STANDBY INSURANCE AS A PRODUCT IN A DE-REGULATED INDUSTRY

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Introduction and Background

Standby services have historically consisted of three general types of services. These are capacity to provide energy on demand for the unpredictable outages of the customer's primary source of power (back-up services), predictable and controllable energy for time periods when the customer schedules maintenance for self-owned generation sources, and supplemental service where the customer purchases additional power beyond what is provided by their other power source. The provision of back-up and maintenance services have often been provided under regulated standby services' rates, apart from primary service rates. Back-up power is the element of standby services that provides the insurance for the purchaser, providing power when their other power supply fails. The service provided is not the standard provision of energy and demand as used, but rather insurance for the possible use of these services. This makes many elements of this service and its pricing more complicated than primary firm service.

The changing marketplace could significantly affect the market for standby services, the products that may be offered, and the opportunities available in an expanded market. Customers may have several alternatives and packages available to them that inter-relate to the provision of standby services. They could be self-generators with the need for these services. They can be independent power producers or qualifying facilities. In the new market, customers could buy power from a third-party or power marketer and desire this insurance from the local and known provider. Third party providers could desire the service in order to guarantee their firm service contracts. Customers could want the insurance in a financial enumeration or as back-up power. They could require this service in order to accept distributed generation. Back-up services could be a portion of their insurance stance along with buying power on the spot market, in place of having additional on-site power back-up supplies, or in addition to purchasing interruptible power from a third party.

A better understanding of the nature of standby services, its pricing issues, prior regulatory issues, and future issues can assist those designing energy service products in examining a broader range of possibilities. For example, the combined (gas and electric) marketers may wish to construct combined packages of distributed generation and back-up power as a lower cost and, yet, secure power package for customers. This type of service was unusual in the old regulated scheme where combined utilities had to maintain distance between their gas and electric business units.

Provision of Standby Services As a Market Niche

Standby services provide insurance (i.e., reduce risks) for either a self-generator, or an entity purchasing power from an unfamiliar source. As a greater number of purchases occur outside the framework of a vertically integrated supply system, reliability may decline (or perceived as being less reliable) and the desire for insurance for these power contracts may expand. Standby contracting will be used by power purchasers to avoid purchasing emergency or backup power from the spot market. It is likely that the market for standby services will grow significantly as the overall power market becomes a more competitive marketplace.

In an open access regime it is more likely that standby contracting will expand to services being provided by a party other than the host utility. If a third party utility wants to supply only standby service to a purchaser, it is all the more important that standby service be priced appropriately. For some utilities with high priced supplies, greatest profitability might be achieved by concentrating on expanding transmission and standby services while letting power supplies become a much smaller part of their business.

Standby pricing has, to-date, often been given only secondary attention. Yet, the quantity of power and capacity obtained as standby services are increasing and expected to increase more rapidly with the move to more competitive markets. The design of efficient markets (i.e., markets that minimize total cost to society) requires including efficient pricing of standby services.

Efficient resource decisions for generation and transmission can not occur unless there is efficient pricing in transmission, generation, ancillary, and standby services. Standby and ancillary services complete the package of the services provided, whether in the retail or wholesale market. The markets for either transmission or generation can not have efficient pricing if their standby services are not also efficiently priced. This principle has been recognized, to some extent, by the competitive market reforms taking place in Europe. For example, in an examination of the reform policies being examined in Finland, Osmo Rännäri, of the Helsinki Energy Board, stated that "For plants to be competitive, the costs of generation, including some system for the cost of standby generation capacity must be minimized ".

The greatest lesson to be learned from the retail experience to-date is that standby pricing should be taken more seriously, and examined more closely sooner. In comparison, the state level experience shows more problems than successes with regard to standby pricing. All too often standby services have been underpriced. Also, there are states in which standby services are not priced separately;

creating potential subsidies to these customers from the other customers in their rate class (i.e., intra-class equity problems). One can, however, learn from these mistakes. Additionally, an attempt to correct these problems can be made while unbundling prices and developing prices (and contracts) for the new competitive market place.

In a truly competitive market for standby services, by definition, price will be determined by the marketplace. Yet, knowing the mistakes made in the previous pricing of standby services can help utilities determine whether they can profitably operate in that market in the long-run. With standby services, this is not necessarily an easy question to address properly.

Yet, Will Standby Services Be Deregulated?

It is not a foregone conclusion that standby services will be deregulated. If the distribution utility becomes the utility of last resort, it may also be regulated to offer standby services as an obligation to serve.

There may be precedence for the distribution utility to be regulated with an obligation to provide standby services. This stems from the fact that the Public Utility Regulatory Policies Act of 1978 (PURPA), with FERC application, required that interruptible backup (standby) services be provided to Qualifying Facilities (QF). Nevertheless, there have been four different interpretations made, in different states, as to the PURPA requirements of standby service for QFs. These are:

1. The utility must offer only interruptible standby service with the price of this service incorporating appropriate cost-of-service fees.
2. The utility will not be required to provide firm or interruptible standby services, if the utility proves to the state regulatory body that doing so would harm its customers.
3. The utility must provide firm standby service with the price incorporating cost-of-service and reservation fees.
4. The utility must provide firm standby service under its normal pricing schedules (i.e., without reservation fees).

The above interpretations are ordered by the amount of potential costs they impose on the utility's captive customers. That is, the first interpretation offers the maximum protection to captive customers while the last offers the least. These differences in costs to captive customers result from a lack of clarity in the obligation to serve clause for providing standby services to QFs. They are not due to purposeful actions by state regulatory authorities to place captive customers at risk. In fact, this lack of clarity was specifically cited by the Michigan Public Service Commission as the reason for not approving a standby service rate request.

> "What is lacking is clarity about the legal requirements imposed by federal and state law and a quantification of the effects on Consumers [Consumers Power Company], its standby customers, and other customers of the variety of ways that standby service might be offered and priced. Consequently, the commission finds that the record is not adequate to resolve these issues in a manner that balances the interests of all parties or serves the public interest."

The Connecticut Department of Public Utility Control (DPUC) provides an example of the first PURPA interpretation listed above. The DPUC does not require firm standby service, and they allow reservation fees to capture the benefits of capacity that is provided to standby customers who receive interruptible service. In a Connecticut Light and Power Company case in 1988, the DPUC stated:

> "Based on the record, we believe the minimum demand charge proposed by CL&P is supportable. It is true there is not a great deal of cost of service data available regarding this class because of the newness of the rate and the immaturity of the subscriber class, but cost of service is not the sole basis upon which to predicate rates. Under exclusive cost of service principles intermittent users and interruptible customers might bear insignificant responsibility for demand related charges. Nonetheless, both classes of customers achieve substantial value from the service being provided and both classes of customers impose substantial duty to serve obligations upon the utility provider. A charge that is reflective not only of costs but of these other considerations is appropriate."

Offering only interruptible standby is equivalent to not requiring utilities to provide capacity to serve standby demand loads. United Illuminating Company, also in Connecticut, offers four levels of interruptible service but no firm service as part of their standby service rate tariff. Several jurisdictions and standby rates do not require the utility to offer firm standby service. For example, the Idaho PUC directly addressed this issue in Order No. 22887 in December 1989, regarding the Idaho Power Company's standby rate proposal. They said that "contract demand bears a meaningful and direct relationship to the utility's obligation to serve."

In California, Pacific Gas and Electric Company (PG&E) has an approved standby tariff that specifically addresses its right to refuse standby service. This special condition grandfathers all current load, but says that PG&E re-

serves the right to deny standby service to new or increased loads, if serving this load may jeopardize service to existing customers. (PG&E will notify the California Public Utilities Commission (CPUC) of any decisions it makes to not serve this reservation load.) This new standby load will be subject to CPUC approval for reservation capacity over one megawatt, or combined reservation capacity across customers that exceed one megawatt from any single non-utility plant.

The relationship between contracting for standby and the obligation to serve can also be seen in state experience in natural gas standby pricing. In an order regarding Arkansas Western Gas Company, the Arkansas Public Service Commission stated, "Customers opting for transportation which do not pay standby charges will be referred to as non-core customers and will have no rights to system supply gas."

Similarly in California, the California Public Utilities Commission stated that, "Standby service shall have the lowest priority during periods of curtailment," in its decision regarding Natural Gas Procurement and System Reliability .

The Texas Public Utility Commission provides us with an example of the second interpretation of PURPA. It requires utilities to provide standby and supplemental services to QFs. Yet, the utility is not required to provide this service(s) if, "after notice ... and opportunity for public comment, the electric utility demonstrates and the commission finds that provision of such power will: impair the electric utility's ability to render adequate service to its customers; or place an undue burden on the electric utility."

Interpretation four has been seen in Massachusetts. For example, standby rates in Massachusetts were eliminated by the Massachusetts Department of Public Utilities (DPU) in the mid-1980s with criteria for an auxiliary service rate set forth in Boston Edison Company, DPU 1720 (1984). This was followed by the disallowance of auxiliary service rates in Cambridge Electric Light Company, DPU 84-165-A (1985) and Massachusetts Electric Company, DPU 85-146. Both of these cases cited the need for greater proof of the differences in costs between standby and non-standby customers. Standby rates were also eliminated in Massachusetts in the mid-1980s, as part of the removal of demand ratchets from all rates in Massachusetts. Massachusetts Electric's auxiliary service rate, in place from 1982 until the above case in 1985, was a modified general service rate. The general service rate applied for all customer charges and standby customers also faced an auxiliary service charge. This service charge was a demand ratchet substituting for a reservation fee. All demand ratchets were disapproved by the Massachusetts DPU as they were believed to lower the incentive for energy efficiency investments.

In North Carolina, Carolina Power and Light Company offers both firm and interruptible standby services. Nevertheless, standby service is limited to protect the captive customers by limiting its availability to amounts less than or equal to 50 mWs.

The Florida Public Service Commission approved Florida Power and Light's (FPL) request that customers with contracts to sell firm capacity and/or energy to FPL, and who cannot restart their generation equipment without power supplied by FPL, would be excluded from being able to take interruptible standby and supplemental service. This restriction protects native customers who rely on the power being sold to FPL by these customers, and assures these standby customers have the power to restart their generators during times when FPL needs this power and interruptible customers are being curtailed.

The foregoing variations in PURPA interpretations demonstrate the importance of fully defining the obligation to serve that will exist in any new regime. It also shows the importance of balancing any obligation to serve with a pricing mechanism that ensures captive customers are protected.

Mistakes Made in the Regulated Pricing of Standby Services

The pricing of standby services is one of the more complicated areas of pricing for energy utilities. First, there are three general types of services within this overall category: back-up (on demand), maintenance (scheduled in advance with utility approval of timing), and supplemental service. Back-up power is the element of standby services that provides the insurance for the purchaser, providing power when their other power supply fails. On the other hand, the maintenance service as scheduled when the utility has excess capacity on-line is the lowest cost service for the utility to provide. Supplemental power augments the power the purchaser obtains elsewhere. The load shapes and predictability of these three types of services vary significantly from that of full firm service customers and among the three.

Utilities do often differentiate pricing by these different types of services: back-up versus maintenance, standby versus supplemental, by transmission and distribution service levels, and by voltage levels. As the standby services market becomes competitive, we would expect that all pricing be either be disaggregated as such or calculated as such and then packaged for the customer.

The greatest difficulty in regulated pricing of standby services comes from estimating the "appropriate" price for capacity within back-up pricing. The main obstacle is that regulated pricing is based upon the fact of allocating costs according to the quantity of power and demand used. Yet, the service being provided in back-up is not power used but insurance for power that may need to be used.

The basic issue for standby pricing is the recovery of fixed costs. Unless additional charges are built into a distinct standby rate, the customer charge and reservation fee (or access fee) are the only bill components of a standby rate that are set-up for the collection of fixed costs. The other components, demand charges and energy charges, are dependent upon usage and, therefore, should only cover variable costs.

The primary difficulty is most often found in the decision of how to price capacity. The capacity charge is a fixed fee to cover the amount of capacity that most be held

for that capacity. Yet, its usage is unpredictable making a selection of applicable marginal cost a problem. The extent of usage is also unpredictable and can vary significantly year-to-year, making allocation a problem. For example, Houston Lighting & Power Company, the US's electric utility with the largest amount of standby service, conducted an extensive study in 1992 examining and comparing 13 methods for calculating back-up pricing.

We also find standby pricing to be an issue in the natural gas industry and can learn from their experiences. The New Hampshire Public Utilities Commission supported a standby schedule for natural gas to recover fixed costs. This ruling stated:

> "Usage data provided by the Company show that a limited number of customers with alternate fuel capability are meeting most of their energy needs with alternate fuel and using the gas distribution system for back-up or standby purposes. Consequently, the average annual consumption of gas by these "standby customers" is considerably lower than the average annual consumption that underlies the applicable rate schedule. As a result, the Company has been unable to recover from these customers its fixed costs. In light of this, the settlement parties recommend that the Company be authorized to replace the current applicable schedule with a standby schedule designed to recover the fixed costs of standing ready to serve."

Standby contracts are the largest mechanism by which partial requirements' customers are placed on a standby rate. Contract length varies from being unidentified to five years. Standby rates may also have required notices to leave standby service. Expansion of these types of contract provisions is quite likely as utilities become deregulated and are no longer protected by the regulatory umbrella of cost recovery.

As a fixed fee, there is a price incentive for customers to underestimate their contract demand needs, if the utility will serve whatever demand is as used. If this is done systematically, there will still be an intra-class equity problem. Very large customers can also cause the utility more difficulties and create greater costs if the utility's planned demand is too low due to the contract demand being too low. To prevent these problems some utilities provide penalties for excess demand, as-used demand greater than contract demand.

One of the heaviest penalties are those contained in Niagara Mohawk Power Corporation's (NMPC) standby tariff. NMPC has a two-tier excess demand penalty clause. If the as-used demand exceeds the contract demand by ten percent the penalty is twelve times the reservation fee, and if the as-used demand exceeds the contract demand by twenty percent the penalty rises to twenty-four times the reservation fee.

The Idaho Public Utility Commission, in its 1989 Order No. 22887 concerning the Idaho Power Company's proposed standby rate, stated that the utility had four alternatives available for addressing excess demand over contract demand. These alternatives were given as the following: contract demand ratchet; load limiting; disconnection; and excess or over-run charge. The standby rate for Idaho Power Company set in 1989 allows a five percent excess demand with a five-dollar excess charge per excess kilowatt plus a fifty-cent excess demand fee for daily kilowatt of excess demand. The PUC also stated that the utility had no obligation to serve above the contract demand.

Utilities also used fixed fees in brackets of demand. For example, this is done by Niagara Mohawk Power Corporation (NMPC), Pacific Gas & Electric (PG&E), and Houston Lighting & Power (by kilovolt-amperes).

Prior to competitive markets, standby pricing was becoming unbundled. As of 1995, the standby rate for NMPC had 13 components, and PG&E's standby rate was 9 pages long with 11 components.

At this time, utilities have not separated fixed transmission and distribution costs from discretionary or marginal costing. It is likely this will become a more important component of pricing, or at least a component that implicitly determines which utilities are profitable within this market.

Given the nature of standby services, back-up power for a customer with an alternative primary power source, standby services are likely to be more important in a competitive market whether or not standby services themselves are de-regulated or not. They will also often be intertwined with the issue or fixed cost recovery and stranded investments. The Delaware Public Service Commission ordered 100% mandatory standby fees in order to protect native customers in a docket regarding a standby natural gas rate for Delmarva Power and Light Company (November 1993, *PURbase*). The link between standby and the move to a competitive market was recognized in the Massachusetts DPU approval of a transition charge as part of a standby rate by Cambridge Electric Light Company in September 1995, DPU 94-101/95-36. The DPU approved a "Customer Transition Charge" (CTC) as a wires' charge (not an exit fee) to recover 75 percent of stranded costs from a move of MIT to QF power (*PUR Weekly*). Yet, the difficulties are also highlighted here as this case has gone on to litigation.

Recommendations for Regulators and Utilities in the Transition to De-Regulated Markets

1. Get standby pricing (retail and wholesale) right as early as possible in the transition to competitive prices.

Competition in generation has been significantly impacted by technological changes and PURPA. As a result, pricing for standby services in retail markets has fluctuated and evolved significantly. Utilities, at first, were somewhat remiss in setting pricing for standby services, assuming that the impacts for inappropriate pricing would be minimal. In other cases, utilities attempted to achieve reservation charges, but were unable to get them approved given how much they increased costs for the standby customers. The importance of these services can be seen by their increasing usage. It is very difficult to raise rates that are priced inappropriately low in the beginning.

2. To the extent that competition exists in generation and transmission access is developed, utilities should have no obligation to provide standby services, i.e., standby services should be supplied through market-based rates.

3. To the extent that regulators (FERC for wholesale, and state regulators for retail) impose standby service obligations and regulate prices, regulators should:

   a) Allow the use of balancing accounts to track costs incurred in providing each standby-related service;
   b) Allow efficient sequencing of services and prices;
   c) Allow the use of a reservation fee to recover fixed costs, including the probability of usage and diversity of loads in the class to be incorporated into the rate;
   d) Allow the use of incentive pricing to discourage customers from shifting costs by purposely underestimating contract demand;
   e) Allow for the recovery of implicit standby costs created by maintaining an obligation to serve customers selecting power from alternative sources/suppliers; and
   f) Allow for the recovery of transitional stranded costs through a fixed fee, such as within the standby reservation fee.

Standby Pricing Issues

From the Customer Perspective

One of the biggest initial issues that will occur in a competitive market for standby services will be the expected price for the service. Customers will initially expect the price for standby services to be the same or lower in the new competitive marketplace. Yet, if standby services have often been underpriced in a regulated environment, this will not likely be offered. Initially, this could cause some sticker shock as the market and customers adjust. It is also possible that it could create significant backlash and even cries for re-regulation of standby pricing.

Should You Be In This Market & At What Price?

The first thought from most people concerning market-based pricing is that isn't pricing determined by the market. Yet, pricing is actually more complicated than this.

All firms attempt to differentiate their products so that they do not face a completely competitive market, i.e., they can have a little control over their price. To the extent they differentiate their service, firms can make marginal pricing decisions while operating in a strategic manner given the moves of their competitors.

Even in a completely competitive market, the firm must decide whether to be in the entire market, a niche submarket, or whether to be in that market at all in the long-run. Classical microeconomics says that these decisions are made by examining expected market price, its associated marginal revenue, against marginal costs. If this price is not at average total costs, over the long-term this market does not allow the firm to cover all its costs and receive a reasonable profit for its risks. The firm should not be operating in this market with their current cost structure.

Utilities are now beginning to assess their costs in relation to offering various services. As they do so, examining the problems seen in pricing standby services, i.e., properly assessing costs, can provide guidance to utilities on how to assess their costs to provide this service. Each of the pricing issues discussed in the above section on past mistakes and issues should be examined by utilities as they determine their actual costs for operating in this market.

A competitive market for standby services may also allow utilities to offer an alternative service option. Some firms may be able to take standby services with a financial remuneration rather than power on demand. That is, some standby customers may require completely firm back-up (e.g., hospital or wholesale municipal customers) while others might be willing to have standby power on demand or financial remuneration in compensation. This latter option might look like an insurance policy where the firm receives a payment equivalent to their lost profit for a production cycle, and the utility selects either providing that payment or power at the instant demanded depending on the market price of the power. In the current regulated environment this alternative service is not offered.

Standby Service Within The Overall Offerings

Retail pricing of firm standby service and interruptible primary service has, at times, led to incompatibilities between these. Not allowing customers to receive both types of service is a result of the state experience with the pricing of standby services. A more appropriate solution might be that as pricing is designed, taking both services should be more expensive than obtaining firm service. Theoretically this should occur as there are greater administration costs to administering both services to a customer, while providing the same level of

capacity and energy, than serving this customer with firm primary service. Yet, in more than one utility or one state customers, if allowed to, could take interruptible and standby services at a lower cost than firm primary service. This means that they are receiving a discount for what is essentially firm primary service. This indicates that the standby service is probably underpriced. (If not, the interruptible primary service is underpriced.)

It is recommended that utilities examine the pricing of services across the board and how they appear in sequence of the service offered. That is, firm primary service should cost more than interruptible; predictable (firm) primary service should cost less than the equivalent take of unpredictable firm (standby) service; and predictable service controllable as non-peak (maintenance service) should cost less than the equivalent take of generally predictable (firm) primary service. This is as shown in Figure 1.

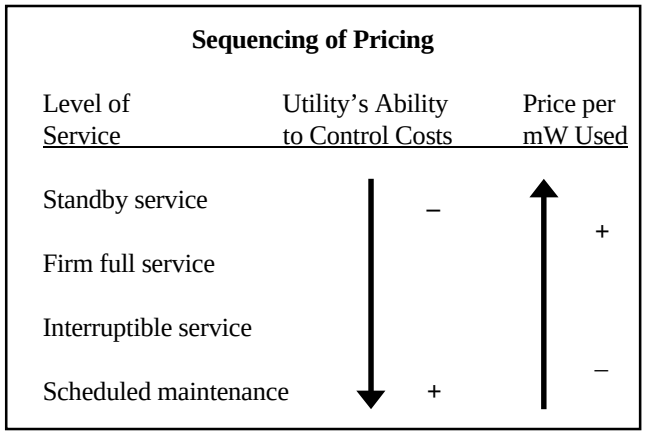

Figure 1

Additionally, utilities should examine their pricing as it is in sequence when combined. That is, a customer should not be able to obtain firm service for less cost, by combining interruptible primary service with a firm standby service for the interrupted periods from one utility provider. [Recognize that open access and competition may allow a customer to achieve a lower cost by obtaining interruptible primary service from one utility, and firm standby service from another utility for the interrupted periods of the first utility. The sequencing of prices may still occur and be economically efficient for each individual utility.] In other words, sequencing of pricing allows the utility to ensure that its pricing and packaging makes sense, more service costs more than less service. Otherwise lost profitability in a purely competitive market (or subsidies in a regulated arena), and economically inefficient decisions will occur.

This is a relatively simple concept. Yet, in today's regulated marketplace it has still been violated.

Acknowledgment

This paper is a follow-up to earlier work performed for the Edison Electric Institute concerning learning lessons from retail standby services pricing to assess potential issues for standby services in the deregulation of wholesale markets. Nevertheless, this paper does not necessarily represent any opinions, explicitly or implicitly, of the Edison Electric Institute.

References

1. Duke Power Corporation, Standby Rates, (1994).
2. Edison Electric Institute, (1991), *Standby Rate: Methods and Descriptions*, Washington, DC.
3. Houston Lighting & Power Company, (1992), "The Costing and Pricing of Standby Service".
4. Massachusetts Electric Company, (1994), Commercial Rates.
5. Megdal, Lori and Eric Ackerman, (1996), "Standby Services & Efficient Competition: Designing for the Markets of the Future," *Proceedings from the Electric Power Research Institute's (EPRI) 1996 Innovative Electricity Pricing Conference*, March, La Jolla, CA, pp. 13-1 - 13-19.
6. Megdal, Lori and Eric Ackerman., (1996), "Issues for Pricing Electricity Standby Service for the Competitive Marketplace", *Proceedings from the 1996 USAEE/IAEE N.A. Conference*, United States Association for Energy Economists, Boston, MA, pp. 10-19.
7. Niagara Mohawk Power Corporation, (1994), Standby Rates.
8. Pacific Gas & Electric Company, (1994), Standby Rates.
9. PURbase©, Public Utilities Reports, Inc.
10. *PUR Weekly*, Public Utilities Reports, Inc., 10/27/95.
11. Rännäri, Osmo, (1995), "Reform of the Finnish Electricity Market," *Competition in the Electricity Supply Industry: Experience from Europe and the United States*, (ed.) Ole Jess Olsen, DJØF Publishing, Copenhagen, Denmark, 1995.
12. Western Massachusetts Electric Company, (1995), Standby Rates.