5 per cent; October, 6 per cent; November, 8 per cent; December, 16 per cent.

To determine the amount of exhaust steam available, it is necessary first to develop electric current or power load curves and from these to estimate the amounts of steam used during various periods. Fig. 5 gives the ideal water rate for engines or turbines working under different initial pressure and back pressure or vacuum conditions, with corrections for superheat in the initial steam. Table 1 gives the factors by which ideal water rates may be multiplied to obtain average expected water rates

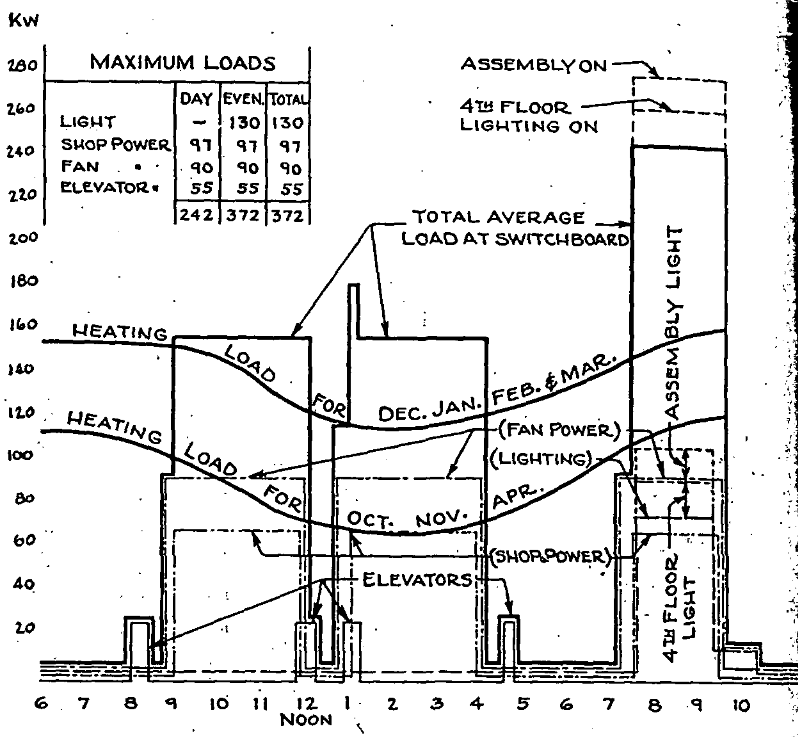

Fig. 4. High School Load Curves

for engines and turbines of various capacities when operating under full load conditions. Table 2 gives the factors by which the actual water rates under full load operating conditions should be multiplied to obtain expected water rates under various load conditions. From the load curves and these tables it is a simple matter to develop curves showing the steam required by the electric generating or power units.

The next step is to determine the amount of heat available in this steam for heating, etc., after it has passed through the generating units. This can be done by deducting the heat transferred into work, plus that lost by radiation from the heat in the steam entering the generating units.

Table 1. Approximate Full Load Efficiencies for Non-Condensing Engine and Multi-Stage Impulse Turbo-Generators—Geared Type

Rated Capacity at Full Load Kw	Mechanical Efficiencies of Engine Units	Mechanical Efficiencies of Turbine Units	Brake Potential Efficiency Ratio of Turbines	[a]Factors for Converting Ideal Water Rates to Actual Water Rates (for Turbines Only)	Generator Efficiencies at Full Load
100	0.900	0.930	0.45	2.22	0.932
200	0.905	0.935	0.50	2.00	0.934
300	0.910	0.940	0.54	1.85	0.936
400	0.915	0.942	0.58	1.74	0.938
500	0.920	0.945	0.61	1.64	0.940
600	0.925	0.947	0.64	1.56	0.942
750	0.930	0.950	0.65	1.54	0.944
1000	0.935	0.952	0.67	1.49	0.945
1250	0.940	0.955	0.67	1.49	0.947
1500	0.945	0.957	0.67	1.49	0.950
2000	0.950	0.960	0.68	1.45	0.954
		Condensing Turbines			
500		0.950	0.68	1.45	0.940
600		0.952	0.69	1.44	0.942
750		0.954	0.70	1.43	0.944
1000		0.956	0.70	1.43	0.945
1250		0.958	0.70	1.43	0.947
1500		0.960	0.70	1.43	0.950
2000		0.960	0.70	1.43	0.954
				(For Non-Condensing Engines Only)	
Single valve automatic engine units up to 400 kw				1.64	
Four valve automatic engine units up to 400 kw				1.42	
Unaflow engine units up to 400 kw				1.20	

[a]These factors are for indicated engine or brake turbine loads and do not take into account the mechanical efficiency of engine units or generator efficiencies for either engine or turbine units; but do include the mechanical efficiency of turbines.

Table 2. Factors by Which to Multiply Actual Water Rates at Full Load to Obtain Estimated Water Rates at Fractional Loads on Non-Condensing Engine and Turbine-Driven Electric Generating Units[a]

Size and Kind of Unit	Load ¼	½	¾	Full
Single valve engines up to 400 kw	1.32	1.09	1.03	1.00
Four valve engines up to 400 kw	1.30	1.08	1.03	1.00
Unaflow engines up to 400 kw	1.10	1.02	0.980	1.00
Geared turbines up to 600 kw	1.57	1.25	1.05	1.00
Geared turbines 600 to 2000 kw	1.50	1.20	1.04	1.00

[a]These values are for indicated or brake loads and do not take into account variations in generator efficiencies under various load conditions. Generator efficiencies vary from 85 per cent at one quarter load to 95 per cent at full load.