

**~~BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH~~**

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~~In The Matter Of The Petition Of US )  
Magnesium LLC For Determination )  
of Long Term Economic ) Docket No. 03-035-19  
Development Rates and Conditions )  
of Interruptible Service ) Direct Testimony of Bruce W.  
Griswold~~

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**AUGUST 2004**

~~DIRECT TESTIMONY~~

~~OF~~

~~BRUCE W. GRISWOLD~~

~~August 20, 2004~~

1 **Q. Please state your name, business address and position with PacifiCorp dba Utah**  
2 **Power & Light Company (the Company).**

3 A. My name is Bruce W. Griswold. My business address is 825 N. E. Multnomah, Suite  
4 600, Portland, Oregon 97232. I am a Manager in the Origination section of the  
5 Company's Commercial and Trading Department.

6 **Qualifications**

7 **Q. Please briefly describe your education and business experience.**

8 A. I have a B.S. and M.S. degree in Agricultural Engineering from Montana State and  
9 Oregon State, respectively. I have been employed with PacifiCorp over eighteen  
10 years in various positions of responsibility in retail energy services, engineering,  
11 marketing and wholesale energy services. I have also worked in private industry and  
12 with an environmental firm as a project engineer. I currently work in the Commercial  
13 and Trading Business unit of PacifiCorp. My responsibilities are wholesale and large  
14 retail transactions including the negotiation and management of the non-tariff power  
15 supply and resource acquisition agreements with PacifiCorp's largest retail customers.

16 **Q. Have you previously appeared in any regulatory proceedings?**

17 A. Yes. I have appeared in proceedings in Utah and Idaho.

18 **Purpose of Testimony**

19 **Q. What is the purpose of your testimony?**

20 A. I will provide testimony to explain and clarify the costs and appropriate terms and  
21 conditions for acquiring interruptibility or curtailment as a power supply resource. I  
22 will describe how operating reserves and other interruptible products interact with  
23 each other and what changes are occurring on operating reserves that may affect a

1 long-term agreement for operating reserves. I will specifically respond to US  
2 Magnesium's ("US Mag") proposed terms and conditions of interruptibility as  
3 presented by Mr. Roger Swenson in his direct testimony.

#### 4 **Interruptible or Curtailment Products and Terms**

5 **Q. What interruptible or curtailment products provided by retail customers have**  
6 **the most value to PacifiCorp?**

7 A. There is a wide range of interruptible or curtailment products that the Company has  
8 purchased or proposes to purchase from its retail customers. I have summarized those  
9 products in the table in Exhibit [No. UP&L\\_\\_ \(BWG-1\)](#). This table contains a general  
10 description of the product and various characteristics that affect how the product is  
11 delivered which in turn influences the value of the product to PacifiCorp and the  
12 resulting price PacifiCorp is willing to pay to acquire the product for the benefit of  
13 our customers. These characteristics include notice time, duration of the interruption,  
14 amount, buy-through provision, etc. Our experience is that these products can be  
15 categorized as interruptible if PacifiCorp has the right as an option, to dispatch the  
16 interruption. There is a category of these curtailment products that is less firm than  
17 others in that customers has an option to buy through the curtailment period. Because  
18 of the customer held option for buy-through, we cannot plan for that customer load  
19 being gone. This requires the Company to continue to plan to meet the load  
20 requirements of the customer including the need to hold operating reserves on the  
21 customer's load. So in the case of the curtailment product with buy-through, the  
22 customer's load is continued to be planned for as a firm load and our obligation to  
23 serve the customer through the buy-through period continues at the contractual

1 structure, usually an agreed market price shaped to the hours of requested curtailment.

2 **Q. How is the US Mag load treated for planning purposes in the current contract?**

3 A. The current contract provides US Mag with a buy-through option when the Company  
4 exercises its option to interrupt. This requires the Company to continue to plan to  
5 serve the US Mag load and therefore it is included in the Company's firm load  
6 requirements and service obligations. This includes the cost of holding reserves for  
7 US Mag's load during the "curtailment period".

8 **Q. How are the costs to acquire these interruptible or curtailment products**  
9 **developed?**

10 A. Because of the wide variation in characteristics, we price these options based on our  
11 alternative – the cost of acquiring them from other counterparties in the wholesale  
12 market or in the case of non-spin operating reserves, not holding them on our own  
13 facilities.

14 **Q. Can interruptible and curtailment products be combined at the individual**  
15 **customer level?**

16 A. Yes, however a number of these products have characteristics that do not allow them  
17 to be held simultaneously on the same load. For example, non-spin operating reserves  
18 and economic curtailment can not be held on the same load for the same period. The  
19 Western Electricity Coordinating Council ("WECC") criteria for non-spin operating  
20 reserves requires the load to be operating, available for interruption within the ten  
21 minute period, and then return to non-contingency mode within the hour after  
22 interruption. If the same load is notified by the Company for economic curtailment,  
23 then it is removed from the load and not available to be interrupted for operating

1 reserves. This issue can be addressed by holding different loads for reserves and  
2 curtailment or holding them during different time periods. In many cases this ~~may~~  
3 will diminish the value of each option.

4 **Q. What are the current conditions or WECC requirements regarding operating**  
5 **reserves that allow retail customers to provide reserves to PacifiCorp today?**

6 A. There are six basic reliability services provided from generation (and sometimes  
7 load), regardless of regulatory environment, market structure, or organizational  
8 framework, to ensure system reliability. Some of the generation services are used to  
9 achieve generation and load balance, for maintaining stability and frequency within  
10 defined limits. These services are regulation, load following, and contingency  
11 reserve. Other services are used to maintain a secure transmission network including  
12 reactive supply from generation sources and frequency response. Finally, services are  
13 used for emergency preparedness and restoration such as system black start capability.  
14 Each utility control area either acquires access to and/or operates resources to provide  
15 for a level of contingency reserve (spinning and non-spinning) sufficient to account  
16 for errors in load forecasting, generation loss, transmission unavailability, and  
17 regulating requirements. Three things happen following a contingency:

- 18 1. Frequency response will immediately begin to control the frequency deviation  
19 across the system.
- 20 2. Within the affected control area, resources providing regulation will begin to  
21 adjust outputs within seconds.
- 22 3. In addition, the control area may deploy, as needed, contingency reserves –  
23 spinning and non-spinning. These reserves are used to restore the pre-

1 contingency generation and demand balance, frequency response capacity, and  
2 regulation capacity.

3 Our historical and current operating reserve agreements with retail customers classify  
4 the operating reserves purchased from these retail customers as contingency reserves  
5 – non-spinning. These agreements allow us to utilize the interruption of load as an  
6 alternative to holding reserves on one of our own generation plants.

7 **Q. Has US Magnesium currently or in the past ever provided non-spin operating**  
8 **reserves to PacifiCorp?**

9 A. No. The Company has never had a contractual agreement with US Mag to provide  
10 non-spin reserves. While Mr. Swenson alludes that US Mag provides this resource to  
11 the Company, they do not nor has the Company ever utilized US Mag for non-spin  
12 reserves. The WECC has very stringent requirements for reserves and the Company  
13 can face penalties for not meeting reserve requirements.

14 **Q. What are capabilities that US Magnesium must have to be considered for**  
15 **providing non-spinning operating reserves?**

16 A. As with our other retail customers who are suppliers of contingency non-spin  
17 reserves, US Mag must meet the following requirements:

18 1. Available for redeployment after the pre-arranged elapsed time as specified by  
19 US Mag.

20 2. In response to the instructions from PacifiCorp, and subject to the declared  
21 capabilities of US Mag, US Mag would:

22 • Reduce specified loads within 7 minutes of a call from PacifiCorp  
23 requesting reserves.

- 1 • Maintain the stated amount of reserves for up to 60 minutes
- 2 subsequent to call.
- 3 • Return to the non-contingency consumption upon instructions from
- 4 PacifiCorp.
- 5 • Allow real-time telemetry of the real power output of each resource
- 6 providing reserves.
- 7 • Allow approved data communication service between US Mag's
- 8 control room and PacifiCorp.
- 9 • Allow approved voice communication service to provide both primary
- 10 and alternate voice communications between PacifiCorp and US
- 11 Mag's operator controlling the resource.

12 **Q. Is US Mag currently able to offer these capabilities?**

13 A. No, I do not believe they are completely set-up with protocol and procedures for  
14 providing reserves at this time. While they have interrupted as directed by the Company's  
15 Transmission function for system reliability, those interruptions are separate from  
16 contingency non-spin reserves and are done under separate protocol as controlled by  
17 Transmission. They stated they have the ability to shut their load off in the required time for  
18 reserves and bring it back upon our direction, but there has been no testing or protocol  
19 established for such a test with US Mag.

20  
21 **Q. How is the retail customer's load actually interrupted for non-spin reserves?**

22 A. The Company recognizes that the retail customer knows their own operation the best.  
23 Therefore, we allow the customer to control their interruption after our notification

1 and they have up to seven (7) minutes to reduce their load to the specified level. That  
2 communication is generally done using a dedicated phone line between the PacifiCorp  
3 generation desk and the customer control room. The communication between the  
4 Company and the customer is critical. A set written script is agreed by the Company  
5 and the customer and used in each instance of interruption for reserves. That way,  
6 there is minimal confusion since our generation desk is in the middle of recovering  
7 from a contingency and does not have time to discuss what is going on with the  
8 customer.

9 **Q. What happens if the customer does not comply with the directive to interrupt?**

10 A. There are two options depending on the Company's electrical system and  
11 interconnection with the Company. Physical interruption is required. In the first  
12 option, if the Company has the ability to remotely operate a breaker and interrupt the  
13 customer's specific load for reserves, the agreement with the customer allows us to  
14 disconnect the customer if non-compliance occurs on our initial directive. The  
15 second option is if the Company does not have the physical means to interrupt the  
16 customer. In that case, if the customer does not comply, there is a per incident penalty  
17 assessed the customer and after two non-compliance incidents, the customer is  
18 removed from operating reserves and compensation to the customer is stopped. This  
19 is the structure for Monsanto because of the electrical system configuration in  
20 southeast Idaho. They pay a per-incident penalty of \$150,000 and are removed after  
21 two such incidents.

22 **Q. Would such non-compliance terms apply to US Mag if they provided reserves.**

1 A. Yes. There would be a requirement in any contract where US Mag agreed to be  
2 interruptible for reserves either to be physically interrupted remotely by the Company  
3 or be subject to financial penalties. In the case of physical disconnect by the  
4 Company, US Mag would be responsible for ~~the any~~ cost associated with ~~any~~  
5 installing the necessary equipment to allow the Company to disconnect. In the case of  
6 financial penalties, the penalty clause would be included in the new agreement  
7 allowing two instances of non-compliance and then exclusion of US Mag from the  
8 Company's non-spin reserve resource with adjustment of compensation to US Mag.:

9 **Q. What changes do you see occurring that would cause PacifiCorp not to want to**  
10 **commit to a long term operating reserve agreement as part of a power supply**  
11 **agreement?**

12 A. Going forward, there have been proposed changes by WECC in their operating  
13 policies that could modify both the quantity and requirements of contingency  
14 reserves. These changes are still under review and not finalized however, the issue is  
15 type and quantity of reserve type required. It is still unknown what the final  
16 requirements will be regarding what amounts of contingency reserves will be required  
17 to be held within the WECC or if the WECC will require other types of reserves such  
18 as frequency response reserves to be increased. If the required volume of contingency  
19 reserves - non-spinning declines significantly then PacifiCorp could be exposed to the  
20 risk of holding a product that has little value. Although the proposed levels are still  
21 under evaluation, we anticipate that PacifiCorp could potentially meet its non-  
22 spinning reserves as a zero-cost option on our own resources. By zero-cost option, I

1 mean that the Company can use its own resources for reserves without purchases of  
2 additional reserves.

3 **Q. What will these changes do to long-term operating reserve agreements with**  
4 **retail customers?**

5 A. At this time, we are willing to move forward with operating reserves as part of an  
6 overall electric service arrangement; however, we are unwilling to accept the risk that  
7 the value of the reserves or the ability to utilize a customer such as US Mag in the  
8 reserve stack will continue unchanged. Therefore, we either need the ability to  
9 change the agreement based on the value of the product, shorten the term of the  
10 agreement to provide more certainty that our payment will match the value of the  
11 service that we receive, or have the option to convert the operating reserve agreement  
12 to another interruptible product of equivalent value to both parties.

13 **Q. Would this be a consideration in US Mag's request for a ten-year agreement?**

14 A. Yes. Our historical contract length with retail customers for non-spin operating  
15 reserves has been one to two years. We have recently extended that up to five years  
16 but our risk beyond that length of contract is considerable and we would require the  
17 ability to modify the agreement if the WECC changed our requirements on non-spin  
18 operating reserves.

19 **Value of Proposed Interruptible Terms**

20 **Q. What is your assessment of US Mag proposal for interruptibility as presented in**  
21 **Mr. Swenson's testimony?**

22  
23 A. First I will provide a simple analysis of the value (or discount to cost of service) Mr.

1 Swenson has determined that US Mag should receive for being interruptible. Mr.  
2 Swenson in his testimony outlines the US Mag's proposal which is very vague  
3 regarding interruptibility. My understanding of their proposal is that they are willing  
4 to be economically curtailed June through September and provide reserves all year.  
5 Mr. Swenson does not define what the specifics are; however, I have assumed for the  
6 purposes of this assessment, that US Mag wants a buy-through option for the summer  
7 interruptible component. As I indicated, Mr. Swenson also references providing non-  
8 spin operating reserves but he does not indicate how many hours, the plant load, etc. It  
9 is also unclear how US Mag would provide the two products from the plant load. His  
10 testimony seems to indicate that they would provide the reserves on top of the  
11 economic curtailment product from the same plant load and this would not be  
12 acceptable even with the buy-through option. As I explained earlier in my testimony,  
13 the WECC requires the load to be operating, available for interruption within the ten  
14 minute period, and then return to non-contingency mode within the hour after  
15 interruption. Therefore, the load targeted for economic curtailment could be removed  
16 from the operation during an actual curtailment and not available to be interrupted for  
17 operating reserves. This is outside the criteria established by the WECC. Please note  
18 that it does not preclude US Mag from providing both the curtailment and reserve  
19 product. They would need to hold each product on separate portions of their load or  
20 have the time periods ~~that they are~~ available to PacifiCorp be exclusive of each other.  
21 This is consistent with the contract structure currently in place with Monsanto in  
22 southeast Idaho. Monsanto has three (3) large electric furnaces. Two are  
23 contractually obligated to provide operating reserves and the third provides economic

1 curtailment with a buy-through option. Each load is mutually exclusive from a value  
2 and operational standpoint but contractually integrated so that the agreement reflects  
3 when each product can or cannot be used.

4 During the months of July and August US Mag has indicated they would be available  
5 for curtailment 4 hours per day on all week days. If you assume an average of four  
6 weeks per month, this would be a total of 80 hours per month in July and August.

7 During the months of June and September, the Company could curtail US Mag for a  
8 four-hour period during weekdays when the temperature is forecast to be greater than  
9 100°F. While it is unclear whether Mr. Swenson means all four hours must be over  
10 100°F or only any hour is over 100°F, to allow the Company to curtail, I have  
11 assumed any weekday when any hour is over 100°F. From a review of historical  
12 weather records, the probability of a weekday in June and September having a  
13 temperature exceeding 100°F is less than 0.1 percent or the less than 1 day per month.

14 So I have assumed that US Mag would be available to be curtailed an additional day  
15 each month or 8 hours total for June and September. Therefore the total hours of  
16 economic curtailment available to PacifiCorp in any year for June through September  
17 are approximately 168 hours. Second, Mr. Swenson indicates that they would provide  
18 reserves on the full load but not for contiguous hours or half the plant load on  
19 contiguous hours. Since we cannot hold reserves on the same plant load as that for  
20 economic curtailment, I assumed that US Mag would provide non-spin reserves in the  
21 eight (8) non-summer months. I also assumed that in those eight months, US Mag  
22 would provide their full plant load under the same conditions and limits that apply to  
23 the other retail customers currently providing reserves. These limits are:

- 1 • Any single day they must provide three (3) one-hour reserve
- 2 interruptions in any four (4) hour period
- 3 • A maximum of twelve (12) interruptions per month
- 4 • One hundred (100) interruptions per year.

5 Under these assumptions the total hours of curtailment and interruption are 268 hours  
6 per year or at a plant load of 85MW this equates to 22,780MWhs. For this number of  
7 hours, US Mag believes they should receive a discount from the cost of service as  
8 provided by Mr. Taylor of \$13 per MWh (\$34 per MWh minus \$21 per MWh).

9 Based on US Mag usage of 533,772 MWh as provided in Mr. Taylor's testimony, this  
10 equates to approximately \$6.9M per year. Assuming the Company interrupted every  
11 hour allowed at 85MW, the cost to the Company per MWh of interruption is \$300 per  
12 MWh. This is clearly unreasonable. In fact, the value they have placed on an hour of  
13 interruption is \$50 per MWh greater than the current FERC cap of \$250 per MWh for  
14 spot wholesale power purchases.

15 **Q. How would PacifiCorp value US Mag's proposal for interruptibility as**  
16 **presented in Mr. Swenson's testimony?**

17 A. The Company has always tried to accommodate a customer's ability to provide  
18 interruptible or curtailment products while not adversely impacting their ability to run  
19 their business. That being said, the Company also needs to treat that product like any  
20 other resource transaction and receive the full value of interruption for the limited  
21 hours provided and compensate the customer accordingly. From a commercial  
22 perspective, we would value the economic curtailment product against the next best  
23 alternative of purchasing the equivalent product in the market place. It is important to

1 point out that with the economic buy-through provision, the Company would continue  
2 to keep US Mag's load in its firm load planning requirements including reserves.  
3 Thus the Company's cost of holding those reserves for the US Mag load must be  
4 included in the economic curtailment analysis. Using the same assumptions presented  
5 above, I evaluated two economic curtailment products:

- 6 1. Economic curtailment with buy-through for July and August – 4 hours  
7 per weekday
- 8 2. Economic curtailment with buy-through for June and September – 4  
9 hours per weekday when forecast temperature exceeds 100°F

10 In conducting my evaluation, for illustrative purposes, I used a ten (10) year term on  
11 the agreement even though there are issues around a term of that length as I have  
12 previously described. The economic curtailment products have a buy-through  
13 provision that has an assumed trigger price of \$80 per MWh which is based on US  
14 Mag's current trigger price affecting when they chose buy-through or physically  
15 curtail. In other words, if the forecast Palo Verde hourly shaped price is greater \$80  
16 per MWh, US Mag would physically curtail. The summary numbers contained in this  
17 testimony are the averages for the ten-year period. For the first economic curtailment  
18 product the cost to the Company for July / August averages \$829,000 per year.

19 Exhibit [No. UP&L\\_\\_ \(BWG-2\)](#) summarizes the monthly calculations. The cost to the  
20 Company of the second economic curtailment product for June / September averages  
21 \$5,100 per year. Exhibit [No. UP&L\\_\\_ \(BWG-3\)](#) summarizes the monthly  
22 calculations.

23 The third product we evaluated was:

1  
2 3. Contingency non-spin operating reserves during eight non-summer  
3 months – 85MW same limits as other retail customers providing  
4 operating reserves.

5 The alternative to US Mag for the Company for non-spin operating reserves is to hold  
6 the reserve amount on our higher cost power plants. Therefore the Company would  
7 pay US Mag on the basis of being able to dispatch 85MW on our higher cost plant(s)  
8 when it is economic to do so. The cost to the Company for the third product of  
9 operating reserves in the non-summer months is approximately \$710,000 per year and  
10 Exhibit [No. UP&L \\_\\_\\_\(BVG-4\)](#) contains the monthly calculations.

11 **Q. What is the total cost to PacifiCorp for acquiring the interruptible or**  
12 **curtailment products proposed by US Mag?**

13 A. On an annual basis, the products would cost PacifiCorp approximately \$1,540,000 or  
14 in terms of a credit per MWh to US Mag against their firm cost of service, it would be  
15 in the range of \$3.00 per MWh based on the estimated annual usage of 533,772  
16 MWhs. Using Mr. Taylor’s firm cost of service of \$34.00 per MWh, US Mag’s net  
17 cost is \$31.00 per MWh.

18  
19 **Q. Are there issues related to the buy-through provisions?**

20 A. Yes, the load center along the Wasatch front (“Utah Bubble”) is understood to be a  
21 transmission constrained area. In other words, there could be times of day when the  
22 available transmission capacities may not be sufficient to bring additional resource  
23 purchases into Utah Bubble. In the event that such a constraint occurs, a customer

1 with a buy-through provision would still require the Company to deliver power as  
2 opposed to the customer physically curtailing and possibly relieving some of the  
3 transmission constraint.

4 **Q. Are there other issues in Mr. Swenson's testimony you would like to address?**

5 A. Yes. Mr. Swenson covers a number of methodologies for valuing curtailment and  
6 interruptibility that were presented in the Utah Interruptible Task Force Final Report  
7 dated June 28, 2004. One of the methodologies he points to is based on IRP  
8 decremented load analysis which focused on a 1 percent% load factor resource. It is  
9 important to distinguish that this 1 percent% load factor resource was meant to reflect  
10 the high value of the very limited hours that the Coolkeeper program captures when it  
11 dispatches load control on residential customers' air conditioning systems. This  
12 program reduces load for a very narrow window of hours...summer afternoons. The  
13 1 percent% load factor was set by the Company based on industry experience with  
14 similar load control programs. The intention of the analysis was not to provide a  
15 comparison to a peaking plant which has the ability to be dispatched at any time for  
16 any number of hours and even to sell in to the market when the price is high enough.

17 **Q. Are the site considerations to be considered with this contract?**

18 A. Yes. It should be noted that US Mag has an on-site generation plant that is a  
19 qualifying facility ("QF"). As a QF, the Company has an obligation to purchase the  
20 output of the QF. Currently, the load at the site is greater than the QF so that on a net  
21 basis, the Company delivers power to US Mag. In Mr. Swenson's testimony he has  
22 indicated that US Mag's load will be fully interruptible which means that at certain  
23 times when we have called for operating reserves and US Mag has physically

1 interrupted their load, there will be a net excess delivered to the Company in that  
2 hour. The Company has concerns regarding how the physical interaction occurs with  
3 the interruption and QF generation and also the contractual interaction between this  
4 power supply agreement and the QF agreement.

5



1

2 **Conclusion**

3 **Q. Based on your analysis what price do you support for US Magnesium?**

4 A. As a starting point for power delivered to US Mag, the \$34 per MWh based on the  
5 cost of service approach presented by Mr. Taylor should be used. Assuming that the  
6 two economic curtailment options with buy-through and the non-spin operating  
7 reserves are the interruptible / curtailment provisions to be included in the contract  
8 and the basic structure as presented in my testimony remains the same, I recommend a  
9 net contract price in the range of \$29 to \$31 per MWh. This is consistent with the net  
10 price recommended by Mr. Taylor in his analysis. I also recommend that going  
11 forward the US Mag contract price should be adjusted concurrent with price changes  
12 for other Utah customers with no favored ~~nations~~nation's clause.

13

14 **Q. Does this conclude your testimony?**

15 A. Yes it does.