

*J. W. Wilson & Associates, Inc.*

**Economic Counsel**

**Report to The Newfoundland and Labrador  
Board of Commissioners of Public Utilities  
on Cost Allocation and Rate Design Issues in the  
Newfoundland and Labrador Hydro (“Hydro”)  
July 30, 2013 General Rate Application**

April 25, 2014

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**Executive Summary**

J.W. Wilson & Associates has been retained by the Board of Commissioners of Public Utilities (“the Board”) to review the cost allocation and rate design issues in the General Rate Application (“GRA”) and supporting information that was filed with the Board by Newfoundland and Labrador Hydro (“Hydro”) on July 30, 2013. Based on our review, we have been asked to prepare this Report to be filed as evidence in Hydro’s GRA proceeding. It is our conclusion that the cost allocation steps in Hydro’s filing have been carried out in general conformance with Hydro’s prior filings and with the cost allocation procedures previously approved by the Board. However, Hydro’s proposed rate design departs significantly from past filings and Board approvals by substantially abandoning economically efficient marginal cost price signals as a cornerstone for energy pricing.

Public policy considerations and other factors requiring the exercise of discretionary regulatory judgment typically play a significant role in resolving questions about “fairness” and “equity” that are central to cost allocation and rate design issues. Regulators are generally accorded considerable latitude in resolving these issues, and they are able to modify cost allocation and rate design practices and procedures to accommodate public policy concerns.

Hydro's cost allocation procedures attribute most generation plant costs (including hydraulic generation, Holyrood and both Island and Labrador isolated system capacity) to customer classes based on both demand and energy percentages. Island interconnected gas and diesel generation capacity costs and Labrador interconnected gas and diesel capacity costs (as well as fuel costs for these plants) are allocated 100 percent to demand on each system. Transmission costs for connecting hydraulic plants to the network are allocated in the same manner as hydraulic generation. All other transmission costs are allocated 100 percent to system peak demand. All transmission substations that connect diesel or gas plants to the network are allocated in the same way as the type of plant they connect. All distribution substations are allocated 100 percent on the basis of peak demand. Other distribution plant and associated costs are split between peak demand and customer based on a so-called "zero-intercept" method. Each of these cost allocation methods is discussed in the Report. As noted, each of these procedures has been used by Hydro and adopted by the Board in prior Hydro rate filings.

"Fairness" and "efficiency" are important rate design objectives. It is generally accepted that rates are "fair" when they charge each customer prices that reflect the costs that the customer's service requirements impose upon the utility system. Rates that are economically "efficient" price each additional or "incremental" element of service at the level of additional costs that adding (or removing) that incremental element of service from the utility's supply requirement will add to (or remove from) the utility's total costs. Hydro's proposed rate design in this case departs from the Board's emphasis on designing rates that achieve economic efficiency.

Hydro's proposed industrial energy rates would implement an inefficient price signal, with a marginal rate for industrial energy consumption of 4.782 cents per kwh, when the marginal cost of energy is 17.768 cents per kwh. This wide disparity between the price and cost of energy would provide a strong economic incentive for industrial customers to consume additional amounts of energy that produce economic benefits that are far below the resource costs of producing the additional energy. In defense of this proposed rate design, Hydro argues that cost-reflective energy price signals for industrial customers on its system are not needed because of Conservation and Demand Management ("CDM") programs and because the system's marginal energy cost will change when the Labrador interconnection comes on line. As discussed in the Report, we disagree with these arguments.

Hydro also proposes to weaken energy price signals by altering NP's current two-block energy rate, which now has a second block rate set equal to the marginal cost of energy, as defined by the Holyrood fuel cost. Instead of setting the second block of NP's energy rate at the marginal energy cost of 17.768 cents per kwh, Hydro proposes to set NP's second block rate at 10.4 cents per kwh, which is equivalent to a Holyrood oil price of \$63.65/bbl., or only about 58 percent of the marginal energy cost. Hydro contends that this departure from marginal cost pricing is required because retaining a marginal cost price signal in NP's second block, given today's high cost of oil, would necessitate a negative first block rate in order to equate total NP revenues and NP's total allocated costs. We also disagree with this argument. As discussed in the Report, the adoption of a seasonal differential, together with reduced energy in the second block and more energy in the first block, would permit the retention of a marginal cost energy price signal in NP's two block energy rate.

Other related issues in this case pertain to the treatment of curtailable loads, the RSP and CDM programs. Rather than treating NP's curtailable load as a generation credit, Hydro proposes that, in the future, interruptible curtailment credit should be given for NP loads only for curtailments that are made at Hydro's direction, at times when load reduction is required for system demand control purposes. This proposal reflects Hydro's belief that there is uncertainty regarding the magnitude and firmness of NP's curtailments and because NP's curtailments appear to be based on energy cost considerations which may not necessarily coincide with system peak demand requirements.

Cost changes currently covered by Hydro's RSP are those associated with variations in hydraulic availability, fuel prices and customer loads. In addition to these cost variables, Hydro now proposes to add a new "Energy Supply" cost element to the RSP. The broad scope of this RSP allows Hydro to adjust its rates over time, largely automatically, so as to match most cost changes on an annual basis. This has enabled Hydro to shift significant business and regulatory risks to its customers without offsetting rate adjustments to reflect Hydro's resulting lower business risks and equity capital costs. Perhaps even more importantly, as RSP coverage increases there is less need for Hydro, and less opportunity for the Board, to conduct general rate reviews. Reasonably frequent general rate cases are a very important element in achieving and preserving sound and effective public utility regulation. The present GRA is Hydro's first in seven years, underscoring the importance of considering how RSP expansion may affect the ability of the Board to best carry out its regulatory responsibilities over time. Since further RSP expansion can be expected to continue the matching of revenue and cost changes over time, in order to provide for adequate comprehensive periodic regulatory review, the Board may wish to consider mandating

reasonably frequent GRA filings (e.g., every 3 years or so) even when the utility is not seeking base rate modification.

Finally, Hydro proposes to adopt deferred (7-year) recovery of CDM program costs as is now done by NP. These deferred costs are proposed to be recovered through a rate rider rather than in test year revenue requirements. While CDM program costs could be recovered by assigning them to the customer class that is offered the CDM program with which they are associated, Hydro proposes to allocate these costs as a common cost to be recovered from all customers in proportion to each customer's energy consumption (as is done by NP). The rationale for this allocation is that each CDM program reduces energy requirements and Holyrood fuel costs for the system as a whole, thus providing cost reduction benefits for all customers. While the logic supporting this allocation of its CDM program costs to all energy consumption is defensible, it appears that Hydro's proposal would be unduly discriminatory and unfair to NP customers. NP's customers pay all of the costs of NP's own CDM programs. Hydro's retail customers do not pay for any of NP's CDM Program costs. In contrast, Hydro's proposal would require NP's retail customers to pay the lion's share of Hydro's CDM costs because NP is, by far, Hydro's largest energy purchaser. The end result would be NP's retail customers paying double for CDM Programs – paying once for all of the costs of NP's own Programs and paying a second time for most of the costs of the same Programs offered by Hydro to its retail customers. A more equitable solution would be for NP to be exempted from an allocation of Hydro's CDM costs so that those costs would be allocated, based on energy consumption, only to Hydro's retail customers.

The Report below discusses each of these matters.

## **I. Introduction**

J.W. Wilson & Associates has been retained by the Board of Commissioners of Public Utilities (“the Board”) to review the cost allocation and rate design issues in the General Rate Application (“GRA”) and supporting information that was filed with the Board by Newfoundland Hydro (“Hydro”) on July 30, 2013. Based on our review, we have been asked to prepare this Report to be filed as evidence in Hydro’s GRA proceeding.

The traditional process for establishing a set of electric utility rates involves five steps:

- (1) Establishing the total revenue requirement, or rate level, required by the utility;
- (2) Grouping of customers into classes upon which different rates will be imposed;
- (3) Dividing the total revenue requirement into the revenue responsibilities for each rate class. This is usually done by functionalizing, classifying and allocating the utility’s rate base and operating costs;
- (4) Designing the general rate form to be used to collect the appropriate revenue from each class; and
- (5) Specifying the detailed elements of each rate, in accord with the overall rate design, class revenue responsibilities, and test year quantities of service to be furnished by the utility.

Steps 2 and 3 of this process are referred to as “cost allocation”, and steps 4 and 5 are “rate design.” Hydro’s GRA filing includes each of these steps. The cost allocation steps

have been carried out in this filing in general conformance with Hydro's prior filings and with the cost allocation procedures previously approved by the Board. However, Hydro's proposed rate design breaks significantly with past filings and Board approvals by substantially abandoning economically efficient marginal cost price signals as a cornerstone for energy pricing. In the discussion below, we address these matters and several new procedures proposed by Hydro in this case, as well as some possible changes in cost allocation procedure that the Board may wish to consider.

## **II. Cost Allocation**

The most common controversies regarding cost allocation in class cost of service studies concern (1) the classification of production and transmission costs between demand and energy-related components, and (2) the classification of distribution facilities costs between customer, energy, and demand related components. Cost allocation procedures that assign more costs to "demand" and less to "energy" benefit high load factor customers (e.g., industrials) and result in higher charges to low load factor customers (e.g., residential and small commercial customers). Likewise, cost allocation procedures that assign more costs to energy and less to demand benefit low load factor customers and result in higher rates for high load factor customers. These outcomes follow from the fact that high load factor customers buy a relatively large amount of energy (kwh) in relation to their capacity demands (KW), whereas low load factor residential and small commercial customers generally require more capacity in relation to their energy needs. Similarly, cost allocation

methods that attribute more costs to “customer” and less to “demand” or “energy” generally result in lower total bills for big customers and higher total bills for small customers.

Not surprisingly, perceptions of cost allocation equity typically differ between customer groups in concert with these predictable end results. That is why large industrial customers almost always argue for cost allocation methods that attribute as much of total cost as possible to peak demand and on a per customer basis and as little cost as possible in proportion to energy consumption. Utilities concerned about the greater competitive options (including location and expansion options) that are typically more available to large industrial customers than to small commercial and residential customers will often have the same bias. Regulators have considerable latitude in resolving these cost allocation and related rate design issues, as they are generally able to modify procedures to accommodate public policy concerns.

Public policy considerations and other factors requiring the exercise of discretionary regulatory judgment typically play a significant role in resolving questions about “fairness” and “equity” that are central to these subjects. Even determinations involving cost causation require subjective judgments to deal with alternative perspectives.

In conformance with traditional cost allocation procedures, Hydro attributes its plant investment and costs to the utility’s distinct operating functions of generation (or power supply), transmission, substation transformation, distribution and customer service. Costs and investments in each of these functional categories are then classified as being determined by system peak demand (KW), system energy requirements (kwh), or number of customers.

These classified costs and investments are then allocated to customer classes in proportion to each class' percentage share of peak demand, energy and number of customers as follows:

**Generation Plant and Costs** – Hydro allocates most generation plant costs (including hydraulic generation, Holyrood and both Island and Labrador isolated system capacity) to customer classes based on both demand and energy percentages. Hydraulic and Holyrood costs are all attributed to the Island interconnected system. The portion of these generation costs that is allocated on the basis of energy and the portion that is allocated on the basis of demand reflect a measure of load factor or plant net capacity factor. The Holyrood plant net capacity factor is used to split Holyrood plant costs between the demand and energy allocators. The Island interconnected system load factor is used to split Hydraulic plant costs between demand and energy, and the Labrador and Island isolated system load factors are used to split isolated system generation capacity costs between demand and energy. In each case, the load factor or net capacity factor determines the portion of generation plant costs that is allocated on the basis of energy, and the demand allocation is the residual. Fuel costs for these plants are all allocated on the basis of class energy requirements on each system.

Island gas and diesel generation capacity costs and Labrador interconnected gas and diesel capacity costs (as well as fuel costs for these plants) are allocated 100 percent to demand on each system. The allocation of fuel costs based on demand is unusual, as fuel costs are incurred as a direct result of energy production. Presumably, the fuel costs for these plants is allocated based on demand in this case because, according to Hydro, Island gas and diesel generation “is not normally called upon as a source of energy, but is used primarily for system peaking, area supply requirements, or energy requirements in the

event of system generation constraints or outages.” See *GRA Application, Section 4.6 Rate Stabilization Plan, footnote 9 at page 4.18*. Likewise, according to Hydro, Labrador interconnected gas and diesel “generation in Happy Valley-Goose Bay are operated for Labrador Interconnected outages or system support.” See *GRA Application, Section 2.6.2 Labrador Interconnected System at page 2.47*.

L’Anse au Loop diesel generation capacity is allocated 100 percent on the basis of demand, but the fuel expense for this plant is allocated 100 percent on the basis of energy.

**Transmission Plant and Costs** -- Only the Island Interconnected system and the Labrador Interconnected system have transmission plant. Transmission costs for connecting hydraulic plants to the network are allocated in the same manner as hydraulic generation (i.e., Island interconnected system demand and energy). All other transmission costs (including rural lines) are allocated 100 percent to system peak demand.

An alternative to allocating all other (non-hydraulic) transmission costs to peak demand would be to allocate transmission costs for connecting other production plant to the network (and possibly network transmission as well) in the same proportions as production plant. The allocation of base load generation plant costs to both demand and energy recognizes the fact that these plants are built and dispatched not just to serve peak loads, but all system loads. Base load generating plants would not be an economical choice if they were intended only for peak loads. The same is true for transmission

networks. There is, therefore, a sound rationale for allocating transmission network costs to both demand and energy. If transmission network costs were allocated to both demand and energy, that would reduce the total cost allocation for lower load factor customers, such as NP and rural domestic customers, since their percentage responsibility for energy costs is less than their percentage responsibility for peak load costs.

Newfoundland's transmission system investments were made with an aim to reducing energy costs, in addition to meeting peak demand. If the goal of constructing generation and transmission capacity was simply to meet peak demand, rather than building expensive hydroelectric and base load plants and their associated high voltage transmission grids, only lower cost peaking plants and local transmission would be built, since these facilities have much lower generation and transmission network capital requirements. Much more costly, but operationally efficient hydraulic and base load generating plants and associated high voltage transmission grids are selected, as in Hydro's case, only if they can be run long enough to generate enough fuel savings that more than offset their higher capital expenditures. Hence, the higher capital costs of these plant investments are incurred to serve year-round energy requirements at a lower total cost. When transmission plant serves both base load and peak load needs (as virtually all transmission systems do), transmission cost classification should reflect both the energy and demand considerations.

A capital-intensive transmission grid reduces energy costs. The Board may therefore wish to properly recognize this in the attribution of transmission network costs. Also in this way, the large industrial consumers who benefit from the lower cost energy that hydraulic and base load plants and their associated transmission grids make possible will

pay a fair share of the costs that reduce their energy charges. This cost-causality is not now fully recognized in Hydro's attribution of substantial transmission costs to only peak demand. All customers who benefit from lower cost energy consumption should be allocated an energy share of the costs that make that consumption possible. In Hydro's case, substantial transmission investment and expense is clearly related to both the transmission and network integration of less costly energy from hydraulic and base load plants rather than to simply meet peak demand. The important network integration and energy cost aspects of these facilities would be better recognized by assigning a significant portion of all transmission plant costs to energy.

**Substation Plant and Costs** -- All terminal stations (transmission substations) that connect diesel or gas plants to the network are allocated in the same way as the type of plant they connect. This is also generally the case for all transformers at generation plants. The same logic that supports allocating transmission network costs to both demand and energy is also true for transmission level substations. These facilities are typically needed on integrated systems that efficiently tie remote base load plants to network load centers so as to enable lower cost energy deliveries, and the costs of these facilities is not only attributable to the cost of peak demand.

**Distribution Plant and Costs** -- All distribution substations are allocated 100 percent on the basis of peak demand. Other distribution plant and associated costs are split between peak demand and customer based on a so-called "zero-intercept" method. This

approach uses statistical analysis to estimate the cost of hypothetical plant designed for a zero load. This hypothetical zero load portion of distribution costs is allocated on a per customer basis and the remainder is allocated based on coincident peak demand. It is generally the case that using the zero intercept method to allocate distribution costs results in a higher cost allocation to small customers than would be the case with a demand or energy cost allocation.

We also note that it is quite unusual to allocate distribution capacity costs on the basis of system coincident peak demand. The more conventional procedure would be to allocate distribution capacity costs on the basis of non-coincident demand. The reason for this is that distribution system costs are driven by local network requirements, which do not necessarily coincide in time with the consolidated system's coincident peak demand. In contrast, generation capacity costs are conventionally allocated on the basis of the system's coincident peak demand because it is combined system demand at peak times that drives generation capacity needs.

The rationale for assigning costs in relation to coincident peak demand is that those costs are determined only by the maximum annual coincident demands placed on the system. However, this rationale does not hold where the costs in question are not determined only by system coincident peak demands. In the case of local distribution networks, it is local loads and energy requirements, which often vary from the system coincident peak, that determine plant investment requirements. Therefore, a non-coincident demand factor for the demand-related component of distribution capacity is generally thought to be more reasonable for cost allocation. Since each class may experience its own peak at a different time than when the system peak occurs, the sum of

the non-coincident class peaks typically will exceed the system coincident peak by a significant margin. This inter-class diversity benefits the system in the sense that the utility need only acquire sufficient generation capacity to meet the diversified (i.e., coincident) peaks of the several classes. However, it still must meet the sum of all local distribution network peaks, which is likely to exceed coincident system peak.

The basic premise underlying the assignment of costs on a per-customer basis is that these costs do not vary with demand levels or energy usage, but only in proportion to the number of customers on a system. Therefore, it is not proper to assign or charge for these costs on the basis of demand or energy. Rather than attributing or charging these costs on the basis of system usage or in proportion to the amount of service that is provided through these facilities, the premise is that they should be recovered through fixed monthly customer charges. Principal concerns that may be considered in evaluating Hydro's zero intercept method of allocating distribution system costs between peak demand and customer are that (1) it attributes a very substantial portion of distribution system costs (transformers, poles and secondary lines) on a flat per customer basis and (2) all of the remainder is attributed in proportion to coincident peak demand. None of these costs are allocated in proportion to energy deliveries or in proportion to non-coincident local area demands. Electricity delivery systems and the facilities that comprise them (poles, wires, transformers, etc.) are designed by their manufacturers and installed by utilities to meet both non-coincident demand and energy requirements as well as to achieve customer connection to the system.

### **III. Rate Design**

Rate design is the array of prices that a utility establishes (with regulatory approval) for its services. These prices or rates usually include energy prices (so much per kwh), demand prices (so much per KW of maximum monthly demand for demand metered customers) and customer charges (a flat monthly charge for each customer regardless of the customer's energy consumption or demand levels). Energy and demand rates may be "blocked" so that different prices prevail for different load levels – e.g., so much for the first block (a specified amount of kwh or KW) of energy or demand and a different price for additional amounts. Also, demand, energy and customer charges often differ between customer classes.

All rate designs must be structured so that, together, the various prices for the various services that are provided to customers in the various rate classes produce total revenues that equal the utility's test year revenue requirement. In addition to this revenue adequacy requirement that must be a feature of all rate designs, there are additional rate design objectives. The most important of these is to have a rate design that is "efficient" and "fair". Both efficiency and fairness involve relating prices to costs. It is generally accepted that rates are fair when they charge each customer prices that reflect the costs that the customer's service requirements impose upon the utility system. Rates that are efficient price each additional or "incremental" element of service at the level of additional costs that adding (or removing) that incremental element of service from the utility's supply requirement will add to (or remove from) the utility's total costs. As noted in the Introduction above, Hydro's proposed rate design in this case breaks from the Board's emphasis in recent cases on designing rates that achieve economic efficiency. Hydro essentially acknowledges this

abandonment of economic pricing principles in its response to CA-NLH-066, wherein it states: “Marginal cost principles were not explicitly incorporated in the Lummus report.” That, in our view, is an important (and unfortunate) departure from good utility rate design.

Consumer decisions to take more or less energy have very apparent direct and measurable cost consequences. Less energy consumption means that the utility will save the cost of purchasing (or the fuel cost of generating) an incremental unit of power. Incremental or “marginal” energy consumption decisions also result in higher or lower environmental costs. More energy consumption results directly in more purchased power or fuel costs. Reduced energy consumption, likewise, directly reduces purchased power and/or fuel costs. In a market economy, consumers will demand more energy if prices are below the value they derive from additional energy consumption and they will reduce demands if prices exceed the value they derive from their marginal energy consumption.

These “economic rules” are at least as equally valid for industrial and commercial customers as they are for residential customers, and maybe even more so, because industrial and commercial customers are often able to more directly and accurately quantify the economic value of their energy consumption decisions in terms of the resulting increases or reductions in their own sales revenues and profits. Efficient marginal energy prices, therefore, should never be set below marginal energy cost. To do so would encourage decisions to consume energy that costs more to produce than the value of the benefits it provides. A straightforward and generally attainable rule for efficient electric utility pricing should be to set energy rates (per kwh of energy) at least high enough to cover the incremental or decremental cost or cost savings of providing one unit more or less of energy.

**Hydro's Proposed Industrial Energy Rates** -- Hydro's proposed industrial energy rates provide a strong but efficiency perverse price signal. Hydro's proposed marginal rate for industrial energy consumption is 4.782 cents per kwh, but the marginal cost of energy for the Hydro system is 17.768 cents per kwh. This wide disparity between the price and cost of energy would be a very strong economic incentive for industrial customers to consume additional amounts of energy that provide benefits that are far below the resource costs of producing the additional energy. The price/cost disparity also provides an economic deterrent to reducing energy consumption that costs far more than the benefits derived from that consumption.

In defense of this proposed rate design change Hydro argues that cost-reflective energy price signals for industrial customers on its system are not needed because of Conservation and Demand Management ("CDM") programs and also because the system's marginal energy cost will change when the Labrador interconnection comes on line (it is now anticipated that this may occur as soon as 2017). According to Hydro, "This program [CDM] has effectively addressed concerns over incentives being available to the IC for CDM, thereby mitigating the need for a two block rate structure." See *Section 3.2.2 of Hydro's Consultant Report, Industrial Customer Energy Conservation Initiatives* (Exhibit 9). Note that this claim is made despite Hydro's acknowledgement that nearly all of the CDM achieved to date on its system has been by rural customers and that industrial CDM has been negligible. See, for example, *Exhibit 9, Section 4.1 Background*.

Hydro also argues that its current least cost generation expansion plan is the Labrador Interconnection. According to Hydro, “At this point, the contract terms, demand and/or energy constraints, and resultant cost of service methodology [for Labrador generation expansion] are uncertain.” Hydro’s consultant then goes on to argue that “The appropriate marginal price signal is therefore uncertain. Adjusting the IC rate structure at this time for a fuel price signal, expected to no longer be required within the relatively near term, and in light of the CDM requirements being addressed as discussed previously, does not appear to be prudent.” See *Exhibit 9, Section 3.2.3 Labrador Interconnection*.

From an economic efficiency perspective it cannot be concluded that the addition of the Labrador interconnection will mean that a marginal cost price signal is unneeded. Indeed, as discussed below, the incremental fuel price may very well continue to be a good proxy for marginal energy cost, even when the Labrador interconnection comes on line.

Hydro further argues against cost-reflective energy prices for industrial customers at this time because, they say, a new industrial customer, Vale, is coming on line and that additional customer will add complexity to rate design. Vale is expected to become Hydro’s largest industrial customer. Hydro’s consultant says that “one concern with a two block energy rate structure under increasing load for an IC, is the requirement to adapt the two block rate structure to that increasing load. The planned load for Vale would add a level of complexity, and a lack of transparency, to the block sizes under a two block rate structure, for the customer in each year after the 2013 test year. The Vale load is anticipated to stabilize around the time of the Labrador Interconnection, where a different rate structure may be more appropriate. This suggests that implementation of a two block energy rate structure at this time may not be advisable. In light of the foregoing, it is recommended that the existing

flat energy rate for the IC continue.” See *Exhibit 9, Section 3.2.4 Vale Construction Power requirements*.

This argument essentially advocates the implementation of economically perverse energy rates for all ICs at this time and at least for the next three to four years. As discussed below in this Report, under a two block rate structure, uniform block sizes are not likely to be necessary or appropriate for Hydro’s industrial customers, and there is no reason why block size cannot be structured to change as Vale’s (or any industrial customer’s) load levels change. Hydro’s most recent estimate of its future marginal energy cost for the Island Interconnected system is in the range of 15.5 and 17.6 cents per kwh for the years 2013 through 2017. In 2018, if the Labrador Interconnection comes online, Hydro estimates that its marginal energy cost may drop to between 5.4 and 7.2 cents per kwh, which is still above the proposed marginal energy rate of 4.782 cents per kwh for industrial customers. See response to CA-NLH-033. At least for the next four years there is no economic justification for the proposed 4.782 cent industrial energy rate. In fact it may be the case that even with the Labrador interconnection on line, a better estimate of Hydro’s marginal energy cost will still be the marginal cost of fuel. That is so because (as in the case of Island Hydraulic power) a large portion of the cost of Labrador purchased power costs will logically have to be considered an energy cost rather than a capacity cost.

Further in response to the argument that CDM negates the need for economically efficient energy price signals, there is no evidence that industrial CDM programs are achieving any significant energy conservation or that they can be expected to offset the negative efficiency incentive of Hydro’s proposed below-cost marginal energy rate. In fact, according to Hydro, “[t]he CDM savings funded by Hydro to date have been only through

the programs offered to its Rural Customers. A custom IC program has also been operating. The IC program has resulted in minimal energy savings to date.” See *Exhibit 9, Section 4.1 Background*.

Finally, while acknowledging that adopting a two-part energy rate for IC customers “would introduce a meaningful price signal” and further stating that “Hydro would [therefore] give serious consideration to such a rate structure” but for “complexities surrounding the IC load and rates”, Hydro nevertheless declines to do so, arguing that “IC rates to 2016 have largely been determined by Government direction, so any price signals would be muted by phased-in rates.” See Hydro’s response to NP-NLH-122. Hydro goes on to extend this argument, contending that “the phase-in of IC rates as directed by the Government establishes the level of rates for September 1, 2013, 2014, and 2015, which would mute any price signals intended to be passed along under such rate design. In light of these factors, there is no alternative rate design available.” See Hydro’s response to CA-NLH-078.

In our view Hydro has substantially misconstrued the Government’s IC rate mandate, and Hydro’s resulting argument against consideration of a two block IC energy rate with a meaningful marginal cost price signal in the tail block energy rate is therefore mistaken and misleading. As stated in Order Number OC2013-089, issued on April 4, 2013,

“effective July 1, 2013, Island industrial customer rates will no longer be frozen. Effective on this date rate increases for island industrial customers will be phased in over a three year period, with funding for the phase-in to be drawn from ... the Rate Stabilization Plan Surplus ....”

We do not read this directive as intending to constrain efficient IC rate design, but as simply directing a phase-in of any IC revenue increases over a three year period. The directed phase-in of industrial rate increases can be accomplished just as well by adopting a two-part energy rate that introduces a meaningful price signal for IC customers. That would be far preferable to retaining the present single energy block rate which would unnecessarily perpetuate the efficiency perverse price signal now contained in Hydro's single energy block IC rate.

Hydro's below-cost IC tail block energy rate, if retained, would also have a distorting effect on the calculation of the load variation adjustment of Hydro's RSP revenue component. (Hydro's Rate Stabilization Plan or "RSP" is discussed further below.) This is so because the load variation adjustment for each customer class is calculated on the basis of the difference between the fuel cost in the test year cost of service and the customer class tail block energy rate. Because Hydro's proposed tail block IC energy rate is far below (less than half) of the proposed NP energy rate, NP's much smaller rate/cost differential results in a much smaller adjustment (than is the case for the IC class) when energy sales change.

For example, if the cost of thermal generation rate at Holyrood is 17.768 cents per kWh, the RSP impact for industrial customers, with a 4.782 cent tail block energy rate, will be

$$(0.17768 - 0.04782) \times \text{energy sales variation} =$$

$$0.1299 \text{ times energy sales variation;}$$

whereas the RSP impact for NP, with a 10.4 cent tail block energy rate, will be

$$(0.17768 - 0.104) \times \text{energy sales variation} = \\ 0.0737 \text{ times energy sales variation.}$$

Thus, in this example, with Hydro's proposed below-cost IC energy rate, the RSP impact from load variation would be 76 percent greater for Hydro's Industrial Customers than for NP.

A more economically efficient IC rate design alternative would be for Hydro to implement a two block energy rate for industrial customers by selecting a first block for each customer that is set at a percentage of the customer's average monthly usage (e.g., 75 percent of historic usage). A percentage should be used to establish each customer's first block because the five industrial customers have substantially different usage levels, and therefore the same block size would not be optimal for each of them. The second block or tail block for each industrial customer could then be priced at marginal cost. In the case of Vale (or any other IC with substantial anticipated load changes) a provision could be made for block size to change periodically as expected load changes. While such a provision could alter Hydro's IC revenue over time, that is also true of load changes alone, and appropriate recognition of such changes could be readily accommodated in the RSP.

**Hydro's Proposed Energy Rates for NP** -- Hydro also proposes to weaken energy price signals by altering NP's current two-block energy rate, which now has a second block rate set equal to the marginal cost of energy, as defined by the Holyrood fuel cost. Instead of setting the second block of NP's energy rate at the marginal energy cost of 17.768 cents per kwh, Hydro proposes to set NP's second block rate at 10.4 cents per kwh, which is

equivalent to a Holyrood oil price of \$63.65/bbl., or only about 58 percent of the marginal energy cost. Hydro contends that this departure from marginal cost pricing is required because retaining a marginal cost price signal in NP's second block, given today's high cost of oil, would necessitate a negative first block rate in order to equate total NP revenues and NP's total allocated costs. As explained in Hydro's Application, "fuel prices have risen steeply since the 2007 Test Year was reviewed. Current fuel cost, applied in the same manner as used in the 2003 and 2006 GRAs, would result in a second block rate of 177.68 mills/kWh. As NP's rates are designed to recover the costs allocated to them using the approved Cost of Service methodology, it was apparent that application of the previously accepted methodology would result in a low, perhaps negative, first block price." See *GRA Application, Section 4.2 Rates for Newfoundland Power*, page 4.3.

While it would add some complexity to NP's rates, the adoption of a seasonal differential, together with reduced energy in the second block and more energy in the first block, would permit the retention of a marginal cost energy price signal in NP's two block energy rate. For example, by setting NP's first block at 85 percent of prior year minimum seasonal usage in each month of a season and by applying the marginal cost rate only to monthly consumption above that amount, an economically efficient marginal cost price signal could be maintained for marginal energy consumption, together with a positive first block energy price that adequately covers Hydro's non-fuel energy costs. As is shown in Appendix A to this Report, the resulting rate for the first block of an economically efficient NP energy rate would be about \$0.03 (Hydro's non-fuel energy cost is 2.8 cents/kwh), with a tail block rate equal to the marginal energy cost of \$0.1776/kwh.

Hydro also indicates that the elimination of a second block marginal energy rate for NP would permit the implementation of a cost-based demand price signal for NP in Hydro's rate structure. NP's demand rate is now set at a negotiated level of \$4/KW, which is less than Hydro's average embedded demand cost of \$9.12/KW. While a case can be made for a demand rate that reflects the incremental cost of capacity expansion, especially at the present time when Hydro must deal with increased capacity costs as a result of growing demand, there is little evidence that marginal cost capacity rates have as significant an impact on efficient capacity demand as marginal energy rates do on efficient energy demand. An efficient demand level occurs when the marginal cost of increased production is equal to the marginal benefit of increased consumption. Consumers are better able to calibrate this equilibrium with direct energy price signals that can be weighed against the benefit derived from increased energy consumption than they are with an estimated marginal demand cost applied as the price for maximum monthly demand.

Moreover, the demand price signal proposed in this case by Hydro (\$9.12/KW) is not Hydro's marginal cost of capacity in any event, but its average embedded cost of capacity, which may be far out of line with an efficient marginal cost price signal. If a choice must be made between efficient energy price signals and efficient capacity price signals, it is likely that conservation and resource efficiency objectives would best be served with prices that reflect marginal energy costs.

In considering these points it is important to note that in order for marginal cost price signals in the rates that Hydro charges NP to achieve economic efficiency, those price signals must be passed through at the retail level by NP to its customers. It is NP's retail customers

who make incremental energy consumption decisions. In order for those decisions to be efficient, NP's retail rates must reflect Hydro's marginal cost of energy supply.

**Hydro's Proposed Rates for Rural Customers** -- Hydro's proposed energy rates for rural customers in the Island Interconnected and L'Anse au Loop systems are set at the level of NP's retail energy rates. These are \$0.10945 per kwh for all domestic service, and \$0.10927 per kwh for the first block of general service. The second block of general service is priced at a rate that is significantly *below* the first block. At these price levels, Hydro's Rural Customers on the Island Interconnected and L'Anse au Loop systems (like NP's retail customers) would not be receiving economically efficient price signals. All of the tail block rates are economically inefficient because they are all below marginal energy cost. This inefficiency is compounded for general service customers, whose tail block (marginal) rates are below average rates when, in fact, they should be higher than average rates at today's marginal cost levels. As in the case of NP's rates, an efficient solution here may be a two block rate structure for domestic service with a marginal cost price for the second block and a two block general service rate with a lower priced first block and a second block priced at marginal cost.

#### **IV. Other Issues Related to Cost Allocation and Rate Design**

**Curtable Loads** -- Hydro has suggested the possibility of treating NP's curtable load as a generation credit. A generation credit would reduce demand billing quantity by the

amount of curtailable load. However, Hydro's consultant disagrees with this treatment of NP's curtailable load because there is uncertainty regarding the magnitude and firmness of NP's curtailments and because NP's curtailments appear to be based on energy cost considerations which may not necessarily coincide with system peak demand requirements. Consequently, based on the consultant's recommendation, Hydro proposes that, in the future, interruptible curtailment credit should be given only for curtailments that are made at Hydro's direction, at times when load reduction is required for system demand control purposes.

Minimum demand billing to NP is now established at 99 percent of test year native load. According to Hydro's consultant, this was done in order to provide an incentive for NP to implement measures to reduce demand during potential winter peaks. If curtailable load is reformulated as a Generation Credit, Hydro says that "there would be a rationale to set the minimum billing demand at 100% of the test year value." See *Exhibit 9, Section 2.1.3 Discussion*. While it is not necessarily the case that NP's minimum billing demand should be raised to 100 percent of test year native load if the generation credit approach is adopted, that change may be justified if interruption is not firm or if it does not occur when needed for system purposes. This may, moreover, be a moot point depending on whether NP's current curtailment procedure is maintained or curtailment control is transferred from NP to Hydro.

Other curtailment-related concerns include: (1) the possible implementation of penalty provisions for NP curtailable customers who fail to curtail when asked to do so and (2) whether voluntary curtailment for economic reasons should be viewed as "no inconvenience" – thus negating any need for a demand credit. As stated by Hydro's consultant, "If curtailable load is treated as a generation credit, penalty provisions may need

to be implemented for non-compliance during annual performance verification or when called on for system benefit.” See *Exhibit 9, Section 2.1.3 Discussion*. Hydro’s consultant also observes that “There is an argument to be made that if customers want to take advantage of opportunities to reduce their own costs through curtailment then there is no “inconvenience” as it is an economic decision.” See *Exhibit 9, Section 2.1.3 Discussion*.

Under current practice, if Newfoundland Power reduces its load for economic reasons, the resulting reduction in oil costs for Holyrood generation benefits everybody on the system. Moreover, load interruption, even for economic reasons, may have two consequences: (1) reduced capacity needs and (2) fuel cost savings. Even if voluntary curtailment may occur for economic reasons that result from fuel cost savings alone, if the curtailment also results in reduced capacity needs that is a further economic benefit. However, as Hydro’s consultant has observed, there is no compelling economic or equity reason requiring the pass-through of the additional capacity cost savings to the curtailed customer if the fuel cost savings alone provide adequate economic incentive for voluntary curtailment.

**Rate Stabilization Plan (RSP)** -- Hydro’s Rate Stabilization Plan (“RSP”) was first implemented in 1986 to smooth customer rate change impacts. The RSP replaced monthly rate changes under the Company’s prior fuel adjustment clause and water equalization provision with monthly accruals (rather than actual monthly rate changes) for certain cost changes, without the need for a general rate case.<sup>1</sup> Cost changes currently accrued under the

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<sup>1</sup> Originally, the fuel adjustment charge (“FAC”) under the RSP changed each month.

RSP are those associated with variations in hydraulic availability, fuel prices and customer loads. Accrued RSP balances are reflected in rate changes that are implemented without GRAs in each subsequent year.

The broad scope of the RSP allows Hydro to adjust its rates, largely automatically, so as to match most cost changes on an annual basis. As discussed below, this has enabled Hydro to shift significant business and regulatory risks to its customers without offsetting adjustments for the resulting lower equity capital costs. Perhaps even more importantly, as RSP coverage increases there is less need for Hydro, and less opportunity for the Board, to conduct general rate reviews. Reasonably frequent general rate cases are a very important element in achieving and preserving sound and effective public utility regulation. The present GRA is Hydro's first in seven years, underscoring the importance of considering how RSP modification and implementation may affect the ability of the Board to best carry out its regulatory responsibilities. If further RSP modification and ongoing implementation can be expected to continue the matching of revenue and cost changes over time, the Board may wish to give consideration to mandating reasonably frequent GRA filings (e.g., every 3 years or so) even if the utility is not seeking base rate modification.

In its Interim Order in this case (Order No. PU 40(2013), effective December 13, 2013, the Board approved the monthly allocation of RSP fuel price variation costs among NP, Island Industrial Firm customers and Rural Island Interconnected customers based on 12 months-to-date kWh energy sales. It further provided that the fuel price variation initially allocated to Rural Island Interconnected customers would be re-allocated between NP and regulated Labrador Interconnected customers and that the allocation to regulated Labrador Interconnected customers would be removed from the Plan and written off to Hydro's net

income. At that time the Board did not approve a corresponding allocation of RSP load variation costs, but ordered that they be held in a separate account in the Plan until its disposition is ordered by the Board.

At this time Hydro is proposing that the RSP rules should be further revised so that the year-to-date total for NP and IC load variation costs would be allocated in proportion to customer energy ratios in the same manner as fuel price variation is allocated. This is the same allocation Hydro proposed in the 2013 RSP Application. See *July 2013 Rate Stabilization Plan Evidence, Section 5.0: Proposed Changes to -Load Variation Component of the RSP*. Until now load variation impacts have been assigned only to those customer loads that vary. Under the new proposal, load variation cost impacts would be allocated to all loads on the same basis as energy costs. The rationale for this proposed change from direct assignment to pro rata allocation is that load variation has an impact on Holyrood energy costs for all customers. While we have concerns about the expansion of RSP coverage, if load variation costs are to be covered by the RSP we agree that Hydro's proposed allocation of these costs based on customer energy ratios is an equitable allocation method.

Hydro also proposes to add a new "Energy Supply" cost element to the RSP. Under this newly created Energy Supply RSP provision, "any increase or decrease in test year energy supply for the Island Interconnected System [would] be stabilized at a value calculated as the difference between the Test Year cost of that supply and the Test Year No. 6 fuel cost of supply." See *2013 GRA Application, Section 4.6: Rate Stabilization Plan*, page 4.17. Also, this newly proposed energy supply adjustment component of the RSP, covering both variations in quantity and variations in price, would adjust rates due to deviations from

the forecasted levels of diesel generation and gas generation and the costs of power purchases for Island Interconnected energy supplies. This, in addition to RSP adjustments for load variation and variations in fuel costs and hydraulic generation, would further shift business risks that Hydro now faces in planning for and acquiring needed power resources to Hydro's customers. When such risk shifting is permitted by regulators, it should, of course, be accompanied by appropriate offsetting changes to the utility's allowed equity return. That would not occur if Hydro's equity return level is automatically set at the level of NP's allowed equity return, and the end result would be a double burden to customers. While adding an RSP provision to recognize cost changes from energy supply variation may be viewed as a reasonable extension of the RSP concept, this is precisely the kind of automatic rate adjustment expansion that can be expected to further minimize the normal periodic revenue/cost imbalances that give rise to the need for GRA filings. Especially if this RSP expansion is implemented, the Board should give consideration to also mandating regular periodic GRA filings. Even when RSP measures balance revenues and costs over time, regular GRA's remain an appropriate and essential component of the regulatory process, as they are needed for full and balanced examinations and assessments of the utility, its operations and its rates over time.

As an alternative to RSP expansion at this time, we suggest that that the Board might rather initiate a proceeding or inquiry to consider more thoroughly the merits of expanded RSP adjustments or whether all of the automatic RSP rate adjustments might better be limited only to cost changes that are not susceptible to management influence. More limited RSP coverage would not only result in more frequent GRA proceedings, but may also better incentivize management performance

Finally, we note the apparent contradiction between Hydro's proposal to add supply variation to the RSP at this time and Hydro's advocacy (as discussed above) of eliminating marginal fuel cost price signals at this time because the incremental supply source may change in four years if the Labrador interconnection comes on line. Surely the same consideration would be relevant in assessing the merits of a new RSP energy supply adjustment for the Company's own revenue adequacy purposes since it is based on the same marginal cost of No. 6 fuel oil.

**Conservation and Demand Management (CDM)** -- Hydro proposes to adopt deferred (7-year) recovery of CDM program costs as is now done by NP. Deferred CDM costs exclude those CDM costs chargeable to plant accounts and those costs that are "general in nature" and are not associated with a specific program. These deferred costs are proposed to be recovered through a rate rider rather than in test year revenue requirements.

CDM program costs could be recovered either directly, by assigning them to the customer class that is offered the CDM program with which they are associated, or by spreading all CDM program costs to all customers. As stated in Hydro's General Rate Application, "Hydro has received approval from the Board to defer its 2009, 2010, 2011 and 2012 CDM program expenditures. To determine an appropriate recovery mechanism for these deferrals, and for future year expenditures, Hydro requested a review of this item by Lummus, its cost of service consultants." See *GRA Application, Section 4.7.2 Proposed Deferral and Recovery Mechanisms at pages 4.22-4.23*. The Lummus conclusion was that "Direct assignment does not recognize that energy savings by any of Hydro's customer

classes results in lower fuel oil costs, which benefits all customer classes.... It is therefore recommended that Hydro consider the CDM Program costs as common costs, applicable to all customer classes consistent with anticipated fuel savings from the programs.” See *Exhibit 9 at page 19*.

While this allocation scheme could be viewed as a subsidy to those customers participating in CDM programs from non-participating customers, Hydro supports the rationale that each CDM program reduces energy requirements and Holyrood fuel costs for the system as a whole, thus providing cost reduction benefits for all customers. Based on this reasoning, Hydro is proposing to allocate its CDM program costs so as to recover them as a common cost from all customers in proportion to each customer’s energy consumption.

Hydro’s proposed allocation of CDM program costs to all energy consumption (kwh) rather than directly to the beneficiaries of CDM programs is already done by NP for its CDM program costs, based on the rationale that all consumers derive cost benefits from reductions in Holyrood generation. While NP and Hydro share the same CDM programs, Hydro’s CDM savings have been achieved largely through programs offered to rural customers. As Hydro has noted, “The justification of the Utilities’ CDM programs has been on system energy savings that benefit all customers on the Island interconnected System, including: Hydro Rural, IC and NP. The CDM savings funded by Hydro to date have been only through the programs offered to its Rural Customers. A custom IC program has also been operating. [However] The IC program has resulted in minimal energy savings to date.” See *Exhibit 9, Section 4.1 Background at page 19*. Note that GRA Table 2.2 shows reported CDM energy savings in 2012 of 3,172 MWh for one industrial program. See *GRA Application, Section 2.2.3 Conservation and Demand Management at page 2.5*. Hydro’s

response to IC-NLH-071 explains that these reported industrial CDM savings “associated with the Industrial Efficiency Program are the result of three retrofit projects completed through the program by Corner Brook Pulp & Paper, which included upgrades to equipment and process improvements.”

While much of Hydro’s logic supporting the allocation of its CDM program costs to all energy consumption is defensible, the process proposed would be discriminatory and unfair to NP customers. This is so because NP’s customers pay all of the costs of NP’s own CDM programs (which are the same as Hydro’s CDM Programs). Hydro’s retail customers do not pay for any of NP’s CDM Program costs. In contrast, Hydro’s proposal would require NP’s retail customers to pay the lion’s share of Hydro’s CDM costs because NP is, by far, Hydro’s largest energy purchaser. The end result would be NP’s retail customers paying double for CDM Programs – paying once for all of the costs of NP’s own CDM Programs and paying a second time for most of the costs of the same Programs offered by Hydro to its retail customers. Under Hydro’s plan, the total CDM recovery amount of \$3,070,956 would be spread over seven years, and the annual amount of \$438,708 would be allocated between NP (\$379,451), IC (\$27,794) and Rural (\$31,463). The Rural amount would, in turn, be assigned to NP (\$28,034) and Labrador Interconnected (\$3,429), with Hydro assuming the Labrador Interconnected portion. At the same time, Hydro’s retail customers, whose CDM Programs would be largely subsidized by NP’s customers, would pay for none of NP’s CDM Program costs. A more equitable solution would be for NP to be exempted from an allocation of Hydro’s CDM costs so that those costs would be allocated, based on energy consumption, only to Hydro’s retail customers. Following that alternative allocation, Island IC customers would be allocated \$205,771 and rural customers would be allocated \$232,937.

Assignment of the rural portion to the rural deficit would result in NP covering \$207,547 of the rural allocation and Hydro absorbing the Labrador Interconnected share of \$25,300.

Thus, the annual allocation of Hydro’s CDM cost recovery would be as follows:

	<u>Hydro Proposal</u>	<u>Alternative Allocation</u>
NP	\$407,485	\$207,547
IC	\$27,794	\$205,771
Hydro	\$3,429	\$25,300

Non-program CDM costs (those that are general in nature and are not associated with a specific program) are allocated in the same manner as A&G costs – i.e., in proportion to the sum of production, transmission, distribution, and customer accounting O&M. These non-program CDM costs (unlike CDM Program costs) are not proposed for deferral, but are proposed for recovery through the test year revenue requirement in base rates. For the same reason discussed above concerning the allocation of Hydro’s CDM Program costs, NP should be exempt from this allocation of Hydro’s non-program CDM costs.

**CFB Goose Bay Credit** – A rate plan Agreement reached during Hydro’s 2006 GRA specified the following use of the then existing CFB Goose Bay Revenue Credit. First, a sufficient portion of the Credit was to be used to maintain existing (2006) rates paid by Customers on the Labrador Interconnected system for 2007. Second, the remainder of the CFB Goose Bay secondary sales revenue credit was to be fully applied to the rural deficit.

This two part procedure continued in subsequent years in conjunction with phasing-in uniform rates, based on the 2007 test year revenue requirement, for all Rural customers on the Labrador Interconnected system by 2011. In that regard, the Board accepted Hydro's proposed methodology for the allocation of the CFB Goose Bay Revenue Credit during the extended phase-in of uniform Labrador Interconnected rates. See Board Order No. P.U. 8(2007). In 2010 the Board approved rates for Labrador Interconnected Rural Customers completing the phase in of 2007 Test Year rates.

In setting new rates in this case, Hydro is proposing to fully apply the CFB Goose Bay revenue credit directly to the rural deficit. Because this revenue credit would be fully applied to the rural deficit in setting new rates, the Rural Rate Alteration calculation (Rural Labrador Interconnected Automatic Rate Adjustment) related to the Labrador Interconnected system would be removed from the RSP. See *GRA Application, Section 4.6.1 Hydro's Application at page 4.20.*

This treatment of the CFB Goose Bay secondary sales revenue credit benefits NP. Before 2004, the credit was used to offset the Labrador Revenue requirement. From 2004 through 2006 the credit was partially used to offset the Labrador Interconnected system's share of the rural deficit subsidy and partially to phase in uniform rates for customers on the Labrador Interconnected System. As noted above, in 2007 the credit was partially used to maintain existing (2006) rates paid by Customers on the Labrador Interconnected system and the remainder was applied directly to the rural deficit balance. In subsequent years the credit continued to be partially used to phase-in uniform rates, based on the 2007 test year revenue requirement, for all Rural customers on the Labrador Interconnected system by 2011, with the balance being directly applied to the rural deficit. Under the present filing the full CFB

Goose Bay revenue credit would be applied directly to the rural deficit burden, so that a large portion of the benefit of that credit (88.7%) goes to NP. This is so because the rural deficit burden is allocated between NP and the Labrador Interconnected system in proportion to energy consumption on each system.

The combined impact of allocated cost increases and this treatment of the CFB Goose Bay revenue credit produces relatively large percentage rate increases (generally greater than 20 percent) for Labrador Interconnected System customers. See *GRA Application, Section 4.4.9 Labrador Interconnected, Table 4.3 at page 4.13*. Under these circumstances, the Board may wish to consider moderating the immediate rate impact for these customers by phasing in Labrador Interconnected system rate increases – for example, by implementing half of the increase at this time and the other half after two years. Such a phase-in would be consistent with the Rate Principles previously established by the Board, which state, in part, that “Where changing rates to accomplish uniform rates on a single electrical system required that large percentage rate increases occur, those rate changes should, where practicable, be phased in gradually...” See Board Order No, P.U. 8(2007) at 43.

**Variations in Isolated Systems’ Diesel Fuel and Purchased Power Costs** -- Hydro proposes to allocate new diesel cost variance and purchased power cost variance deferral accounts for isolated systems between NP and the Labrador Interconnected system in the same proportion as the rural deficit (based on billing determinants). As stated in Hydro’s Application, “The diesel unit cost variation will be allocated between NP and Labrador Interconnected Rural Customers in the same proportion as the rural deficit was allocated in

the approved Test Year Cost of Service Study.” The same applies to power purchase cost variation. See *GRA Application, Section 4.7.3 Recovery Mechanisms, pages 4.26 and 4.27.*

The portion of this cost variation allocated to the Labrador Interconnected system customers would be written off against Hydro’s net income. Therefore, NP will pay 88.7 percent of these cost variances. At the present time Hydro is at risk for 100 percent of these cost variances. Consequently, the proposed new procedure represents a further transfer of risk from Hydro to its customers – in this case to NP. In this case Hydro’s gain from the risk shifting is at least partially offset by the proposed write off of the 11.3 percent Labrador allocation. However, it is still the case that this risk shifting results in a double payment by NP – once in the risk shift itself, and again in the assessment of an unadjusted ROE.

In addition to this risk transfer itself, another potential regulatory concern is that the transfer of this risk to NP (and ultimately to NP’s customers) may eliminate or reduce incentives for Hydro to minimize fuel and purchased power costs and to thus achieve most efficient operations. If a utility is at risk for cost variances (i.e., if it has to pay for cost increases and if it retains the savings of cost reductions), it will have a direct economic incentive to find and pursue ways to keep costs from rising and achieve cost savings. On the other hand, if the risk is passed downstream to consumers, this incentive disappears. In this case, it might be argued that a Crown Corporation is not likely to be as responsive to profit motivation as private enterprise, and the loss of this incentive may therefore be tempered.

## Appendix A

### Newfoundland Power Seasonal Rate Design

1	\$/bbl	\$	108.74		
2	Holyrood Conversion Rate (kWh/bbl)		612		
3	Mills/kWh	\$	177.68		
4	Total Holyrood Fuel Costs	\$	200,692,615		
5	NP Energy Ratio		0.8673		
<b>NP Revenue Requirement</b>					
6	Total Revenue Requirement	\$	453,005,298		
7	Demand Revenue Requirement	\$	127,044,995		
8	Energy Revenue Requirement	\$	267,676,715		
9	NP Allocated Holyrood Fuel Costs	\$	174,060,705		
10	Non-Fuel Energy Costs	\$	93,616,010		
	<b>Rate</b>		<u>kW/kWh</u>	<u>Rate</u>	<u>Revenue</u>
11	Demand		13,929,036	\$ 9.12	\$ 127,044,995
12	Energy				
	First Block				
	Jun-Sep (280 GWh/mo)		1,120,000,000		
	Apr-May, Oct-Nov (350 GWh/mo).		1,400,000,000		
	Dec-Mar (500 GWh/mo.).		<u>2,000,000,000</u>		
13	Total First Block		4,520,000,000	0.02988 <sup>2</sup>	\$ 135,078,960
	Second Block				
14	(GWh in excess of first block)		1,074,300,000	0.17768	\$ 190,881,343
			-----		-----
15	Total		5,594,300,000		\$ 453,005,298

<sup>2</sup> If the current negotiated demand rate of \$4.00/kW is retained, the first block energy rate would increase to \$0.04566/kWh.

**Qualifications**

**Of**

**Dr. John W. Wilson**

# Dr. John W. Wilson

## EDUCATION

B.S.	(Senior Honors)	-	University of Wisconsin
M.S.	(Economics)	-	University of Wisconsin
Ph.D.	(Economics)	-	Cornell University

## EMPLOYMENT

1975 - Present	-	President, J.W. Wilson & Associates, Inc.
1973 - 1974	-	Independent Economic Consultant
1972 - 1973	-	Chief, Division of Economic Studies Federal Power Commission
1971 - 1972	-	Economist, Federal Power Commission
1969 - 1971	-	Assistant Professor of Economics (and Captain, U.S. Army); United States Military Academy; West Point, New York. Also varsity debate coach, USMA; and antitrust consultant, U.S. Department of Justice.
1966 - 1969	-	Teaching Assistant, Cornell University
1965 - 1966	-	Research Assistant, University of Wisconsin
1961 - 1965	-	Independent Insurance Agent (Licensed in the State of Wisconsin)

## PUBLICATIONS

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Committee on Interstate and Foreign Commerce, Subcommittee on Energy and Power; expert testimony concerning natural gas producer regulation, March 1975.

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Committee on the Judiciary, Subcommittee on Monopolies and Commercial Law Oversight Hearings on Mergers and Acquisitions; expert testimony concerning merger policy and antitrust enforcement, December 1981.

Committee on Energy and Commerce, Subcommittee on Energy Generation and Power; expert testimony concerning competition in the electric power industry and the importance of public preference on hydroelectric relicensing in that regard, 1986.

Committee on the Judiciary, Subcommittee on Monopolies and Commercial Law, September 13, 1984; expert testimony concerning competition in the insurance industry.

Before the United States Senate -

Joint Economic Committee, Subcommittee on Energy; expert testimony concerning antitrust problems related to the development of an integrated fuels industry in the United States; November 1975.

Committee on the Judiciary, Subcommittee on Antitrust and Monopoly; expert testimony dealing with integration between the oil, coal, and nuclear industry, June 1975.

Committee on the Judiciary, Joint Hearing before the Subcommittee on Antitrust and Monopoly and the Subcommittee on Administrative Practice and Procedure; expert testimony dealing with natural gas reserves in the United States, October 1973.

Committee on Commerce; expert testimony on market conditions in the natural gas producing industry and field price regulation, October 1973.

Committee on the Judiciary, Subcommittee on Antitrust and Monopoly, expert testimony dealing with competition in the petroleum industry, June 1973.

Committee on the Judiciary, Subcommittee on Antitrust and Monopoly; expert testimony on matters pertaining to S.403, A Bill to Prohibit Certain Combinations and Control Between Electric and Gas Utilities, May 1971.

Committee on Government Operations; expert testimony pertaining to S.607, A Bill to Establish an Office of Utility Consumers' Counsel, 1970.

Committee on the Judiciary; expert testimony concerning the proposed settlement of the AT&T antitrust lawsuit, March 1982.

Committee on Energy and Natural Resources, Subcommittee on Water and Power; expert testimony concerning competition in electric power industry and the importance of public preference in hydroelectric relicensing, 1986.

Before the American Arbitration Association -

Commercial Arbitration, Dallas Division, No. 71 198 00323 01, Report regarding control, ownership and operation of Cleburne generating plant, competition between Brazos and Enron and Enron's status as an electric utility on behalf of Claimant, Brazos Electric Power Cooperative, Inc., March 12, 2003.

Before the California State Legislature -

Expert testimony on matters dealing with natural gas supply in the State of California.

Assembly Committee on Natural Resources and Energy of the California Assembly.  
A Report to the California State Assembly, March 1983.

Expert testimony on matters pertaining to profitability, competition and discrimination in California property/ casualty insurance markets before the California State Assembly, 1986.

Before the New York State Legislature -

Expert testimony on matters dealing with natural gas supply in the State of New York.

Expert testimony concerning medical malpractice insurance rates and profits in New York, February, 1988.

Before the Texas State Legislature -

Expert testimony before the Texas State Legislature concerning insurance rate regulation and industry data reporting to the State Insurance Board, 1989.

Before the Virginia State Legislature -

Expert testimony before the Virginia House of Delegates on behalf of the Attorney General concerning the need for improved regulation of rates charged by property/casualty insurance companies in the State of Virginia (various dates 1987-1989).

Expert testimony before the Virginia Senate on behalf of the Attorney General in support of legislation strengthening the regulation of property/casualty insurance companies rates for commercial liability insurance by the Virginia Corporate Commission (various dates 1987-1989).

Before the Federal Communications Commission -

Affidavit dealing with the economic structure and performance of competitive markets in connection with implementation of wide area paging systems.

Expert witness concerning AT&T's migration strategy.

Expert witness in CC Docket No. 80-286; testimony on cost methods.

Before the Federal Energy Regulatory Commission (formerly Federal Power Commission) -

Expert witness in Docket ER76-205, Southern California Edison Company; testimony concerning rate of return and other related financial issues.

Expert witness in Docket ER77-175, Florida Power & Light Company; testimony concerning transmission service rate and related antitrust issues.

Expert witness in Docket ER76-304, New England Power Company; testimony concerning rate of return.

Expert witness in Docket No. ER76-495, Carolina Power & Light Company; testimony concerning rate of return and related financial issues.

Expert witness in Docket No. ER76-45, Consumers Power Company; testimony concerning antitrust and bulk power supply issues.

Expert witness in Docket No. RP76-57-1, Plant City Natural Gas Case; testimony concerning special exemptions for natural gas curtailments.

Expert witness in Docket No. CP74-192, Florida Gas Transmission Company; testimony concerning natural gas supply, and pipeline abandonment and conversion to oil products line.

Expert witness in Docket No. E-9147, Virginia Electric & Power Company; testimony concerning rate of return.

Expert witness in Docket No. E-8884, Carolina Power & Light Company; testimony concerning rate of return, managerial efficiency, and cost of service.

Expert witness in Docket No. E-8570, Southern California Edison Company; testimony concerning rate of return, economic efficiency, cost of service, fuel adjustment clause, and anticompetitive price discrimination.

Expert witness in Docket No. E-8176, Southern California Edison Company; testimony concerning rate of return.

Expert witness in Docket No. RP74-50-5, Florida Hydrocarbons Company and Florida Gas Transmission Company; testimony concerning natural gas curtailment exemptions for liquefied petroleum gas production.

Expert witness in Docket No. E-8881, Carolina Power & Light Company; testimony concerning rate of return and related economic matters.

Expert Economic Policy Witness in Docket No. CI73-501, Louisiana Land and Exploration Company; testimony concerning prices and competition.

Expert Rate of Return Witness in Docket No. E-7738, Boston Edison Company.

Expert Economic Policy Witness in Docket No. CI73-293, et al., Belco Petroleum Corporation, et al.; testimony concerning prices and competition.

Expert Economic Policy Witness in Docket No. E-7679, Florida Power Corporation; testimony concerning rate of return, rate structure design and antitrust matters.

Expert Economic Policy Witness in Docket No. CI72-301, et al., Northern Michigan Exploration Company, et al.; testimony concerning prices and competition.

Expert Witness on matters pertaining to competition in Docket No. E-7618, Southern California Edison Company.

Expert Rate of Return Witness in Docket No. E-7645, Public Service Company of Indiana.

Expert Rate of Return Witness in Docket No. E-7602, Central Telephone & Utility Corporation.

Expert witness for City of Anaheim, California in Docket No. ER76-205, Southern California Edison Company; testimony dealing with rate of return issues.

Expert witness in Docket Nos. ER78-19, ER78-81, Florida Power & Light Company; testimony concerning prices and competition.

Expert witness in Docket No. ER76-714, Indiana & Michigan Electric Company; testimony concerning rate of return.

Expert witness for the Municipal Wholesale Power Group in Docket No. ER77-347, Wisconsin Power & Light Company; testimony concerning price squeeze issues.

Expert witness in Docket Nos. EL78-15 and ER78-339, Public Service of New Hampshire; concerning the inclusion of construction work in progress in rate base.

Expert witness in Docket No. ER78-379, et al., Indiana & Michigan Electric Company; testimony concerning rate of return and capital structure.

Expert witness in Docket No. OR78-1, Trans-Alaska Pipeline; testimony concerning rate of return, rate base, and capital structure.

Expert witness in Docket No. OR79-1, Williams Pipe Line Company; testimony concerning rate base valuation and related regulatory issues.

Expert witness in Docket No. ER78-522, Virginia Electric & Power Company; testimony concerning price squeeze issues.

Expert witness in Docket ER78-360, Connecticut Yankee Atomic Power Company; testimony concerning rate of return and related issues.

Expert witness in Docket No. RP83-11, Transcontinental Gas Pipeline Company; testimony concerning rate of return and sales volumes.

Expert witness in Docket No. ER82-427-000, Southern California Edison Company; testimony concerning fuel procurement practices and nuclear plant operating efficiency.

Expert witness in Docket No. ER82-483-000, Middle South Utilities Company; testimony concerning equalization of costs.

Expert witness in Docket No. ER76-205-003, Southern California Edison Company; testimony concerning price squeeze issues related to wholesale rates.

Expert witness, Docket No. ER82-545-000, Public Service Company of Oklahoma, analyzed competitive issues related to rates, terms and conditions for transmission tariffs filed,

Expert witness in Docket No. ER83-609, Southwestern Electric Power Company; testimony concerning cost of capital and rate of return.

Expert witness in Docket No. ER85-204-000, South Carolina Generating Company, Inc.; testimony concerning corporate reorganization and the application for initial rate schedule.

Expert witness in Docket Nos. ER85-646-005 and ER85-647-003 (Phase II), New England Power Company; testimony concerning the issue of the proper regulatory treatment of abandoned plant costs.

Expert witness in Docket No. ER84-571 (Phase I), Utah Power and Light; on behalf of the Western Area Power Administration (WAPA) and other parties concerning Utah Power and Light's application to overturn fixed price contracts.

Expert witness in Docket Nos. ER86-76 and ER86-230, Commonwealth Edison Company; testimony concerning Commonwealth Edison's proposed "marginal cost-based" tariffs for wheeling services.

Expert witness in Docket No. ER85-785-001, Wisconsin Electric Power Company; testimony concerning proposed "value of service" rates for transmission services.

Expert witness in Docket No. RP86-119-000, Tennessee Gas Pipeline Company; testimony concerning the proper regulatory treatment of gas supply contract reformation costs and excess take or pay costs.

Expert witness in Docket No. RP86-126-000; Transwestern Pipeline Company; testimony concerning the proper regulatory treatment of gas supply contract reformation costs and excess take or pay costs.

Expert witness in Docket No. RM85-17 on behalf of the American Public Power Association concerning proposed rules and regulations pertaining to the implementation of new economic pricing techniques for wholesale electric utility services and ratemaking, and the competitive implications of risk sharing between buyers and sellers of wholesale services.

Expert witness in Docket No. ER-84-31-000, Central and South West Services, Inc.; testimony concerning competition in the electric utility industry and the potential competitive impact of the proposed Central and Southwest pool.

Expert witness in Docket No. RP87-103-000, Panhandle Eastern Pipeline Company; testimony concerning regulatory and economic principles that are violated by proposal of Indiana Gas company regarding recovery of gas supply costs.

Expert witness in Docket No. 88-68, Transcontinental Gas Pipeline Corporation; testimony concerning proposal of "Indicated Shippers" regarding recovery of gas supply costs and violation of regulatory and economic principles.

Expert witness in Docket Nos. ER89-256-000, ER90-333- 000, EC89-10-000, Palisades Generating Company; testimony concerning certain aspects of proposed "Purchase Power Agreement" and other related agreements.

Expert witness in Docket Nos. EC90-10-000, ER90-143-000, ER90-144-000, ER90-145-000, and EL90-9-000, Northeast Utilities Service Company (re Public Service Company of New Hampshire); testimony concerning economic aspects of a proposed utility acquisition as well as related regulatory policies and competitive issues.

Expert witness in Docket Nos. ER90-374-000, ER90-373-000, ER90-390-000, ER90-373-001, ER90-090-00, Northeast Utilities Service Company; testimony on concerns expressed by the Commission in its Orders of August 28, 1990 and October 31, 1990 regarding the "opportunity cost" provisions in Northeast Utilities transmission agreements and to respond to its expressed views in this regard.

Expert witness in Docket Nos. EC90-10-007 and ER93-294-000; affidavit concerning arguments expressed by Northeast Utilities Service Company with respect to "opportunity cost" rates.

Expert witness in Docket No. ER92-331-000 and ER92-332-000; testimony concerning economic issues related to "open access" transmission service Consumers Power Company claims to offer in its proposed tariff and the non-firm transmission service offered in its proposed coordinated operating agreement between CPCo, the Michigan Public Power Agency, and Wolverine.

Expert witness in Docket Nos. ER92-595-000, ER92-596-000 and ER92-626-000; Pacific Gas & Electric Company, Southern California Edison, et al., testimony concerning anticompetitive effects of the unreasonable restrictions and limitations that would be imposed on TANC and its Members by the rate and service schedules filed by the Companies.

Expert witness in Docket No. ER93-465-000, Florida Power & Light; affidavit concerning the discriminatory and anticompetitive practices of FPL and imposed costs on Florida cities.

Expert witness in Docket No. RP92-166-000, Panhandle Eastern Pipe Line Company; rebuttal testimony concerning FERC staff witness' recommended common equity return allowance.

Expert witness in Docket No. RP93-109-000, Williams Natural Gas Company; testimony concerning the appropriate rate of return allowance in addition, to determine whether WNG's proposed rates are discriminatory, preferential or anticompetitive.

Expert witness in Docket Nos. TX93-4-000 and EL93-51-000; Florida Power & Light Company; affidavit dealing with the amount of network transmission service that FPL would require Florida Municipal Power Agency to buy in order to receive service and FPL's proposed restrictions on FMPA's access to transmission interconnections with other utilities.

Expert witness in Docket Nos. ER93-465-000, et al., Florida Power & Light Company; testimony regarding competitive issues concerning "open access" transmission service and appropriate rate of return for wholesale rates.

Provide advice and comments on behalf of Pennsylvania Boroughs in Docket Nos. RM95-8-000 & RM95-7-000 regarding NOPRs proposed treatment of stranded costs.

Expert witness in Docket No. ER95-112-000; Entergy Services, Inc; testimony regarding the Comparability of Entergy open-access tariffs.

Expert witness in Docket No. EC96-10-000, Baltimore Gas and Electric Company, Potomac Electric Power Company; testimony filed on behalf of the DC Office of People's Counsel on competition and merger related market power issues.

Expert witness in Docket No. EC96-13-000, et al., The Wisconsin Intervenors; examination of economic issues relating to proposed merger with a focus on market power issues.

Expert witness in Docket No. EC96-13-000, et al., Badger Cooperative Group, et al.; testimony on Remedies.

Expert witness in Docket No. EC97-5-000, Ohio Edison Company, Pennsylvania Power Company, The Cleveland Electric Illuminating Company, Toledo Edison Company; affidavit submitted on behalf of the Boroughs of Ellwood City, Grove City and Zelienople, Pennsylvania concerning Applicant's "Order Compliance Filing" in response to the Commission's July 16, 1997 Order regarding the competitive impact of the merger.

Expert witness in Docket Nos. EC97-5-000, Ohio Edison, Pennsylvania Power Company, The Cleveland Electric Illuminating Company, The Toledo Edison Company; affidavit submitted on behalf of Industrial Energy Users-Ohio, regarding economic issues pertaining to Applicant's Compliance Filing in response to Commission's July 16, 1997 Order.

Expert witness in Docket No. EC97-5-000, Ohio Edison Company, Pennsylvania Power Company, The Cleveland Electric Illuminating Company, The Toledo Edison Company; affidavit filed on behalf of the City of Cleveland regarding its protest and the impact of merger on competition in electric power markets.

Expert witness in Docket No. EC97-56-000, Western Resources and Kansas City Power & Light Company; affidavit filed on behalf of The Kansas City Board of Public Utilities regarding merger related market power issues.

Expert witness in Docket Nos. EC98-1-000 & ER98-6-0000, New England Power Company, The Narragansett Electric Company, U.S. Gen New England, Inc., Application for Required Approvals Under Sections 203 & 205 of the Federal Power Act for Divestiture of Generating Business & Related Matters; affidavit filed on behalf of the Town of Norwood, Massachusetts concerning economic issues resulting from NEP's sale of all its non-nuclear generation assets to U.S. Generating.

Expert witness in Docket No. EC98-40-000, American Electric Power Company, Inc., Central & South West Corporation; affidavit filed on behalf of American Electric Group Intervenors concerning merger related market power issues as a result of the merger between AEP & CSW.

Expert witness in Docket No. RP95-364-005, Williston Basin Interstate Pipeline Company; testimony filed on behalf of the Public Utilities Commission of South Dakota and the Montana Consumer Counsel concerning investors' long term growth expectation component of the discounted cash flow (DCF) model, November, 1999.

Expert witness in Docket Nos. ER99-28-001, ER99-28-003, EL99-38-002 and ER99-945-002, Sierra Pacific Power Company; testimony filed on behalf of the Transmission Agency of Northern California concerning the interconnection of the Alturas Intertie Project with the Pacific Northwest-Southwest AC Intertie, January, 2000.

Expert witness in Docket Nos. EC00-55-000 & ER00-1520-001, CP&L Holdings, Inc. and Florida Progress Corporation, affidavit filed on behalf of The Florida Cities concerning market power issues as a result of the proposed merger of CP&L and FPC, April 2000.

Expert witness in Docket No. EC00-63-000, Sierra Pacific Power, Nevada Power Company and Portland General Electric Company, affidavit filed on behalf of The Transmission Agency of Northern California concerning merger related market power issues and the potential for anticompetitive exploitation by applicants, May 2000.

Expert witness in Docket No. EC01-33-000, FPL Group and Entergy Corporation, affidavit filed on behalf of Seminole Electric Cooperative and Florida Municipal Power Agency concerning competitive market and ratepayer protection issues as a result of proposed merger between FPL and Entergy, January 2001.

Expert witness in Docket No. EL01-80-000, National Grid USA, affidavit concerning competitive market issues as a result of National Grid's Petition for a Declaratory Order, declaring they not be deemed a "market participant" as defined by Commission regulations with respect to region served by the Alliance RTO, June 2001.

Expert witness in Docket No. ER01-1639-000, Pacific Gas & Electric Company, testimony filed on behalf of the Northern California Power Agency concerning economic arguments of PG&E proposed amendment to Contract 2948A with Western Area Power Administration, September 2001.

Expert witness in Docket Nos. EC01-156-000 and ER01-3254-000, Alliant Energy Corporate Services, Inc., MidAmerican Energy Company, Xcel Energy Services, Inc., TRANSLink Transmission Company, affidavit filed on behalf of IAMU, CMMPA, and MMUA concerning economic, cost of capital and competitive market issues, November 2001.

Expert advice and analysis in Docket No. RM01-12-000, Remedying Undue Discrimination Through Open Access Transmission Service and Standard Electricity Market Design; comments filed on behalf of Montana Consumer Counsel concerning FERC SMD Proposal, November, 2002.

Expert witness in Docket No. EL03-37-000, Town of Norwood, Massachusetts v. New England Power Company; testimony filed on behalf of Town of Norwood concerning complaint against National Grid, USA for imposing unlawful and excessive rates and charges, December, 2002.

Expert witness in Docket Nos. EL00-95-000, et al., San Diego Gas & Electric Company, et al.; testimony on behalf of interveners City of Burbank, City of Glendale, Imperial Irrigation District and Turlock Irrigation District concerning alleged market manipulation, February, 2003.

Expert advice and analysis in Docket Nos. EL01-118-000 and EL01-118-001 on behalf of Montana Consumer Counsel, comments on proposed revisions to market-based rate tariffs and authorizations, July 2003.

Expert witness in Docket Nos. ER00-2019-006, et al., California Independent System Operator Corp.; testimony filed on behalf of the California Department of Water Resources State Water Project concerning transmission cost allocations, economic efficiency and rate structure design, September 2, 2003.

Expert witness in Docket Nos. EL03-180-000, et al., Enron Power Marketing Inc., et al.; testimony filed on behalf of City of Glendale responding to allegations reflected in Commission's *Order to Show Cause Concerning Gaming and/or Anomalous Market Behavior Through the Use of Partnerships, Alliances or Other Arrangements and Directing Submission of Information*, September, 2003.

Expert witness in Docket No. ER03-1223-000, Montana Megawatts I, LLC, affidavit filed on behalf of the Montana Consumer Counsel concerning NWE/MMI proposed power sales rate formula in support of their request that the Commission accept their “cost based” Power Purchase Agreement as an initial rate filing, October 2003.

Expert witness in Docket Nos. ER04-157-000, Bangor Hydro, et al.; testimony filed on behalf of the New England Consumer Owned Entities (NECOE), concerning Joint Return on Equity filing by the New England Transmission owners made in connection with the proposed formation of a Regional Transmission Organization for New England, December 2003.

Expert advice and analysis in Docket Nos. ER 93-465-033, ER 93-417-002, ER 96-1375-003, OA 96-39-010 and OA 97-245-003, Florida Power & Light Company; Affidavit regarding anticompetitive transmission cost discrimination, June 2004.

Expert witness in Docket Nos. ER-03-563-030, Devon Power, LLC, et al testimony on the design of a locational installed capacity (“LICAP”) market in New England.

Expert witness on behalf of Wellesley Municipal Light Plant, Reading Municipal Light Department, and Concord Municipal Light Plant in Docket Nos. ER-03-563-030 Devon Power, LLC et al.; testimony regarding LICA pricing and demand curve parameters. November 2004.

Expert Witness in the matter of PPL Montana, LLC, Docket No. ER 99-3491-003, ER-00-2184-001 and ER00-2185-001. Affidavit dealing with PPL Montana’s Market Power Analysis. January 2005.

Affidavit in the matter of PPL Montana, LLC, Dockets No. ER 99-3491-003, ER-00-2184-001, ER00-2185-001, EL05-124-000 and Delivery Price Test dealing with PPL Montana’s Market Power Analysis. November 2005.

Expert witness in the matter of Market-Based Rates for wholesale Sales of Electric Energy Capacity and Ancillary Services by Public Utilities. Docket No. RM04-7-000. August 2006.

Expert Witness in the matter of Mystic Development, LLC, on Behalf of Wellesley Municipal Light Plant, Reading Municipal Light Plant, Concord Municipal Light Plant, And Massachusetts Municipal Wholesale Electric Company Docket No. 06-427-000. November 9, 2006.

Expert witness in Docket No. EL03-37-000, Town of Norwood, Massachusetts v. National Grid USA, New England Electric System, New England Power Company, Massachusetts Electric Co. and Narragansett Electric Company; Affidavit filed on behalf of Town of Norwood. May 2007.

Expert Witness in Docket ER08-552-000, Niagara Mohawk Power Corporation Affidavit on behalf of the New York Association of Public Power (“NYAPP) and several of its members (Green Island Power Authority, the Jamestown Board of

Public Utilities, the City of Salamanca, the City of Sherrill, the Village of Solvay and Oneida Madison). March 17, 2008.

Expert witness in the matter of ISO New England, Inc. March 17, 2008.

Expert advice in the matter of New York Regional Interconnect, Inc. Docket No. ER08-39-000. June 2008.

Expert witness in Docket No. EL-11-66-001, Bangor Hydro-Electric Company, Central Maine Power Company, New England Power Company, et al., on behalf of the Eastern Massachusetts Consumer-Owned Systems, regarding return on equity issues. October 2012.

Before the International Trade Commission -

Expert witness on the profitability of AT&T's Small Business Telephone Systems and Subassemblies, Inv. Nos. 731-TA-426-428(F).

Before the Nuclear Regulatory Commission -

Affidavit dealing with proposed licensing conditions pertaining to a new nuclear power plant to be constructed by the Florida Power & Light Company, April 1976.

Affidavit dealing with proposed licensing conditions pertaining to a proposed Nuclear Power Plant License Renewal, Docket No. 90-16500, October 1990.

Before the Securities & Exchange Commission -

Expert economic witness for the U.S. Justice Department on the matter of American Electric Power Company, Inc., SEC File No. 70-4596 (proposed merger with Columbus & Southern Ohio Electric Company), February-March, 1971.

Before the Surface Transportation Board -

Verified Statement on Behalf of The Western Coal Traffic League, American Public Power Association, Edison Electric Institute, National Association of Regulatory Utility Commissioners and National Rural Electric Cooperative Association. STB Finance Docket No. 35506. November 2011.

Before the United States Department of Energy -

Dealing with gas supplies and natural gas pipeline service to Florida.

Before the Federal Maritime Commission -

Expert witness in Docket No. 85-3, Matson Navigation Company, Inc.; testimony concerning proposed overall rate increase.

Before the U.S. Court of Federal Claims -

Expert witness in Brazos Electric Power Cooperative, Inc. v. The United States, No. 98-837C, affidavit filed on behalf of Brazos concerning economic damages suffered as a result of the Government's breach of contract, October 2001.

Before the U.S. District Court for the -

Northern District of New York, Expert witness in 79-CV-163, Town of Massena, New York v. Niagara-Mohawk Power Corporation; testimony concerning antitrust issues pertaining to Massena, New York's establishment of a municipal electric distribution system.

District of Connecticut, expert witness in antitrust liability and damage phases of Jury Trial in Civil Action B-75-319, Northeastern Telephone Company v. American Telephone & Telegraph Company, et al.

District Court of Maryland, expert witness in Civil Action No. K83-2990, City of Hagerstown, Town of Thurmont and Town of Williamsport, Maryland v. The Potomac Edison Company, Allegheny Service Corporation; testimony concerning the price elasticity of demand for electric power.

District Court of Wyoming, expert witness in Civil Action No. C82-0443; testimony concerning the motivations and consequences of Burlington Northern Railroad's alleged monopolization of coal supplies from the Powder River Basin in Wyoming.

District Court of Wyoming, expert witness in Civil Action No. C-86-0172, January, 1988, concerning natural gas markets in the Rocky Mountain area.

District Court of Massachusetts, expert witness in Civil Action No. 87-1881-C concerning antitrust liability issues and economic damages sustained by the Towns of Concord and Wellesley, Massachusetts, 1989.

Eastern District of Missouri, Southeastern Division, expert witness in Civil Action No. S83-288c concerning economic damages sustained by the Town of Malden, Missouri, resulting from alleged antitrust violation by Union Electric Company.

District of New Mexico, expert witness in Civil Action No. CV84-1430-JB concerning the carbon dioxide market in the Bravo Dome area of Northeastern New Mexico.

District of Alabama, expert witness in Civil Action concerning the constitutionality of "tort reform" legislation limiting punitive damages. Testimony concerned the profitability of the property/casualty insurance industry in the State of Alabama, 1989.

Eastern District of Missouri, Civil Action No. 83-2756(c), expert testimony quantifying the damages resulting from alleged anticompetitive practices by the Union Electric Company.

Southern District of Texas, Houston Division, Civil Action No. H-91-627, expert witness regarding anticompetitive practices and quantifying the damages resulting from the alleged anticompetitive practices by Baker Hughes Inc., Hughes Tool Company, Reed Tool Company, Camco International Inc., and Smith International, Inc.

Middle District Court of Alabama, Northern Division; Civil Action No. 89-H-519N; expert witness evaluating private agreements between the defendants meet the purpose of the "active supervision" test for state action immunity.

U.S. District Court for the District of Kansas, Case No. 85-2349, expert witness concerning competitive markets in the natural gas industry and the quantification of damages resulting from the alleged anticompetitive conspiracy of Amoco and affiliates with Cities Service Gas Company, its parent corporation, and affiliates.

Northern District of Alabama, Southern Division, Civil Action No. CV-91-PT-00445-S, affidavit concerning the impact on competition in the relevant market caused by various actions of Southern Natural Gas Company and Alabama Gas Corporation.

District of Minnesota, Third Division, Civil Action No. CV-3-90-240; affidavit concerning anticompetitive practices and resulting damages caused by of Fujitsu Systems of America, Inc.

Northern District of Illinois, Eastern Division, Civil Action No. 87 C 3839; report on Ecolochem's lost profits due to Arrowhead's alleged patent infringement.

Middle District of Florida, Orlando Division, Case No. 92-35-CIV-Orl-18; affidavit concerning Florida Power & Light Company's position and conduct for purposes of determining their competitive implications in light of Section 2 of the Sherman Act.

Western District of Oklahoma, Civil Action Nos. 89 1186 T and 89 822 T; affidavit concerning workers compensation rates in Oklahoma and anticompetitive conspiracy between the defendants and anticompetitive pricing.

District of New Mexico, No. CIV 93-0397 SC/WWD, report concerning damages sustained by New Mexico insurance agencies as a result of adverse actions taken by CIGNA in connection with COMPAR program in which agencies were participants.

District of Minnesota, Fourth Division, expert witness in Civil File No. 4-93 Civil 577, affidavit concerning the effect of reinsurance costs in setting premiums and the reasonable rate of return in workers compensation insurance.

District of Colorado, report prepared to evaluate economic damages in Civil Action No. 94-K-728, June, 1996.

District of New Mexico, report prepared to review and analyze pricing and royalty payments in order to assess economic damages in Civil Action, No. 95-12 JC/WWD, February, 1997.

District of Ohio, expert witness in Civil No. CV96-0308-E-BLW, Snake River Valley Electric Association v. PacifiCorp; affidavit filed on behalf of SRVEA regarding the competitive structure of electric utility markets in which PacifiCorp and SRVEA operate, September, 1997.

District of Massachusetts, Expert witness in Case No. 97-CV10818-PBS, Town of Norwood Massachusetts v. New England Power Company; affidavit filed on behalf of the Town of Norwood, September, 1997.

Southern District of Iowa, Central Division, expert witness in Case No. 4-97-CV-80782, North Star Steel Company v. Mid American Energy Holdings Company and Mid American Energy Company; declaration filed on behalf of NSSC regarding economic issues relating to regulation, antitrust and competition in the electric utility industry, February, 1998.

Eastern District of Michigan, expert witness in Docket No. 97-10366, Indeck Energy Services v. Consumers Energy Company; affidavit filed on behalf of Indeck concerning competition February, 1998.

Eastern District of Texas, expert witness in Civil Action No. H-97-3994, North Star Steel Texas Inc. V Entergy Gulf States, Inc.; declaration filed on behalf of North Star regarding market structure and competition, March, 1998.

Middle Pennsylvania, expert witness in Civil Action No. 4:CV-96-2176, AVCO v. Superior Air Parts, Inc.; report filed on behalf of AVCO concerning economic damages suffered as a result of alleged actions by defendants.

District of Colorado, expert witness in Case No. 96-Z-2451, United States Government and CO<sub>2</sub> Claims Coalition, LLC v. Shell Oil Company, Shell Western E&P, Inc., Mobil Producing Texas and New Mexico, Inc. and Cortez Pipeline Company; report submitted on behalf of Plaintiffs' concerning Defendants' pricing and royalty payment practices for carbon dioxide gas produced from the McElmo Dome CO<sub>2</sub> gas unit in Colorado, August, 1998.

District of Nebraska, expert advice and analysis in Civil Action No. 8:97CV-346. Report filed on behalf of Nebraska Public Power District concerning NPPD's Nuclear Decommissioning Trust Fund Investments, April 1999.

Middle District of Pennsylvania, expert witness in Case No. 3:CV-01-2308, Borough of Olyphant, Pennsylvania v. PP&L, Inc., PP&L Corporation, and PP&L Generation, L.L.C.; affidavit concerning competitive structure of electric utility markets in which PP&L and Olyphant operate, PP&L market power and anticompetitive injury suffered by Olyphant as consequence of PP&L conduct, December, 2002.

District of Montana, Billings Division, Expert witness in CV-03-129-BLG-RWA, Upper Missouri Generation & Transmission Electric Cooperative, Inc. v. Western Plains Electric Cooperative, Inc.; Damages Report, March 2004.

Southern District of Texas, affidavit in the matter of Gary R. Shannahan, Daniel L. Mortland, And Kathryn M. Scott Individually And For Others Similarly Situated Dynege, Inc., Dynege Inc.Benefit Plans Committee, Louis Dorey, Robert D. Doty, Jr., Alec G. Dreyer, Andrea Lang, Michael Mott, Milton L. Scott, And R. Blake Young. Civil Action No. 4:06-cv-00160 (September 15, 2006).

District of Columbia, Expert Witness in Case No. 1:04cv-00940-RWR, City of Moundridge , et al v. Exxon-Mobil Corporation et al. May 2008.

Before the Circuit Court of the Second Judicial Circuit, State of Florida -

Expert witness in Florida Excess Profits Statute Enforcement; testimony concerning excess profit levels in the private passenger automobile insurance industry in the state of Florida.

Expert testimony on behalf of the State of Florida Insurance Department concerning the constitutionality of and technical need for the recent strengthening of the State's insurance regulatory law as it is applied to commercial liability insurance rates. (1986)

Before the Missouri Circuit Court of Callaway County -

Expert witness in Case No. CV 587-4; testimony concerning rates to be charged for electric transmission services; 1989.

Before the Superior Court of New Jersey, Law Division, Cumberland County -

Expert witness in Docket No CUM-L-001206-00, Atlantic City Electric Company; on behalf of The City of Vineland, New Jersey. Report on The Fair Market Value of Property to be Acquired by The City of Vineland, New Jersey from the Atlantic City Electric Company, July 2000.

Before the Superior Court Division of North Carolina, Wake County -

Affidavit concerning North Carolina workers compensation insurance regulatory framework and the effect of residual market service carrier fees on employers costs of workers compensation insurance and the extent to which the fees are subject to regulatory scrutiny and control.

Before the St. Lawrence County (New York) Court Commissioners of Appraisal -

Expert testimony, Index 59244 concerning the condemnation value to be established for Niagara Mohawk's distribution property being acquired by the Town of Massena, New York to establish a municipal system.

Prepared for the St. Lawrence County (New York) -

Preliminary report for the Towns and Villages of Canton and Potsdam, New York; feasibility and legal considerations for the establishment of a municipal electric system, August 1996.

Before the Maine Superior Court of Kennebec County -

Expert witness in Docket No. CV-85-459, NCCI v. Superintendent of Insurance, witness for the State of Maine concerning the reasonableness of Maine's workers compensation insurance regulatory law.

Before the Arizona Superior Court, Coconino County -

Expert testimony in Case No. 39780 on behalf of the City of Page, Arizona, concerning the condemnation value of electric utility properties being taken by the City of Page to establish its own municipally-owned electric utility system.

Before the Arizona Superior Court, Maricopa County -

Expert witness in Civil Action No. 87-36278 concerning the condemnation value of electric utility properties being taken by the City of Gilbert to establish its own municipally owned electric utility system, 1989.

Before the California Superior Court for San Francisco -

Expert testimony in Case No. 843144 concerning the anticompetitive nature of anti-rebate laws applicable to the California property/casualty insurance industry.

Before the California Superior Court, Sacramento County -

Expert advice and analysis in Case No. 98AS052270 on behalf of California consumers of diesel fuel concerning anticompetitive pricing among certain oil companies doing business in the State of California, July, 1999.

In the Court of Common Pleas, State of South Carolina, County of Greenville

Affidavit providing a description of the overall framework of the South Carolina workers compensation insurance regulatory scheme with a focus on residual market servicing carrier fees; Case No. 93-CP-23-2428, October 1996.

Report filed in Case No. 94-CP-23-2428 on economic liability and anticompetitive damages for workers' compensation insurance buyers in South Carolina, May, 1998.

In the Circuit Court for Bullock County, Alabama

Affidavit quantifying the direct economic value of proposed settlement to workers compensation purchaser in Alabama; Civil Action No. CV-94-82.80, October 1996.

In the Circuit Court of the 11<sup>th</sup> Judicial Circuit in and for Miami-Dade County, Florida

Expert witness in Case No. 99-17626 CA 23, Violeta Sobrado Rothe, et al. v. Amedex Insurance Company; testimony concerning the usage and importance of the terms “class” and “block” in the insurance industry, June 2001.

In the Circuit Court of the 15<sup>th</sup> Judicial Circuit in and for Beach County, Florida

Expert witness in Case No. CL94-3275 AD, National Council on Compensation Insurance, Inc. et al., vs. Uniforce Temporary Personnel, Inc. et al. Retained by Uniforce to testify as to damages suffered as a result of NCCI’s alleged improper determination of its Experience Modifier between 1988 and 1992, May, 1997.

In the District Court of Travis County, Texas, 53<sup>rd</sup> District & 250<sup>th</sup> Judicial District Court

Expert witness in Consolidated Action Nos. 97-08264 and 95-15470; report filed on behalf of Plaintiffs, on class certification issues regarding economic conspiracy and damages, January, 1998.

In the District Court of Harris County, Texas, 269<sup>th</sup> Judicial District Court

Expert advice and analysis in Cause No. 96-016613, Cities of Wharton, Pasadena and Galveston v. Houston Lighting & Power Company. Expert Report filed on behalf of Cities concerning municipal franchise fees, October, 1999.

In the Circuit Court of Coahoma County, Mississippi

Expert witness in Civil Action No. 14CI-97-0006, Mississippi Valley Gas Company vs. City of Clarksdale Public Utilities Commission; testimony on behalf of City of Clarksdale concerning allegations and evidence relating to antitrust liability and damages, August 1998.

In the District Court of Johnson County, Texas, 249<sup>th</sup> Judicial District Court

Affidavit in Cause No. C-2002-00267; Brazos Electric Power Cooperative, Inc. v. Ponderosa Pine Energy, L.L.C., et al., on behalf of Brazos Electric Power Cooperative, Inc. regarding control, ownership and operation of Cleburne generating plant, competition between Brazos and Enron, and Enron’s Status as an electric utility, August 4, 2003.

Before the Alabama Public Service Commission -

Expert witness in Docket No. 17667, Alabama Power Company; testimony concerning rate base and cost of service issues.

Expert witness in Case No. 18548, South Central Bell Telephone Company; testimony concerning the restructuring of WATS rates.

Expert witness in Docket No. 1882, South Central Bell Telephone Company; testimony dealing with the Company's proposed levels of revenue, expenses, rate of return and rate base.

Before the Governor of Alabama's Special Commission on Insurance Regulation and Tort

Expert testimony on profitability in the property/casualty insurance industry and the underlying causes of the liability insurance crisis, 1986.

Before the Alaska Pipeline Commission -

Expert witness in Docket P-78-5, Northpole Refinery; testimony on cost allocation and rate design issues.

Before the Arizona Corporation Commission -

Expert witness for Honeywell Information Systems, Inc. in Docket No. U-1345, Arizona Public Service Company; testimony concerning cost of service and marginal cost pricing.

Expert witness in Docket No. 9981-E-1051-83, Mountain States Telephone and Telegraph Company; testimony concerning financial condition, cost of capital and rate of return.

Expert witness in Docket No. U-1345-83-155, Arizona Public Service Company; testimony concerning financial condition, earnings level, cash flow and incentive regulation.

Expert witness in Docket No. 9981-E-1051-83-286, Mountain States Telephone and Telegraph Company; testimony dealing with post-divestiture cost estimates.

Expert witness in Docket Nos. E-1032-86-020, E-1656-86-020, E-2276-86-020, and E-2334-86-020, Citizens Utilities Company; testimony addressing issues of fair rate of return, capital structure, and prudent utility operations.

Expert witness in Docket No. U-1345-85-156, Arizona Public Service Company; testimony concerning fair rate of return and capital structure, the effects of diversification on APS, APS affiliate relations and tax issues.

Expert witness in Docket No. E-1032-86-020, et al; Citizens Utilities Company; testimony concerning the revenue requirements, operating and accounting practices of Citizens Utilities Water, Wastewater, Electric and Gas Operations in Arizona.

Expert witness in Docket No. E-1032-85-204 et al; Citizens Utilities Rural Company, Inc.; testimony concerning the rate of return and revenue requirements for Citizens Utilities telephone utility operations in Arizona.

Expert witness in Docket No. U-1933-92-101, Tucson Electric Power Company; testimony concerning TEP's requested authorization for restructuring of agreements and the appropriate regulatory policy the Commission should follow as it deals with TEP's continuing restructuring process and the ratemaking impact of that process.

Expert witness in Docket No. U-1933-93-006, Tucson Electric Power Company; testimony concerning TEP's cost of capital and fair rate of return that should be allowed for the purpose of setting electric utility rates and TEP's proposed cost allocation methodology and related rate design proposals.

Before the Arkansas Public Service Commission -

Expert witness in Docket No. 81-144-U, Arkansas Power & Light Company; testimony concerning proposals by AP&L and Commission staff to retroactively allocate to Reynolds Metals a customer-specific charge for unrecovered revenue balance.

Expert witness in Docket No. U-2748, Southwestern Bell Telephone Company; testimony concerning service and equipment costs, tariff structures and competition in the telecommunications industry.

Expert witness in Docket No. U-2896, Generic Hearing; testimony concerning competition in the telecommunications industry.

Expert witness in Docket No. 82-314-0, Arkansas Power & Light Company; testimony concerning cost of service issues.

Expert witness in Docket No. 83-064-U, Southwestern Electric Power Company; testimony concerning rate of return, CWIP and cash working capital issues.

Expert witness in Case No. 84-249-U, Arkansas Power & Light Company; testimony discussing the extent to which the cost of Middle South Utilities Grand Gulf Unit 1 should be included in Arkansas Power & Light Company's rates.

Before the Canadian Radio Television and Telecommunications Commission -

Expert testimony concerning the competitive implications of Canadian Pacific Telecommunication's application for access to the Bell Canada network.

Expert testimony concerning cost methods in Docket No. 1981-41.

Expert testimony concerning the Commission's Revenue Settlement Plan and the cost methodologies presented by Bell Canada and others; the testimony presents a fully distributed cost methodology for application to the major telephone utilities in Canada.

Expert testimony concerning the resale of telecommunication services and the interconnection of competitive long distance carriers to the local networks of telephone companies.

Newfoundland and Labrador Board of Commissioners of Public Utilities - Canada

Expert witness in the matter of Newfoundland and Labrador Hydro, testimony and report filed on behalf of Board of Commissioners concerning cost of service methodology, rate design and proposed rates, July 2001.

Expert witness In The Matter of an Amended Application by Petition of Newfoundland Light & Power Co. Limited; testimony on behalf of the Board of Commissioners concerning NL&P cost allocations and proposed rate design, July, 1996.

Report to The Board of Commissioners of Public Utilities of Newfoundland and Labrador concerning Newfoundland Power Company's Study of Rate Designs Based on Marginal Costs.

Report to The Board of Commissioners of Public Utilities of Newfoundland and Labrador, *Regulation of Electric Utility Capital Expenditures: A Summary of North American Jurisdictions*, January 2004.

The California Earthquake Authority -

Report to the California Earthquake Authority, *Actuarial Report Regarding the California Earthquake Authority's 2002 Proposed Rate Application*, October 2002.

Before the California State Insurance Commissioner -

Expert testimony in File No. REB-1002 (Consolidated); testimony in the Matter of Various Rate Increase Applications and With Respect to Certain Issues Related to the Control, Review and Approval of Insurance Rates Pursuant to Insurance Code Sections 1861.01(a), 1861.05, and Related Laws, March 1990.

Expert testimony in the matter of determination of rate of return, leverage factor, and projected yield for 1989 rate calculations, File No. RCD-2 (Continued Hearings) 1991.

Report to the California Insurance Department -

Using Industry Loss Trends to Project Individual Insurer Loss Trends, July 1991.

Before the California Public Utilities Commission -

Expert witness in Application No. 55723, Pacific Telephone & Telegraph Company; testimony concerning the basis and economic implications of cost allocation rate

levels, and rate design for various types of telephone equipment and service classifications.

Expert witness in Centrex 10191, Investigation into Rates, Tariffs, and Costs of Centrex Service; testimony concerning service and equipment costs, tariff structures, and competition in the telecommunications industry.

Expert witness in Case No. OII 83 06 01, Western Union; testimony concerning "natural" monopolies and regulatory restrictions in telecommunications systems.

California Office of the Attorney General -

Preliminary Report on 1996 Gasoline and Diesel Fuel Retail Price Increases in California, August, 1996.

Before the Colorado Public Utilities Commission -

Expert witness in Docket No. 1154, 1133, Case No. 5748, Mountain States Telephone & Telegraph Company; testimony concerning Dimension PBX and Com Key tariffs as well as Western Electric pricing practices and impacts on competitors in the interconnect industry.

Expert witness in Docket No. 1067, Case No. 5703, Mountain States Telephone & Telegraph Company; testimony concerning service and equipment costs, tariff structure and competition in the telecommunications industry.

Expert witness in Docket No. 1425, Public Service Company of Colorado; testimony concerning service extension charges.

Expert witness in Docket No. 34444, Public Service Company of Colorado; testimony concerning service extension charges.

Before the Connecticut Department of Public Utility Control -

Expert witness in Docket No. 94-12-13, Investigation Into the Restructuring of the Electric Utility Industry.

Expert witness in the application of the Connecticut Light and Power Company for approval of amended rate schedules, Docket No. 90-12-03.

Expert witness in Docket No. 92-11-11, Connecticut Light & Power Company; testimony concerning CL&P's proposed implementation of "average and excessive" cost allocation methodology and proposed rates.

Expert witness in Docket No. 95-07-05, DPUC Investigation of a Fully Tracking Energy Adjustment Clause for Electric Companies; testimony on behalf of the Office of Consumer Counsel concerning the adoption of an EAC to replace the FAC and

GUAC to protect the interests of Connecticut ratepayers and ensure economy and efficiency in energy production and purchasing.

Expert witness in Docket No. 96-01-28, DPUC Review of the Purchased Gas Adjustment Clause; testimony on behalf of the Office of Consumer Counsel to determine whether elimination of adjustment clauses would better achieve regulatory policy goals in the natural gas industry, June, 1996.

Expert witness in Docket No. 99-07-20, Joint Application of Energy East Corp. and Connecticut Energy Corporation for Approval of a Change of Control; testimony filed on behalf of Connecticut Office of Consumer Counsel concerning competitive market issues pertaining to the proposed acquisition of Connecticut Energy Corporation by Energy East Corporation, September, 1999.

Expert witness in Docket No. 99-08-02, Joint Application of Northeast Utilities and Yankee Energy System for Approval of a Change of Control; testimony filed on behalf of Connecticut Office of Consumer Counsel concerning competitive market issues pertaining to the proposed acquisition of Yankee Energy System by Northeast Utilities, October, 1999.

Expert witness in Docket No. 99-08-09, Joint Application of Energy East Corporation and CTG Resources for Approval of a Change of Control; testimony filed on behalf of Connecticut Office of Consumer Counsel concerning competitive market issues pertaining to the proposed acquisition of CTG by Energy East, October, 1999.

Before the Delaware Public Service Commission -

Expert witness in Docket No. 80-9, Delmarva Power & Light Company; testimony concerning class revenue requirements, review of the Company's proposed rates, and incentives in the design of the fuel adjustment tariff.

Expert witness in Docket No. 81-8, Diamond State Telephone Company; testimony concerning affiliated relationship and terminal equipment.

Expert witness in Docket No. 83-12, Diamond State Telephone Company; testimony concerning Company's financial condition and rate of return.

Before the D.C. Public Service Commission -

Expert witness in Formal Case No. 686, Washington Gas Light Company; testimony dealing with cost allocation and rate design issues.

Expert witness in Case No. 729, The C&P Telephone Company; testimony concerning regulatory and economic treatment of tax expenses in establishing revenue requirements.

Expert witness in Case No. 748, Potomac Electric Power Company; testimony pertaining to requested rate increase.

Expert witness in Formal Case No. 768, Washington Gas Light Company; testimony concerning the financial condition of the Washington Gas Light Company.

Expert witness in Formal Case No. 777, Chesapeake & Potomac Telephone Company; testimony dealing with Financial Condition, depreciation and Capital Recovery, and Cost Methods.

Expert witness in Formal Case No. 712, Attrition; testimony dealing with Attrition.

Expert witness in Formal Case No. 785, Potomac Electric Power Company; testimony dealing with company request for rate increase.

Expert witness in Formal Case No. 787, Washington Gas Light Company; testimony concerning WGL's financial condition and revenue increase requirements.

Expert witness in Formal Case No. 869, Potomac Electric Power Company; testimony concerning revenue requirement and rate design issues.

Expert witness in Formal Case No. 951, Office of the Peoples Counsel; testimony examining rates, costs, and competitive issues.

Advice and Comments in Formal Case No. 945, Investigation into Electric Services, Market Competition and Regulatory Practices; on behalf of D.C. Office of People's Counsel, January, 1997.

Expert witness in Formal Case No. 922, Application of Washington Gas Light Company District of Columbia Division for Authority to Increase Existing Rates and Charges for Gas Services; testimony on behalf of the Office of People's Counsel concerning reasonableness of financial assumptions underlying the WGL filing in support of its proposed phase-in of post retirement benefits expense under FAS 106, June, 1997.

Report to the D.C. Office of the People's Counsel on Bell Atlantic's Merger Commitments to the Federal Communications Commission, August, 1997.

Report to the D.C. Office of the People's Counsel; Alternatives to the PEPCO/BG&E Merger.

Expert witness in Formal Case No. 1057, Verizon Washington, DC Inc.,s Competitive Under Price Cap Plan 2007 for the Provision of Local Telecommunicatiions's Services in the District of Columbia on behalf of the D.C. Office of the People's Counsel. January 31, 2008.

Before the Florida Department of Insurance -

Expert testimony concerning the underwriting return allowable in establishing workers compensation insurance rates (1984).

Expert witness in the 1986 Workers Compensation Insurance Rate Case; testimony concerning the appropriate rate of return for workers compensation insurers in the State of Florida.

Expert testimony concerning the underwriting return and profit rate that should be established in setting rates for workers compensation insurance in Florida (1985).

Expert witness in 1987 workers' compensation insurance rate case; testimony concerning return and underwriting profit that should be established in setting rates for workers compensation insurance in Florida.

Expert witness in 1988 workers' compensation insurance rate case; testimony concerning rate of return for establishing workers' compensation insurance rates in Florida.

Expert witness in 1989 workers' compensation insurance rate case; testimony concerning rate of return for establishing workers' compensation insurance rates in Florida.

Expert witness in an Application of National Counsel on Compensation Insurance for Revision of Workers Compensation Insurance Rates, October 1989.

Expert Witness in the Application of National Counsel on Compensation Insurance for Revision of Workers Compensation Insurance Rates, October 1991.

Before the Florida Public Service Commission -

Expert witness in Docket No. 810035TP, Southern Bell Telephone & Telegraph Company; testimony concerning revenue adjustment to achieve the full normalization of deferred tax expenses and the associated current tax costs.

Expert witness in Docket No. 810095-TP, General Telephone Company; testimony dealing with tax normalization issues.

Expert witness in Docket No. 810235-TP, Central Telephone Company of Florida; testimony dealing with deregulation of telephone terminal equipment.

Expert witness in Docket No. 900202-EU, City Electric System of the Utility Board of the City of Key West, Florida; testimony concerning the critical economic importance of coordination in the electric utility industry.

Expert witness in Docket No. 020233-EI, Review of GridFlorida Regional Transmission Organization (RTO) Proposal; testimony concerning prudence of GridFlorida market design principles, October, 2002.

Before the Public Service Commission of Georgia -

Expert witness in Docket No. 3231-U, Southern Bell Telephone & Telegraph Company; testimony concerning its relationship with AT&T with respect to general services and licenses, and the proper treatment of the costs involved.

Expert witness for the Commission's Advisory Staff in Docket No. 18300-U, Georgia Power Company's 2004 Rate Case, testimony on cost of service methodology and rate design, October 2004.

Before the Georgia Department of Insurance -

Report to the Department of Insurance on NCCI's 1992 rate filing regarding appropriate rate of return and underwriting profit and contingency factor that should be allowed in establishing workers compensation insurance rates.

Expert witness in Case No. 93C-147, National Council on Compensation Insurance, audit report of NCCI's 1993 voluntary and residual market workers compensation insurance rate filings and recommendation on appropriate rate of return and required underwriting profit and contingency factor that should be allowed in establishing workers compensation insurance rates.

Before the Hawaii Public Utility Commission -

Expert witness in Docket No. 4125, Citizens Electric Company - Kauai Electric Division; testimony concerning rate of return, capital structure and related issues.

Expert witness in Docket No. 4156, Maui Electric Company, Ltd.; testimony concerning rate of return and related issues.

Expert witness in Docket No. 4306, Hawaii Telephone & Telegraph Company; testimony on overall financial health and revenue requirements.

Expert witness in Docket No. 4588, Hawaiian Telephone Company; testimony on cost-based telephone utility rates and flat customer access charges.

Expert witness in Docket No. 5114, Hawaiian Telephone Company; testimony concerning interstate rate increases and revised rate schedules.

Expert witness in Docket No. 6801, GTE Hawaiian Telephone Company; testimony concerning cost of capital impacts of GTE Corporation and HTC reorganization.

Before the Idaho Public Utilities Commission -

Expert witness in Case U-1000-37, Mountain States Telephone & Telegraph Company; testimony concerning rate of return, capital structure and related issues.

Before the Illinois Commerce Commission -

Expert witness in Docket No. 77-0511, Illinois Bell Telephone Company; testimony concerning proposed trunk rates and regulations.

Expert witness in Docket No. 85-0079, Continental Telephone Company of Illinois; testimony concerning proposed general increases in telephone rates.

Expert witness in Docket Nos. 83-0573 and 84-0555, Commonwealth Edison Company; testimony on behalf of the Attorney General of the State of Illinois concerning a phase-in of new rates for Commonwealth Edison.

Expert witness in Docket No. 84-0111, Illinois Bell Telephone Company; testimony concerning the proposed restructuring of Centrex services applicable in all exchanges.

Expert witness in Docket No. 87-0427, Commonwealth Edison Company; testimony concerning cost of capital and rate of return issues for the purpose of setting electric utility rates.

Expert witness in Docket No. 90-0169, Commonwealth Edison Company; testimony concerning cost of capital and rate of return issues for the purpose of setting electric utility rates.

Before the Indiana Public Service Commission -

Expert witness in Cause No. 35214, Public Service of Indiana, Inc.; testimony concerning cost allocation, rate design issues and the economic implications of electric utility rates.

Expert witness, Cause No. 35214, Public Service Company of Indiana; testimony concerning rate structure design and cost allocation issues.

Expert witness in Cause No. 37558, Indiana Bell Telephone Company, Inc.; testimony concerning the authority to make adjustments in the existing Centrex exchange and network services rates, for approval of new schedules, rates, and rules and regulation.

Before the Iowa State Commerce Commission -

Expert witness in Docket No. RPU-84-7, Northwestern Bell Telephone Company; testimony concerning the adjustment of intrastate rates and charges.

Expert witness in Docket No. RPU-84-40 (RF-84-305), Iowa-Illinois Gas and Electric Company; testimony on behalf of North Star Steel concerning the appropriateness of the proposed revision to Rider 4 for interruptible service.

Expert witness in Docket No. RPU-86-8, Interstate Power Company; testimony concerning the implementation of management efficiency standards in the regulatory process.

Before the Iowa Utilities Board -

Expert witness for the Office of Consumer Advocate in Docket No. RPU-05-2-TF-05-143 and TF-05-144; Aquila, Inc. d/b/a Aquila Networks regarding the Management Performance of Aquila, Incorporated and the potential of this performance on Iowa gas utility ratepayers. August 2005.

Expert witness for the Office of Consumer Advocate in Docket RPU-08-3; Black Hills/Iowa Gas Utility Company, LLC d/b/a Black Hills Energy (f/k/a Aquila, Inc, d/b/a Aquila Networks. December 3, 2008.

Expert witness for the Office of Consumer Advocate in Docket No. RPU-2010-0001, Interstate Power and Light Company. Testimony - July 2010.

Idaho Tax Commission -

Expert advice and analysis in valuing Electric Utility Property. Report Valuing Electric Utility Property prepared and presented to the Idaho State Tax Commission, and testimony in property tax proceedings for Idaho Power Company and PacifiCorp. June 2005.

Before the State Corporation Commission of the State of Kansas-

Expert witness in Docket Nos. 105, 712-U, Southwestern Bell Telephone Company; testimony dealing with service and equipment costs, tariff structures and competition in the telecommunications industry.

Expert witness in Docket No. 97-WSRE-676-MER, Joint Application of Western Resources, Inc. and Kansas City Power and Light Company for Approval of Merger and Other Related Relief; testimony filed on behalf of Kansas City Board of Public Utilities regarding merger related market power issues, February, 1999.

Before the District Court of Montgomery County, Kansas –

Expert witness in Case No. 09 CV 691, Coffeyville Resources Nitrogen Fertilizers, LLC vs.City of Coffeyville, Kansas. August 2010

Before the Utility Regulatory Commission of Kentucky -

Expert witness in Case No. 7669, General Telephone Company of Kentucky; testimony concerning an adjustment in rates.

Expert witness in Case No. 9160, South Central Bell Telephone Company; testimony concerning an increase in rates and the approval of tariff changes for telecommunications service.

Expert witness in Case No. 8847, South Central Bell Telephone Company; testimony concerning financial condition, rate base and rate of return.

Before the Louisiana Insurance Rating Commission -

Expert witness in the Matter of Workers Compensation Insurance Rates 1986; testimony concerning loss development, expense trending and financial matters pertaining to the specification of an appropriate rate level for workers compensation insurance in Louisiana.

Before the Louisiana Public Service Commission -

Expert witness in Docket No. U-14495, Gulf States Utilities Company; testimony concerning price elasticity of demand for electric utility service.

Before the Maine Public Utilities Commission -

Expert testimony in F.C. #2168, Central Maine Power Company; testimony concerning electric utility rate structure design.

Expert witness in Docket No. F.C. 2332, Central Maine Power Company; testimony dealing with rate design issues and the economic implications of electric utility rates.

Expert witness in Docket No. 80-142, New England Telephone & Telegraph Company; testimony concerning proposed increase in rates.

Expert witness in Docket No. 80-108, Bangor Hydro-Electric Company; testimony concerning cost of serving an interruptible customer.

Expert witness in Docket No. 80-66, Central Maine Power Company; testimony concerning cost of service and rate design issues.

Before the Maine Bureau of Insurance -

Expert witness in the Matter of Workers Compensation Insurance Rates; testimony concerning loss development, expense trending, investment income and other matters pertaining to the appropriate level of workers compensation insurance rates in Maine.

Expert witness in Docket No. INS-88-2, National Counsel on Compensation Insurance; testimony concerning earnings rate and underwriting return for establishing workers' compensation insurance rates in Maine.

Expert witness in Docket No. INS-91-66; testimony concerning appropriate profit and contingency component for inclusion in the servicing carrier allowance for workers compensation rates.

Before the Maryland Public Service Commission -

Expert testimony in Case No. 6807, Future Adequacy of Service; testimony concerning electric power demand modeling and forecasting.

Expert witness in Case No. 7338, Phase III, Potomac Edison Company; testimony concerning electric utility rate design pertinent to the Public Utility Regulatory Policies Act of 1978.

Expert witness in Case No. 7408, Baltimore Gas & Electric Company; testimony concerning BG&E's Gas Service Tariff provisions regarding the costs to be paid by new customers for gas main extensions and service line extensions in excess of 50 feet.

Expert witness in Case No. 7435, Chesapeake & Potomac Telephone Company; testimony concerning capital cost issues.

Expert witness in Case No. 7450, Chesapeake & Potomac Telephone Company; testimony concerning issues related to the divestiture by AT&T.

Expert witness in Case No. 7450 Phase II/7735, Chesapeake & Potomac Telephone Company; testimony concerning cost of service and subscriber access costs.

Expert witness in Case No. 7851, Chesapeake & Potomac Telephone Company; testimony concerning the application for authority to restructure schedule of rates and charges.

Expert witness in Case No. 7467, The Chesapeake & Potomac Telephone Company; testimony concerning the regulatory and economic treatment of deferred tax expenses and credits in establishing revenue requirements.

Expert witness in Case No. 7591, Chesapeake & Potomac Telephone Company; testimony dealing with cost methods.

Expert witness in Case No. 7661, Chesapeake & Potomac Telephone Company; testimony concerning the development of cost of service methodologies.

Before the Utilities Commission of St. Michaels, MD -

Expert witness in annual rent arbitration; testimony concerning fair and reasonable revised annual rent for period 10/15/91 to 10/15/96 to be paid by Delmarva Power & Light Company under its 1981 lease of the St. Michaels service territory.

Before the Massachusetts Public Utility Commission -

Expert witness in D.P.U. 19139, Investigation of Rates and Charges for Dimension 400 PBX Service; testimony concerning service and equipment costs; tariff structures and competition in the telecommunications industry.

Expert witness in Docket No. D.P.U. 84-25, Western Massachusetts Electric Company; testimony concerning CWIP in rate base, cash flow and phase-in issues.

Before the Commonwealth of Massachusetts Division of Insurance -

Expert witness in Docket No. 2001-29, Automobile Insurance Bureau of Massachusetts, testimony filed on behalf of the Massachusetts Attorney General concerning cost of capital and rate of return, September 2001.

Expert witness in Docket No. 2000-10, Automobile Insurance Bureau of Massachusetts, testimony filed on behalf of The Massachusetts Attorney General concerning private passenger automobile insurance rates and underwriting profit, August 2000.

Expert witness in Application of Automobile Insurance Bureau of Massachusetts, 2000 Massachusetts Private Passenger Automobile Underwriting Profit Filing; testimony filed on behalf of Massachusetts Attorney General concerning rate of return and cost of capital, September, 1999.

Before the Michigan Public Service Commission -

Expert witness for the State of Michigan, Department of Attorney General in Case Nos. U-5365 and U-5322, Michigan Consolidated Gas Company; testimony concerning rate of return and cost of service issues.

Expert witness in Case No. U-5502, Detroit Edison Company; testimony concerning rate of return.

Expert witness of the State of Michigan, Department of Attorney General in Case No. U-5608, Indiana & Michigan Electric Company; testimony concerning rate of return.

Expert witness for the State of Michigan Office of Attorney General in Case No. U-5669, Upper Peninsula Power Company; testimony concerning rate of return and cost of service issues.

Expert witness in Case U-5955, Michigan Consolidated Gas Company; testimony concerning rate of return and capital structure issues.

Expert witness in Case U-6002, Michigan Bell Telephone Company; testimony concerning capital structure and rate of return issues.

Expert witness in Case U-5979, Consumer's Power Company; testimony concerning rate of return issues.

Expert witness in Cases U-5197, U-5752, U-5753 and U-5754, Michigan Bell Telephone Company; testimony concerning cost of service and antitrust issues.

Expert witness in Docket No. U-6103, Detroit Edison Company; testimony concerning cost of service and steam heat rates.

Expert witness in Cause No. U-7660, Detroit Edison Company; testimony concerning financial conditions, revenue requirements and cash flow issues.

Expert witness in Cause No. U-7830, Consumers Power Company; testimony concerning capital structure and rate of return as well as revenue requirement issues pertaining to the Midland plant.

Expert witness in Case No. U-8789, The Detroit Edison Company; testimony concerning costs of excess capacity in setting utility rates in regard to proper ratemaking treatment for the FERMI 2 plant.

Expert witness in Case No. U-10127 and U-8871, Consumers Power Company; testimony concerning the merits of CPCo's proposed settlement agreement to resolve Midland Cogeneration Venture Limited Partnership cost recovery issues.

Before the Michigan Department of Commerce, Insurance Bureau -

Expert witness in Case No. 91-11806-BC, Blue Cross Blue Shield of Michigan; testimony concerning required rate levels for BCBSM.

Before the Minnesota Commerce Commission -

Expert witness in O.A.H. Docket No. 9-1004-3412-2, St. Paul Fire & Marine Insurance Company; testimony concerning required return, profit and contingency factor, expense level, loss ratio and resulting rate change that should be implemented in establishing St. Paul's rates for physicians and surgeons medical malpractice liability insurance in Minnesota.

Before the Minnesota Public Service Commission -

Expert cost of service and rate design witness in Docket No. E-002/GR-77-611, Northern States Power Company; testimony concerning cost responsibility, cost allocation, and principles of rate structure design.

Expert cost of service and rate design witness in Docket No. E002/GR-76-934, Northern States Power Company; testimony concerning cost responsibility and cost allocation issues and principles of rate structure design.

Expert rate design witness in Docket No. ER-2-1, Northern States Power Company; testimony involved analysis of rate design issues including time-of-day pricing, marginal cost responsibility, and load factor analysis.

Expert witness in Docket No. G-008/GR-77-1237, Minnesota Gas Company; testimony concerning cost allocation and rate of return issues.

Before the Mississippi Public Service Commission -

Expert witness in Docket No. U-3929, Mississippi Power Company; testimony concerning proposed increase in rates, and recommendations to a fair rate of return in electric utility rates.

Before the Missouri Public Service Commission -

Expert witness in Docket No. TR82-1998, Southwestern Bell Telephone Company; testimony concerning rate of return requirements.

Expert witness in Case No. TR-83-253, Southwestern Bell Telephone Company; testimony concerning cost of service and subscriber access costs.

Expert witness in Case No. EM-96-149, Application of Union Electric Company for an Order Authorizing (1) Certain Merger Transactions Involving Union Electric Company; (2) the Transfer of Certain Assets, Real Estate, Leased Property, Easements and Contractual Agreements to Central Illinois Public Service Company; and (3) in Connection therewith, Certain Other Related Transactions; testimony filed on behalf of the PSC concerning merger related market power issues, November, 1996.

Before the Missouri Department of Insurance -

Expert witness in Case No. 93-06-09-0621, Modern American Life Insurance Company; affidavit concerning MAL's proposed reorganization and its effect on policyholders.

Before the Montana Public Service Commission -

Expert witness for the Commission Staff in Docket No. 6279, Montana Power Company; testimony concerning rate structure design, cost of service issues, and rate of return.

Expert witness for the Commission Staff in Docket No. 6277, Montana-Dakota Utilities Company; testimony concerning rate of return, rate structure design, and cost of service issues.

Expert witness for the Commission Staff in Docket No. 6441, Montana-Dakota Utilities Company; testimony concerning rate of return issues.

Expert witness for the Consumer Counsel in Docket No. 6454, Montana Power Company; testimony concerning rate of return.

Expert witness for the Consumer Counsel in Docket No. 6496, Mountain States Telephone and Telegraph Company; testimony concerning rate of return and cost of capital.

Expert witness for the Consumer Counsel in Docket No. 6494 and 6495, Butte Water Company; testimony dealing with rate of return and cost of service issues.

Expert witness in Docket Nos. 6545 and 6546, Montana Power Company Water Rates; testimony concerning proposed water rate increases. (Rate of return and cost of service issues.)

Expert witness for the Consumer Counsel in Docket No. 6567, Montana-Dakota Utilities Company; testimony concerning rate of return, cost allocation, and rate design issues.

Expert witness in Docket No. 6618, Phase I and Phase II, Montana Power Company; testimony concerning rate of return, capital structure, and gas utility rate structure design issues.

Expert witness for the Consumers' Counsel in Docket No. 6701, Great Falls Gas Company; testimony concerning cost of service, cost allocation, and rate design issues.

Expert witness for the Consumer's Counsel in Docket No. 6695, Montana-Dakota Utilities Company; testimony concerning gas and electric rate design and testimony concerning the profits earned by an affiliated coal company.

Expert witness in Docket No. 80.4.2, Montana Power Company; testimony concerning cost of capital and rate of return.

Expert witness in Docket No. 80.7.52, Montana-Dakota Utilities Company; testimony concerning revenue adjustment and the associated current tax costs, and recommendations concerning gas utility rate design.

Expert witness in Docket No. 80.10.79, Mountain States Telephone & Telegraph Company; testimony concerning pro-posed rate changes and rate structure recommendations.

Expert witness in Docket No. 80.12.100, Mountain States Telephone & Telegraph Company; testimony concerning revenue adjustment and the associated current tax costs, and treatment of affiliate relationship costs.

Expert witness in Docket No. 81.1.2, Montana-Dakota Utilities Company; testimony concerning revenue adjustment and the associated current tax costs, the profits earned by an affiliated coal company, and electric rate structure design.

Expert witness in Docket No. 81.8.70, Pacific Power & Light Company; testimony on rate design and excess coal profits.

Expert witness in Docket No. 82.2.8, Mountain States Telephone Company; testimony dealing with financial conditions and rate of return.

Expert witness in Docket No. 82.4.28, Pacific Power and Light Company; testimony concerning the issues of coal profit levels and an "attrition" adjustment.

Expert witness on Docket No. 82.8.54, Montana Power Company; testimony dealing with utility captive coal profits and revenue increase needs.

Expert witness in Docket No. 83.3.18, Mountain States Telephone & Telegraph Company; testimony concerning cost of service and access charge matters.

Expert witness in Docket No. 83.3.18, Mountain States Telephone & Telegraph Company; testimony concerning cost of capital, rate of return, and cost of service issues.

Reply Comments on Telephone Access Costs and Rates in Docket No. 83.6.47.

Expert witness in Docket No. 83.5.36, Pacific Power and Light Company; testimony concerning coal profit levels.

Expert witness in Docket No. 83.9.67, Montana Power Company; testimony concerning coal profit levels and cost allocation and rate design issues.

Expert witness in Docket No. 83.9.68, Montana-Dakota Utilities Company; testimony concerning coal purchases and operations.

Expert witness in Docket No. 83.11.80, AT&T Communications of the Mountain States, Inc.; testimony concerning the Company's financial circumstances, its forecasted budgeted test year, access charges, and the rate of return to be included in the rate for intrastate toll services.

Expert witness in Utility Division Docket No. 84.10.64, in the matter of the Commission's Investigation of Electric Avoided Cost. Testimony presented on behalf of the Montana Consumer Counsel concerning a range of alternative methods of determining the avoided cost of Montana jurisdictional utilities that should be applied in setting rates payable to cogenerators and qualifying facilities.

Expert witness in Case No. 84.4.19, Mountain States Telephone and Telegraph Company; testimony deals with the Company's financial circumstances, its forecasted budgeted test year, directory revenues and expenses, productivity, official services, cash working capital and the rate of return which should be included in the telephone service rates.

Expert witness in Docket No. 87.12.77, The Montana-Dakota Utilities Company; testimony concerning as utility rate design.

Expert witness in Docket No. 88.1.2, Mountain States Telephone & Telegraph Company; testimony concerning rate of return to support MBT's telephone utility service in Montana.

Expert advice and analysis in the matter of the application for approval of (A) the general filing of Pacific Power and Light Company in demonstration of one test year as a merged company and (B) proposed new tariff, Schedule No. 47T, on the PP&L Champion International Inc. Electric Service Contract, Utility Division Docket No. 90.11.78.

Advice and analysis in the matter of the application of U S West Communications Inc. for approval of an alternative form of regulation, et al., Docket Nos. 90.12.86, 89.8.28, 89.8.29, 89.9.29, 90.5.32.

Expert witness in Docket No. 91.3.12, GTE Northwest, Inc.; testimony concerning required rate of return allowance to support GTE-NW's jurisdictional telephone utility service.

Expert witness in Docket No. 92.7.32, PTI Communications; testimony concerning rate of return allowance that PTIC requires to support its jurisdictional telephone utility service rate base.

Expert witness in Docket No. 93.3.10, Order No. 5701a; testimony concerning a Commission investigation of standards of the Energy Policy Act of 1992 and whether adoption of standards would carry out the purpose of Title I of the Public Utility Regulatory Policies Act of 1978.

Expert witness in Docket No. 93.6.24, Montana Power Company; testimony concerning rate requirements, regulatory policy issues, and restrictions on profits in dealings with affiliates.

Expert witness in Docket No. 93.7.29, Montana Power Company; testimony concerning cost allocation and rate design.

Expert witness in Docket No. D2001.10.144, Montana Power Company; testimony concerning MPC's electric default supply portfolio filing and proposed tariffs and rate changes, January, 2002.

Expert advice and analysis in Docket No. D2002.7.93; comments concerning Commission's Inquiry into Necessary and Reasonable Rates for Default Electric Supply Service, August, 2002.

Expert advice and analysis in Docket No. D2003.8.109 concerning Investigation of NorthWestern Energy's Financial and Related Transactions with NorthWestern

Corporation, its Affiliates and Creditors that May Impair its Financial Solvency and Public Utility Service Obligations, August 2003.

Expert witness for the Montana Consumer Counsel in Docket No. D2004.3.45; the Application of North Western Energy for Approval of Agreement for Sale and Purchase of Capacity and Energy between North Western Energy and Basin Creek Equity Partners, LLC, June 2004.

Direct Testimony in Docket No. D2003.6.77 and D2004.6.90 Utility Division, Northwestern Energy's Electric Default Supply Tracker Filings for the periods of July 1, 2002 through June 30, 2003 and July 1, 2003 through June 30, 2004 and for the Forecasted Period July 1, 2004 through June 30, 2005. December 13, 2004

Direct Testimony on behalf of the Montana Consumer Counsel In the Matter of the Joint Application of NorthWestern Corporation and Babcock & Brown Infrastructure Limited, BBI US Holdings Pty Ltd., BBI US Holdings II Corp., and BBI Glacier Corp. For Approval on the Sale and Transfer of NorthWestern Corporation Pursuant to a Merger Agreement. Docket No. D2006.6.82 December 15, 2006.

Expert witness for the Montana Consumer Counsel. Direct Testimony In the Matter of NorthWestern Energy's Electric Default Supply Tracker Filings for the Periods July 1, 2005 through June 30, 2006 and July 1, 2006 through June 30, 2007 and for the Forecasted Period July 1, 2007 through June 30, 2008. Docket Nos. D2006.5.66 and D2007.5.46. October 5, 2007.

Expert witness for the Montana Consumer Counsel. Direct Testimony In the Matter of Montana-Dakota Utilities Co., Application for Authority to Establish Increased Rates for Electric Service. Docket No. D2007.7.79. October 22, 2007.

Expert witness for the Montana Consumer Counsel. Testimony In the Matter of NorthWestern Energy's Application for Authority to Establish Increased Natural Gas and Electric Service Rates. Docket No. D2007.7.82. November 9, 2007

Expert witness for the Montana Consumer Counsel. Direct Testimony In the Matter of An Investigation of NorthWestern Corporation Compliance with Order 6505e. Docket No. D2008.4.36. May 20, 2008.

Expert witness for the Montana Consumer Counsel. Testimony In the Matter of NorthWestern Energy's Application for Authority to Establish Increased Natural Gas and Electric Service Rates. Phase II. Docket No. D2007.7.82. July 18, 2008.

Direct Testimony In the Matter of the Application of NorthWestern Energy for Approval to Construct and Operate the Mill Creek Generating Station to Supply Regulation Service for NorthWestern Energy's Montana Electric Operations and Montana Transmission Control Area Docket No. D2008.8.95. November 20, 2008.

Direct Testimony on behalf of the Montana Consumer Counsel In the Matter of the Petition of Energy West Incorporated for an Order Approving Its Corporate

Reorganization to Create a Holding Company Structure; Docket No. D2008.5.57; January 29, 2009.

Testimony on behalf of the Montana Consumer Counsel In the matter of the Application of Energy West Incorporated for Approval of its Acquisition of And Transfer of Stock of Brainard Gas Corporation, Great Plains Natural Gas Company, Lightning Pipeline Company, Inc. and Membership Interest in Great Plains Land Development Co., Ltd. Docket No. D2008.11.132, April 17, 2009.

Direct Testimony on behalf of the Montana Consumer Counsel In the matter of NorthWestern Energy's Electric Supply Tracker Filings for the Periods July 1, 2007 through June 30, 2008 and July 1, 2008 through June 30, 2009 and for the Forecasted Period July 1, 2009 through June 30, 2010. Docket Nos. D2008.5.45 and D2009.5.62.

Testimony on behalf of the Montana Consumer Counsel In the matter of the Application of Mountain Water Company for Authority to Increase Rates and Charges for Water Service to its Missoula, Montana Customers. Docket No. D2010.4.41, Order No. 7088, October 15, 2010.

Direct Testimony on behalf of the Montana Consumer Counsel In the matter of NorthWestern Energy's Application for Approval of Avoided Cost Tariff For New Qualifying Facilities. Docket No. D2010.7.77, November 10, 2010.

Direct Testimony on behalf of the Montana Consumer Counsel In the matter of the Application of Montana-Dakota Utilities Co., a Division of MDU Resources Group, Inc. for Authority to Establish Increased Rates for Electric Service. Docket No. D2010.8.82, December 23, 2010.

Direct Testimony on behalf of the Montana Consumer Counsel In the matter of the Application of Energy West Montana to Establish Increased Service Rates in the Great Falls, Cascade and West Yellowstone Service Areas. Docket No. D2010.9.90, April 12, 2011.

Direct Testimony on behalf of the Montana Consumer Counsel In the matter of the Consolidated Petition by Mountain Water Company for Declaratory Rulings and Application for Approval of Sale and Transfer of Stock in Park Water Company. Docket No. D2011.1.8, July 29, 2011.

Compliance Direct Testimony on behalf of the Montana Consumer Counsel In the matter of the Application of Northwestern Energy for Approval to Construct and Operate the Mill Creek Generating Station to Supply Regulation Service for Northwestern Energy's Montana Electric Operations and Montana Transmission Control Area. Docket No. D2008.8.95, August 12, 2011.

Direct Testimony on behalf of the Montana Consumer Counsel In the matter of the Application of NorthWestern Energy for Approval to Purchase and Operate the Spion Kop Wind Project, for Certification of the Spion Kop Wind Project as an Eligible

Renewable Resource, and for Related Relief. Docket No. D2011.5.41, September 22, 2011.

Before the State of Montana Tax Appeal Board –

Expert witness in the matter of PPL Montana, LLC v. Montana Department of Revenue. Cause No. DV-STP-2002-4 (Report – April 2004).

Expert witness in Case No. SPT-2006- NorthWestern Corporation v. State of Montana, Department of Revenue. Economic Critique of the Shaw Stone & Webster Appraisal. December 2006.

Expert witness in the matter of PacifiCorp v. State of Montana Department of Revenue. Cause No. CT-2005-3.

Expert witness. The Value of Puget Sound Energy, Inc.'s Electric and Gas Property An Economic Critique of the Davis Appraisal And the Cornia/Walters Obsolescence Analysis. April 2008.

Before the Montana Thirteenth Judicial District Court -

Expert witness in Cause No.: DV-10-1312, Bresnan Communications, LLC vs. State of Montana Department of Revenue. Report dated July 2011, Affidavit September 1, 2011.

Before the Nebraska Public Service Commission -

Expert witness in Docket No. C-227, Northwestern Bell Telephone Company; testimony concerning rate of return and capital structure issues.

Before the Nevada Public Service Commission -

Expert witness in Docket No. 83-707, Nevada Power Company; testimony concerning cost of common equity and rate of return.

Before the New Hampshire Public Utilities Commission -

Expert witness in Docket No. DG 10-017, EnergyNorth Natural Gas; testimony concerning cost of common equity and rate of return. October 22, 2010.

Direct Testimony on behalf of the Commission Staff in Docket No. DG 10-055 Unitil Energy Systems, Incorporated; testimony concerning rate of return and cost of common equity. November 5, 2010.

Before the New Jersey Department of Public Utilities -

Expert witness in PUC Docket Number 7512-1314, New Jersey Bell Telephone Company; testimony concerning service and equipment costs, tariff structures and competition in the telecommunications industry.

Expert witness in Docket No. 8312-1126, Western Union; testimony concerning competition in intrastate telecommunications.

Expert testimony concerning whether the provision of telecommunications service is a "natural monopoly," whether regulatory restrictions should be imposed in order to maintain monopoly conditions, and the extent to which monopolized interexchange service permits subsidies to local exchange service.

Before the New Jersey Insurance Department -

Expert witness in Rate Counsel File No. 83-PPA-6, Keystone Insurance Company; testimony concerning the underwriting return on private passenger automobile insurance rates and loss/expense projections.

Expert witness in File No. 83-30, Reliance Insurance Company; testimony concerning the underwriting return on private passenger automobile insurance rates and loss/expense projections.

MIC Insurance Company; expert testimony concerning the underwriting return that should be allowed in establishing MIC's private passenger automobile insurance rates in New Jersey.

Expert witness in Department of Insurance Filing Nos. 86-847 and 86-1964, Prudential Property and Casualty Insurance Company; testimony concerning the appropriate underwriting margins for Prudential's automobile liability and physical damage coverage in New Jersey.

Expert witness in DOI Filing No. 87-1725, State Farm Mutual Automobile Insurance Company; testimony concerning earnings rate, expense level and underwriting return for establishing private passenger automobile insurance rates in New Jersey.

Expert witness in DOI Filing No. 87-1845, The Prudential Property and Casualty Insurance Company; testimony concerning earnings rate, expense level and underwriting return for establishing private passenger automobile insurance rates for Prudential in New Jersey.

Expert witness in DOI Filing No. 88-188, Liberty Mutual Fire Insurance Company; testimony concerning earnings rate, expense level and underwriting return for establishing private passenger automobile insurance rates for Liberty Mutual in New Jersey.

Expert witness in DOI Filing No. 88-211, Colonial Penn Insurance Company; testimony concerning earnings rate, expense level and underwriting return for establishing private passenger automobile insurance rates for Colonial Penn in New Jersey.

Expert witness in DOI File No. 88-1736, The Prudential Property and Casualty Insurance Company; testimony concerning earnings rate, expense level and the

underwriting return for establishing private passenger automobile insurance rates for Prudential in New Jersey.

Before the New Mexico Corporation Commission -

Expert witness in Docket No. 1002, Mountain States Telephone & Telegraph Company; testimony concerning cost of service allocation issues.

Before the New York Public Service Commission -

Expert witness for Suffolk County in Case No. 27136, Long Island Lighting Company; testimony dealing with rate of return and cost of service issues.

Presentation regarding telephone customer access line charges and bypass before an en banc meeting of the Public Service Commission, March 1984.

Expert witness in Case No. 27006, New York Telephone Company; testimony concerning service and equipment costs, tariff structure and competition in the telecommunications industry.

Expert witness in Cases 26943, 26944, 26945, Niagara Mohawk Power Corporation; testimony concerning electric utility costs and rate structure design.

Expert witness in Cases 27374 and 27375, Long Island Lighting Company; testimony concerning electric and gas rate issues.

Expert witness in Docket No. 27774, Long Island Lighting Company; testimony concerning electric utility rate structure design.

Expert witness in Case 27469, New York Bell Telephone Company; testimony concerning terminal equipment rates. Affidavit dealing with the legality of tariffs filed by the Rochester Telephone Corporation.

Expert witness in Case No. 28954, Consolidated Edison Company of New York; testimony concerning claimed revenue requirements regarding capital structure.

Expert witness in Case No. 28978, New York Telephone; testimony presents the theoretical foundations for an appropriate Centrex rate structure and rates.

Expert witness in Case Nos. 90-E-1185 and 90-G-0112, Long Island Lighting Company; testimony addressing ratemaking issues concerning LILCO's proposed "sales adjustment mechanism, insurance costs, advertising expenditures, and Edison Electric Institute (EEI) dues." (May 1991)

Expert witness in Case No. 96-E-0132, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations for Long Island Lighting Company for Electric Service to Determine if Opportunities Exist to Reduce Electric Prices;

testimony filed on behalf of LIPA concerning LILCO's required rate of return on rate base, August, 1996.

Before the North Carolina Utility Commission -

Expert witness for the Commission Staff in Docket No. E-22, Sub 224, Virginia Electric & Power Company; testimony concerning rate of return.

Expert witness for the Commission Staff in Docket No. E-7, Sub 237, Duke Power Company; testimony concerning rate of return.

Expert witness for the Commission Staff in Docket No. P-55, Sub 816, Southern Bell Telephone Company; testimony concerning rate of return and capital structure issues.

Expert witness in Docket No. P100, Sub 65, on behalf of the North Carolina Department of Justice, testimony concerning telephone access charges.

Expert witness in Docket No. E-7, Sub 373, Duke Power Company; testimony concerning rate base and cost of service issues.

Expert witness in Docket No. E-7, Sub 391, Duke Power Company; testimony concerns required rate of return and cost of capital.

Expert witness in Docket No. P55, Sub 834, Southern Bell Telephone and Telegraph Company; testimony concerning attrition adjustment, rate of return, and divestiture related revenue requirement issues.

Expert witness in Docket No. E-2, Sub 503, Carolina Power & Light Company; testimony pertains to application for authority to adjust and increase electric rates.

Expert witness in Docket Nos. E-2, Sub 391; E-2, Sub 416; E-2, Sub 402; E-2, Sub 411; E-2, Sub 446, Carolina Power & Light Company; testimony presents an independent analysis of the appropriateness of the fuel factors employed by Carolina Power & Light Company.

Expert witness to Docket No. E-2, Sub 481, Carolina Power & Light Company; testimony concerns the amounts of CWIP included in CP&L's rate base.

Expert witness in Docket E-100, Sub 41A, testimony addressing the biennial determination of rates for sale and purchase of electricity between utilities and qualifying facilities.

Expert witness in Docket No. E-2, Sub 481, Carolina Power & Light Company; testimony addresses the necessity for the requested rate relief.

Expert witness in Docket No. E-7, Sub 408; Duke Power Company; testimony concerning the expense, rate base and rate of return issues pertaining to Duke's request for an increase in retail electric rates.

Before the North Carolina Insurance Commission -

Expert witness on behalf of the North Carolina Insurance Department in Docket No. 361, concerning private passenger automobile insurance rates filed by the North Carolina Insurance Service office.

Expert witness pertaining to the earnings rate that should be allowed in establishing private passenger automobile insurance rates.

Expert witness pertaining to the underwriting return that should be allowed in establishing farmowners multiple peril insurance rates.

Expert witness in Docket No. 474; testimony concerning the appropriate rate of return and underwriting margin for automobile insurers in North Carolina.

Expert witness before the Commissioner of Insurance; testimony concerning the allowable underwriting return in farmowners multiple peril insurance rates.

Expert witness in 1987 private passenger automobile insurance rate case; testimony concerning earnings rate and underwriting return for establishing private passenger automobile insurance rates in North Carolina.

Expert witness in 1987 workers' compensation insurance rate case; testimony concerning earnings rate and underwriting return for establishing workers' compensation insurance in North Carolina.

Expert witness in 1988 private passenger automobile insurance rate case; testimony concerning earnings rate and underwriting return for establishing private passenger automobile insurance rates in North Carolina.

Expert witness in 1989 private passenger automobile insurance rate case; testimony concerning earnings rate and underwriting return for establishing private passenger automobile insurance rates in North Carolina.

Expert witness in Docket No. 478; testimony concerning dividends, deviations, accounting principles, and premium-to-surplus ratios are appropriate in determining rates.

Expert witness in Docket No. 535, North Carolina Rate Bureau; testimony regarding a revision of Private Passenger Automobile Insurance Rates, October 1989.

Expert witness, North Carolina Rate Bureau 1992 filing, testimony concerning appropriate rate of return on the underwriting profit and contingency factor that should be allowed in establishing workers compensation rates.

Expert witness concerning the appropriate rate of return and underwriting profit and contingency factor that should be allowed in establishing private passenger automobile insurance rates.

Expert witness in Docket Nos. 670 & 671; North Carolina Rate Bureau 1993 filing, testimony concerning appropriate rate of return and underwriting profit and contingency factor that should be allowed in establishing homeowners and dwelling fire and extended coverage insurance rates.

Expert witness in Docket No. 689, North Carolina Rate Bureau 1994 filing; testimony concerning appropriate rate of return and underwriting profit and contingency factor that should be allowed in establishing private passenger automobile insurance rates.

Before the Public Utilities Commission of Ohio -

Expert witness in Case No. 99-1212-EL-ETP, First Energy Corporation; testimony filed on behalf of Shell Energy Services Company concerning “stranded” costs and competitive market rates.

Expert witness in Case Nos. 99-1729-EL-ETP & 99-1730-EL-ETP, American Electric Power electric restructuring proceeding; testimony filed on behalf of Shell Energy Services Company, concerning stranded costs and competitive market rates.

Expert witness in Case No. 76-26-TP-CCS, Ohio Bell Telephone Company; testimony concerning service and equipment costs, tariff structures and competition in the telecommunications industry.

Expert witness in Case No. 78-676-EL-AIR, Ohio Power Company; testimony concerning rate of return and capital structure issues.

Expert witness in Case No. 79-1184-TP-AIR, Ohio Bell Telephone Company; testimony concerning proper ratemaking treatment of costs and adjustments for demand curtailment and stimulation.

Expert witness in Case Nos. 80-260-EL-AIR, and 80-429-EL-ATA, Cincinnati Gas & Electric Company; testimony concerning rate structure design, calculation of tariffs and revenue responsibilities.

Expert witness in Case No. 81-782-EL-AIR, Ohio Power & Light Company; testimony on company's request for rate increase.

Expert witness in Case No. 80-1155-GA-AIR et al., Columbia Gas of Ohio; testimony dealing with rate of return.

Expert witness in Docket No. 83-464-TP-COI, Ohio Bell Telephone Company; testimony concerning intrastate access charges.

Expert witness in Case No. 11-346-EL-SSO et al., Columbus Southern Power Company and Ohio Power Company, rate of return and return on equity issues, May 2012.

Before the Oklahoma Corporation Commission -

Expert witness in Case No. 28002, Southwestern Bell Telephone Company; testimony concerning financial condition, cost of capital, rate of return and cost of service issues.

Expert witness in Cause No. 28123, Oklahoma Gas and Electric Company; testimony concerning rate of return, CWIP, and cash working capital issues.

Expert witness in Cause Nos. 28331 and 28875, Public Service Company of Oklahoma; testimony analyzing request for rate relief; presents a cost of capital study and addresses the allocations and determination of Transok's cost of service.

Expert witness in Cause No. 28309, testimony addressing the development of intrastate access charges.

Expert witness in Cause No. 29321, Southwestern Bell Telephone Company; testimony analyzing Southwestern Bell's request for interim intrastate rate relief; pursuant to intrastate rates, charges, services and practices necessary to achieve an increase in rate of return; and, intrastate access charges and tariffs.

Before the Oklahoma State Board of Property and Casualty Rates -

Expert testimony pertains to the earnings rate and the underwriting return allowed in establishing worker's compensation insurance rates.

Expert witness File No. 92-1566C; testimony concerning appropriate rate of return on the underwriting profit and contingency factor that should be allowed in establishing workers compensation insurance rates.

Before the Ontario Energy Board -

Expert witness in Case No. OEB-HR-17; Ontario Hydro; testimony concerning cost allocation and rate design issues and nuclear decommissioning cost matters and parallel generation.

Expert witness in Case No. E.B.R.O. 410-III and E.B.R.O. 414-II, The Consumers Gas Company, Ltd.; testimony concerning gas utility cost allocation and rate design.

Before the Ontario Legislative Assembly -

Ontario Hydro Select Committee; expert testimony on economic principles of electric utility rate structure design; March 9, 1976.

Before the Pennsylvania Insurance Commissioner -

Expert testimony concerning rate of return issues in determining private passenger automobile insurance rates.

Expert witness regarding rate of return in determining private passenger automobile insurance rates.

Expert witness to present testimony on the rate of return that should be allowed in establishing workers compensation insurance rates in Pennsylvania.

Expert witness to present testimony on the appropriate rate of return and on the underwriting profit and contingency factor that should be allowed in establishing workers compensation insurance rates that are not inadequate, excessive or unreasonably discriminatory, November, 1991.

Before the Pennsylvania Insurance Department -

Expert advice and analysis regarding the effect of market structure on Pennsylvania Blues' surplus position, November 2003.

Before the Pennsylvania Public Utility Commission -

Expert witness in Docket No. I-8400381, Philadelphia Electric Company; testimony pertains to Company's load forecast and the question of instituting regulatory incentives designed to improve performance and reduce electric utility costs.

Expert witness in Docket No. R-842651, Pennsylvania Power & Light Company; testimony concerning the impact of electric power rate increases on the local economy, the terms and conditions for the measurement of billing demands, the feasibility of deferred return ratemaking.

Expert witness in Docket No. 850152, Philadelphia Electric Company; testimony to assess the merits of adopting operating performance standards for PECO's nuclear power plants.

Expert witness in the Commission's 1984 Generic proceeding on the establishment of new cogeneration rates.

Expert witness in Docket No. A-2010-2176733, Joint Application For Approval Under Chapter 11 of the Pennsylvania Public Utility Code of the Change of Control of Qwest Communications Company, LLC and For All Other Approvals Required Under the Public Utility Code. Testimony in regard to issues pertaining to the proposed merger of CenturyLink and Qwest. July 2010.

Expert witness in Docket No. A-2010-2176520/A-2010-2176732, Joint Application of West Penn Power Company d/b/a Allegheny Power, Trans-Allegheny Interstate

Line Company and FirstEnergy Corp, Testimony concerning the effect of the merger on competition. August 2010

Before the Rhode Island Public Utilities Commission -

Expert witness for the Commission Staff in Docket No. 1170, New England Telephone and Telegraph Company; testimony concerning rate of return, working capital allowance, tax issues and earnings erosion.

Expert witness for the Commission Staff in Docket No. 1167, Bristol County Water Company; testimony dealing with rate of return and the financial implications of leveraged capitalization within a multi-tier holding company structure.

Expert witness for the Commission Staff in Docket No. 1185, Blackstone Valley Electric Company; testimony concerning the principles of electric utility rate structure design.

Expert witness for the Commission Staff in Docket No. 1189, Providence Gas Company; testimony concerning rate of return for a gas utility.

Expert witness for the Division of Public Utilities and Carriers in Docket No. 1268, Newport Electric Corporation; testimony concerning rate of return.

Expert witness for the Division of Public Utilities and Carriers in Docket No. 1251, New England Telephone & Telegraph Company; testimony concerning rate of return.

Expert witness for the Division of Public Utilities and Carriers in Docket No. 1256, Wakefield Water Company; testimony regarding rate of return.

Expert witness for the Division of Public Utilities and Carriers in Docket No. 1258, Providence Gas Company; testimony regarding rate of return and cost of service.

Expert witness in Docket No. 1262, Blackstone Valley Electric Company; testimony presenting and summarizing the results of the Rhode Island Demonstration Project. Expert witness for the Division of Public Utilities and Carriers in Docket No. 1311, Newport Electric Corporation; testimony concerning inverted rates and lifeline rates.

Expert witness in Docket No. 1468, Narragansett Electric Company; testimony consists of a critique of the rate of return testimony presented by the Applicants' witness, and of an analysis of the cost of senior securities and common equity capital.

Expert financial and cost of service witness in Docket No. 1502, Bristol County Water Company; testimony concerning proposed rate increase.

Expert witness in Docket No. 1560, New England Telephone & Telegraph Company; testimony concerning rate of return, affiliated relationships, license contract, migration and related issues.

Expert witness in Docket No. 2320; Rhode Island Department of the Attorney General; testimony addressing various economic issues relating to electric utility restructuring. (A Plan for Restructuring the Electric Utility Industry was also prepared for the Rhode Island Department of the Attorney General.)

**Before the Rhode Island Department of Business Regulation, Insurance Division -**

Expert witness, National Council on Compensation Insurance, testimony concerning the appropriate rate of return and underwriting profit and contingency factor that should be allowed in establishing workers compensation insurance rates.

**Before the South Carolina Department of Insurance -**

Expert witness in Docket No. 82-053, Insurance Company of North America; testimony concerning the underwriting return for private passenger automobile insurance rates.

Expert witness in Docket No. 83-001, Rate Filing for Private Passenger Automobile Liability and Physical Damage Insurance Rate; testimony concerning rate level requirements for private passenger automobile insurance.

Expert witness in Docket No. 84-046, State Farm Mutual Automobile Insurance Company; testimony addresses the underwriting return that should be allowed in establishing private passenger automobile insurance rates (1984).

Expert witness, State Farm Mutual Automobile Insurance Company; testimony concerning the earnings rate and the underwriting return that should be allowed in establishing private passenger automobile insurance rates (1985).

Expert witness in Docket No. 84-023 concerning rates to be charged by South Carolina for fire insurance on dwellings.

Expert witness in 1987 workers compensation insurance rate case; testimony concerning earnings rate and underwriting return for establishing workers' compensation insurance rates in South Carolina.

Expert witness in 1988 Mark Four insurance rate case, Blue Cross and Blue Shield of South Carolina; testimony concerning earnings rate and underwriting return for establishing Mark Four insurance rates for Blue Cross in South Carolina.

Expert witness in 1989 workers' compensation insurance rate case; testimony concerning earnings rate and underwriting return for establishing workers' compensation insurance rates in South Carolina.

**Before the South Carolina Public Service Commission -**

Expert witness in Docket No. 80-69-E, Carolina Power & Light Company; testimony concerning rate design issues and the economic implications of electric utility rates and focusing on the PURPA cost of service standard.

Expert witness in Docket No. 82-328-E, Carolina Power & Light Company; testimony concerning rate of return issues.

Expert witness in Docket Nos. 84-388-E and 84-389-EIG, South Carolina Electric & Gas Company; testimony reviews the application pertaining to the restructure of SCE&G's corporate organization.

Before the South Dakota Public Utilities Commission -

Expert witness for the Commission Staff in Docket No. F-3112, Black Hills Power & Light Company; testimony dealing with rate of return, rate structure design, and subsidiary operations.

Expert witness for the Commission Staff in Docket No. F-3053, Montana-Dakota Utilities Company; testimony dealing with rate of return, rate structure design, and subsidiary operations.

Expert witness for the Commission Staff in Docket No. F-3054, Northern States Power Company; testimony concerning rate of return.

Expert witness for the Commission Staff in Docket No. F-3055, Northwestern Public Service Company; testimony concerning rate of return.

Expert witness for the Commission staff in Docket No. F-3052, Otter Tail Power Company; testimony concerning rate of return.

Expert witness for the Commission Staff in Docket No. F-3126, Montana Dakota Utilities Company; testimony dealing with electric utility rate of return.

Expert witness for the Commission Staff in Docket No. F-3159, Montana-Dakota Utilities Company; testimony dealing with gas utility rate of return.

Expert witness for the Commission Staff in Docket No. F-3153, Northwestern Public Service Company; testimony concerning rate of return.

Expert witness for the Commission Staff in Docket No. F-3164, Otter Tail Power Company; testimony concerning rate of return.

Expert witness for the Commission Staff in Docket No. F-3174, Black Hills Power & Light Company; testimony concerning rate of return issues.

Expert witness for the Commission Staff in Docket No. F-3188, Northern States Power Company; testimony concerning rate of return.

Expert witness in Dockets F-3240 and F-3241, Montana-Dakota Utilities Company; testimony concerning rate of return, cost of capital, rate structure design and coal subsidiary profits.

Expert witness in Docket No. F-3262, Black Hills Power & Light Company; testimony concerning rate of return, cost of capital, rate structure design and coal subsidiary profits.

Expert witness in Docket No. F-3367, Northwestern Public Service Company; testimony concerning rate of return and other ratemaking issues.

Expert witness in Docket No. F-3371, Nebraska Public Power District; testimony on proposed MANDAN Nominal 560KV Transmission Facility.

Expert witness in Docket No. F-3370, Montana-Dakota Utilities Company; testimony dealing with rate design.

Expert witness in Docket No. F-3382, Northern States Power Company; testimony on rate of return.

Expert witness in Docket No. F-3384, Montana-Dakota, Utilities Company; testimony on rate of return.

Expert witness in Docket No. F-3389, Black Hills Power & Light Company; testimony on rate of return and cost of service.

Expert witness in Docket No. F-3508, Northwestern Public Service Company; testimony examined electric rate requirements giving particular attention to cost of capital and rate of return.

Expert witness in Docket No. F-3391, Northwestern Public Service Company; testimony presents a cost of capital study and recommends a fair rate of return.

Before the Tennessee Public Service Commission -

Expert witness in Docket No. U-6285, South Central Bell Telephone Company; testimony pertaining to Western Electric's cost allocations and anticompetitive implications of South Central Bell's rate levels and rate design for telephone services.

Before the Texas Public Utility Commission -

Expert witness in Docket No. 78, Southwestern Bell Telephone Company; testimony concerning telephone equipment, telephone service costs, rate of design, and the economic implications thereof.

Expert witness in Docket No. 3094, General Telephone Company of the Southwest; testimony concerning the application for an adjustment in rates for intrastate telephone service.

Expert witness in Docket 2672, Southwestern Bell Telephone Company; testimony concerning telephone answering service rates proposed by Southwestern Bell.

Expert witness in Docket No. 5640, Texas Utilities Electric Company; testimony pertaining to rate of return and the inclusion of CWIP in rate base.

Expert witness in Docket No. 9300, Texas Utilities Electric Company; testimony concerning cost of capital, rate of return, revenue requirement, and "pure prudent investment rule" issues.

Expert Witness in Docket Nos. PUC 14980 and SOAH 473-95-1708, Office of Public Utility Counsel; testimony addressing various competitive market issues.

Expert witness in PUC Docket No. 15560, SOAH Docket 493-96-0897, Application of Texas-New Mexico Power Company for Approval of its Community Choice Transition Plan; testimony on behalf of the Texas Office of Public Utility Counsel concerning economic issues relating to TNP's application for approval of its "Community Choice Transition Plan", November, 1996.

Report to the Office of Public Utility Counsel on the Criteria for the Sale of Generation Assets by ERCOT Generation-Ownng Utilities; Criteria for Electric Generation Divestiture in ERCOT, October, 1998.

Expert witness in PUC Docket No. 25395, SOAH Docket No. 473-02-3457, Application of Central Power and Light for a Declaratory Order; testimony on behalf of Citgo Refining and Chemicals, L.P., responding to issues specified in the Commission's Preliminary Order of March 27, 2003, May 30, 2003.

Before the Texas Railroad Commission -

Expert witness for the City of San Antonio in Docket No. GUD-500, Lo-Vaca Gas Gathering Company; analysis of the economic impact upon purchased gas costs of certain extraordinary transactions.

Before the Texas Railroad Commission -Gas Services Division

Expert witness in Gas Utilities Docket No. 8664; Aligned Cities; testimony examining rate issues and related economic matters with an emphasis on corporate reorganization.

Before the Texas State Board of Insurance -

Expert witness in the Matter of Workers Compensation and Employer Liability Insurance Rates 1986; testimony concerning loss development, expense trending, investment income and other matters pertaining to the establishment of appropriate rate levels for workers compensation insurance in Texas.

Expert witness in the Matter of Private Passenger Automobile Insurance Rates (1986); affidavit concerning the appropriate underwriting margin for automobile liability and physical damage insurance rates in Texas.

Expert witness in Docket Nos. 1675 and 1678 concerning workers compensation insurance rates in the State of Texas; 1989.

Before the Public Service Commission of Utah -

Expert witness in Case No. 76-049-01, Mountain States Telephone & Telegraph Company; testimony concerning service and equipment costs, tariff structures and competition in the telecommunications industry.

Expert witness in Case No. 82-049-08, Mountain States Telephone & Telegraph Company; testimony concerning cost of service allocations between service categories and rate of return requirements and capital structure.

Expert witness in Case No. 83-049-05, Mountain States Telephone & Telegraph Company; testimony concerning the need for interim rate relief.

Expert witness in Case No. 84-049-01, Mountain States Telephone & Telegraph Company; testimony concerning post-divestiture cost estimates.

Expert witness in Case No. 84-035-02, Utah Power & Light Company; testimony addresses UP&L's application to form a wholly-owned subsidiary to carry out unregulated business enterprises.

Before the Vermont Public Service Board -

Expert witness in Docket 4299, Central Vermont Power Company; testimony concerning condemnation value and antitrust issues pertaining to the establishment of a municipal electric system in Springfield, Vermont.

Before the Virginia Corporation Commission -

Expert witness in PUE Case No. 790012; testimony concerning rate structure design, analysis of cost structure, revenue responsibilities, time-of-use rates, and customer responses.

Expert witness in Case No. PUE860031, Commonwealth Gas Services, Inc.; testimony concerning cost allocation, revenue requirements and rate design for Commonwealth Gas.

Expert witness in Case No. Ins. 860156; testimony concerning the appropriate underwriting margin for workers compensation insurers in the State of Virginia.

Expert witness in Case No. INS 870235; testimony concerning earnings rate and underwriting return for establishing workers' compensation rates in Virginia.

Expert testimony in Case No. INS 880340; testimony concerning earnings rate and underwriting return for establishing workers' compensation insurance rates in Virginia.

Expert witness in Case No. INS 890253, The Virginia Insurance Reciprocal; testimony concerning required return, profit and contingency factor, expense level, loss ratio and resulting change that should be implemented in establishing rates for lawyers professional liability insurance in Virginia; 1989.

Report on behalf of the Virginia Trial Lawyers Association, in Case No. INS870060, concerning whether lawyers' professional liability insurance is available in Virginia at reasonable prices and whether competition is an adequate regulator of rates; 1987.

Expert witness in Case No. PUE880053, Northern Virginia Gas; testimony concerning rate for interruptible transportation service proposed by NVNG; 1988.

Expert witness on behalf of the Attorney General in Case No. INS890313, St. Paul Fire & Marine Insurance Company and St. Paul Mercury Insurance Company; testimony concerning required return, profit and contingency factor, expense level, loss ratio and resulting change for establishing St. Paul's rates for physicians and surgeons medical malpractice liability insurance in Virginia; 1989.

Expert witness on behalf of the Attorney General in Case No. INS890416; concerning the identification of "troubled lines" of property/casualty insurance in the State of Virginia; 1989.

Expert witness on behalf of the Attorney General in Case No. INS 900256; concerning the determination of competition as an effective regulator of rates.

Expert witness on behalf of the Attorney General in Case No. INS 910224; testimony concerning rate of return that should be allowed in establishing workers compensation rates.

Expert witness on behalf of the Attorney General in Case No. INS 920241; testimony concerning competition as an effective regulator of rates pursuant to Virginia Code 38.2-1905.1.E.

Before the Virginia District Court (Eastern District) -

Expert witness of Civil Action No. 90-488-A, The Progressive Corporation v. Integon P & C Corporation; testimony concerning issues of competition and profitability in non-standard automobile insurance lines in Virginia.

The Virginia Trial Lawyers Association -

Report to the Virginia Trial Lawyers Association, *Report on Medical Malpractice Insurance in the Commonwealth of Virginia*, July 2003.

Prepared for the Virgin Islands Director of Banking and Insurance -

A Life and Health Insurance Examination and a Property and Casualty Examination for prospective insurance agents, along with a Training Manual for Insurance Agents, Brokers and Adjusters. (October, 1991)

Before the Washington State Utilities and Transportation Commission -

Expert witness in Case No. U-79-66, Pacific Northwest Bell Telephone Company; testimony concerning rate of return, cost of capital, and rate design.

Expert witness in Case No. U-82-19, Pacific Northwest Bell Telephone Company; testimony concerning rate of return and cost allocation issues.

Expert witness in Docket No. TO-011472, Olympic Pipe Line Company; testimony concerning cost of capital and rate of return, May 2002.

Expert witness for the Commission Staff in Docket Nos. UG-040640 and UE-040641 (consolidated) Puget Sound Energy, Inc.; testimony regarding cost of capital and rate of return, September 2004.

Before the Superior Court of Washington for Clark County -

Affidavit in No. 91 2 01840 9 in response to Plaintiff's Motion for Partial Summary Judgment concerning methods used to value utility property.

Before the West Virginia Public Service Commission -

Expert witness in PSC Case Nos. 8500, 8750, and 8879; Chesapeake & Potomac Telephone Company of West Virginia; testimony concerning service and equipment costs, tariff structures and competition in the telecommunications industry.

Before the West Virginia Insurance Commissioner -

Expert witness in the matter of Medical Malpractice Insurance Rates in the State of West Virginia, September, 1986; testimony concerning the appropriate underwriting margin and need for rate increases for medical malpractice underwriters.

Before the Public Service Commission of Wisconsin -

Expert witness in File Number 6720-TR-10, Wisconsin Telephone Company; testimony concerning service and equipment costs, tariff structure and competition in the telecommunications industry.

Expert witness in I-AC-15, WPSC Internal Wiring Proceeding; testimony concerning pricing standards for the sale of inside wiring.

Expert witness in Docket No. 6720-TR-34B, Wisconsin Telephone Company; testimony concerning Optional Local Measured Service.

Expert witness in Docket No. 6630-UR-100, Wisconsin Electric Power Company; testimony concerning the capital structure and fair rate of return for Wisconsin Electric Power.

Expert witness in Docket No. 6680-UM-100, merger of WPL Holdings, Inc. and Wisconsin Power & Light Company and all related transactions; testimony filed on behalf of The Wisconsin Intervenors relating to market power and merger induced efficiencies, evergreen contracts and merger remedies, May 1997.