

May 1, 1995

DOCKET NO. E-015/RP-94-291

ORDER APPROVING 1994 RESOURCE PLAN AND REQUIRING INTERIM REPORT

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Don Storm  
Tom Burton  
Joel Jacobs  
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Chair  
Commissioner  
Commissioner  
Commissioner  
Commissioner

In the Matter of Minnesota Power's 1994  
Biennial Resource Plan Filing

ISSUE DATE: May 1, 1995

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PLAN AND REQUIRING INTERIM  
REPORT

**PROCEDURAL HISTORY**

On July 1, 1994, Minnesota Power Company (MP or the Company) submitted its proposed 1994 Resource Plan.

On July 26, 1994, Richard J. Andree filed a petition to intervene. His petition was granted on November 1, 1994.

On August 16, 1994, MP filed additional information to supplement its 1994 Resource Plan.

On August 25, 1995, the Minnesota Department of Public Service (the Department) filed a letter indicating that, with the additional information, MP's 1994 Resource Plan was complete.

On September 20, 1994, the Department petitioned as of right for party status in the proceeding.

On November 1, 1994, participant L. David Ostlie, Chairman and CEO of Energy Performance Systems, Inc. (EPS), submitted comments on MP's 1994 Resource Plan.

On November 1, 1994, the Department submitted comments on MP's 1994 Resource Plan.

On December 20, 1994, MP responded to Mr. Ostlie's comments.

On December 22, 1994, MP responded to the Department's comments.

On March 30, 1995, the Commission met to consider this matter.

## FINDINGS AND CONCLUSIONS

### **I. INTRODUCTION**

MP does not expect to construct new facilities or to make major modifications or refurbishments to existing facilities to meet its Minnesota jurisdictional customer needs for the next 15 years (1995-2009). For this reason, MP's resource plan does not include proposals for new facilities. It does, however, describe strategies to meet customer needs under low and high load scenarios should they occur.

This Order will address issues raised in the course of considering the following aspects of MP's proposed plan:

- the Company's planning approach
- its energy and peak-demand needs
- rate design
- demand-side options
- supply-side options
- contingency planning

### **II. PLANNING APPROACH**

#### **A. The Department**

The Department objected that MP does not integrate its demand- and supply-side resources in its plan. Rather, the Company included the effects of demand-side management (DSM) in its expected forecast and discussed how it will meet its remaining requirements through existing capacity. In so doing, the Department stated, MP does not consider all cost-effective, achievable conservation in its plan.

The Department recommended that the Commission order the Company to determine the costs of supply-side and demand-side resources and develop an optimal plan using its least-cost options.

The Department further argued that the selection of resources should be done on the basis of social costs, including both private costs directly borne by the Company and other costs borne by society. Specifically, the Department urged the Commission to require MP to use the interim externality values adopted in Docket No. E-999/CI-93-583 (ORDER ESTABLISHING INTERIM ENVIRONMENTAL COST VALUES, March 1, 1994), including the value for volatile organic compounds (VOCs).

#### **B. MP's Response**

In its response, MP accepted the Department's suggestion to determine and more clearly present the cost of power supply resources and DSM options with the goal of developing an optimal plan that uses least-cost options. The Company stated that it would do this in its 1996 filing and would meet with the Department and other interested parties to define an appropriate integration methodology.

MP expressed concern, however, about the Department's recommendation that the Company be required to acquire a model to integrate power supply resources and DSM options. MP stated that it would be inappropriate to order a utility not needing new capacity resources to expend considerable resources to acquire a planning model such as the Electric Generation Expansion Analysis System (EGEAS). MP added that the Department and the Resource Planning Advisory Group members have documented their agreement that detailed and expensive analytical tools are not warranted in MP's case.

Regarding the use of environmental externalities cost figures, MP stated that its DSM forecast was developed before the Commission established its environmental cost values. The Company indicated that its analysis implicitly included an estimated environmental externality value of 0.31 cents/kWh. MP stated that it will, in future resource plans, incorporate the Commission's interim or final environmental cost values to the extent they are available and applicable.

However, the Company indicated its concern over the Department's comments on how the Company should determine its conservation goals. Specifically, the Company disagreed with the Department's application of interim environmental externality values to a 100-MW decrement in the dispatch of the Company's existing generation for purposes of determining the cost-effective level of demand management. The Company argued that it should not be required to implement unnecessary and uneconomic demand management in lieu of operating existing resources. MP quoted language from the Commission's Orders in the interim externality values proceeding to support its position.

## **C. Commission Action Regarding Planning Issues**

### **1. Integration**

The best resource planning is the result of an integration of demand-side and supply-side resources. In MP's case, however, the expense involved in integrating those sources (e.g. planning model costs) is a reasonable concern, particularly since the Company does not anticipate a need to add to existing facilities during the next 15 years.

In these circumstances, the Commission will not require MP to amend its current resource plan to include the results of such a planning model. However, it will expect the Company to make progress on this issue in its next filing. In support of that direction, the Commission will require MP to meet with the Department (and other interested parties) to define an appropriate methodology to integrate demand-side and supply-side planning for selection of an optimal plan.

## **2. Externality Values**

As indicated previously, the Commission determined interim externality values on March 1, 1994. Under that Order, utilities are to use those interim values in resource procurement proceedings until the Commission determines more permanent values in Docket No. E-999/CI-93-583.

Accordingly, the Commission will require MP in its future resource plans to determine social costs for both its demand-side and supply-side options using all of the applicable Commission-determined externality values, interim or final.

### **III. ENERGY AND PEAK-DEMAND NEEDS**

#### **A. The Department**

The Department stated that MP has changed several forecasting procedures since 1992. As a result, the Department found the Company's forecasting methodology to be generally satisfactory. After analyzing the Company's forecasting procedures in detail, the Department identified two additional areas for change in the energy forecasting models.

- First, the Department recommended that the Company replace its employment variable in the residential model for the Superior Water, Light & Power (SWL&P) Division (a wholly owned subsidiary of MP) due to economic theory and its correlation with the household income variable.
- Second, the Department recommended that the Company replace the National Gross Domestic Product (GDP) variable with a regional domestic product variable in two commercial models.

The Company applied load factor projections to its energy forecasts to develop a peak-demand forecast. Because of the critical role played by load factors in that process, the Department recommended that the Company be required to provide a detailed explanation of the development of those load factors in its next resource plan filing.

#### **B. MP's Response**

MP agreed to substitute the variable "number of residential customers" or some other appropriate variable for the employment variable in the SWL&P residential model.

MP stated that it continues to believe that GDP is an acceptable variable to use in its commercial models because commercial activity in the region is highly dependent on two national industries (i.e., the taconite and wood product industries). Nevertheless, MP indicated its willingness to use an output from its REMI model, i.e., Gross Regional Product in 1987 dollars.

Regarding the Department's recommendation on load factors, MP indicated that it is currently evaluating the benefits of additional load factor analysis.

### **C. Commission Action Regarding the Company's Energy and Peak-Demand Needs**

Although MP has indicated a willingness to go along with the Department's recommendations on this subject, the Commission is not totally convinced at this time of their ultimate value. Forecasting involves a lot of trial and error. Sometimes variables that appear appropriate from a theoretical standpoint do not work as well as expected in practice because of data limitations or other problems.

Consequently, the Commission will proceed prudently, directing MP to try the Department's recommendations but to implement them only if they work well in practice. Specifically, the Commission will:

- approve MP's energy forecast in this proceeding, as recommended by the Department
- require MP to consider the energy forecast changes recommended by the Department and implement them in its next resource plan or carefully explain why it would be inappropriate to do so and
- require MP to provide a detailed explanation of its formulation of the projected load factors in its next resource plan, as recommended by the Department.

## **IV. ADDITIONAL RATE DESIGN INFORMATION**

### **A. The Department**

The Department stated that MP has taken steps in other forums to use rate design to further its planning goals. MP has agreed to study the introduction of real-time pricing for its Large Power customers and has proposed an additional 100 MW of interruptible load for Large Power customers.<sup>1</sup>

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<sup>1</sup> See Docket Nos. E-015/GR-94-1 and E-015/M-94-718.

The Department indicated that both proposals would affect the load patterns of the Company's largest customers.

The Department recommended that MP be required to provide in its next resource plan filing an analysis of the effects of these proposals, if approved, focusing on resource planning and the potential for additional gains from expansion or modification of these proposals.

## **B. The Company**

MP agreed with the Department's recommendation that the Company provide additional information on the May 1995 interruptible offering and real-time pricing opportunities. However, the Company argued that it is already providing this information pursuant to Orders in other dockets: Docket Nos. E-015/GR-94-1 and E-015/M-94-718. The Company argued that, as a consequence, it is not appropriate or necessary to require that this information also be filed as part of any compliance filings in the current docket.

## **C. Commission Action Regarding Additional Rate Design Information**

The Commission will not require the Company to file the information requested by the Department as part of the compliance filing in this matter. The Commission has reviewed the reporting requirements imposed on the Company in the cited dockets and believes that it will be preferable to simply make follow-up requests (as necessary) on the information filed in those dockets rather than receiving largely duplicate information in the next resource plan docket. Together, the compliance filing requirements in the cited proceedings and any necessary Department follow-up will ensure that the Department and the Commission have adequate information on expanded interruptible service and real-time pricing efforts to be implemented during the next year.

## **V. DEMAND-SIDE OPTIONS**

### **A. The Department**

The Department indicated that MP has significantly increased its goals for demand reduction due to load management. However, the Department argued that the Company's goals for energy and demand savings due to strategic conservation should be higher.

The Department concluded that the optimal levels of annual energy and winter-demand savings from strategic conservation are 854 GWh and 173 MW by the end of the planning period. By combining its own strategic conservation demand savings estimate with the Company's goal for demand savings from load management, the Department estimated that MP can cost-effectively reduce its winter peak by 286 MW by the end of the planning period. The Department also calculated a summer peak reduction goal of 265 MW.

The Department explained that the Company's goals are much lower than its goals because of the different approaches used. According to the Department, MP first determines its statutorily required level of investment in DSM activities, then identifies the achievable conservation of its Large Power customers, and finally determines the achievable conservation for its other customer classes. The Department indicated that it has the following objections to the methodology used by MP to determine its goals for strategic conservation:

- The method is not based on avoided costs.
- MP bases its goals on changes in legislation.
- MP limits conservation opportunities for its Large Power customers with its assumption that conservation potential for the class will be exhausted by 1999.
- MP does not include seasonal impacts of DSM, despite having the capability to produce that information.

The Department argued in support of its approach to determining achievable conservation potential, as described in its comments on MP's 1992 plan. The Department's method determines the three following types of information: the technical potential for conservation; the cost-effective portion of the technical potential; and the portion of the cost-effective potential that can be achieved given market and attitudinal barriers.

Accordingly, the Department recommended that the Commission implement the following requirements in its decision on this resource plan filing:

- that MP achieve, by the end of the planning period, conservation goals proposed by the Department, including an annual energy reduction of 854 GWh, a winter peak-demand reduction of 286 MW, and a summer peak-demand reduction of 265 MW;
- that MP use the Department's three-tier approach to derive its goals for strategic conservation; and
- that MP calculate the seasonal effects of its DSM programs.

#### **B. MP's Response**

MP disagreed with the Department's DSM goals. The Company argued that it has worked closely with the Department in developing good programs and reliable assessments of program impacts. MP indicated that its forecast best reflects its system DSM potential.

MP stated that its 1994 Resource Plan shows no need for additional power supply resources during the planning period. According to the Company, the lack of need for added capacity and the upward cost pressure of DSM programs on rates suggest that the higher DSM goals of the Department are not necessarily least cost or in the public interest.

The Company argued that one reason why the Department's goals appear higher is that the Department's comparison excluded "process efficiency" impacts from MP's goals while including Large Power "conservation" impacts in the Department's goals. Further, the Department assumed that DSM impacts continue throughout the forecast period. In contrast, MP's goals included only savings over the expected lives of the measures. The Company added that the Department made other assumptions that had the effect of increasing the goals. Consideration of all of these factors, the Company indicated, implies that the differences between the two sets of goals are not as great as suggested by the Department.

MP indicated its strong disagreement with the Department's recommended three-tier approach in determining DSM goals. The Company argued that its DSM forecast and achievable goals are based on detailed historical program and customer information combined with specific future customer, program and economic expectations. MP added that it uses end-use studies similar to the Department's recommended three-tier approach to check the reasonableness of the Company's forecast and goals. According to the Company, imposition of a similar approach would result in unnecessary costs without any improvement in accuracy. MP indicated that it is willing to continue to work with the Department to improve its DSM forecast.

Regarding the Department's suggestion that MP calculate the seasonal effects of its DSM programs, MP indicated that it would provide the Department with an analysis of the seasonal effects of its DSM goals and include the seasonal effects provided sufficient time is allowed to assemble this detailed information.

### **C. Commission Action Regarding Demand-Side Options**

There is no apparent disagreement between the Company and the Department over load management goals. The parties do disagree, however, over the strategic conservation portions of the Company's DSM goals. The differences between the Department and MP represent a philosophical difference in approach, a policy question that the Commission will need to address at some point. The policy question is whether conservation beyond the statutorily-required levels should be ordered, even if it increases rates, on the basis that the conservation is beneficial to society as a whole when external environmental costs are considered.

The Commission does not believe, however, that this docket is the appropriate time and place to depart from the Company's proposed goals. The Commission's decision is grounded in three considerations. First, the Commission is reluctant to substitute the Department's numbers for the Company's because the Department's calculations use some numbers not specifically for MP's service area.

The Company probably has superior knowledge of its customers and its system. Second, since MP is not planning any new supply-side facilities, the most important use of the strategic conservation goals is in providing input and direction in the conservation improvement program administered by the Department. Since the conservation improvement plans are also filed every two years, the most critical goals would be those over the next few years, a period during which the differences in goals are not large.

Based on its analysis, the Commission concludes that the differences in the goals are insufficient in the near-term to cause concern about the need for new supply-side resources. The Commission will accept the Company's near-term strategic conservation goals as proposed.

At the same time, the Commission is concerned over the questions raised by the Department about those goals. The Company, the Department, and the Commission could benefit from further discussions on methodology and results. The Commission will, therefore, require the Company to work with the Department in identifying the proper analytical procedures and goals for strategic conservation. In addition, the Commission will require MP to include in its next resource plan filing an analysis of the seasonal effects of its proposed DSM programs, as recommended by the Department and essentially accepted by the Company.

## **VI. SUPPLY-SIDE OPTIONS**

### **A. The Department's Comments**

The Department acknowledged that MP provided a renewables study in its current filing. However, the Department noted that the Company did not analyze every renewable option that might be available. Further, its study indicated considerable cost uncertainty with emerging options such as Whole Tree Energy (WTE<sup>TM</sup>) technology. As a result, the Department recommended that MP be required to continue its monitoring of renewable energy sources and to provide a complete renewables study in its next resource plan.

The Department also discussed MP's efforts in relicensing its hydro plants. The Federal Energy Regulatory Commission (FERC) is considering proposals which may affect the availability of power and energy from MP's hydro units. Also, the Company may have to alter its policy of maintaining a fairly constant water level at the Island Lake Reservoir, as recommended by intervenor Richard Andree. According to the Department, MP's past policy may have had the effect of reducing hydro production and increasing system fuel costs.

The Department recommended that the Commission require MP to update the Commission on the status of the FERC relicensing of the Company's hydro facilities on the St. Louis River. The Department also recommended that the Commission require MP to file a report on how FERC's decision actually affected the efficiency of MP's hydroelectric production. The Department indicated that this report should be filed in its next rate case or its next resource plan filing, whichever comes first.

Finally, the Department indicated that the Company's analysis of capacity options did not include consideration of VOCs. The Department recommended that the Company be required to perform a more rigorous analysis of capacity options in its next resource plan and that the analysis include VOC emissions.

## **B. Comments of Participant L. David Ostlie**

Mr. Ostlie, the owner and developer of Whole Tree Energy (WTE™) technology, presented the following concerns regarding information in MP's resource plan filing:

- 1) Fuel costs would be far less than MP's estimate of \$2.00 per million BTU (MBtu). Of seven areas studied by the Electric Power Research Institute (EPRI) for location of a whole-tree plant, five of the regions had projected fuel costs under \$1.30 per MBtu. Also, the EPRI study indicated that the effect of the Conservation Reserve Program (CRP) could reduce MP's estimate to approximately \$1.23 per MBtu.
- 2) Expected plant emissions cited by MP are too high compared to pulverized coal. For example, EPRI reported much lower oxide and particulate emissions than those indicated by MP.
- 3) The capital cost comparison given by MP (of a whole-tree plant versus a coal-fired plant) is unfair. In comparing base-load options, the annual capacity factor and unit size should be kept the same for each option. EPRI, Bechtel Engineering, and Energy Performance Systems, Inc. (EPS) all agree that a whole-tree facility will cost 10% to 25% less than a coal-fired plant of the same size.

## **C. MP's Response**

### **1. MP's Response to the Department's Comments**

MP indicated that the renewables study included in its 1994 Resource Plan covered those renewable options addressed in the Commission's 1992 Order, as further clarified in subsequent meetings with the Department. MP indicated that the Department had not asked for a study of landfill-gas-powered turbines and fuel cells. Nevertheless, the Company is obtaining information on these options from product developers and EPRI. MP indicated that it plans to present a set of power supply and DSM options in its next resource plan filing, including those renewable options identified as commercial technologies in EPRI's most recent issue of the Technical Assessment Guide (TAG™). Further, the Company indicated that it would investigate all renewable options with commercial operating experience prior to committing to construction of any new generation. MP added that a Laskin retrofit with WTE™ technology was addressed in 1992 and that such a retrofit project would be high-cost and risky.

In responding to the Department's comments on hydro relicensing, MP stated that FERC has released its Draft Environmental Impact Statement, which outlines the proposed operating conditions for the St. Louis River project. Based on the draft, MP expects to see a drop in energy production of about 77 GWh at a cost of about \$1.1 million in 1995, assuming MP is able to install a bypass pipe at the Fond du Lac station.

Finally, MP agreed to continue its efforts to develop a more rigorous study of its capacity options, especially when the Company identifies a need for a capacity addition. The Company indicated that it will include VOCs in its analysis of supply resources in future resource plans if the Commission establishes environmental cost values for VOCs.

## **2. MP's Response to Mr. Ostlie's Comments**

MP indicated that the least-cost capacity screening results in its 1994 Resource Plan would not change if Mr. Ostlie's capital and fuel cost assumptions were used. The Company stated that the differences in the assumptions relate to variations between projections for a first demonstration plant and projections for a mature, commercially-proven plant. MP pointed out that no WTE<sup>TM</sup> facility has been built and that, as a consequence, successful operation has not yet been demonstrated.

With respect to the three issue areas raised by Mr. Ostlie, MP responded as follows:

- 1) MP chose the St. Cloud area fuel costs because of close proximity to existing forest, to a poplar demonstration project, and to large tracts of land suitable for short-rotation woody crops. Also, for the St. Cloud area, current whole tree cost and availability data were obtainable from an independent consultant. The estimate of \$2.00 per MBtu is relatively low when constraints of available existing forest and limited experience with short-rotation woody crops are considered. Existing federal farm subsidies for tree planting on agricultural lands expire before a demonstration plant could be built.
- 2) There is no authoritative operating data upon which to base emission estimates for a 100-MW WTE<sup>TM</sup> facility. A 1993 EPRI report lists emission estimates equal to or higher than those cited either by Mr. Ostlie or by the Company in its 1994 Resource Plan.
- 3) The capital cost used by the Company reflects cost estimates provided in three EPRI studies, adjusted for inflation and to reflect utility rate base economics. The following costs need to be included to establish MP's total capital cost requirement: allowance for funds used during construction; a dollar-year adjustment for inflation; owner construction management costs; technology use fees and prepaid royalties; start-up fees; and an inventory and spare parts allowance. The Company considers the \$1700 per kilowatt installed cost (1994 \$) to be a reasonable estimate of the total capital requirement for a 100-MW WTE<sup>TM</sup> facility.

### **C. Commission Analysis and Action**

The Commission is interested in seeing evidence that MP has considered and is monitoring all appropriate supply-side options for possible use. However, the Commission is not inclined to specify what options the Company should discuss in its next resource plan filing, as recommended by the Department. The Commission notes that MP's current filing contains a great deal of information on wind, photovoltaics and WTE<sup>TM</sup> technology.

Specifically regarding WTE<sup>TM</sup>, the Commission is persuaded by the Company's responses to Mr. Ostlie's concerns that the Company has appropriately analyzed the usefulness of this resource option in its current resource plan.

### **VII. CONTINGENCY PLANNING**

The Department indicated that MP's contingency planning in the current filing is much better than that included in its 1992 filing. The Department concluded that the current plan satisfactorily deals with several identified uncertainties. Accordingly, the Department recommended approval of the Company's contingency plan without any changes. The Commission will accept the Department's recommendation.

### **VIII. CONCLUSION**

Based on its review of MP's 1994 Resource Plan and the foregoing analysis of certain resource planning issues, the Commission will approve Company's Plan, including the Company's contingency plan and DSM goals.<sup>2</sup>

At the same time, the Commission notes that the Company's implied DSM goals and their development require further discussion and study before the Company submits its next resource plan. In addition, the Department has suggested updates on certain issues that may change or be resolved prior to the Company's 1996 filing. The Commission believes that it would be beneficial for the Company to meet with the Department and other interested parties to discuss the unresolved issues identified in this Order.

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<sup>2</sup> In its comments recommending approval of MP's resource plan, the Department appeared to envision DSM goals and the Company's proposed contingency planning as separate from the Resource Plan. The Department recommended approval of the Resource Plan, separate approval of the Company's proposed contingency planning, and rejection of its proposed DSM goals. The Commission clarifies that DSM goals and contingency planning are a part of a utility's Resource Plan, which the Commission is authorized to "approve, reject, or modify." Minn. Stat. § 216B.24422 (1992).

To encourage thoughtful and substantive discussion among the parties at such meetings, the Company will be required to file an interim report providing the results of those discussions, as well as updates on hydro facilities, transmission developments, and other significant matters.

### **ORDER**

1. Minnesota Power Company's (MP's) 1994 Resource Plan is approved.
2. Within six months of this Order, MP shall file an interim report containing
  - a. a summary of the results of its discussions with the Department and any other parties or persons who show an interest regarding 1) the Company's implied DSM goals and 2) the other issues identified in this Order; and
  - b. updates on hydro relicensing, transmission developments, and other significant resource planning developments.
3. In its 1996 Resource Plan filing, MP shall
  - a. determine social costs for demand-side and supply-side options using all of the environmental externality values adopted by the Commission;
  - b. use the energy forecast variables recommended by the Department, or carefully explain why it would be inappropriate to do so;
  - c. explain its development of the load factor projections used in the peak-demand forecasts;
  - d. include an analysis of the seasonal effects of its produced DSM programs;
  - e. provide a discussion of specific renewable energy resources;
  - f. include a report on the efficiency of the Company's hydroelectric production<sup>3</sup>; and
  - g. provide updates on hydro relicensing, transmission developments, and other significant resource planning developments.
4. This Order shall become effective immediately.

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<sup>3</sup> If the Company's next rate case filing is submitted prior to July 1, 1996, this report shall be provided in the rate case filing instead of the 1996 Resource Plan filing.

BY ORDER OF THE COMMISSION

Burl W. Haar  
Executive Secretary

(S E A L)