

BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

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)

SURREBUTTAL TESTIMONY

OF

BRUCE W. GRISWOLD

November 12, 2004

1 **Q. Are you the same Bruce W. Griswold that filed direct, supplemental and**
2 **rebuttal testimony in this case?**

3 A. Yes I am.

4 **Purpose of Testimony**

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

6 A. I will comment on rebuttal testimony filed by US Magnesium (“US Mag”). I will
7 show how the current and proposed qualifying facility (“QF”) agreement provides a
8 hedge for the net effective power price of US Mag. I will also show that the actual
9 physical interruptions proposed as part of the US Mag’s power supply agreement are
10 substantially less than what US Mag has stated in their testimony.

11

12 **Q. What do you believe is the correct starting point for comparing price changes for**
13 **US Mag?**

14 A. While I believe that US Mag should be given the most reasonable rate, based on the
15 costs to service, I think it is necessary to correct some assertions made in the
16 testimony of Mr. Swenson and Mr. Brown. I have read both Mr. Swenson’s and Mr.
17 Brown’s rebuttal testimony and am very confused by the percentage increases to their
18 net power costs quoted in their testimony. Neither of them have provided any
19 exhibits with back-up calculations to support their assertions. PacifiCorp was also
20 unable to obtain that back-up information through the discovery process. I have
21 therefore been unable to verify or replicate their numbers. I believe that the year 2002
22 is the correct starting point for price change comparison for several reasons. . One
23 reason is that 2002 is the beginning of the first QF Contract between the Company

1 and US Mag. Prior to 2002, US Mag did not have a QF contract with PacifiCorp and
2 it is becoming apparent that US Mag has and will use their generation to hedge the
3 electric service agreement prices.

4
5 **Q. In your view, what is the net impact to US Mag based on PacifiCorp's proposal?**

6 A. Throughout Mr. Brown's and Mr. Swenson's testimony, they complain about huge
7 increases to their net effective power cost but they always fail to mention the benefit
8 of their on-site generation. If in fact, we are talking about "net" power cost at the
9 magnesium facility, then we must include the on-site generation. To date it has been
10 left out of the "net" power cost equation, although it is clearly a key option for US
11 Mag. The on-site generation has always been a key consideration of this contract as
12 stated by Mr. Larson in his testimony. To ignore its impact, is to ignore the full facts.
13 US Mag will use the on-site generation as a hedge against the price changes in the
14 power supply agreement and I will show how that clearly dampens any price changes.

15

16 **Q. What has changed for US Mag's generation?**

17 A. Historically, the only option US Mag had for the output of its generation was
18 to offset its own load. In fact, the 1968 interruptible agreement was
19 developed based on the fact that US Mag's predecessor could use their on-site
20 generation to supply their own load, thus qualifying to be interruptible. More
21 recently, US Mag's and its predecessors have options for their generation.
22 They could offset their own load to minimize their purchases, or they could
23 sell it to PacifiCorp or to the wholesale market, whichever provided the higher

1 price. I have not reviewed records prior to 2000-01 but at least in those years
2 they actually sold the output to the wholesale market, not to PacifiCorp.
3 Therefore, in those years, the Company was delivering power to US Mag,
4 including that power that could be offset by their generation, for prices in the
5 range of \$18.00 per MWh, as an “interruptible” customer while US Mag was
6 selling the output of their generation to the wholesale market at extremely
7 high market prices. This was a significant departure from the 1968 contract
8 that Mr. Brown discusses in this testimony..
9

10 **Q. What is the structure proposed for US Mag’s generation going forward?**

11 A. US Mag and the Company currently have a draft QF agreement before the
12 Commission in a separate docket. While there are two outstanding issues to be
13 resolved in that docket, it has been agreed between US Mag and PacifiCorp that US
14 Mag has the right, but not the obligation, to deliver non-firm power to PacifiCorp
15 from the QF and that PacifiCorp shall pay US Mag 93 percent of the hourly shaped
16 Palo Verde firm on or off-peak market price for all energy delivered. This is a very
17 similar structure to the current proposed QF agreement which runs from January 1,
18 2002 through December 31, 2004 in which US Mag sells non-firm power to
19 PacifiCorp.
20

21 **Q. Why is this important?**

22 A. With the proposed non-firm QF agreement, US Mag can continue to use the
23 generation to offset their own load, or sell to PacifiCorp. Thus, they have a hedge

1 depending on market prices to either financially offset replacement power which is
2 based on the same hourly scaled market prices, or reduce their market exposure by
3 offsetting load. More importantly, the initial purpose of the generation to provide
4 interruptibility as defined in the 1968 agreement has been circumvented to the
5 financial benefit of US Mag.

6 **Q. What is the impact of the QF hedge on net effective power cost to US Mag?**

7 A. In order to see the hedging effect, I have started with Exhibit UP&L_(BWG-1S) as
8 supplied in my supplemental testimony and first modified it to include the year 2001,
9 and then included the impact of the QF revenue based on the same market price
10 forecast as used in the replacement power. While I believe that the correct starting
11 point is 2002, I included 2001 so that we can see the impact as US Mag moved from
12 their old contract, to the current contract, to PacifiCorp's proposed agreements. I
13 would like to point out that during the years 2001-2002, US Mag was known as
14 Magnesium Corporation or MagCorp so while I talk about US Mag during those years
15 it is actually MagCorp, their predecessor.

16

17 **Q. Are there costs to US Mag associated with producing power from their QF?**

18 A. Yes. The US Mag QF is a cogeneration plant. In other words, they require thermal
19 energy in their process so they produce the thermal energy via the cogeneration
20 system and as a secondary product, they produce electrical energy. The rationale here
21 is simple. US Mag requires thermal energy in their process to produce magnesium
22 whether it is hot air or steam. Thus, even if no power were to be generated it still

1 requires the thermal energy. Therefore for a small incremental amount of thermal
2 energy over its process needs, US Mag can generate electric power very efficiently.

3

4 **Q. What percent of the thermal energy is attributed to power generation?**

5 A. Based on a 1997 energy study done by Linnhoff-March, a consulting firm, at US Mag
6 plant the estimated percentage of thermal energy attributed to power generation is
7 approximately 35 percent. In other words, for every 100 Btus of gas input to create
8 heat in the process, 35 Btus go to generate power. Additionally, a percentage of
9 variable O&M costs must be attributed to power generation. So if we can estimate
10 the revenue to US Mag from selling QF power, we can also estimate the cost of
11 generating that power and therefore the net cost or benefit of the QF power as it
12 impacts the overall net effective cost of power to US Mag.

13

14 **Q Please summarize the components that go into the overall net effective power
15 cost to US Mag.**

16 A. The following are the general power cost components that apply to US Mag:

- 17 1. Cost to US Mag for PSA cost of power delivered in \$ per MWh
- 18 2. Payment to US Mag for System Integrity in \$ per MWh
- 19 3. Payment to US Mag for July / August physical interruption over 100F in \$ per
20 MWh
- 21 4. Payment to US Mag for Non-Spin Operating Reserves through separate agreement
22 in \$ per kW-month
- 23 5. Cost to US Mag for replacement power in buy-through in \$ per MWh

1 6. Payment to US Mag for non-firm QF power in \$ per MWh

2 7. Cost to US Mag for generating QF power in \$ per MWh

3 In Mr. Swenson's testimony, he states that US Mag will incur lost production costs
4 due to physical interruption. I have not included that cost at this time because US
5 Mag has announced expansion of production capacity at the plant and therefore that
6 suggests they have excess capacity available to make up the lost production in other
7 hours. Secondly I will address later in my testimony the actual physical interruptions
8 and how they will most likely be less than proposed based on historical operating
9 reserve records. Using these seven components, I will show the estimated net effect
10 power cost impact to US Mag for the proposed contract and also how it changes for
11 the period 2001 through 2009, both with the QF impact and without the QF. I have
12 summarized our estimates of price changes in two charts in Exhibit UP&L_(BWG –
13 1R). First is the net effect power price without the QF impact which is shown on the
14 tab labeled "Net Effective Price Chart". The second tab labeled "Net Effective Price
15 Chart w QF" includes the QF impact. As noted in my supplemental testimony, these
16 are estimates and obviously dependent upon a number of factors; including the final
17 adjustment to Schedule 9 in PacifiCorp's rate cases, the changes in the forward price
18 curve for market prices, the projected forward price of natural gas, and US
19 Magnesium's projected usage over the term. I have not changed the starting
20 conditions for my analysis from my supplemental testimony. I did find a math error
21 in the original exhibit where the payment for operating reserves was treated as a cost
22 to US Mag so that has been corrected but the baseline assumptions remain the same. I

1 have added the following adjustments on the QF which are documented in Exhibit
2 UP&L_(BWG-1SR) tabs; “Existing QF” and “Proposed QF”:

- 3 • Variable O&M started at \$2.50 per MWh and escalated at 5% per year.
- 4 • QF power price is based on Palo Verde market prices and hourly shaped
5 exactly as the replacement power in the electric service agreement for buy-
6 through – Forward market price forecast for Palo Verde on-peak firm
7 dated September 28, 2004 was used. Change in monthly price from the
8 previous year was applied to the price for the current year. The Non-Firm
9 purchase price is per the Stipulation Order.
- 10 • US Magnesium’s QF output level is matched to changes in magnesium
11 usage level. This assumes that the QF generation will increase to match
12 any thermal needs for a process expansion.
- 13 • Thermal energy attributed to power production is estimated at
14 approximately 35 percent per 1997 Linhoff-March study.
- 15 • Yearly gas price forecast based PacifiCorp’s forecast in the Stipulation
16 Order.

17 The results show that the net effective power price (costs to US Mag minus
18 payments to US Mag) increases at an average rate of 1.8% per year over the term
19 of the proposed agreement and only 4.8% average per year since 2001. When you
20 include the impact of the QF hedge, the net effect power price over the five year
21 term is an average of \$19.27 per MWh. It basically remains flat and the average
22 increase since 2001 is 1.5%. This is no where near what either Mr. Brown or Mr.

1 Swenson state in their testimony and I have actually provided the back-up
2 documentation to my analysis. Something neither was willing to do.

3 **Q. Can you comment on the how the price varies under different conditions?**

4 A. Yes. While the results presented in Exhibit UP&L_(BWG-1SR) are our best
5 estimates over the proposed term, Exhibit UP&L_(BWG-1SR) was developed as a
6 model with the ability to vary key price drivers including projected changes to
7 Schedule 9, gas prices, changes in US Mag's energy usage, and market prices.
8 Exhibit UP&L_(BWG-1SR) tab "Price Variation Summary" provides a summary of
9 the various changes to key price drivers. I attempted to look at both a worst case and
10 best case scenario in order to show a range. In the worst case, the PSA increases 6
11 percent per year, US Mag's load remains the same, market prices decrease by 10
12 percent and gas prices increase 20%. This results in an average net effective price of
13 \$23.69 per MWh over the five year term. The price increases an average of 6% per
14 year during the term and only an average 5% per year since 2001. In the best case, the
15 PSA increases 1 percent per year, US Mag's load increases 10%, market prices
16 increase by 10 percent and gas prices decrease 10%. This results in an average net
17 effective price of \$17.31 per MWh over the five year term. Prices show an average
18 decrease of 2.9% per year during the term and remain flat compared to 2001. This
19 clearly shows how the QF is an effective hedge against price increases in the PSA and
20 secures US Mag with a net effective power cost in the range Mr. Brown testifies he
21 needs to keep US Mag operational and secure new investors. As a non-firm
22 generator, US Mag can either sell to PacifiCorp or offset its own load.

23

1 **Q. Please comment on the physical interruption exposure to US Mag.**

2 A. Mr. Swenson indicates that US Mag will be exposed to well over 120 hours of
3 physical interruption under the proposed agreement. Let's review those hours. As I
4 mentioned in my rebuttal testimony, the 100F temperature trigger in the PSA shows
5 an average of five days per year of temperatures over 100F based on historical
6 weather data at the Salt Lake Airport. This is the same data referenced by Mr.
7 Swenson in his supplemental and rebuttal testimony. While he has indicated in his
8 rebuttal testimony that US Mag is not interested in that option, I have included it and
9 continue to believe that it would contribute to physically reducing the Utah summer
10 peak. Therefore the estimated physical interruption exposure during those five days is
11 20 hours of interruption to their business, normally concentrated in the two months of
12 July and August. The second physical exposure is identified by Mr. Swenson as the
13 hours of physical interruption for system integrity. This is an exposure that large
14 industrial customers already have. The difference is that US Mag is now being paid
15 for that. The current agreement has this provision as well as the historical agreements
16 with US Mag's predecessor. Therefore these hours would be in any agreement
17 regardless and should not be counted as any incremental hours of physical
18 interruption in the proposed agreement. The third physical exposure is based on US
19 Mag providing non-spin operating reserves. Exhibit UP&L_(BWG – 2SR) shows
20 actual historical interruptions in both number of interruptions and length of
21 interruptions for other non-spin operating reserve agreements with retail customers.
22 With both customers the number of interruptions was significantly less than the
23 contractual maximum (historically, these non-spin operating reserve agreements

1 allowed for similar number of hours of interruptions as proposed with US Mag) and
2 the length of interruption averaged 30 minutes versus the maximum of 60 minutes.
3 Therefore, projecting this historical information to US Mag, it would reasonable to
4 assume 30 to 50 interruptions for reserves for an average of 30 minutes or an
5 equivalent physical exposure of 15 to 25 hours total for non-spin reserves.
6 Additionally, I understand from conversations with Mr. Brown, Mr. Swenson and US
7 Mag plant operations that it is much easier for US Mag to tolerate a 30 minute
8 interruption compared to a full hour without adversely impacting magnesium
9 production. Combining these three physical components, the estimated physical
10 interruptions are more likely to be in the range of 35 to 45 equivalent full hours.
11 When you look at individual interruptions, many of the interruptions would be of
12 duration less than a full hour and I believe reasonable for US Mag to achieve.

13
14 **Q. Are there comments you wish to make regarding Mr. Swenson's rebuttal**
15 **testimony?**

16 A. Yes, Mr. Swenson states that US Mag would provide spinning and non-spin operating
17 reserves. That is not correct there has not been a proposal for US Mag to supply that
18 type of operating reserves. This Company remains concerned about US Mag's
19 physical capability to deliver non-spin operating reserves, but takes US Mag's
20 statement in good faith on this issue. Our understanding is that US Mag is willing to
21 provide PacifiCorp a means to physically disconnect the load at their plant designated
22 for non-spin operating reserves. Thus, in the event that US Mag fails to interrupt for
23 operating reserves when PacifiCorp calls, PacifiCorp would physically interrupt the

1 load remotely. This arrangement is not currently in place nor has US Mag physically
2 demonstrated it can provide the full amount of non-spin operating reserves. The
3 Company will require physical demonstration by US Mag of its ability to provide
4 non-spin operating reserves and installation by US Mag of the necessary equipment to
5 allow PacifiCorp to remotely interrupt US Mag in the event of non-performance
6 before the operating reserve agreement can be effective. These were the same
7 requirements that both Monsanto and Nucor had to meet prior to the Company
8 contracting with them for non-spin operating reserves.

9 **Does this conclude your testimony?**

10 A. Yes it does.