BEFORE THE

IDAHO PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE APPLICATION OF ROCKY MOUNTAIN POWER FOR APPROVAL OF CHANGES TO ITS ELECTRIC SERVICE SCHEDULES AND A PRICE INCREASE OF $27.7 MILLION, OR APPROXIMATELY 13.7 PERCENT	**CASE NO. PAC-E-10-07**

Direct Testimony of

Brian C. Collins

(Economic Valuation of Monsanto Interruptible Products)

On behalf of

Monsanto Company

Project 9210
December 22, 2010

BRUBAKER & ASSOCIATES, INC.
CHESTERFIELD, MO 63017

PACIFICORP dba ROCKY MOUNTAIN POWER

BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

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Direct Testimony of Brian C. Collins

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Brian C. Collins. My business address is 16690 Swingley Ridge Road, Suite 140, Chesterfield, MO 63017.

Q ON WHOSE BEHALF ARE YOU APPEARING IN THIS PROCEEDING?

A I am appearing on behalf of Monsanto Company ("Monsanto"), a special contract customer of Rocky Mountain Power ("RMP" or "Company"). RMP is a division of PacifiCorp.

Q ARE YOU THE SAME BRIAN C. COLLINS WHO PREVIOUSLY FILED TESTIMONY IN THIS PROCEEDING?

A Yes, I am. On November 1, 2010 I provided direct testimony as to the interruptible nature of Monsanto's loads, the treatment of Monsanto by RMP in its Integrated Resource Plan ("IRP"), and the economic benefits to RMP, its customers and the power system as a whole from a long-term interruptible program such as Monsanto's.

Q PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A This information was included in my direct testimony filed November 1, 2010.

Q WHAT IS THE SUBJECT OF THIS DIRECT TESTIMONY?

A I provide testimony as to an appropriate basis for the economic valuation of Monsanto's interruptible load. This information is used by my colleague, Kathryn Iverson, in her testimony. I will also respond to the testimony of RMP witness Paul Clements with regard to the Company's approach to valuing Monsanto's interruptibility.

Q ARE YOU SPONSORING ANY EXHIBITS IN CONNECTION WITH YOUR TESTIMONY?

A Yes. I am sponsoring Exhibit No. 254 (BCC-1) through Exhibit No. 256 (BCC-3). These exhibits were prepared either by me or under my supervision and direction.

Q WOULD YOU PLEASE SUMMARIZE YOUR FINDINGS AND CONCLUSIONS?

A My findings and conclusions are as follows:

1. Monsanto's interruptible load is a long-term resource that provides capacity value as well as the opportunity for 1,050 hours per year of interruption.

2. RMP uses Monsanto's interruptible load resource much like it would a combustion turbine, which is a peak generation resource or "peaker."

3. One reasonable approach to determining the value of Monsanto's interruptibility is to base it on the costs RMP would incur to install and operate a combustion turbine, or peaker.

4. Based on its current provision of operating reserves, economic curtailment and system integrity to RMP, the avoided peaker cost indicates a value of $25.5 million for Monsanto's interruptibility.

5. Another reasonable approach to determining the value of Monsanto's interruptible load resource is to base it on the avoided costs that RMP pays Qualifying Facilities ("QFs").

6. Utilizing the 20-year levelized QF rates results in a value of $25.8 million for Monsanto's interruptibility.

7. The Company has offered its valuation of Monsanto's interruptibility under two methods: the Front Office model and the GRID model. These models are strictly

short-term and do not consider the benefits associated with avoiding or deferring generation. The Front Office model, in particular, focuses exclusively on valuing Monsanto's reserves on the basis of RMP's least-profitable gas units.

8. The annual market prices used in the Company's models do not adequately reflect the avoided capacity costs associated with peaking resources. The $25.5 million value determined in Exhibit No. 254 (BCC-1) properly accounts for the avoided costs, which are long-term. The Company's methods are strictly short-term and do not properly reflect resource values. For this reason, I recommend that the Commission give no weight to the Company's valuations.

Q WHAT AMOUNT OF INTERRUPTIBILITY DOES MONSANTO PROVIDE ROCKY MOUNTAIN POWER?

A The 2008 Electric Service Agreement ("ESA")[1] provides for three types of interruption: (1) Operating Reserves of at least 95 MW which can be called upon 188 hours per calendar year; (2) Economic Curtailment of 67 MW available for 850 hours per calendar year; and (3) System Integrity of 162 MW available 12 hours per calendar year.

RMP's Treatment of Monsanto's Load

Q HOW MUCH OF MONSANTO'S LOAD DOES THE COMPANY CLAIM AS FIRM?

A In the response to Monsanto Data Request 16.3 pertaining to the Supplemental Testimony of Paul Clements, Mr. Clements states the following:

> Monsanto's entire load is treated as firm load and their interruptible products are treated as firm resources. Please see the Rebuttal Testimony of Gregory N. Duvall in Case No. PAC-E-10-07 for a detailed explanation of the treatment of Monsanto load in the integrated resource plan.

[1] Monsanto Exhibit No. 251 (RCB-X).

Q HOW DOES MR. DUVALL IN HIS REBUTTAL TESTIMONY EXPLAIN THE TREATMENT OF MONSANTO'S LOAD IN THE IRP?

A Mr. Duvall states the following:

> Monsanto's load is treated as firm load and their interruptible products are treated as firm resources. If Monsanto's interruptible products were no longer economic, the Company would find other means to meet its firm load obligation and would have an obligation to serve Monsanto's entire load.

Q IS 100% OF MONSANTO'S LOAD TREATED AS FIRM IN THE COMPANY'S IRP?

A No. The Company's **net firm obligation** formula is defined in the Company's 2008 IRP at page 89 as the following:

Net Firm Obligation = Obligation – Purchase – DSM – Interruptible

where Obligation equals all load plus firm sales at the time of RMP's system peak.[2] Though Monsanto's entire load is included as an obligation, Monsanto's interruptible load is subtracted from RMP's obligation to arrive at its net firm obligation.

Monsanto's interruptible load is excluded from the Company's net firm obligation. Firm resources are not acquired by RMP to serve interruptible loads; firm resources are acquired to serve the net firm obligation.

Q IS THERE ANY REASON TO EXPECT MONSANTO'S INTERRUPTIBLE LOAD WOULD EVER BECOME FIRM?

A No. Monsanto's interruptible load has been interruptible since 1951. As long as Monsanto is a customer of RMP, it plans to be an interruptible customer. Monsanto's interruptible load is included as a firm resource (i.e., a deduction from its system peak obligation) by RMP in the IRP planning process through 2019.

[2]Monsanto Exhibit No. 248 (RCB-X).

Q WITH RESPECT TO THE IRP, HOW MUCH OF MONSANTO'S LOAD DOES THE COMPANY DEDUCT FROM ITS SYSTEM PEAK OBLIGATION?

A In the 2008 IRP, RMP deducted a total of 157 MW (67 MW for economic curtailment and 90 MW for operating reserves) from its total system peak obligation. However, in a slide presented at an IRP meeting in October 2010, the Company deducted only 49 MW of operating reserves from its system peak obligation. This would result in a total deduction of 116 MW of Monsanto load from the Company's system peak obligation. This proposal has not been published in the Company's final IRP report.

Q IS IT APPROPRIATE TO DEDUCT ONLY 119 MW OF MONSANTO'S LOAD FROM ITS SYSTEM PEAK OBLIGATION?

A No. Based on my review of the current Monsanto contract with regard to furnace operation, it is my understanding that Monsanto could simultaneously provide both 95 MW of operating reserves as well as 67 MW of economic curtailment. Since this could happen at the time of RMP's system peak, it is appropriate to deduct Monsanto's entire interruptible load in the amount of 162 MW from the Company's system peak obligation forecasted in its IRP.

Q ARE YOU AWARE OF ANY RECENT INSTANCES WHEN MONSANTO WAS PROVIDING SIMULTANEOUS ECONOMIC CURTAILMENT AND OPERATING RESERVE INTERRUPTIONS TO RMP?

A Yes, I am aware of at least six recent instances. On August 29, 2008, July 18, 2010 (twice), July 20, 2010 (twice), and August 2, 2010, Monsanto was providing RMP with simultaneous economic curtailment and operating reserve interruptions of up to 162 MW.

Peaker Valuation of Interruptibility

Q DOES MONSANTO'S INTERRUPTIBLE LOAD PROVIDE CAPACITY VALUE TO RMP?

A Yes. Monsanto's load is a flexible, price-responsive load that may be interrupted in whole or in part during system emergencies, or during periods of high market prices or stressed regional resources. Monsanto has provided RMP and its predecessors with an interruptible load resource for over 59 years, and as long as it is a customer of RMP plans to be interruptible. Because of this long-term commitment, it is appropriate to base the value of this resource not on some short-term value, but on the long-run avoided cost of resources with similar attributes. Like Monsanto's interruptibility, a combustion turbine is used to meet peak periods of high demand, or in situations where numerous generator outages result in a scarcity of resources.

Q DOES MONSANTO'S INTERRUPTIBLE LOAD ALLOW RMP TO DELAY OR AVOID THE CONSTRUCTION OR ACQUISITION OF GENERATING RESOURCES?

A Yes. Typically, generating capacity is not constructed or acquired to serve interruptible loads. RMP's predecessor company, Utah Power & Light ("UPL"), was of the opinion that generating capacity is not built or acquired for interruptible loads. At page 2 of Order No. 24220 for Case No. UPL-E-92-2, the Commission cites UPL's Application as stating the following:

> According to the Application, demand charges are not assigned to Monsanto's interruptible service because the Company provides that service to Monsanto out of its operating reserves **(i.e., generation plant is not built to meet an interruptible demand).** *(emphasis added)*

Q WHAT ENSURES A SUFFICIENT COMMITMENT IS MADE BY MONSANTO TO ALLOW RMP TO DELAY OR AVOID THE CONSTRUCTION OR ACQUISITION OF NEW GENERATION CAPACITY?

A A multi-year contract is sufficient commitment. Monsanto currently has a three-year contract term with RMP. This three-year term requires a significant commitment from Monsanto and is sufficient for RMP to recognize Monsanto's interruptible load in its integrated resource planning. In fact, Monsanto is willing to enter into commitments longer than three years if based upon reasonable contract terms and conditions.

Q DO YOU BELIEVE THAT RMP CURRENTLY USES MONSANTO'S INTERRUPTIBILITY MUCH LIKE IT WOULD A COMBUSTION TURBINE?

A Yes. Under the current contract, RMP calls upon Monsanto practically every month of the year to provide either operating reserves or economic curtailment. In times of emergency, the Company has called on Monsanto to interrupt all three of its furnaces, or has sought Monsanto's cooperation to keep furnaces from coming on-line. Monsanto has been highly successful in its interruptible performance and the Company has even sought additional interruptions at critical times. There are significant penalties set forth in the 2008 ESA for failure to interrupt, but RMP has never had to exercise them since Monsanto has complied 100% with all interruption requests.

Q SINCE MONSANTO'S LOAD IS TREATED LIKE A COMBUSTION TURBINE, SHOULD ITS VALUE OF INTERRUPTIONS BE LIKEWISE DETERMINED ON THE BASIS OF THE AVOIDED COST OF A COMBUSTION TURBINE?

A Yes. A reasonable approach to determining the interruption value is to base it on the costs RMP would incur if it were to build and install a new combustion turbine. A

combustion turbine that can provide quick-start capability in less than 10 minutes, such as an aero-derivative simple cycle combustion turbine ("Aero SCCT") should be used as the basis for the load which Monsanto can interrupt within 10 minutes, in particular the 95 MW of operating reserves. While the 67 MW of economic curtailment can also be interrupted in a matter of seconds for the 12 hours of system integrity, the contract currently requires a two-hour notice for the 850 hours of economic curtailment. Thus, to be conservative I have used the lesser capacity cost of a combustion turbine that does not have quick-start capability, e.g., a Frame "F" simple cycle combustion turbine ("Frame CT"), to model the value associated with the 67 MW economic curtailment.

Q WHAT ARE THE COSTS ASSOCIATED WITH THESE TWO TYPES OF TURBINES?

A The avoided capital and running costs of these turbines are shown in Exhibit No. 254 (BCC-1). The avoided capital costs represent RMP's own estimates of peaking resources in Utah as detailed in the 2010 Update of the 2008 IRP. The running costs are based on the heat rates of these units used in the 2008 IRP and the delivered fuel costs as detailed in RMP's Utah QF filing from June 2010, which is based on RMP's March 2010 price curve.

The real levelized[3] cost of an Aero SCCT is $107.81[4] per kW-year based on construction in Utah at a carrying charge of 9.08% and including fixed operation and

[3]To determine a levelized cost, the present value of the cost to construct the generating unit is converted to equal annual costs over its economic life. Real levelized capacity costs used in this analysis comprise the first year's deferral. Real levelization (in contrast to a nominal levelization) assumes that the avoided capital portion would increase each year by the rate of inflation. As a result, this methodology can be used to calculate the capacity value regardless of contract length.

[4]The $107.81 per kW-year cost is the average of RMP's costs of an Aero SCCT and Intercooled Aero SCCT.

maintenance and other costs.[5] The avoided energy cost is $79.54 per MWh. The lower capacity cost of the Frame CT is $70.61 per kW-year on a real levelized basis, with higher energy costs of $96.14 per MWh.

Applying these two sets of resource costs to the 95 MW of operating reserves, and the 67 MW of economic curtailment results in a value of roughly $25.5 million: $14.3 million attributable to the operating reserve portion[6] and $11.2 million for the economic curtailment.

Q WHY HAVE YOU BASED YOUR VALUATION ON THE COST OF A NEW COMBUSTION TURBINE GENERATOR INSTEAD OF THE MARKET PRICE FOR CAPACITY?

A Currently, combustion turbine generation is the lowest cost form of capacity that is readily available for construction. While the current market price for capacity is lower than the amortized cost of a new combustion turbine generator, this is only a temporary situation. Market prices can be volatile and will need to average to at least the amortized cost of a new combustion turbine in order for the market to sustain itself. Finally, long-term participation by Monsanto as an interruptible customer allows RMP to avoid the construction or acquisition of new generation that it would incur if it instead had to serve Monsanto's interruptible load as firm load.

The basic concept behind interruptible power is that the utility does not have to install generation capacity to serve interruptible load because these loads can be interrupted when capacity is needed to maintain service to firm customers. Interruptible demand goes beyond just allowing RMP to avoid making short-term capacity purchases from the market. For all of these reasons, the valuation of

[5]2008 IRP, page 104, and 2008 IRP Update, page 43.
[6]This also includes the avoided energy cost associated with system integrity.

Monsanto's interruptible load should be based on the cost of new combustion turbine generation.

Q WHY DO YOU INCLUDE A 12% RESERVE MARGIN WHEN CALCULATING THE AVOIDED PEAKER COSTS?

A Monsanto's interruptible load allows RMP to avoid constructing or purchasing a firm resource. If Monsanto's load were firm, RMP would need to construct or purchase a resource to serve Monsanto's firm load as well as planning reserves needed to serve the load as firm. Thus, RMP avoids the cost of a long-term resource equal to the load plus the planning reserves. Therefore, it is appropriate to include a reserve margin in any avoided capacity cost valuation of Monsanto's interruptibility.

Q CAN YOU PROVIDE AN EXAMPLE TO ILLUSTRATE THE EFFECT OF A RESERVE MARGIN ON THE AMOUNT OF RMP'S AVOIDED CAPACITY RESOURCES?

A A utility must have more than 1 MW of capacity available for every 1 MW of net firm load. A reserve margin provides a cushion against expected load growth, extreme weather conditions and outages of generating equipment. According to the Company's IRP, RMP typically plans for a 12% reserve margin. Stated differently, RMP must install at least 112 MW of generating capacity to reliably serve 100 MW of net firm load. It follows, therefore, that by encouraging customers to opt for interruptible service, RMP would not have to install 112 MW of generating capacity for every 100 MW of interruptible load.

Q IN HIS SUPPLEMENTAL TESTIMONY, DOES MR. CLEMENTS ASSERT THAT A PEAKER VALUATION IS IMPROPER FOR VALUING MONSANTO'S INTERRUPTIBILITY?

A Yes. In his supplemental testimony at page 20, Mr. Clements states that a peaker valuation is not appropriate to value Monsanto's interruptibility. He argues that the products, terms and conditions offered by Monsanto are not equivalent to the products, terms and conditions available through ownership or lease of a combustion turbine. This is based on his claim that a combustion turbine is available 8,410 hours per year assuming a 96% availability factor.

Q DO YOU AGREE WITH MR. CLEMENTS' POSITION?

A No. The fact that a combustion turbine might be available 8,410 hours per year is irrelevant to the valuation of Monsanto's interruptibility. Monsanto's interruptible value depends on the resources it is displacing. What is relevant to Monsanto's valuation is that when RMP interrupts Monsanto's load, it is at times of peak periods of high demand or in situations where generator outages result in a scarcity of resources. At these times, RMP should be operating all of its generating resources, including peaking resources. The decision by RMP to interrupt Monsanto at these times should be based on the economic displacement of RMP's highest cost peaking resources (at times of high demand) or the economic addition to RMP's peaking resources (at the time of generation resource scarcity). Since Monsanto is displacing peaking resources or adding to RMP's economic peaking resources, Monsanto's interruptibility is treated and operated as a peaking capacity resource and should be valued as such.

Q WHAT CHARACTERISTICS SHOULD AN INTERRUPTIBLE LOAD EXHIBIT IN ORDER FOR IT TO BE CREDITED WITH AVOIDING THE COSTS OF A COMBUSTION TURBINE?

A An article written by Eric C. Woychik, Vice President of Regulatory Affairs for Comverge, Inc., regarding the benefits of demand response ("DR") resources, including interruptible load, best describes these characteristics:

> In order for DR to be credited with avoiding supply-side capital cost **it must avoid load equally or better than a comparable supply-side resource** (proxy) **would serve load if the DR weren't available.** It must respond operationally as quickly as, or quicker than, the supply-side proxy. It also must be equivalent or better in terms of certainty and predictability, and must exhibit a ramp-rate that is equal or better than the supply-side resource. Finally, it must have comparable or higher short-term reliability (in terms of FOR and POR) than the supply-side resource.
>
> **DR's value for avoiding supply-side capital costs depends on the resource it's displacing.** A critical distinction in power markets is the difference between firm power and non-firm power. Firm power is backed up by operating reserves (spinning reserves and non-spinning reserves), while non-firm power is not.[7]

Q DOES MONSANTO'S INTERRUPTIBILITY MEET THESE CHARACTERISTICS SUCH THAT IT CAN DISPLACE A COMBUSTION TURBINE?

A Yes. I provide additional details as to how Monsanto's interruptibility meets these characteristics such that it displaces a combustion turbine, later in this section of my testimony.

Q DOES THE COMPANY CONTROL WHEN MONSANTO IS INTERRUPTED?

A Yes. The Company controls the interruptions that Monsanto has committed to provide the Company and it is the responsibility of the Company to manage those

[7] "Optimizing Demand Response," *Public Utilities Fortnightly*, May 2008, page 54, emphasis added.

interruptions. RMP has historically managed Monsanto's interruptible load such that interruptions occur in every month of the year. Monsanto must stand ready at all times to comply with RMP's interruption requests. This is a 24 x 7 x 52 obligation. Interruptions are not cost free to Monsanto, and being ready to interrupt demand at anytime is an ongoing process. The ability to interrupt is of great value, even if the actual interruption is not triggered.

Q ISN'T A COMBUSTION TURBINE MORE FLEXIBLE AND VERSATILE THAN MONSANTO'S INTERRUPTIBILITY?

A No, it is not. Monsanto can interrupt its load within 10 minutes and is available to RMP 24 hours a day during every month of the year, just like a combustion turbine if the combustion turbine has a fuel supply, and far superior to a combustion turbine when it has not been fueled. Monsanto can actually interrupt its load within seconds for emergency purposes and is willing to do so, which makes Monsanto's operational response and ramp rate even quicker than a combustion turbine. Response time is of utmost importance for an electric system, because generation and load must always be in balance. As more renewable generation, such as wind generation, is added to the electric grid, Monsanto's provision of operating reserves becomes even more valuable. Monsanto can provide operating reserves in a matter of a few minutes.

Q HOW DOES MONSANTO'S CAPACITY FACTOR FOR ITS INTERRUPTIBLE LOAD COMPARE TO THE CAPACITY FACTOR OF RMP'S COMBUSTION TURBINE?

A When Monsanto provides 67 MW of economic curtailment at its maximum of 850 hours per year under the current contract, its annual capacity factor is 9.7%.

This compares favorably to RMP's capacity factor modeled for its Gadsby CT in the test year net power costs.

Q DOES INTERRUPTIBLE LOAD PROVIDE ANY OTHER ADVANTAGES RELATIVE TO COMBUSTION TURBINES?

A Yes. Monsanto has fully complied with RMP's interruption requests. By contrast, combustion turbines are not guaranteed to start every time their capacity is needed. Since Monsanto has complied 100% with all interruption requests, it has higher reliability than a combustion turbine as well as more certainty and predictability than a combustion turbine.

Q HAS RMP PREVIOUSLY USED THE COST OF A COMBUSTION TURBINE TO VALUE INTERRUPTIBLE LOADS?

A Yes. In response to IIPA Data Request 46, RMP states the following:

> The Company has estimated the system value of the Idaho Irrigation Load Control Program for cost-effectiveness evaluation using a methodology first developed in 2007 and reviewed by the IIPA. This methodology **captures the capacity deferral benefit of the resource via displacement of simple cycle combustion turbine proxy resources** and firm market purchases. The latest estimate, $73.09[8] kW-year, was prepared in April 2009 and cited in the Company's 2009 dispatchable irrigation program report. (Emphasis added)

[8]This cost is comparable to the cost for the Frame CT ($70.61 per kW-year) used in the valuation of Monsanto's economic curtailment shown in Exhibit No. 254 (BCC-1). RMP adjusts the $73.09 per kW-year value for line losses (10.392%) to arrive at a value of $81.56 per kW-year (see RMP's 2009 Demand Side Management Annual Report – Idaho, Appendix 1, page 22).

Other Indicators of Capacity Value

Q PLEASE DESCRIBE RMP'S RECENT INVESTMENTS IN GENERATION RESOURCES ON ITS SYSTEM.

A RMP has included both wind resources and coal unit turbine upgrades in the test year of the instant rate case. For example, the Dunlap 1 wind resource included in the rate case costs $2,353 per kW while the coal unit turbine upgrade costs range from $1,583 per kW to $1,988 per kW. These investments on the RMP system are higher on a per kW basis than the peaker cost of $770 per kW (for economic curtailment) and $1,084 - $1,126 per kW (for operating reserves) upon which I recommend that the Monsanto valuation be determined.

Q AS THE COMPANY ADDS INVESTMENTS TO ITS SYSTEM GENERATION, WHAT HAPPENS TO ITS RATES?

A Its rates increase. RMP is asking for a 13.7% increase in its overall revenue requirement for the instant rate case.

Q AS RMP'S SYSTEM COSTS INCREASE, AND IN TURN, ITS RATES INCREASE, WOULD YOU ALSO EXPECT THE VALUE OF MONSANTO'S INTERRUPTIBILITY TO INCREASE?

A Yes. Decreasing the value of Monsanto's interruptibility, while simultaneously asking for an overall increase of 13.7% as RMP has, is counter-intuitive and at odds with reality.

Q ARE THERE ANY OTHER POSSIBLE VALUATIONS OF MONSANTO'S INTERRUPTIBILITY THAT YOU WOULD CONSIDER APPROPRIATE?

A Yes. I would also consider RMP's QF rates in Utah (Schedule No. 37) as a reasonable method to value Monsanto's interruptibility. Using RMP's 20-year levelized QF rate would result in an annual valuation of $25.8 million for Monsanto's interruptibility. This calculation is shown in Exhibit No. 255 (BCC-2).

Q CAN UTAH'S QF RATES BE USED TO EVALUATE SPECIAL CONTRACTS?

A Yes. According to the December 14, 2009 order in Docket No. 09-035-T14, at page 2, the Public Service Commission of Utah stated that the QF rates can be used in the evaluation of special contracts:

> The rates are based on avoided costs developed from the Company's Integrated Resource Plan ("IRP"). Avoided costs are costs the Company would incur to serve its native load but for the generation provided by the QFs. Schedule No. 37 prices may also be used to evaluate special contracts, demand side resource programs and form the basis of credits paid under Electric Service Schedule No. 135, the Company's Net Metering Service tariff. Specifically in this filing, the Company updates the rates for known and expected changes to system costs.

Q HAS RMP PLACED A VALUE ON MONSANTO'S ABILITY TO PROVIDE SYSTEM INTEGRITY INTERRUPTIONS?

A Yes. Monsanto makes 162 MW of capacity available to RMP for a maximum of 12 hours per year when required to maintain system integrity. RMP has based the value of system integrity using an average annual heavy load hour (6x16) market price for energy. RMP's approach results in a system integrity value of only about $100,000. When system integrity is in jeopardy, market prices will likely be much higher than the annual average market price. As a result, RMP's approach to value system integrity is not appropriate.

Q WHAT DO YOU RECOMMEND FOR THE VALUE OF SYSTEM INTEGRITY INTERRUPTIBILITY?

A The provision of system integrity interruptions should be valued at not less than $400 per MWh. This value reflects the current price cap for power in the Western Electricity Coordinating Council ("WECC"). This is a conservative estimate. The California Independent System Operator's ("CAISO") energy bid cap is set to increase from $750 per MWh to $1,000 per MWh in April 2011. As a result, on May 20, 2010, the Federal Energy Regulatory Commission ("FERC") in Docket No. EL10-56-000 instituted an investigation into the WECC price cap since $400 per MWh may no longer be just and reasonable and may need to be increased. The FERC has noted that changes in CAISO affect the entire WECC region and a lower cap in the WECC could result in reduced supply options available to WECC purchasers.

At $400 per MWh, Monsanto's system integrity valuation is equal to $806,000 and at $1,000 per MWh is equal to $2.0 million.

Q IS THIS A CONSERVATIVE VALUATION?

A Yes. It assumes that the market purchase alternative actually exists. If it did not (i.e., no one had power to sell at the time), the result could actually be curtailment of firm load. The cost of firm load curtailments to electricity consumers can be quite high and difficult to quantify. However, the value of lost load ("VOLL") has been estimated by the U.S. Department of Energy to have an average value in the range of $2,000 to $5,000 per MWh.[9]

[9]U.S. Department of Energy, "Benefits of Demand Response in Electricity Markets and Recommendations for Achieving Them," February 2006, page 83.

Q YOU MENTIONED EARLIER THAT DEMAND-SIDE RESOURCES CAN OFFER POTENTIAL ENVIRONMENTAL BENEFITS. HAVE YOU QUANTIFIED THESE BENEFITS?

A No, a quantification of environmental benefits is not available. While interruptible resources promote efficient use of resources in general and have the potential to reduce emissions during peak times, there is currently no valuation of these environmental benefits performed by the Company either in this case or its 2008 IRP. RMP has a goal of protecting and enhancing the environment and the Monsanto interruptible contract is consistent with that goal. Though no quantification of environmental benefits is available for the Monsanto interruptibility, RMP's recent expenditures on wind turbines, or "green" resources, in excess of $2,300 per kW would suggest that Monsanto's interruptibility provides even greater value to RMP than I have quantified.

Q WHY HAVE YOU NOT INCLUDED A VALUATION OF MONSANTO'S INTERRUPTIBILITY BASED ON THE COST OF AVOIDED SHORT-TERM MARKET PURCHASES?

A The current cost of avoided market purchases reflects a short-term valuation. As previously stated, Monsanto's interruptibility should be valued on the basis of RMP's long-term avoided capacity cost. The use of a short-term method to value Monsanto's interruptibility is inappropriate since Monsanto's interruptibility is a long-term resource and should be valued as such. RMP does not serve its firm loads entirely with purchases at current market prices. If it did, it would never install any capacity. For the same reason, Monsanto's interruptibility value should not be determined based on the avoided cost of purchases at current market prices.

Q IS IT IMPORTANT THAT THE VALUATION OF MONSANTO'S INTERRUPTIBILITY BE FAIR AND REASONABLE?

A Yes. RMP assumes that Monsanto's interruptible load is a firm resource available over the entire IRP time horizon, which is through the end of 2019. In order to retain interruptible loads in its resource portfolio, the Company should encourage this commitment through fair and reasonable valuations.

It is important to recognize that industrial end-users are principally attempting to operate their businesses to profitably produce their core products. When energy consumption is interrupted, these end-users can incur significant lost production margins and other costs they would not otherwise incur. It is obviously not desirable to incur these costs, but, if the net reduction in electricity costs adequately exceeds the cost incurred by the customer for interrupting, the customer will generally be willing to interrupt its consumption.

Q IS SUCH AN APPROACH CONSISTENT WITH CURRENT FERC POLICY ON DEMAND RESPONSE RESOURCES?

A Yes. The encouragement of interruptible loads to participate as demand response resources available to electric utilities is consistent with FERC current policy on demand response. On page 1 of FERC's June 17, 2010 National Action Plan on Demand Response, FERC states the following:

> Demand response is a valuable resource for meeting the nation's energy needs. By lowering the peak demand for energy, demand response programs reduce the need to construct new, expensive generation units. However, according to a Federal Energy Regulatory Commission (FERC or Commission) staff report — A National Assessment of Demand Response Potential (National Assessment), submitted to Congress in June 2009 — current demand response programs tap less than a quarter of the total market potential for demand response. FERC staff has worked with stakeholders to develop this National Action Plan on Demand Response (National Action Plan), which sets out actions to achieve the demand response

potential in the United States. Congress required FERC to develop such a plan in the Energy Independence and Security Act (EISA) of 2007. ***Because current efforts have missed a significant portion of the cost effective demand response potential, it is evident that action needs to be taken to either create new programs or expand existing ones where cost-effective.*** (Emphasis added)

Response to RMP's Flawed Front Office and GRID Based Valuations

Q DID RMP PROVIDE ANY TESTIMONY WITH REGARD TO THE VALUATION OF MONSANTO'S INTERRUPTIBILITY?

A On September 30, 2010, the Company provided the Supplemental Testimony of Paul Clements. Mr. Clements has handled the valuation on a year-to-year basis. He has not attempted to value Monsanto's interruptibility as a long-term capacity resource.

Q WHAT HAS LED YOU TO THIS CONCLUSION?

A Mr. Clements has valued Monsanto's interruptibility under two methods: the Front Office model, and RMP's GRID net power costs model. The Front Office model separately values each component of Monsanto's interruptions, but only based upon projected forward price curves and "lost profits." Consequently, the value from the Front Office model is simply the result of short-run projected market prices (and to some degree on the running costs of its own "highest cost" plants).

Likewise, the Company has also used the GRID model to value Monsanto's interruptibility based on additional sales in a single year under projected market prices, whether as a result of reduced sales to Monsanto or additional generation from existing resources. The GRID model is incapable of calculating a value for the system integrity component.

The only capacity value captured by these two models, consequently, is the extent to which the forward market prices include an *implied* capacity payment.

Neither of these methods were approved by the Commission in Case No. PAC-E-07-05 to value Monsanto's interruptibility. The December 28, 2007 order (Order No. 30482) in that case stated the following at page 8:

> The curtailment valuation for Monsanto is based on a "black box" determination with no party accepting a specific methodology for setting this valuation.

Q WHAT ARE "LOST PROFITS" UNDER THE FRONT OFFICE MODEL?

A To value reserves under the Front Office model, RMP determines which of its generating units has the highest running cost "in the money," that is, where running costs are less than the market price. This least profitable unit is designated as the unit being held back for reserves, and thus the Company is losing any profits it could have made had it not been held back. The opportunity cost, or foregone margin, is the value the Company ascribes to operating reserves. In the Front Office model, "lost profits" from only gas-fired resources are included in the reserve value. Because the Front Office model uses only gas-fired generation, and it uses only the least profitable gas units, it sets the absolute minimum value on reserves.

Q WHAT VALUE DOES MR. CLEMENTS' MODELS PLACE ON MONSANTO'S INTERRUPTIBILITY?

A For the period 2011 to 2013, Mr. Clements determined the annual value of Monsanto's operating reserves to be in the range of $2.4 million to $3.7 million and the annual value of Monsanto's economic curtailment to be in the range of $3.2 million to $4.3 million.

Q HAVE YOU QUANTIFIED THE IMPLIED AVOIDED CAPACITY COMPONENT OF THE COMPANY'S VALUES?

A Yes. A quantification of the implied avoided capacity component is presented in Exhibit No. 256 (BCC-3) under two scenarios: the incremental generating units are assumed as either peaking resources with an average running cost of $85 per MWh, or the incremental units are assumed as intermediate type resources, such as a combined cycle unit, with running costs of $59 per MWh. These two scenarios present reasonable approximations for analyzing what amount of avoided capacity costs is implied within the Company's projected market prices.

For operating reserves (shown on page 1 of Exhibit No. 256 (BCC-3)), the implied avoided capacity costs from the Company's models range from $8.69 per kW-year to a high of $27.40 per kW-year. These low values aptly demonstrate the failure of the Company's models to reasonably reflect the avoided capacity cost of an Aero SCCT which averages $108 per kW-year.

For the economic curtailment component (shown on page 2 of Exhibit No. 256 (BCC-3)), the implied avoided capacity values range from -$27.16 to $11.99 per kW-year.[10] These low values aptly demonstrate the failure of the Company's models to reasonably reflect the avoided capacity cost of a Frame CT which averages $71 per kW-year.

Q WHAT DO YOU CONCLUDE FROM YOUR ANALYSIS?

A The annual market prices used in the Company's models do not adequately reflect the avoided capacity costs associated with peaking resources. The $25.5 million value determined in Exhibit No. 254 (BCC-1) properly accounts for the avoided costs,

[10]A negative capacity value indicates that the Company's models fail to even capture the entire avoided energy component of peaking resources.

which are long-term. The Company's methods are strictly short-term and do not properly reflect resource values. For this reason, I recommend that the Commission give no weight to the Company's valuations.

Q DOES THIS CONCLUDE YOUR DIRECT TESTIMONY REGARDING THE ECONOMIC VALUATION OF MONSANTO INTERRUPTIBLE PRODUCTS?

A Yes, it does.

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Rocky Mountain Power

Value of Monsanto Curtailment Based on Avoided Peakers

Line	Description	Operating Reserves: Intercooled Aero SCCT (1)	or Aero SCCT (2)	Economic Curtailment: SCCT Frame (2 Frame "F") (3)	Total (4)
	Avoided Capital:				
1	Avoided Capacity Cost ($/kW-year) [1]	$102.97	$112.69	$70.61	
2	Capacity (kW)	95,000	95,000	67,000	
3	Adjustment for Reserve Margin	12%	12%	12%	
4	Capacity Adjusted for Reserves (kW)	106,400	106,400	75,040	
5	Adjustment for Losses	4.98%	4.98%	4.98%	
6	Capacity Adjusted for Losses (kW)	111,699	111,699	78,777	
7	Capacity Value	$11,501,304	$12,587,418	$5,562,759	$17,607,120
	Avoided Energy:				
8	Hours Curtailed	188	188	850	
9	MWh Curtailed	17,860	17,860	56,950	
10	Adjustment for Losses	3.61%	3.61%	3.61%	
11	MWh Curtailed	18,505	18,505	59,006	
12	Avoided Energy Cost ($/MWh) [1]	$76.62	$82.47	$96.14	
13	Energy Value - Curtailment	$1,417,889	$1,526,018	$5,672,543	
14	Avoided Energy Cost - System Integrity [2]	$805,671	$805,671	---	
15	Energy Value	$2,223,560	$2,331,690	$5,672,543	$7,950,168
16	**Total Value [3]**	**$14,321,986**		**$11,235,301**	**$25,557,287**

(1) PacifiCorp 2008 IRP, page 104; PacifiCorp 2008 IRP Update (March 2010), page 43.

(2) Includes the 12 hours of system integrity (162 MW) at $400 per MWh.

(3) Total Value = Capacity Value + Energy Value-Curtailment + Avoided Energy Cost-System Integrity
Total Value includes the average of the Operating Reserves value based on the cost of an Intercooled Aero SCCT and the cost of an Aero SCCT.

Rocky Mountain Power

Value of Monsanto Curtailment Based on Qualifying Facility Rates in Utah

Line	Description	Operating Reserves (1)	Economic Curtailment (2)	Total (3)
	Avoided Capital:			
1	Avoided Capacity Cost ($/kW-year) [1]	$115.80	$115.80	
2	Capacity (kW)	95,000	67,000	
3	Adjustment for Reserve Margin	12%	12%	
4	Capacity Adjusted for Reserves (kW)	106,400	75,040	
5	Capacity Value	$12,321,120	$8,689,632	$21,010,752
	Avoided Energy:			
6	Hours Curtailed	188	850	
7	MWh Curtailed	17,860	56,950	
8	Avoided Energy Cost ($/MWh) [1]	$53.40	$53.40	
9	Energy Value - Curtailment	$953,724	$3,041,130	
10	Avoided Energy Cost - System Integrity [2]	$805,671	---	
11	Energy Value	$1,759,395	$3,041,130	$4,800,525
12	**Total Value [3]**	**$14,080,515**	**$11,730,762**	**$25,811,277**

(1) Rocky Mountain Power, Utah Electric Service Schedule No. 37, 20-Year Levelized.

(2) Includes the 12 hours of system integrity (162 MW) at $400 per MWh.

(3) Total Value = Capacity Value + Energy Value-Curtailment + Avoided Energy Cost-System Integrity.

Rocky Mountain Power

Implicit Avoided Capacity Cost of Operating Reserves

		OPERATING RESERVES					
		Front Office Model			GRID Model		
		2011 (1)	2012 (2)	2013 (3)	2011 (4)	2012 (5)	2013 (6)
	Assuming Avoided Energy Costs of Peaking Resource						
1	Company's Value for Monsanto	$2,400,000	$3,200,000	$3,700,000	$2,400,000	$2,700,000	$2,800,000
2	Total MWh Curtailed	18,505	18,505	18,505	18,505	18,505	18,505
3	Avoided Energy Cost ($/MWh) of SCCT [1]	$85.07	$85.07	$85.07	$85.07	$85.07	$85.07
4	Avoided Energy Component	$1,574,288	$1,574,288	$1,574,288	$1,574,288	$1,574,288	$1,574,288
5	Avoided Capacity Component	$825,712	$1,625,712	$2,125,712	$825,712	$1,125,712	$1,225,712
6	**Implicit Avoided Capacity Cost ($ per kW-Yr)**	**$8.69**	**$17.11**	**$22.38**	**$8.69**	**$11.85**	**$12.90**
	Assuming Avoided Energy Costs of Combined Cycle Resource						
7	Company's Value for Monsanto	$2,400,000	$3,200,000	$3,700,000	$2,400,000	$2,700,000	$2,800,000
8	Total MWh Curtailed	18,505	18,505	18,505	18,505	18,505	18,505
9	Avoided Energy Cost ($/MWh) of CCCT [2]	$59.26	$59.26	$59.26	$59.26	$59.26	$59.26
10	Avoided Energy Component	$1,096,617	$1,096,617	$1,096,617	$1,096,617	$1,096,617	$1,096,617
11	Avoided Capacity Component	$1,303,383	$2,103,383	$2,603,383	$1,303,383	$1,603,383	$1,703,383
12	**Implicit Avoided Capacity Cost ($ per kW-Yr)**	**$13.72**	**$22.14**	**$27.40**	**$13.72**	**$16.88**	**$17.93**

(1) Based on average avoided energy cost of SCCT shown on Exhibit No. 254 (BCC-1).
(2) Based on average avoided energy costs of CCCT.

	Levelized Fuel	Variable Costs		Total
CCCT (Wet "F" 1x1)	$48.97	$11.39		$60.36
CCCT (Wet "F" 2x1)	$47.59	$11.15		$58.74
CCCT (Wet "G" 1x1)	$46.17	$12.52		$58.69
		Average	=	$59.26

Rocky Mountain Power

Implicit Avoided Capacity Cost of Economic Curtailment

		ECONOMIC CURTAILMENT					
		Front Office Model			GRID Model		
		2011 (1)	2012 (2)	2013 (3)	2011 (4)	2012 (5)	2013 (6)
	Assuming Avoided Energy Costs of Peaking Resource						
1	Company's Value for Monsanto	$3,900,000	$4,200,000	$4,300,000	$3,200,000	$3,800,000	$4,100,000
2	Total MWh Curtailed	59,006	59,006	59,006	59,006	59,006	59,006
3	Avoided Energy Cost ($/MWh) of SCCT [1]	$85.07	$85.07	$85.07	$85.07	$85.07	$85.07
4	Avoided Energy Component	$5,019,916	$5,019,916	$5,019,916	$5,019,916	$5,019,916	$5,019,916
5	Avoided Capacity Component	-$1,119,916	-$819,916	-$719,916	-$1,819,916	-$1,219,916	-$919,916
6	**Implicit Avoided Capacity Cost ($ per kW-Yr)**	**-$16.72**	**-$12.24**	**-$10.75**	**-$27.16**	**-$18.21**	**-$13.73**
	Assuming Avoided Energy Costs of Combined Cycle Resource						
7	Company's Value for Monsanto	$3,900,000	$4,200,000	$4,300,000	$3,200,000	$3,800,000	$4,100,000
8	Total MWh Curtailed	59,006	59,006	59,006	59,006	59,006	59,006
9	Avoided Energy Cost ($/MWh) of CCCT [2]	$59.26	$59.26	$59.26	$59.26	$59.26	$59.26
10	Avoided Energy Component	$3,496,771	$3,496,771	$3,496,771	$3,496,771	$3,496,771	$3,496,771
11	Avoided Capacity Component	$403,229	$703,229	$803,229	-$296,771	$303,229	$603,229
12	**Implicit Avoided Capacity Cost ($ per kW-Yr)**	**$6.02**	**$10.50**	**$11.99**	**-$4.43**	**$4.53**	**$9.00**

(1) Based on average avoided energy cost of SCCT shown on Exhibit No. 254 (BCC-1).
(2) Based on average avoided energy costs of CCCT.

	Levelized Fuel	Variable Costs		Total
CCCT (Wet "F" 1x1)	$48.97	$11.39		$60.36
CCCT (Wet "F" 2x1)	$47.59	$11.15		$58.74
CCCT (Wet "G" 1x1)	$46.17	$12.52		$58.69
		Average	=	$59.26