

determining cost responsibilities in this filing. The design day demand estimates for each customer class were employed in the marginal cost study to establish forward looking cost responsibilities. These costs became the basis for establishing class revenue responsibilities. The class design day estimates were also employed in the development of allocation factors for capacity related costs such as the costs of mains, pressure stations, and storage, in the accounting cost of service study.

Since design day temperatures occur so infrequently, natural gas distribution companies such as National Grid NH have limited data upon which to measure aggregate system design day demands. And, because customer consumption is metered monthly, the company has no daily demand data at the rate class level. Therefore, this demand measure and the rate class allocation must be estimated. In order to insure reasonable estimates, I selected the best estimate using two alternative methods. The first method is called the "Regression Method" and is the preferred method when the regressions are sufficiently robust. Under this approach, the monthly sales data is deemed the independent variable and regressed against the degree days ("DDs") in the customer's billing cycle. Using conventional Least Squares Fit regression techniques, the data is used to generate an equation of the form:

$$Y = a + bX$$

Where "a" is the Y-intercept and is interpreted as the customer's base use in the absence of any heating load

and

Where “b” is the slope of the equation and represents the customer’s heating increment, i.e., the customer’s additional use in therms per degree day.

When a valid regression was established the class load was estimated using the Company’s planning criteria, to be able to provide firm service up to 73 heating degree days¹. The regression method was employed whenever the statistical analysis revealed a high degree of correlation as measured by the value of R-Squared, a “goodness of fit” statistic.

The second method is called the Peak Month Average Use Method. In this method the design day for the class is calculated as the average daily use for the class during the peak month for the G-54 and G-63 classes.

The results of the design day (Dt) are presented in Table 13 of the marginal cost study, Attachment PMN-3, at the bottom (line 33) along with other billing statistics which are used to calculate the total marginal class costs presented on the next page, Table 14.

¹ For the purposes of this study 73 heating degree days were used as the design day standard in place of the 80 effective degree day standard the company uses for supply planning purposes because the billing degree day data used for the analysis are measured as heating degree days.