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COST OF SERVICE STUDY

Q. Do you have any comments on the cost of service study submitted by Hydro in this proceeding?

A. While PDD's customers have been absorbed into Hydro's system, Hydro chose not to show them as a customer in the cost of service study. The generally accepted practice in the case where a customer class is to be excluded from the cost of service is to perform a separation study to show that the costs and revenues are being properly excluded from the remaining system.

A separation study is simply a cost of service study which shows in a logical and understandable manner how the total costs and revenues of the utility are split up. In the U.S., the studies are important to ensure that the regulated portions of the utility are not being asked unfairly to pick up costs not rationally attributable to them. In the case of NLP, such a study is important even though NLP and the industrials will be asked to pay any difference between the cost of serving Hydro's rural customers and the revenues gathered from them, because without such a study it is impossible to properly review those costs. Surely Hydro's other customers who are being asked to pay a hidden subsidy in their rates have a right to know how that subsidy was determined.

PROPOSED RATE STRUCTURE

Q. Do you have any concerns about the rate structure proposed by Hydro in this proceeding?

A. Yes. Hydro proposes to continue its practice of serving industrial customers with a rate

containing both a demand and energy component, while offering an energy charge only rate to NLP. This is done in spite of the fact that the cost of service study contains sufficient information to provide a demand and energy rate structure to NLP.

As I previously touched upon, it is a well known principle of good ratemaking practice that costs imposed on an electric system are primarily functions of the three variables: number of customers, energy taken (kWh), and the demand (kW) imposed on the system. It is also widely accepted practice, consistent with the principle of ensuring rates reflect costs, to therefore signal these three costs separately in customer, energy and demand charges, where it is practical to do so.

NLP can impose any sort of load pattern on Hydro and, so long as the total energy use is the same under the various load patterns, the price NLP pays Hydro is the same until Hydro has a rate referral to propose a rate change. On an annual basis, a partial adjustment is made through the RSP.

This lack of proper rate design gives little incentive for NLP to engage in demand side management activities that reduce peak load. Peak load reduction programs are among the most common and cost effective demand side management programs in existence. With an energy only rate, however, there are no immediate savings to NLP and its customers for reducing its demand on the Hydro system. Because NLP applies demand charges to its large customers to control their demands, NLP will actually lose money if those customers respond properly.

Another fact that the Board should consider is the effect of the Hydro energy-only rate on NLP rates. It forces NLP to have energy rates that are too high and demand rates

that are too low. If NLP is to achieve proper matching between the distinct cost causation effects of demand and energy, the Board should recommend that Hydro develop a rate structure that includes these important components.

Q. Could you outline any examples of alternative rate structures you feel might be more appropriate for Hydro to use in billing NLP?

A. Yes. While I am not proposing a specific rate for immediate implementation, I have outlined examples of two alternative rate structures that address this issue: a "Hopkinson" type of rate with an explicit demand and energy rate, and a "Wright" or hours-use-of-demand rate form.

Hydro currently uses the Hopkinson rate alternative in its rates to industrial customers. It consists of a monthly demand charge for each kilowatt (kW) of demand and uniform energy charge for all kilowatt-hours (kWh) of energy. A Hopkinson rate alternative for Hydro's service to NLP, based on data provided by Hydro, is as follows:

Demand Charge:	$7.17 per kW of demand per month
Energy Charge:	$0.0300 per kWh of energy consumed

The Hopkinson rate design differentiates between costs associated with capacity or demand in kW and those associated with the consumption of energy in kWh. The derivation of this rate, which is contained in Exhibit LBB-2 recovers much of Hydro's demand related cost in the demand charge.

Q. Please explain the Wright rate form.

A. The Wright rate uses the concept of hours-use-of-demand or load factor in pricing

electric power service. Load factor is the ratio of the average load in kilowatts during a period divided by the maximum load during that period. Loads which occur at lower load factors pay a higher rate per kilowatt-hour. The Wright rate typically consists of a series of declining blocks with a specified number of kilowatt-hours per kilowatt of electric power included in each block. The Wright rate alternative for Hydro's service to NLP is as follows:

1st Block,	0 - 300 Hours Use of Demand	$0.05389 per kWh per kW
2nd Block,	Over 300 Hours Use of Demand	$0.03000 per kWh per kW

The Wright rate form was designed to recover much of Hydro's demand related, or capacity costs as well as a certain amount of running costs in the first block. This is sometimes called an implicit demand charge. The terminal block is designed to recover Hydro's running or energy costs.

Q. Will the Hopkinson or Wright rate form give NLP an incentive to make expenditures that will cause it and its customers to increase load factor, to lower demands imposed on Hydro's system, thus delaying future generating plants?

A. Yes. These rate forms encourage customers to lower their peak demands and spread their usage over a longer period of time, thereby improving the system load factor. Customers that maintain high load factors are able to spread demand charges over more kilowatt-hours and therefore achieve lower average costs.

Q. Did you design both rates to recover Hydro's revenue requirement during 1990?

A. Yes. Both rates were designed to recover the same revenue as Hydro's proposed energy-only rate for the full year 1990 (i.e. 45.31 mills). The rates are based on the

estimates of a) Hydro's 1990 Cost of Service Study, b) the 1990 Revenue Requirement from NLP calculated using Hydro's proposed rate of 45.31 mills effective January 1, 1990, and c) the NLP loads that will be imposed on Hydro. Details of the calculations as well as a graph of the various alternatives are contained in LBB-2. Page 1 is a graphical representation of the average revenue from the two example rates and Hydro's proposed 1990 energy-only rate compared to the level of costs incurred at various load factors or hours use.

The primary difference between the two alternative rate structures is that the Hopkinson rate has an explicit demand charge whereas the Wright rate recovers most of the demand-related costs in the first energy block.

Q. Should the Board consider other criteria in establishing such a rate?

A. Yes. The Board should consider rate history when adopting a demand-energy rate structure for NLP. A radical departure from an established rate form might have an adverse consequence on the supplier and the customer. This concept of continuity is often referred to as "gradualism". The rate alternatives offered above do separate demand and energy costs but neither may be the best alternative. My recommendation would therefore be that Hydro work with NLP and develop a rate structure containing a demand component for implementation on July 1, 1991.

LEAST COST PLANNING

Q. Could you define the term demand side management?

A. Yes. Demand side management is generally defined as any attempt by the utility to influence customer use of electricity in ways that will produce desired changes in the

controlling the supply side, how would the two be integrated?

Flexibility and risk are also important issues. A good least cost plan is able to respond well to charges in input assumptions, like fuel cost projections or changes in technology. One should not commit to any course of action which is only the best course if all assumptions hold true.

Presumably very little specific data on demand side management programs will be available. This raises the issue of how to balance the need for accurate study data with the need to act early to avoid building future power plants.

Another important consideration will be how to give utilities proper incentives to engage in demand side management, activities which will decrease their loads and revenues. Can the utilities put any demand management expenditures into rate base, or must they be expensed?

How to optimize the blend of supply and demand side options and how to recognize externalities, like environmental costs are difficult questions.

Obviously, to arrive at answers to such questions will require analysis, discussions and possibly generic public hearings.

SUMMARY

Q. Would you please summarize your testimony and recommendations?

A. Yes. I have enumerated several major principles of a sound regulatory framework. I have also attempted to show why Hydro's proposal in this proceeding violates several

of our principles. I would recommend:

1. That Hydro's proposed guarantee of profits without full review for three years be rejected as violating the need to encourage efficiency of their operations. Instead, they should be limited to the 1990 test year at this time.

2. That Hydro's proposal to defer and then amortize over five years any difference between rates and costs be denied to the extent that such "losses" may be recovered from the balance in the RSP because this violates the principle of matching rates to costs, plus the RSP was established to stabilize rates.

3. That the Board consider seeking changes to the legislation that would either eliminate the requirement that NLP subsidize rural customers or that they be given more influence over the costs imputed as least cost to serve them, because such subsidies are unfair and inefficient.

4. That Hydro be required in the next rate case to file a cost of service study showing in full and proper detail the cost of serving all its customers because the parties to the case have a need and a right to such information.

5. That the Board encourage least cost planning procedures and filings from all the electric utilities it regulates to ensure efficiency of investment.

6. That the Board recommend that Hydro work with NLP and submit a rate structure that incorporates a demand component for implementation on July 1, 1991, because such a rate will better encourage proper demand side management and efficient operations by NLP's customers.