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CHAPTER 18

ESTIMATING FUEL CONSUMPTION FOR SPACE HEATING

Bases of Fuel Estimates; Season Efficiency; Calculated Heat Loss Method: Computation and Application, Examples and Solutions, Short Methods for Estimating Heat Loss; Degree-Day Method: Computation and Application, Unit Fuel Consumption per Degree-Day, Estimating Consumption for Various Fuels, Examples and Solutions, Degree-Day as an Operating Unit; Industrial Degree-Days; Maximum Demand and Load Factors

IT IS often necessary to estimate the anticipated heat requirements and fuel consumptions of heating plants for either short or long terms of operation. There are various general methods for estimating these conditions, and frequently the methods can be so modified as even to become useful in evaluating the effectiveness of heat production or fuel utilization during plant operation.

In applying a consumption-estimating method to a particular building, it is well to note that the bases of the methods may vary as to reliability. For example:

1. Records of past heat requirements or fuel consumption of the particular building are a better basis for estimates than are averages from records of similar buildings.
2. In the absence of past records for a particular building, the data from similar plants in the same locality may become very helpful.
3. Averages of consumption taken from many types of plants in many types of buildings in various localities can only produce an average estimate which may prove to be very inaccurate as applied to the particular building being considered.
4. Estimates based upon computed heat losses (without benefit of operating data) are wholly dependent, of course, on the degree to which the computation represents the actual facts.

Where unusual operating conditions exist due to factors such as excessive ventilation, abnormal inside temperatures and heat gains from external sources, or where, in the case of proposed buildings of unusual design, no information is available regarding former consumption, it is necessary to estimate fuel consumption from the computed heat losses.

In preparing fuel consumption estimates it is well to realize that any estimating method used will produce a more reliable result over a long period operation than over a short period. Nearly all of the methods in common use will give trustworthy results over a full *annual* heating season, and in some cases such estimates will prove consistent within themselves for monthly periods. As the period of the estimate is shortened, there is more chance that some factor not allowed for in the estimating method will become dominant, and thus give discrepant and even ridiculous results.

The Calculated Heat-Loss Method, and the Degree-Day Method of estimating fuel requirements are illustrative of all methods used. Both methods are based upon an estimate of seasonal efficiency. The former is also based upon an estimate of average seasonal temperature. Neither method takes into account factors which are difficult to evaluate, such as