DRAFT

Consent 16

Jan/92 HEARING

COSTING METHODOLOGIES AND RATE DESIGN STUDY

Prepared For

NEWFOUNDLAND AND LABRADOR HYDRO

Prepared by

FOSTER ASSOCIATES, INC.
Washington, D.C.
May 1991

V. RATE DESIGN

A. General

In the rate design process it is important to distinguish between the goals or objectives of rate making, and the tools used to attain those objectives. The latter includes costing methodologies and rate forms. Thus, methods themselves are not right or wrong per se. They are only proper or improper measured in terms of how they aid in attaining the desired objectives. The objectives of rate design include at least the following: meeting the annual revenue requirement, equity or fairness, economic efficiency, simplicity and administrative ease, stability and gradualism, conservation of resources, social goals, employment, and protection of the environment. A discussion of these goals or objectives is provided in Appendix B.

B. Changes in Rate Design

This chapter also provides a discussion of the recommended changes in rate design within various rate classes and with regard to the consolidation of certain of the existing rate classes. These recommended changes include the following:

1. Assign the rural revenue deficiency to the Island Industrial, Labrador Interconnected and NLP in a manner that will result in equal revenue to cost ratios.

2. Reduce the burden to be borne by Island Industrial and NLP by means of the following revenue increases:

    a) Gradual elimination of the "Preferential Rates" which provide a preferential discount for specific

customers from the rates that would normally be applicable.

b) Use of higher rates, up to the limit of cost, for sales in diesel areas which are in excess of 700 kWh per customer, per month.

c) Increases in Labrador Interconnected System rates.

3. Use of a three-part customer-demand-energy rate form for NLP which gives weight to marginal cost in terms of structure. (Unit customer, demand, and energy cost will be scaled on an equiproportional basis to yield unit prices that meet the class annual revenue requirement.)

4. Modification of Industrial rates so that the Industrial rate structure parallels the proposed NLP rate design.

5. Consolidation of the separate Island Industrial rates into a single rate class for cost of service allocation.

6. Simplification of rural Domestic and General Service rates.

C. Use of a Three-Part Rate for NLP

The existing energy only rate for NLP is probably wasteful of capacity due to the lack of a demand charge and economically inefficient because the energy charge is thereby substantially in excess of marginal energy cost. Further, the lack of a suitable demand charge inhibits a DSM program aimed at both demand and energy reduction since savings in demand by NLP are not reflected in a reduction in demand charges.

A three-part rate structure includes a customer charge and is consistent with the present rate structure of the Industrial Customers. Use of a demand charge for NLP raises the following issues with respect to the design of such a rate:

1. Cost basis for the level of the demand charge.

2. Use of a demand ratchet.

3. Impact of Rate Stabilization Plan (RSP).

4. Susceptibility to untoward manipulation by means of NLP owned generation.

1. Cost Basis for Demand Charge

The cost basis for an NLP demand charge could be either allocated or marginal cost. Use of unit costs based upon the allocated cost of service study would result in 60 percent of total revenue being derived from such demand charges. The resultant monthly rate, without a ratchet, would be about $8.32 per kW. Such a rate, unless suitably modified, would encourage peak shaving. It would also result in an energy charge, on a cost of service basis, of about 1.62 cents per kWh. That figure is substantially less than marginal energy cost of about 3.0 cents per kWh.

If the energy charge is set at the level of marginal cost, or about 3.0 cents per kWh, the resulting monthly demand charge will be about $3.69 per kW. That amount is substantially less than the cost of new combustion turbine peaking capacity.

The installed cost of a new combustion turbine based upon Hydro's estimate is $1,000 per kW. If that figure is annuitized in terms of return, depreciation, taxes, and non-fuel O&M, the monthly cost per kW will be about $10.00.

If the proposed demand charge were to exceed the cost of peaking capacity, a variable rate demand charge could be utilized to mitigate problems with respect to that issue. It is recommended that the demand, energy, and customer charges for the three-part rate be established by means of an equiproportional scaling of marginal costs to a level that results in rates that yield the target revenue.

2. Use of Demand Ratchet

The classic argument for the use of a demand charge ratchet, i.e., use of a billing demand that reflects, for at least a 12 month period, some percentage of the highest demand established, is that the provision of capacity involves a fixed cost. As a consequence, a monthly demand charge may be regarded as an annual demand charge payable monthly. An acceptable variant is to base the ratchet on the highest demand in the seasonal peak period for the total system. An advantage of the use of a ratchet is revenue stability since the revenue derived from demand charges will thereby reflect, to a lesser degree, demand variations caused by climate and economic variables. This can be an item of importance if the customer served is in a cyclical industry.

If a demand ratchet is to be used, the billing demand can be based on a contract demand (CD), or the highest measured demand. It might also be based upon the greater of (i) the CD, or (ii) the highest measured demand.

Use of a demand ratchet will encourage peak shaving by the customer. This occurs because a reduction in the annual peak for the customer will also reduce demand in all months in which the ratchet applies. Under some circumstances use of a ratchet may distort DSM efforts, particularly if the ratcheted demand is based upon a demand established in an off-peak period.

If a demand ratchet is not used, the resulting demand charge will be higher since the number of billing units on an annual basis will be less. The magnitude of the demand charge will be equal to the target demand revenue divided by annual billing demand units.

Administration of a DSM program is simplified for the customer if demand is not ratcheted, since a reduction in demand in any month will result in an immediate reduction in revenue. From the utility's viewpoint, avoided cost savings can only be made if investment in capacity is either reduced or deferred. Since such savings may be a number of years in the future, the ratchet will, at best, have only a transitory effect upon demand related revenue change caused by DSM activities.

In the interest of simplicity and ease of administration it is recommended that a demand ratchet not be used for NLP.

3. Impact of RSP

The rate stabilization plan adjusts for changes in energy sales, however, it does not adjust for changes in demand charges at the present time. For that reason, any downward fluctuation in demand charge revenue resulting from a reduction in billing units due to weather, DSM, or other causes will result in a deficiency. It is very unlikely that avoided demand cost savings will be experienced in the forecast period. Thus, use of a two-part demand-energy rate form for NLP will increase the financial risk of cost recovery for Hydro. This risk will be mitigated if the magnitude of the demand charge is given a lower priority than energy charges in terms of setting prices equal to marginal cost, i.e., higher energy charges, equated to marginal cost, will result in lower demand charges for the same target revenue.

A device that would eliminate this risk would be a contract provision calling for billing demand to be, as a minimum, equal to an agreed upon contract demand

for the period between rate cases. This may not be acceptable to the customer or regulator and would be at odds with the objectives of a DSM program.

4. Susceptibility to Manipulation

For a rate to be susceptible to manipulation by a customer, it is necessary that a customer be able to vary a parameter that affects billing under the proposed rate such as demand or energy.

A full requirements utility customer, i.e., a customer with no owned generation, has virtually no control over demand and energy since these parameters depend upon his customers, assuming that all sales to the ultimate user are firm sales. A full requirements industrial customer can vary his demand and energy usage by adjusting his operation. In actual practice, efficient use of his manufacturing plant investment may constrain adjustment of his electrical load to obtain a power cost advantage.

A partial requirements customer, particularly a utility, has the ability to adjust demand and energy requirements, as viewed by Hydro, within the limits of, (i) the difference between load and generating capacity, (ii) ability to store energy, or (iii) ability to interchange power with entities other than Hydro.

Of course, flexibility should not be confused with manipulation. Flexibility can result in a mutual advantage. A sound approach is to view Hydro and its customers with generation as a single entity when considering economic operating practices. Then, adjust pricing so that when operating in such a manner, both share in any benefits. It will also be necessary to include rate provisions that will inhibit operating practices that increase total cost for the entity but provide an advantage to only one of the parties.

The primary safeguard against manipulation is to insure that payments to Hydro are based upon the customer's total demand less the assured capability of the customer's own generation. In practice this can be accomplished by either selling reserve capacity to the customer so that all of the customer's generation may be regarded as firm, or by suitably discounting the customer's capacity in order to arrive at a figure for firm capacity. Failure to do so would permit the customer to reduce peak demand by the total amount of customer owned generation. If this were done, Hydro would in effect be providing free reserve for the customer's capacity. Such a mode of operation would, however, be economically feasible if a 100 percent ratchet was utilized at all times so that any failure of the customer's generation would result in payment for the higher demand established for a full twelve month period.

The recommended approach is to sell reserve capacity for NLP's generation and base billing demand on total customer load less total customer generation exclusive of the purchase reserve. Such an arrangement will be mutually beneficial so long as Hydro has the right to require NLP to run its generation in the event of emergency.

Another potential for manipulation depends upon whether or not it is feasible to install hydro or combustion turbine peaking capacity and displace Hydro demand charges while at the same time continuing to purchase essentially the same amount of energy.

It is important that unwarranted advantages not be given to partial requirements customers. Otherwise, the potential effect of such rate provisions would be to encourage other full requirements customers to install some form of generation and become a partial requirements customer in order to obtain these artificially generated advantages. Similarly, it would be unwise to penalize the partial requirements customer so that he would be encouraged to dispose of economically operable generation in order to effect a savings, which when considered from the

viewpoint of Hydro and its customers as a single entity, would be nonexistent. This was discussed supra, in connection with the cost basis for a demand charge.

D. Consolidation of Industrial Rate Classes

The costing of Island Industrial rate classes should be consolidated in order to better reflect cost of service and achieve simplicity and administrative ease in the future. The individual rates for service to the Island Industrial Customers served by the Island Interconnected system should therefore be consolidated into a single industrial rate applicable to all large industrial customers. That rate, which would provide for a single demand and energy charge, as well as method of determining billing demand, could become an appendix to the individual contracts negotiated with the various industrial customers. Differences due to facilities provided, etc. can continue to be recognized in the individual contracts.

E. Simplification of Rural Rate Classes

The use of the same rate structure for the Labrador Interconnected eg. Happy Valley/Goose Bay and Wabush, as Island Interconnected will permit use of a single Company wide rate structure in the future. If this program is started now, it will be accomplished without hardship by the time that the future infeed is placed in service.