

After careful investigation, and consideration of all the conditions, both local and general, it was decided to use steam turbines.

The water at Nacozari is saturated with lime salts, and deposits hard scale in large quantities in the boilers, unless it is chemically treated to replace the lime salts by sodium sulphate. In the latter case great waste is involved in blowing off the boilers to keep down the degree of concentration of the sodium sulphate in solution, which would otherwise cause foaming. The use of steam turbines, and the consequent absence of oil in the exhaust steam, makes it easily possible to get pure feed water for the boilers by using surface condensers, thus transferring scale deposit from the economizer and boiler tubes to those of the condenser, where it is more easily dealt with, and where, at the lower temperature, the deposit will possibly be lessened.

In addition to the water being hard, it is also scarce in the dry season, and very turbid and full of sediment during the rains. Of necessity, in times of scarcity, and for the sake of clear water in times of plenty, the condensing water is passed over a cooling tower, the new water supplied being only that quantity needed to make up for the evaporation in the cooling tower. Whether it will be cheaper to treat this water supply chemically, or to expend labor in scaling the condenser tubes, remains to be determined by experience.

The near-by load on the power plant is about 1000 K. W. This is consumed by the concentrating mill, the town lighting, and a few general service motors, and is approximately fixed in amount. The transmission load is about 500 K. W., and this is the portion of the load which is most likely to require extension, possibly in several directions; since the broken and mountainous character of the country, the scarcity of cheap fuel, and of water of any kind, make any but transmitted power for mining operations very costly. It was therefore decided to generate power at a voltage suitable for direct transmission to the mine, having in mind also that step-down transformers would, in any case, be needed for the bulk of the near-by load, since no good site for the power plant could be found sufficiently near the concentrating mill to permit transmission of the mill power at motor-voltage.

DESCRIPTION OF POWER PLANT.

The plan and sectional elevation of the plant are shown by Fig. 1 and Fig. 2. The framework of the buildings is steel. The roofs are corrugated steel. The walls of the boiler room are also corrugated steel. The outside wall of the turbine room is concrete, and the partition between the turbine room and the boiler room is reinforced concrete.