A Case Study

How A Major Purchaser Negotiated Interrelated Power Contracts

More Than 20 Electric Utilities Were Involved

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This article illustrates how electric power purchase terms, appropriate for the evolving electric environment, were negotiated with different utilities to serve an industrial load at multiple sites. Retail competition between alternate power suppliers is either nonexistent or strictly constrained today in the states where these facilities are located. However, as these states eventually follow the lead of others, this will change in the next several years.

The article is written for those with the task of acquiring power in the emerging environment, particularly those with little or no experience in acquiring power in an environment allowing competitive access to multiple energy suppliers.

It includes what each of the sides in the negotiations held as important; a summary of the key contract features; and a recap of how these features balance the conflicting desires of the parties allowing each side to achieve those goals they value most highly. Appended to the article is a reference list of questions an industrial purchaser may find helpful in negotiating electric service in the evolving electrical environment.

THE PROJECT: THE PURCHASE OF ELECTRICAL SERVICE

The focus of this article, the purchase of electrical service, is one facet of a far more comprehensive project.

Background

The purchaser owns and operates a large diameter, high pressure, high volume pipeline transporting natural gas from the Canadian border to the Midwest. The pipeline is being extended from central Iowa to the Chicago area and expanded to accommodate increased volumes from Canada. To maintain the internal pipeline pressure, which causes the gas to flow, gas compressors are located at appropriate intervals along the pipeline. Until now the compressors on this particular pipeline have been powered by natural gas fueled gas turbines. With respect to acquiring electrical service, the project started as a comparison between using electric motors to drive a new compressor at each, or any, of four existing compressor station sites versus powering them with new 20,000 hp gas turbines.

During the regulatory approval process the scope of this extension/expansion project was revised several times. The 20,000 hp gas turbines units were dropped and consideration was given to 35,000 hp units at five sites; a 13,000 hp unit at one location; and a 6,500 hp unit at another.

Scope of Analysis and Negotiations

Discussions were held with the staff of the regional electric reliability organization, representatives of four state utility commissions and over 20 utilities in five states. Contracts were signed to purchase electric power for the two smallest units. Also, substantial agreement was reached to power two of the larger units with electricity before the decision was made to use gas turbines for reasons unrelated to the negotiations.

PROJECT STRATEGY

Three early decisions were critical in the success of the project:

Consultants

No one in the pipeline's organization had particular experience evaluating and negotiating power purchases of this magnitude and in the emerging environment. Therefore, two consultants were retained to advise on the project. One has particular insight into the emerging environment, including how to frame appropriate provisions to be included in contracts for the purchase of electric energy. The other is particularly familiar with the electric industry in the geographic area where the facilities are located.

Selling the Application

The purchaser realized the need to 'sell' the proposed application to the utilities. To be feasible, the application required a low price. But many utilities are unfamiliar with the characteristics of a load such as this that mitigate the price issue:

Size — the proposed site in South Dakota would have been the second largest single point of consumption in the entire state.

Consistent high load factor — the motors are projected to run at a nearly uniform high load throughout the year. This has a positive effect on the off-peak 'valleys' that are characteristic of typical utility load profiles.

Absence of a large 'in-rush' current when starting. The 'soft start' characteristics eliminate the typical load surge upon motor start.

Mutual Benefit

The contracts had to be 'win-win' situations for the utilities and the pipeline, both now and in the future. Many pipeline organization veterans had experienced the problems gas producers and pipelines had in bringing contracts developed in the previous gas pipeline environment into conformity with the realities that emerged following the introduction of pipeline competition.

THE PURCHASER'S CRITERIA

Four criteria have to be met if electric drives are to power the gas compressors:

Reliability

The electric drives have to be at least as reliable as the gas turbines, measured in terms of the percentage of time they are available to run. Gas pipelines have an obligation to deliver contractual volumes as called upon any and everyday of the year. The availability of the compressors is pivotal in meeting this obligation. Since the fuel for gas turbines is within the pipeline, availability of the compressor is primarily a function of the gas turbine itself. As a mechanical device, an electric motor probably surpasses a gas turbine in reliability. The relevant consideration concerning motor reliability becomes a function of on-site availability of appropriate quantities of electric energy. Comparatively short interruptions in power are acceptable, but extended interruptions are intolerable.

Economical

The electric units have to be economical on an 'all things considered' basis. At least two factors dictate this. First, the company has considerable experience with gas turbines and little experience with electric motor drives of this size. Second, the pipeline's shipper-customers, who ultimately pay for the fuel that is used, have to see that any decision to use electric drives was in their best interests. Many of these shippers are natural gas producers. Using electricity would mean that their product was not being used as fuel to drive the compressors.

Contracts

Any contracts for electrical power purchase need to accommodate the current electric industry environment as well as bridge to the emerging, but not yet fully defined, competitive environment. The term of the contract has to be sufficiently long so that the purchaser has a high confidence that there will be access to a competitive retail market when the contract term expires. Yet if the term is too long he may forego for some years the benefits of the competitive market.

Independence

The analysis and any negotiations had to be carried out on an independent basis. Each of the major equity partners in the pipeline purchaser is an energy company with ancillary operations in the electric merchant business. None of these operations was to have a favored position because of their participation in the analysis or negotiations.

THE REGIONAL PICTURE

The Mid-Continent Area Power Pool (MAPP) is one of the regional members forming the National Electric Reliability Council. It establishes rules intended to assure reliable electric service. A particular rule critical to this project is the percentage of spare, or reserve, generating capacity a utility must provide to cover its firm peak requirements (plus provide a cushion for the potential unavailability of generating units). Other critical rules are the specification of what loads are to be included in 'firm peak requirements' and what comprises 'certifiable' interruptible load. The geographic area covered by MAPP generally conforms to the region defined as 'West North Central' for statistical tabulations. Each of the utilities contacted is a member of MAPP and all of the compressor sites under consideration for electric drives fall within the MAPP geographic area.

The MAPP region is characterized by low electric energy production cost as compared to the rest of country. Many generating units are coal fired, either 'mine mouth' or served by comparatively inexpensive rail hauls. Demand growth has been less than what was estimated when large increments of generating capacity were built. There are transmission constraints in terms of both capacity and distance in moving electricity out of the region. The result is surplus generating capacity and relatively low wholesale market prices.

Retail competition between alternate power suppliers is nonexistent or strictly constrained in each of the states within the MAPP region. The seven sites that were eventually considered for electric drive compression are in four of these states. In each of these states the utilities have defined service territories. In two states the utilities have absolute geographic monopolies. In the other two there are potential exemptions from the service territory limitations for new services larger than a prescribed threshold.

THE UTILITIES' (PERCEIVED) POSITIONS

Through the course of negotiations it became apparent that each utility had its particular set of priorities, biases or uncertainties and reasons for those positions. But there were common elements:

Competitive Retail Access

All of the utilities were adamantly opposed to allowing the purchaser 'retail wheeling' rights. While several acknowledged that some form of competitive retail access was on the horizon, the common theme was 'not now, not for this project.' Paraphrased, the stated reasons for opposition included: 1) 'It is not legal in this state at this time,' 2) 'To allow any exceptions is precedent setting and therefore to our detriment,' and, 3) 'It directly conflicts with our public/political positions.'

Not verbalized, but evident from the utilities' positions, are two underlying reasons. The first is the reluctance to abandon a comparatively comfortable monopoly position. In a competitive environment they would face the potential for lower profits plus costs that may be "stranded" without assurance of recovery. The second relates to the 'level playing field.' Those that believe they are comparatively advantaged fear they will lose the advantage. Those that feel disadvantaged want to delay competition until their disadvantage is removed.

Capacity/Demand Balance

All of the utilities showed a degree of reluctance to take on the obligation to serve a load that may impose a long term on-peak demand, particularly when the service needs to be priced at a level that would be economical for the purchaser. All had available generating capability during off-peak periods and, to varying degrees, most had available on-peak capability. Aside from the price issue, their reluctance is attributed to three types of uncertainty. They see uncertainty in relationship to:

1) how much demand will the utility be called to serve in the future (especially if competitive retail access comes about and the utility gains or loses market share);
2) what will be the utility's cost of providing new peak capacity in the future; and,
3) what will be the market value of peak capacity in the future.

Other than 'low cost power will be demanded by someone' the utilities see few clear answers to these uncertainties.

Incremental Capital Expenditures

At certain sites rather significant capital expenditures are required to provide the service. Since the purchaser is being served from transmission lines, a substation, including transformer and switches, is required. In addition, certain sites required a few miles of radial transmission line in order to connect to the existing transmission grid. The utility approach is to include in the price of the service a component for return on and return of any incremental capital expenditure. Many utilities want to limit their risk by fully recovering the investment over the initial term of the contract. This gives rise to a dilemma. The shorter the term of the contract, the higher the rate component. With a higher rate it is more difficult it is to justify electric motor drives on an economic basis.

KEY CONTRACT PROVISIONS — WHAT'S INCLUDED

The accommodations the parties made to meet each others valued needs are intertwined and reflected in four areas of the contract:

Interruptible Service

Service is provided on an interruptible basis conditioned by two major provisions. First, the number of hours in which the purchaser may be interrupted are limited. There is a limit both on the aggregate annual

hours of interruption and on the hours of interruption in any twenty-four hour period. Second, during periods when the purchaser would otherwise be interrupted the involved utility will shop the wholesale market for supplemental power. If power is available on the wholesale market and can be delivered to the purchaser, including provision for transmission expenses and line loss, at or below a price prespecified by the purchaser, the utility will acquire the energy on the open market and resell it to the purchaser. Otherwise service is subject to interruption.

Facilities

The purchaser agreed to design, build, own and maintain the substation that is required to receive service. In addition, the purchaser will reimburse the utility for the incremental costs of the radial transmission line, switches and control equipment required to connect the substation to the existing transmission grid. The utility owns and maintains these facilities.

Term of the Contract

Specific provisions of the contracts vary slightly. In general they provide for a bundled energy and delivery service for an initial number of years. Following this initial period there are alternatives. If the purchaser has the right to purchase energy for end-use consumption from an alternate energy supplier the original utility is obligated to provide a delivery service for an additional period of years. Or, if electric service is not economical the purchaser can terminate the contract and use an alternate form of energy to meet his needs. Or finally, if the parties agree the contract can be extended under the previous terms.

Price

The specific pricing provisions of the contracts also vary slightly. They provide for an initial fixed price. The price then escalates for a time at a fixed escalation rate. Finally, as the end of the initial term approaches, adjustments in the price are indexed to certain costs that the utility experiences.

KEY CONTRACT PROVISIONS — HOW CRITICAL NEEDS WERE MET

Meeting a specific need may be the result of several provisions rather than one. But to avoid excessive detail the needs that were the principle beneficiaries of certain sections are shown below.

Interruptible Service

With the limiting provisions attached to the interruptible service the purchaser attained an acceptable degree of reliability. For the purchaser the 'buy through' provision turns the concern related to interruptions into an economic question rather than a question regarding a local utility's available generating capacity. The purchaser ascribes to the concept that in a competitive wholesale market energy will be available at nearly all times at some price. The question is whether the service is worth the price.

The utilities gain the right to serve a load which helps fill their off-peak demand valley. During the primary term of the contract they plan to manage their demand peaks within the limitations on interruptions and avoid an obligation for additional peak period generating capacity.

For several utilities, with whom deals were not done, the 'buy through' provision was a form of the dreaded 'retail wheeling.' The successful utilities point to differences: They, the utility, is the party who shops the market and they, the utility, buys and takes title to the energy. For them it is simply an extension of their energy buying activity, except in this case it is resold at a price which has a direct relationship to the cost of an individual package of energy.

Facilities

In the state where service contracts were finally signed, the rules on authorized service territories are very rigid. In each of these two cases the purchaser moved the location of the compressor stations about a mile from the original proposed site. This allowed the location to be served by a different utility more amenable to meeting the needs of the purchaser.

Since the purchaser intends to use these facilities far longer than the fairly short initial term of the contract, they are not faced with the utilities' imperative of recovering the cost over a comparatively short time period.

Title to the transmission facilities remains with the utilities due to their capability of providing maintenance and because of state regulatory restrictions on who may own transmission lines.

Term of the Contract

For the purchaser the term of the contract, with its initial fixed period, gives a reasonable assurance that:

- the price will be reasonable during the fixed period.
- competitive retail access will be available by the end of the fixed period. However, it will probably not be available for such a long time

that it represents a significant lost opportunity due to having been locked into a contract with an extended term.

- if competitive access is available at the end of the fixed period, the purchaser has assurance of a reasonably priced delivery service required to deliver the energy to the site.

For the utility, despite the aforementioned uncertainties, the contract term dovetails nicely with their best projection of when the growth in market demand will require them to add generating capacity.

Price

For the purchaser the price meets the requirements of being economical on an 'all in' basis when the cost of electric drives are compared to the cost of gas turbine drives. The supporting computational analysis included the difference in the initial capital expenditures, including the substation and transmission line; the difference in annual maintenance costs and the difference in cost of the actual energy.

For the utility the price provides, perhaps, a lower unit margin than their customary sale. However, the size and comparative assurance of the load, the off-peak benefits, and the fact that the term is short enough that they have a reasonable estimate of costs make the deal worth doing.

CONCLUDING COMMENT

Purchasing electric service in an evolving environment is a challenge. Two factors can help: Understand both the utility's and your own company's needs, biases and uncertainties; and creatively work towards mutually satisfactory solutions, including those outside traditional norms. Many utilities haven't learned to market in a competitive environment. Therefore more of the "marketing" is forced on the customer if the desired results are to be obtained. In particular, this involves the customer learning more about the utility and "selling" his situation to the utility.

ADDENDUM

QUESTIONS THAT MAY HELP

Is your question "What do I need to know to help me negotiate a power purchase contact in the evolving electric utility environment?"

Sorry, no one has your exact list. But you may find that obtaining answers to some of these questions will be helpful. Or, since the list is far from exhaustive, perhaps they will trigger other questions that will be the key for you. Good luck in your research and negotiations.

Regional Reliability Council

These are questions you may want answered regarding your regional member of the National Electric Reliability Council. (NERC) These include MAPP, MAIN, ECAR, etc.

- How it is structured?
- What regional transmission groups (RTGs) are included?
- What is the status of setting up an independent system operator (ISO)?
- Does it include or accommodate market mechanisms for a wholesale market? What are they?
- What are the rules regarding generating reserve requirements? interruptible loads?.transmission services? — types, rate structures, etc.
- What are the procedures that are followed when generating or transmission capacity is constrained?

State Utility Regulations

Questions to ask regarding the regulations in your state include:

Who is eligible to serve you?

Do certified service territories limit who can serve?

Are there exceptions for new loads over a certain size?

Who can own transmission property?

Can you build your own transmission line?

Who is regulated by the state commission?

IOUs? Coops? Municipalities? Marketers?

To what extent are they regulated?

Service areas? terms of service? rates? — some, none or all of these.

Questions re: services the utilities can offer:

Is the utility required to file a tariff?

Are there special rate provisions for certain loads?

Water heating? Space heating?

Irrigation? Time of day rates?

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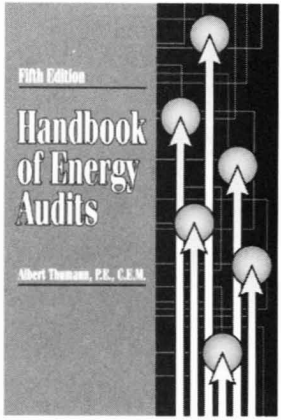

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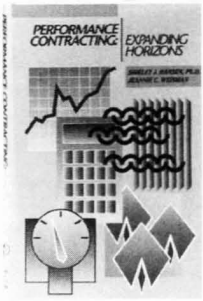

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Price escalators?

Discounts for taking service at higher voltages?

Penalties for low power factors or objectionable harmonics?

Can they offer services/negotiate terms other than those listed in the tariff?

Does this flexibility apply only to new loads or loads over a certain size?

Are negotiated contracts subject to regulatory approval?

Are the terms of negotiated contracts confidential or a matter of public record?

Questions for Each Utility

Answers to these questions may pinpoint the position of the utility that proposes to serve you.

What is the projected demand/generating capacity balance?

For the utilities' control group and, if possible, for the specific utility
By month for the first couple of years
By year for several following years

What has been the historic availability and load factors of their generating equipment?

What is their annual hourly load data? (You may want to apply some statistical tools to manipulate this data to find when peaks and valleys occur, their magnitude and their duration.)

What are the their costs of power per kWh?

Marginal cost (Lambda)
Total cost

If available, what are the terms of recent industrial sales that they have negotiated?

What stranded costs does the utility potentially face?

How are they or how do they plan to deal with the issue?

Who, besides themselves, are members of their control area?
Who dispatches the generating capacity?

What facilities do they have in proximity to your load?
What available capacity do the circuits have?
Are they loop fed or radial lines?
Where does the feed come from?
How 'strong' is the source?
What is the history of service interruptions on the lines?

Your Needs and Limitations

What alternatives do you have to reduce high-priced electric service?

Can you substitute a different form of energy, e.g., natural gas—coal—liquid fuels?
Can you produce your own energy? (or buy it from an adjacent facility?), e.g., cogeneration?
Or alter your processes, e.g., preheating?
Can another supplier serve you, e.g., locate your point of consumption where another supplier can serve?
What services do you need?
Will an interruptible service meet some or all of your needs?
Can you shift your periods of consumption to use proportionately more during the utilities off-peak periods?

ABOUT THE AUTHOR

James L. Menning is a business development representative for Northern Plains Natural Gas Company, operator of Northern Border Pipeline Company. He has been involved in the evaluation and purchase of electric energy for several sites in conjunction with an $800 million expansion/extension of Northern Border Pipeline. He is currently managing an owner-controlled insurance program in conjunction with the pipeline construction. Additionally, he is involved in the evaluation of electric generation using waste heat from the exhaust of gas turbines used on the pipeline.

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