from more steady loads.* Where continued operation is essential, *provide* "load insurance." The sketches here and on page 83 give ideas.

Load Voltages. When otherwise practical, raising voltage can *save a lot in* copper cost, line loss and voltage drop. Very *often some*, or even all, of the existing load can be swung from 220 to 440 v. In many cases, existing 220-v motors can be reconnected *for 440 by* simply juggling leads at the motor.

Motors and Control. *Classify* all motors broadly as induction, synchronous and direct-current. Integral-horsepower induction motors break down into squirrel-cage, wound-rotor and commutator-type variable-*speed ac motors. Wound*-rotor permits greater starting torque.

The synchronous motor, a constant-speed unit, should be considered for all heavy loads. It may well fit into your modernization *program by efficiently* handling certain large loads (such as *compressor drives*) and correcting pf.

The dc motor is still the old standby for adjustable speed, better in this respect than any ac motor. *For* wide-speed variation the direct-current motor *is often the best answer*, even if it involves the complication of a motor-generator set or equivalent arrangement to supply dc from ac.

Your modernization program should

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