Evaluation of Bonneville Power Administration Transmission Business Line Olympic Penninsula Demand Reduction Pilot Project

Contract No. 18716

Final Report

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Executive Summary

Introduction

In March of 2004, the Bonneville Power Administration’s (BPA) Transmission Business Line (TBL) ran the Olympic Peninsula Demand Reduction Pilot Program. This pilot program was designed to investigate if voluntary load reduction and voluntary generation had the potential for deferring an upgrade to the transmission lines serving the Olympic Peninsula. The program is one component of a larger BPA effort to test alternative strategies for demand reduction.

In the program, five participants received payment for voluntarily reducing their load on the system either through generation or load reduction when called upon to do so. BPA made monetary offers for capacity during specific hours through the Apogee Demand Exchange system. Participants could accept, reject, or counter an offer and then were responsible for delivering the specified load the following day. The five events included; 1 evening hour, 4 morning hours, 4 evening hours, and two four hour events on the same day.

The evaluation research objectives are to determine the effectiveness of this program, both in terms of process, and MW capacity achieved, and whether it could be implemented reliably during a period of extremely cold weather. Five participants and five non participants were interviewed regarding their involvement in the program, how effectively it worked for them, and about their plans for future participation, especially in extremely cold weather conditions. Their load data were analyzed to determine the impact, lost revenues, and the potential peak impact had the program been run during the system peak.

The load analysis incorporated five steps using four different perspectives to answer the questions posed. The first perspective assessed the capacity achievements under the assumption that the participant “event” results were directly transferable to the peak day and hour. The second perspective added in the participants load profile and assessed whether the load profile characteristics were also present at the time of peak demand. The third perspective brought in the participants’ responses regarding their participation during extremely cold weather. The fourth perspective introduced an alternative delivery method called a call option and assessed the resulting capacity.
Results

Discussions are provided on the results of the impacts analysis, the participant survey, and the non-participant survey. These discussions are provided in Section 3.

Impact Analysis

For each of the “events”, the participants provided more capacity than they bid. The bid amounts ranged from 5 MW to 30 MW, and the capacity delivered ranged from 5.2 MW to 40.5 MW. No participant provided capacity for all five events with the reasons primarily being because the program contract was not yet in place for all participants by the time the “events” began and because of technical difficulties at the participant’s plant. For the analysis, Itron chose a “representative event” for each participant and applied the characteristics of that event to estimate the peak day impact.

In the first step of the analysis that was conducted under the assumption that the participant “representative event” results were directly transferable to the peak day and hour shows a delivered capacity potential of about 50 MW at the system peak. Incorporating the January load profile of the load shedding participant to the analysis reduced this potential to 41.7 MW. However, when customer survey responses were incorporated regarding extreme weather conditions, the resulting anticipated firm capacity falls dramatically to 5.5 MW. Only one of the five participants was willing to commit participation in the program under extreme weather conditions. This same single participant was also the only participant willing to state that they would also likely participate under a different program design, if it were offered.

Participant Survey

The participants thought the program was well run, easy to participate in, and they were happy with BPA staff efforts. Respondents were asked to be candid and to offer insights to improve the program. Respondents cited the following concerns:

- Not being able to deliver the promised capacity.
- That the timing of the email notification and the short two hour response window would make it difficult to respond to an offer to bid,
- That a one-hour event is too costly for them to participate in.
- Uncertainty about when an event will occur and possibly missing it due to inattention.

Most indicated they would continue to participate at their current level of capacity if the program were continued, but preferred the current program design over a call option approach. The bid price was not a driving factor in their decision to participate, but they felt
that the $130 - $150 per MW capacity incentive was appropriate. Under conditions of extremely cold weather, only one of the five participants was willing to commit to continued participation.

**Non-participant Survey**

Most of the non-participants stated that they would consider participating in a program such as this, and could meet the 1 MW threshold, but would not state decisively that they would participate without receiving more information. Combined the five non-participants who were interviewed could provide about 7 MW of capacity. Some believed they could provide the capacity over extended periods of time. In addition several felt they could provide the same capacity at the same price in extremely cold weather for consecutive days. They had mixed feelings about the call option; some liked it because it would provide an income stream. The most important finding from the non-participant survey was that they all needed more information before they could provide decisive answers.

Concerns cited by the non-participants included:

- Degradation of generation equipment due to use,
- The risk of restarting operations after a stoppage,
- The possibility that they would have decreased their load already and would be unable to respond to an offer to provide capacity,
- Getting involved in a potentially overly complex program, and
- Capacity ownership and payment issues related to that ownership.

**Conclusions**

**Participant Conclusions**

The respondents were forthcoming with their responses and offered several suggestions where BPA could improve the program. They all felt that BPA staff was easy to work with and that this was a strength that should be capitalized on in future efforts. They were especially impressed with the flexibility of the staff on working through issues. Price was a difficult area for the respondents to address; for the most part they had not considered it and therefore had difficulty addressing it intelligently.

The participants suggested an education program that could address the following areas. The bid and counter offer procedure, acceptable reasons for non-delivery, how to anticipate an event, generator use and maintenance, how to offer capacity to maximize payment and minimize uncompensated capacity delivery, and program training for multiple staff within an organization.
They also suggested changes to the event process. These changes included: increase the participant response time, change the timing of the notification, offer event advance notice, provide event reminder calls, add a pager system to the event notification system in place, call events for a minimum of four hours, and pay for additional delivered capacity on a prorated basis.

Programmatic changes the participants would like to see include: provide a schedule of events to be called, provide certainty about when events will be called and how many will be called, if the call option is implemented add a fuel price escalator, and create a tiered program that offers different payment levels based on the amount of notice provided.

**Non-participant Conclusions**

The non-participants appeared willing to consider participating in the program and they appeared to have enough load to overcome the 1 MW threshold. However, they need more education about the program in general and the call option specifically, before they could definitively provide feedback regarding their potential future involvement.
1

Introduction

1.1 Program Description

In March of 2004, the Bonneville Power Administration’s (BPA) Transmission Business Line (TBL), executed a new Demand Reduction Pilot Program, in order to investigate the potential for deferring the construction of new transmission lines servicing the Olympic Peninsula\(^1\). The Demand Reduction Pilot Program would provide crucial information regarding voluntary load reduction and/or generation, which could delay an upgrade to the transmission line serving this area. This pilot program is one component of larger pending programs, which, based upon the results of the pilot program period, may allow BPA to defer transmission upgrades, while also maintaining the reliability of the system.

The Demand Reduction Pilot Program, focused on a voluntary reduction of 1 to 4 hours several times during the Program period of March 2004. Through the pilot program, BPA’s Transmission Business Line (TBL) Division negotiated either a payment or credit to the participants for the voluntary peak demand reduction.

Following these Program directives and goals, BPA staff contacted five likely participants for inclusion in the pilot program. After signing participant contracts, which outlined their potential load reduction or generation, BPA used the Apogee Demand Exchange service system to notify them via e-mail, of a call for action. This call for action consisted of the following steps:

- E-mail notifications would be forwarded to the participants at 8:00 a.m., one day prior to when the power was to be generated or the load shed.
- Upon receiving notification, the participants had two hours to respond, and each had the option of accepting, rejecting or countering the offer. In their response, they were to designate the number of MWs they felt they could provide, either through generation or load shedding, for each hour of the event. If they chose they could offer a counter price.
- Upon receiving the participant’s response, BPA had two hours to accept or reject the counter offer.

\(^1\) North of Olympia, Washington
Assuming the response was accepted, on the following day, the participant was to either generate power or shed the MW’s they had designated for the event time specified. If they did so, they were paid the amount agreed upon in whole MW increments. Participants who were able to generate power or shed more load than designated were only paid for what they designated in their response to the offer. If the participant failed to deliver the agreed upon capacity, they paid a penalty equal to the expected payment.

Based upon the participant response, there were five events over four days in this program pilot. The events as conducted are outlined as follows:

- The first event: one evening hour and was used as a test of the system and participant’s response,
- The second event: four morning hours,
- The third event: four evening hours, and
- The fourth and fifth events (same day): four morning hours and four evening hours.

The participants were not randomly selected but specifically chosen because they had generation capability or loads great enough to be able shed at least one MW, which was the threshold of the program, and were thought by the program recruiters to be willing to participate in this pilot program effort.

For the purposes of the evaluation of the Demand Reduction Pilot Program, five non-participating organizations were contacted who may have been able to participate originally, had they been asked. In order to evaluate their potential involvement, these five non-participants were provided a description of the pilot program, and asked if they might participate in the future, should the program be expanded, and be available to them.

1.2 Program Research Objective

The objective of the BPA Demand Reduction Pilot Program was to determine if voluntary customer load curtailment and or voluntary customer load generation could efficiently and reliably shave the local system peak demands so that transmission system upgrades can be deferred. Specifically, BPA wanted to determine if they could make monetary offers to participants and in return, obtain a reliable method of reducing the demand on the Olympic Peninsula transmission line.

The evaluation research objectives were to determine the effectiveness of the BPA Transmission Business Line Olympic Peninsula Demand Reduction Pilot Program, both in terms of process, and MWs achieved, and whether this or a similar program, could be
implemented reliably during a period of extremely cold weather. Participants were interviewed regarding their involvement in the program, how effectively it worked for them, and about their plans for future participation. In discussing future participation, the interviewer outlined potentially different parameters, as it would be under conditions of extreme cold and possibly under a different incentive structure.

1.3 Final Report Overview

The evaluation report is organized into 3 major sections:

- Section 1: Introduction
- Section 2: Methodology
- Section 3: Results and Conclusions
Methodology

2.1 Evaluation Methodology

Evaluation Overview

The Pilot Program evaluation consisted of three major components: In-Person Interviews; Contract Review, and Load Data Analysis.

Within the Program evaluation process, nine in-person interviews with both participants and non-participants were held at ten different organizations. Each interview was conducted using an interview guide developed based upon the Program goals and discussions with BPA staff. The in-person interviews were conducted in the following three steps:

- The first step consisted of interviewing Bonneville Power Administration (BPA) staff to gain an in-depth understanding of the Demand Reduction Pilot Program, as well as to confirm the insights that BPA staff hoped to gain from the evaluation process.
- Based upon input received from the BPA staff, the second step consisted of developing two interview guides, one for pilot program participants and the other for pilot program non-participants.
- The third step consisted of contacting the appropriate individuals, scheduling appointments and conducting in-person interviews with staff from each of the ten organizations selected.

Both participant and non-participants interviewed were encouraged to be candid in order to provide the most accurate feedback to BPA, which will be useful as they utilize these evaluation results to make effective changes to the Program.

Each in-person interview included a description of the program, a discussion of why an independent third party was being used to evaluate the program and a discussion of why BPA was interested in the evaluation results, and how the results might be used for future Program direction.
All the in-person interviews occurred within a three-day timeframe in August 2004. The results of the input received during the interviews, were analyzed and have been summarized and presented in Section 3 of this report.

Load data were reviewed by the evaluation team in order to confirm the impact, estimate the peak impact, and to incorporate the results of the participant survey responses. These responses include respondents’ reports of what they would do in an ongoing program, in extremely cold weather, and in consecutive days in extremely cold weather. This analysis is also presented within Section 3.

The evaluation team obtained contracts from similar programs in order to review BPA’s contract elements. The results of this review provide direction to BPA for elements to include in future Program contracts. The goal of this review was to ensure that the contracts contain all the best elements of programs run elsewhere. Results of the overall contract review are presented within Section 3 of this report.

2.2 In-Person Interviews

BPA Staff Interviews

BPA staff members from various departments were interviewed in order to better understand the program, how it operated, the impact the departments had on the Program and what impact, if any, the program had on the departments. Additionally, the evaluation team gathered input for the in-person interview guides to ensure that the appropriate questions were posed to both participants and the non-participants, to effectively evaluate all components of the Program.

The BPA staff and/or departments interviewed included: the Transmission Business Line, the Pilot Program Project Manager, the Munro Dispatch Center, and representatives from Legal, Disbursement, Metering, and Load Forecasting. In addition, staff from Apogee, the software vendor and service provider who created the Energy Exchange software and provides Energy Exchange Services, was also interviewed. These interviews provided an in-depth understanding of the program and set the stage for developing the interview guides.

Participants

There were 5 participants in this program. They included: Mason County PUD 3, the U.S. Navy at two different bases, (the Bangor Submarine base and the Puget Sound Naval Station), Nippon Paper Industries USA Co LTD., and Port Townsend Paper Corp. Nippon Paper Industries shed load for the program, and the remaining participants generated power.
Participant Interview Guide

The participant interview guide was developed utilizing various forms of input. This input included the goals outlined in the initial BPA request for proposal, the elements of the proposal submitted to BPA, the discussion at the project kickoff meeting, the questions raised in the interviews with BPA staff, and feedback from BPA. It consisted of 36 questions that addressed the following areas:

- Experience with similar programs,
- Their decision to participate in this program,
- Their experience in participating,
- The issues they had with participating,
- Ways the program could be improved,
- The contracting process,
- Future participation,
- The impact of extremely cold weather on their decision to participate,
- The role price played in participating, and
- An alternative program structure that gives BPA the right to call on them to reduce load or generate power by predetermined amounts.

A copy of the Participant Interview Guide can be found in Appendix A of this report.

Non-Participants

Five non-participants were chosen based upon their potential for being viable participants in the program in the future. These organizations had also been identified as having either generation capability, or a large enough load that they could shed in the Demand Reduction Program, or the ability to aggregate load to cross the 1 MW threshold.

These organizations were contacted in advance and an interview time was set to conduct the interview at their place of business in August 2004. The non-participants included: Simpson Timber, The Bureau of Reclamation, The City of Port Angeles, Clallam County PUD, and the Clallam Bay Correctional Center.

Non-Participant Interview Guide

The non-participant interview guide was much shorter than the participant guide. It contained the following questions:

- Would they participate in the program in the future?
- How much load could they shed or power could they generate?
- How long could they provide that load to BPA?
- What incentive they would require to participate?
- If the incentive were higher would they provide more load?
- Would or could they participate in extremely cold weather?
- Could they participate over consecutive days?
- Their input on an alternate program structure being considered by BPA, and
- Did they have any questions or issues about the program?

A copy of the Non-Participant Interview Guide can be found in Appendix B of this report.

The goal of these interviews was to understand if there were any concerns regarding the program structure, if more candidates would be likely to participate, and the manner in which they would participate.

### 2.3 Load Data Analysis

#### Load Analysis Methodology

The load analysis methodology incorporated six steps to determine the peak impact and the lost revenues associated with the Demand Reduction Pilot Program. The capacity delivered was reviewed under four different perspectives to understand the effect that each scenario has on the peak. The five steps of the load analysis methodology are described below.

- The first step in the analysis was to assume that the delivered capacity achievements, no matter what time of day, are directly transferable to BPA’s peak day and hour. It involved estimating the impact and costs associated with the delivered levels of capacity.

- The second step further tested whether the event characteristics are transferable to the BPA system peak day and hour (January 8:00 AM) based on the load profile of the participant. It involved assessing the load characteristics of the event day and examining whether those characteristics are also present at the peak. For example, generators typically operate on an as needed basis, therefore the load characteristics of generators would be available at the BPA system peak and thus the characteristics are directly transferable, but the load profile for a load shedding participant may be different in January than in the March, when the Pilot Program test events occurred.

- The third step incorporates the results from the participant interviews and assesses the likelihood of participation during an extreme cold weather event. Respondents were asked if they would participate at the same level of capacity during extreme cold and if they would charge a different price. Respondents’ answers were used to make a judgment about capacity delivery under the extreme conditions and higher prices.
The fourth step also incorporates the results of the participant interviews and judges whether the call option would have an impact on the amount of firm capacity that would be delivered.

The fifth step incorporates the results of the non-participant interviews. Non-participants were asked if they would be interested in participating in such a program, how much load they thought they could provide (especially under extreme weather conditions), and their reactions to an alternate program structure.

Each of the load impact reviews includes a section on potential revenue impact, which addresses the cost of the capacity purchased and the associated lost revenue. The rates used in the analysis are January 2004 rates.

**Data description**

BPA provided data for this analysis. The data included:

- Load generation or load reduction bid on the event dates,
- Load generation or load reduction delivered on the event dates
- The price offered by BPA and the price countered (if any) by the participant
- The amount paid to participants for the capacity delivered
- Load data for the event day for each participant
- Participant load data for the BPA system peak day and the two days on either side
- Load Data from January to March 2004 for each participant
- Load graphs of the data
- Settlement data and methodology

The data were used to conduct the scenarios described above.

### 2.4 Contract Review

Contracts for other similar programs were reviewed and compared to the contract developed for BPA’s *Demand Reduction Program*. The evaluation team found contracts or supporting information for ISO-NE Load Response Program, California Independent System Operator Corporation Summer Reliability Agreement, and PJM Emergency Load Response Program. Each was reviewed for key elements and compared to the BPA contract.
3

Results and Conclusions

3.1 Introduction

As stated earlier, the Demand Reduction Pilot Program focused on a voluntary reduction of load or utilization of backup generation during test periods from 1 to 4 hours several times in March 2004. There were five events carried out over four different days during different timeframes as follows:

- March 16\textsuperscript{th}: a one-hour event in the evening.
- March 22\textsuperscript{nd}: a four-hour event in the morning.
- March 23\textsuperscript{rd}: a four-hour event in the evening.
- March 31\textsuperscript{st}: a four-hour event in the morning.
- March 31\textsuperscript{st}: a four-hour event in the evening.

Table 3-1 highlights the bid and delivered capacity by each participant for each event and hour during the five test periods. Additionally it outlines totals for each event and hour and the method used by each participant to deliver capacity. One participant provided capacity through shedding of load and the remaining participants utilized their back-up generators.

In reviewing the information provided in Table 3-1 on the following page, it is shown that none of the participants provided capacity for all of the events and some participated in only one event. As later revealed in interviews with participants and BPA staff, non-participation for the most part was caused by either the pilot program contract not being in place until the last event (the two naval bases) or technical difficulties at the plant (Port Townsend Paper).
This section of the report will include a review of the findings from each set of interviews (BPA staff, program participants, and non-participants), a section reviewing the load impacts, and a review of the participant contract compared to other contracts from similar programs across the country.

The load impacts will be reviewed in several steps. The first will be based on the assumption that the delivered capacity achievements are directly transferable to a system peak event hour. The second will entail a review of the hourly load characteristics of each participant to see if it is reasonable to transfer the results from the pilot program to the system peak hour. The third will use the results from the participant interviews to assess the likelihood of participation during an extreme cold weather event. The fourth will use the results from the “call option” portion of the participant interviews to judge if this program design option could have an impact on the amount of firm capacity that could be delivered. The fifth and final step will use the results of the non-participant interviews to make inferences with respect to non-participants’ potential impact on firm capacity delivery.

Each of these load impact reviews will include a section on potential revenue impacts. The revenue impacts will include the cost of the capacity purchased and the lost revenue. The most common bid price, $130/MW, will be used for the capacity purchase cost and lost revenue will be based on January rates. The following rates are used:

- Transmission rate of $1.686/kW (All)
3.2 Impact Analysis

Each of the pilot program participants provided different bids and delivered different amounts of capacity. For various reasons, some only participated one time and others participated many times. However, those who participated more than once generally bid about the same amount and delivered about the same capacity each time. For simplicity, a single event for each participant will be considered representative and utilized in this impact analysis. The peak month and hour are assumed to be January at 8:00 a.m.

Table 3-2 summarizes the potential impacts on peak demand and costs if the program were directly transferable from the test period to the period of January peak demand. In total, more than 40 MW of capacity could be shed or generated at costs averaging $7.42/KW. The primary cost of the program is from lost revenue with the bid settlement cost only representing about 5% of the total cost. Although Table 3-2 illustrates the potential for significant demand reduction at a low cost, results from the participant interviews brings down this potential demand reduction significantly. When asked if they would participate during periods of extreme cold, only Mason PUD #3 answered that they would. The remaining participants cited several reasons why they wouldn’t participate under the scenario of extreme weather conditions. It appears that the design of the program needs to change in order to secure reliable resources at the time of likely peak demand; during periods of extremely cold weather.

Table 3-2: Summary of Peak Demand Impact and Cost

<table>
<thead>
<tr>
<th></th>
<th>Nippon Paper</th>
<th>Port Townsend Paper</th>
<th>Mason PUD #3</th>
<th>Bremerton Naval Shipyard</th>
<th>Bangor Naval Base</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Demand Reduction (MW)</td>
<td>23.1</td>
<td>1.2</td>
<td>5.5</td>
<td>4.1</td>
<td>7.8</td>
<td>41.7</td>
</tr>
<tr>
<td>Bid Settlement Cost</td>
<td>$10,400</td>
<td>$130</td>
<td>$2,600</td>
<td>$1,040</td>
<td>$4,160</td>
<td>$18,330</td>
</tr>
<tr>
<td>Lost Revenue Cost</td>
<td>$159,461</td>
<td>$9,145</td>
<td>$39,017</td>
<td>$28,914</td>
<td>$54,963</td>
<td>$291,500</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$169,861</td>
<td>$9,275</td>
<td>$41,617</td>
<td>$29,954</td>
<td>$59,123</td>
<td>$309,830</td>
</tr>
<tr>
<td>Total Cost/Peak KW</td>
<td>$7.36</td>
<td>$7.46</td>
<td>$7.58</td>
<td>$7.26</td>
<td>$7.59</td>
<td>$7.42</td>
</tr>
</tbody>
</table>
The remaining portion of this section provides an impact analysis by participant. Each participant subsection includes tables that outline bid amount, demand reduction and energy reduction for the representative event. Energy reduction estimates are provided for the event period as well as for shoulder hours around the event period. Data for the shoulder hours are included to capture lost revenues resulting from powering up generators or shedding load immediately before or after an event to ensure that the promised delivered bid capacity amount is provided. To insure that the shoulder values include only those values in response to the event and not incidental changes, threshold differences must be met before the impacts are included in the analysis.

**Nippon Paper**

Nippon Paper participated in 3 of the 5 test events. Their bids ranged from 18 to 25 MW and their deliveries from 26.2 to 35 MW. The March 23\textsuperscript{rd} event is typical of their participation profile and will be used as their representative event. Figure 3-1 and Table 3-3 represent the Nippon Paper hourly load for March 23\textsuperscript{rd}. The event occurred during hours 19 through 22. The Nippon Paper bid was 23 MW in hour 19, 25 MW in hour 20, and 20 MW each in hours 21 and 22. Nippon Paper was successful in delivering each of its hourly bid amounts.

**Figure 3-1: Nippon Paper Load Profile for March 23\textsuperscript{rd}, 2004**

![Nippon Paper Load Profile](image-url)
Table 3-3: Nippon Paper Load Profile for March 23rd, 2004

<table>
<thead>
<tr>
<th>Event</th>
<th>Event Day Load 3/23/2004 (kWh)</th>
<th>Estimated Baseline Load 3/23/2004 (kWh)</th>
<th>Deviation From Estimated Base (if at least 50% of average amount shed) (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hr13</td>
<td>42,992</td>
<td>36,981</td>
<td>0</td>
</tr>
<tr>
<td>hr14</td>
<td>42,368</td>
<td>34,649</td>
<td>0</td>
</tr>
<tr>
<td>hr15</td>
<td>42,260</td>
<td>39,418</td>
<td>0</td>
</tr>
<tr>
<td>hr16</td>
<td>41,862</td>
<td>42,642</td>
<td>0</td>
</tr>
<tr>
<td>hr17</td>
<td>41,606</td>
<td>48,045</td>
<td>0</td>
</tr>
<tr>
<td>hr18</td>
<td>39,346</td>
<td>49,395</td>
<td>0</td>
</tr>
<tr>
<td>hr19</td>
<td>24,702</td>
<td>54,480</td>
<td>29,778</td>
</tr>
<tr>
<td>hr20</td>
<td>25,394</td>
<td>56,832</td>
<td>31,438</td>
</tr>
<tr>
<td>hr21</td>
<td>26,192</td>
<td>56,335</td>
<td>30,143</td>
</tr>
<tr>
<td>hr22</td>
<td>25,298</td>
<td>55,161</td>
<td>29,863</td>
</tr>
<tr>
<td>hr23</td>
<td>38,970</td>
<td>61,885</td>
<td>22,915</td>
</tr>
<tr>
<td>hr24</td>
<td>63,364</td>
<td>63,224</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL kWh Event &amp; Shoulder Hours</td>
<td>144,137</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL kWh Event Hours</td>
<td>121,222</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Capacity Shed - Event Hours (MW)</td>
<td>30.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak Capacity Shed - Event Hours (MW)</td>
<td>31.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Event Directly Transferable to Peak Day and Hour**

In this analysis, it is assumed that the peak day and hour correspond to the participation event period depicted in Figure 3-1 and Table 3-3. Assuming that the peak hour is when they delivered their greatest amount of capacity, Nippon Paper could provide 31.4 MW of capacity at a bid price of $11,440. Table 3-4 identifies the potential cost of Nippon Paper participation under this perspective. The costs include the participation cost as well as lost revenue estimates. The cost per peak demand KW would be about $7.25.
Table 3-4: Nippon Paper Cost if Representative Event Equals Peak Day/Hour

| Bid Settlement Cost ($130/MW) | $11,440 |
| Transmission Revenue ($1.686/KW) | $53,004 |
| Demand Revenue ($3.10/KW) | $97,458 |
| Ancillary Service Charge (42% of Transmission and Demand Revenue) | $63,194 |
| Energy Revenue (2.89 cents/kWh) | $3,503 | $4,166 |
| Total Cost | $228,600 | $229,262 |
| Total Cost/Peak KW | $7.27 | $7.29 |

Is the Event Transferable to Peak Day and Hour Based on Load Profile?

For the purposes of this analysis, it is assumed that the BPA system peak occurs in January at 8:00 a.m. The representative event for Nippon Paper occurs in the evening hours. Nippon Paper never participated in an event that occurred in the morning.

Figure 3-2 illustrates load profiles for three days in January 2004 for Nippon Paper as well as the representative event day load profile of March 23, 2004. The participation period on the event day was between hours 19 and 22 with this event period load approaching the lowest loads for the day, which were in the range of 20,000 to 25,000 KW.

Table 3-5 illustrates a potential 4-hour event scenario for Nippon Paper. The hourly load is the average of the three January days illustrated in Figure 3-2. The event load is the same as the average January load except that the four event hours match the impact experienced by Nippon Paper during its March 23rd event (this is assuming that the evening participation impact can be transferred to the morning).
Table 3-6 identifies the potential cost of Nippon Paper participation under this perspective. The costs include the participation cost as well as lost revenue estimates. The cost per peak demand KW would be about $7.36. However, the peak hour impact is reduced from the March event estimate of 31.4 MW to 23.1 MW.
Table 3-5: Nippon Paper Load Profile for an Average January with an Event

<table>
<thead>
<tr>
<th></th>
<th>Estimated Event Day Load (kWh) (January Peak Day)</th>
<th>Baseline Load (kWh) (Average of Jan. 4, 5, 6 of 2004)</th>
<th>Deviation From Baseline Load (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hr1</td>
<td>46,626</td>
<td>46,626</td>
<td>0</td>
</tr>
<tr>
<td>hr2</td>
<td>48,193</td>
<td>48,193</td>
<td>0</td>
</tr>
<tr>
<td>hr3</td>
<td>48,435</td>
<td>48,435</td>
<td>0</td>
</tr>
<tr>
<td>hr4</td>
<td>48,675</td>
<td>48,675</td>
<td>0</td>
</tr>
<tr>
<td>hr5</td>
<td>48,449</td>
<td>48,449</td>
<td>0</td>
</tr>
<tr>
<td>hr6</td>
<td>48,450</td>
<td>48,450</td>
<td>0</td>
</tr>
<tr>
<td>hr7</td>
<td>24,702</td>
<td>48,500</td>
<td>23,798</td>
</tr>
<tr>
<td>hr8</td>
<td>25,394</td>
<td>48,477</td>
<td>23,083</td>
</tr>
<tr>
<td>hr9</td>
<td>26,192</td>
<td>47,268</td>
<td>21,076</td>
</tr>
<tr>
<td>hr10</td>
<td>25,298</td>
<td>46,763</td>
<td>21,465</td>
</tr>
<tr>
<td>hr11</td>
<td>46,722</td>
<td>46,722</td>
<td>0</td>
</tr>
<tr>
<td>hr12</td>
<td>47,212</td>
<td>47,212</td>
<td>0</td>
</tr>
</tbody>
</table>

TOTAL kWh Event Hours: 89,423
Average Capacity Delivered - Event Hours (MW): 22.4
8 AM Capacity Delivered - Event Hours (MW): 23.1

Table 3-6: Nippon Paper Cost Using January Average Load and Estimated Event Impact

<table>
<thead>
<tr>
<th></th>
<th>Delivered Bid Capacity (MW)</th>
<th>Peak Demand Reduction (MW)</th>
<th>Energy Reduction During Event (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80</td>
<td>23.1</td>
<td>89,423</td>
</tr>
<tr>
<td>Bid Settlement Cost ($130/MW)</td>
<td></td>
<td></td>
<td>$10,400</td>
</tr>
<tr>
<td>Transmission Revenue ($1.686/KW)</td>
<td></td>
<td></td>
<td>$38,919</td>
</tr>
<tr>
<td>Demand Revenue ($3.10/KW)</td>
<td></td>
<td></td>
<td>$71,558</td>
</tr>
<tr>
<td>Ancillary Service Charge (42% of Transmission and Demand Revenue)</td>
<td></td>
<td>$46,400</td>
<td></td>
</tr>
<tr>
<td>Energy Revenue (2.89 cents/kWh)</td>
<td></td>
<td></td>
<td>$2,584</td>
</tr>
<tr>
<td>Total Cost</td>
<td></td>
<td></td>
<td>$169,861</td>
</tr>
<tr>
<td>Total Cost/Peak KW</td>
<td></td>
<td></td>
<td>$7.36</td>
</tr>
</tbody>
</table>
Modifications Based on Participant Interview Regarding Participation During Periods of Extreme Cold

Program participants responded to questions about potential future participation during periods of extreme cold. Such a period would likely be coincident or similar in intensity to the BPA system peak demand period. Representatives from Nippon Paper expressed significant concern about participating in the program during such a period and indicated that the likelihood of their participation under such conditions was unlikely. They expressed fears that running on a minimum schedule could cause freezing in some portions of their operations and put additional strain on their equipment. Based on their responses, it is concluded that no reduction in demand can be expected from Nippon Paper under these conditions.

Modifications Based on Participant Interview Regarding the “Call” Option

This option was described to Nippon representatives as a possible change to the program, and they were asked if this approach would work for their company. They said they would consider the option. However, the timeframe would be important to them in making a decision to participate. Extreme weather conditions would still be a major concern.

Mason PUD

PUD #3 of Mason County participated in all but one of the five test events. They participated in the program by utilizing two, natural gas fired reciprocating engine generators rated at 2.5 megawatt nominal each. These generators are run by contractors and overtime pay could become an issue if there are two shorter events spread over the course of a day. Mason PUD did not shed any load. In each of the events where they participated, they bid 5 MW and delivered between 5.2 and 5.5 MW. The March 31st event is typical of their participation profile and the morning event for that day will be used as their representative event. Figure 3-3 illustrates the full day profile for Mason PUD generators on March 31st and Table 3-7 the individual hourly generation in the morning of that day.
Figure 3-3: Mason PUD Load Profile for March 31st, 2004 (Generator)

Table 3-7: Mason PUD Morning Load Profile for March 31st, 2004 (Generator)

<table>
<thead>
<tr>
<th>Event Day Load 3/31/2004 (kWh)</th>
<th>Baseline Load 3/31/2004 (kWh)</th>
<th>Deviation From Base (if at least 20% of average Delivered Capacity) (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hr1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>hr2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>hr3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>hr4</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>hr5</td>
<td>80</td>
<td>0</td>
</tr>
<tr>
<td>hr6</td>
<td>170</td>
<td>0</td>
</tr>
<tr>
<td>hr7</td>
<td>5,400</td>
<td>5,400</td>
</tr>
<tr>
<td>hr8</td>
<td>5,440</td>
<td>5,440</td>
</tr>
<tr>
<td>hr9</td>
<td>5,470</td>
<td>5,470</td>
</tr>
<tr>
<td>hr10</td>
<td>5,490</td>
<td>5,490</td>
</tr>
<tr>
<td>hr11</td>
<td>310</td>
<td>0</td>
</tr>
<tr>
<td>hr12</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

TOTAL kWh all Hours: 21,800
TOTAL kWh Event Hours: 21,800
Average Capacity Delivered - Event Hours (MW): 5.5
Peak Capacity Delivered - Event Hours (MW): 5.5

Results and Conclusions
Event Directly Transferable to Peak Day and Hour

Within this perspective, it is assumed that the peak day and hour correspond to the participation event period depicted for the morning in Figure 3-3 and Table 3-7. At 8:00 AM, the time of BPA’s system peak, they generated 5.4 MW of capacity. We conclude that the event is directly transferable to the peak day. The bid cost for the four morning hours was $2,600. Table 3-8 identifies the potential cost of Mason PUD’s participation under this perspective. The costs include the participation cost as well as lost revenue estimates. The cost per peak demand KW would be about $7.58.

Table 3-8: Mason PUD Cost if Representative Event Equals Peak Day/Hour

<table>
<thead>
<tr>
<th></th>
<th>Delivered Bid Capacity (MW)</th>
<th>Peak Demand Reduction (MW)</th>
<th>Energy Reduction During Event (kWh)</th>
<th>Energy Reduction During Event and Shoulder Hours (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bid Settlement Cost ($130/MW)</td>
<td>$2,600</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission Revenue ($1.686/KW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demand Revenue ($3.11/KW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ancillary Service Charge (46% of Transmission and Demand Revenue)</td>
<td>$12,112</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy Revenue (2.638 cents/kWh)</td>
<td></td>
<td>$575</td>
<td></td>
<td>$575</td>
</tr>
<tr>
<td>Total Cost</td>
<td></td>
<td></td>
<td>$41,617</td>
<td>$41,617</td>
</tr>
<tr>
<td>Total Cost/Peak KW</td>
<td></td>
<td></td>
<td>$7.58</td>
<td>$7.58</td>
</tr>
</tbody>
</table>

Is the Event Transferable to Peak Day and Hour Based on Load Profile?

The two generators provided by Mason PUD for this program are back-up generators and are generally always available. The demand reductions and costs identified in Table 3-8 should be directly transferable to the peak day and hour.

Modifications Based on Participant Interview Regarding Participation During Periods of Extreme Cold

Representatives from Mason PUD indicated that they would likely participate at the same level of capacity in the program during times of extreme cold. However, they also mentioned that fuel cost influences their participation decision. Based on their responses, it
is concluded that Mason PUD could provide a 5.5 MW reduction in demand for each hour of an event under extreme conditions, but that the price would likely be higher.

**Modifications Based on Participant Interview Regarding the “Call” Option**

The Mason PUD representatives indicated they would consider the call option approach, but that they preferred the current approach. It would be more appealing for them if a fuel price escalator were included in the calculations used in the new approach. They also wanted a better understanding of all the parameters involved in the new approach. Based on their responses they would likely provide firm power under all weather conditions, but at a higher price.

**Puget Sound Naval Shipyard (PSNS)**

PSNS participated in the morning portion of the March 31st event by operating two 2 MW diesel powered generators. The morning portion of this event lasted four hours and PSNS provided capacity in each of these four hours. However, they only bid to participate in the third and fourth hours of the AM four-hour block. For these two hours, they bid and delivered 4 MW.

PSNS has five 2 MW generators, three of which could be available for the program. However, they prefer to commit to only two generators. These generators have both remote start and auto start capability. March 31st is the only day they participated in the program (the contract had not been signed until then) and because they are using back-up generators, it is likely a good representative profile. The morning of March 31st will be used as their representative event. Figure 3-4 and Figure 3-5 illustrate the full day profile for each of the two generators on March 31st and Table 3-9 shows the load in the morning of that day.
Figure 3-4: PSNS Load Profile for March 31st, 2004 (Generator #1)
Figure 3-5: PSNS Load Profile for March 31st, 2004 (Generator #2)

Table 3-9: PSNS Morning Load Profile for March 31st, 2004 (Both Generators)

<table>
<thead>
<tr>
<th></th>
<th>Event Day Load 3/31/2004 (Kwh)</th>
<th>Baseline Load 3/31/2004 (Kwh)</th>
<th>Deviation From Base (if at least 20% of average Delivered Capacity) (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hr1</td>
<td>1</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>hr2</td>
<td>-1</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>hr3</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>hr4</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>hr5</td>
<td>0</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>hr6</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>hr7</td>
<td>0</td>
<td>70</td>
<td>0</td>
</tr>
<tr>
<td>hr8</td>
<td>0</td>
<td>286</td>
<td>0</td>
</tr>
<tr>
<td>hr9</td>
<td>4,185</td>
<td>290</td>
<td>3,895</td>
</tr>
<tr>
<td>hr10</td>
<td>4,417</td>
<td>290</td>
<td>4,127</td>
</tr>
<tr>
<td>hr11</td>
<td>4,405</td>
<td>555</td>
<td>3,850</td>
</tr>
<tr>
<td>hr12</td>
<td>4,397</td>
<td>148</td>
<td>4,249</td>
</tr>
</tbody>
</table>

TOTAL kWh all Hours: 16,121
TOTAL kWh Event Hours: 8,023
Average Capacity Delivered - Event Hours (MW): 4.0
Peak Capacity Delivered - Event Hours (MW): 4.1

Results and Conclusions
**Event Directly Transferable to Peak Day and Hour**

Within this perspective, it is assumed that the peak day and hour correspond to the participation event period depicted for the morning in Table 3-9. PSNS did not generate specifically at 8:00 AM, but did average 4 MW of capacity during their event hours of 9:00 and 10:00 AM. The bid cost for the two morning hours was $1,040. Table 3-10 identifies the potential cost of PSNS’s participation under this perspective. The costs include the participation cost as well as lost revenue estimates. The cost per peak demand KW would be about $7.26. We conclude that the event capacity is directly transferable to the peak day, and believe it would also be directly transferable to the peak hour.

**Table 3-10: PSNS Cost if Representative Event Equals Peak Day/Hour**

<table>
<thead>
<tr>
<th></th>
<th>Delivered Bid Capacity (MW)</th>
<th>Peak Demand Reduction (MW)</th>
<th>Energy Reduction During Event (kWh)</th>
<th>Energy Reduction During Event and Shoulder Hours (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bid Settlement Cost ($130/MW)</td>
<td>8</td>
<td>4.1</td>
<td>8,023</td>
<td>16,121</td>
</tr>
<tr>
<td>Transmission Revenue ($1.686/KW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demand Revenue ($3.11/KW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ancillary Service Charge (45% of Transmission and Demand Revenue)</td>
<td></td>
<td></td>
<td>8,908</td>
<td></td>
</tr>
<tr>
<td>Energy Revenue (2.638 cents/kWh)</td>
<td></td>
<td></td>
<td>$212</td>
<td>$425</td>
</tr>
<tr>
<td>Total Cost</td>
<td></td>
<td></td>
<td>$29,954</td>
<td>$30,167</td>
</tr>
<tr>
<td>Total Cost/Peak KW</td>
<td></td>
<td></td>
<td>$7.26</td>
<td>$7.31</td>
</tr>
</tbody>
</table>

**Is the Event Transferable to Peak Day and Hour Based on Load Profile?**

The PSNS typically runs its generators once a month for 4 hours for maintenance and testing. To the extent the peak can be worked into the schedule, the event is transferable. PSNS also has more generators it tests and maintains that could be made available to the program. This option offers an additional two to three times per month that PSNS could make generation available. In addition, fuel cost is not an issue for PSNS because they have annual fuel contracts. Because of all of these factors it is likely that generators would be available for the peak. Therefore it is likely that the demand reductions and costs identified in Table 3-10 should be directly transferable to the peak day and hour.

*Results and Conclusions* 3-15
Modifications Based on Participant Interview Regarding Participation During Periods of Extreme Cold

The representative from PSNS indicated that they would likely not participate in the program during times of extreme cold. The reason given is that the staff that would normally run the generators would likely be unavailable in such weather conditions. They have their own distribution system to maintain and in an extreme weather event, it is likely that all available staff would be in the field maintaining their system. Based on their responses, it is concluded that no reduction in demand can be expected from PSNS under extreme conditions for any price.

Modifications Based on Participant Interview Regarding the “Call” Option

PSNS representatives said that the call option might be viable if the events fit the maintenance schedule, but it may be difficult to get such a contract signed by the appropriate parties. However, the extreme weather issue, and the consecutive day issue coupled with the maintenance schedule and the probable difficulty in getting a contract signed make it unlikely that this option would be accepted. Based on these caveats it is concluded that PSNS would not participate in a Call Option.

Bangor Submarine Base

Bangor Submarine Base participated in the morning portion of the March 31st event by operating four 2 MW diesel powered generators. The morning portion of this event lasted four hours and Bangor Submarine Base provided capacity and bid in each of these four hours. They bid and delivered 8 MW. Bangor only participated on March 31st because the program participation contract was not finalized until that time.

Bangor has nine back up generating units spread over five locations for a total of 18 MW, and will commit four 2 MW turbines to the program. These four turbines are at one location, are metered, and do not have remote start capability. Their participation profile in the March 31st morning event will be used as their representative event. Figure 3-6 illustrates the full day profile for the Bangor Submarine Base generators on March 31st and Table 3-11 shows the load in the morning of that day.
Figure 3-6: Bangor Submarine Base Load Profile for March 31st, 2004 (Generator)
### Table 3-11: Bangor Submarine Base Morning Load Profile for March 31st, 2004 (Generator)

<table>
<thead>
<tr>
<th></th>
<th>Event Day Load 3/31/2004 (kWh)</th>
<th>Baseline Load 3/31/2004 (kWh)</th>
<th>Deviation From Base (if at least 20% of average Delivered Capacity) (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hr1</td>
<td>-10</td>
<td>-21</td>
<td>0</td>
</tr>
<tr>
<td>hr2</td>
<td>-17</td>
<td>-21</td>
<td>0</td>
</tr>
<tr>
<td>hr3</td>
<td>-13</td>
<td>-22</td>
<td>0</td>
</tr>
<tr>
<td>hr4</td>
<td>-15</td>
<td>-21</td>
<td>0</td>
</tr>
<tr>
<td>hr5</td>
<td>-13</td>
<td>-19</td>
<td>0</td>
</tr>
<tr>
<td>hr6</td>
<td>6,438</td>
<td>-20</td>
<td>6,458</td>
</tr>
<tr>
<td>hr7</td>
<td>7,679</td>
<td>-9</td>
<td>7,688</td>
</tr>
<tr>
<td>hr8</td>
<td>7,734</td>
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</tr>
<tr>
<td>hr9</td>
<td>7,753</td>
<td>-22</td>
<td>7,775</td>
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<tr>
<td>hr10</td>
<td>7,765</td>
<td>-21</td>
<td>7,786</td>
</tr>
<tr>
<td>hr11</td>
<td>8</td>
<td>-18</td>
<td>0</td>
</tr>
<tr>
<td>hr12</td>
<td>12</td>
<td>-23</td>
<td>0</td>
</tr>
</tbody>
</table>

**TOTAL kWh all Hours**: 37,461  
**TOTAL kWh Event Hours**: 31,003  

**Average Capacity Delivered - Event Hours (MW)**: 7.8  
**Peak Capacity Delivered - Event Hours (MW)**: 7.8

*Event Directly Transferable to Peak Day and Hour*

In this perspective, we believe that the peak day and hour correspond to the participation event period depicted for the morning in Figure 3-6 and Table 3-11. At 8:00 a.m., the time of BPA’s system peak, they generated 7.8 MW of capacity. The bid cost for the four morning hours was $4,160. Table 3-12 identifies the potential cost of Bangor Submarine Base’s participation under this perspective. The costs include the participation cost as well as lost revenue estimates. The cost per peak demand KW would be about $7.60.
Table 3-12: Bangor Submarine Base Cost if Representative Event Equals Peak Day/Hour

<table>
<thead>
<tr>
<th>Delivered Bid Capacity (MW)</th>
<th>Peak Demand Reduction (MW)</th>
<th>Energy Reduction During Event (kWh)</th>
<th>Energy Reduction During Event and Shoulder Hours (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>7.8</td>
<td>31,003</td>
<td>37,461</td>
</tr>
</tbody>
</table>

Bid Settlement Cost ($130/MW) $4,160

Transmission Revenue ($1.686/KW) $13,127

Demand Revenue ($3.11/KW) $24,214

Ancillary Service Charge (45% of Transmission and Demand Revenue) $16,804

Energy Revenue (2.638 cents/kWh) $818 $988

Total Cost $59,123 $59,294

Total Cost/Peak KW $7.59 $7.62

Is the Event Transferable to Peak Day and Hour Based on Load Profile?

Bangor Submarine Base typically runs its generators once a month for 4 hours for maintenance and testing. To the extent the peak can be worked into the schedule, the event is transferable. Bangor also has more generators it tests and maintains that could be made available to the program. In addition, fuel cost is not an issue for Bangor because they have annual fuel contracts. As a result it is likely that generators would be available for the peak. Therefore it is likely that the demand reductions and costs identified in Table 3-12 should be directly transferable to the peak day and hour.

Modifications Based on Participant Interview Regarding Participation During Periods of Extreme Cold

The representative from Bangor Submarine Base indicated that they would likely not participate in the program during times of extreme cold. The reason given is that because these turbines do not have remote start capability the staff that would normally run the generators would likely be unavailable in such weather conditions. They have their own distribution system to maintain and in an extreme weather event, it is likely that all available staff would be in the field maintaining their system. Based on their responses, it is concluded that no reduction in demand can be expected from Bangor Submarine Base under extreme conditions for any price.

Results and Conclusions 3-19
** Modifications Based on Participant Interview Regarding the “Call” Option

The Bangor Submarine Base Representatives said that the call option might be viable if the events fit the maintenance schedule, and if the contract could be signed. However, the extreme weather issue, and the consecutive day issue coupled with the maintenance schedule and the probable difficulty in getting a contract signed make it unlikely that this option would be accepted. Based on these caveats it is concluded that Bangor Submarine Base would not participate in a Call Option.

** Port Townsend Paper

Port Townsend Paper Company participated in the first event, which lasted one hour. This company has three turbines, one of which is a back up turbine that can be used to generate 3 MW of electricity, but is only used when excess steam is available from the three boilers. This 1920 turbine’s output is uncertain because it uses governors instead of electronic controls.

Port Townsend Paper bid 1 MW and delivered 1.2 MW for the March 16th event. Because this was the only event they participated in (they had technical difficulties during the other event periods) it will be used as their representative event. Figure 3-7 illustrates the full day profile for the Port Townsend Paper generator on March 16th and Table 3-13 shows the load in the afternoon of that day.
Figure 3-7: Port Townsend Paper Load Profile for March 16th, 2004 (Generator)

Table 3-13: Port Townsend Paper Afternoon Load Profile for March 16th, 2004 (Generator)

<table>
<thead>
<tr>
<th></th>
<th>Event Day Load 3/16/2004 (Kwh)</th>
<th>Baseline Load 3/16/2004 (KWh)</th>
<th>Deviation From Base (if at least 20% of average Delivered Capacity) (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hr13</td>
<td>420</td>
<td>599</td>
<td>0</td>
</tr>
<tr>
<td>hr14</td>
<td>436</td>
<td>586</td>
<td>0</td>
</tr>
<tr>
<td>hr15</td>
<td>466</td>
<td>552</td>
<td>0</td>
</tr>
<tr>
<td>hr16</td>
<td>444</td>
<td>573</td>
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<td>400</td>
<td>549</td>
<td>0</td>
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<tr>
<td>hr18</td>
<td>448</td>
<td>532</td>
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<tr>
<td>hr19</td>
<td>838</td>
<td>522</td>
<td>316</td>
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<tr>
<td>hr20</td>
<td>1,776</td>
<td>533</td>
<td>1,243</td>
</tr>
<tr>
<td>hr21</td>
<td>800</td>
<td>527</td>
<td>273</td>
</tr>
<tr>
<td>hr22</td>
<td>534</td>
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<td>436</td>
<td>530</td>
<td>0</td>
</tr>
<tr>
<td>hr24</td>
<td>426</td>
<td>521</td>
<td>0</td>
</tr>
</tbody>
</table>

TOTAL kWh all Hours 1,832
TOTAL kWh Event Hours 1,243
Average Capacity Delivered - Event Hours (MW) 1.2
Peak Capacity Delivered - Event Hours (MW) 1.2
**Event Directly Transferable to Peak Day and Hour**

In this perspective, we believe that the peak day and hour correspond to the participation event period depicted for the afternoon in Figure 3-7 and Table 3-13. At 8:00 PM, the assumed representative time of BPA’s system peak from this event, Port Townsend Paper generated 1.2 MW of capacity. The bid cost for the one evening hour was $130. Table 3-14 identifies the potential cost of Port Townsend Paper Company’s participation under this perspective. The costs include the participation cost as well as lost revenue estimates. The cost per peak demand KW would be about $7.47.

**Table 3-14: Port Townsend Paper Company Cost if Representative Event Equals Peak Day/Hour**

<table>
<thead>
<tr>
<th></th>
<th>Delivered Bid Capacity (MW)</th>
<th>Peak Demand Reduction (MW)</th>
<th>Energy Reduction During Event (kWh)</th>
<th>Energy Reduction During Event and Shoulder Hours (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bid Settlement Cost ($130/MW)</td>
<td>1</td>
<td>1.2</td>
<td>1,243</td>
<td>1,832</td>
</tr>
<tr>
<td>Transmission Revenue ($1.686/KW)</td>
<td></td>
<td></td>
<td>$2,096</td>
<td></td>
</tr>
<tr>
<td>Demand Revenue ($3.10/KW)</td>
<td></td>
<td></td>
<td>$3,853</td>
<td></td>
</tr>
<tr>
<td>Ancillary Service Charge (53% of Transmission and Demand Revenue)</td>
<td>$3,153</td>
<td></td>
<td>$3,153</td>
<td></td>
</tr>
<tr>
<td>Energy Revenue (3.431 cents/kWh)</td>
<td></td>
<td></td>
<td>$43</td>
<td>$62</td>
</tr>
<tr>
<td>Total Cost</td>
<td></td>
<td></td>
<td>$9,275</td>
<td>$9,294</td>
</tr>
<tr>
<td>Total Cost/Peak KW</td>
<td></td>
<td></td>
<td>$7.46</td>
<td>$7.48</td>
</tr>
</tbody>
</table>

**Is the Event Transferable to Peak Day and Hour Based on Load Profile?**

The output of the turbine is uncertain because it depends on plant operations. Due to technical difficulties, Port Townsend Paper failed to participate in the following four events. In addition because of changes in the next year, this turbine will no longer be available. Based on all the planned plant improvements they anticipate a 3-5 MW reduction in BPA purchased energy, and will have nothing available for this program. They plan to bypass the pressure reducing valve to save energy, implement a power factor improvement project, and upgrade the controls on the system.
The demand reductions and costs identified in Table 3-14 are not applicable to peak hour and day due to expected changes in the plant.

**Modifications Based on Participant Interview Regarding Participation During Periods of Extreme Cold**

The representative from Port Townsend Paper indicated that under current plant operations, they would likely be able to participate at the same level of capacity in the program during times of extreme cold. However, based on the expected changes in the plant, no generating capacity will likely be available.

**Modifications Based on Participant Interview Regarding the “Call” Option**

The Port Townsend Paper Representatives did not feel the call option approach was viable for them because of the potential to lose production. In addition, because their boilers are not dependable or predictable, they cannot guarantee capacity delivery.

**Summary of Impact Potential from the Participants**

Combined, the five participants of the pilot program supplied bid amounts that ranged from a low of 5 MW to 30 MW. Actual delivery ranged from a low of 5.2 MW to 40.5 MW. Based on participation data, Itron selected “representative events” for each participant for use in analysis of how transferable the event data are to BPA’s January peak day as well as how responses to the interview questions affected potential participation under extreme cold and under alternate contract arrangements.

Using the “representative event” as directly applicable to peak month/hour without any consideration of load profile or interview responses gives a delivered capacity of about 50 MW. Only Nippon Paper shed load as part of their participation and in reviewing their load shape information for loads in early January, it was concluded that their ability to deliver capacity at time of system peak should be reduced from 31.4 MW to 23.1 MW. All other loads were thought to be transferable.

Responses to the interview questions, both for extreme weather conditions and for changing the program design to a “call option” approach had significant impact on the estimated amount of capacity that could be delivered. Only Mason County PUD answered that they could likely provide about the same amount of participation either under extreme weather conditions or under a “call option” approach. This reduced potential delivered capacity from the program participants to only 5.5 MW.
Potential Impact From Non-Participant Group

Results from the non-participant interviews indicated some interest in the program. However, considerable uncertainty on the part of the non-participants on many of the program issues makes estimation of potential from this group impossible.

3.3 Results and Conclusions – Process Evaluation

BPA

Staff from different departments within BPA were asked about their areas of expertise as it related to the program, about their experience with the Demand Reduction Pilot program and about issues that should be addressed in the interview guides. A summary of these discussions is presented below. The BPA staff and/or departments interviewed included:

- The Transmission Business Line
- The Pilot Program Project Manager
- The Monroe Dispatch Center
- A representative from Legal
- A representative from Disbursement
- A representative from Metering
- A representative from Load Forecasting
- Representatives from Apogee, the software vendor and service provider who created the Energy Exchange software and provides energy exchange services

The Transmission Business Line

The Transmission Business Line Account Executive found that the program was easier than expected and felt that the BPA program managers were satisfied. He thought that the metering data were timely, however he was integral in providing the data for the program. He also noted that there were a variety of metering solutions used. He wanted the interview guides to address the one-hour event. He felt participants would have negative reactions to the one-hour event and they did.

The Pilot Program Project Manager

The Pilot Program Project Manager thought the pilot went well, and noted a few problem areas. He felt two hours was not sufficient response time for an offer, and the participants agreed. Operationally, there were two problem areas; one was a math error in disbursement, which was quickly corrected, and the other was that the portal sent out multiple event notices. Another easily fixed problem was that customers did not realize that technical difficulties excused non-delivery. Some customers bid conservatively because they did not understand this.
When asked what he would like to learn from the customers he said he would like to know if the customers were happy with the program, their reaction to the proposed Call Option, whether they would respond to a one hour event, if they would commit more capacity, and if end use customers could be aggregated. He also wanted to learn if the Munro Dispatch Center wanted the responsibility for calling the events; they did not unless it is very easy for them to do.

The Monroe Dispatch Center

The Monroe dispatch center had limited involvement in this program. They did not have a need for or use the information coming from the program. They believe the program worked, it appeared to have an impact but the magnitude is too small to be readily apparent. They stated that they do not want to be responsible for predicting and initiating events. If an algorithm were established that would sound an alarm they could react to, they would be willing to take on the responsibility, but they do not want additional work. They had no issues to include in the surveys.

Legal

BPA Legal staff drafted the template contracts and modified them in response to the customer requests. They felt the contracts were adequate in protecting BPA’s interests. They had no questions to be addressed in the survey guides.

Disbursement

Disbursement did not run as smoothly as the other areas in the program. Both time constraints and communication issues accounted for the majority of the issues. Data presentation is a feature of the Apogee Demand Exchange platform and one, which BPA purchased for this program. The contract for that purchase was signed late and there were operational issues with system startup. In the end the data were not transferred correctly using the system, and excel spreadsheets were sent instead. Communication breakdowns occurred as well. There was confusion about whether to use Hour Ending or Hour Beginning data. There was also discussion about sending flat files as opposed to XML files. In the end they decided on XML files but the BPA Disbursement contractor who deals with the XML files only comes in two times per week. Had there been more time and better communication many of these issues may have been resolved.

Metering

Metering was used in the program to prove that there was an impact and as the basis for payment. However the BPA metering department was not very involved in the program. They could have been and could have provided a metering system. However, this program
used existing metering and used multiple data sources. This department did not have any questions to add to the interview guide.

**Load Forecasting**

Load forecasting provided a load forecast for the pilot, but was not further involved. The Olympic Peninsula is a small part of what they address; any information must be detailed and utility specific for it to be helpful for forecasting load. Currently load forecasting has a very small staff, which limits their analysis detail. They had no issues they wanted addressed in the interview guides, and were not expecting a lot of data from this pilot.

**Apogee**

Apogee felt their system worked. There were some issues however. First there were technical issues which were resolved, second BPA staff was unfamiliar with the system, third the pagers did not work to contact participants signaling an event, and fourth Apogee saw a problem with BPA getting through all the legal agreements both internally and with the end use customers. Apogee believes their systems are adequate, and that the problem lies with the customer who is not there to receive the event notification. This could be resolved by Apogee remotely starting generators, but customers typically will not release that control. Apogee noted that using their system to alleviate transmission constraints was a unique way to use the system, but that the system is similar to other systems in use. Furthermore BPA has added the counter offer feature, which is not commonly used.

Apogee wanted to know how the customers determine their price, how likely customers will be to use the counter feature, if they expect higher payment for less lead time, if they would accept lower payment for longer lead time, and how long the customers expect settlement to take. The majority of these questions are addressed in this results section.

BPA staff was not entirely happy with the Apogee services. They wanted to use the data presentation feature to present data to participants, but this feature did not work properly. The data did not get moved properly and there was confusion about whether to use hour ending or hour beginning. In the end BPA Staff manually created the spreadsheets for participants to view. BPA staff admitted that there were mistakes on both sides of the house and that the short timeframe contributed to the issues. Overall BPA staff felt that there were more bugs than anticipated.

**Participant**

Five participants were personally interviewed about their involvement in the Demand Reduction Pilot Program and about their expected future participation under different scenarios. The results of these surveys are given below in the order the questions were asked
in the interviews, and are labeled accordingly. Responses were grouped when the questions addressed a specific concept. A summary is presented at the end of the results section.

**Question 1: Awareness of and Participation in Other Programs**

Participants were asked if they were aware of any other programs similar to the BPA Demand Reduction Pilot Program either in the Pacific Northwest or elsewhere. All were aware of other demand reduction programs, but typically did not know of programs being used specifically for the purposes of transmission benefits. Most were familiar with BPA’s Power Business Line program.

**Question 2: Potential Reasons for Not Participating in the Program**

When asked if there were elements of the pilot program that made them consider not participating, respondents did cite some concerns. Of prime concern, were financial issues, and the potential for being obligated to provide the capacity either through shedding load or generating power. Specifically the issues and concerns included:

- A concern that the payments received would not cover their costs. In some cases there were many variables to be considered, in others they had contractors who ran generators and they were concerned with paying them overtime rates.
- A concern about the penalty clause in the contract. However, since the penalty amount had been decreased in the final contract, it became a non-issue for them.
- A concern about the perception of an obligation to deliver. Some were concerned that by being in the program they would have to deliver even if they had not responded to an offer. Others were concerned that they would not be able to deliver due to mechanical problems.
- A concern about the risk of bidding and not being able to deliver. Demand for their products and the need to use electricity to meet this demand would outweigh their commitment to deliver the promised capacity.
- A concern by one participant that because they shape their load already in order to take advantage of off-peak rates, they feared they would not be able to reduce their load when called upon to do so.
- A concern that the program may become overly complex and require more effort than the perceived benefits.

**Question 3: BPA Responsiveness to Participants’ Concerns**

The respondents indicated that overall, BPA staff had been very easy to work with and were accommodating within this pilot program. BPA staff solved all the outstanding issues by eliminating problem areas such as the non-performance penalty. The respondents further stated that communication with BPA was outstanding and they felt that BPA was clear on
what was required. However, based on their responses to later questions it is clear that some respondents did not understand important elements of the program.

**Question 4: Days and Levels of Program Participation**

This question only confirmed their participation during specific events.

**Question 5: Ease of Participation in the Events**

Respondents were asked on a scale of 1 to 10 how they would characterize their organization’s involvement on each of the event days with 1 being difficult and 10 being easy. Not all organizations were able to participate on all days for a variety of reasons. These reasons are discussed under Question 6: Intermittent Participation.

In general, the respondents thought that the mechanics of participating in the program were easy, i.e. receive an e-mail offering, evaluate it, e-mail a response, and provide the load reduction or power generation. The respondents rated the ease of participation with scores ranging from 3 to 10, however most were in the 7 – 10 range with one giving the 3 rating. This organization had internal technical issues to deal with that were not directly related to the program.

**Question 6: Intermittent Participation**

Respondents were asked why they participated on some days and not on others. There were a variety of reasons cited. In one case a participant was asked to bid 0 MW in order to test how the system would respond to such a bid. In another case, the respondent’s participation contract had not been completed before some of the earlier events. However, it was executed in time for the last event. Some respondents had technical problems with equipment that was down, or their load was already down and they could not have shed any load below the baseline. One participant stated that they didn’t want to over commit themselves and therefore bid conservatively.

**Question 7: Different Bids**

Respondents were asked why they bid different amounts on different days. They provided a variety of reasons including being conservative, having the opportunity to only bid once, and one wanted to see how BPA would respond to different bids. Another respondent indicated that their load varies considerably by time of day and therefore the time of day for the requested load shedding influenced their ability to bid.

**Question # 8: Issues Making it Difficult to Participate**

The respondents were asked if there were any specific issues that made participation difficult. The respondents identified only one issue: the e-mail notification timing for the upcoming
event. An 8:00 a.m. e-mail may not be read until much later as the staff is busy with plant operations, and not at their desk.

Beyond this single issue, the respondents indicated that the process was straight forward, and other issues they encountered had nothing to do with BPA. For example, one respondent’s company had recently re-organized, which made communication channels between BPA and the company uncertain. An additional issue considered by one respondent was if there would be any detrimental affects from stopping and starting equipment when responding to the program.

Questions #9 - #17: Event Participation

With this series of questions, respondents were asked about their participation in the events. Specifically they were asked:

- What made it easy to participate?
- Were the procedures adequate?
- Was it easy to participate?
- Was the e-mail notification system adequate?
- Did the two-hour notification provide adequate time to respond?
- Was the process efficient?
- Did their understanding of the program increase or stay the same?
- Were they glad they participated?
- Would they recommend participation to others?

Respondents indicated that the key element that made program participation easy was the BPA staff flexibility in modifying the program structure in response to their concerns. Several respondents indicated they felt BPA staff had “bent over backwards” to make participation easy. One participant thought the service was easy to use. Overall, the process, procedures and training were adequate, and it was easy to participate.

As discussed earlier under Question 8, the e-mail method of notification may need to be modified. One respondent indicated that they liked the e-mail notification system. However, most respondents indicated that it could be a problem since they were not always available to receive e-mail notifications and it might be several hours between incidences of checking e-mail. Fortunately in this pilot program, BPA called in advance to say they would be scheduling an event the next day and respondents found this method helpful. When respondents were asked about the two-hour window to respond to the BPA offer, some felt that two hours was not enough time, and that three to four hours would be better.
Respondents stated that the program ran efficiently and was easy to participate in. They felt they understood the program and that it was well described. Several went on to say that they learned more about BPA and its operations and why it is important to focus efforts on reducing demand on the transmission system. When asked if they were glad they had participated in the pilot program, most indicated that they were glad, with only one indicating that it didn't do much for them. Most felt that it was a good program that provided benefit to both parties. Multiple respondents said they participated because BPA asked them to and they wanted to cooperate with BPA whenever they could.

When asked if they would recommend that others participate, they said they would recommend that others at least consider how participation fits into operations, as the benefits are site specific. The payments provided by BPA covered their costs. Others thought it was a unique and forward-looking program that was attempting to address transmission issues before they became problems.

Questions #18 & #19: Events

Respondents were asked to discuss their participation in the events, if the duration of an event affected their decision to participate, and if the duration made a difference in their operations. For the most part, they felt that a one-hour event was difficult to participate in, and that they typically would not participate for only one hour. For generators the one-hour event is too costly because of the generator ramp-up and ramp-down time, and for those using contractors, the cost of the contractor exceeds the payment they would receive from BPA for only one hour. For load shedders there is the concern that the equipment will have difficulty starting up again and they are concerned with the time it takes to bring the product back up to grade, once production has been interrupted. They noted that many systems run better if they can run continuously.

One participant did say that if their operations were down already they would participate for only one hour. They did however, prefer a four-hour event, and most would like an even longer event as the one-hour events cost them more on a per hour basis and longer events create financial benefit for them because they are paid for each hour that they provide capacity.

When asked about the ideal duration for an event, all said longer is better. One stated that two hours would be the minimum duration, and others said four hours. Some generators fit the events into their maintenance schedule, which lasts four hours. Anything less than four hours would not allow them to complete their maintenance requirements.
Question #20: Suggestions for Improvement

When asked for suggestions to improve the program, participants gave the following suggestions:

- Pre-notify participants that an event will be called,
- Provide a reminder call that an event has been called,
- Provide some certainty about when and how many events will be called,
- Provide a schedule of when events will be called,
- Have no penalty for mechanical failure,
- They would like to get paid for what they produce, currently they get paid for what they bid and if they produce more capacity they get no additional payment for the additional capacity,
- Change the timing of the notification because 8:00 AM is inconvenient, and
- Lengthen the time available to respond to an offer.

Questions #21 - #26: Contracts

Respondents were either happy with, or indifferent to, the contracts. They all indicated that the final version of the contract addressed all their concerns and was easy to understand. Most stated that the contracts were adequate in protecting their interests, and noted that otherwise they would not have signed them. Most did not even have the contracts legally reviewed. They were happy with the process of getting the contracts done, and felt that BPA was responsive in making changes to meet their concerns.

When asked about interaction with BPA Contracts staff they stated that the BPA staff was easy to work with, they worked very hard, they coordinated the process well, they were easy to communicate with, they did all the work, and that they were accommodating. However, one mentioned that they received revised versions of the contracts in unmarked mode, which made it hard to see changes.

Question #27: Participation Benefits

When asked about the benefits they received from participating, respondents indicated that key factors were:

- The monetary payment,
- An opportunity to operate their system, which gave them a clearer understanding of how it works,
- An opportunity to get paid for maintenance runs they would be completing anyway,
- A better understanding of how BPA operates,
- An opportunity to work with BPA positively,
- Financial savings due to a decreased demand charges, and
- The benefit of helping BPA by being a good customer.

**Question # 28: Value to BPA**

When asked what benefit they felt BPA received from running this pilot program, respondents indicated that BPA gained an opportunity to see if an alternative program could work to offset peak demand. If it works, BPA could delay the expensive option of upgrading the transmission line to the Olympic peninsula.

**Question # 29: Permanent Program**

When asked if they would participate in the program if it were converted from a pilot to a permanent program, the majority said they would participate at the current level and in the current program design. In some cases the respondents’ ability to contribute capacity is limited by their generation capacity therefore they would not be able to deliver more capacity in an ongoing program. In other cases, outside influences such as demand for their product, may limit the size of future bids. One participant stated that they will only participate if the event coincides with their testing and monthly maintenance runs of the generating systems. As a result their response to requests for generating capacity beyond these monthly maintenance runs may be limited or non-existent.

**Questions # 30 - # 33: Weather**

Respondents were asked about their possible involvement in a future program. Initially they were asked about their expected participation under weather conditions that were similar to the test period. Would they offer the same MW capacity and what is the minimum offer they would accept? Then they were asked about their participation under extremely cold weather conditions, and if they provide more capacity if the price were higher. Finally, they were asked if they could participate for consecutive days in extremely cold weather conditions.

**Same Weather.** Most respondents could not say that they could offer the same capacity for a future program, and likewise they could not address the price issue. There are many variables that go into the decision to participate. For those who shed load, the condition of their equipment is a factor as is the demand for their product. If the demand and price for their product were high, they would limit or not shed or generate the power. Instead they would produce their product. For generators the price of fuel plays an important role. For some, their willingness to provide the load is not price dependent, but other factors, such as
fitting into a maintenance schedule, are more important. For the most part, participants thought that $130 -$150 per MW incentive was about right.

**Extremely Cold Weather.** The participants were mixed in their willingness to provide capacity in extremely cold weather. More said they could not provide the same level of capacity. None indicated that they could provide more capacity. One generator was concerned about fuel price. They believe that if fuel prices were high, they would not be able to recoup their expenses. Others had fixed fuel prices, so fuel price would not be the issue. One respondent could provide generation, but they are also responsible for maintaining their own distribution system. They indicated that with extremely cold weather, transmission line maintenance increases and maintaining the integrity of their own transmission lines is more important than running their generators under this program.

**Question # 34: Consecutive Days**

When asked if they could provide the capacity for two or more consecutive days in extremely cold weather, the responses were mixed. Two could provide the capacity for unlimited duration and two said they would not be able to do so. The reason given by one is that their generator testing would be completed during the first day and they don’t intend to run their generators beyond the testing for maintenance requirements. The other had a concern that their operations would freeze if they shut down, and as such, would not curtail their load for an extended period of time.

**Question # 35: Notice to Respond**

When asked how much notice they need to respond to an offer and how much notice they need to provide the capacity to BPA, the responses varied. One stated that a week’s notice is preferred and another said two hours notice to provide the capacity is good. Two indicated that 24 hours is preferred.

**Question # 36: Call Option**

The respondents were asked about an alternative approach where BPA would purchase from them the right to curtail load when certain conditions exist. The curtailment would be for a predetermined amount of capacity, within a predetermined amount of notice, for a predetermined maximum amount of time. Payment would be made for being on call to provide the capacity, and another payment would be made for actual offered and delivered capacity. Respondents were asked if this approach would work for their company, if it would be a preferred approach, or if the existing approach is preferred.

One participant thought the approach would not work for their organization. The others would consider the alternative approach, but the current approach is preferred. One indicated that the current approach is preferred because it is voluntary. However, if a link to the price
of gas was included they could consider the new approach. Internal corporate/organizational concerns were also cited. The respondents cited concerns with presenting these alternative approaches to upper management, and also indicated that participation may be dependant upon the overall organization workload.

**Question #37 (Navy Only): Navy Gas Line**

The U.S. Navy was asked under what circumstances it would consider bringing in a gas line. They responded that they currently couldn’t comment. This form of request would need to be submitted and the outcome would be dependent in part, by who was in command at the time the information was presented.

**Question #38 (Mason PUD Only): Lost Revenues**

The Mason PUD #3 was asked if lost revenues and reduced load that could result if their ratepayers participated in this program in the future, is a concern. They indicated that while they understood the need for such a program, the degree of participation would influence their level of concern. Greater participation levels increase their concern.

**Non-Participant Survey Results**

Five non-participants were personally interviewed with a non-participants interview guide to understand if they would consider the program and if they had concerns or issues about the program. The results of those discussions are presented below in the order the questions were asked in the interviews, and are labeled accordingly. Responses were grouped when the questions addressed a specific concept. A summary is presented at the end of the Results Section.

**Question #1: Would You Participate?**

When asked if they would consider participating in a program such as this, four of the five respondents said they might be willing to consider it. Their potential interest in participating is dependent on needing to learn more about the program details and once knowing more, seeing if management is interested. One of the respondents indicated that participation could come only at a high price.

**Questions #2 and #3: Available Load and Amount of Load for this Program**

Each of the respondents indicated that they could generate power or shed load for this program if they participated. Further, each said they could meet the 1 MW thresholds with the lowest amount being 1.5 MW. As a group, the non-participant respondents said they could provide approximately 7 MW of capacity for this program.
Question #4: Duration of Load

The responses varied from hours to days. Typically if the non-participant is a generator, they can generate power for an extended period. However, if they shed load there are other factors, such as product demand, that decreases the potential duration of their offer.

Question #5 and #6: Incentive Required to Participate?

The non-participants did not know the amount of incentive they would need to participate. Often they are not aware of their exact operating or fuel costs and therefore cannot give an educated estimate. In order to do so, they would need time to complete an analysis to determine what incentive they would require.

Question #7: Extremely Cold Weather

All non-participants indicated that they would be able to provide the same level of load at the same price during extremely cold weather. However, this may be an uninformed answer, as they have not considered the incentive level they would require to participate and they may not have considered the impact extremely cold weather would have on operations.

Question #8: Consecutive Days

Non-participants stated that they could provide the same level of load at the same price for consecutive days. Additionally, one non-participant stated that they could increase the load offered by 5 MW as they would likely shut down their plant thereby taking it completely off line and making the line capacity available to the system. However, as with their responses to the previous questions, the respondents were not knowledgeable about many key aspects that would determine program participation.

Question #9: Call Option

Non-participants had mixed feelings about the call option. Some indicated no interest in receiving a call, while others were concerned with the details. However, some liked the concept because payment of the call option could generate an income stream.

Concern was expressed by several of the respondents that they already participate in other conservation and load reduction efforts and because of this, there is little load available for shedding. One stated that they thought the “devil was in the details” and would need to work through all those details in order to determine if it made sense for them.

Question #10: Issues or Concerns

There were several internal organizational issues and concerns mentioned by the non-participants. Following are some of their concerns and/or perceptions:
Participation as a generator in a program such as this may cause unwanted wear and tear on their generators leading to potential generator failure.

One organization thought the program could become overly complex and was apprehensive about levels of administration both within the PUD and within BPA.

There is concern surrounding the effectiveness and reliability of the plant equipment in cold weather as it is being shut down and then brought back on-line.

Who would own the generated power and would the utility be billed for it?

One organization indicated that the current program they plan on running operates on an ongoing basis. Therefore, there could be no further reduction available, as they would have already reduced base load.

The utility interviewed noted that lost revenues is not an issue for them unless the lost revenues become large. They further went on to state that in an emergency situation it would also not be an issue.

Summary

BPA Interview Summary

BPA staff was helpful in providing detailed information about the program and its operations. Most areas provided questions to include in the interview guide, and it was helpful to have their perspective in mind when conducting the interviews. Many offered observations that were confirmed in the interviews.

Most felt that the program went well and that it was easier than expected. Several departments had limited involvement and need for the information generated by the program. They also stated that poor communication and lack of time created difficulties in implementing the program. The Munro Dispatch Center would like to keep its involvement to a minimum, and prefers to simply respond to either a notification by the program manager or alarms triggered by preset algorithms.

Itron reached the following conclusions.

- Multiple individuals stated that lack of time and poor communications created issues in this program; both of these areas would be areas to focus on in future efforts.

- Customers did not understand that mechanical failure was one justification for non-delivery; participants need to be better educated about this aspect of the program.

- A back up notification system needs to be developed for participants; some did not receive the notification and could not bid on an event.
A decision about who triggers an event is required. The Munro Dispatch center indicated that either the program manager should trigger an event or algorithms should be established that would trigger the event.

A decision about whether the data from this program should be further developed for other areas within BPA. There is limited need for the data from this program for the other areas, but one area, Load Forecasting, requires detailed utility specific data. The Demand Reduction Pilot program data may require data enhancement, and the benefits would have to be weighed.

**Participant Summary**

Survey respondents were aware of other programs. For this program they were concerned about a negative financial impact, penalty clauses for non performance, an obligation to deliver capacity regardless of circumstances (this was a misperception about the program), an inability to respond to an event because of previously reduced load, and the fear that the program would be too complex and would require too much effort on their part.

The respondents thought the program was well run, easy to participate in, and they were very happy with the efforts of BPA staff. Many explicitly said that BPA staff was great to work with. Most felt that involvement in the events was easy. Respondents did not participate for a variety of reasons most of which were resolved by the end of the pilot.

However, three issues remain that should be addressed if the program is to continue. 1. Equipment difficulties about which BPA has no influence, 2. Reduced load making further reduction difficult, it is possible that the organization could fine tune their operations and still be able to provide capacity for BPA, 3. Conservative bids so as to not over commit, BPA could work with these customers to better understand their loads and abilities. Generally when respondents bid differently for different events, they had good justification for doing so. Given that this was a pilot, variations would be expected. In an ongoing program the variability should decrease as participants become used to the system and the program. Respondents felt that this program was easy to participate in. Issues were typically due to internal participant factors.

The respondents felt the process, procedures and training were adequate, and that it was easy to participate, respondents especially liked the BPA staff flexibility. However, respondents had issues with the e-mail notification timing. Two hours is not enough response time, they reported that they need three to four hours.

They also reported that the program was efficient, well described, and most are glad they participated. This program provides benefits to both parties, and is a unique and forward-looking program. The respondents recommend that others consider participation and noted that the benefits are site specific, which is why they recommend that others consider it.

**Results and Conclusions**

3-37
Most respondents did not like the one-hour event because it is too costly with too little reward, and because the systems typically operate better if run continuously they hesitate to either shut down the load or start the generation. Most respondents preferred four-hour events or longer ones. They also prefer more lead-time, certainty of an event, compensation for additional capacity, a change in the timing of the notification, and a longer response time.

Respondents felt that the contracts adequately addressed their concerns; otherwise they would not have signed them. They also felt that BPA staff was easy to work with in developing the contracts. One respondent noted that the contracts were not sent in marked mode, which they would have preferred.

Respondents noted many benefits from the program. They gained financial benefit, an opportunity to be paid for the maintenance work they would do anyway, an opportunity to operate their generator, an opportunity to understand BPA operations better, an opportunity to work with BPA, and an opportunity to help BPA. Universally they thought that BPA gained an option to offset peak demand and thereby delay upgrading the transmission system on the Olympic Peninsula.

When asked if they would participate if the program were an ongoing program, most said they would participate at their current level of capacity and in the current program design. However, they also indicated that under the same weather conditions they could not say how much capacity they would offer due to the many variables involved. They indicated that their willingness to participate is not price dependent; rather it depends on product demand or their current maintenance schedules. However, they believe that an incentive of $130 - $150 per MW is about the right price. For extremely cold weather they gave mixed responses. None said that they could provide more capacity, some said they could provide the same capacity and others said they couldn’t provide any capacity. The ability to provide capacity on consecutive days is dependent on factors internal to the company. When asked about the notice they require the responses varied. Some prefer a week to respond while others prefer two hours. They said they would consider the call option and one wanted to link the price to the gas price.

The Navy was asked if they would extend a gas line to the bases, and they could not comment on that at the time.

Mason PUD #3 was asked if Lost Revenues is an issue for them. They said it depends on the degree of participation and resulting amount of lost revenue.
Participant Conclusions

Respondents were forthcoming with their responses, attitudes, and suggestions for improvement. They were asked to be candid, and they were. The following conclusions are grouped into general comments, suggested operational changes, and suggested programmatic changes.

General Comments

Organizations participate, but it is generally an individual who makes the decision. The key in expanding the program will be to find the one individual in each new organization that is predisposed to participate and establish a relationship with them. Most participants thought that BPA program staff was easy to work with and this is a strength that should be capitalized on.

Price was a difficult area to answer. Respondents thought that $130 - $150 per MW was about right. However, the respondents have not really thought about it and do not appear to be including all the parameters in their estimation.

Suggested Operational Changes

The operational changes can be grouped into education, and changes to the event process to improve the program. These are listed below.

Education

One of the biggest operational changes recommended for the Demand Reduction Program is to develop an education curriculum about the program, how it works and how to participate. Several of the respondents concerns were due to a lack of understanding on how the program operated. Yet when asked, respondents felt they were well informed. For example some did not bid because they feared they would not cover their costs yet they could have provided a counter bid. Another misunderstanding that could have been alleviated by better education was a customer who did not bid because of fear of non-delivery due to mechanical problems. Yet this is an acceptable reason for non-delivery. An education effort should cover the following areas:

- The counter offer,
- Acceptable reasons for non delivery,
- How to anticipate an event,
- Generator use and maintenance to increase generator lifetime,
- Capacity offering to maximize payment and minimize uncompensated capacity delivery,
- Program training for multiple staff people within an organization.

**Event Process Changes**

Participants also offered insights on how to change the event process to achieve better participation:

- Lengthen the two-hour event notification response time to 3 or 4 hours.
- Change the timing of the notification, 8:00 AM was too early 10:00 or 1:00 would be better.
- Offer advance notice of events.
- Make reminder calls about an event.
- Add a pager system to the email notification system.
- Make the events four hours long or longer, 1 hour is too short.
- Pay for additional delivered capacity on a prorated basis

Participants went on to offer advice about programmatic changes. These are listed below:

- Provide a schedule of when events will be called.
- Provide certainty about when events will be called and how many will be called.
- If the Call Option is implemented add a fuel price escalator.
- Create a tiered program that offers different payment levels based on the amount of notice. For example provide one-week advance notice, 24-hour notice, and 2-hour notice.

**Non-Participant Summary**

Most non-participant survey respondents said they would consider participating, but they needed more information to make the decision. The respondents who said they could participate also felt they could meet the 1 MW threshold, and as a group they thought they could provide approximately 7 MW of capacity. The duration of this capacity varied. Generators indicated they could provide the capacity for extended periods of time, while load shedders preferred shorter durations. Load shedders have many factors affecting their load-shed duration. Respondents could not give an estimate of what incentive they required without further review of the program and of their systems.

Furthermore, respondents thought they could provide the same capacity at the same price in extremely cold weather. However, we believe they may be making an uninformed statement. If they have not considered the price, it is unlikely that they have considered the entire
impact during extremely cold weather; however they do know their operations. Respondents went on to state that they can provide the same capacity at the same price for consecutive days during extremely cold weather, and one felt that they could increase the capacity offered because they would shut down the plant. They had mixed feeling about the call option, it is clear that they need to understand the details of this proposed approach. Note, however that some liked the option because it created an income potential.

Respondents do have concerns about the program. They are concerned that running the generators could degrade their equipment and that if they allow their operations to stop they may not get the systems running again. In some cases they may have already reduced their load and would not be able to shed load further for the program. They were also concerned that the program would be a very complex one. One utility was concerned about who owns the capacity and if they would be billed for that capacity, regardless of the fact that the capacity was created for the Demand Reduction Program.

Non-Participant Conclusions

The non-participant respondents were willing to consider participating in the program and had enough load to contribute to the program to overcome the 1 MW threshold. The respondents do need more education about the program and how it works but in concept they liked it. Non-participants are undecided about the call option; it is certainly worth more exploration and explanation.

3.4 Results and Conclusions – Contract Analysis

The evaluation team’s review concludes that the Demand Reduction Pilot Program contracts are adequate. The BPA contracts include the majority of the elements of the contracts reviewed. However, if the contracts are to be revised the following elements should be considered.

- Have participants pay for the cost of the metering equipment or make them guarantee they will stay in the program for a minimum length of time.
- Increase non-performance penalties to ensure delivery.
- Have the customer provide the compliance data to BPA for settlement.
- Set up escrow accounts from which to withdraw the penalties.

3.5 Results and Conclusions – Price Curve

One of the requested elements is a price curve that shows limits, constraints and strike price ranges to participation. Based on the results obtained in the interviews any curve developed
here would have little meaning. There were too few respondents to make the results transferable and responses given were not based on fact or empirical data. The respondents don’t have enough information about the program and in some cases about their operations to make informed statements about prices. They admitted as much in the interviews. Typically, respondents stated that they had not thought about it. They did say that $130 to $150 seemed about right with a lower limit is about $120 for generation. With out more responses and more informed responses any resulting price curve is inaccurate.
Hello, thank you for talking with me. Let me give you an overview of what we are going to be talking about today. My firm, Itron, has been hired to evaluate the TBL Olympic Peninsula Demand Reduction Pilot Program for the Bonneville Power Administration. I am going to be asking you about your involvement in this program so that I can make an assessment about how well or poorly the program went and provide feedback to Bonneville as to how they might improve the program.

Your answers are very important both to me and to Bonneville and I ask that you be candid and frank. If you request, I will keep your responses confidential, and only report aggregated data. One of the goals in doing this evaluation is to improve the program. Without candid answers it will be difficult to make the program the best that it can be. Bonneville is looking to expand the program and this information will be used to help them do that. So thank you in advance for your time and openness.

**General Information:**

1. Are you aware of any other programs similar to the Bonneville Demand Reduction Pilot Program, either in the PNW or elsewhere?
   
   Yes _____    No _____
   
   If yes, can you describe that other program?
   
   ______________________________________________________
   
   ______________________________________________________
   
   Did your firm/organization participate in that other program?
   
   Yes _____    No _____

   *Now I am going to be asking you about your decision to participate in the Bonneville program in general.*

2. Were there elements that made you consider not participating in the BPA pilot program?
   
   Yes _____    No _____
   
   If yes what were they?____________________________________________________
3. Did BPA do a good job of working through these elements with you?
   Yes _____    No _____

   What did they do, can you describe some examples?
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

4. I understand you participated in the demand reduction program on the following dates with the following bids and subsequent reductions. (see summary)

5. On a scale of 1-10, how would you characterize your firm’s involvement on each of these days (1=difficult and 10=easy)?
   a. Tuesday 3/16/2004: ______
   c. Tuesday 3/23/2004:  ______
   d. Wednesday 3/31/2004  ______

6. (ask if applicable) Why did you participate on certain days but not others?
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

7. (ask if applicable) Why did you bid different amounts on different days?
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

8. Was there any specific issue that made participation difficult?
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________
9. Was there any specific issue that made participation easy?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

10. Were the procedures of the program adequate to prepare you for what happened? Yes _____ No ____

If No, what was missing?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

11. Was it easy to participate in an event?
Yes _____ No ____

If No, what was it that made it difficult?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

12. Was the email notification signaling an event an adequate means of being informed about a forthcoming event? Yes _____ No ____

If No, why?

________________________________________________________________________
________________________________________________________________________

If No, what would have been a better notification mechanism?

________________________________________________________________________
________________________________________________________________________

13. Was 2 hours enough time to respond to an offer BPA made to you to either generate load or shed load? Yes _____ No ____

If No, why not?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
14. Did you think the Demand Exchange processes worked efficiently?  
   Yes _____  No ____
   Why?
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

15. Is your understanding of the program the same now as when you signed up?  
   Yes _____  No ____
   If No, what is different?
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

16. Are you glad you participated in the demand Reduction pilot program  
   Yes _____  No ____
   Can you talk about why (both positive and negative)?
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

17. Would you recommend that others participate?  
   Yes _____  No ____
   Can you talk about your reasons?
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________
   What elements stand out?
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________
18. Tell me about your participation in the 1 hour event. Was your willingness to participate based on the fact that it only lasted an hour?
   Yes _____    No _____

Was your willingness to participate decreased because it was only an hour?
   Yes _____    No _____

Would you prefer participating in a 4 hour event?
   Yes _____    No _____

Reasons:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

19. Can you tell me about the difference, from an operational perspective, between a 1 hour and a 4 hour event and if it made a difference to you?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

20. Do you have suggestions for improving or modifying this program if it were expanded to a permanent program?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Now I am going to talk about contracting and how that process went

21. Were you happy with the contracts?
   Yes _____    No _____

Can you talk about this?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
22. Were the contracts adequate in protecting your interests?  
Yes _____    No ____
Can you talk about it?
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

23. Were you happy with the contracting process?  
Yes _____    No ____
Can you elaborate? (Probe – professional, helpful, knowledgeable, timely, rigid)
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

24. How was BPA to work with in developing the contracts?  
Can you describe what was easy and hard about it?
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

25. Did BPA address your concerns adequately 
Yes _____    No ____
If No, what was not addressed fully?
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

26. Was BPA staff easy to work with 
Yes _____    No ____
Can you talk about what they did well?
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
Can you talk about some of the difficulties?
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
Now let’s talk about benefits you got from participating in the program and your thoughts about future participation

27. Can you tell me about the benefits you got from participating in this pilot program?

________________________________________________________________

________________________________________________________________

________________________________________________________________

28. From your perspective what value does BPA get from the program?

________________________________________________________________

________________________________________________________________

________________________________________________________________

29. If this program changed from a pilot effort to a permanent program, would you participate?
   a. Yes, at the current level of participation _____
   b. Yes, at a higher level of participation _____
   c. Yes, at a reduced level of participation _____
   d. No _____
   e. Don’t know _____

If No, what are the reasons for not participating?

________________________________________________________________

________________________________________________________________

________________________________________________________________

If Yes, what makes it possible for you to participate at higher levels?

________________________________________________________________

________________________________________________________________

________________________________________________________________

Now I would like for you to look into the future and talk about what you might do in a future program. We will be talking about different weather conditions and different amounts of capacity that you could offer.

30. Under weather conditions similar to what occurred during the test period, what would be the minimum offer/bid you would accept? (for about the same amount of capacity) (unprompted)
   a. $90 _____
   b. $100 _____
   c. $120 _____
   d. $150 _____
   e. Other _____
   f. Don’t know _____

Appendix A: Participant Interview Guides
Now we will shift the focus to extremely cold weather scenarios.

31. Under extremely cold weather conditions, what would be the minimum offer/bid you would accept? (for about the same amount of capacity) *(unprompted)*
   
   a. $90
   b. $100
   c. $120
   d. $150
   e. Other
   f. Don’t know

32. Under extremely cold weather conditions, what would be the minimum offer/bid you would accept to provide ...? *(unprompted)*
   
   25% more capacity ... 50% more capacity ...
   
   a. $90
   b. $100
   c. $120
   d. $150
   e. Other
   f. Unable to do
   g. Don’t know

33. *[for those who indicated they could provide 50% more capacity in Q 32]*
   Under extremely cold weather conditions, could you provide even more than 50% greater capacity? *(unprompted)*
   
   a. Yes, for about the same price amount % more
   b. Yes, for a higher price amount % more
   c. No
   d. Don’t know

34. If the program required participation for two or more consecutive days during extremely cold weather, could you participate?
   
   a. Yes maximum number of days
   b. No
   c. Don’t know

   If No, what are the reasons that you couldn’t participate for consecutive days?
   
   ____________________________________________________
   ____________________________________________________
   ____________________________________________________
35. How much notice do you need to respond to a bid or to provide load reduction for a specific event? [unprompted]
   a. Two hours or less _____
   b. More than two but less than 24 _____
   c. 24 hours _____
   d. More than 24 hours _____
   e. Don’t know _____

Now I would like for you to ask you about a potential alternative program structure being considered.  BPA would purchase from you the RIGHT to curtail your load when certain conditions exist by a predetermined amount with a predetermined amount of notice for a predetermined maximum amount of time. Payment would be made for being on call to shed, and another payment for any actual loads that were required to be shed.

36. Do you think this approach could work for your company? [unprompted]
   a. Yes, likely a preferred approach _____
   b. Yes, would work about the same as the current pilot _____
   c. Yes, but prefer the current approach _____
   d. No _____
   e. Don’t know _____

If answered “c”, or “d”, why do you prefer the current approach?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Then next question is for the Navy only

37. "Under what circumstances would the Navy consider bringing in a gas line?"
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Then next question is for Mason PUD #3 only

38. Is lost revenues a concern for you. If your customers were reducing load would it be an issue?
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
Appendix B

Non-Participant Interview Guide
Non-Participant Interview Question Topics

Non-Participant Interview Guide

Hi my name is Ulrike Mengelberg, of Itron, a private consulting firm. Itron has been hired by BPA to evaluate their Transmission Business Line Olympic Peninsula Demand Reduction Pilot. This pilot supports BPA’s Non-Wires Solutions program. BPA ran the pilot this spring when customers were asked to respond to several offers to voluntarily reduce load or provide on-site generation in an effort to reduce system peak loads. In return for participation, a payment was made for each MW reduced or generated. Participation in each event was voluntary with the participant given the option to either choose to accept the offer, counter the offer with regard to the size of the reduction or price for it, or reject the offer.

I would like to talk to you about this program, get your input, and see if this is something you might be interested in the future. May I tell you more about the program?

1. Is this type of program something in which your firm would consider participating?
   a. Yes _____
   b. No _____
   c. Don’t know _____

   If no, what are your concerns about this program?
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

2. Does your firm have any load you could shed or back up generation you could use in a program like this?
   a. Yes _____
   b. No _____
   c. Don’t know _____

   [If NO to Q2, End Survey and Thank Respondent]

3. How much load?
   a. Shed _____ MW
   b. Generate _____ MW
   c. Don’t know _____

4. How long could you shed load or generate?

Appendix B: Non-Participant Interview Guide

B-2
a. Shed _____ Hours  
b. Generate _____ hours  
c. Don’t know _____ 

6. What incentive price per MW would BPA need to provide for your firm to participate?  
   *(unprompted select cost categories later after seeing the responses)*  
   a. $90 ____  
   b. $100 ____  
   c. $120 ____  
   d. $150 ____  
   e. Other ____  
   f. Don’t know _____ 

7. If the incentive price were 25% higher than your minimum price you just mentioned, could you provide even greater levels of load shedding and/or generation?  
   a. Yes _____ % more _____%  
   b. No ____  
   c. Don’t know _____ 

8. If the program were primarily implemented only during extremely cold weather conditions, would your firm still consider participating? And would the load level and price be different?  

9.  
   a. Yes, at same level of load and price _____  
   b. Yes, with load change but same price _____,  
      with more load _____% or, less load _____%  
   c. Yes, with load change and % higher price _____%,  
      with more load _____% or less load _____%  
   d. No _____  
   e. Don’t know _____ 

If no what are your concerns?  

_________________________________________________________________________  
_________________________________________________________________________  
_________________________________________________________________________  

Appendix B: Non-Participant Interview Guide
10. If the program included the possibility of consecutive days of participation during extremely cold weather conditions, would your firm still consider participating? And would the load level and price be different?
   a. Yes, at same level of load and price _____
   b. Yes, with load change but same price _____,
      with more load _____% or, less load _____%
   c. Yes, with load change and % higher price _____%,
      with more load _____% or less load _____%
   d. No _____
   e. Don’t know _____

   If no what are your concerns?
   ____________________________________________
   ____________________________________________
   ____________________________________________

Now I would like for you to ask you about a potential alternative program structure being considered. BPA would purchase from you the right to curtail your load when certain conditions exist by a predetermined amount with a predetermined amount of notice for a predetermined maximum amount of time. Payments would be made for being in the program and additional payments would be made if the load reductions were actually required.

11. Do you think this approach could work for your company? [unprompted]
   a. Yes, likely a preferred approach _____
   b. Yes, would work about the same as the pilot described _____
   c. Yes, but prefer the described pilot approach _____
   d. No _____
   e. Don’t know _____

   If answered “c” or “d” Why do you prefer the described pilot (voluntary each time) approach?
   ____________________________________________
   ____________________________________________
   ____________________________________________

   If answered “a” Why do you prefer the prepaid but required reduction approach?
   ____________________________________________
   ____________________________________________
   ____________________________________________
12. Are there program or BPA issues related to this program that concern you?
   a. Yes _____
   b. No _____
   c. Don’t Know _____

If yes what are your concerns?

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________