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May 3, 2010



Darrell Nitschke  
Executive Secretary/Director of Administration  
North Dakota Public Service Commission  
State Capitol - 600 East Boulevard  
Bismarck, ND 58505-0480

**RE: Otter Tail Power Company's Annual Report**

Dear Mr. Nitschke:

Enclosed is Otter Tail Power Company's ("Otter Tail's") 2009 Annual Report for North Dakota. As in past years, I am also enclosing a copy of Otter Tail Corporation's 2009 Annual Report to Shareholders. Otter Tail filed its FERC 1 on April 12, 2009, but we have identified a few minor corrections to it; therefore, we have not printed paper copies of FERC Form No. 1 for 2009. Otter Tail's FERC Form 1 is available on line at <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12334825>. We will notify you when the resubmitted FERC Form 1 is available. I am also forwarding an electronic copy of the North Dakota Annual Report in pdf format by email to you at [dnitschk@nd.gov](mailto:dnitschk@nd.gov) and to [ndpsc@nd.gov](mailto:ndpsc@nd.gov).

As part of Otter Tail's general rate case (Case No. PU-08-862) concluded in 2009, Otter Tail and the North Dakota Public Service Commission advocacy staff entered into a Partial Settlement dated February 20, 2009, regarding rate of return and return on equity. That Partial Settlement was later included in a comprehensive Settlement Agreement signed in early October. The Public Service Commission issued its Order on Settlement on November 25, 2009. The settlement included an earnings sharing provision, as follows:

*If the Company earns in excess of 10.75 percent ROE as reflected in the annual report of jurisdictional regulated electric earnings for any fiscal year prior to either: (i) 2011; or (ii) the test year included in the Company's next electric general rate case (whichever occurs sooner), the Company will refund to customers revenues corresponding to earnings as shown below:*

- 50 percent of earnings above 10.75 percent ROE up to and including 11.25 percent ROE
- 75 percent of earnings above 11.25 percent ROE

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*Earnings sharing credits would be applied to customer accounts as soon as practical after July 1, after the annual report of electric earnings for the given fiscal year has been filed with the Commission (typically on May 1). A refund would be administered as a one-time bill credit.*

Otter Tail's return for 2009 calculated on revenue and expenses recovered through base rates was 11.24 percent resulting in an earnings sharing credit of \$422,452. The primary reasons for the higher return were: (1) the load of a large customer did not completely materialize as anticipated in the general rate case, reducing the North Dakota's share of expenses and capital costs, and (2) a change in the tax rules in 2009, which Otter Tail adopted, reduced income tax expense.

The calculation of the earnings sharing credit is found on page 1 of Otter Tail's Annual Report. Pages 2-4 provide supporting financial information in the customary format. Pages 5 and 6 show financial information that includes revenue and costs related to Otter Tail's wind generation. The information on pages 5 and 6 is provided for reference and for comparative purposes only since the revenue requirements for wind are determined through a separate cost recovery process, which includes its own true-up mechanism for prior period under- and over-collections.

Otter Tail will implement the refund as soon as practical after July 1, 2010.

If you have questions on the information provided, don't hesitate to contact me at (218) 739-8607 or pbeithon@otpc.com.

Very truly yours,

/s/ PETE BEITHON  
Pete Beithon  
Manager, Regulatory Economics

wao  
Enclosures  
By electronic service and overnight mail

ANNUAL REPORT  
OF  
**OTTER TAIL POWER COMPANY**  
TO THE  
PUBLIC SERVICE COMMISSION OF NORTH DAKOTA  
FOR THE  
YEAR ENDED DECEMBER 31, 2009

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**Shared Earnings Calculation Based on the Order in Docket No. PU-08-862**

<u>Line</u>	<u>Item and Report Reference</u>		
1	Unadjusted earnings from base electric operations (page 1, line 24):		\$17,849,332
2	Debt expense and preferred equity dividends:		
	a. Regulated average rate base (page 3, line 13):	\$200,107,262	
	b. Weighted cost of debt (page 3, line 15):	2.97%	
	c. Weighted preferred equity cost (page 3, line 16):	0.06%	
	d. Debt & pref. equity costs (line 2a X {line 2b+line 2c}):		6,063,250
3	Actual common equity earnings (line 1 - line 2d):		\$11,786,082
4	Baseline ROE common equity earnings:		
	a. Regulated average rate base (page 3, line 13):	\$200,107,262	
	b. Equity ratio (page 4, line 5):	52.40%	
	c. Equity portion of average rate base (line 4a X line 4b):	\$104,856,205	
	d. Starting point for 50% sharing of earnings (line 4c X starting ROE limit):	10.75%	\$11,272,042
	e. Upper limit ROE for 50% sharing (line 4c X upper ROE sharing):	11.25%	\$11,796,323
5	Actual common equity earnings subject to ROE 50% sharing (line 3 - line 4d):		\$514,040
6	Pre-tax multiplier (1 / {1-tax rate}):	Tax rate: 39.16%	1.643655
7	Pre-tax amount to share (line 5 X line 6):		844,904
	a. Customer refund (50% of line 7):	<b>\$422,452</b>	
	b. Retained by company (line 7 - line 7a):	\$422,452	
8	Actual common equity earnings subject to ROE 75% sharing (line 3 - line 4e):		\$0
9	Pre-tax multiplier (1 / {1-tax rate}):	Tax rate: 39.16%	1.643655
10	Pre-tax amount to share (line 8 X line 9):		\$0
	a. Customer refund (75% of line 10):	<b>\$0</b>	
	b. Retained by company (line 10 - line 10a):	\$0	
10	Total Pre-tax amount to refund (line 7a.+ line 10 a.		<b>\$422,452</b>

## Operating Statement - Base Rates

LINE #	DESCRIPTION	(A)	(B)	(C)
		2009 TOTAL COMPANY	2009 NORTH DAKOTA	N. D. % (B / A)
<b>Operating Revenues:</b>				
1	Residential	\$95,082,225	\$42,867,314	45.1%
2	Small Commercial and Industrial	53,043,725	24,076,455	45.4%
3	Large Commercial and Industrial	121,324,804	46,097,925	38.0%
4	Other Retail	5,406,091	2,297,047	42.5%
5	Total Retail Revenue	<u>\$274,856,844</u>	<u>\$115,338,742</u>	42.0%
6	Other Electric Revenue	13,351,685	5,254,694	39.4%
7	Total Revenue	<u>\$288,208,529</u>	<u>\$120,593,436</u>	41.8%
<b>Operating Expenses:</b>				
8	Production Expenses	129,383,547	51,960,446	40.2%
9	Transmission Expenses	10,686,696	4,413,930	41.3%
10	Distribution Expenses	14,334,019	6,395,105	44.6%
11	Customer Accounting Expenses	11,149,593	4,873,168	43.7%
12	Customer Service and Information Expenses	5,198,814	999,167	19.2%
13	Sales Expenses	878,227	486,317	55.4%
14	Administration and General Expenses	32,158,082	13,016,778	40.5%
15	Charitable Contributions	93,665	0	0.0%
16	Depreciation Expense	27,052,662	11,340,468	41.9%
17	General Taxes	8,198,591	3,458,950	42.2%
18	Total Operating Expenses	<u>\$239,133,896</u>	<u>\$96,944,329</u>	40.5%
19	Net Operating Income Before Income Taxes	\$49,074,633	\$23,649,107	48.2%
Income Tax Expense:				
20	Investment Tax Credit	(1,401,097)	(586,711)	41.9%
21	Deferred Income Taxes	20,027,530	8,263,965	41.3%
22	Income Taxes	<u>(7,289,799)</u>	<u>(1,877,469)</u>	25.8%
23	Total Income Tax Expense	<u>\$11,336,634</u>	<u>\$5,799,785</u>	51.2%
24	Net Regulated Earnings	<u>\$37,737,999</u>	<u>\$17,849,322</u>	47.3%

## Rate Base and Return on Equity - Base Rates

LINE #	DESCRIPTION	(A)	(B)	(C)
		2009 TOTAL COMPANY	2009 NORTH DAKOTA	N. D. % (B / A)
1	Plant in Service	\$1,027,925,517	\$430,445,291	41.88%
2	Net Capitalized Items - Big Stone Plant	62,826	57,623	91.72%
3	Accumulated Depreciation	<u>(480,119,113)</u>	<u>(199,359,250)</u>	41.52%
4	Net Plant in Service	\$547,869,230	\$231,143,663	42.19%
5	Plant Held for Future Use	29,657	13,038	43.96%
6	Construction Work in Progress	21,050,061	762,833	3.62%
7	Materials and Supplies	15,715,814	6,681,668	42.52%
8	Fuel Stocks	8,615,745	3,366,508	39.07%
9	Prepayments	(35,012,678)	(14,771,698)	42.19%
10	Customer Advances	(396,606)	(167,326)	42.19%
11	Cash Working Capital	33,580,949	13,716,104	40.84%
12	Accumulated Deferred Income Taxes	<u>(98,960,044)</u>	<u>(40,637,528)</u>	41.06%
13	Total Average Rate Base	<u>\$492,492,128</u>	<u>\$200,107,262</u>	40.63%
<b>ACTUAL</b>				
14	Rate of Return on Average Rate Base (page 1, Line 24 /line 13)	7.66%	8.92%	
15	Less: Weighted Cost of Ltd (Page 3, line 1 (D))	2.97%	2.97%	
16	Weighted Cost of Pref. Stock (Page 3 line 2 (D))	<u>0.06%</u>	<u>0.06%</u>	
17	Weighted Return on Equity	4.62%	5.89%	
18	% of Equity to Capital Structure (Page 3, line 3 (B))	<u>52.40%</u>	<u>52.40%</u>	
19	Return on Equity (Page 3, line 4 (D))	<u>8.82%</u>	<u>11.24%</u>	

AVERAGE WEIGHTED COST OF CAPITAL - BASE RATES					
LINE #	DESCRIPTION	(A) AVERAGE BALANCE	(B) RATIO	(C) COST	(D) WEIGHTED COST
1	LONG TERM DEBT	\$285,578,187	46.25%	6.43%	2.97%
2	PREFERRED EQUITY	8,346,154	1.35%	4.75%	0.06%
3	COMMON EQUITY	<u>323,534,543</u>	52.40%	11.24%	<u>5.89%</u>
4	TOTAL	<u>\$617,458,884</u>	100.00%		<u>8.92%</u>

## Operating Statement - With Wind

LINE #	DESCRIPTION	(A)	(B)	(C)	(D)	(E)
		2009 TOTAL COMPANY	2009 NORTH DAKOTA	N. D. % (B / A)	2008 NORTH DAKOTA	ANNUAL CHANGE (B-D / D)
<b>Operating Revenues:</b>						
1	Residential	\$99,346,417	\$45,574,088	45.9%	\$44,247,318	3.0%
2	Small Commercial and Industrial	55,577,203	25,520,269	45.9%	24,735,886	3.2%
3	Large Commercial and Industrial	128,040,509	49,593,623	38.7%	46,572,747	6.5%
4	Other Retail	5,639,884	2,445,490	43.4%	2,265,328	8.0%
5	Total Retail Revenue	\$288,604,013	\$123,133,470	42.7%	\$117,821,279	4.5%
6	Other Electric Revenue	13,351,685	5,148,668	38.6%	14,287,747	-64.0%
7	Total Revenue	\$301,955,698	\$128,282,138	42.5%	\$132,109,026	-2.9%
<b>Operating Expenses:</b>						
8	Production Expenses	130,630,194	52,449,537	40.2%	59,685,584	-12.1%
9	Transmission Expenses	10,686,696	4,413,930	41.3%	4,340,860	1.7%
10	Distribution Expenses	14,334,019	6,395,105	44.6%	6,580,346	-2.8%
11	Customer Accounting Expenses	11,149,593	4,873,168	43.7%	4,776,101	2.0%
12	Customer Service and Information Expenses	5,198,814	999,167	19.2%	1,235,888	-19.2%
13	Sales Expenses	878,227	486,317	55.4%	549,189	-11.4%
14	Administration and General Expenses	32,445,811	13,100,321	40.4%	12,968,983	1.0%
15	Charitable Contributions	93,665	0	0.0%	0	N/A
16	Depreciation Expense	35,594,312	14,645,116	41.1%	12,326,318	18.8%
17	General Taxes	8,845,653	3,652,475	41.3%	3,612,560	1.1%
18	Total Operating Expenses	\$249,856,984	\$101,015,136	40.4%	\$106,075,829	-4.8%
19	Net Operating Income Before Income Taxes	\$52,098,714	\$27,267,002	52.3%	\$26,033,197	4.7%
Income Tax Expense:						
20	Investment Tax Credit	(9,310,969)	(3,851,083)	41.4%	(1,758,657)	119.0%
21	Deferred Income Taxes	49,188,192	20,283,411	41.2%	14,529,948	39.6%
22	Income Taxes	(38,074,003)	(13,474,894)	35.4%	(6,825,772)	97.4%
23	Total Income Tax Expense	\$1,803,220	\$2,957,434	164.0%	\$5,945,519	-50.3%
24	Net Regulated Earnings	\$50,295,494	\$24,309,568	48.3%	\$20,087,678	21.0%

Rate Base - With Wind

LINE #	DESCRIPTION	(A)	(B)	(C)	(D)	(E)
		2009 TOTAL COMPANY	2009 NORTH DAKOTA	N. D. % (B / A)	2008 NORTH DAKOTA	ANNUAL CHANGE (B-D / D)
1	Plant in Service	\$1,259,301,236	\$520,855,934	41.36%	\$450,702,162	15.57%
2	Net Capitalized Items - Big Stone Plant	62,826	57,623	91.72%	77,960	-26.09%
3	Accumulated Depreciation	<u>(487,804,746)</u>	<u>(202,327,550)</u>	41.48%	<u>(189,465,997)</u>	6.79%
4	Net Plant in Service	\$771,559,316	\$318,586,007	41.29%	\$261,314,125	21.92%
5	Plant Held for Future Use	29,657	13,038	43.96%	12,856	1.42%
6	Construction Work in Progress	21,620,500	811,747	3.75%	1,081,966	-24.97%
7	Materials and Supplies	16,272,126	6,897,649	42.39%	6,285,142	9.75%
8	Fuel Stocks	8,615,745	3,366,508	39.07%	3,091,368	8.90%
9	Prepayments	(35,012,678)	(14,457,151)	41.29%	(13,628,136)	6.08%
10	Customer Advances	(396,606)	(163,763)	41.29%	(97,950)	67.19%
11	Cash Working Capital	38,298,264	15,582,567	40.69%	5,794,569	168.92%
12	Accumulated Deferred Income Taxes	<u>(160,174,658)</u>	<u>(65,893,347)</u>	41.14%	<u>(39,234,571)</u>	67.95%
13	Total Average Rate Base	<u>\$660,811,666</u>	<u>\$264,743,255</u>	40.06%	<u>\$224,619,369</u>	17.86%

## MISCELLANEOUS

LINE #	DESCRIPTION	2009	2008	2007	2006	2005
	Customer Related (ND):					
	Year End # of Customers					
1	Residential	44,340	44,222	44,319	44,343	44,261
2	Commercial	11,194	11,277	11,271	11,211	11,195
3	Industrial	878	843	826	815	787
4	Other	532	536	520	525	517
5	Total	<u>56,944</u>	<u>56,878</u>	<u>56,936</u>	<u>56,894</u>	<u>56,760</u>
	KWH's Sold					
6	Residential	600,554,154	568,278,543	553,508,219	534,576,036	536,382,178
7	Commercial	318,238,797	301,585,437	298,698,198	285,337,128	288,908,102
8	Industrial	751,574,603	709,550,579	709,886,478	686,826,359	677,680,888
9	Other	31,552,451	30,499,320	30,727,584	30,850,754	31,231,684
10	Subtotal	<u>1,701,920,005</u>	<u>1,609,913,879</u>	<u>1,592,820,479</u>	<u>1,537,590,277</u>	<u>1,534,202,852</u>
11	Unbilled sales	4,072,195	9,168,347	4,191,000	1,872,000	(6,429,000)
12	Total	<u>1,705,992,200</u>	<u>1,619,082,226</u>	<u>1,597,011,479</u>	<u>1,539,462,277</u>	<u>1,527,773,852</u>
13	Reliability Indices (1)					
14	SAIDI (total minutes)	62.1	68.1	65.8	59.8	186.4
15	SAIFI (frequency)	1.1	1.2	1.2	1.4	20.9
16	CAIDI (duration)	56.9	58.4	54.4	43.2	8.9

(1) Beginning in 2006, Otter Tail began using a new interruption monitoring system. The new IMS allows use of the more common definition of a service interruption (longer than 5 minutes). With the changed definition, the frequency of measured interruptions decreases while the length of recorded interruptions increases. Total minutes of interruptions is generally comparable with historic measures.

## Otter Tail Power Company May 2010 Annual Report to North Dakota

### Report on Status of Smart Metering

In its Order dated August 8, 2007, Case No. PU-06-290, the North Dakota Public Service Commission, at ordering paragraph no. 2, required that:

"Each jurisdictional electric utility shall include in its annual reports to the Commission, beginning with reports filed for 2007, a discussion of progress towards the feasibility of making smart metering available for all customers."

"Smart Grid" and "Smart Metering" terms have been used interchangeably as the utility industry moves to adopt changes that make sense for each of the utilities service areas. Otter Tail's response to this Commission's order in May 2008 and May 2009 has been to review the status of technology available for "Smart Metering". This year Otter Tail is providing an overview of our "Smart Grid" applications as our response to this requirement.

Otter Tail has used technology to improve employee productivity and customer service for many years. "Smart Grid" investments occur in many aspects of our work and our mission, which is to produce and deliver electricity as reliably, economically, and environmentally responsibly as possible to the balanced benefit of customers, shareholders, and employees and to improve the quality of life in the area in which we do business.

The following is a description of some of the "Smart Grid" type applications that are in use at Otter Tail.

- Home Energy Monitoring
- Bill Analyzer
- Power Profiler
- Peak-Shaving Technologies
- Energy Storage Systems
- Interruption Monitoring System
- Mobile Data Pilot Project
- Protective Relaying

#### **Home Energy Monitoring**

Our "Community Energy Challenge" in Rothsay, Minnesota includes the installation of 50 in-home energy monitoring devices. These devices display in real time the estimated dollar amount of electricity the household is consuming. A wireless sensor is attached to our meter and transmits information to the portable receiver in the customer's home. The portable wireless receiver displays energy usage on a large LCD screen. It can be set to display in dollars and cents based on Otter Tail rates, or in kilowatt hours. We are interested to see how this information can help customers reduce usage and if the reduction is sustainable.

## **Bill Analyzer**

A new program was recently added to our Otter Tail Power Company website that allows our customers to analyze their energy usage and billing, input home profile data, and compare their usage with other comparable customers. The program is called Bill Analyzer and the purpose of this tool is to help our customers, who have the desire to better understand their energy bill, to understand what steps they could take to reduce energy use and manage cost. After a simple registration process a customer can review 25 months of billing history, provide personal information about their home, appliances, and living habits, and review payment information. The analytic engine uses weather data and the provided information to calculate probable reasons for changes in usage. By entering their home profile the customer can determine how their usage is broken out by applications and see how their usage compares to other customers with comparable size homes. Bill analyzer features include:

Bill center - Customer account with amount due, due date, last payment, and graphs to compare energy use.

Bill highlights - Factors that may have contributed to a change in the electric bill . If customers need more details they can dig deeper with bill analysis.

Bill history and analysis - 25 months of history let customers compare statements from any two billing cycles.

Home energy center - Energy audit for the home. After the audit, customers can create a plan to save energy.

The website link: <http://www.otpc.com/YourElectricAccount/BillAnalyzer.asp>

A counterpart to the Bill Analyzer web self-service tool is a version used by Service Representatives and call center representatives to answer high bill complaints and other customer questions.

## **Power Profiler**

The Power Profiler is a fee based on-line program offered to customers with interval metering. Commercial or industrial customers are the main users of this program.

The program allows “day after” or “month after” 15 minutes energy and demand usage to be displayed in a variety of graphical formats. Our larger customers have found this data to be valuable to find and eliminate costly demand peaks by fine-tuning equipment operation and altering work schedules.

The Power Profiler has nine detailed reports as bar graphs, line graph or data output.

- Peak day demand
- 24 hour profile

- kVA / power factor
- Daily peaks
- Detail profile
- Daily totals
- Peaks report
- Statistics report
- Comparison graph

This software program will be used to monitor individual building usage and evaluate energy savings as a key part of our “Campus Energy Challenge” at the University of Minnesota Crookston campus.

### **Peak-Shaving Technologies**

Otter Tail has a long history of installing peak-shaving technologies at customer premises. This legacy started with electric water heaters back in the 1940s that were controlled with time-clocks set to avoid energy usage during the morning and evening highest load periods each day. In the 1980’s this legacy system was updated with a radio control system. Beginning in 2003, Otter Tail began to replace the radio control system with an updated radio control system. This update was completed in 2007. This system allows Otter Tail to send a signal out to groups of customers during periods of high demand which includes capacity constraints or high energy prices. When the signal is received by a radio typically near the customer’s meter socket, the customer’s system automatically reduces their controllable load.

The tariffs and related loads that are part of the peak-shaving technologies applied by our customers and controlled by Otter Tail include: electric water heaters, dual fuel systems, thermal storage systems, air conditioning, residential demand control, commercial demand control, and irrigation systems. We have approximately 41,000 load management receivers installed and have demonstrated over 100 MW of control during the coldest days in the winter, or approximately 12-15 percent of our on peak capacity needs.

The system and supporting tariff that allows the most flexibility for the customer is the Residential Demand Controller (RDC). A radio receiver mounted near the customer meter socket receives the signal when our system demand is high. A demand controller installed in the home reacts to this signal by reducing the customer demand to a level preselected by the customer that meets their individual energy usage needs. A set station installed in the living area identifies that the customer is being controlled, shows the demand level that is being maintained by the demand controller, and in cases where the connected load does not reduce home demand to the preselected level, the set stations signals to the customer that further action is required to reduce non-controlled load. At this point the customer has the choice to either increase their preselected demand or reduce demand by turning off lights, electric appliances or any heating equipment that may not be connected to the demand controller. In exchange for controlling their demand, the customer receives a rate that is up to thirty percent lower than the firm residential service rate.

### **Energy Storage System**

As noted above, our Peak-Shaving Technologies include Energy Storage Systems which are known at Otter Tail as “Thermal Storage” or “Deferred Load” systems. These include under-floor heating, brick storage furnaces, and brick room heaters. These systems are sized before installation to store adequate thermal energy to allow the home or business to be comfortable during long period of load control by Otter Tail (up to 14-16 hours continuous depending on the tariff used). These systems store energy by charging during off-peak periods and heat is available for discharge into the home or business as needed. In this instance energy is not called for from the grid during peak periods.

Otter Tail serves a region rich in wind resources. With the abundance of wind energy in our service area we are piloting the use of distributed thermal storage systems as a sink for renewable energy during times of low and negative energy prices, or during periods when there are ample wind resources. These low cost distributed storage systems are a much cheaper alternative to large utility scale battery storage.

We have started discussions with a vendor of brick furnaces to modify their smart control package to allow multiple steps of energy storage in these systems while maintaining comfort in the home. These systems need to be able to receive signals to store energy at a multiple temperature levels and disperse energy as needed for home comfort. Testing of this smart technology is also available for water heating units and would follow a successful brick furnace pilot.

In addition, we have developed a model with Integral Analytics to value the benefits of storing energy while optimizing a variety of resources. That model is currently being marketed as WindStore (trademark pending).

### **Interruption Monitoring System**

In order to monitor and improve the reliability of our electrical system an Interruption Monitoring System (IMS) was installed. Voltage and outage monitoring devices manufactured by Telemetric have been installed on each of the 725 distribution feeders in the Otter Tail system. These intelligent field devices report power interruptions, over/under voltage alarms and power reliability status using the commercial cellular networks (GPRS and 1XRTT).

Web based analysis and application tools allow reporting, alarm notifications and graphical status updates. Our reliability engineer uses the IMS for reporting reliability indices and for further analysis as he works with our Area Engineers to propose projects to improve reliability.

We recently added a graphical mapping tool which integrates IMS data with Google mapping on which each feeder is shown as a black dot. The dot changes to red when an interruption occurs, yellow for a momentary interruption that has been restored, and green for a sustained interruption that has been restored. This tool provides an overall view of the status of the Otter Tail system in real time.

The Google mapping is available for use by our front line staff along with management and engineering staff who have found this information helpful in response to customer outage questions and for restoration of service. Additional work is underway to make the information available for our customers through our website.

### **Mobile Data Pilot Project**

In mid 2008, Otter Tail began a Mobile Data Pilot Project to a few field Service Representatives in our Milbank CSC and in 2009 this pilot was expanded to a few Service Representatives in the Morris CSC. In 2010 we are planning to roll out the Mobile Data System to across our service territory to allow Service Representatives to directly access needed information in ways that they have not the opportunity before.

The goal of this project is to improve productivity and efficiency while enhancing customer satisfaction by providing Service Representatives with “real time” information with the use of a mobile computer in Company vehicles.

Data available to from the Mobile Data System will include:

- Company email
- Customer Information Systems (the Company’s billing system)
- Customer Service Guide
- Load management real time control information
- Interruption monitoring system
- Ability to display and update maps and prints of Otter Tail’s electrical system
- Otter Tail website
- Bill Analyzer, and other on-line tools

This will assist the Service Representatives as they provide customer service in areas such as supporting rates, handling customer’s questions, and meeting conservation and demand side management objectives.

### **Protective Relaying**

The first “smart” protective relays were developed and installed in the mid 1980’s. Otter Tail was involved with the first installation on high voltage transmission lines of the devices designed by SEL (Schweitzer Engineering Labs). These devices provided system data during faults, giving engineers information to determine fault location. This information was used by our System Operations area to isolate the faulted line section quickly and reduce outage duration on our transmission system.

Before the use of the SEL fault locating relays, each time a line tripped, it required a long process of switching and re-energizing the line section by section to determine which section of the transmission line experienced the fault.

The technology used for remote communication to protective relays in our substations has improved greatly since the mid 1980's, allowing advance monitoring of the transmission grid by Otter Tail and the Midwest Independent System Operator ("MISO").

Otter Tail will be participating in the North American SynchroPhasor initiative by installing special relays and related communications in at least three substations in 2010. This reliability project is being coordinated by MISO for our region.

Synchrophasors are precise grid measurements now available from monitors called Phasor Measurement Units (PMUs). PMU measurements are taken at high speed. Typically 30 observations per second compared to one every 4 seconds using conventional technology. Each measurement is time-stamped according to a common time reference. Time stamping allows synchrophasors from different utilities to be time-aligned (or "synchronized") and combined together providing a precise and comprehensive view of the entire interconnection. Synchrophasors enable a better indication of grid stress, and can be used to trigger corrective actions to maintain reliability.