Line 100 miles long.
Load 10,000 H. P. for each transmission circuit.
Conductor 4/0.
Voltage at receiving end 50,000.
Space between conductors 60"
Charging current at 60 cycles = 23 amps.
Charging current at 25 cycles = 9.6 amps.
Regulation 60 cycles.

100% P. F. full load	9.0%
80% P. F. full load current	23.0%

(Step up and step down transformers included in this calculation.)
Regulation 25 cycles (Including transformer).

100% P. F. full load	5.5%
80% P. F. full load current	10%

The regulation and capacity or charging current are decidedly in favor of the 25 cycle transmission. The results for the 60 cycle system, while considerably in excess of those at 25 cycles, are considered quite normal for commercial purposes and inasmuch as the increase and decrease in the load is gradual the regulation is well within control of the central station operators or automatic devices.

As to the railway load, this had better be carried on a separate circuit, whenever a multiplicity of circuits is used in transmitting the power. In our case there are three transmission circuits.

Considering the successful operation of one of the long distance transmission lines of 150 miles in California where the charging current forms 40% of full load current, and where the regulation is 40% at full load, 80% power factor, we need not hesitate to operate our line with a regulation of 23%, 80% power factor.

The power factor of the system, however, is to a large extent within the control of the operating company, as it may recommend to power users such apparatus as will best answer the purposes of the system as a whole. Beside this, by employing synchronous motors running as rotary condensers, it will be enabled to regulate the power factor of the system and keep it if necessary at unity. These synchronous motors running idle, used supplementary to the synchronous motor generator sets, will allow of a perfect control of the power factor of the system, reducing the regulation to 9% under full load condition.

In conclusion, we will say, that under the conditions as stated, for a mixed lighting and power load, with a railway load not exceeding 33% of the total output, a 3 phase 60 cycle system should be employed throughout and all transformation should be accomplished by $\triangle$ to $\triangle$ connections.