



SOUTH DAKOTA

TEN YEAR

BIENNIAL PLAN

Report RP04 - 3

Resource Planning Department

Otter Tail Power Company

June 2004

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**SOUTH DAKOTA PUBLIC
UTILITIES COMMISSION**

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Resource Planning Department

Otter Tail Power Company

June 2004

June 17, 2004

South Dakota Public Utilities Commission
State Capitol Building
Pierre, SD 57501

Attention: Executive Director

Commissioners:

Subject: OTTER TAIL POWER COMPANY'S BIENNIAL TEN YEAR PLAN - JUNE 2004

Pursuant to the rules of the South Dakota Public Utilities Commission Energy Facility Plans ARSD 20:10:21, Otter Tail Power Company hereby files its Biennial Ten Year Plan.

With the above introduction, Otter Tail Power Company submits the following biennial ten year plan in accordance with ARSD 20:10:21 and Guidelines issued October 1977.

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INTRODUCTION

In accordance with the rules and regulations of the South Dakota Public Utilities Commission Energy Facility Plans ARSD 20:10:21, Otter Tail Power Company hereby files its Biennial Ten Year Plan.

Ten copies of this Biennial Ten Year Report are being filed with the Commission with enclosures. Notice of Filing of the plan is being sent to each of the state agencies and officers designated in Section 23 of the Energy Facility Plans.

SECTION 4 -- EXISTING ENERGY CONVERSION FACILITIES

A. Big Stone Plant

1. The Big Stone Plant is located in Grant County, South Dakota, approximately two miles west-northwest of Big Stone City, 1-3/4 miles from Big Stone Lake, and approximately two miles north of U.S. Highway 12. The site is in the central portion of Section 12, Township 121 N, Range 47 W.
2. The turbine-generator was built by Westinghouse and has a nameplate capacity of 414,590 kW at the generator terminals with inlet steam conditions of 2,400 psig, 1000 degrees F, a condenser pressure of 3.25 inches HgA, and 0% makeup.
3. Big Stone Unit #1 has a cruise rating of 450 MWs using the sub-bituminous coal. Net generation for the year 2002 was 3,115,519 MWh, and for 2003 was 3,324,951 MWh.
4. The Big Stone Plant appropriates its entire supply of water from Big Stone Lake. During calendar year 2002, 4,174 acre-feet of water was appropriated, and during 2003, 4,768 acre-feet was appropriated.
5. The Big Stone Plant continued to burn sub-bituminous coal in 2002 and 2003. The amount of sub-bituminous coal burned in 2002 was 1,918,857 tons and 2,013,763 tons in 2003. Big Stone also supplemented its coal supply by burning alternative fuels totaling about 3% of its annual fuel requirements. Tire-derived fuel (TDF) and renewable resource material (RRM) are burned at Big Stone Plant. TDF consumption for calendar year 2002 was 22,745 tons and for 2003 was 13,309 tons. In addition, 11,751 tons of RRM was burned in 2002 and 32,273 tons of RRM was burned in 2003.
6. Otter Tail Power does not have a projected date of removal from service for the Big Stone unit.

NOTE: Big Stone Plant is jointly owned by Otter Tail Power, Montana-Dakota Utilities Co., and Northwestern Public Service. Otter Tail Power serves as the operating agent for the unit.

B. Lake Preston Peaking Plant

1. The Lake Preston Peaking Plant is located in the city of Lake Preston, South Dakota, west of the intersection of 4th Street NW and Preston Street.
2. The generating unit consists of a G.E. frame 5 fuel oil fired combustion turbine connected to an electrical generator with a rated capacity of 23.95 MW at 59 degrees F. ambient temperature.
3. In 2002 the unit had net generation of 173 MWh and 2,272 MWh in 2003.
4. Water source does not apply for this unit.
5. In 2002, 32,158 gallons of #2 fuel oil were consumed and in 2003, 292,074 gallons were consumed.
6. Otter Tail Power does not have a projected date of removal for this unit.

SECTION 5 -- PROPOSED ENERGY CONVERSION FACILITIES

The possibility of a second unit at Big Stone Generation Station near Milbank in Grant County exists. A study project is underway to determine the feasibility of the project.

An ethanol plant built adjacent to Big Stone Plant became operational in March 2003. Big Stone Plant provides steam, fire protection, and access to its rail line for transporting the ethanol.

SECTION 6 -- EXISTING TRANSMISSION FACILITIES

Otter Tail Power owns three high-voltage transmission line sections described as follows:

1. A section of the Canby-Toronto 115 kV line starting from a point on the South Dakota line in Section 34, Township 114, Range 47, to a substation one mile west of Toronto, a distance of 13.1 miles, all in Deuel County. This is a wood-pole, H-frame line. No date has been projected for the removal of this line. Maps were provided with the 1998 plan.
2. A section of the Big Stone-Gary 230 kV line starting from a point .76 miles north of County Road #18 in Section 4, Township 118, Range 47, to a 230 kV substation four miles north of Gary in Section 16, Township 116, Range 47, a distance of 14.96 miles, 5.76 miles in Grant County and 9.2 miles in Deuel County. This is a wood-pole, H-frame line. No date has been projected for the removal of this line. Maps were provided with the 1998 plan.

3. A section of the Big Stone-Hankinson 230 kV line starting at a point on the South Dakota line in Section 26, Township 129, Range 50, to a point .3 miles north of the Roberts County Highway #23 in Section 11, Township 127, Range 50, a distance of 22.62 miles, all in Roberts County. This is a wood-pole, H-frame line. No date has been projected for the removal of this line. Maps were provided with the 1998 plan.

SECTION 7 -- PROPOSED TRANSMISSION FACILITIES

No transmission 230 kV and above is under consideration in South Dakota during the ten year period.

SECTION 8 -- COORDINATION OF PLANS

In 2001 Otter Tail Power Company and other transmission-owning members of the Mid-Continent Area Power Pool (MAPP), voted to integrate with the FERC approved Midwest Independent Transmission System Operator (MISO). MISO is headquartered in Indianapolis, Indiana. The objective of MISO will be to continue to coordinate the planning and operation of transmission facilities to provide reliable and economic electric service to it's members customers in a broader Midwest region. MISO also has the responsibility and authority over the process to interconnect new or expanded generation to the MISO transmission system. MAPP, located in St. Paul, MN will continue to operate as part of the MISO. MAPP will serve as a reliability organization responsible for establishing standards in accordance with National Energy Reliability Council (NERC) standards. In addition, Otter Tail Power is involved from time to time with other utilities serving load in South Dakota on various study groups and task forces.

Montana-Dakota Utilities Co., Northern States Power Company, Northwestern Public Service Company, Otter Tail Power Company, Minnkota Power Cooperative, and Basin Electric Cooperative are members of the Dakotas-Montana Power Suppliers Group. This group was formed in 1979 to provide regional planning coordination.

SECTION 9 -- SINGLE REGIONAL PLANS

The proposed facilities mentioned in Sections 5 and 7 comprise a part of the Mid-Continent Area Power Pool (MAPP) Regional Plan.

SECTION 10 -- SUBMISSION OF REGIONAL PLAN

The Mid-Continent Area Power Pool publishes a ten-year map entitled 'Principal Power Supply Facilities Existing and Authorized-10Year Map'. Facilities to be added during the ten-year period 2004-2013 are based upon information contained in the 2004 MAPP – U.S. Coordinated Bulk

Power Supply Program. An authorized 500 kV line is proposed from Huron to Sioux Falls in 2007. Since the project is located outside of the OTP service territory in South Dakota, Otter Tail Power is not involved in the project.

SECTION 11 -- UTILITY RELATIONSHIPS

Refer to Section 8 for a listing of the associations and power pools in which Otter Tail Power Company is involved. In addition, we have interconnections and transmission agreements in South Dakota with the following utilities: Northwestern Public Service Company, Montana-Dakota Utilities Co., East River Electric Cooperative, and Western Area Power Administration.

SECTION 12 -- EFFORTS TO MINIMIZE ADVERSE EFFECTS

Otter Tail Power Company has taken several positive steps in an effort to identify, minimize or avoid adverse environmental, social, economic, health, public safety, and historic or aesthetic preservation effects. One way of identifying, minimizing, and avoiding adverse environmental effects is using information gained through research. Otter Tail Power financially contributes to and actively participates in environmentally oriented research projects through organizations, such as the University of North Dakota Energy and Environment Research Center.

Otter Tail was involved for a year and a half with an Advanced Hybrid Particulate Collector (AHPC) pilot unit developed at the University of North Dakota that showed that the new system is highly effective. The AHPC's cutting-edge technology will enable the new emission-control system to remove 99.99 percent of fine particulates from the flue gas stream at Big Stone Plant. In 2001 the US Department of Energy granted 49 percent funding for the \$13.4 million project. The AHPC became operational in October 2002 and made Big Stone Plant a world leader in particulate emission controls.

By monitoring programs, OTP is able to identify any adverse environmental effects at Big Stone Plant. Although not required to do so by any federal, state, or local governmental bodies, Otter Tail Power engaged in pre-operational and post-operational air, water, and soil monitoring programs at Big Stone Plant. The purpose of these programs is to provide information to determine any effects of Big Stone Plant on the surrounding environment and to provide an "early warning" system should any of the effects of the plant be adverse.

Condenser cooling at Big Stone is accomplished by using a 340-acre closed-cycle cooling pond. Use of such a pond eliminates any potential problems created by plant thermal discharges to public bodies of water.

In 1980, construction was completed on the \$13.5 million Big Stone Plant wastewater management project, including a brine concentrator. The purpose of the brine concentrator is to remove the accumulated dissolved solids from water recycled in the closed-cycle cooling pond by a process similar to that employed in a distillery. Benefits of the brine concentrator include

reduced disposal volume of plant wastewater and improved cooling pond water quality.

Dikes surround oil storage tanks and larger chemical storage facilities to prevent contamination of large areas of soil or water should rupture of a storage tank occur. All underground petroleum storage tanks have been removed and replaced where necessary with above ground storage tanks. All above ground tanks are in compliance with existing requirements of the Department of Water and Natural Resources.

Otter Tail Power will continue to cooperate with the South Dakota Public Utilities Commission, the Department of Health, and the Department of Water and Natural Resources in an effort to site and operate future power plants and transmission lines in an environmentally acceptable manner, contingent with the needs of a reliable supply of electrical energy.

Social and Economic Effects

Social and economic effects are very closely related. In fact, they are often referred to as "socioeconomic" effects. Because of their close relationship, the socioeconomic effects will be discussed jointly.

From experience gained in past construction projects, such as Big Stone Plant, and Coyote Station located near Beulah, North Dakota, Otter Tail Power has been made aware of the socioeconomic effects of large construction projects. Pre-construction and post-construction socioeconomic monitoring was conducted in the vicinity of Big Stone in order to evaluate the effect of a large construction force on such things as the business community, housing, and essential services such as hospital and dental care. This type of monitoring was employed in conjunction with the construction of Coyote Station. Should Otter Tail Power need to construct a large facility in South Dakota, socioeconomic monitoring would be initiated to identify potential problem areas and direct the proper steps to problem solving.

In order to aid the economy in the area of construction, it has been Otter Tail Power's policy to utilize the local labor force and local contractors as much as possible. Local contractors also provide essential services during plant operations.

Health Effects

Various governmental regulations, including, for example, primary and secondary ambient air quality standards and water quality standards, have been promulgated to protect the public health and welfare. Otter Tail Power will comply with these regulations. In addition, Otter Tail Power contributes to research organizations, such as the Edison Electric Institute, which work to identify potential health and environmental problems as they relate to the electric utility industry.

Public Safety

Otter Tail Power is very concerned about public safety. All readily accessible substations and major plant sites are fenced to prevent unescorted access by the public who might be unfamiliar with electric energy or associated generation facilities.

In addition, Otter Tail Power complies with all applicable construction codes for the construction of electrical transmission lines and generation facilities.

Otter Tail Power also inspects its facilities periodically to help safeguard against failures of vital components and prevent any unnecessary exposure to the general public. Included in the inspections are electric transmission lines, circuit breakers, capacitors, and transformers.

Historic or Aesthetic Preservation Effects

Aesthetic effects have been considered in the design of transmission lines and power plants and will be considered in the design of future facilities. Transmission line routing considerations include visual effect on surrounding terrain. The design of Big Stone Plant included the choice of a color scheme that would blend with the surrounding countryside.

SECTION 13 -- EFFORTS RELATING TO LOAD MANAGEMENT

Otter Tail Power Company began the development of a load management program and control system in September of 1975. The Company investigated and tested several control systems and, in 1980, started the installation of the FM Radio Load Management System. In 1992 the new PC Based Automated Control System was completed. In 2002, Otter Tail updated the long-range forecast capability of the Load Management System .

In 2003 Otter Tail started a multi-year process to replace our existing Load Management System with new hardware and software from Comverge, Inc. of Norcross, GA. This multi-year replacement program will extend from 2003 through 2006. The existing system is 24 years old and it's becoming difficult to find replacement components to keep it operational. Also, the communications protocol it uses is no longer supported by equipment manufacturers and is not compatible with current Load Management system architecture supplied by equipment manufacturers. To date Otter Tail has replaced all of the system software and communications infrastructure and are approximately 24% complete with the replacement of individual radio receivers at customer premises.

The main objective of the control system is to turn off a variety of selected customer loads at times when Otter Tail Power Company's system is experiencing peak or near peak loads. This system has allowed Otter Tail to delay the need for the addition of new generating facilities and to permit the system to be more efficiently operated. The latest MAPP Load and Capability Report shows an increasing use of this system. The load forecast used in the MAPP Load and

Capability Report reflects conservation efforts that are customer driven, as well as those that are initiated by Otter Tail as part of the Conservation Improvement Plan (CIP), and those that develop as a natural result of load management efforts.

Some of the customer loads that are included in the Load Management Program are electric water heaters, the electric heating portion of dual fuel heating plants, electric process heating, irrigation, electric thermal storage and, on our Residential Demand Control (RDC) Program. Otter Tail is initiating an air conditioning program in the state of Minnesota. Depending upon evaluation of that program's success, the air conditioning program may be rolled into North and South Dakota in 2005. These loads are turned off at varying periods of time to achieve lower demands when Otter Tail Power is in a peak period.

Total installations as of May 2004 include 40,424 radio receivers and 39 radio transmitters on the Otter Tail Power system. There are 4,179 of these receivers and 4 transmitters located in the state of South Dakota.

The radio receivers are used to control electric water heaters, small dual fuel accounts (less than 80 kW), large dual fuel accounts (greater than 80 kW), thermal storage accounts, and residential demand control customers on Otter Tail Power Company lines. The radio signal to control these loads is initiated at the System Operations Center in Fergus Falls, Minnesota.

SECTION 14 -- LIST OF REPORTS

No reports or studies have been filed with federal or state agencies relating to the proposed facility mentioned in Section 5. Should any of the other facilities mentioned be scheduled for construction, Otter Tail Power Company, when acting as the lead agency, will file all studies and reports then required with governmental agencies.

SECTION 15 -- CHANGES IN STATUS AT FACILITIES

There is no change in the Big Stone Plant status. The unit continues to be operated as a base-loaded unit for Otter Tail system load. Lake Preston continues to be operated during peak demands and line stability conditions. In the summer of 2001 an inlet fogging system was added at Lake Preston to increase monthly summer ratings.

SECTION 16 -- PROJECTED ELECTRIC DEMAND

The projected winter season demand for the Otter Tail Power system is as follows:

	Unmanaged	Managed	Load Management.
<u>Year</u>	<u>Peaks</u>	<u>Peaks</u>	<u>Utilized</u>
2004	724	690	34
2005	733	636	97
2006	747	649	98
2007	756	657	99
2008	765	665	100
2009	778	677	101
2010	787	684	103
2011	796	692	104
2012	809	704	105
2013	818	712	106
2014	827	720	107

The South Dakota portion of the Otter Tail Power System Demand is not metered; it is estimated. It is estimated to be about 8.1% of the Otter Tail Power System total.

	Unmanaged	Managed	Load Management
<u>Year</u>	<u>Peaks</u>	<u>Peaks</u>	<u>Utilized</u>
2004	59	56	3
2005	59	52	7
2006	61	53	8
2007	61	53	8
2008	62	54	8
2009	63	55	8
2010	64	55	9
2011	64	56	8
2012	66	57	9
2013	66	58	8
2014	67	58	9

The 2004-2014 MAPP Load & Capability Forecast reports Otter Tail's projected seasonal surpluses and deficits. As a company, Otter Tail Power will continue to use a combination of load management and purchase agreements with other utilities to meet any future deficits. Otter Tail also continues to study and assess the potential for future additions to its generation. In 2003, Otter Tail Power had a system peak of 669 MW on February 10th for hour ending at 9 a.m.

Otter Tail Power has purchased summer season peaking capacity for the year 2004. Otter Tail has also purchased summer and winter capacity from Manitoba Hydro Electrical Board for May 1997 through April 2005 and also for May 1, 2000 through April 30, 2010. Otter Tail Power also has a diversification contract with XCEL Energy (formerly Northern State Power) for the exchange of summer and winter capacity that is in effect through the summer of 2004. Further detailed information may be obtained from Otter Tail Power's 2004 Resource Plan filed with the Minnesota Department of Commerce. Copies of Otter Tail Resource Plans are provided to the South Dakota Public Utilities Commission.

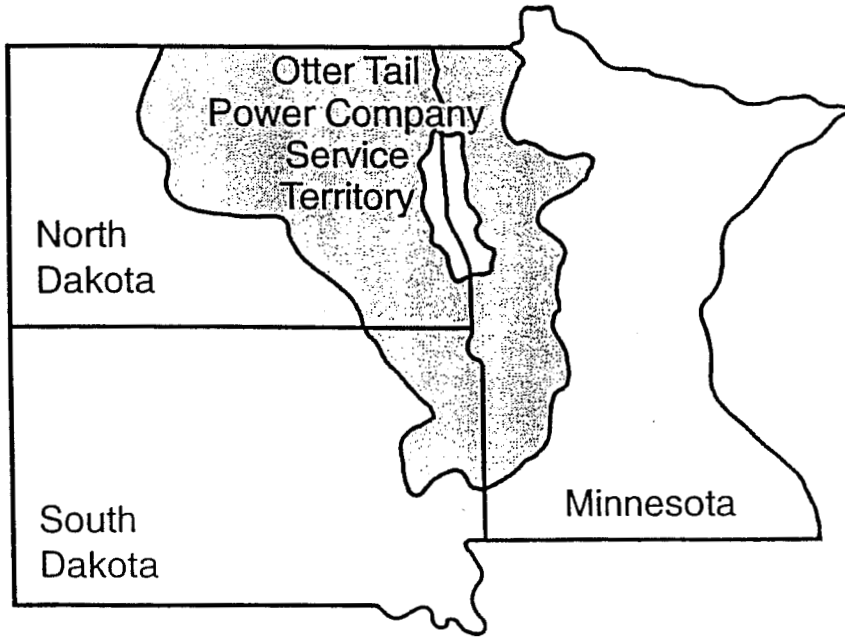
SECTION 17 -- CHANGES IN ELECTRIC ENERGY

The projected increase of winter season demand for Otter Tail Power system and South Dakota:

Year	Unmanaged System Load Increase	Percent Increase of System	South Dakota Load Increase	Percent Increase of South Dakota
2005	9 MW	1.23%	0 MW	0.00%
2006	14 MW	1.87%	2 MW	3.28%
2007	9 MW	1.19%	0 MW	0.00%
2008	9 MW	1.18%	1 MW	1.61%
2009	13 MW	1.67%	1 MW	1.59%
2010	9 MW	1.14%	1 MW	1.56%
2011	9 MW	1.13%	1 MW	1.56%
2012	13 MW	1.61%	2 MW	3.03%
2013	9 MW	1.10%	0 MW	0.00%
2014	9 MW	1.09%	1 MW	1.49%

SECTION 18 -- MAP OF SERVICE AREA

A map of the Otter Tail Service Area is shown below.



Ten copies of this Ten Year Biennial Plan are being filed with the Commission with enclosures. Notice of Filing of the plan is being sent to each of the state agencies and officers designated in Section 23 of the Energy Facility Plans. Should the commission wish additional copies of the Plan or Notices of Filing to be sent by Otter Tail Power, please inform us.

Very truly yours,



Bryan Morlock
Manager, Resource Planning

Enclosures

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Notices of Filing sent as designated in Section 23 of ARSD 2:10:21.