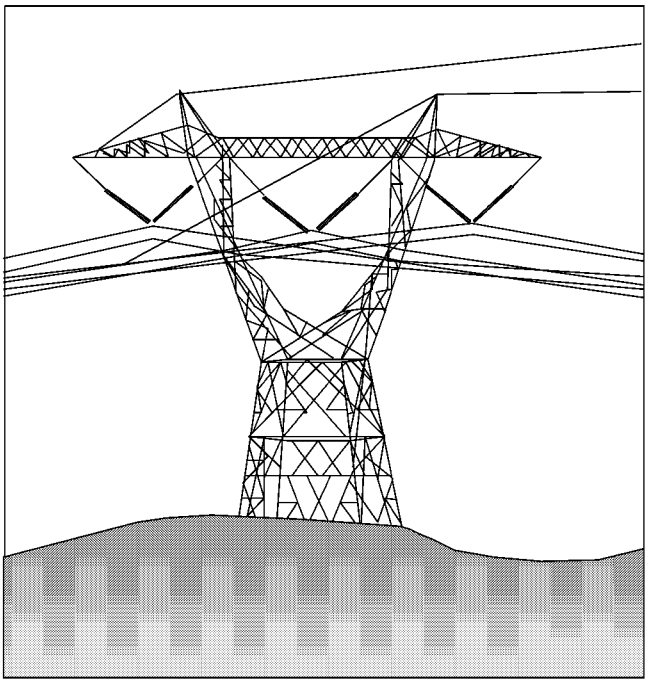
BONNEVILLE POWER ADMINISTRATION
TRANSMISSION BUSINESS LINE

2004 FINAL TRANSMISSION PROPOSAL

REVENUE REQUIREMENT STUDY DOCUMENTATION

TR-04-FS-BPA-01A



MAY 2003

Bonneville Power Administration
Transmission Business Line

2004 Final Transmission Proposal

Revenue Requirement Study Documentation

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CHAPTER 1

TRANSMISSION REVENUE REQUIREMENTS

I. Introduction

This chapter documents how Bonneville Power Administration's (BPA) annual transmission revenue requirements are determined. Two tables are presented showing both years of the rate period (FYs 2004 and 2005). On the first table, revenue requirements for FYs 2004 and 2005 are projected in an income statement format. The second table, a statement of annual cash flows, determines the minimum required net revenues and presents the annual cash flows available for risk mitigation.

II. Income Statement

A more detailed description of the following line items is presented in Chapter 4 of the Revenue Requirement Study (Study) (TR-04-FS-BPA-01). Operating expenses (lines 1-5) include: BPA's transmission system operation, maintenance and development expenses, environmental remediation, facility leases, non-Federal transmission arrangements, transmission marketing and scheduling, transmission business line support services and overheads, and corporate overheads (line 2); inter-business lines expenses (primarily the generation inputs for ancillary services) (line 3), and annual straight-line depreciation (remaining life technique) for transmission and general plant-in-service (line 4).

Federal interest expense is calculated in transmission repayment studies on appropriations granted by Congress for BPA capital investments prior to the Transmission Systems Act (line 8) and on bonds that BPA issues to the U.S. Treasury (line 9). Amortization of capitalized bond premiums (line 11) is the annual amortization of call premiums resulting from early retirement of bonds that have been refinanced. The call premiums are

capitalized and included in the principal of the replacement bonds. They are then amortized over the term of the respective replacement bonds and constitute a non-cash component of interest expense. Bond interest is reduced by interest income from BPA's projected cash reserves (line 10). The capitalization adjustment and the Allowance for Funds Used During Construction (AFUDC) (lines 22-23) further reduce gross interest expense. The capitalization adjustment, a non-cash expense, is the annual recognition of the write-down in principal that resulted from the BPA Refinancing Act.

Planned net revenues (lines 16-18) are included to ensure coverage of planned amortization payments (minimum required net revenues) and to meet the Administrator's risk mitigation policy (planned net revenues for risk). *See* Chapter 8 of this volume and Section 2.2 of the Revenue Requirement Study TR-04-FS-BPA-01.

III. Statement of Cash Flows

- ***Cash from Current Operations***: Minimum required net revenues (line 2) is the amount necessary to ensure that cash from operations is sufficient for planned amortization payments. It is the amount by which these planned payments to the U.S. Treasury exceed the expenses that do not require cash outlays (depreciation [line 4], amortization of capitalized bond premiums [line 5] and the capitalization adjustment [line 6]) and the revenues that do not provide cash in that year (accrual revenues from AC Intertie capacity ownership and fiber optic cable leases [line 7]).

- ***Cash Used for Capital Investments***: Investment in utility plant (line 11) is the increase in capital outlays associated with BPA investments for transmission, environment and general plant assets.

- ***Cash from Treasury Borrowing and Appropriations***: Increase in long-term debt (line 14) is the annual increment in bonds that BPA issues to Treasury to fund capital outlays for transmission, environment and general plant assets. Repayment of long-term debt (line 15) is planned amortization of bonds issued to Treasury, as determined in transmission repayment studies. Repayment of capital appropriations (line 16) is planned amortization associated with pre-Transmission System Act appropriations, as determined in transmission repayment studies.

TRANSMISSION REVENUE REQUIREMENT
INCOME STATEMENT
($thousands)

		A FY 2004	B FY 2005
1	OPERATING EXPENSES		
2	OPERATION AND MAINTENANCE	276,605	281,875
3	INTER-BUSINESS LINE EXPENSES	80,303	80,303
4	FEDERAL PROJECTS DEPRECIATION	178,813	190,746
5	TOTAL OPERATING EXPENSES	535,721	552,924
6	INTEREST EXPENSE		
7	INTEREST ON FEDERAL INVESTMENT -		
8	ON APPROPRIATED FUNDS	63,484	60,696
9	ON LONG-TERM DEBT	162,991	174,795
10	INTEREST INCOME	(20,380)	(20,400)
11	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	3,914	3,451
12	CAPITALIZATION ADJUSTMENT	(19,752)	(18,968)
13	AFUDC	(24,493)	(23,500)
14	NET INTEREST EXPENSE	165,764	176,074
15	TOTAL EXPENSES	701,485	728,998
16	MINIMUM REQUIRED NET REVENUES 1/	13,009	0
17	PLANNED NET REVENUES FOR RISK	0	0
18	TOTAL PLANNED NET REVENUES	13,009	0
19	**TOTAL REVENUE REQUIREMENT**	**714,494**	**728,998**

1/ SEE NOTE ON CASH FLOW TABLE.

TRANSMISSION REVENUE REQUIREMENT
STATEMENT OF CASH FLOWS
($thousands)

		A FY 2004	B FY 2005
1	CASH FROM CURRENT OPERATIONS:		
2	MINIMUM REQUIRED NET REVENUES 1/	13,009	0
3	EXPENSES NOT REQUIRING CASH:		
4	FEDERAL PROJECTS DEPRECIATION	178,813	190,746
5	AMORTIZATION OF CAPITALIZED BOND PREMIUMS	3,914	3,451
6	CAPITALIZATION ADJUSTMENT	(19,752)	(18,968)
7	ACCRUAL REVENUES (AC INTERTIE/FIBER)	(5,261)	(5,261)
8	CASH PROVIDED BY CURRENT OPERATIONS	170,723	169,968
9	CASH USED FOR CAPITAL INVESTMENTS:		
10	INVESTMENT IN:		
11	UTILITY PLANT	(335,035)	(284,706)
12	CASH USED FOR CAPITAL INVESTMENTS	(335,035)	(284,706)
13	CASH FROM TREASURY BORROWING AND APPROPRIATIONS:		
14	INCREASE IN LONG-TERM DEBT	320,035	269,706
15	REPAYMENT OF LONG-TERM DEBT	(115,906)	(153,500)
16	REPAYMENT OF CAPITAL APPROPRIATIONS	(39,817)	(1)
17	CASH FROM TREASURY BORROWING AND APPROPRIATIONS	164,312	116,205
18	ANNUAL INCREASE (DECREASE) IN CASH	0	1,467
19	PLANNED NET REVENUES FOR RISK	0	0
20	TOTAL ANNUAL INCREASE (DECREASE) IN CASH	0	1,467

1/ Line 18 must be greater than or equal to zero, otherwise net revenues will be added so that there are no negative cash flows for the year.

CHAPTER 2

TRANSMISSION EXPENSES

I. Introduction

This chapter compiles the expenses that are the basis for cost recovery in determination of transmission revenue requirements for the rate approval period.

II. Expenses

BPA used O&M expenses reflected in the final spending level process and decisions explained in Chapter 2 of the Study.

Inter-business line expenses are the generation inputs for ancillary services and the COE and BOR annual costs of network transmission and utility delivery facilities of those agencies. Also included, are costs associated with redispatch.

Depreciation expense, calculated using the straight-line method and remaining life technique is determined for lines, substations, and each of the FERC Accounts in the general plant category. *See* Chapter 3 - FCRTS Investment Base.

Interest expense is calculated in the transmission repayment study, using the capital appropriations and BPA revenue bonds issued to Treasury at individual interest rates.

***See* Chapter 4 - Projected Cash Balances / Interest Credit** for calculation of the interest credit on cash reserves.

TBL Operating Expenses
($thousands)

		2004	2005
1	**Operating Expenses**		
2	Transmission G&A	17,481	17,918
3	Transmission Marketing and Scheduling	23,742	24,335
4	Transmission System Operations	37,455	38,391
5	Transmission System Maintenance	79,996	81,996
6	Transmission System Development	18,854	19,325
7	Transmission Support Services	17,634	18,075
8	TBL Services (reimbursables)		
9	Environment	4,495	4,607
10	Administrative & Support Services	61,498	63,978
11	Between Business Line Expenses	80,303	80,303
12	CSRS Pension Expense	15,450	13,250
13	Total System Operation & Maintenance	356,908	362,178
14	O&M only	276,605	281,875

FEDERAL COLUMBIA RIVER TRANSMISSION SYSTEM
CAPITAL-RELATED COSTS
SUMMARY OF TRANSMISSION CURRENT REPAYMENT STUDY DATA
($000)

	A 2003	B 2004	C 2005
1 INTEREST EXPENSE (GROSS)			
2 BPA APPROPRIATIONS	65,279	63,484	60,696
3 TRANSMISSION LONG-TERM DEBT	145,159	162,991	174,795
4 REPAYMENT STUDY INTEREST INCOME	(8,297)	(8,892)	(8,868)
5 TOTAL INTEREST EXPENSE	202,141	217,583	226,623
6 PLANNED AMORTIZATION			
7 BPA APPROPRIATIONS	26,247	39,817	1
8 LONG-TERM DEBT	116,600	115,906	153,500
9 TOTAL AMORTIZATION	142,847	155,723	153,501

SUMMARY OF TRANSMISSION REVISED REPAYMENT STUDY DATA

10 INTEREST EXPENSE (GROSS)			
11 BPA APPROPRIATIONS	65,279	63,484	60,790
12 TRANSMISSION LONG-TERM DEBT	145,159	162,990	174,795
13 REPAYMENT STUDY INTEREST INCOME	(8,297)	(8,804)	(8,914)
14 TOTAL INTEREST EXPENSE	202,141	217,670	226,671
15 PLANNED AMORTIZATION			
16 BPA APPROPRIATIONS	26,247	38,317	1,501
17 LONG-TERM DEBT	116,600	115,906	153,500
18 TOTAL AMORTIZATION	142,847	154,223	155,001

SUMMARY OF DEPRECIATION EXPENSE

19 TRANSMISSION PLANT			
20 LINES	46,754	47,743	50,865
21 SUBSTATIONS	67,288	70,182	74,939
22 GENERAL PLANT	56,312	60,888	64,942
23 TOTAL DEPRECIATION	170,354	178,813	190,746

AFUDC
BPA Transmission Business Line
($ thousands)

		2002	2003	2004	2005
1	capital expenditures		328,713	327,842	281,721
2	plant-in-service		160,885	224,821	478,847
3	SOY CWIP Balance		319,262	504,840	632,354
4	EOY CWIP Balance	319,262	487,090	607,861	435,228
5	Average CWIP Balance		403,176	556,351	533,791
6	Interest Income Rate		5.87%	5.87%	5.87%
7	AFUDC		17,750	24,493	23,500

Amortization of Premiums on Construction Bond Refinancings

Date of Refinancing	Premium	Proration	No. of Months	Monthly Amortization	Type of Bond	Last Month to Amortize	Annual Amortiz
8/31/1992	$15,520,000	50%	180	$43,111.11	Construction	Aug-2007	517,333
10/31/1993	$8,440,000	100%	480	$17,583.33	Construction	Oct-2033	211,000
8/31/1997	$7,954,100	100%	120	$66,284.17	Construction	Aug-2007	795,410
4/30/1998	$4,998,330	100%	120	$41,652.75	Construction	Apr-2008	499,833
5/31/1998	$4,827,690	100%	132	$36,573.41	Construction	May-2009	438,881
5/31/1998	$2,556,947	100%	156	$16,390.69	Construction	May-2011	196,688
5/31/1998	$6,322,053	100%	408	$15,495.23	Construction	May-2032	185,943
8/31/1998	$4,684,950	100%	360	$13,013.75	Construction	Aug-2028	156,165
8/31/1998	$6,560,000	100%	360	$18,222.22	Construction	Aug-2028	218,667
1/31/2000	$3,500,000	99%	60	$57,866.67	Construction	Jan-2005	694,400
Total	$65,364,070			$326,193.32			3,914,320 thru 2004 3,451,387 in 2005

CHAPTER 3

FCRTS INVESTMENT BASE

I. Introduction

This chapter documents the development of the FCRTS investment for the rate approval period. In this proposal the investment data primarily serve as the source of depreciation calculations.

II. Methodology

The historical investment information is prepared from BPA's plant investment records. The general plant investment is identified according to different types of facilities (communications, supervisory control, buildings, etc.) by FERC Account. The historical plant investment data are from FY 2002.

Forecasted plant additions have been adjusted to take into account the investment associated with Delivery segment facilities projected to be sold prior to the rate approval period.

Depreciation is calculated using the straight-line method, remaining life technique. For general plant categories, annual depreciation rates are used unadjusted. For lines and substations, the annual rate has been weighted by the groups that compose these facilities, e.g., Substations is made up of land and land rights, structures and improvements, and station equipment. Both historical investment and forecasted additions are depreciated according to their group rate.

BPA TRANSMISSION PLANT DEPRECIATION AND ACCUMULATED DEPRECIATION
($ THOUSANDS)

	A 2002 PLANT INVEST	B 2002 ACCUM DEPREC	C 2003 PLANT INVEST	D 2003 DEPREC EXPEN	E 2003 ACCUM DEPREC	F 2004 PLANT INVEST	G 2004 DEPREC EXPEN	H 2004 ACCUM DEPREC	INVEST 2005 PLANT INVEST	J 2005 DEPREC EXPEN	K 2005 ACCUM DEPREC
1 LINES:											
2 GENER-INTEGRATION	16,843	8,100	17,112	387	8,487	17,297	392	8,879	17,410	396	9,275
3 NETWORK	1,715,099	824,315	1,744,817	39,443	863,758	1,794,040	40,343	904,101	2,013,705	43,408	947,509
4 SOUTHERN INTERTIE	200,569	96,572	202,918	4,600	101,172	204,543	4,645	105,817	205,534	4,675	110,492
5 EASTERN INERTIE	99,190	52,554	99,863	2,269	54,823	100,327	2,282	57,105	100,609	2,291	59,396
6 UTILITY DELIVERY	804	25	1,314	24	49	1,668	34	83	1,887	41	124
7 DSI DELIVERY	1,031	12	1,711	31	43	2,211	45	88	2,504	54	142
8 PLANT LEASED	0	0	0	0	0	0	2	2	0	0	2
9 TOTAL LINES	2,033,536	981,578	2,067,735	46,754	1,028,332	2,120,086	47,743	1,076,075	2,341,649	50,865	1,126,940
10 SUBSTATIONS:											
11 GENER-INTEGRATION	47,263	18,617	47,927	1,466	20,083	48,506	1,485	21,568	48,962	1,501	23,069
12 NETWORK	1,490,697	571,612	1,558,007	46,950	618,562	1,663,577	49,612	668,174	1,801,585	53,363	721,537
13 SOUTHERN INTERTIE	468,275	135,605	472,137	14,482	150,087	475,674	14,596	164,683	530,794	15,500	180,183
14 EASTERN INERTIE	24,272	7,865	24,752	755	8,620	25,140	768	9,388	25,457	779	10,167
15 UTILITY DELIVERY	46,918	26,400	47,998	1,462	27,862	49,414	1,500	29,362	50,162	1,533	30,895
16 DSI DELIVERY	69,817	33,775	71,257	2,173	35,948	72,962	2,221	38,169	73,959	2,263	40,432
17 PLANT LEASED	0	0	0	0	0	0	0	0	0	0	0
18 TOTAL SUBSTATIONS	2,147,242	793,874	2,222,078	67,288	861,162	2,335,273	70,182	931,344	2,530,919	74,939	1,006,283

BONNEVILLE POWER ADMINISTRATION
PROJECTED TRANSMISSION PLANT INVESTMENT
($ IN THOUSANDS)

	A TOTAL 2002 INVEST	B 2003 ADDITIONS	C TOTAL 2003 INVEST	D 2004 ADDITIONS	E TOTAL 2004 INVEST	F 2005 ADDITIONS	G TOTAL 2005 INVEST
1 GENER-INTEGRATION	64,106	933	65,039	764	65,803	569	66,372
2 NETWORK	3,205,796	97,028	3,302,824	154,793	3,457,617	357,673	3,815,290
3 SOUTHERN INTERTIE	668,844	6,211	675,055	5,162	680,217	56,111	736,328
4 EASTERN INERTIE	123,462	1,153	124,615	852	125,467	599	126,066
5 UTILITY DELIVERY	47,722	1,590	49,312	1,770	51,082	967	52,049
6 DSI DELIVERY	70,848	2,120	72,968	2,205	75,173	1,290	76,463
7 PLANT HELD	0	0	0	0	0	0	0
8 PLANT LEASED	189	0	189	0	189	0	189
9 GENERAL PLANT	834,315	53,171	887,486	73,406	960,892	63,134	1,024,026
10 TOTAL BPA	5,015,282	162,206	5,177,488	238,952	5,416,440	480,343	5,896,783

BONNEVILLE POWER ADMINISTRATION
PLANT INVESTMENT ADDITIONS
($ IN THOUSANDS)

	A	B	C	D	E	F	G	H	I	J	K	L
	LINES	SUBS	GEN PLANT	TOTAL 2003 ADDITIONS	LINES	SUBS	GEN PLANT	TOTAL 2004 ADDITIONS	LINES	SUBS	GEN PLANT	TOTAL 2005 ADDITIONS
1 GENER-INTEGRATION	269	664		933	185	579		764	113	456		569
2 NETWORK	29,718	67,310		97,028	49,223	105,570		154,793	219,665	138,008		357,673
3 SOUTHERN INTERTIE	2,349	3,862		6,211	1,625	3,537		5,162	991	55,120		56,111
4 EASTERN INERTIE	673	480		1,153	464	388		852	282	317		599
5 UTILITY DELIVERY	510	1,080		1,590	354	1,416		1,770	219	748		967
6 DSI DELIVERY	680	1,440		2,120	500	1,705		2,205	293	997		1,290
7 PLANT HELD				0				0				0
8 PLANT LEASED				0				0				0
9 GENERAL PLANT			53,171	53,171			73,406	73,406			63,134	63,134
10 TOTAL BPA	34,199	74,836	53,171	162,206	52,351	113,195	73,406	238,952	221,563	195,646	63,134	480,343

ADJUSTMENT FOR FY 2002 ACTUAL PLANT DATA
SEGMENTED LINES AND SUBSTATIONS PLANT
($000)

		2002 PROJ'D PLANT INVEST	2002 PROJ'D PLANT ADDTNS	ADJ TO ADDTNS	2002 ADJ ACTUAL PLANT INVEST
1	LINES:				
2	GENER-INTEGRATION	16,731	265	112	16,843
3	NETWORK	1,703,364	27,714	11,735	1,715,099
4	SOUTHERN INTERTIE	199,553	2,400	1,016	200,569
5	EASTERN INTERTIE	98,910	661	280	99,190
6	UTILITY DELIVERY	574	543	230	804
7	DSI DELIVERY	724	724	307	1,031
8	PLANT LEASED	0			0
9	TOTAL LINES	2,019,856	32,307	13,681	2,033,537
10	ACTUAL INVESTMENT	2,033,537			
11	SUBSTATIONS:				
12	GENER-INTEGRATION	47,302	972	(39)	47,263
13	NETWORK	1,493,649	72,768	(2,952)	1,490,697
14	SOUTHERN INTERTIE	468,440	4,054	(165)	468,275
15	EASTERN INTERTIE	24,289	423	(17)	24,272
16	UTILITY DELIVERY 1/	49,129	1,561	(63)	46,918
17	DSI DELIVERY 2/	76,240	2,081	(84)	69,817
18	PLANT LEASED/GP	107,830	27,003	(1,096)	106,734
19	TOTAL SUBSTATIONS	2,266,879	81,859	(3,322)	2,253,976
20	ACTUAL INVESTMENT	2,263,557			

SEGMENTED BPA PLANT INVESTMENT 9/30/01
AND ACCUMULATED DEPRECIATION ALLOCATION
($ IN THOUSANDS)

	A	B	C	E	F	G	H	I	J	K	L
	GENER INTEG	NETWORK	SOUTH INTER	EAST INTER	UTIL DELIV	DSI	MTRNG AND GN PLNT 1/	PLANT LEASED	EMRGCY SPRS & PT SBS	OTHR PLNT	TOTAL 9.30.01
1. SUBSTATIONS	43,443	1,332,351	462,813	23,866	62,353	79,409	64,059	4	107,759		2,176,057
2. METERING STATIONS							16,461				16,461
3. SUB TOTAL	43,443	1,332,351	462,813	23,866	62,353	79,409	80,520	4	107,759		2,192,518
4. EMRGNCY SPARES & PORT SUBS 2/	2,887	88,530	1,573	0	4,143	5,276	5,350		(107,759)		0
5. TOTAL SUBSTATIONS	46,330	1,420,881	464,386	23,866	66,496	84,685	85,870	4			2,192,518
6. ACCUMULATED DEPRECIATION	(17,176)	(526,774)	(121,242)	(7,124)	(24,653)	(31,396)	(31,835)	(4)			(760,200)
7. NET SUBSTATIONS	29,154	894,107	343,144	16,742	41,843	53,289	54,035				1,432,314
8. LINES (INCL LEASD/OTHERS)	16,466	1,675,650	197,153	98,249	31	0		185			1,987,734
9. ACCUMULATED DEPRECIATION	(7,720)	(785,660)	(92,038)	(50,303)	(15)	0		(185)			(935,921)
10. NET LINES	8,746	889,990	105,115	47,946	16	0		0			1,051,813
11. GENERAL PLANT							656,602				656,602
12. ACCUMULATED DEPRECIATION							(206,304)				(206,304)
13. NET GENERAL PLANT							239,268				239,268
14. OTHER PHYSICAL PLANT (LAND) 3/										39	39
15. PLANT FOR FUTURE USE (LAND)										3,245	3,245
16. TOTAL COMPLETED PLANT	62,796	3,096,531	661,539	122,115	66,527	84,685	742,472	189	0	3,284	4,840,138
17. TOTAL BPA COMPLETED PLANT 4/	62,796	3,096,531	661,539	122,115	66,527	84,685	742,472	189		3,245	4,840,099
18. ACCUMULATED DEPRECIATION	(24,896)	(1,312,434)	(213,280)	(57,427)	(24,668)	(31,396)	(238,139)	(189)		0	(1,902,429)
19. NET COMPLETED PLANT	37,900	1,784,097	448,259	64,688	41,859	53,289	504,333	0		3,245	2,937,670

1/ LINE 1 INCLUDES POWER SYSTEM CONTROL EQUIPMENT.
2/ ALLOCATED TO SEGMENTS BY SUBSTATION INVESTMENT.
3/ NON-DEPRECIABLE LAND.
4/ DOES NOT INCLUDE NON-DEPRECIABLE LAND.

BPA GENERAL PLANT
CUMULATIVE PLANT INVESTMENT
($THOUSANDS)

		FERC ACCT	2002 TOTAL	2003 TOTAL	2004 TOTAL	2005 TOTAL
1	LAND & LAND RIGHTS	389	8,248	8,248	8,248	8,248
2	STRUCTURES & IMPROVEMENTS	390	137,280	146,407	154,939	163,721
3	OFFICE FURNITURE & FIXTURES	391.1	1,641	1,641	1,641	1,641
4	DATA PROCESSING -EQUIPMENT	391.2	23,938	25,095	26,331	27,604
5	DATA PROCESSING -SOFTWARE	391.3	44,637	44,637	44,637	44,637
6	TRANSPORT EQUIPMENT	392.1	20,112	21,180	22,196	23,143
7	HELICOPTERS	392.2	5,178	5,894	6,576	7,212
8	AIRPLANES	392.3	4,821	5,537	6,219	6,855
9	STORES EQUIPMENT	393	1,914	2,982	3,998	4,945
10	TOOLS, SHOP & GARAGE EQUIPMENT	394	6,201	6,917	7,599	8,235
11	LAB EQUIPMENT	395	33,100	34,533	35,897	37,169
12	TEST FACILITIES	395.1	3,512	3,512	3,512	3,512
13	POWER OPERATED EQUIPMENT	396	24,963	26,396	27,760	29,032
14	COMMUNICATIONS EQUIPMENT	397	411,449	423,395	455,267	473,846
15	MISC EQUIPMENT	398	587	587	587	587
16	SUBTOTAL GENERAL PLANT		727,581	756,961	805,407	840,387
17	STATION EQUIPMENT	353	106,734	130,525	155,485	183,639
18	TOTAL GENERAL PLANT		834,315	887,486	960,892	1,024,026

BPA GENERAL PLANT
DEPRECIATION EXPENSE
($THOUSANDS)

		FERC ACCT	FY 2002 TOTAL	FY 2003 TOTAL	FY 2004 TOTAL	FY 2005 TOTAL
1	LAND & LAND RIGHTS	389	111	111	111	111
2	STRUCTURES & IMPROVEMENTS	390	2,430	2,591	2,742	2,898
3	OFFICE FURNITURE & FIXTURES	391.1	85	85	85	85
4	DATA PROCESSING -EQUIPMENT	391.2	3,363	3,526	3,700	3,878
5	DATA PROCESSING -SOFTWARE	391.3	7,941	7,941	7,941	7,941
6	TRANSPORT EQUIPMENT	392.1	2,327	2,451	2,568	2,678
7	HELICOPTERS	392.2	174	198	221	242
8	AIRPLANES	392.3	162	186	209	230
9	STORES EQUIPMENT	393	68	106	142	176
10	TOOLS, SHOP & GARAGE EQUIPMENT	394	251	279	307	333
11	LAB EQUIPMENT	395	1,966	2,051	2,132	2,208
12	TEST FACILITIES	395.1	60	60	60	60
13	POWER OPERATED EQUIPMENT	396	1,725	1,824	1,918	2,006
14	COMMUNICATIONS EQUIPMENT	397	23,617	24,303	26,132	27,199
15	MISC EQUIPMENT	398	41	41	41	41
16	SUBTOTAL GENERAL PLANT		44,321	45,753	48,309	50,086
17	STATION EQUIPMENT	353	8,635	10,559	12,579	14,856
18	TOTAL GENERAL PLANT		52,956	56,312	60,888	64,942

BPA TRANSMISSION GENERAL PLANT
PROJECTED PLANT ADDITIONS

		FERC ACCT	FY 2003 ADDTNS	FY 2004 ADDTNS	FY 2005 ADDTNS
1	LAND & LAND RIGHTS	389	0	0	0
2	STRUCTURES & IMPROVEMENTS	390	9,127	8,532	8,782
3	OFFICE FURNITURE & FIXTURES	391.1			
4	DATA PROCESSING -EQUIPMENT	391.2	1,157	1,236	1,273
5	DATA PROCESSING -SOFTWARE	391.3			
6	TRANSPORT EQUIPMENT	392.1	1,068	1,016	947
7	HELICOPTERS	392.2	716	682	636
8	AIRPLANES	392.3	716	682	636
9	STORES EQUIPMENT	393	1,068	1,016	947
10	TOOLS, SHOP & GARAGE EQUIPMENT	394	716	682	636
11	LAB EQUIPMENT	395	1,433	1,364	1,272
12	TEST FACILITIES	395.1	0	0	0
13	POWER OPERATED EQUIPMENT	396	1,433	1,364	1,272
14	COMMUNICATIONS EQUIPMENT	397	11,946	31,872	18,579
15	MISC EQUIPMENT	398	0	0	0
16	SUBTOTAL GENERAL PLANT		29,380	48,446	34,980
17	STATION EQUIPMENT	353	23,791	24,960	28,154
18	TOTAL GENERAL PLANT		53,171	73,406	63,134

CHAPTER 4

PROJECTED CASH BALANCES/INTEREST CREDITS

I. Introduction

This chapter projects BPA-TBL cash balances for the rate period and estimates the interest income (credits) to be earned on of BPA's projected cash balances and on annual funds to be returned to Treasury. Included in BPA-TBL's projected cash balances are proceeds from the sale of Delivery segment facilities projected to be sold prior to the 2004-2005 rate period.

II. Interest credits on BPA's projected cash balances

The beginning rate period cash balance was derived from BPA's separate accounting analysis for FY 2001 and from current TBL forecasts of revenues, expenses and cash flows for FYs 2002 and 2003. The annual incremental cash provided from forecasted net revenues are added to this, for both revenue requirements and the revised revenue test. Using projected interest earnings rates, annual interest income is calculated from projected average annual cash balances. The resulting interest income is applied as a credit against interest expense in the transmission revenue requirements and in the income statement of the revised revenue test.

III. Proceeds from projected sales of Delivery facilities

BPA-TBL has compiled a list of Delivery facilities expected to be sold prior to the 2004-2005 rate period. Book value was calculated for the Delivery facilities and BPA-TBL staff estimated the sales proceeds. The total book value was included in the beginning cash balance for the rate period to provide an interest credit comparable to the reduction in interest expense that would occur from retirement of an equivalent amount of transmission debt. This portion of the projected sales proceeds was not available for the risk analysis to use in determining Treasury payment probability.

Interest Income from Projected Cash Balances
BPA Transmission Business Line
($ thousands)

		2004	2005	
1	Annual Cash Surplus/(Deficit)	-	1,467	
2	Adjustments to Cash			
3	SOY Cash Balance 1/	195,715	195,715	
4	EOY Cash Balance	195,715	197,182	
5	Average Cash Balance	195,715	196,449	
6	Interest Income Rate	5.87%	5.87%	
7	Annual Interest Income *	20,380	20,400	
	* includes from repayment study	8,892	8,868	
1/	Includes:			
	Ending FY 2001 Cash Balance	79,310		SAA results proration
	FY 2002 change in cash	85,439		actuals
	FY 2003 change in cash	30,966		3/21/2003

Interest Income from Projected Cash Balances
Revenues from Current Rates
BPA Transmission Business Line
($ thousands)

		2004	2005
1	Annual Cash Surplus/(Deficit)	(31,157)	(24,240)
2	Adjustments to Cash		
3	SOY Cash Balance	195,715	175,132
4	EOY Cash Balance	164,558	150,892
5	Average Cash Balance	180,137	163,012
6	Interest Income Rate	5.87%	5.87%
7	Annual Interest Income *	19,473	18,444
	* includes from repayment study	8,899	8,875

Interest Income from Projected Cash Balances
Revenues from Proposed Rates
BPA Transmission Business Line
($ thousands)

		2004	2005
1	Annual Cash Surplus/(Deficit)	(10,553)	(5,469)
2	Adjustments to Cash		
3	SOY Cash Balance	195,715	196,341
4	EOY Cash Balance	185,162	190,872
5	Average Cash Balance	190,439	193,606
6	Interest Income Rate	5.87%	5.87%
7	Annual Interest Income *	19,983	20,279
	* includes from repayment study	8,804	8,914

Forecasted Delivery Facilities Sold
Sales Prior to Rate Period
($000s)

Substation	Customer	Proceeds	Book Value
Baxter	Big Bend	$ 70,000	$ 70,000
Burnt Woods	Consumers Power Inc.	$ 228,000	$ 203,000
Cheney	City of Cheney / Inland	$ 386,543	$ 386,543
Clinton	Missoula Electric Coop	$ 77,000	$ 77,000
Corvallis	Ravalli	$ 357,000	$ 349,000
Delight	Big Bend	$ 162,000	$ 162,000
East Hills	South Side Electric	$ 99,000	$ 84,000
Eltopia	Big Bend	$ 397,000	$ 515,000
Four Lakes	City of Cheney / Inland	$ 558,706	$ 558,706
Frenchtown	Missoula Electric Coop	$ 309,000	$ 309,000
Froman	Consumers Power Inc.	$ 120,000	$ 100,000
Grantsdale	Ravalli	$ 49,000	$ 33,000
Harrisburg	Consumers Power Inc.	$ 210,000	$ 113,000
Hatton	Big Bend	$ 421,000	$ 421,000
Huson	Missoula Electric Coop	$ 64,000	$ 64,000
Mesa	Big Bend	$ 194,000	$ 194,000
Newcomb	South Side Electric	$ 173,000	$ 182,000
North Butte	Consumers Power Inc.	$ 125,000	$ 101,000
Pendleton	Umatilla Electric	$ 1	$ 13,339
Ralston	Big Bend	$ 238,000	$ 338,000
Ritzville	Big Bend	$ 205,000	$ 205,000
Roes Corner	Rupert/East End/Riverside/United	$ 950,000	$ 1,662,000
Scarcello	Kootenai	$ 187,500	$ 814,000
Schrag	Big Bend	$ 313,000	$ 313,000
Stevensville	Ravalli	$ 167,000	$ 146,000
Tarkio	Missoula Electric Coop	$ 168,000	$ 168,000
Victor	Ravalli	$ 30,000	$ 22,000
	Sales by 9/30/03	**$6,258,750**	**$ 7,603,588**

CHAPTER 5

INTEREST RATES FOR TREASURY SOURCES OF CAPITAL AND PRICE DEFLATORS

Introduction

Interest rates on bonds issued by BPA to Treasury are used in development of repayment studies and projections of Federal interest expense in revenue requirements. Price deflators are used for developing spending levels in revenue requirements.

WEFA

The WEFA Group (WEFA) provides Treasury yield curve forecasts that BPA uses to project interest rates on bonds issued to Treasury. WEFA is also the source of price deflators that BPA treats as escalators for purposes of developing spending levels. The price deflators are derived from projections of Gross Domestic Product (GDP). The GDP consists of the sum of consumption, investment, government purchases and net exports, excluding transfers to foreigners.

Interest Rate Projections

Projected interest rates for BPA bonds issued to Treasury are based on WEFA's yield curve projections of Treasury market rates, plus a markup of 32 to 90 basis points depending on the length of time to maturity. The markup estimate reflects an interagency agreement that Treasury price BPA bonds at a level comparable to securities (bonds) issued by U.S. government corporations. The markup estimate reflects the average basis point markup on recent intermediate and long-term bonds issued by BPA. As noted in the attached transmittal memo documenting the interest rates in this revenue requirement study, for the FY 2004-2005 period the 30-year rate reflects a markup of 90 basis points.

Deflators

The current and cumulative price deflator used to escalate midyear dollars are derived from the fiscal and calendar year price deflators provided by WEFA. They are calculated as follows:

$$[(FY_1/100) \times 0\ 5] + 1 = \text{Cumulative Price Deflator}_1$$

The fiscal year GDP price deflator for the current year is divided by one hundred and multiplied by one half. The result, when added to one, yields the cumulative price deflator for the first year.

$$[1 + (FY_t/100)] \times \text{Cumulative Price Deflator}_{t-1} = \text{Cumulative Price Deflator}_t, \text{ when } t > 1$$

The fiscal year GDP price deflator for a future year is divided by one hundred and added to one. The result, when multiplied by the cumulative price deflator from the previous year, yields the cumulative price deflator for the each successive year.

To the extent deflators are used in developing the FY 2004-2005 spending levels they are based on the price deflators from the Second Quarter 2002 WEFA forecast.

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(Previously BPA 303)

BONNEVILLE POWER ADMINISTRATION

InterOffice Memo

Date: August 9, 2002

To: See Attached

From: Robert Mealey, Financial Economist - CMD
Claudia Andrews, Corporate Risk Manager - C

Subject: FY 2002. Q3 Price Deflator and BPA Long-Term Borrowing Rate Projections

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Attached are updated Third Quarter FY 2002 price deflator and BPA borrowing rate projections for the period 1997 to 2019. These projections are based on The WEFA Group's (WEFA) CY 2002 Second Quarter Long-Term Economic Outlook.

Table 1 contains updated projections for BPA's long-term Treasury borrowing rates. WEFA projections of 30-year U.S. Government bond rates are shown in Column A. Column B provides these projections for fiscal years. Column C summarizes BPA Treasury borrowing rates for fiscal years. BPA's borrowing rate projections include a 90 basis point markup over the 30 year T-bond rate. The markup is an average value taken from recently issued long-term Treasury bonds and BPA Treasury analyst adjustments. Table 2 compares BPA's FY 2002.Q3 borrowing rate forecast with its FY 1998.Q3 forecast. Tables 3 and 4 provide borrowing rate projections for

15 and 20-year U.S. Treasury rates. Table 5 summarizes projections of BPA's borrowing rate over the entire Treasury yield curve.

The Gross Domestic Product (GDP) price deflator is an important measure of inflation. GDP deflator forecasts are shown in Table 6. Column A summarizes the relative growth in the GDP price deflator over the forecast period. The GDP deflator forecast in BPA fiscal years is shown in Column B. Column C lists the cumulative price deflator index by fiscal year. This index assumes 1992 as the base year and is adjusted to express fiscal year dollar values as mid-year dollar values. GDP may be viewed as the goods and services produced by both domestic and foreign capital and labor within the United States. Major components of GDP include: total consumption, investment, government purchases, and net exports. The government's method for calculating GDP changed in 1996. Instead of fixed weights the new measure of GDP is based on a chain-weighted methodology. This means real GDP calculations will reflect not just the changing mix of the components in GDP, but also the relative price changes in these components. Table 7 compares the FY 2002.Q3 Quarter Inflation Forecast with BPA's FY 1998.Q3 forecast.

Please forward to the appropriate people in your group. Your assistance in identifying addressees for future forecasts is appreciated. If you have any questions, give me a call at (503) 230-5389.

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TABLE 1

30 YEAR TREASURY YIELDS
FY 2002.Q3 FORECAST OF BPA TREASURY BORROWING RATES

Calendar/Fiscal Years 1997 - 2019

	(A)	(B)	(C)
	BOND RATE 1/	BOND RATE	BPA RATE 2/
YEAR	Calendar Year	Fiscal Year	Fiscal Year
1997	6.60%	6.63%	7.53%
1998	5.58%	5.84%	6.74%
1999	5.86%	5.79%	6.69%
2000	5.94%	5.92%	6.82%
2001	5.49%	5.60%	6.50%
2002	5.74%	5.68%	6.58%
2003	6.23%	6.11%	7.01%
2004	6.30%	6.28%	7.18%
2005	6.17%	6.20%	7.10%
2006	6.19%	6.19%	7.09%
2007	6.20%	6.20%	7.10%
2008	6.21%	6.21%	7.11%
2009	6.23%	6.23%	7.13%
2010	6.27%	6.26%	7.16%
2011	6.31%	6.30%	7.20%
2012	6.45%	6.42%	7.32%
2013	6.65%	6.60%	7.50%
2014	6.90%	6.84%	7.74%
2015	7.03%	7.00%	7.90%
2016	7.27%	7.21%	8.11%
2017	7.46%	7.41%	8.31%
2018	7.71%	7.65%	8.55%
2019	7.83%	7.80%	8.70%

1/ Source: The WEFA Group, U.S. Long-Term Economic Outlook, First Quarter 1999, Volume 1, Trend\Moderate Growth Scenario. Average market yield on 30-year Treasury bonds.

TABLE 2

30 YEAR TREASURY YIELDS
FY 2002.Q3 COMPARISON OF BPA BORROWING RATE FORECASTS

Fiscal Years 1997 - 2019

	(A)	(B)	(C)
YEAR	FY 2002.Q3 FORECAST BPA RATE 1/	FY 1998.Q3 FORECAST BPA RATE 2/	DIFFERENCE (A-B)
1997	7.53%	7.53%	0.00%
1998	6.74%	7.00%	-0.27%
1999	6.69%	7.21%	-0.52%
2000	6.82%	7.30%	-0.48%
2001	6.50%	7.15%	-0.65%
2002	6.58%	7.05%	-0.48%
2003	7.01%	6.92%	0.09%
2004	7.18%	6.88%	0.30%
2005	7.10%	6.85%	0.25%
2006	7.09%	6.81%	0.27%
2007	7.10%	6.77%	0.32%
2008	7.11%	6.74%	0.37%
2009	7.13%	6.70%	0.43%
2010	7.16%	6.66%	0.50%
2011	7.20%	6.65%	0.55%
2012	7.32%	6.65%	0.67%
2013	7.50%	6.64%	0.86%
2014	7.74%	6.64%	1.10%
2015	7.90%	6.64%	1.26%
2016	8.11%	6.64%	1.47%
2017	8.31%	6.64%	1.68%
2018	8.55%	6.63%	1.91%
2019	8.70%	6.63%	2.07%

1/ Forecast prepared May 19, 1999. Source: The WEFA Group, U.S. Long-Term Economic Outlook, First Quarter, 1999, Volume 1, Trend\Moderate Growth Scenario. Average market yield on 30-year,

TABLE 3

15 YEAR TREASURY YIELDS
FY 2002.Q3 FORECAST OF BPA TREASURY BORROWING RATES

Calendar/Fiscal Years 1997 - 2019

	(A)	(B)	(C)
YEAR	BOND RATE 1/ Calendar Year	BOND RATE Fiscal Year	BPA RATE 2/ Fiscal Year
1997	6.41%	6.44%	7.12%
1998	5.34%	5.61%	6.30%
1999	5.70%	5.61%	6.30%
2000	6.01%	5.93%	6.62%
2001	5.14%	5.36%	6.04%
2002	5.45%	5.37%	6.06%
2003	6.01%	5.87%	6.56%
2004	6.11%	6.08%	6.77%
2005	5.96%	6.00%	6.69%
2006	6.00%	5.99%	6.68%
2007	6.03%	6.02%	6.71%
2008	6.05%	6.04%	6.73%
2009	6.08%	6.07%	6.76%
2010	6.13%	6.12%	6.80%
2011	6.18%	6.16%	6.85%
2012	6.32%	6.29%	6.97%
2013	6.53%	6.48%	7.17%
2014	6.80%	6.73%	7.42%
2015	6.93%	6.89%	7.58%
2016	7.18%	7.12%	7.81%
2017	7.39%	7.33%	8.02%
2018	7.64%	7.58%	8.27%
2019	7.76%	7.73%	8.42%

1/ Source: The WEFA Group, U.S. Long-Term Economic Outlook, First Quarter 1999, Volume 1, Trend\Moderate Growth Scenario. Average market yield on 15-year Treasury bonds.

TABLE 4

20 YEAR TREASURY YIELDS
FY 2002.Q3 FORECAST OF BPA TREASURY BORROWING RATES

Calendar/Fiscal Years 1997 - 2019

	(A)	(B)	(C)
YEAR	BOND RATE 1/ Calendar Year	BOND RATE Fiscal Year	BPA RATE 2/ Fiscal Year
1997	6.48%	6.50%	7.32%
1998	5.42%	5.68%	6.50%
1999	5.75%	5.67%	6.49%
2000	5.99%	5.93%	6.75%
2001	5.26%	5.44%	6.26%
2002	5.55%	5.47%	6.29%
2003	6.09%	5.95%	6.77%
2004	6.17%	6.15%	6.97%
2005	6.03%	6.07%	6.89%
2006	6.06%	6.05%	6.87%
2007	6.09%	6.08%	6.90%
2008	6.10%	6.10%	6.92%
2009	6.13%	6.12%	6.94%
2010	6.18%	6.16%	6.98%
2011	6.22%	6.21%	7.03%
2012	6.37%	6.33%	7.15%
2013	6.57%	6.52%	7.34%
2014	6.83%	6.77%	7.59%
2015	6.96%	6.93%	7.75%
2016	7.21%	7.15%	7.97%
2017	7.41%	7.36%	8.18%
2018	7.67%	7.60%	8.42%
2019	7.78%	7.75%	8.57%

1/ Source: The WEFA Group, U.S. Long-Term Economic Outlook, Second Quarter 2002, Volume Trend\Moderate Growth Scenario. Average market yield on 20-year Treasury bonds.

Table 5

2002.Q3 BPA TREASURY BORROWING RATE YIELD CURVE FORECAST 1/

FORECAST PREPARED MAY 19, 1999

Fiscal Years 1997 - 2019

MATURITY

Year	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year	11 Year	12 Year	13 Year	14 Year	15 Year	16 Year
1997	5.92	6.18	6.45	6.54	6.64	6.72	6.81	6.85	6.89	6.93	6.97	7.01	7.05	7.09	7.12	7.16
1998	5.52	5.64	5.75	5.80	5.84	5.94	6.03	6.05	6.07	6.09	6.13	6.17	6.21	6.26	6.30	6.34
1999	5.39	5.58	5.77	5.82	5.87	6.00	6.13	6.12	6.11	6.10	6.14	6.18	6.22	6.26	6.30	6.33
2000	6.17	6.29	6.41	6.42	6.42	6.50	6.58	6.55	6.52	6.49	6.52	6.54	6.57	6.59	6.62	6.64
2001	4.46	4.72	4.99	5.18	5.38	5.53	5.69	5.74	5.78	5.83	5.87	5.92	5.96	6.00	6.04	6.09
2002	3.19	3.84	4.49	4.79	5.09	5.31	5.53	5.63	5.73	5.83	5.87	5.92	5.97	6.01	6.06	6.11
2003	4.49	4.99	5.49	5.67	5.84	6.00	6.16	6.22	6.29	6.35	6.39	6.43	6.48	6.52	6.56	6.60
2004	5.77	5.96	6.15	6.22	6.29	6.39	6.49	6.52	6.55	6.57	6.61	6.65	6.69	6.73	6.77	6.81
2005	5.90	6.01	6.11	6.17	6.22	6.32	6.42	6.44	6.46	6.49	6.53	6.57	6.61	6.65	6.69	6.73
2006	5.83	5.94	6.05	6.12	6.19	6.29	6.39	6.42	6.45	6.48	6.52	6.56	6.60	6.64	6.68	6.71
2007	5.83	5.94	6.06	6.14	6.21	6.32	6.42	6.45	6.49	6.52	6.56	6.59	6.63	6.67	6.71	6.75
2008	5.85	5.96	6.08	6.16	6.24	6.35	6.45	6.48	6.51	6.54	6.58	6.62	6.65	6.69	6.73	6.77
2009	5.85	5.98	6.10	6.18	6.26	6.37	6.48	6.51	6.55	6.58	6.61	6.65	6.69	6.72	6.76	6.80
2010	5.86	5.99	6.12	6.21	6.30	6.41	6.52	6.55	6.59	6.63	6.66	6.70	6.73	6.77	6.80	6.84
2011	5.85	5.99	6.13	6.23	6.33	6.44	6.56	6.60	6.64	6.68	6.71	6.75	6.78	6.82	6.85	6.89
2012	5.91	6.07	6.24	6.34	6.45	6.57	6.68	6.72	6.76	6.80	6.83	6.87	6.90	6.94	6.97	7.01
2013	6.04	6.23	6.41	6.52	6.64	6.76	6.88	6.92	6.96	7.00	7.03	7.06	7.10	7.13	7.17	7.20
2014	6.29	6.48	6.67	6.78	6.90	7.01	7.13	7.17	7.21	7.25	7.28	7.32	7.35	7.38	7.42	7.45
2015	6.42	6.62	6.82	6.94	7.06	7.18	7.30	7.34	7.38	7.42	7.45	7.48	7.51	7.55	7.58	7.61
2016	6.64	6.84	7.05	7.17	7.29	7.41	7.52	7.56	7.60	7.64	7.68	7.71	7.74	7.77	7.81	7.84
2017	6.84	7.05	7.26	7.38	7.51	7.62	7.74	7.78	7.82	7.87	7.90	7.93	7.96	7.99	8.02	8.05
2018	7.07	7.28	7.50	7.63	7.76	7.88	7.99	8.03	8.07	8.11	8.14	8.17	8.21	8.24	8.27	8.30
2019	7.15	7.39	7.62	7.76	7.89	8.01	8.13	8.18	8.22	8.26	8.29	8.32	8.35	8.38	8.42	8.45

1/ Based on The WEFA Group, U.S. Long-Term Economic Outlook, Second Quarter 2002, Volume 1, Trend\Moderate Growth Scenario. Treasury markup ranges from 32 to 90 bp.

20 Year	21 Year	22 Year	23 Year	24 Year	25 Year	26 Year	27 Year	28 Year	29 Year	30 Year	50 Year	Year
7.32	7.34	7.36	7.38	7.40	7.42	7.44	7.46	7.48	7.50	7.53	7.53	**1997**
6.50	6.53	6.55	6.57	6.60	6.62	6.64	6.67	6.69	6.71	6.74	6.74	**1998**
6.49	6.51	6.53	6.55	6.57	6.59	6.61	6.63	6.65	6.67	6.69	6.69	**1999**
6.75	6.75	6.76	6.77	6.78	6.78	6.79	6.80	6.81	6.81	6.82	6.82	**2000**
6.26	6.28	6.31	6.33	6.36	6.38	6.40	6.43	6.45	6.48	6.50	6.50	**2001**
6.29	6.32	6.35	6.38	6.41	6.44	6.46	6.49	6.52	6.55	6.58	6.58	**2002**
6.77	6.79	6.82	6.84	6.87	6.89	6.91	6.94	6.96	6.98	7.01	7.01	**2003**
6.97	6.99	7.01	7.03	7.05	7.08	7.10	7.12	7.14	7.16	7.18	7.18	**2004**
6.89	6.91	6.93	6.95	6.97	6.99	7.02	7.04	7.06	7.08	7.10	7.10	**2005**
6.87	6.89	6.92	6.94	6.96	6.98	7.00	7.02	7.04	7.06	7.09	7.09	**2006**
6.90	6.92	6.94	6.96	6.98	7.00	7.02	7.04	7.06	7.08	7.10	7.10	**2007**
6.92	6.94	6.95	6.97	6.99	7.01	7.03	7.05	7.07	7.09	7.11	7.11	**2008**
6.94	6.96	6.98	7.00	7.02	7.03	7.05	7.07	7.09	7.11	7.13	7.13	**2009**
6.98	7.00	7.02	7.04	7.05	7.07	7.09	7.11	7.12	7.14	7.16	7.16	**2010**
7.03	7.05	7.06	7.08	7.10	7.11	7.13	7.15	7.17	7.18	7.20	7.20	**2011**
7.15	7.17	7.18	7.20	7.22	7.23	7.25	7.27	7.28	7.30	7.32	7.32	**2012**
7.34	7.35	7.37	7.39	7.40	7.42	7.44	7.45	7.47	7.48	7.50	7.50	**2013**
7.59	7.60	7.62	7.63	7.65	7.66	7.68	7.69	7.71	7.72	7.74	7.74	**2014**
7.75	7.76	7.78	7.79	7.81	7.82	7.84	7.85	7.87	7.88	7.90	7.90	**2015**
7.97	7.98	8.00	8.01	8.02	8.04	8.05	8.07	8.08	8.10	8.11	8.11	**2016**
8.18	8.19	8.21	8.22	8.23	8.25	8.26	8.27	8.29	8.30	8.31	8.31	**2017**
8.42	8.43	8.45	8.46	8.47	8.48	8.50	8.51	8.52	8.53	8.55	8.55	**2018**
8.57	8.58	8.60	8.61	8.62	8.64	8.65	8.66	8.67	8.69	8.70	8.70	**2019**

TABLE 6

FY 2002.Q3 FORECAST OF INFLATIONARY TRENDS

CHANGE IN GROSS DOMESTIC PRODUCT PRICE DEFLATOR

Calendar/Fiscal Year, Index = 1996

YEAR	(A) CALENDAR YEAR % CHANGE 1/	(B) FY 02.Q3 FISCAL YEAR % CHANGE	(C) FISCAL YEAR CUMULATIVE PRICE DEFLATOR INDEX 2/ (2002 Base Year)
2001	2.19%	2.21%	
2002	1.24%	1.48%	1.007
2003	2.34%	2.07%	1.028
2004	2.35%	2.35%	1.052
2005	2.33%	2.33%	1.077
2006	2.26%	2.28%	1.101
2007	2.27%	2.26%	1.126
2008	2.24%	2.25%	1.152
2009	2.26%	2.26%	1.178
2010	2.34%	2.32%	1.205
2011	2.52%	2.48%	1.235
2012	2.72%	2.67%	1.268
2013	2.80%	2.78%	1.303
2014	2.89%	2.87%	1.340
2015	2.95%	2.93%	1.380
2016	3.05%	3.02%	1.421
2017	3.15%	3.13%	1.466
2018	3.27%	3.24%	1.513
2019	3.27%	3.27%	1.563

1/ Source: WEFA Second Quarter 2002 U.S. Long-Term Economic Outlook, Gross Domestic Product Implicit Price Deflator Index, Calendar Year. Base year Index = 1996

2/ Fiscal Year Cumulative Price Deflator escalates to midyear dollars. The first year, 1994, is determined as follows: 1.012 = [(2.45%/100)*.5] + 1. Subsequent years use the prior Fiscal Year Cumulative Price Deflator. For example, the rate in 1995 is given by: 1.038 = [1+ (2.5%/100)]*1.012.

TABLE 7

FY2002.Q3 INFLATION FORECAST COMPARISONS

GROSS DOMESTIC PRODUCT PRICE DEFLATOR INDEXES

BPA Fiscal Year

YEAR	(A) FY 02.Q3 1/ IMPLICIT PRICE DEFLATOR INDEX	(B) FY 98.Q3 2/ IMPLICIT PRICE DEFLATOR INDEX	(C) (A - B) DIFFERENCE
2001	2.21%	2.46%	-0.25%
2002	1.48%	2.55%	-1.08%
2003	2.07%	2.74%	-0.68%
2004	2.35%	2.58%	-0.24%
2005	2.33%	2.52%	-0.19%
2006	2.28%	2.57%	-0.29%
2007	2.26%	2.62%	-0.35%
2008	2.25%	2.63%	-0.38%
2009	2.26%	2.63%	-0.38%
2010	2.32%	2.63%	-0.30%
2011	2.48%	2.63%	-0.15%
2012	2.67%	2.63%	0.04%
2013	2.78%	2.64%	0.14%
2014	2.87%	2.64%	0.23%
2015	2.93%	2.64%	0.29%
2016	3.02%	2.64%	0.39%
2017	3.13%	2.63%	0.50%
2018	3.24%	2.64%	0.60%
2019	3.27%	2.64%	0.63%

1/ Source: WEFA Second Quarter 2002 U.S. Long-Term Economic Outlook, Gross Domestic Product Implicit Price Deflator Index, Calendar Year. Base Year Index = 1996

2/ Source: WEFA, Third Quarter 1998 Long Term Economic Outlook Gross Domestic Product Implicit Price Deflator Index. Base Year Index = 1992

CHAPTER 6

PROJECTED NEW BONDS ISSUED TO TREASURY

Purpose: To provide the projected bonds that BPA plans to issue to the U.S. Treasury to finance BPA capital investments.

Method: New long-term debt consist of bonds issued by BPA to Treasury reflecting projected outlays for BPA Transmission and Environmental programs during the cost evaluation period (FY 2003-2005). All bonds projected for issuance are entered into the projected portions of the repayment study.

Application of Methodology: New bonds for the cost evaluation period are based on Programs in Review capital program outlays.

Table C-4

BPA Projected Transmission Federal Borrowing
FY 2003 - 2005
($ Thousands)

FY Year	Description	Interest Rate	Term	Total Borrowing	
2003	Construction	6.58	35	352,497	1/
	Environment	6.06	15	2,675	2/
				355,172	
2003	Construction	7.01	35	311,633	3/
	Environment	6.56	15	7,369	
				319,002	
2004	Construction	7.18	35	262,831	3/
	Environment	6.77	15	5,414	
				268,245	
2005	Construction	7.10	35	421,027	4/
	Environment	6.69	15	5,553	
				426,580	

1/ Capital projection is $322,297, but assumes cashing in of $30,200 in deferred borrowing carried over from 2002

2/ Capital projection is $7,175, but assumes cashing in of -$4,500 in deferred borrowing carried over from 2002

3/ Capital projection is $331,633, but assumes $15,000 in revenue financing

4/ Capital projection is $282,831, but assumes $15,000 in revenue financing

Table C-2A

Association of Transmission Construction
Funded by Bonds [1/]
FY 1977 - FY 2002
($ Thousands)

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	
Fiscal Year	Plant in Service 2/	Amount Funded by Bonds	Amount of Bond Sales	Amount Outstanding	Interest Rate	Term	Year Due	Refinancing Date	Refinancing Amount	
1977	171,038	100,800 3/								
		50,000								
		20,238								
		171,038								
1978	90,494	54,762	50,000	0	8.95	35	2013			
		35,732								
		90,494								
1979	67,649	14,268	75,000	0	9.45	35	2014			
		53,381	50,000	0	9.90	35	2014			
		67,649								
1980	48,043	48,043	115,000	0	13.00	35	2015			
1981	253,151	13,576	175,000	0	16.60	35	2016			
		175,000								
		50,000								
		14,575								
		253,151								
1982	92,111	85,425	50,000	0	14.40	35	2017			
		6,686	100,000	0	14.40	35	2017			
			85,000	0	14.15	35	2017	7/31/1987	85,000	4/
		92,111								
1983	149,133	78,314	40,000	0	10.85	35	2018	2/29/1988	40,000	5/
		40,000	30,000	0	11.70	35	2018			
		30,000	45,000	0	12.25	35	2018			
		819								
		149,133								
1984	235,214	44,181	30,000	0	12.30	35	2019			
		30,000	60,000	0	13.05	35	2019			
		60,000								
		100,000								
		1,033								
		235,214								
1985	115,901	98,967	100,000	0	11.25	45	2030			
		16,934								
		115,901								

1986	326,694	283,066	100,000		0	8.15	10	1996			
		43,628	300,000		0	8.95	45	2031	8/31/1992	100,000	7/
									8/31/1992	100,000	8/ 20/
									5/31/1994	40,000	11/
		326,694									
1987	167,781	56,372	100,000		0	9.30	45	2032	4/30/1992	100,000	6/
		100,000	100,000		0	8.35	5	1992			
		11,409	50,000		0	9.55	45	2032			
		167,781									
1988	96,878	38,591	150,000		0	9.50	45	2033	10/31/1993	100,000	10/
									5/31/1994	50,000	11/
		58,287	40,000		0	9.90	45	2033			
		96,878									
1989	211,811	91,713	75,000		0	8.95	10	1999	5/31/1999	26,200	23/
		40,000									
		75,000									
		5,098									
		211,811									
1990	88,894	44,902	50,000		0	9.25	40	2030	1/31/2000	50,000	24/
		43,992									
		88,894									
1991	139,891	16,008	60,000		0	7.55	4	1995			
		123,883									
		139,891									
1992	214,883	26,117	150,000		0	8.80	40	2032	8/31/1997	103,300	15/
		50,000	50,000		0	7.00	5	1997			
		138,766	150,000		0	8.13	40	2032	4/30/1998	70,300	16/
		214,883							5/31/1998	67,900	17/ 26/
1993	209,541	11,234	50,000		0	6.05	5	1998			
		50,000	99,962	9/	0	8.35	40	2033			
		99,962	130,000		0	7.80	40	2033	5/31/1998	40,000	18/
										90,000	18/
		48,345	100,000		0	7.50	40	2033	8/31/1998	100,000	19/
			110,000		110,000	6.95	40	2033			
		209,541									
1994	239,060	81,655	50,000		50,000	6.85	40	2034			

		100,000		50,000		50,000	7.05	40	2034
		57,405		50,000		0	8.20	40	2034
				55,000		0	7.65	5	1999
		239,060							
1995	290,154	52,595		55,000		0	8.35	6	2001
		50,000		49,933	12/	34,976	7.70	30	2025
		50,000		65,000		0	7.70	30	2025
		50,000							
		55,000							
		32,559							
		290,154							
1996	146,886	22,441		54,378	13/	54,378	5.90	7	2003
		49,933		70,000		70,000	7.05	10	2006
		65,000							
		9,512							
		146,886							
1997	178,551	44,866		22,600	14/	22,600	6.80	7	2004
		70,000		80,000		80,000	6.90	8	2005
		22,600							
		41,085							
		178,551							
1998	149,940	38,915		50,000		50,000	6.65	30	2028
		50,000		36,819	21/	36,819	5.75	10	2008
		36,819							
		24,206							
		149,940							
1999	126,238	24,714		48,920	22/	48,920	5.90	15	2014
		40,000		40,000		0	6.20	3	2002
		61,524							
		126,238							
2000	104,957	17,528		40,000		40,000	6.40	3	2002
		40,000		39,052	25/	39,052	7.00	4	2004
		47,429		40,000		40,000	6.75	6	2006
		104,957							
2001	126,298	32,504		20,000		20,000	5.65	4	2005
		25,000		59,933	27/	59,933	6.05	9	2010
		50,000		25,000		25,000	5.95	10	2011
		18,794	29/	50,000		50,000	5.75	10	2011
		126,298							

2002	273,625	86,548	105,342	28/	105,342	4.60	3	2005
		100,000	100,000		60,000	3.75	3	2005
		60,000	60,000		100,000	3.05	4	2006
		27,077	29/					
		273,625						

1/ These investments have an estimated average service life of 40 years and a maximum repayment period of 40 years

2/ BPA's Summary Financial data, Analysis of Funds Returned to the U.S Treasury and Cash Amortization Table change in Total column from previous year

3/ Funded by appropriations (Reference WP-89-E-BPA-01A1, Documentation for the Revenue Requirement Study - Volume 1, 1989 Rate Proposal, page 195)

4/ Refinanced on 7/31/87 with $ 95,000 issued at 9.55%, 30 year term, due 2017

5/ Refinanced on 2/29/88 with $43,700 issued at 9.50%, 30 year term, due 2018

6/ Refinanced on 4/30/92 with $80,000 issued at 6.20%, 3 year term, due 1995; and $28,300 issued at 7.00%, 5 year term, due 1997

7/ Refinanced on 8/31/92 with $107,800 issued at 6.60%, 8 year term, due 2000

8/ Refinanced on 8/31/92 with $107,700 issued at 7.25%, 15 year term, due 2007

9/ $100,000 bond, $38 functionalized to Generation 1993

10/ Refinanced on 10/31/93 with $108,400 issued at 6.85%, 40 year term, due 2033.

11/ Refinanced on 5/31/94 with $97,100 issued at 7.1%, 4 year term, due 1998 (this new bond also refinanced one other bond

12/ $50,000 bond, $67 functionalized to Generation 1995

13/ $60,000 bond, $5,622 functionalized to Generation 1996

14/ $30,000 bond, $7,400 functionalized to Generation 1997

15/ Refinanced on 8/31/97 with $111,300 at 6.65% for 10 year term, due 2007.

16/ Refinanced on 4/30/1998 with $75,300 issued at 6.0%, 10 year term, due 2009

17/ Refinanced on 5/31/98 with $72,700 at 6.00% for 11 year term, due 2009 and $40,000 at 6.20% for 13 year term, due 2011.

18/ Refinanced on 5/31/98 with $40,000 issued at 6.20% for 13 year term, due 2011; and refinanced on 5/31/98 with $98,900 issued at 6.70%, 34 year term, due 2032

19/ Refinanced on 8/31/98 with $106,500 at 5.85% for 30 year term, due 2028

20/ Refinanced again on 8/31/98 with $112,300 at 5.85%, 30 year term, due 2028

21/ $40,000 bond, $3,181 functionalized to Generation 1998

22/ $60,000 bond, $11,080 functionalized to Generation 1999

23/ Refinanced on 5/31/99 with $26,200 issued at 5.95%, 5 year term, due 2004

24/ Refinanced on 1/31/2000 with $53,500 issued at 7.15%, 5 year term, due 2005

25/ $50,000 bond, $10,948 functionalized to Generation 2000

26/ Refinanced on 8/31/00 with $15,300 at 6.85% for 3 year term, due 2003

27/ $60,000 bond, $67 functionalized to Generation 2001

28/ $110,000 bond, $4,648 functionalized to Generation 2002

29/ This amount not yet financed through long-term bonds

Table C-3

Association of Environment Investment
Funded by Bonds
FY 1997 - 2002
($ Thousands)

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
Fiscal Year	Plant in Service	Amount Funded by Bonds	Amount of Bond Sales	Amount Outstanding	Interest Rate	Term	Year Due	Refinancing Date	Refinancing Amount
1995	16,014	16,014 1/							
1997	40,000	40,000	40,000	40,000	6.95	15	2011		
1999	10,517	10,517							
2000	9,394	9,394							
2001	12,091	10,089	30,000	30,000	6.05	9	2010		
		2,002							
		12,091							
2002	8,651	8,651	30,000	30,000	3.06	4	2006		

1/ Funded by construction bond

CHAPTER 7

REPLACEMENTS PROJECTED AFTER THE COST EVALUATION PERIOD

Purpose: To project the amount of additional capital investment necessary to maintain an existing project at its current operating level after the Cost Evaluation Period.

Method: BPA uses the Iowa Curve Methodology to forecast replacements for the transmission system.

Application of Methodology: The repayment study incorporates a schedule of Federal investment with the replacements that are expected to occur over the repayment period for the existing transmission system. This schedule is expressed in mid-year dollars for FYs 2004 through 2005 and is based on the amount of the plant-in-service in the transmission system for BPA through the end of the cost evaluation period.

Transmission Replacements:

The Iowa Curve methodology is used to calculate future replacements for the transmission system. The Iowa Curves are a set of curves with different shapes corresponding to how much of the initial asset survives as a function of time. They are described in the book Statistical Analyses of Industrial Property Retirements by Robley Winfrey, bulletin 125 revised, Engineering Research Institute, Iowa State University. The Iowa Curves are initially used in BPA's depreciation. BPA's total plant, catalogued by FERC account and in-service date, was analyzed and the various FERC accounts were assigned to various Iowa Curves.

A table from Winfrey's book, TABLE 22 - TOTAL RENEWALS FOR TYPE CURVES, tells what fraction of plant represented by a given curve will have to be replaced each tenth-of-

lifetime to maintain the initial plant. A data file with the contents of that table accurate to twelve lifetimes has been created for use in calculating BPA's future transmission replacements. *See* TABLE 22. For each of the Iowa Curves Table 22 will call for replacements equal to about 50 percent of the initial plant in the first lifetime and approaching 100 percent of initial plant in later lifetimes.

Table 22 gives replacement plant in the same physical units as the initial plant. The net investment in plant of any historical year must first be converted to units of physical plant by dividing the investment by an appropriate historical cost per unit plant. BPA's plant cost is converted to quasi-physical units of plant by use of the Handy-Whitman Index. The Handy-Whitman Index provides cost trends for electric, gas, telephone, and water utilities in geographical regions of generally similar characteristics. The Handy-Whitman Index numbers are widely used in the industry to trend original cost records to estimate reproduction cost at prices prevailing at a later date. The cost trends for each of the utilities are further subdivided by type of plant. In particular, the cost trends for electrical utilities include trends for total transmission plant and trends for the major FERC accounts within transmission plant. *See* table entitled HANDY-WHITMAN INDICES. The trends for individual FERC accounts are used when available. The trends for total transmission plant are used for those accounts for which no specific trend is included.

Surviving transmission plant investment by FERC account and in-service year is obtained from BPA's Plant Investment Section. *See* years 1940 through 2005 of table entitled PLANT INVESTMENT BY YEAR AND ACCOUNT. The plant investment of each year and account is divided by the corresponding Handy-Whitman number to obtain plant in quasi-physical units. The quasi-physical plant is then multiplied by factors obtained by interpolating in the appropriate column of Table 22 to obtain quasi-physical replacements for all years from the last year of the

Handy-Whitman index through the last year of the repayment period. The resulting quasi-physical units are multiplied by the Handy-Whitman number for the last year of the index for the corresponding FERC account to yield replacement costs in the dollars of that last year. These replacement costs are accumulated by future year and FERC account. *See* table entitled REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS.

Gross plant investment data for the cost evaluation period is obtained from BPA's Budget Support. *See* table entitled COST-EVALUATION PERIOD DATA. This latter plant is first de-escalated to the dollars of the last year of the Handy-Whitman index and then distributed among the various FERC accounts in the same proportions as the total plant of BPA's summary of BPA investment from plant balances as of September 30, 2002. *See* years 1940 through 2005 of table entitled PLANT INVESTMENT BY YEAR AND ACCOUNT. Some of the historical plant obtained from the Plant Investment Section will be retired during the cost evaluation period and be replaced with plant funded by amounts obtained from Budget Support. If future replacements were calculated for both, a double counting would occur. Therefore the amount budgeted for a cost evaluation period year is reduced by the amount calculated for replacements for the same year. Future replacements are then calculated for only the remaining net initial investment of that year. *See* table entitled ADJUSTED PLANT INVESTMENT BY YEAR AND FERC ACCOUNT.

The replacement costs of each future year and FERC account are then accumulated for all FERC accounts and inflated from the dollars of the most recent Handy-Whitman year to the dollars of the rate change year. *See* the table entitled FUTURE REPLACEMENTS.

AC Intertie Replacements:

Future replacements on the AC Intertie Facilities are calculated separately so that the contributions made toward those replacements by Non-Federal Capacity Owners can be properly credited in the repayment studies. For historical plant, the plant investment as of September 30, 2002 in each of the lines and substations composing the AC Intertie System (*see* LINES and SUBSTATIONS) was apportioned among the years on the basis of the same line or substation data in a recent plant investment file. These investments by year were accumulated for all lines and substations to obtain historical plant investment by year. These annual investments were apportioned among land and the major FERC accounts on the same basis as the total lines and substations. *See* table entitled AC INTERTIE PLANT-IN-SERVICE.

The cost-evaluation period data for the AC Intertie was obtained. *See* the table entitled Segmentation Summary. The resulting plant data was then processed by the replacement methodology as described above. Those listings that apply only to the AC Intertie follow those for the transmission system. The results are the future replacements for the total AC Intertie and have to be multiplied by the appropriate fraction, 21 percent, to obtain the future contributions required by new capacity owners. These fractional parts, together with the amounts budgeted for the cost evaluation period, are entered into the Transmission Repayment Studies as negative expenses in the Capital Contract Obligation field. *See* Chapters 9 and 11, Repayment Study Input Data.

Plant-In-Service Projection Summary

SUB-LIN-GP Summary

	FY 02	FY 03	FY 04	FY 05	FY 06
TOTAL Plant-In-Service - (SUB'S)	81,858.4	74,834.3	113,194.9	195,645.4	106,967.9
TOTAL Plant-In-Service - (LINES)	30,466.3	32,879.7	50,993.7	220,067.4	161,002.4
TOTAL Plant-In-Service - (GEN PLNT)	63,416.7	53,171.3	60,632.7	63,134.4	58,692.8
Grand Total	$175,741.4	$160,885.4	$224,821.3	$478,847.3	$326,663.1

Substations Summary By Segment - w/ Indirects Rolled Into The Segments

Segment	FY 02	FY 03	FY 04	FY 05	FY 06
DSI Segment	2,081.0	1,439.7	1,704.9	996.6	1,277.9
Generation Integration Segment	971.5	663.7	579.4	456.3	598.3
Montana Intertie Segment	423.1	479.5	387.6	317.0	408.1
Network Segment	72,768.2	67,309.5	105,569.8	138,008.1	99,857.8
Public Utility Segment	1,560.8	1,079.7	1,415.7	747.5	958.4
AC Intertie Segment	2,238.4	2,170.9	1,962.5	1,642.9	2,137.8
DC Intertie Segment	1,815.3	1,691.3	1,574.9	53,477.2	1,729.7
Subs Grand Total	$81,858.4	$74,834.3	$113,194.9	$195,645.4	$106,967.9

Lines Summary By Segment - w/ Indirects Rolled Into The Segments

Segment	FY 02	FY 03	FY 04	FY 05	FY 06
DSI Segment	723.8	680.4	499.8	292.5	289.3
Generation Integration Segment	264.6	269.1	185.4	112.6	118.1
Montana Intertie Segment	661.4	672.8	463.5	281.5	295.3
Network Segment	27,713.5	29,717.9	49,222.8	219,664.9	160,163.3
Public Utility Segment	542.9	510.3	353.5	219.4	217.0
AC Intertie Segment	1,530.8	1,511.2	1,044.0	636.2	669.3
DC Intertie Segment	869.3	838.3	580.6	354.7	374.0
Lines Grand Total	$32,306.3	$34,199.9	$52,349.5	$221,561.8	$162,126.2

General Plant Summary By Account

Account	FY 02	FY 03	FY 04	FY 05	FY 06
Metering Stations	144.0	112.0	117.8	127.7	103.6
Cntl. Equip.	26,858.8	23,679.0	24,841.8	28,026.2	25,286.9
Comm. Equip.	19,926.8	11,945.5	31,872.3	18,578.7	18,925.2
Structures & Imp.	6,311.5	9,127.2	8,531.8	8,782.4	6,733.3
Data Processing Equip. & Software	1,107.9	1,157.1	1,235.8	1,272.5	1,293.3
Tools, Shop & Garage Equip.	908.0	716.4	682.1	636.2	636.6
Stores Equip.	1,356.0	1,068.1	1,015.8	946.7	947.3
Helicopter	908.0	716.4	682.1	636.2	636.6
Lab Equip.	1,815.9	1,432.7	1,364.1	1,272.4	1,273.1
Test Facilities	0.0	0.0	0.0	0.0	0.0
Land & Land Rights	0.0	0.0	0.0	0.0	0.0
Fixed Wing	908.0	716.4	682.1	636.2	636.6
Office Furn. & Fixtures	0.0	0.0	0.0	0.0	0.0
Rolling Stocks	1,356.0	1,068.1	1,015.8	946.7	947.3
Power Operations Equip.	1,815.9	1,432.7	1,364.1	1,272.4	1,273.1
General Plant Grand Total	$63,416.7	$53,171.3	$73,405.5	$63,134.4	$58,692.8

BPA REPLACEMENTS

1 TABLE22 FROM 'STATISTICAL ANALYSES OF INDUSTRIAL PROPERTY RETIREMENTS' BY ROBLEY WINFREY, BULLETIN 125, IOWA STATE UNIVERSITY

	L0	L1	L2	L3	L4	L5	S0	S1	S2	S3	S4	S5	S6	R1	R2	R3	R4	R5	O1
1	2.93	.95	.11	.00	.00	.00	1.17	.16	.00	.00	.00	.00	.00	2.78	1.14	.15	.02	.00	2.53
2	4.82	2.09	.68	.08	.00	.00	2.68	.89	.12	.00	.00	.00	.00	3.23	1.57	.40	.06	.00	5.25
3	5.92	3.64	1.60	.47	.00	.00	3.84	2.03	.58	.06	.00	.00	.00	3.69	2.12	.88	.19	.00	5.52
4	6.72	5.35	2.78	1.22	.16	.00	4.83	3.36	1.59	.38	.00	.00	.00	4.18	2.81	1.60	.51	.00	5.80
5	7.32	6.90	4.83	2.40	.95	.01	5.71	4.78	3.16	1.34	.10	.00	.00	4.76	3.67	2.59	1.18	.05	6.10
6	7.77	7.95	7.42	4.63	2.64	.46	6.52	6.17	5.18	3.32	.79	.02	.00	5.47	4.73	3.83	2.45	.46	6.41
7	8.18	8.45	9.50	8.28	5.00	2.64	7.25	7.48	7.39	6.36	3.28	.46	.00	6.31	6.01	5.37	4.53	1.96	6.74
8	8.54	8.82	10.62	12.11	8.66	6.70	7.94	8.63	9.49	10.00	8.66	4.05	.36	7.25	7.50	7.50	7.49	5.59	7.09
9	8.87	9.16	10.85	14.12	16.35	14.73	8.56	9.61	11.20	13.32	15.88	15.63	8.93	8.25	9.17	10.38	11.23	13.40	7.45
10	9.16	9.47	10.58	13.60	20.53	28.50	9.14	10.37	12.30	15.36	21.28	29.85	40.71	9.24	10.85	13.57	17.14	24.92	7.83
11	9.41	9.73	10.20	11.66	16.77	23.71	9.67	10.92	12.71	15.52	21.28	29.85	40.71	10.16	12.32	15.94	21.62	29.98	8.23
12	9.62	9.93	9.93	9.80	11.27	12.45	10.14	11.24	12.45	13.88	15.91	15.63	8.93	10.94	13.23	16.20	18.76	18.70	8.66
13	9.78	10.08	9.86	8.80	7.93	6.23	10.54	11.34	11.68	11.17	8.80	4.05	.36	11.52	13.26	13.79	11.69	4.71	9.10
14	9.92	10.18	9.94	8.70	6.40	3.26	10.86	11.24	10.64	8.49	3.79	.47	.00	11.84	12.34	9.97	5.69	.49	9.57
15	10.01	10.24	10.06	9.14	6.00	2.09	11.08	10.96	9.61	6.79	2.20	.14	.00	11.86	10.85	7.63	3.08	.65	10.06
16	10.08	10.25	10.16	9.76	6.57	2.78	11.20	10.54	8.84	6.50	3.31	.74	.01	11.56	9.54	6.34	3.94	1.78	10.57
17	10.12	10.24	10.19	10.26	8.12	5.42	11.17	10.05	8.52	7.44	6.10	2.95	.30	10.97	8.66	6.31	5.87	4.13	11.11
18	10.15	10.21	10.16	10.48	10.34	9.68	10.95	9.55	8.69	8.99	9.76	8.16	3.18	10.18	8.04	7.68	8.19	8.17	11.68
19	10.15	10.16	10.09	10.42	12.28	14.97	10.48	9.17	9.23	10.50	13.32	15.90	14.83	9.39	8.17	9.13	10.67	13.68	12.28
20	10.14	10.11	10.02	10.18	12.93	18.28	9.55	9.08	9.89	11.51	15.55	22.11	31.68	8.87	8.94	10.46	12.94	18.94	12.91
21	10.12	10.06	9.96	9.94	12.22	16.98	8.86	9.43	10.38	11.87	15.61	22.11	31.68	8.74	9.66	11.48	14.43	20.78	11.01
22	10.10	10.01	9.93	9.80	10.88	12.84	9.22	9.81	10.62	11.60	13.57	15.90	14.83	9.15	10.24	12.00	14.40	17.13	8.76
23	10.08	9.97	9.92	9.80	9.62	8.75	9.51	10.06	10.62	10.91	10.39	8.19	3.18	9.52	10.62	11.92	12.67	10.08	8.93
24	10.05	9.95	9.94	9.89	8.78	5.94	9.73	10.20	10.48	10.07	7.45	3.11	.30	9.84	10.79	11.29	10.00	4.35	9.10
25	10.03	9.94	9.96	10.00	8.47	4.73	9.90	10.26	10.25	9.37	5.82	1.35	.02	10.08	10.77	10.35	7.64	2.27	9.26
26	10.01	9.94	9.99	10.07	8.69	5.25	10.02	10.25	10.02	8.99	5.88	2.06	.15	10.25	10.58	9.44	6.54	3.02	9.41
27	10.00	9.94	10.00	10.10	9.33	7.28	10.10	10.20	9.84	8.99	7.34	4.82	1.23	10.34	10.30	8.84	6.85	5.40	9.56
28	9.98	9.96	10.02	10.07	10.12	10.24	10.15	10.13	9.75	9.31	9.53	9.42	5.79	10.36	10.00	8.70	8.11	8.85	9.69
29	9.98	9.97	10.02	10.03	10.73	13.08	10.17	10.05	9.74	9.78	11.62	14.70	16.08	10.31	9.76	8.97	9.70	12.74	9.82
30	9.98	9.99	10.02	9.98	10.96	14.53	10.16	9.99	9.79	10.23	12.94	18.34	26.73	10.23	9.61	9.49	11.13	15.91	9.93
31	9.98	10.00	10.01	9.96	10.79	13.98	10.14	9.94	9.89	10.52	13.10	18.35	26.73	10.13	9.59	10.06	12.06	16.93	10.03
32	9.98	10.01	10.00	9.96	10.38	11.95	10.10	9.91	9.99	10.59	12.15	14.73	16.08	10.02	9.67	10.50	12.29	15.07	10.11
33	9.98	10.01	10.00	9.98	9.93	9.53	10.06	9.91	10.07	10.47	10.54	9.55	5.79	9.93	9.82	10.73	11.77	11.12	10.17
34	9.99	10.01	10.00	10.00	9.60	7.61	10.02	9.92	10.12	10.22	8.92	5.26	1.24	9.86	9.98	10.71	10.70	7.04	10.21
35	9.99	10.01	10.00	10.01	9.46	6.72	9.98	9.95	10.12	9.96	7.86	3.21	.22	9.84	10.11	10.50	9.49	4.65	10.24
36	10.00	10.01	10.00	10.02	9.52	7.04	9.94	9.98	10.09	9.76	7.67	3.60	.51	9.84	10.19	10.18	8.57	4.54	10.23
37	10.00	10.00	10.00	10.01	9.75	8.36	9.92	10.01	10.04	9.67	8.33	6.01	2.36	9.88	10.20	9.86	8.26	6.24	10.20
38	10.00	10.00	10.00	10.01	10.02	10.19	9.92	10.03	10.00	9.70	9.49	9.73	7.47	9.93	10.17	9.63	8.58	8.94	10.14
39	10.00	10.00	10.00	10.00	10.23	11.82	9.93	10.04	9.96	9.82	10.70	13.56	16.07	9.99	10.10	9.54	9.33	11.83	10.05
40	10.00	10.00	10.00	9.99	10.32	12.63	9.96	10.04	9.95	9.97	11.53	16.02	23.53	10.03	10.03	9.61	10.18	14.02	9.92

1 TABLE22 FROM 'STATISTICAL ANALYSES OF INDUSTRIAL PROPERTY RETIREMENTS' BY ROBLEY WINFREY, BULLETIN 125, IOWA STATE UNIVERSITY

	L0	L1	L2	L3	L4	L5	S0	S1	S2	S3	S4	S5	S6	R1	R2	R3	R4	R5	O1
41	10.00	10.00	10.00	9.99	10.28	12.36	9.99	10.02	9.95	10.10	11.73	16.04	23.53	10.06	9.96	9.77	10.86	14.74	9.78
42	10.00	10.00	10.00	10.00	10.15	11.24	10.02	10.01	9.96	10.17	11.30	13.66	16.07	10.07	9.92	9.97	11.18	13.67	9.80
43	10.00	10.00	10.00	10.00	9.99	9.80	10.03	10.00	9.98	10.18	10.47	10.02	7.48	10.06	9.90	10.15	11.09	11.21	9.85
44	10.00	10.00	10.00	10.00	9.87	8.60	10.03	9.99	10.00	10.13	9.56	6.70	2.39	10.04	9.91	10.25	10.66	8.43	9.89
45	10.00	10.00	10.00	10.00	9.81	8.02	10.03	9.99	10.02	10.05	8.91	4.88	.70	10.02	9.94	10.26	10.06	6.47	9.93
46	10.00	10.00	10.00	10.00	9.83	8.19	10.02	10.00	10.02	9.97	8.71	5.02	1.05	10.00	9.98	10.20	9.51	6.01	9.96
47	10.00	10.00	10.00	10.00	9.90	9.00	10.01	10.00	10.02	9.92	8.99	6.89	3.38	9.99	10.01	10.09	9.18	7.01	9.99
48	10.00	10.00	10.00	10.00	10.00	10.10	10.01	10.00	10.02	9.90	9.59	9.76	8.49	9.98	10.04	9.97	9.16	8.95	10.00
49	10.00	10.00	10.00	10.00	10.07	11.07	10.00	10.00	10.01	9.91	10.26	12.63	15.66	9.97	10.05	9.88	9.42	11.09	10.02
50	10.00	10.00	10.00	10.00	10.11	11.55	9.99	10.00	10.00	9.95	10.77	14.42	21.26	9.97	10.04	9.84	9.84	12.73	10.03
51	10.00	10.00	10.00	10.00	10.10	11.42	9.99	10.00	9.99	10.00	10.95	14.47	21.26	9.98	10.01	9.85	10.26	13.32	10.03
52	10.00	10.00	10.00	10.00	10.06	10.77	9.99	10.00	9.99	10.04	10.78	12.81	15.66	9.98	9.99	9.90	10.54	12.69	10.03
53	10.00	10.00	10.00	10.00	10.00	9.92	9.99	10.00	9.99	10.06	10.35	10.19	8.50	9.99	9.98	9.98	10.61	11.10	10.02
54	10.00	10.00	10.00	10.00	9.96	9.18	10.00	10.00	9.99	10.05	9.85	7.67	3.46	10.00	9.97	10.04	10.47	9.18	10.01
55	10.00	10.00	10.00	10.00	9.94	8.81	10.00	10.00	10.00	10.04	9.46	6.19	1.40	10.01	9.97	10.08	10.20	7.70	10.00
56	10.00	10.00	10.00	10.00	9.94	8.90	10.00	10.00	10.00	10.01	9.30	6.20	1.72	10.01	9.98	10.10	9.90	7.18	9.99
57	10.00	10.00	10.00	10.00	9.96	9.39	10.00	10.00	10.00	9.98	9.40	7.57	4.25	10.01	10.00	10.08	9.66	7.72	9.98
58	10.00	10.00	10.00	10.00	10.00	10.05	10.00	10.00	10.00	9.97	9.70	9.75	9.09	10.01	10.01	10.04	9.53	9.03	9.97
59	10.00	10.00	10.00	10.00	10.02	10.63	10.00	10.00	10.00	9.97	10.08	11.91	15.14	10.00	10.01	10.00	9.62	10.58	9.96
60	10.00	10.00	10.00	10.00	10.04	10.92	10.00	10.00	10.00	9.98	10.38	13.27	19.53	10.00	10.02	9.96	9.79	11.82	9.96
61	10.00	10.00	10.00	10.00	10.04	10.85	10.00	10.00	10.00	9.99	10.52	13.34	19.53	10.00	10.01	9.94	10.02	12.34	9.96
62	10.00	10.00	10.00	10.00	10.02	10.48	10.00	10.00	10.00	10.00	10.46	12.16	15.14	9.99	10.01	9.94	10.20	11.98	9.97
63	10.00	10.00	10.00	10.00	10.00	9.97	10.00	10.00	10.00	10.01	10.24	10.24	9.12	9.99	10.00	9.96	10.30	10.94	9.98
64	10.00	10.00	10.00	10.00	9.99	9.52	10.00	10.00	10.00	10.02	9.97	8.35	4.39	9.99	10.00	9.98	10.29	9.61	9.99
65	10.00	10.00	10.00	10.00	9.98	9.29	10.00	10.00	10.00	10.02	9.74	7.18	2.18	9.99	9.99	10.01	10.18	8.51	9.99
66	10.00	10.00	10.00	10.00	9.98	9.34	10.00	10.00	10.00	10.01	9.62	7.12	2.44	10.00	9.99	10.03	10.03	8.03	9.99
67	10.00	10.00	10.00	10.00	9.99	9.62	10.00	10.00	10.00	10.00	9.65	8.12	4.97	10.00	9.99	10.03	9.88	8.30	9.99
68	10.00	10.00	10.00	10.00	10.00	10.02	10.00	10.00	10.00	9.99	9.80	9.74	9.44	10.00	10.00	10.03	9.79	9.16	9.99
69	10.00	10.00	10.00	10.00	10.01	10.37	10.00	10.00	10.00	9.99	10.00	11.38	14.60	10.00	10.00	10.02	9.78	10.26	9.99
70	10.00	10.00	10.00	10.00	10.01	10.55	10.00	10.00	10.00	9.99	10.18	12.42	18.17	10.00	10.00	10.00	9.84	11.19	9.99
71	10.00	10.00	10.00	10.00	10.01	10.51	10.00	10.00	10.00	9.99	10.28	12.51	18.17	10.00	10.00	9.99	9.94	11.63	9.99
72	10.00	10.00	10.00	10.00	10.01	10.29	10.00	10.00	10.00	10.00	10.26	11.66	14.62	10.00	10.00	9.98	10.05	11.46	9.99
73	10.00	10.00	10.00	10.00	10.00	9.99	10.00	10.00	10.00	10.00	10.16	10.25	9.50	10.00	10.00	9.98	10.13	10.77	9.98
74	10.00	10.00	10.00	10.00	10.00	9.72	10.00	10.00	10.00	10.00	10.01	8.82	5.18	10.00	10.00	9.98	10.16	9.85	9.98
75	10.00	10.00	10.00	10.00	9.99	9.58	10.00	10.00	10.00	10.00	9.88	7.92	2.98	10.00	10.00	9.99	10.13	9.04	9.98
76	10.00	10.00	10.00	10.00	9.99	9.60	10.00	10.00	10.00	10.00	9.80	7.83	3.18	10.00	10.00	10.00	10.06	8.63	9.98
77	10.00	10.00	10.00	10.00	9.99	9.77	10.00	10.00	10.00	10.00	9.80	8.54	5.58	10.00	10.00	10.01	9.98	8.74	9.98
78	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	9.87	9.75	9.64	10.00	10.00	10.01	9.91	9.30	9.98
79	10.00	10.00	10.00	10.00	10.00	10.22	10.00	10.00	10.00	10.00	9.98	10.99	14.09	10.00	10.00	10.01	9.88	10.08	9.98
80	10.00	10.00	10.00	10.00	10.00	10.33	10.00	10.00	10.00	10.00	10.08	11.79	17.06	10.00	10.00	10.01	9.89	10.76	9.98

1 TABLE22 FROM 'STATISTICAL ANALYSES OF INDUSTRIAL PROPERTY RETIREMENTS' BY ROBLEY WINFREY, BULLETIN 125, IOWA STATE UNIVERSITY

	L0	L1	L2	L3	L4	L5	S0	S1	S2	S3	S4	S5	S6	R1	R2	R3	R4	R5	O1
81	10.00	10.00	10.00	10.00	10.00	10.31	10.00	10.00	10.00	10.00	10.14	11.88	17.06	10.00	10.00	10.00	9.91	11.13	9.98
82	10.00	10.00	10.00	10.00	10.00	10.18	10.00	10.00	10.00	10.00	10.15	11.28	14.12	10.00	10.00	10.00	9.97	11.07	9.99
83	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.10	10.24	11.07	10.00	10.00	10.00	10.03	10.62	9.99
84	10.00	10.00	10.00	10.00	10.00	9.84	10.00	10.00	10.00	10.00	10.02	9.16	4.51	10.00	10.00	10.00	10.08	9.98	9.99
85	10.00	10.00	10.00	10.00	10.00	9.75	10.00	10.00	10.00	10.00	9.94	8.46	3.75	10.00	10.00	10.00	10.09	9.39	9.99
86	10.00	10.00	10.00	10.00	10.00	9.76	10.00	10.00	10.00	10.00	9.90	8.37	3.88	10.00	10.00	10.00	10.07	9.06	9.99
87	10.00	10.00	10.00	10.00	10.00	9.86	10.00	10.00	10.00	10.00	9.89	8.88	6.10	10.00	10.00	10.00	10.02	9.09	9.99
88	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	9.92	9.77	9.75	10.00	10.00	10.00	9.98	9.44	9.98
89	10.00	10.00	10.00	10.00	10.00	10.12	10.00	10.00	10.00	10.00	9.98	10.70	13.62	10.00	10.00	10.00	9.95	9.98	9.98
90	10.00	10.00	10.00	10.00	10.00	10.19	10.00	10.00	10.00	10.00	10.04	11.32	16.13	10.00	10.00	10.00	9.94	10.48	9.98
91	10.00	10.00	10.00	10.00	10.00	10.19	10.00	10.00	10.00	10.00	10.08	11.42	16.17	10.00	10.00	10.00	9.95	10.78	9.98
92	10.00	10.00	10.00	10.00	10.00	10.11	10.00	10.00	10.00	10.00	10.08	10.98	13.94	10.00	10.00	10.00	9.98	10.78	9.98
93	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.06	10.21	10.23	10.00	10.00	10.00	10.02	10.49	9.98
94	10.00	10.00	10.00	10.00	10.00	9.90	10.00	10.00	10.00	10.00	10.02	9.41	6.06	10.00	10.00	10.00	10.04	10.05	9.98
95	10.00	10.00	10.00	10.00	10.00	9.85	10.00	10.00	10.00	10.00	9.98	8.86	4.18	10.00	10.00	10.00	10.05	9.62	9.98
96	10.00	10.00	10.00	10.00	10.00	9.85	10.00	10.00	10.00	10.00	9.95	8.77	4.52	10.00	10.00	10.00	10.04	9.36	9.98
97	10.00	10.00	10.00	10.00	10.00	9.91	10.00	10.00	10.00	10.00	9.94	9.14	6.55	10.00	10.00	10.00	10.01	9.34	9.98
98	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	9.95	9.80	9.81	10.00	10.00	10.00	9.98	9.56	9.98
99	10.00	10.00	10.00	10.00	10.00	10.07	10.00	10.00	10.00	10.00	9.98	10.50	13.19	10.00	10.00	10.00	9.99	9.93	9.98
100	10.00	10.00	10.00	10.00	10.00	10.12	10.00	10.00	10.00	10.00	10.01	10.97	15.36	10.00	10.00	10.00	10.01	10.30	9.98
101	10.00	10.00	10.00	10.00	10.00	10.11	10.00	10.00	10.00	10.00	10.04	11.06	15.45	10.00	10.00	10.00	10.01	10.53	9.98
102	10.00	10.00	10.00	10.00	10.00	10.07	10.00	10.00	10.00	10.00	10.05	10.76	13.46	10.00	10.00	10.00	10.02	10.56	9.98
103	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.04	10.19	10.12	10.00	10.00	10.00	10.02	10.38	9.98
104	10.00	10.00	10.00	10.00	10.00	9.94	10.00	10.00	10.00	10.00	10.02	9.57	6.74	10.00	10.00	10.00	10.02	10.08	9.98
105	10.00	10.00	10.00	10.00	10.00	9.91	10.00	10.00	10.00	10.00	9.99	9.16	4.89	10.00	10.00	10.00	10.01	9.77	9.98
106	10.00	10.00	10.00	10.00	10.00	9.91	10.00	10.00	10.00	10.00	9.97	9.08	5.07	10.00	10.00	10.00	10.00	9.56	9.98
107	10.00	10.00	10.00	10.00	10.00	9.95	10.00	10.00	10.00	10.00	9.96	9.34	6.94	10.00	10.00	10.00	9.99	9.53	9.98
108	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	9.97	9.83	9.85	10.00	10.00	10.00	9.98	9.66	9.98
109	10.00	10.00	10.00	10.00	10.00	10.04	10.00	10.00	10.00	10.00	9.99	10.35	12.81	10.00	10.00	10.00	9.99	9.91	9.98
110	10.00	10.00	10.00	10.00	10.00	10.07	10.00	10.00	10.00	10.00	10.00	10.72	14.70	10.00	10.00	10.00	10.00	10.18	9.98
111	10.00	10.00	10.00	10.00	10.00	10.07	10.00	10.00	10.00	10.00	10.02	10.80	14.79	10.00	10.00	10.00	10.00	10.36	9.98
112	10.00	10.00	10.00	10.00	10.00	10.04	10.00	10.00	10.00	10.00	10.03	10.58	13.04	10.00	10.00	10.00	10.01	10.40	9.98
113	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.02	10.16	10.11	10.00	10.00	10.00	10.01	10.29	9.98
114	10.00	10.00	10.00	10.00	10.00	9.97	10.00	10.00	10.00	10.00	10.01	9.70	7.21	10.00	10.00	10.00	10.01	10.09	9.98
115	10.00	10.00	10.00	10.00	10.00	9.95	10.00	10.00	10.00	10.00	10.00	9.38	5.53	10.00	10.00	10.00	10.00	9.87	9.98
116	10.00	10.00	10.00	10.00	10.00	9.95	10.00	10.00	10.00	10.00	9.99	9.31	5.61	10.00	10.00	10.00	9.99	9.71	9.98
117	10.00	10.00	10.00	10.00	10.00	9.97	10.00	10.00	10.00	10.00	9.98	9.49	7.27	10.00	10.00	10.00	9.99	9.66	9.98
118	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	9.98	9.85	9.86	10.00	10.00	10.00	9.99	9.74	9.98
119	10.00	10.00	10.00	10.00	10.00	10.02	10.00	10.00	10.00	10.00	9.99	10.25	12.47	10.00	10.00	10.00	10.00	9.91	9.98
120	10.00	10.00	10.00	10.00	10.00	10.04	10.00	10.00	10.00	10.00	10.00	10.53	14.13	10.00	10.00	10.00	10.00	10.10	9.98

C	TOTAL	STATN	TOWRS	POLES	OVRHD	1
C YEAR	PLANT	EQPMT	& FIX	& FIX	CNDCT	1
C		#353	#354	#355	#356	1
C						1
1940	22	35	17	15	22	1
1941	23	36	19	17	23	40
1942	25	37	20	18	25	41
1943	25	36	20	19	26	42
1944	25	35	21	21	26	43
1945	26	35	21	22	26	44
1946	29	39	24	24	30	45
1947	34	47	28	29	35	46
1948	37	49	31	32	39	47
1949	38	52	32	32	39	48
1950	40	56	34	33	41	49
1951	45	63	37	36	47	50
1952	46	64	39	37	49	51
1953	49	68	41	39	51	52
1954	50	69	42	40	52	53
1955	52	70	43	42	55	54
1956	56	77	46	44	61	55
1957	57	81	48	47	63	56
1958	59	84	51	49	63	57
1959	60	83	53	50	62	58
1960	60	77	55	52	63	59
1961	59	70	57	53	63	60
1962	59	69	57	54	65	61
1963	59	65	59	55	61	62
1964	61	69	61	56	64	63
1965	64	73	63	58	67	64
1966	67	75	67	61	70	65
1967	70	79	71	63	73	66
1968	73	83	74	65	73	67
1969	78	85	78	69	80	68
1970	83	89	82	76	89	69
1971	89	91	87	81	98	70
1972	93	94	92	87	99	71
1973	100	100	100	100	100	72
1974	124	124	123	126	117	73
1975	145	148	147	145	146	74
1976	158	156	150	150	173	75
1977	172	172	154	160	191	76
1978	174	182	170	170	176	77
1979	190	196	186	190	194	78
1980	211	217	210	210	215	79
1981	230	235	227	233	237	80
1982	245	254	229	253	251	81
1983	254	257	233	257	277	82
1984	255	261	247	263	265	83
1985	252	260	254	255	250	84
1986	256	262	262	258	254	85
1987	257	270	267	260	234	86
1988	286	280	280	282	326	87
1989	296	295	288	301	320	88
1990	308	315	290	309	333	89
1991	314	315	281	334	356	90
1992	310	323	283	353	312	91
1993	321	335	297	359	325	92
1994	336	353	314	376	333	93
1995	353	365	321	391	368	94
1996	358	365	332	410	372	95
1997	363	369	340	419	373	96
1998	375	382	347	428	391	97
1999	369	388	354	419	354	98
2000	373	391	365	413	356	99
2001	401	421	377	432	403	100
2002	411	434	385	448	406	101

COST EVALUATION PERIOD DATA:

YEAR, ESC FACT AND PROJ PLANT

2003	1.02800	160885.0
2004	1.05200	224821.0
2005	1.07700	478847.0

PLANT INVESTMENT BY YEAR AND ACCOUNT

YEAR	R2	R3	SQ	S0	R2	R3	R2	R3
	60	60	40	39	34	34	32	32
	1	1	2	2	2	2	2	2
1940	304.	238.	0.	1820.	0.	0.	0.	0.
1941	749.	466.	0.	1420.	0.	0.	3.	3.
1942	376.	337.	0.	1475.	0.	0.	0.	0.
1943	439.	297.	0.	1806.	0.	0.	1.	1.
1944	23.	7.	0.	9.	0.	0.	0.	0.
1945	31.	16.	0.	275.	0.	0.	0.	0.
1946	97.	78.	0.	323.	0.	0.	0.	0.
1947	109.	34.	0.	63.	0.	0.	0.	0.
1948	176.	152.	0.	1466.	0.	0.	3.	3.
1949	44.	44.	0.	2429.	0.	0.	0.	0.
1950	409.	341.	0.	1963.	0.	0.	1.	1.
1951	283.	215.	0.	2856.	0.	0.	2.	2.
1952	457.	189.	0.	2597.	0.	0.	3.	3.
1953	1073.	713.	0.	9282.	0.	0.	16.	16.
1954	534.	430.	0.	3749.	0.	0.	5.	5.
1955	768.	459.	0.	6180.	0.	0.	2.	2.
1956	526.	361.	0.	7632.	0.	0.	2.	2.
1957	748.	535.	0.	8036.	0.	0.	1.	1.
1958	445.	339.	0.	6859.	0.	0.	0.	0.
1959	320.	160.	0.	7206.	0.	0.	13.	13.
1960	425.	80.	0.	2991.	0.	0.	3.	3.
1961	666.	195.	0.	4387.	0.	0.	7.	7.
1962	392.	275.	0.	3374.	0.	0.	3.	3.
1963	1656.	159.	0.	2895.	0.	0.	46.	46.
1964	527.	296.	0.	2722.	0.	0.	7.	7.
1965	798.	91.	0.	3581.	0.	0.	3.	3.
1966	355.	293.	0.	8929.	0.	0.	22.	22.
1967	797.	584.	0.	8602.	0.	0.	15.	15.
1968	1549.	1354.	0.	16121.	0.	0.	19.	19.
1969	1780.	1060.	0.	17864.	0.	0.	15.	15.
1970	5896.	5781.	0.	60570.	0.	0.	24.	24.
1971	927.	684.	0.	0.	5274.	5274.	29.	29.
1972	3442.	1119.	0.	0.	7077.	7077.	9.	9.
1973	2612.	1078.	0.	0.	8024.	8024.	30.	30.
1974	2251.	560.	0.	0.	7490.	7490.	26.	26.
1975	3191.	1834.	0.	0.	12110.	12110.	24.	24.
1976	1685.	1008.	0.	0.	11909.	11909.	47.	47.
1977	8557.	1315.	0.	0.	14520.	14520.	106.	106.
1978	2342.	885.	0.	0.	21581.	21581.	35.	35.
1979	6504.	518.	0.	0.	8738.	8738.	53.	53.
1980	1794.	860.	0.	0.	9575.	9575.	56.	56.
1981	2248.	1215.	0.	0.	20605.	20605.	159.	159.
1982	2344.	950.	0.	0.	16527.	16527.	38.	38.
1983	9758.	2629.	0.	0.	19497.	19497.	84.	84.
1984	7926.	3632.	0.	0.	33206.	33206.	34.	34.
1985	6116.	4143.	0.	0.	36763.	36763.	455.	455.
1986	3977.	2515.	0.	0.	11160.	11160.	316.	316.

1987	5531.	3753.	0.	0.	16226.	16226.	241.	241.
1988	5286.	4428.	0.	0.	10793.	10793.	416.	416.
1989	17714.	13046.	0.	0.	64615.	64615.	256.	256.
1990	5607.	1964.	0.	0.	26351.	26351.	274.	274.
1991	9276.	3316.	0.	0.	35024.	35024.	345.	345.
1992	9680.	1579.	0.	0.	52078.	52078.	183.	183.
1993	8040.	4187.	0.	0.	39644.	39644.	330.	330.
1994	39201.	14181.	0.	0.	116802.	116802.	336.	336.
1995	8403.	5851.	0.	0.	32350.	32350.	657.	657.
1996	14480.	3738.	1078.	0.	41601.	41601.	819.	819.
1997	6185.	3515.	3.	0.	42447.	42447.	377.	377.
1998	13668.	5666.	145.	0.	26760.	26760.	721.	721.
1999	5250.	2728.	3458.	0.	29899.	29899.	2769.	2769.
2000	1032.	767.	0.	0.	20304.	20304.	213.	213.
2001	2334.	1494.	0.	0.	30100.	30100.	146.	146.
2002	10225.	2364.	0.	0.	35151.	35151.	462.	462.
2003	8338.	3767.	156.	6645.	28785.	28785.	342.	342.
2004	11652.	5264.	218.	9285.	40225.	40225.	478.	478.
2005	24818.	11213.	464.	19776.	85675.	85675.	1017.	1017.

YEAR	R2	R3	R3	R2	R3	R4	S3	R4
	13	13	100	50	50	100	30	75
	2	2	3	4	4	5	1	1
1940	0.	0.	1165.	19.	19.	1337.	0.	100.
1941	0.	0.	3833.	278.	278.	6805.	0.	145.
1942	0.	0.	68.	285.	285.	1711.	0.	289.
1943	0.	0.	4237.	55.	55.	3636.	0.	428.
1944	0.	0.	1.	10.	10.	328.	0.	131.
1945	0.	0.	538.	102.	102.	489.	0.	101.
1946	0.	0.	613.	48.	48.	443.	0.	20.
1947	0.	0.	9.	165.	165.	560.	0.	112.
1948	0.	0.	325.	272.	272.	1928.	0.	177.
1949	0.	0.	394.	582.	582.	1618.	0.	114.
1950	0.	0.	3994.	484.	484.	5746.	0.	998.
1951	0.	0.	2043.	426.	426.	4309.	0.	12.
1952	0.	0.	7448.	322.	322.	7377.	194.	9.
1953	0.	0.	9406.	1695.	1695.	10971.	0.	231.
1954	0.	0.	13091.	715.	715.	12380.	0.	1592.
1955	0.	0.	2126.	214.	214.	2606.	0.	50.
1956	0.	0.	16296.	205.	205.	12919.	0.	356.
1957	0.	0.	1479.	687.	687.	3667.	0.	299.
1958	0.	0.	5519.	954.	954.	6998.	0.	740.
1959	0.	0.	2173.	561.	561.	3627.	0.	236.
1960	0.	0.	756.	186.	186.	1110.	0.	40.
1961	0.	0.	3222.	372.	372.	4187.	0.	286.
1962	0.	0.	11359.	669.	669.	9864.	0.	543.
1963	0.	0.	1223.	222.	222.	1842.	0.	402.
1964	0.	0.	2201.	105.	105.	1508.	0.	53.
1965	0.	0.	9012.	151.	151.	11667.	0.	538.
1966	0.	0.	4065.	561.	561.	6233.	0.	274.
1967	0.	0.	11304.	404.	404.	12198.	1401.	235.
1968	0.	0.	34717.	159.	159.	36806.	0.	1036.
1969	0.	0.	26192.	572.	572.	27856.	0.	487.
1970	0.	0.	26607.	583.	583.	28540.	0.	943.
1971	0.	0.	16012.	319.	319.	14207.	0.	328.
1972	0.	0.	14962.	605.	605.	18862.	0.	879.
1973	0.	0.	28660.	274.	274.	26381.	1494.	1615.
1974	0.	0.	6504.	792.	792.	7248.	0.	1121.
1975	0.	0.	20982.	942.	942.	15017.	0.	1320.
1976	6.	6.	33087.	1035.	1035.	29182.	1318.	860.
1977	27.	27.	62116.	744.	744.	68980.	65.	1017.
1978	4.	4.	7713.	712.	712.	7625.	43.	51.
1979	0.	0.	9162.	1047.	1047.	12052.	0.	1337.
1980	317.	317.	14706.	394.	394.	16057.	0.	201.
1981	0.	0.	61361.	629.	629.	64666.	0.	527.
1982	0.	0.	3576.	338.	338.	5060.	0.	356.
1983	0.	0.	28605.	1488.	1488.	28663.	0.	827.
1984	113.	113.	76261.	1663.	1663.	80157.	0.	8400.
1985	0.	0.	242.	1037.	1037.	1672.	4573.	59.
1986	32.	32.	7491.	4225.	4225.	16166.	0.	742.
1987	286.	286.	100491.	6965.	6965.	145662.	0.	40293.
1988	298.	298.	4838.	1331.	1331.	6827.	0.	309.
1989	264.	264.	2056.	1855.	1855.	2294.	0.	141.

1990	43.	43.	3377.	684.	684.	2590.	0.	0.
1991	12081.	12081.	1305.	763.	763.	3258.	0.	0.
1992	8180.	8180.	11016.	1056.	1056.	20042.	0.	2021.
1993	574.	574.	14158.	1510.	1510.	23660.	0.	4254.
1994	587.	587.	5807.	1874.	1874.	4879.	0.	118.
1995	2085.	2085.	826.	778.	778.	5072.	0.	201.
1996	234.	234.	1685.	99.	99.	4008.	0.	2.
1997	1387.	1387.	16096.	1083.	1083.	12459.	14.	2638.
1998	264.	264.	8932.	1451.	1451.	12847.	7.	1784.
1999	4343.	4343.	-645.	3878.	3878.	241.	0.	416.
2000	182.	182.	95.	1039.	1039.	717.	0.	0.
2001	996.	996.	1404.	2142.	2142.	2965.	0.	1193.
2002	1212.	1212.	1926.	8230.	8230.	13284.	12838.	793.
2003	1116.	1116.	25655.	2100.	2100.	30113.	731.	2824.
2004	1560.	1560.	35851.	2934.	2934.	42080.	1022.	3946.
2005	3323.	3323.	76358.	6250.	6250.	89627.	2176.	8405.

YEAR	SQ 20 1	SQ 5 1	L3 10 1	SQ 15 1	SQ 30 1	SQ 25 1	L2 15 1	S4 40 1	
1940	0.	0.	0.	0.	0.	0.	0.	0.	5002.
1941	0.	0.	0.	0.	0.	0.	0.	0.	13980.
1942	0.	0.	0.	0.	0.	0.	0.	0.	4826.
1943	0.	0.	0.	0.	0.	0.	0.	0.	10955.
1944	0.	0.	0.	0.	0.	0.	0.	0.	519.
1945	0.	0.	0.	0.	0.	0.	0.	0.	1654.
1946	0.	0.	0.	0.	0.	0.	0.	0.	1670.
1947	0.	0.	0.	0.	0.	0.	0.	0.	1217.
1948	0.	0.	0.	0.	0.	0.	0.	0.	4774.
1949	0.	0.	0.	0.	0.	0.	0.	0.	
5807.									
1950	0.	0.	0.	0.	0.	0.	0.	0.	
14421.									
1951	0.	0.	0.	0.	0.	0.	0.	0.	
10574.									
1952	0.	0.	0.	0.	0.	0.	0.	0.	
18921.									
1953	0.	0.	0.	0.	0.	0.	0.	0.	35098.
1954	0.	0.	1.	0.	0.	0.	0.	0.	33217.
1955	0.	0.	0.	0.	0.	0.	0.	0.	12621.
1956	0.	0.	33.	0.	0.	0.	0.	0.	38537.
1957	0.	0.	0.	0.	0.	0.	0.	0.	16140.
1958	0.	0.	0.	0.	0.	0.	0.	0.	22808.
1959	0.	0.	0.	0.	0.	0.	26.	0.	14896.
1960	0.	0.	0.	0.	0.	0.	0.	0.	5780.
1961	0.	0.	0.	0.	0.	0.	0.	0.	13701.
1962	0.	0.	0.	0.	0.	0.	0.	0.	27151.
1963	0.	0.	7.	0.	0.	0.	0.	0.	8720.
1964	0.	0.	19.	0.	0.	0.	22.	0.	7572.
1965	0.	0.	0.	0.	0.	0.	0.	0.	25995.
1966	0.	0.	8.	0.	0.	0.	16.	0.	21339.
1967	0.	0.	16.	0.	0.	0.	7.	0.	35982.
1968	0.	0.	32.	0.	0.	0.	18.	0.	91989.
1969	0.	0.	127.	0.	0.	0.	95.	0.	76635.
1970	0.	0.	123.	0.	0.	0.	36.	0.	129710.
1971	0.	0.	250.	0.	0.	0.	12.	0.	43664.
1972	0.	0.	66.	0.	0.	0.	115.	0.	54827.
1973	0.	0.	587.	0.	0.	0.	167.	0.	79250.
1974	0.	0.	437.	0.	0.	0.	247.	0.	34984.
1975	0.	0.	730.	0.	0.	0.	198.	0.	69424.
1976	0.	0.	301.	0.	0.	0.	841.	0.	94276.
1977	0.	0.	304.	0.	0.	0.	860.	0.	174008.
1978	0.	0.	1018.	0.	0.	0.	325.	0.	64666.
1979	0.	0.	245.	0.	0.	0.	615.	0.	50109.
1980	0.	0.	246.	0.	1653.	4054.	-3746.	0.	56509.
1981	0.	0.	565.	0.	44.	68.	598.	0.	174078.
1982	0.	0.	781.	0.	0.	0.	600.	0.	47473.
1983	0.	0.	355.	1562.	0.	0.	1155.	0.	115692.
1984	0.	0.	59.	0.	0.	0.	989.	0.	247456.
1985	0.	0.	240.	0.	0.	0.	1047.	0.	94602.

1986	0.	0.	116.	2102.	0.	0.	1280.	0.	65855.
1987	0.	0.	57.	14.	0.	0.	593.	0.	343830.
1988	0.	0.	350.	6054.	0.	0.	513.	0.	54281.
1989	0.	0.	1215.	5557.	0.	0.	310.	0.	176313.
1990	0.	0.	358.	20451.	0.	0.	981.	0.	90032.
1991	0.	0.	1232.	11183.	0.	0.	1076.	0.	127072.
1992	0.	0.	1772.	37786.	0.	0.	3014.	0.	209904.
1993	0.	0.	976.	29859.	0.	0.	2357.	0.	171607.
1994	0.	0.	805.	34284.	0.	0.	723.	0.	339196.
1995	639.	0.	1076.	22100.	0.	0.	943.	323.	117174.
1996	0.	0.	1267.	45069.	2.	0.	1665.	0.	158500.
1997	0.	0.	533.	41803.	0.	0.	1.	9029.	182864.
1998	0.	0.	371.	11793.	0.	0.	395.	37884.	151884.
1999	0.	5686.	548.	20212.	214.	1615.	1329.	69789.	192619.
2000	0.	1840.	0.	9964.	0.	101.	0.	0.	57992.
2001	0.	6181.	329.	6385.	0.	20.	0.	1776.	90849.
2002	0.	20555.	2591.	13772.	0.	344.	5541.	12562.	186905.
2003	21.	1141.	671.	10657.	64.	207.	832.	4376.	160885.
2004	30.	1595.	938.	14892.	89.	289.	1162.	6114.	224821.
2005	63.	3397.	1997.	31719.	190.	615.	2475.	13023.	478847

1 ADJUSTED PLANT INVESTMENT BY YEAR AND FERC ACCOUNT

YEAR	R2	R3	SQ	S0	R2	R3	R2	R3
	60	60	40	39	34	34	32	32
	1	1	2	2	2	2	2	2
2003	-3518.	-1826.	0.	-28052.	-16633.	-14204.	-181.	-148.
2004	-3654.	-1917.	0.	-28351.	-17794.	-15741.	-191.	-159.
2005	21029.	9207.	464.	-8819.	66741.	68316.	816.	848.

YEAR	R2	R3	R3	R2	R3	R4	S3	R4
	13	13	100	50	50	100	30	75
	2	2	3	4	4	5	1	1
2003	-2679.	-2995.	-4927.	-3316.	-3699.	-2628.	-1003.	-652.
2004	-2991.	-3542.	-5160.	-3408.	-3801.	-2822.	-1015.	-698.
2005	57.	-641.	70961.	2760.	2356.	86603.	1155.	7658.

YEAR	SQ	SQ	L3	SQ	SQ	SQ	L2	S4
	20	5	10	15	30	25	15	40
	1	1	1	1	1	1	1	1
2003	0.	0.	-3114.	0.	0.	0.		-91399.
2004	0.	0.	-3151.	0.	0.	0.		-96301.
2005	63.	3397.	-1176.	31719.	190.	615.		377846.

2003 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	R2	R3	SQ	S0	R2	R3	R2	R3
LIFE	60	60	40	39	34	34	32	32
H-W	1	1	2	2	2	2	2	2
2003	3518.	1826.	0.	28052.	16633.	14204.	181.	148.
2004	3659.	1917.	0.	28361.	17851.	15749.	192.	159.
2005	3802.	2007.	0.	28659.	19069.	17378.	203.	170.
2006	3941.	2095.	0.	28956.	20307.	19066.	214.	182.
2007	4079.	2183.	0.	29239.	21591.	20837.	226.	194.
2008	4220.	2273.	0.	29501.	22904.	22648.	238.	208.
2009	4363.	2365.	0.	29751.	24241.	24463.	250.	222.
2010	4509.	2461.	0.	29990.	25605.	26294.	263.	237.
2011	4655.	2551.	0.	30212.	26973.	28086.	276.	254.
2012	4803.	2639.	0.	30410.	28344.	29839.	289.	270.
2013	4952.	2724.	0.	30591.	29709.	31518.	303.	288.
2014	5103.	2810.	0.	30752.	31062.	33120.	317.	307.
2015	5255.	2897.	0.	30890.	32378.	34619.	332.	327.
2016	5409.	2989.	0.	30998.	33662.	36039.	346.	346.
2017	5562.	3076.	0.	31095.	34915.	37382.	361.	367.
2018	5716.	3161.	0.	31175.	36095.	38584.	376.	388.
2019	5869.	3243.	0.	31234.	37221.	39758.	391.	408.
2020	6023.	3323.	0.	31270.	38293.	40906.	406.	429.
2021	6177.	3402.	0.	31303.	39287.	41946.	421.	450.
2022	6332.	3485.	0.	31320.	40199.	42881.	436.	471.
2023	6485.	3569.	0.	31320.	41053.	43778.	450.	489.
2024	6639.	3654.	0.	31300.	41826.	44605.	464.	508.
2025	6791.	3739.	0.	31260.	42497.	45302.	477.	526.
2026	6942.	3820.	0.	31192.	43094.	45859.	489.	541.
2027	7091.	3898.	0.	31094.	43606.	46275.	500.	555.
2028	7239.	3970.	0.	30965.	44028.	46608.	510.	566.
2029	7387.	4046.	0.	30821.	44326.	46705.	518.	575.
2030	7534.	4122.	0.	30671.	44534.	46650.	525.	581.
2031	7679.	4198.	0.	30494.	44634.	46419.	531.	584.
2032	7823.	4269.	0.	30303.	44630.	46062.	535.	584.
2033	7961.	4337.	0.	30113.	44535.	45515.	537.	580.
2034	8096.	4392.	0.	29946.	44310.	44654.	537.	570.
2035	8229.	4454.	0.	29758.	44034.	43710.	537.	560.
2036	8361.	4518.	0.	29574.	43670.	42712.	534.	545.
2037	8489.	4581.	0.	29402.	43221.	41566.	529.	524.
2038	8614.	4640.	0.	29240.	42708.	40360.	523.	504.

2003 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	R2	R3	R3	R2	R3	R4	S3	R4
LIFE	13	13	100	50	50	100	30	75
H-W	2	2	3	4	4	5	1	1
2003	2679.	2995.	4927.	3316.	3699.	2628.	1003.	652.
2004	3002.	3544.	5161.	3410.	3801.	2822.	1015.	698.
2005	3308.	3974.	5399.	3497.	3895.	3025.	1021.	747.
2006	3562.	4207.	5645.	3577.	3975.	3239.	1020.	799.
2007	3711.	4109.	5900.	3652.	4036.	3474.	1018.	857.
2008	3739.	3748.	6162.	3724.	4087.	3722.	1013.	919.
2009	3670.	3340.	6436.	3793.	4132.	3988.	1003.	982.
2010	3532.	3029.	6718.	3858.	4175.	4266.	994.	1048.
2011	3373.	2829.	7004.	3916.	4201.	4552.	986.	1117.
2012	3240.	2752.	7297.	3966.	4206.	4851.	976.	1189.
2013	3128.	2792.	7601.	4012.	4201.	5166.	971.	1262.
2014	3035.	2914.	7911.	4055.	4192.	5500.	971.	1339.
2015	2988.	3020.	8226.	4095.	4179.	5847.	971.	1421.
2016	3016.	3106.	8549.	4127.	4154.	6210.	979.	1503.
2017	3070.	3184.	8886.	4151.	4117.	6596.	995.	1587.
2018	3114.	3261.	9230.	4171.	4080.	7000.	1013.	1674.
2019	3161.	3344.	9592.	4189.	4043.	7425.	1038.	1766.
2020	3207.	3403.	9965.	4204.	4007.	7866.	1073.	1857.
2021	3240.	3418.	10343.	4213.	3973.	8318.	1111.	1947.
2022	3269.	3392.	10732.	4217.	3945.	8786.	1152.	2036.
2023	3293.	3328.	11133.	4219.	3918.	9280.	1201.	2120.
2024	3308.	3238.	11542.	4219.	3892.	9797.	1251.	2203.
2025	3305.	3152.	11958.	4217.	3871.	10331.	1300.	2285.
2026	3293.	3088.	12382.	4214.	3860.	10888.	1349.	2367.
2027	3272.	3053.	12816.	4210.	3858.	11488.	1400.	2449.
2028	3240.	3050.	13263.	4204.	3859.	12112.	1443.	2528.
2029	3211.	3079.	13725.	4199.	3860.	12769.	1478.	2607.
2030	3189.	3123.	14201.	4193.	3864.	13445.	1514.	2674.
2031	3176.	3168.	14683.	4190.	3878.	14135.	1537.	2740.
2032	3171.	3214.	15180.	4188.	3901.	14842.	1548.	2805.
2033	3176.	3249.	15691.	4185.	3927.	15587.	1559.	2866.
2034	3187.	3268.	16216.	4182.	3953.	16359.	1557.	2917.
2035	3200.	3274.	16751.	4180.	3982.	17152.	1541.	2967.
2036	3214.	3268.	17294.	4180.	4017.	17969.	1524.	3017.
2037	3227.	3250.	17840.	4181.	4061.	18793.	1499.	3067.
2038	3235.	3224.	18398.	4184.	4106.	19640.	1464.	3113.

2003 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	SQ	SQ	L3	SQ	SQ	SQ	L2	S4	
LIFE	20	5	10	15	30	25	15	40	
H-W	1	1	1	1	1	1	1	1	
2003	0.	0.	3114.	0.	0.	0.	1825.	0.	89574.
2004	0.	0.	3151.	0.	0.	0.	1906.	0.	94493.
2005	0.	0.	3176.	0.	0.	0.	1975.	0.	99330.
2006	0.	0.	3191.	0.	0.	0.	2032.	0.	103975.
2007	0.	0.	3211.	0.	0.	0.	2079.	0.	108317.
2008	0.	0.	3243.	0.	0.	0.	2131.	0.	112348.
2009	0.	0.	3265.	0.	0.	0.	2181.	0.	116264.
2010	0.	0.	3245.	0.	0.	0.	2235.	0.	120223.
2011	0.	0.	3188.	0.	0.	0.	2275.	0.	124175.
2012	0.	0.	3136.	0.	0.	0.	2308.	1.	128208.
2013	0.	0.	3117.	0.	0.	0.	2325.	4.	132335.
2014	0.	0.	3128.	0.	0.	0.	2330.	12.	136516.
2015	0.	0.	3150.	0.	0.	0.	2330.	20.	140594.
2016	0.	0.	3170.	0.	0.	0.	2322.	33.	144603.
2017	0.	0.	3180.	0.	0.	0.	2315.	61.	148523.
2018	0.	0.	3181.	0.	0.	0.	2307.	118.	152218.
2019	0.	0.	3176.	0.	0.	0.	2301.	176.	155860.
2020	0.	0.	3169.	0.	0.	0.	2298.	246.	159401.
2021	0.	0.	3163.	0.	0.	0.	2295.	367.	162713.
2022	0.	0.	3160.	0.	0.	0.	2295.	578.	165813.
2023	0.	0.	3161.	0.	0.	0.	2295.	789.	168797.
2024	0.	0.	3164.	0.	0.	0.	2296.	1020.	171609.
2025	0.	0.	3167.	0.	0.	0.	2297.	1340.	174180.
2026	0.	0.	3169.	0.	0.	0.	2297.	1807.	176547.
2027	0.	0.	3169.	0.	0.	0.	2297.	2273.	178733.
2028	0.	0.	3168.	0.	0.	0.	2296.	2754.	180752.
2029	0.	0.	3166.	0.	0.	0.	2295.	3306.	182472.
2030	0.	0.	3166.	0.	0.	0.	2294.	3955.	183987.
2031	0.	0.	3165.	0.	0.	0.	2294.	4603.	185211.
2032	0.	0.	3165.	0.	0.	0.	2293.	5242.	186221.
2033	0.	0.	3166.	0.	0.	0.	2293.	5849.	186984.
2034	0.	0.	3167.	0.	0.	0.	2293.	6370.	187311.
2035	0.	0.	3167.	0.	0.	0.	2293.	6892.	187494.
2036	0.	0.	3167.	0.	0.	0.	2294.	7377.	187564.
2037	0.	0.	3167.	0.	0.	0.	2294.	7708.	187398.
2038	0.	0.	3166.	0.	0.	0.	2294.	7770.	187120.

2004 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	R2	R3	SQ	S0	R2	R3	R2	R3
LIFE	60	60	40	39	34	34	32	32
H-W	1	1	2	2	2	2	2	2
2003	3518.	1826.	0.	28052.	16633.	14204.	181.	148.
2004	3654.	1917.	0.	28351.	17794.	15741.	191.	159.
2005	3796.	2006.	0.	28610.	19014.	17370.	203.	170.
2006	3935.	2094.	0.	28871.	20275.	19058.	214.	182.
2007	4077.	2182.	0.	29128.	21556.	20828.	225.	194.
2008	4218.	2272.	0.	29365.	22867.	22638.	237.	208.
2009	4361.	2365.	0.	29590.	24198.	24447.	249.	222.
2010	4507.	2460.	0.	29806.	25559.	26275.	262.	237.
2011	4654.	2551.	0.	30008.	26924.	28066.	275.	254.
2012	4801.	2638.	0.	30186.	28291.	29813.	289.	270.
2013	4950.	2724.	0.	30347.	29650.	31488.	302.	288.
2014	5100.	2809.	0.	30490.	30999.	33087.	317.	307.
2015	5252.	2896.	0.	30611.	32311.	34583.	331.	326.
2016	5407.	2988.	0.	30703.	33587.	35994.	345.	346.
2017	5560.	3075.	0.	30783.	34836.	37333.	360.	366.
2018	5713.	3159.	0.	30847.	36011.	38531.	375.	387.
2019	5866.	3242.	0.	30892.	37129.	39697.	390.	408.
2020	6020.	3322.	0.	30913.	38194.	40839.	405.	428.
2021	6174.	3401.	0.	30931.	39182.	41875.	420.	449.
2022	6329.	3483.	0.	30934.	40086.	42803.	435.	470.
2023	6482.	3567.	0.	30920.	40931.	43690.	448.	488.
2024	6635.	3652.	0.	30886.	41696.	44510.	462.	507.
2025	6787.	3737.	0.	30833.	42361.	45202.	475.	525.
2026	6938.	3818.	0.	30752.	42945.	45741.	487.	540.
2027	7087.	3895.	0.	30642.	43449.	46147.	498.	554.
2028	7235.	3968.	0.	30500.	43863.	46472.	508.	565.
2029	7383.	4043.	0.	30344.	44151.	46552.	516.	574.
2030	7530.	4120.	0.	30182.	44348.	46478.	523.	579.
2031	7675.	4195.	0.	29994.	44439.	46236.	529.	582.
2032	7818.	4266.	0.	29791.	44426.	45868.	533.	583.
2033	7956.	4333.	0.	29589.	44321.	45303.	535.	578.
2034	8091.	4388.	0.	29412.	44087.	44430.	535.	568.
2035	8225.	4451.	0.	29213.	43801.	43475.	534.	558.
2036	8356.	4514.	0.	29019.	43432.	42479.	532.	544.
2037	8484.	4577.	0.	28837.	42976.	41330.	527.	523.
2038	8609.	4636.	0.	28665.	42455.	40114.	521.	502.
2039	8727.	4691.	0.	28464.	41905.	38962.	514.	483.

2004 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	R2	R3	R3	R2	R3	R4	S3	R4
LIFE	13	13	100	50	50	100	30	75
H-W	2	2	3	4	4	5	1	1
2003	2679.	2995.	4927.	3316.	3699.	2628.	1003.	652.
2004	2991.	3542.	5160.	3408.	3801.	2822.	1015.	698.
2005	3281.	3967.	5398.	3493.	3895.	3024.	1021.	747.
2006	3527.	4194.	5644.	3571.	3974.	3239.	1020.	799.
2007	3668.	4086.	5900.	3645.	4035.	3474.	1018.	857.
2008	3685.	3712.	6162.	3717.	4085.	3722.	1013.	919.
2009	3603.	3287.	6436.	3785.	4131.	3988.	1003.	982.
2010	3451.	2955.	6718.	3850.	4173.	4266.	994.	1048.
2011	3275.	2731.	7004.	3908.	4199.	4552.	986.	1117.
2012	3122.	2624.	7298.	3958.	4203.	4851.	976.	1189.
2013	2988.	2627.	7601.	4003.	4197.	5167.	970.	1262.
2014	2871.	2703.	7912.	4045.	4188.	5501.	969.	1339.
2015	2799.	2754.	8227.	4084.	4174.	5847.	969.	1421.
2016	2802.	2786.	8550.	4116.	4148.	6211.	976.	1503.
2017	2834.	2821.	8887.	4140.	4111.	6596.	991.	1587.
2018	2862.	2879.	9232.	4159.	4072.	7000.	1007.	1674.
2019	2902.	2976.	9593.	4175.	4035.	7425.	1031.	1766.
2020	2952.	3086.	9966.	4190.	3998.	7867.	1064.	1857.
2021	2999.	3163.	10344.	4198.	3963.	8318.	1099.	1947.
2022	3047.	3188.	10734.	4202.	3934.	8786.	1138.	2036.
2023	3092.	3158.	11134.	4202.	3906.	9280.	1184.	2120.
2024	3124.	3084.	11544.	4202.	3879.	9798.	1232.	2203.
2025	3134.	2997.	11960.	4199.	3857.	10332.	1277.	2285.
2026	3131.	2914.	12384.	4195.	3844.	10889.	1323.	2367.
2027	3113.	2854.	12819.	4189.	3841.	11489.	1372.	2449.
2028	3075.	2824.	13266.	4183.	3840.	12114.	1412.	2528.
2029	3035.	2830.	13728.	4176.	3840.	12770.	1445.	2607.
2030	3003.	2856.	14204.	4170.	3843.	13447.	1480.	2674.
2031	2980.	2888.	14686.	4165.	3855.	14136.	1501.	2740.
2032	2967.	2928.	15184.	4162.	3876.	14844.	1511.	2805.
2033	2968.	2968.	15695.	4158.	3900.	15589.	1522.	2867.
2034	2976.	2997.	16220.	4153.	3925.	16362.	1519.	2917.
2035	2989.	3018.	16756.	4150.	3951.	17155.	1504.	2967.
2036	3004.	3030.	17299.	4148.	3985.	17972.	1488.	3017.
2037	3021.	3027.	17845.	4149.	4026.	18796.	1465.	3067.
2038	3034.	3011.	18404.	4150.	4069.	19643.	1432.	3113.
2039	3043.	2988.	18967.	4150.	4110.	20518.	1398.	3159.

2004 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	SQ	SQ	L3	SQ	SQ	SQ	L2	S4		
LIFE	20	5	10	15	30	25	15	40		
H-W	1	1	1	1	1	1	1	1		
2003	0.	0.	3114.	0.	0.	0.		1825.	0.	89574.
2004	0.	0.	3151.	0.	0.	0.		1905.	0.	94396.
2005	0.	0.	3173.	0.	0.	0.		1971.	0.	99167.
2006	0.	0.	3180.	0.	0.	0.		2022.	0.	103775.
2007	0.	0.	3180.	0.	0.	0.		2064.	0.	108053.
2008	0.	0.	3179.	0.	0.	0.		2107.	0.	111998.
2009	0.	0.	3144.	0.	0.	0.		2148.	0.	115791.
2010	0.	0.	3033.	0.	0.	0.		2187.	0.	119596.
2011	0.	0.	2875.	0.	0.	0.		2210.	0.	123378.
2012	0.	0.	2753.	0.	0.	0.		2226.	1.	127261.
2013	0.	0.	2725.	0.	0.	0.		2229.	4.	131289.
2014	0.	0.	2776.	0.	0.	0.		2224.	12.	135413.
2015	0.	0.	2850.	0.	0.	0.		2219.	20.	139437.
2016	0.	0.	2905.	0.	0.	0.		2209.	33.	143366.
2017	0.	0.	2926.	0.	0.	0.		2202.	61.	147206.
2018	0.	0.	2920.	0.	0.	0.		2197.	118.	150830.
2019	0.	0.	2900.	0.	0.	0.		2193.	176.	154427.
2020	0.	0.	2878.	0.	0.	0.		2192.	246.	157978.
2021	0.	0.	2863.	0.	0.	0.		2191.	367.	161327.
2022	0.	0.	2860.	0.	0.	0.		2191.	576.	164465.
2023	0.	0.	2866.	0.	0.	0.		2192.	788.	167469.
2024	0.	0.	2875.	0.	0.	0.		2191.	1020.	170292.
2025	0.	0.	2883.	0.	0.	0.		2191.	1341.	172845.
2026	0.	0.	2886.	0.	0.	0.		2191.	1803.	175156.
2027	0.	0.	2884.	0.	0.	0.		2190.	2272.	177283.
2028	0.	0.	2880.	0.	0.	0.		2189.	2756.	179233.
2029	0.	0.	2877.	0.	0.	0.		2188.	3311.	180870.
2030	0.	0.	2875.	0.	0.	0.		2188.	3954.	182310.
2031	0.	0.	2875.	0.	0.	0.		2188.	4609.	183475.
2032	0.	0.	2876.	0.	0.	0.		2187.	5254.	184437.
2033	0.	0.	2878.	0.	0.	0.		2188.	5866.	185159.
2034	0.	0.	2879.	0.	0.	0.		2188.	6388.	185461.
2035	0.	0.	2879.	0.	0.	0.		2189.	6918.	185625.
2036	0.	0.	2879.	0.	0.	0.		2189.	7410.	185698.
2037	0.	0.	2878.	0.	0.	0.		2190.	7749.	185526.
2038	0.	0.	2878.	0.	0.	0.		2190.	7824.	185233.
2039	0.	0.	2877.	0.	0.	0.		2190.	7892.	184956.

2005 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	R2	R3	SQ	S0	R2	R3	R2	R3
LIFE	60	60	40	39	34	34	32	32
H-W	1	1	2	2	2	2	2	2
2003	3518.	1826.	0.	28052.	16633.	14204.	181.	148.
2004	3654.	1917.	0.	28351.	17794.	15741.	191.	159.
2005	3789.	2006.	0.	28595.	18934.	17359.	202.	170.
2006	3933.	2094.	0.	28829.	20267.	19055.	214.	181.
2007	4082.	2183.	0.	29064.	21633.	20834.	226.	194.
2008	4234.	2273.	0.	29283.	22953.	22649.	239.	208.
2009	4379.	2366.	0.	29490.	24295.	24464.	251.	222.
2010	4526.	2461.	0.	29688.	25662.	26292.	263.	237.
2011	4673.	2552.	0.	29874.	27039.	28093.	277.	254.
2012	4822.	2640.	0.	30039.	28418.	29852.	290.	271.
2013	4972.	2726.	0.	30186.	29788.	31534.	304.	289.
2014	5123.	2811.	0.	30315.	31148.	33143.	319.	308.
2015	5277.	2899.	0.	30424.	32476.	34656.	333.	327.
2016	5432.	2991.	0.	30504.	33768.	36084.	348.	347.
2017	5587.	3078.	0.	30572.	35027.	37433.	363.	368.
2018	5742.	3163.	0.	30625.	36222.	38655.	378.	389.
2019	5896.	3246.	0.	30658.	37359.	39845.	394.	410.
2020	6051.	3326.	0.	30669.	38440.	41005.	409.	431.
2021	6207.	3406.	0.	30677.	39448.	42067.	424.	453.
2022	6363.	3489.	0.	30670.	40377.	43025.	439.	473.
2023	6519.	3574.	0.	30646.	41244.	43939.	453.	492.
2024	6674.	3660.	0.	30602.	42030.	44784.	467.	512.
2025	6827.	3746.	0.	30540.	42723.	45513.	481.	530.
2026	6980.	3827.	0.	30449.	43337.	46089.	493.	545.
2027	7130.	3905.	0.	30330.	43864.	46515.	504.	560.
2028	7281.	3979.	0.	30180.	44311.	46888.	515.	572.
2029	7431.	4056.	0.	30015.	44633.	47020.	523.	581.
2030	7580.	4133.	0.	29844.	44860.	46985.	531.	588.
2031	7727.	4209.	0.	29648.	44985.	46790.	537.	591.
2032	7872.	4281.	0.	29436.	45010.	46493.	542.	593.
2033	8013.	4350.	0.	29227.	44944.	45996.	544.	590.
2034	8151.	4406.	0.	29041.	44747.	45184.	545.	581.
2035	8287.	4470.	0.	28835.	44500.	44306.	545.	572.
2036	8421.	4535.	0.	28633.	44170.	43389.	543.	559.
2037	8551.	4599.	0.	28445.	43758.	42336.	538.	539.
2038	8678.	4659.	0.	28265.	43273.	41193.	533.	520.
2039	8800.	4716.	0.	28057.	42758.	40099.	527.	501.
2040	8915.	4757.	0.	27847.	42215.	39093.	518.	479.

2005 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	R2	R3	R3	R2	R3	R4	S3	R4
LIFE	13	13	100	50	50	100	30	75
H-W	2	2	3	4	4	5	1	1
2003	2679.	2995.	4927.	3316.	3699.	2628.	1003.	652.
2004	2991.	3542.	5160.	3408.	3801.	2822.	1015.	698.
2005	3266.	3964.	5397.	3490.	3894.	3024.	1021.	747.
2006	3509.	4187.	5644.	3568.	3973.	3239.	1020.	799.
2007	3644.	4074.	5901.	3644.	4035.	3474.	1018.	857.
2008	3655.	3692.	6164.	3716.	4085.	3722.	1013.	919.
2009	3567.	3258.	6439.	3784.	4130.	3989.	1003.	983.
2010	3407.	2913.	6722.	3849.	4172.	4267.	994.	1048.
2011	3221.	2674.	7009.	3907.	4198.	4553.	986.	1117.
2012	3057.	2548.	7304.	3956.	4202.	4852.	976.	1189.
2013	2911.	2528.	7608.	4001.	4196.	5168.	970.	1262.
2014	2780.	2576.	7920.	4044.	4187.	5502.	969.	1339.
2015	2693.	2591.	8235.	4083.	4173.	5849.	968.	1421.
2016	2681.	2582.	8560.	4115.	4147.	6213.	975.	1504.
2017	2700.	2582.	8897.	4138.	4109.	6598.	990.	1587.
2018	2717.	2614.	9243.	4157.	4070.	7002.	1006.	1674.
2019	2749.	2704.	9605.	4174.	4033.	7428.	1030.	1766.
2020	2799.	2836.	9978.	4188.	3996.	7869.	1063.	1858.
2021	2852.	2953.	10358.	4197.	3961.	8321.	1097.	1948.
2022	2911.	3021.	10749.	4200.	3931.	8790.	1136.	2037.
2023	2969.	3023.	11152.	4200.	3903.	9284.	1183.	2121.
2024	3012.	2970.	11563.	4200.	3876.	9803.	1230.	2203.
2025	3031.	2889.	11980.	4197.	3853.	10337.	1276.	2286.
2026	3034.	2800.	12407.	4192.	3840.	10895.	1323.	2369.
2027	3020.	2724.	12843.	4187.	3837.	11496.	1372.	2450.
2028	2980.	2676.	13292.	4180.	3836.	12120.	1413.	2529.
2029	2934.	2664.	13755.	4174.	3835.	12777.	1446.	2609.
2030	2895.	2674.	14232.	4167.	3837.	13454.	1482.	2676.
2031	2866.	2695.	14717.	4162.	3849.	14145.	1505.	2742.
2032	2849.	2727.	15217.	4159.	3870.	14854.	1515.	2807.
2033	2846.	2765.	15731.	4155.	3894.	15600.	1527.	2869.
2034	2852.	2800.	16259.	4150.	3918.	16375.	1526.	2920.
2035	2864.	2830.	16797.	4146.	3944.	17169.	1511.	2971.
2036	2880.	2853.	17342.	4145.	3977.	17987.	1496.	3021.
2037	2898.	2862.	17891.	4145.	4017.	18813.	1473.	3072.
2038	2914.	2855.	18452.	4146.	4060.	19662.	1440.	3118.
2039	2925.	2838.	19018.	4146.	4100.	20537.	1406.	3164.
2040	2934.	2814.	19594.	4147.	4139.	21446.	1372.	3210.

2005 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	SQ	SQ	L3	SQ	SQ	SQ	L2	S4		
LIFE	20	5	10	15	30	25	15	40		
H-W	1	1	1	1	1	1	1	1		
2003	0.	0.	3114.	0.	0.	0.		1825.	0.	89574.
2004	0.	0.	3151.	0.	0.	0.		1905.	0.	94396.
2005	0.	0.	3173.	0.	0.	0.		1969.	0.	99031.
2006	0.	0.	3177.	0.	0.	0.		2019.	0.	103690.
2007	0.	0.	3169.	0.	0.	0.		2057.	0.	108030.
2008	0.	0.	3152.	0.	0.	0.		2097.	0.	111958.
2009	0.	0.	3089.	0.	0.	0.		2134.	0.	115707.
2010	0.	0.	2932.	0.	0.	0.		2166.	0.	119434.
2011	0.	0.	2703.	0.	0.	0.		2182.	0.	123131.
2012	0.	0.	2510.	0.	0.	0.		2190.	1.	126926.
2013	0.	0.	2441.	0.	0.	0.		2187.	4.	130884.
2014	0.	0.	2495.	0.	0.	0.		2178.	12.	134979.
2015	0.	0.	2601.	0.	0.	0.		2170.	20.	139008.
2016	0.	0.	2692.	0.	0.	0.		2161.	33.	142941.
2017	0.	0.	2735.	0.	0.	0.		2155.	61.	146765.
2018	0.	0.	2734.	0.	0.	0.		2151.	118.	150392.
2019	0.	0.	2707.	0.	0.	0.		2149.	175.	154004.
2020	0.	0.	2673.	0.	0.	0.		2148.	246.	157589.
2021	0.	0.	2648.	0.	0.	0.		2148.	367.	161017.
2022	0.	0.	2640.	0.	0.	0.		2148.	577.	164252.
2023	0.	0.	2646.	0.	0.	0.		2148.	787.	167347.
2024	0.	0.	2660.	0.	0.	0.		2148.	1022.	170246.
2025	0.	0.	2672.	0.	0.	0.		2147.	1346.	172882.
2026	0.	0.	2678.	0.	0.	0.		2146.	1811.	175259.
2027	0.	0.	2677.	0.	0.	0.		2146.	2276.	177414.
2028	0.	0.	2671.	0.	0.	0.		2145.	2771.	179423.
2029	0.	0.	2666.	0.	0.	0.		2144.	3336.	181118.
2030	0.	0.	2662.	0.	0.	0.		2143.	3991.	182601.
2031	0.	0.	2661.	0.	0.	0.		2143.	4645.	183830.
2032	0.	0.	2663.	0.	0.	0.		2144.	5313.	184887.
2033	0.	0.	2666.	0.	0.	0.		2144.	5948.	185716.
2034	0.	0.	2668.	0.	0.	0.		2145.	6494.	186124.
2035	0.	0.	2669.	0.	0.	0.		2145.	7040.	186416.
2036	0.	0.	2668.	0.	0.	0.		2146.	7564.	186619.
2037	0.	0.	2667.	0.	0.	0.		2147.	7933.	186604.
2038	0.	0.	2666.	0.	0.	0.		2147.	8039.	186433.
2039	0.	0.	2666.	0.	0.	0.		2147.	8145.	186259.
2040	0.	0.	2666.	0.	0.	0.		2147.	8196.	186144.

FUTURE REPLACEMENTS FOR YEAR 2003:

YEAR	2002 DOLLARS	2003 DOLLARS
2003	89574.	
2004	94493.	97138.
2005	99330.	102111.
2006	103975.	106886.
2007	108317.	111350.
2008	112348.	115494.
2009	116264.	119520.
2010	120223.	123590.
2011	124175.	127652.
2012	128208.	131798.
2013	132335.	136041.
2014	136516.	140338.
2015	140594.	144531.
2016	144603.	148652.
2017	148523.	152682.
2018	152218.	156480.
2019	155860.	160224.
2020	159401.	163865.
2021	162713.	167269.
2022	165813.	170456.
2023	168797.	173523.
2024	171609.	176414.
2025	174180.	179057.
2026	176547.	181490.
2027	178733.	183738.
2028	180752.	185813.
2029	182472.	187581.
2030	183987.	189139.
2031	185211.	190397.
2032	186221.	191435.
2033	186984.	192219.
2034	187311.	192556.
2035	187494.	192744.
2036	187564.	192815.
2037	187398.	192645.
2038	187120.	192359.

FUTURE REPLACEMENTS FOR YEAR 2004:

YEAR	2002 DOLLARS	2004 DOLLARS
2003	89574.	
2004	94396.	
2005	99167.	104324.
2006	103775.	109171.
2007	108053.	113672.
2008	111998.	117822.
2009	115791.	121813.
2010	119596.	125815.
2011	123378.	129794.
2012	127261.	133879.
2013	131289.	138116.
2014	135413.	142455.
2015	139437.	146688.
2016	143366.	150821.
2017	147206.	154861.
2018	150830.	158673.
2019	154427.	162458.
2020	157978.	166193.
2021	161327.	169716.
2022	164465.	173017.
2023	167469.	176178.
2024	170292.	179147.
2025	172845.	181833.
2026	175156.	184264.
2027	177283.	186501.
2028	179233.	188553.
2029	180870.	190275.
2030	182310.	191790.
2031	183475.	193015.
2032	184437.	194027.
2033	185159.	194787.
2034	185461.	195105.
2035	185625.	195278.
2036	185698.	195354.
2037	185526.	195173.
2038	185233.	194865.
2039	184956.	194573.

FUTURE REPLACEMENTS FOR YEAR 2005:

YEAR	2002 DOLLARS	2005 DOLLARS
2003	89574.	
2004	94396.	
2005	99031.	
2006	103690.	111674.
2007	108030.	116348.
2008	111958.	120579.
2009	115707.	124617.
2010	119434.	128630.
2011	123131.	132612.
2012	126926.	136699.
2013	130884.	140962.
2014	134979.	145372.
2015	139008.	149712.
2016	142941.	153948.
2017	146765.	158066.
2018	150392.	161972.
2019	154004.	165862.
2020	157589.	169724.
2021	161017.	173415.
2022	164252.	176899.
2023	167347.	180232.
2024	170246.	183355.
2025	172882.	186194.
2026	175259.	188754.
2027	177414.	191075.
2028	179423.	193239.
2029	181118.	195064.
2030	182601.	196662.
2031	183830.	197985.
2032	184887.	199123.
2033	185716.	200016.
2034	186124.	200455.
2035	186416.	200770.
2036	186619.	200989.
2037	186604.	200973.
2038	186433.	200789.
2039	186259.	200601.
2040	186144.	200477.

AC INTERTIE REPLACEMENTS

AC INTERTIE COST-EVALUATION PERIOD DATA:

YEAR	PLANT INVESTMENT	ESCALATION FACTOR
2003	3682.	1.02800
2004	3007.	1.05200
2005	1932.	1.07700

PLANT INVESTMENT BY YEAR AND ACCOUNT

YEAR	R2	R3	SQ	S0	R2	R3	R2	R3
	60	60	40	39	34	34	32	32
	1	1	2	2	2	2	2	2
1951	0.	0.	0.	16.	0.	0.	0.	0.
1952	0.	0.	0.	24.	0.	0.	0.	0.
1953	331.	177.	0.	883.	0.	0.	0.	0.
1954	18.	0.	0.	0.	0.	0.	0.	0.
1955	30.	6.	0.	48.	0.	0.	0.	0.
1956	208.	207.	0.	796.	0.	0.	0.	0.
1957	47.	1.	0.	21.	0.	0.	0.	0.
1958	7.	5.	0.	1430.	0.	0.	0.	0.
1959	28.	0.	0.	288.	0.	0.	0.	0.
1960	0.	0.	0.	24.	0.	0.	0.	0.
1961	0.	0.	0.	6.	0.	0.	0.	0.
1962	98.	0.	0.	5.	0.	0.	0.	0.
1963	0.	0.	0.	68.	0.	0.	0.	0.
1964	0.	0.	0.	25.	0.	0.	0.	0.
1965	0.	0.	0.	7.	0.	0.	0.	0.
1966	11.	8.	0.	333.	0.	0.	0.	0.
1967	26.	0.	0.	1.	0.	0.	0.	0.
1968	336.	211.	0.	1498.	0.	0.	0.	0.
1969	206.	131.	0.	2617.	0.	0.	0.	0.
1970	1.	1.	0.	1460.	0.	0.	0.	0.
1971	0.	0.	0.	0.	323.	323.	0.	0.
1972	238.	193.	0.	0.	2389.	2389.	0.	0.
1973	0.	0.	0.	0.	68.	68.	0.	0.
1974	0.	0.	0.	0.	62.	62.	0.	0.
1975	46.	46.	0.	0.	429.	429.	0.	0.
1976	22.	22.	0.	0.	33.	33.	0.	0.
1977	49.	49.	0.	0.	888.	888.	0.	0.
1978	8.	0.	0.	0.	89.	89.	0.	0.
1979	0.	0.	0.	0.	186.	186.	0.	0.
1980	63.	1.	0.	0.	-2.	-2.	0.	0.
1981	0.	0.	0.	0.	75.	75.	0.	0.
1982	6.	6.	0.	0.	243.	243.	0.	0.
1983	1206.	1203.	0.	0.	5636.	5636.	0.	0.
1984	252.	58.	0.	0.	24.	24.	0.	0.
1985	16.	16.	0.	0.	28.	28.	0.	0.
1986	79.	0.	0.	0.	407.	407.	0.	0.
1987	366.	316.	0.	0.	6.	6.	0.	0.
1988	38.	0.	0.	0.	1834.	1834.	0.	0.
1989	2548.	2548.	0.	0.	2738.	2738.	0.	0.
1990	152.	152.	0.	0.	336.	336.	0.	0.
1991	167.	167.	0.	0.	100.	100.	0.	0.
1992	879.	879.	0.	0.	21296.	21296.	0.	0.
1993	235.	88.	0.	0.	4545.	4545.	0.	0.
1994	3358.	3158.	0.	0.	29122.	29122.	18.	18.
1995	183.	183.	0.	0.	3103.	3103.	34.	34.
1996	133.	85.	0.	0.	2334.	2334.	53.	53.

1997	23.	23.	0.	0.	386.	386.	0.	0.
1998	0.	0.	0.	0.	1479.	1479.	24.	24.
1999	31.	0.	0.	0.	575.	575.	0.	0.
2000	1.	1.	0.	0.	1653.	1653.	0.	0.
2001	2.	2.	0.	0.	3108.	3108.	0.	0.
2002	200.	142.	0.	0.	1846.	1846.	0.	0.
2003	140.	122.	0.	115.	1029.	1029.	2.	2.
2004	115.	99.	0.	94.	840.	840.	1.	1.
2005	74.	64.	0.	60.	540.	540.	1.	1.

PLANT INVESTMENT BY YEAR AND ACCOUNT

YEAR	R2 13 2	R3 13 2	R3 100 3	R2 50 4	R3 50 4	R4 100 5	S3 30 1	R4 75 1
1951	0.	0.	0.	0.	0.	0.	0.	0.
1952	0.	0.	0.	0.	0.	0.	0.	0.
1953	0.	0.	0.	0.	0.	0.	0.	0.
1954	0.	0.	0.	0.	0.	0.	0.	0.
1955	0.	0.	0.	0.	0.	0.	0.	0.
1956	0.	0.	0.	0.	0.	0.	0.	0.
1957	0.	0.	0.	0.	0.	0.	0.	0.
1958	0.	0.	0.	0.	0.	0.	0.	0.
1959	0.	0.	0.	0.	0.	0.	0.	0.
1960	0.	0.	0.	0.	0.	0.	0.	0.
1961	0.	0.	0.	0.	0.	0.	0.	0.
1962	0.	0.	0.	0.	0.	0.	0.	0.
1963	0.	0.	0.	0.	0.	0.	0.	0.
1964	0.	0.	0.	0.	0.	0.	0.	0.
1965	0.	0.	0.	0.	0.	0.	0.	0.
1966	0.	0.	0.	0.	0.	0.	0.	0.
1967	0.	0.	0.	0.	0.	0.	0.	0.
1968	0.	0.	9688.	0.	0.	9685.	0.	413.
1969	0.	0.	0.	0.	0.	0.	0.	0.
1970	0.	0.	0.	0.	0.	0.	0.	0.
1971	0.	0.	0.	0.	0.	0.	0.	0.
1972	0.	0.	0.	0.	0.	0.	0.	0.
1973	0.	0.	0.	0.	0.	2.	0.	0.
1974	0.	0.	0.	0.	0.	0.	0.	0.
1975	0.	0.	48.	0.	0.	0.	0.	0.
1976	0.	0.	0.	0.	0.	0.	0.	0.
1977	0.	0.	0.	0.	0.	0.	0.	0.
1978	0.	0.	0.	0.	0.	0.	0.	0.
1979	0.	0.	0.	0.	0.	0.	0.	0.
1980	0.	0.	0.	0.	0.	0.	0.	0.
1981	0.	0.	0.	0.	0.	0.	0.	0.
1982	0.	0.	0.	0.	0.	0.	0.	0.
1983	0.	0.	0.	0.	0.	0.	0.	139.
1984	0.	0.	0.	0.	0.	3.	0.	0.
1985	0.	0.	0.	0.	0.	0.	0.	0.
1986	0.	0.	0.	0.	0.	38.	0.	0.
1987	0.	0.	0.	0.	0.	0.	0.	0.
1988	0.	0.	0.	0.	0.	0.	0.	0.
1989	0.	0.	0.	0.	0.	0.	0.	0.
1990	0.	0.	0.	0.	0.	55.	0.	0.
1991	0.	0.	0.	0.	0.	0.	0.	0.
1992	0.	0.	10214.	0.	0.	13250.	0.	1696.
1993	0.	0.	10142.	864.	864.	17279.	0.	3553.
1994	0.	0.	4326.	0.	0.	2779.	0.	0.
1995	0.	0.	0.	0.	0.	0.	0.	0.
1996	0.	0.	0.	0.	0.	0.	0.	0.

1997	0.	0.	0.	0.	0.	0.	0.	0.
1998	0.	0.	0.	0.	0.	0.	0.	0.
1999	3.	3.	0.	0.	0.	0.	0.	0.
2000	0.	0.	0.	0.	0.	0.	0.	0.
2001	0.	0.	0.	0.	0.	25.	0.	0.
2002	0.	0.	0.	0.	0.	0.	0.	0.
2003	0.	0.	415.	10.	10.	520.	0.	70.
2004	0.	0.	339.	9.	9.	424.	0.	57.
2005	0.	0.	218.	5.	5.	273.	0.	37.

PLANT INVESTMENT BY YEAR AND ACCOUNT

YEAR	SQ 20 1	SQ 5 1	L3 10 1	SQ 15 1	SQ 30 1	SQ 25 1	L2 15 1	S4 40 1	
1951	0.	0.	0.	0.	0.	0.	0.	0.	16.
1952	0.	0.	0.	0.	0.	0.	0.	0.	24.
1953	0.	0.	0.	0.	0.	0.	0.	0.	1391.
1954	0.	0.	0.	0.	0.	0.	0.	0.	18.
1955	0.	0.	0.	0.	0.	0.	0.	0.	84.
1956	0.	0.	0.	0.	0.	0.	0.	0.	1211.
1957	0.	0.	0.	0.	0.	0.	0.	0.	69.
1958	0.	0.	0.	0.	0.	0.	0.	0.	1442.
1959	0.	0.	0.	0.	0.	0.	0.	0.	316.
1960	0.	0.	0.	0.	0.	0.	0.	0.	24.
1961	0.	0.	0.	0.	0.	0.	0.	0.	6.
1962	0.	0.	0.	0.	0.	0.	0.	0.	103.
1963	0.	0.	0.	0.	0.	0.	0.	0.	68.
1964	0.	0.	0.	0.	0.	0.	0.	0.	25.
1965	0.	0.	0.	0.	0.	0.	0.	0.	7.
1966	0.	0.	0.	0.	0.	0.	0.	0.	352.
1967	0.	0.	0.	0.	0.	0.	0.	0.	27.
1968	0.	0.	0.	0.	0.	0.	0.	0.	21831.
1969	0.	0.	0.	0.	0.	0.	0.	0.	2954.
1970	0.	0.	0.	0.	0.	0.	0.	0.	1462.
1971	0.	0.	0.	0.	0.	0.	0.	0.	646.
1972	0.	0.	0.	0.	0.	0.	0.	0.	5209.
1973	0.	0.	0.	0.	0.	0.	0.	0.	138.
1974	0.	0.	0.	0.	0.	0.	0.	0.	124.
1975	0.	0.	0.	0.	0.	0.	0.	0.	998.
1976	0.	0.	0.	0.	0.	0.	0.	0.	110.
1977	0.	0.	0.	0.	0.	0.	0.	0.	1874.
1978	0.	0.	0.	0.	0.	0.	0.	0.	186.
1979	0.	0.	0.	0.	0.	0.	0.	0.	372.
1980	0.	0.	0.	0.	0.	0.	0.	0.	60.
1981	0.	0.	0.	0.	0.	0.	0.	0.	150.
1982	0.	0.	0.	0.	0.	0.	0.	0.	498.
1983	0.	0.	0.	0.	0.	0.	0.	0.	13820.
1984	0.	0.	0.	0.	0.	0.	0.	0.	361.
1985	0.	0.	0.	0.	0.	0.	0.	0.	88.
1986	0.	0.	0.	0.	0.	0.	0.	0.	931.
1987	0.	0.	0.	14.	0.	0.	0.	0.	708.
1988	0.	0.	0.	235.	0.	0.	0.	0.	3941.
1989	0.	0.	0.	307.	0.	0.	0.	0.	10879.
1990	0.	0.	0.	2299.	0.	0.	0.	0.	3330.
1991	0.	0.	0.	142.	0.	0.	0.	0.	676.
1992	0.	0.	0.	1390.	0.	0.	0.	0.	70900.
1993	0.	0.	0.	1059.	0.	0.	0.	0.	43174.
1994	0.	0.	0.	6317.	0.	0.	0.	0.	78218.
1995	0.	0.	0.	699.	0.	0.	0.	0.	7339.
1996	0.	0.	0.	2520.	0.	0.	0.	0.	7512.

1997	0.	0.	0.	557.	0.	0.	0.	0.	1375.
1998	0.	0.	0.	414.	0.	0.	0.	0.	3420.
1999	0.	0.	0.	481.	0.	0.	0.	1214.	2882.
2000	0.	0.	0.	126.	0.	0.	0.	0.	3434.
2001	0.	0.	0.	57.	0.	0.	0.	0.	6302.
2002	0.	0.	0.	382.	0.	0.	0.	0.	4416.
2003	0.	0.	0.	205.	0.	0.	0.	15.	3682.
2004	0.	0.	0.	167.	0.	0.	0.	12.	3007.
2005	0.	0.	0.	108.	0.	0.	0.	8.	1932.

ADJUSTED PLANT INVESTMENT BY YEAR AND FERC ACCOUNT

YEAR	R2	R3	SQ	S0	R2	R3	R2	R3
	60	60	40	39	34	34	32	32
	1	1	2	2	2	2	2	2
2003	-162.	-82.	0.	-1220.	-1301.	-1034.	-1.	0.
2004	-169.	-88.	0.	-1235.	-1393.	-1150.	-1.	0.
2005	-102.	-30.	0.	-1187.	-944.	-729.	0.	0.

YEAR	R2	R3	R3	R2	R3	R4	S3	R4
	13	13	100	50	50	100	30	75
	2	2	3	4	4	5	1	1
2003	0.	0.	-90.	-4.	-1.	-29.	0.	-5.
2004	0.	0.	-96.	-4.	-2.	-33.	0.	-6.
2005	0.	0.	116.	1.	4.	236.	0.	31.

YEAR	SQ	SQ	L3	SQ	SQ	SQ	L2	S4
	20	5	10	15	30	25	15	40
	1	1	1	1	1	1	1	1
2003	0.	0.	0.	0.	0.	0.		-3930.
2004	0.	0.	0.	0.	0.	0.		-4176.
2005	0.	0.	0.	108.	0.	0.		-2490.

2003 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	R2	R3	SQ	S0	R2	R3	R2	R3
LIFE	60	60	40	39	34	34	32	32
H-W	1	1	2	2	2	2	2	2
2003	162.	82.	0.	1220.	1301.	1034.	1.	0.
2004	169.	88.	0.	1235.	1395.	1150.	1.	0.
2005	176.	94.	0.	1250.	1490.	1270.	1.	1.
2006	182.	100.	0.	1265.	1589.	1395.	1.	1.
2007	189.	106.	0.	1279.	1693.	1528.	1.	1.
2008	196.	112.	0.	1292.	1800.	1660.	1.	1.
2009	203.	119.	0.	1305.	1907.	1785.	2.	1.
2010	211.	126.	0.	1318.	2019.	1918.	2.	1.
2011	218.	133.	0.	1330.	2135.	2054.	2.	1.
2012	225.	140.	0.	1341.	2249.	2174.	2.	2.
2013	233.	148.	0.	1352.	2364.	2297.	2.	2.
2014	241.	155.	0.	1362.	2484.	2425.	2.	2.
2015	248.	162.	0.	1371.	2604.	2558.	3.	2.
2016	256.	170.	0.	1379.	2720.	2685.	3.	2.
2017	264.	177.	0.	1387.	2841.	2823.	3.	3.
2018	272.	185.	0.	1394.	2963.	2976.	3.	3.
2019	280.	192.	0.	1399.	3082.	3148.	3.	3.
2020	287.	199.	0.	1404.	3200.	3321.	4.	4.
2021	295.	206.	0.	1408.	3320.	3508.	4.	4.
2022	303.	213.	0.	1410.	3441.	3709.	4.	5.
2023	310.	220.	0.	1411.	3556.	3896.	4.	5.
2024	318.	227.	0.	1411.	3669.	4093.	5.	5.
2025	325.	234.	0.	1410.	3780.	4278.	5.	6.
2026	332.	239.	0.	1406.	3885.	4453.	5.	6.
2027	339.	245.	0.	1401.	3981.	4605.	5.	7.
2028	346.	251.	0.	1395.	4071.	4731.	6.	7.
2029	353.	257.	0.	1387.	4147.	4822.	6.	7.
2030	360.	263.	0.	1378.	4212.	4897.	6.	8.
2031	366.	269.	0.	1367.	4264.	4923.	6.	8.
2032	372.	274.	0.	1355.	4296.	4883.	6.	8.
2033	378.	279.	0.	1342.	4324.	4823.	6.	8.
2034	383.	284.	0.	1332.	4326.	4690.	6.	7.
2035	389.	291.	0.	1322.	4310.	4523.	6.	7.
2036	394.	297.	0.	1312.	4284.	4335.	6.	6.
2037	399.	304.	0.	1304.	4241.	4123.	6.	6.
2038	404.	310.	0.	1294.	4180.	3885.	6.	5.

2003 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	R2	R3	R3	R2	R3	R4	S3	R4
LIFE	13	13	100	50	50	100	30	75
H-W	2	2	3	4	4	5	1	1
2003	0.	0.	90.	4.	1.	29.	0.	5.
2004	0.	0.	96.	4.	2.	33.	0.	6.
2005	0.	0.	102.	4.	2.	37.	0.	6.
2006	0.	0.	107.	5.	2.	41.	0.	7.
2007	0.	0.	113.	5.	2.	44.	0.	8.
2008	0.	0.	119.	5.	3.	48.	0.	8.
2009	0.	0.	126.	6.	3.	52.	0.	9.
2010	0.	0.	132.	6.	3.	57.	0.	10.
2011	0.	0.	139.	6.	4.	61.	0.	11.
2012	0.	0.	145.	7.	4.	65.	0.	12.
2013	0.	0.	152.	7.	5.	69.	0.	13.
2014	0.	0.	160.	7.	5.	76.	0.	15.
2015	0.	0.	168.	8.	5.	84.	0.	16.
2016	0.	0.	175.	8.	6.	91.	0.	17.
2017	0.	0.	183.	9.	6.	99.	0.	19.
2018	0.	0.	191.	9.	7.	106.	0.	20.
2019	0.	0.	200.	10.	7.	115.	0.	22.
2020	0.	0.	209.	10.	8.	123.	0.	24.
2021	0.	0.	217.	11.	9.	131.	0.	26.
2022	0.	0.	226.	11.	9.	139.	0.	28.
2023	0.	0.	234.	12.	10.	147.	0.	30.
2024	0.	0.	244.	12.	11.	160.	0.	32.
2025	0.	0.	255.	13.	11.	172.	0.	35.
2026	0.	0.	265.	13.	12.	185.	0.	37.
2027	0.	0.	275.	14.	13.	198.	0.	40.
2028	0.	0.	285.	15.	14.	211.	0.	43.
2029	0.	0.	296.	15.	15.	225.	0.	46.
2030	0.	0.	307.	16.	16.	239.	0.	50.
2031	0.	0.	318.	17.	17.	253.	0.	53.
2032	0.	0.	329.	17.	18.	267.	0.	56.
2033	0.	0.	340.	18.	19.	281.	0.	60.
2034	0.	0.	354.	19.	21.	300.	0.	65.
2035	0.	0.	368.	19.	22.	319.	0.	70.
2036	0.	0.	382.	20.	23.	337.	0.	75.
2037	0.	0.	396.	21.	25.	356.	0.	80.
2038	0.	0.	410.	22.	26.	376.	0.	85.

2003 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	SQ	SQ	L3	SQ	SQ	SQ	L2	S4		
LIFE	20	5	10	15	30	25	15	40		
H-W	1	1	1	1	1	1	1	1		
2003	0.	0.	0.	0.	0.	0.		0.	0.	3930.
2004	0.	0.	0.	0.	0.	0.		0.	0.	4178.
2005	0.	0.	0.	0.	0.	0.		0.	0.	4431.
2006	0.	0.	0.	0.	0.	0.		0.	0.	4694.
2007	0.	0.	0.	0.	0.	0.		0.	0.	4969.
2008	0.	0.	0.	0.	0.	0.		0.	0.	5247.
2009	0.	0.	0.	0.	0.	0.		0.	0.	5518.
2010	0.	0.	0.	0.	0.	0.		0.	0.	5804.
2011	0.	0.	0.	0.	0.	0.		0.	0.	6095.
2012	0.	0.	0.	0.	0.	0.		0.	0.	6367.
2013	0.	0.	0.	0.	0.	0.		0.	0.	6645.
2014	0.	0.	0.	0.	0.	0.		0.	0.	6935.
2015	0.	0.	0.	0.	0.	0.		0.	0.	7229.
2016	0.	0.	0.	0.	0.	0.		0.	0.	7514.
2017	0.	0.	0.	0.	0.	0.		0.	0.	7814.
2018	0.	0.	0.	0.	0.	0.		0.	1.	8131.
2019	0.	0.	0.	0.	0.	0.		0.	2.	8462.
2020	0.	0.	0.	0.	0.	0.		0.	2.	8793.
2021	0.	0.	0.	0.	0.	0.		0.	3.	9139.
2022	0.	0.	0.	0.	0.	0.		0.	5.	9499.
2023	0.	0.	0.	0.	0.	0.		0.	7.	9837.
2024	0.	0.	0.	0.	0.	0.		0.	9.	10188.
2025	0.	0.	0.	0.	0.	0.		0.	11.	10524.
2026	0.	0.	0.	0.	0.	0.		0.	16.	10840.
2027	0.	0.	0.	0.	0.	0.		0.	20.	11124.
2028	0.	0.	0.	0.	0.	0.		0.	25.	11375.
2029	0.	0.	0.	0.	0.	0.		0.	29.	11577.
2030	0.	0.	0.	0.	0.	0.		0.	36.	11751.
2031	0.	0.	0.	0.	0.	0.		0.	42.	11861.
2032	0.	0.	0.	0.	0.	0.		0.	48.	11882.
2033	0.	0.	0.	0.	0.	0.		0.	54.	11879.
2034	0.	0.	0.	0.	0.	0.		0.	59.	11787.
2035	0.	0.	0.	0.	0.	0.		0.	63.	11647.
2036	0.	0.	0.	0.	0.	0.		0.	68.	11473.
2037	0.	0.	0.	0.	0.	0.		0.	73.	11262.
2038	0.	0.	0.	0.	0.	0.		0.	73.	11003.

2004 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	R2	R3	SQ	S0	R2	R3	R2	R3
LIFE	60	60	40	39	34	34	32	32
H-W	1	1	2	2	2	2	2	2
2003	162.	82.	0.	1220.	1301.	1034.	1.	0.
2004	169.	88.	0.	1235.	1393.	1150.	1.	0.
2005	175.	94.	0.	1248.	1486.	1269.	1.	1.
2006	182.	100.	0.	1261.	1583.	1394.	1.	1.
2007	189.	106.	0.	1273.	1686.	1527.	1.	1.
2008	196.	112.	0.	1286.	1793.	1658.	1.	1.
2009	203.	119.	0.	1298.	1899.	1783.	2.	1.
2010	210.	126.	0.	1309.	2011.	1916.	2.	1.
2011	217.	133.	0.	1320.	2126.	2051.	2.	1.
2012	225.	140.	0.	1330.	2239.	2171.	2.	2.
2013	232.	147.	0.	1340.	2353.	2293.	2.	2.
2014	240.	155.	0.	1349.	2472.	2419.	2.	2.
2015	248.	162.	0.	1357.	2591.	2551.	3.	2.
2016	256.	170.	0.	1365.	2707.	2677.	3.	2.
2017	263.	177.	0.	1372.	2826.	2814.	3.	3.
2018	271.	185.	0.	1378.	2947.	2966.	3.	3.
2019	279.	192.	0.	1383.	3064.	3137.	3.	3.
2020	287.	199.	0.	1387.	3181.	3309.	4.	4.
2021	294.	206.	0.	1390.	3300.	3494.	4.	4.
2022	302.	213.	0.	1391.	3419.	3694.	4.	5.
2023	309.	220.	0.	1392.	3532.	3879.	4.	5.
2024	317.	227.	0.	1391.	3644.	4074.	5.	5.
2025	324.	233.	0.	1389.	3752.	4258.	5.	6.
2026	331.	239.	0.	1385.	3856.	4430.	5.	6.
2027	338.	244.	0.	1379.	3950.	4580.	5.	7.
2028	345.	250.	0.	1372.	4037.	4703.	6.	7.
2029	352.	256.	0.	1364.	4112.	4791.	6.	7.
2030	359.	262.	0.	1355.	4175.	4863.	6.	8.
2031	365.	269.	0.	1343.	4224.	4886.	6.	8.
2032	371.	274.	0.	1330.	4254.	4842.	6.	8.
2033	376.	278.	0.	1317.	4279.	4779.	6.	7.
2034	382.	283.	0.	1306.	4279.	4642.	6.	7.
2035	387.	290.	0.	1296.	4261.	4472.	6.	7.
2036	393.	297.	0.	1285.	4232.	4280.	6.	6.
2037	398.	303.	0.	1276.	4188.	4066.	6.	6.
2038	402.	309.	0.	1266.	4125.	3825.	6.	5.
2039	406.	315.	0.	1258.	4046.	3611.	6.	5.

2004 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	R2	R3	R3	R2	R3	R4	S3	R4
LIFE	13	13	100	50	50	100	30	75
H-W	2	2	3	4	4	5	1	1
2003	0.	0.	90.	4.	1.	29.	0.	5.
2004	0.	0.	96.	4.	2.	33.	0.	6.
2005	0.	0.	102.	4.	2.	37.	0.	6.
2006	0.	0.	107.	5.	2.	41.	0.	7.
2007	0.	0.	113.	5.	2.	44.	0.	8.
2008	0.	0.	119.	5.	3.	48.	0.	8.
2009	0.	0.	126.	6.	3.	52.	0.	9.
2010	0.	0.	132.	6.	3.	57.	0.	10.
2011	0.	0.	139.	6.	4.	61.	0.	11.
2012	0.	0.	145.	7.	4.	65.	0.	12.
2013	0.	0.	152.	7.	5.	69.	0.	13.
2014	0.	0.	160.	7.	5.	76.	0.	15.
2015	0.	0.	168.	8.	5.	84.	0.	16.
2016	0.	0.	175.	8.	6.	91.	0.	17.
2017	0.	0.	183.	9.	6.	99.	0.	19.
2018	0.	0.	191.	9.	7.	106.	0.	20.
2019	0.	0.	200.	10.	7.	115.	0.	22.
2020	0.	0.	208.	10.	8.	123.	0.	24.
2021	0.	0.	217.	10.	9.	131.	0.	26.
2022	0.	0.	226.	11.	9.	139.	0.	28.
2023	0.	0.	234.	12.	10.	147.	0.	30.
2024	0.	0.	244.	12.	11.	160.	0.	32.
2025	0.	0.	254.	13.	11.	172.	0.	35.
2026	0.	0.	265.	13.	12.	185.	0.	37.
2027	0.	0.	275.	14.	13.	198.	0.	40.
2028	0.	0.	285.	15.	14.	211.	0.	43.
2029	0.	0.	296.	15.	15.	225.	0.	46.
2030	0.	0.	307.	16.	16.	239.	0.	50.
2031	0.	0.	318.	17.	17.	253.	0.	53.
2032	0.	0.	329.	17.	18.	267.	0.	56.
2033	0.	0.	340.	18.	19.	281.	0.	60.
2034	0.	0.	354.	19.	21.	300.	0.	65.
2035	0.	0.	368.	19.	22.	319.	0.	69.
2036	0.	0.	382.	20.	23.	337.	0.	75.
2037	0.	0.	396.	21.	25.	356.	0.	80.
2038	0.	0.	410.	22.	26.	376.	0.	85.
2039	0.	0.	425.	22.	27.	397.	0.	90.

2004 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	SQ	SQ	L3	SQ	SQ	SQ	L2	S4		
LIFE	20	5	10	15	30	25	15	40		
H-W	1	1	1	1	1	1	1	1		
2003	0.	0.	0.	0.	0.	0.		0.	0.	3930.
2004	0.	0.	0.	0.	0.	0.		0.	0.	4176.
2005	0.	0.	0.	0.	0.	0.		0.	0.	4424.
2006	0.	0.	0.	0.	0.	0.		0.	0.	4683.
2007	0.	0.	0.	0.	0.	0.		0.	0.	4956.
2008	0.	0.	0.	0.	0.	0.		0.	0.	5231.
2009	0.	0.	0.	0.	0.	0.		0.	0.	5500.
2010	0.	0.	0.	0.	0.	0.		0.	0.	5783.
2011	0.	0.	0.	0.	0.	0.		0.	0.	6072.
2012	0.	0.	0.	0.	0.	0.		0.	0.	6342.
2013	0.	0.	0.	0.	0.	0.		0.	0.	6617.
2014	0.	0.	0.	0.	0.	0.		0.	0.	6904.
2015	0.	0.	0.	0.	0.	0.		0.	0.	7196.
2016	0.	0.	0.	0.	0.	0.		0.	0.	7478.
2017	0.	0.	0.	0.	0.	0.		0.	0.	7774.
2018	0.	0.	0.	0.	0.	0.		0.	1.	8088.
2019	0.	0.	0.	0.	0.	0.		0.	2.	8416.
2020	0.	0.	0.	0.	0.	0.		0.	2.	8743.
2021	0.	0.	0.	0.	0.	0.		0.	3.	9085.
2022	0.	0.	0.	0.	0.	0.		0.	5.	9442.
2023	0.	0.	0.	0.	0.	0.		0.	7.	9775.
2024	0.	0.	0.	0.	0.	0.		0.	9.	10123.
2025	0.	0.	0.	0.	0.	0.		0.	11.	10454.
2026	0.	0.	0.	0.	0.	0.		0.	16.	10765.
2027	0.	0.	0.	0.	0.	0.		0.	20.	11044.
2028	0.	0.	0.	0.	0.	0.		0.	25.	11289.
2029	0.	0.	0.	0.	0.	0.		0.	29.	11486.
2030	0.	0.	0.	0.	0.	0.		0.	35.	11654.
2031	0.	0.	0.	0.	0.	0.		0.	42.	11758.
2032	0.	0.	0.	0.	0.	0.		0.	48.	11772.
2033	0.	0.	0.	0.	0.	0.		0.	54.	11762.
2034	0.	0.	0.	0.	0.	0.		0.	59.	11664.
2035	0.	0.	0.	0.	0.	0.		0.	63.	11517.
2036	0.	0.	0.	0.	0.	0.		0.	68.	11337.
2037	0.	0.	0.	0.	0.	0.		0.	72.	11121.
2038	0.	0.	0.	0.	0.	0.		0.	72.	10857.
2039	0.	0.	0.	0.	0.	0.		0.	72.	10609.

2005 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	R2	R3	SQ	S0	R2	R3	R2	R3
LIFE	60	60	40	39	34	34	32	32
H-W	1	1	2	2	2	2	2	2
2003	162.	82.	0.	1220.	1301.	1034.	1.	0.
2004	169.	88.	0.	1235.	1393.	1150.	1.	0.
2005	175.	94.	0.	1247.	1484.	1269.	1.	1.
2006	182.	100.	0.	1258.	1578.	1393.	1.	1.
2007	188.	106.	0.	1269.	1680.	1526.	1.	1.
2008	195.	112.	0.	1280.	1785.	1657.	1.	1.
2009	202.	119.	0.	1291.	1891.	1781.	2.	1.
2010	210.	126.	0.	1301.	2002.	1914.	2.	1.
2011	217.	133.	0.	1311.	2117.	2049.	2.	1.
2012	224.	140.	0.	1320.	2228.	2167.	2.	2.
2013	232.	147.	0.	1329.	2342.	2289.	2.	2.
2014	239.	155.	0.	1337.	2460.	2414.	2.	2.
2015	247.	162.	0.	1345.	2578.	2545.	3.	2.
2016	255.	170.	0.	1351.	2692.	2670.	3.	2.
2017	263.	177.	0.	1357.	2810.	2806.	3.	3.
2018	270.	184.	0.	1363.	2930.	2957.	3.	3.
2019	278.	192.	0.	1366.	3046.	3126.	3.	3.
2020	286.	199.	0.	1370.	3161.	3297.	4.	4.
2021	293.	206.	0.	1372.	3279.	3480.	4.	4.
2022	301.	213.	0.	1373.	3396.	3678.	4.	5.
2023	309.	219.	0.	1372.	3508.	3862.	4.	5.
2024	316.	226.	0.	1371.	3618.	4055.	5.	5.
2025	323.	233.	0.	1369.	3724.	4236.	5.	6.
2026	330.	239.	0.	1364.	3825.	4406.	5.	6.
2027	337.	244.	0.	1357.	3918.	4554.	5.	7.
2028	344.	250.	0.	1350.	4003.	4674.	6.	7.
2029	351.	256.	0.	1341.	4075.	4760.	6.	7.
2030	357.	262.	0.	1331.	4135.	4828.	6.	8.
2031	364.	268.	0.	1318.	4183.	4848.	6.	8.
2032	369.	273.	0.	1305.	4210.	4800.	6.	8.
2033	375.	278.	0.	1291.	4232.	4733.	6.	7.
2034	380.	283.	0.	1280.	4229.	4591.	6.	7.
2035	386.	290.	0.	1269.	4209.	4417.	6.	7.
2036	391.	296.	0.	1258.	4178.	4221.	6.	6.
2037	396.	302.	0.	1249.	4131.	4003.	6.	6.
2038	400.	309.	0.	1238.	4065.	3758.	6.	5.
2039	404.	314.	0.	1230.	3984.	3541.	6.	5.
2040	408.	321.	0.	1222.	3899.	3344.	6.	4.

2005 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	R2	R3	R3	R2	R3	R4	S3	R4
LIFE	13	13	100	50	50	100	30	75
H-W	2	2	3	4	4	5	1	1
2003	0.	0.	90.	4.	1.	29.	0.	5.
2004	0.	0.	96.	4.	2.	33.	0.	6.
2005	0.	0.	102.	4.	2.	37.	0.	6.
2006	0.	0.	107.	5.	2.	41.	0.	7.
2007	0.	0.	113.	5.	2.	44.	0.	8.
2008	0.	0.	119.	5.	3.	48.	0.	8.
2009	0.	0.	126.	6.	3.	52.	0.	9.
2010	0.	0.	132.	6.	3.	57.	0.	10.
2011	0.	0.	139.	6.	4.	61.	0.	11.
2012	0.	0.	145.	7.	4.	65.	0.	12.
2013	0.	0.	152.	7.	5.	69.	0.	13.
2014	0.	0.	160.	7.	5.	76.	0.	15.
2015	0.	0.	168.	8.	5.	84.	0.	16.
2016	0.	0.	175.	8.	6.	91.	0.	17.
2017	0.	0.	183.	9.	6.	99.	0.	19.
2018	0.	0.	191.	9.	7.	106.	0.	20.
2019	0.	0.	200.	9.	7.	114.	0.	22.
2020	0.	0.	208.	10.	8.	123.	0.	24.
2021	0.	0.	217.	10.	9.	131.	0.	26.
2022	0.	0.	226.	11.	9.	139.	0.	28.
2023	0.	0.	234.	12.	10.	147.	0.	30.
2024	0.	0.	244.	12.	11.	160.	0.	32.
2025	0.	0.	254.	13.	11.	172.	0.	35.
2026	0.	0.	264.	13.	12.	185.	0.	37.
2027	0.	0.	275.	14.	13.	198.	0.	40.
2028	0.	0.	285.	15.	14.	211.	0.	43.
2029	0.	0.	296.	15.	15.	225.	0.	46.
2030	0.	0.	307.	16.	16.	239.	0.	50.
2031	0.	0.	318.	16.	17.	253.	0.	53.
2032	0.	0.	329.	17.	18.	267.	0.	56.
2033	0.	0.	340.	18.	19.	281.	0.	60.
2034	0.	0.	354.	19.	21.	300.	0.	65.
2035	0.	0.	368.	19.	22.	318.	0.	69.
2036	0.	0.	382.	20.	23.	337.	0.	75.
2037	0.	0.	396.	21.	24.	356.	0.	80.
2038	0.	0.	410.	21.	26.	376.	0.	85.
2039	0.	0.	424.	22.	27.	397.	0.	90.
2040	0.	0.	439.	23.	29.	418.	0.	94.

2005 REPLACEMENTS BY INDIVIDUAL PLANT ACCOUNTS:

CURVE	SQ	SQ	L3	SQ	SQ	SQ	L2	S4		
LIFE	20	5	10	15	30	25	15	40		
H-W	1	1	1	1	1	1	1	1		
2003	0.	0.	0.	0.	0.	0.		0.	0.	3930.
2004	0.	0.	0.	0.	0.	0.		0.	0.	4176.
2005	0.	0.	0.	0.	0.	0.		0.	0.	4422.
2006	0.	0.	0.	0.	0.	0.		0.	0.	4675.
2007	0.	0.	0.	0.	0.	0.		0.	0.	4944.
2008	0.	0.	0.	0.	0.	0.		0.	0.	5217.
2009	0.	0.	0.	0.	0.	0.		0.	0.	5484.
2010	0.	0.	0.	0.	0.	0.		0.	0.	5764.
2011	0.	0.	0.	0.	0.	0.		0.	0.	6050.
2012	0.	0.	0.	0.	0.	0.		0.	0.	6318.
2013	0.	0.	0.	0.	0.	0.		0.	0.	6590.
2014	0.	0.	0.	0.	0.	0.		0.	0.	6874.
2015	0.	0.	0.	0.	0.	0.		0.	0.	7163.
2016	0.	0.	0.	0.	0.	0.		0.	0.	7442.
2017	0.	0.	0.	0.	0.	0.		0.	0.	7735.
2018	0.	0.	0.	0.	0.	0.		0.	1.	8045.
2019	0.	0.	0.	0.	0.	0.		0.	2.	8369.
2020	0.	0.	0.	0.	0.	0.		0.	2.	8693.
2021	0.	0.	0.	0.	0.	0.		0.	3.	9031.
2022	0.	0.	0.	0.	0.	0.		0.	5.	9384.
2023	0.	0.	0.	0.	0.	0.		0.	7.	9713.
2024	0.	0.	0.	0.	0.	0.		0.	9.	10055.
2025	0.	0.	0.	0.	0.	0.		0.	11.	10382.
2026	0.	0.	0.	0.	0.	0.		0.	16.	10688.
2027	0.	0.	0.	0.	0.	0.		0.	20.	10961.
2028	0.	0.	0.	0.	0.	0.		0.	25.	11201.
2029	0.	0.	0.	0.	0.	0.		0.	29.	11392.
2030	0.	0.	0.	0.	0.	0.		0.	35.	11554.
2031	0.	0.	0.	0.	0.	0.		0.	42.	11651.
2032	0.	0.	0.	0.	0.	0.		0.	48.	11657.
2033	0.	0.	0.	0.	0.	0.		0.	54.	11641.
2034	0.	0.	0.	0.	0.	0.		0.	58.	11535.
2035	0.	0.	0.	0.	0.	0.		0.	63.	11381.
2036	0.	0.	0.	0.	0.	0.		0.	68.	11193.
2037	0.	0.	0.	0.	0.	0.		0.	72.	10969.
2038	0.	0.	0.	0.	0.	0.		0.	72.	10699.
2039	0.	0.	0.	0.	0.	0.		0.	72.	10446.
2040	0.	0.	0.	0.	0.	0.		0.	72.	10208.

FUTURE REPLACEMENTS FOR YEAR 2003:

YEAR	2002 DOLLARS	2003 DOLLARS
2003	3930.	
2004	4178.	4295.
2005	4431.	4556.
2006	4694.	4825.
2007	4969.	5109.
2008	5247.	5394.
2009	5518.	5673.
2010	5804.	5966.
2011	6095.	6265.
2012	6367.	6546.
2013	6645.	6831.
2014	6935.	7129.
2015	7229.	7432.
2016	7514.	7725.
2017	7814.	8032.
2018	8131.	8358.
2019	8462.	8699.
2020	8793.	9039.
2021	9139.	9395.
2022	9499.	9765.
2023	9837.	10112.
2024	10188.	10474.
2025	10524.	10819.
2026	10840.	11144.
2027	11124.	11435.
2028	11375.	11693.
2029	11577.	11901.
2030	11751.	12080.
2031	11861.	12194.
2032	11882.	12214.
2033	11879.	12211.
2034	11787.	12117.
2035	11647.	11973.
2036	11473.	11794.
2037	11262.	11577.
2038	11003.	11311.

FUTURE REPLACEMENTS FOR YEAR 2004:

YEAR	2002 DOLLARS	2004 DOLLARS
2003	3930.	
2004	4176.	
2005	4424.	4654.
2006	4683.	4926.
2007	4956.	5214.
2008	5231.	5503.
2009	5500.	5786.
2010	5783.	6084.
2011	6072.	6388.
2012	6342.	6672.
2013	6617.	6961.
2014	6904.	7263.
2015	7196.	7570.
2016	7478.	7867.
2017	7774.	8178.
2018	8088.	8508.
2019	8416.	8853.
2020	8743.	9198.
2021	9085.	9558.
2022	9442.	9933.
2023	9775.	10283.
2024	10123.	10649.
2025	10454.	10998.
2026	10765.	11325.
2027	11044.	11618.
2028	11289.	11876.
2029	11486.	12084.
2030	11654.	12260.
2031	11758.	12369.
2032	11772.	12384.
2033	11762.	12374.
2034	11664.	12271.
2035	11517.	12116.
2036	11337.	11926.
2037	11121.	11699.
2038	10857.	11421.
2039	10609.	11161.

FUTURE REPLACEMENTS FOR YEAR 2005:

YEAR	2002 DOLLARS	2005 DOLLARS
2003	3930.	
2004	4176.	
2005	4422.	
2006	4675.	5035.
2007	4944.	5325.
2008	5217.	5619.
2009	5484.	5906.
2010	5764.	6208.
2011	6050.	6516.
2012	6318.	6804.
2013	6590.	7097.
2014	6874.	7403.
2015	7163.	7715.
2016	7442.	8015.
2017	7735.	8330.
2018	8045.	8664.
2019	8369.	9014.
2020	8693.	9362.
2021	9031.	9727.
2022	9384.	10106.
2023	9713.	10460.
2024	10055.	10830.
2025	10382.	11182.
2026	10688.	11511.
2027	10961.	11805.
2028	11201.	12064.
2029	11392.	12270.
2030	11554.	12444.
2031	11651.	12548.
2032	11657.	12555.
2033	11641.	12537.
2034	11535.	12424.
2035	11381.	12257.
2036	11193.	12055.
2037	10969.	11814.
2038	10699.	11523.
2039	10446.	11250.
2040	10208.	10994.

CHAPTER 8

Financial Risk and Mitigation

8.1 BACKGROUND

BPA adopted a long-term policy in its 1993 Final Rate Proposal calling for setting rates that build and maintain financial reserves sufficient for the agency to achieve a 95 percent probability of meeting U.S. Treasury payments in full and on time for each two-year rate period. *See* 1993 Final Rate Proposal, Administrator's Record of Decision, WP-93-A-02 at page 72.

In this rate proposal, BPA has analyzed its transmission risks and has determined that the Final Rate Proposal achieves the 95 percent probability standard for the transmission function.

To achieve this Treasury payment probability, the following risk mitigation "tools" were considered in the rate proposal:

1. Starting reserves. Starting financial reserves include cash in the BPA Fund and the deferred borrowing balance attributed to the transmission function. The risk-adjusted value for starting reserves is projected to average $182 million at the beginning of FY 2004.

2. Planned Net Revenues for Risk (PNRR). PNRR is a component of the revenue requirement that is added to annual expenses. PNRR adds to cash flows so that financial reserves mitigate short run cost and revenue risk and achieve the TPP goal. No PNRR were required in the revenue requirement to achieve the TPP standard under the Final Rate Proposal.

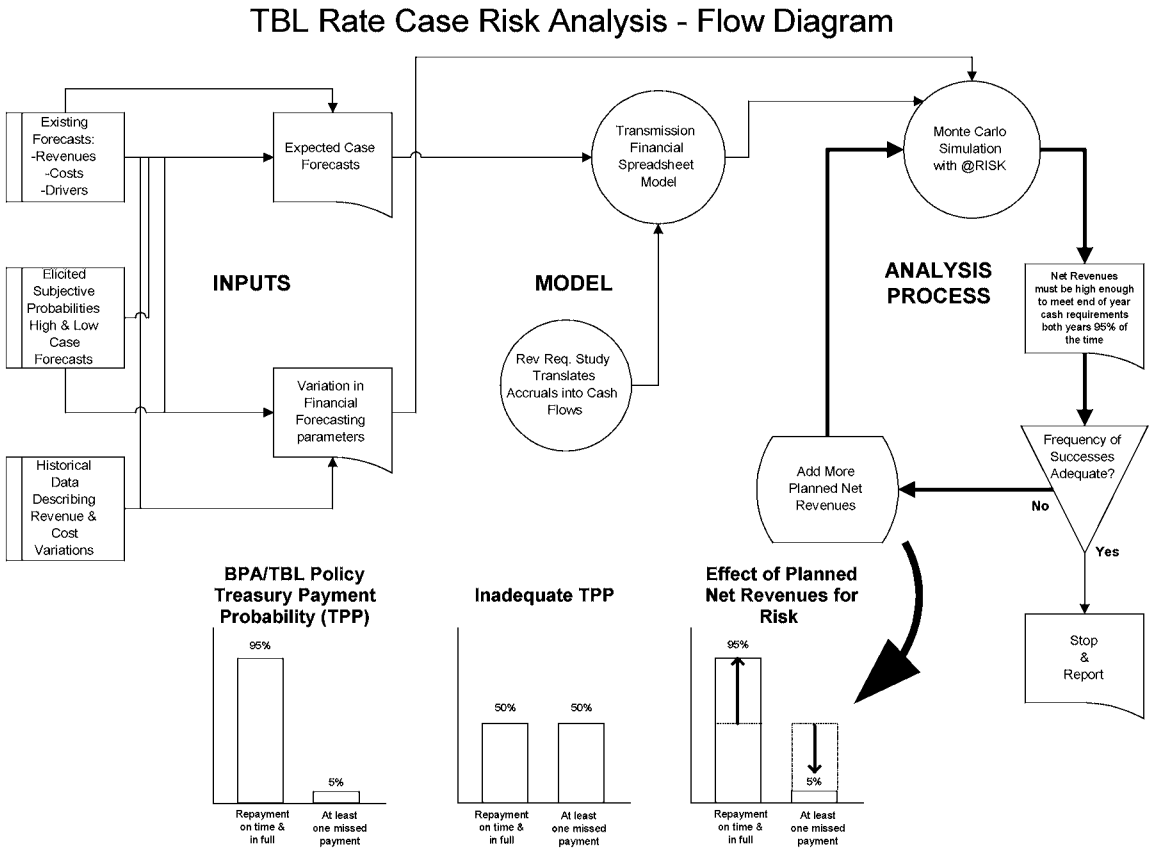
3. Two Year Rate Period. BPA is proposing to adopt rates for a two-year period. The ability to revise rates after two years, or more frequently if need be, serves as an important risk mitigation tool for BPA's transmission function. By adopting a two-year rate period the TBL limits the amount of risk that must be covered by financial reserves and PNRR.

8.2 TRANSMISSION RISK ANALYSIS

To quantify the effects of risk on the finances of BPA's transmission function, BPA analyzes the effects of uncertainty in expenses and revenues on transmission cash flows using a Monte Carlo simulation method. *See* Figure 8.1. The analysis is used to estimate the probability of successful Treasury payment on time and in full during the rate period (FY 2004 and FY 2005). Successful Treasury payment is assumed to occur when the end of year cash reserve for the transmission function is at least sufficient to cover the TBL's working capital requirement of $20 million per year. The working capital requirement was estimated based on historical monthly net cash flow patterns and monthly cash requirements for the TBL.

The risk analysis is part of the Revenue Requirements Study (RRS). It uses inputs that come from the RRS, and transmission sales, revenue, and expense forecasts. The risk analysis estimates the cash reserves expected at the beginning of the rate period and PNRR if cash reserves are insufficient to meet the TPP standard of 95%. Initial input values for point estimates of expenses and revenues, when combined with inputs describing uncertainty in expenses and revenues, provide the basis for the initial estimate of PNRR. The PNRR is in turn provided as an expense input to the RRS, changing the transmission revenue requirement and ultimately transmission rates.

Figure 8.1



The adjusted transmission rates increase the expected revenues during the rate period. The revised estimates of expected revenues combined with the revenue and expense uncertainties are used to update the risk analysis, TPP and adequacy of PNRR. This iterative analysis process is continued until estimates of PNRR converge on a particular amount of PNRR. The estimated amount of PNRR is used to set the PNRR expense for the RRS.

The risk analysis covers the period of FY 2002 through FY 2005. The analysis begins with a historical period, FY 2002. The change in revenues, expenses, and accrual to cash adjustments that are expected to occur between the final rate proposal and the end of the next rate period is analyzed. The amount of cash reserves at the start of the next rate period has a direct effect on the amount of cash reserves and PNRR needed to achieve BPA's TPP standard. The FY 2002

information reflects historical data, FY 2003 is a transition year, part history and part forecast, and FY 2004 and 2005 cover the next rate period forecast. The transition year of 2003 is analyzed with uncertainty in revenues and expenses so that uncertainty in cash reserves at the beginning of the next rate period (FY 2004-2005) is captured in the risk analysis.

8.3 TRANSMISSION RISK ANALYSIS MODEL

The foundation of the risk analysis is a transmission financial spreadsheet model. This model was developed in Microsoft Excel to estimate the effects of risk and risk mitigation on end of year cash reserves and likelihood of successful Treasury payment during the rate period. Cash reserve levels at the end of a FY determine whether BPA is able to meet its Treasury payment obligation. The model is organized as a "workbook" with individual work sheets including: an input matrix of revenues and expenses, an income statement, a cash flow statement, and individual work sheets for the risks analyzed using the model.

The calculation of end of year cash reserves starts with historical data on start of year cash reserves, revenues earned and expenses paid during FY 2002 (Tables 8.1 and 8.2). FY 2002 transmission revenues and expenses are based on audited results of BPA's 2002 Fourth Quarter Review. The accrual based revenues and expenses shown in the income statement are then converted to cash flows in the cash flow statement worksheet. The year-end cash balance in FY 2002 becomes the beginning year cash balance for FY 2003. The structure of the income statement and cash flow statement are similar to those contained in the RRS, but does not match precisely because the tables contained in the risk analysis are for the purpose of forecasting net cash flow instead of determining the revenue requirement, and the values found are expected values instead of point estimates. The net cash flow provides an estimate of the annual change in cash balance which, when added to the beginning cash balance, yields the year-end cash balance.

The year-end cash balance, when combined with deferred borrowing, provides an estimate of end of year financial reserves. This flow of computations is repeated sequentially for each year from FY 2002 through FY 2005.

Simulating transmission cash flows in this manner permits forecasting start of year reserves at the beginning of the rate period instead of defining FY 2004 start of year reserves as an uncertain input variable. The model forecasts the start of year FY 2004 cash reserves based on transmission function historical cash flows, current forecasts of expenses and revenues, and uncertainty in expenses and revenues explicitly modeled for FY 2003 (Table 8.1). Table 8.1 shows the expected value forecasts of expenses and revenues used in the RRS and the revenue forecast (TR-04-FS-BPA-01A). In some cases these expected values are different than the point estimate forecasts of revenues and expenses found in the RRS for the same model input variables because the uncertainty is not always symmetric about the point estimate assumed to represent the most likely value of the probability distribution for the input variable in the risk analysis.

8.4 RISK ANALYSIS COMPUTER SOFTWARE

The model used to perform the risk analysis was developed with Microsoft Excel, version 2000, and @RISK, version 4.0.5. Microsoft Excel is a basic spreadsheet computer program and @RISK is an Excel add-in computer program available from Palisade Corporation. The @RISK software allows the user to develop models incorporating uncertainty in a spreadsheet computer program environment. Uncertainty is incorporated by specifying model variables as probability distributions that reflect the variability in an input variable of interest. With model input variables specified as probability distributions instead of as point estimates, @RISK samples values from the probability distributions and then carries out the spreadsheet computations. Randomly sampled sets of input values are drawn for each game in a Monte Carlo simulation

process that involves computing results of large numbers of games in order to describe a probability distribution of outcomes, such as net revenues or cash reserves. The values sampled from the probability distributions are drawn with probability based on their relative likelihood of occurrence as specified in the input probability distributions. While @RISK provides tools that enable users to turn spreadsheet models into Monte Carlo simulation models, the user still has the burden of determining the input probability distributions for uncertain variables in the model. This is done in analyses external to the @RISK computer program.

8.5 RISK FACTORS

Transmission risk factors used in the risk analysis include:

(1) Network long-term firm NT revenues;

(2) Network long-term firm Take or Pay (PTP, IR, FPT) revenues;

(3) Network short-term firm PTP revenues;

(4) Network hourly non-firm revenues;

(5) Southern Intertie long-term firm PTP revenues;

(6) Southern Intertie short-term firm PTP revenues;

(7) Southern Intertie hourly non-firm revenues;

(8) scheduling, system control & dispatch revenues;

(9) reactive supply & voltage control revenues;

(10) regulation & frequency response revenues;

(11) Delivery segment revenues;

(12) revenue from leasing dark fiber capacity;

(13) total transmission expense annual variation, excluding between business line expenses paid to the PBL and Corporate expense;

(14) BPA Corporate expenses paid by the transmission function;

(15) effects of interest rates on interest expense for new borrowing; and

(16) proceeds from the sale of delivery facilities.

The risk variables analyzed were those judged to represent a significant impact on net revenues and cash flows, and that reasonably bear on estimating the amount of required PNRR during the next rate period. They are expected to influence beginning cash reserves at the start of the next rate period, as well. These risks are regarded as normal operating risks for the transmission function and mainly affect short-run variability in transmission cash flows between FY 2003 and FY 2005. Other long run risks such as variation in capital investment patterns; environmental effects on generation and load patterns that may change transmission expenses and capacity availability; and potential changes in transmission industry structure due to formation of a Regional Transmission Organization are more speculative and not included in the analysis. Such risks are not mitigated by the combination of cash reserves at the beginning of a rate period and any PNRR that may be required to supplement those reserves. In other words they are considered exogenous risks mitigated by the TBL's ability to change rate levels in response to fundamental changes in business environment and long-term changes in cost structure.

BPA relied on two approaches to forecasting the uncertainty in risk variables modeled. When historical data were present on which to base the estimation of uncertainty in a risk variable, BPA estimated the uncertainty in the historical data as the basis for forecasting the uncertainty in the variable. The underlying rationale for this approach is that the variation in the recent past is a reasonable basis for forecasting the short run future (5 years or less). When historical data were not reasonably available, BPA relied on the judgment of technical staff familiar with specific areas of transmission risk as the basis for forecasting the uncertainty in those risks. In contrast to BPA's power rate case, the risk analysis for the transmission rate case does not rely on econometric models for forecasting the uncertainty due to various risk factors. Models with

underlying economic behavior do not exist for the transmission function today. As a result, the transmission function relies on a statistical approach to estimating the uncertainty in risk factors when historical data are available.

Network and Intertie Transmission Revenue Uncertainties

Although the Network and Intertie rates are fixed during the rate period, the amount of revenue earned can be expected to vary due to uncertainty surrounding the quantity of service purchased by transmission customers. This is generally referred to as volumetric risk. Various underlying factors can affect the quantity of transmission service purchased. Some of these factors are related to weather such as the effect of temperature upon electric load and precipitation upon stream flows that determine the amount of generation output at hydro facilities in the Northwest. The same kinds of factors in effect outside the Northwest can influence the amount of transmission purchased to move power between regions. Other factors such as growth rates in the regional economy also influence the quantity of electricity usage and the amount of transmission needed to serve the demand for electricity. Within BPA's power functions, there is a long history of modeling and analysis aimed at understanding the effects of these factors on the demand for electricity, both at the retail and wholesale level. However, the same cannot be said for BPA's transmission function, requiring another means for forecasting the variability in the volume of transmission services sales and resultant revenues.

One source of information available for assessing transmission service volumetric risk is historical usage of the transmission system, called Total Transmission System Load or TTSL. This source of information approximates hourly loading for the transmission system defined as a whole, including the effects of interchange loads. Although these data are available over a period going back to 1985, the data are not defined and collected by segment (Network versus Intertie) or by type of service (e.g., point to point versus network integration service). The other

shortcoming of historical usage data is that customers generally buy firm transmission capacity on a take or pay basis and do not always use all of the capacity that they are entitled to use. They do however pay for all of the capacity they've reserved. As a consequence, transmission usage statistics are not a good predictor of variability in transmission service revenues and can be expected to overstate the uncertainty in transmission service revenue.

Preferably, at least a decade of historical transmission billing data would be used to extrapolate future variation in transmission revenues. Unfortunately, prior to 1997, BPA billed most customers for delivered power with transmission charges embedded in the delivered bill amount. Even the bills for wheeling customers for this period offer an incomplete picture of the patterns of monthly and annual transmission revenues earned by BPA. So much has changed affecting the operation of BPA's transmission function since the 1992 Energy Policy Act and more recent FERC open access transmission orders that relatively little useful historical data are available on which to base forecasts of revenue uncertainty.

Data were available for 60 months of billed transmission revenue, by segment and type of service, for FY 1998 through 2002. If only the annual data could be used to estimate revenue variations, this analysis would be limited to only five years of annual bills. Two observations are not sufficient to estimate the standard deviation for annual revenues. An alternative method uses data comprised of monthly observations. Although an approximation of annual variability the method focuses on the 60 monthly observations as a sample of revenues that does still reflect underlying factors, such as, weather and economic activity that drive customer transmission demand. Each of the 60 monthly observations is a consequence of those factors at play in each month of the five fiscal years for which BPA has consistently reported revenue data. The values for these months represent a sample distribution of monthly transmission revenues. For the 60 historical months for which data were available, the absolute range of monthly revenues, the

minimum monthly revenue and the maximum monthly revenue are known for that period. The average monthly transmission revenue and the total annual transmission revenue can be estimated as well. The frequency with which revenues fall within particular ranges of revenue can be considered an indication of the frequency or probability that similar values will occur in future months in the short run. A histogram can be constructed based on the historical data that shows the frequency distribution for different ranges of transmission revenue by type of service. However, the number of observations remains limited and the precision with which one may describe an estimate of the underlying probability distribution is not great.

In order to maximize the value of the limited data available, BPA adopted a statistical technique referred to as the "bootstrap." Dr. Bradly Efron developed this technique at Stanford University in 1977. The bootstrap is one of a variety of statistical techniques referred to under the heading of "resampling." The techniques rely on the use of repeated samples drawn, in the case of the bootstrap, with replacement from sample populations for the purposes of building simulated data sets with much larger sample sizes used to empirically estimate measures of statistical inference, such as means, standard errors, or confidence intervals.

The purpose of the bootstrap is to enable the analyst to make statistical inferences without the necessity of the traditional probability distribution assumption of normality. The bootstrap instead treats the sample as a direct analogy to the population and then empirically estimates the statistic's sampling distribution. BPA used the bootstrap technique to empirically build a sample distribution of annual network long-term firm NT revenues by drawing a large number of replicate random samples (5000) of sample size 12 (for the number of months in a year) from the original sample distribution of 60 historical monthly revenues. From this distribution the statistic annual Network long-term firm NT revenue is estimated. The resulting frequency distribution of 5000 annual Network long-term firm NT revenue samples is an estimate of the sampling

distribution of annual revenues based on FY 1998 through 2002 monthly revenues. The sampling distribution allows an estimate to be made of the uncertainty associated with the statistic annual Network long-term firm NT revenue. The bootstrap treats the sample (60 monthly revenues) as the population. *See* Efron, B., 1993, *An Introduction to the Bootstrap,* Chapman & Hall/CRC, Boca Raton; and Mooney and Duval, 1993, *Bootstrapping: A Nonparametric Approach to Statistical Inference*, Sage Publications, Newbury Park.

The bootstrap estimated sampling distributions for Network and Southern Intertie annual revenues were used to select @RISK probability distribution functions and input parameters for these transmission revenue probability distributions. Network and Southern Intertie annual long-term firm and NT revenue uncertainties were described with a normal distribution, while annual short-term firm and hourly nonfirm revenue uncertainties were generally described using the log normal distribution. A truncated normal distribution was used for revenue categories and years where the take or pay nature of the service and the amount of contracted service in existence permitted setting a minimum for the distribution higher than minimum value for the tail of the distribution that the @RISK software would determine. The forecasted point estimates of revenues from the revenue forecast (TR-04-FS-BPA-01A) were used for the mean and the standard deviation was based on the bootstrap sampling distributions. The specific input values for the Network and Intertie Revenue Risks are in Tables 8.4 and 8.5 respectively.

Although the bootstrap is a relatively recent nonparametric technique for statistical inference, it is applied today elsewhere in electric transmission industry. The bootstrap is used by the TBL System Operations and Planning Group to estimate "control limits" for quality assurance, that describe the normal range of variation expected in transmission outage frequency and duration. Control limits are much like confidence intervals from statistical inference. The TBL adopted this technique following the same practice established by the California Independent System

Operator (CAISO). The use of the bootstrap to set control limits, or "Control References" was also contained in the WECC proposal for procedures for measuring and reporting transmission availability under the Reliability Management System.

Delivery Segment Revenues

Uncertainty in delivery segment revenues was estimated in the same manner as the uncertainty in transmission revenues for the Network and Intertie segments. The bootstrap technique was applied to the 60 monthly historical observations from FY 1998 though 2002 to generate a simulated sample distribution used to specify the rate period uncertainty in delivery segment revenues. The specific input values for Delivery Segment Revenue risk are presented in Table 8.7.

Fiber Revenues

The uncertainty in revenues from the sale of dark fiber optic cable transmission capacity sales were developed by members of the TBL transmission staff responsible for fiber optics program. These subject matter experts developed the distribution of future revenues anticipated from the lease of dark fiber optic cable transmission capacity, surplus to BPA's operational needs during the next rate period. The specific input values for Fiber Revenue Risks are presented in Table 8.8.

Transmission Operations and Maintenance Expense

The uncertainty in transmission O&M expense was estimated using 21 years of historical data from FY 1978 through FY 1998. Historical expense data only were available for the total O&M expense. It was assumed that the variety of factors that have influenced year to year variations in transmission O&M expense in the historical period can reasonably be expected to prevail during the future, particularly the near term future. Like transmission revenues, the objective was to

describe short run volatility and not long run variability or variation in trend that may be due to factors, such as, changes in the structure of the transmission industry in the Northwest. Such long-term effects are mitigated by the TBL's ability to change rate levels as frequently as every two years. Because the risk analysis is a short run analysis, long-term trend variation was not estimated. Instead, the short run volatility in expense was applied to the point forecasts, which include a prediction of expense trends. To estimate the short run variability in expense the trend in the data was first removed, and then the variation in the historical data was estimated. The trend in the historical data was removed by first fitting a Lowess smooth curve to the data. The Lowess smooth curve is a robust non-parametric smooth curve that is insensitive to outliers and not dependent on underlying parametric distribution assumptions. The nonlinear curve represents the long-term trend in total O&M expense. The trend was then subtracted from the historical observations and the resulting data, or residuals, were used to estimate the standard deviation for total O&M expense.

Since the risk analysis model includes subcategories of transmission O&M expense with forecasted point estimates of expenses, the volatility in total O&M expense was distributed proportionally based on the relative size of individual expense categories to the total O&M expense. Individual expense category point estimates could then be revised without compromising the integrity of the uncertainty in expenses quantified on the basis of historical variation in total O&M expense. Because the variation associated with individual categories of expenses, effected by regression toward the mean, cannot be assumed to be the same as the uncertainty in total O&M expense it was necessary to model individual expense categories as perfectly correlated risk variables so that the uncertainty in the model's sum of transmission O&M expenses would reflect the historical variation in transmission total O&M expense used to determine the expense probability distributions. The specific input values for Transmission O&M Expense are shown in Table 8.3.

Ancillary Services Revenue

The risk associated with TBL's inter-business line expense is implicitly treated in the ancillary services revenue risk assessment. Three of the six ancillary services revenue categories were modeled with uncertainty in the risk analysis. They are 1) Scheduling, System Control, and Dispatch; 2) Reactive Supply & Voltage Control from Generation; and 3) Regulation and Frequency Response Service. The remaining three ancillary services revenues were treated as risks borne by BPA's power marketing function because the transmission function only buys what it sells or the amount of revenue expected to be earned from the sale of the service was too small to warrant modeling revenue uncertainty.

Scheduling, System Control and Dispatch is a surcharge on transmission rates and transmission customers are not permitted to self-supply this service. There is no price risk since the rate for this service is set in the rates process. The volumetric risk is assumed to vary in a manner directly proportional to the uncertainty in the total of transmission revenue. Since the majority of transmission wheeling revenue uncertainty is modeled as a normal distribution, Scheduling, System Control and Dispatch uncertainty is assumed to be normally distributed with mean equal to the point estimate forecast for revenues from the revenue forecast (TR-04-FS-BPA-01A) and standard deviation equal to 1.6% of mean forecasted revenue. The standard deviation is based on the simulated variation of total Network and Southern Intertie revenues from the risk analysis model. This revenue uncertainty is modeled with the @RISK function RiskNormal. *See* Table 8.6.

Reactive Supply and Voltage Control service also is a mandatory service required for each transmission transaction. This service must be acquired from TBL unless the transmission customer demonstrates that it can self-supply a portion of its requirements. This factor creates a

larger down side revenue risk for the service compared with Scheduling, System Control and Dispatch service. BPA's TBL has little prior experience selling Reactive Supply and Voltage Control ancillary services. Therefore, it is difficult to quantify the uncertainty in future revenues expected from services like Reactive Supply and Voltage Control where customer's ability to self-supply poses a clear risk. As a result the @RISK function RiskTriang was adopted to quantify the uncertainty in this revenue as a triangular distribution with inputs defining the minimum revenue, the most likely revenue and the maximum revenue. The triangular distribution is recommended by the developers of @RISK for applications where little data is available and where only rough estimates of uncertainty are feasible. The input assumptions were obtained from TBL staff familiar with the ancillary services tariffs and rates. The most likely revenue input is the point estimate used in the RRS and the minimum and maximum values are found in Table 8.6.

Regulation and Frequency Response service is a load-based service that only is applied to load in BPA's control area. The amount of revenue earned from this service is dependent on the amount of load that exists within TBL's control area and the rate of load growth. Similarly, the TBL adopted the triangular distribution as a means of approximating the uncertainty that is expected to be associated with revenues earned from this service. TBL staff familiar with ancillary services based their estimate of the variation in Regulation and Frequency Response revenue on their assessment of the potential for load leaving the TBL's load control area and potential for load growth. The estimated variation defined the minimum revenue and maximum revenue for this service. The specific input values for the @RISK RiskTriang function are in Table 8.6.

Interest Rate Risk

Annual volatility in Treasury borrowing rates can affect short run interest expense for new debt required to finance transmission capital program additions. This effect was modeled by defining

Treasury borrowing rates as an uncertain variable using the same distribution assumptions as in BPA's 2002 power rate case and estimating the effects of the uncertain interest rates on incremental transmission interest expense each year from FY 2003 through FY 2005. *See* Risk Analysis Study Documentation, Chapter 2, WP-02-E-BPA-03A. In each year, a randomly sampled interest rate is drawn in each game for the debt added in that year. The extent to which the interest rate is above or below the expected rate determines whether there is an increase or decrease in interest expense compared to the expected interest expense for that new investment. The change in interest expense applies only to the new debt for the year in which the debt was incurred and for subsequent years during which interest payments are made on the debt. Since new debt is assumed issued midway through the fiscal year, the interest expense deviation for the first year is only half of the total interest expense deviation expected to occur for an entire year. The entire deviation in interest expense affects subsequent years. New debt in each successive year is treated similarly. Randomly sampled interest rates are drawn independently for each year in which new debt is added and for each game of the simulation. The specific input values for Interest Rate Risk are shown in Table 8.9. Since this table shows expected value deviations in interest expense for new transmission debt, the actual deviation in net interest expense values shown are nil because the expected value or mean deviation in interest expense is nil.

Sale of Delivery Facilities Risk

Transmission customers who take service through delivery facilities have the opportunity to acquire those facilities instead of paying the Delivery charge. The proceeds from these facilities have in some instances exceeded the book value of the facilities. More sales are expected, but the sales are not expected to yield net proceeds above book value. There is uncertainty in the pricing of the facilities that BPA expects will be sold and the number of facilities sold. The proceeds from facilities sold are assumed applied to amortization payments, lagged one year, made as BPA removes these assets from its books. The proceeds from the sale of facilities were

modeled as an uncertain variable in the risk analysis although it has very little effect on cash reserves. The uncertainty in proceeds from the sale of facilities was estimated based on the judgement of staff directly involved in the sale of facilities. That assessment takes into account affects of the number of facilities that may be sold and the potential for differences between sale price and book value of the facilities. The specific input values for Sale of Facilities Net Proceeds Risk are shown in Table 8.10.

8.6 RISK CORRELATIONS

The risk analysis models revenue and expense risks as diversified risks. The chances of outcomes for individual risk factors are therefore independent of each other. The result is that the chance of consistently good luck or consistently bad luck across all of the risks is very low. More frequently in any individual simulation game the chances are that some risks will harm the TBL's financial reserves while others will benefit or increase financial reserves. However, the TPP standard is focused on the downside risk or the chances of the TBL not being able to meet it Treasury payment obligations.

If there were significant correlations between risk factors the assumption of diversified risks could serve to either bias the risk analysis in the direction of excessive risk mitigation or insufficient risk mitigation depending on the direction of the correlation. Risks can either be positively correlated or negatively correlated. Where data were available BPA analyzed risk factor correlation and found no compelling basis for explicitly modeling the effects of correlations among revenue and expense risks. See Final Revenue Requirement Documentation, TR-02-FS-BPA-01A, Chapter 9.

8.7 RISK ANALYSIS RESULTS

The transmission risk analysis simulation resulted in 2,999 games out of 3000 in which end of year financial reserves were sufficient to pay Treasury on time and in full in both years of the FY 2004 through FY 2005 rate period. This represents a 99.96% TPP for the rate period. These results were obtained with a pseudo random number seed value of "20" and the @RISK sampling option set for Latin Hypercube sampling.

Financial Reserves and PNRR

The expected year-end cash reserves for FYs 2004 and 2005 are estimated to be $174 million and $184 million, respectively (Table 8.2). The range of possible financial reserves at the end of the current rate period and each year of the next rate period is shown in Figure 8.2. Since the 5th percentile of year-end reserves stays above $20 million, assuming $182 million start of year reserves in 2004 and the proposed rate levels, no PNRR were necessary to achieve the 95% TPP.

Figure 8.2

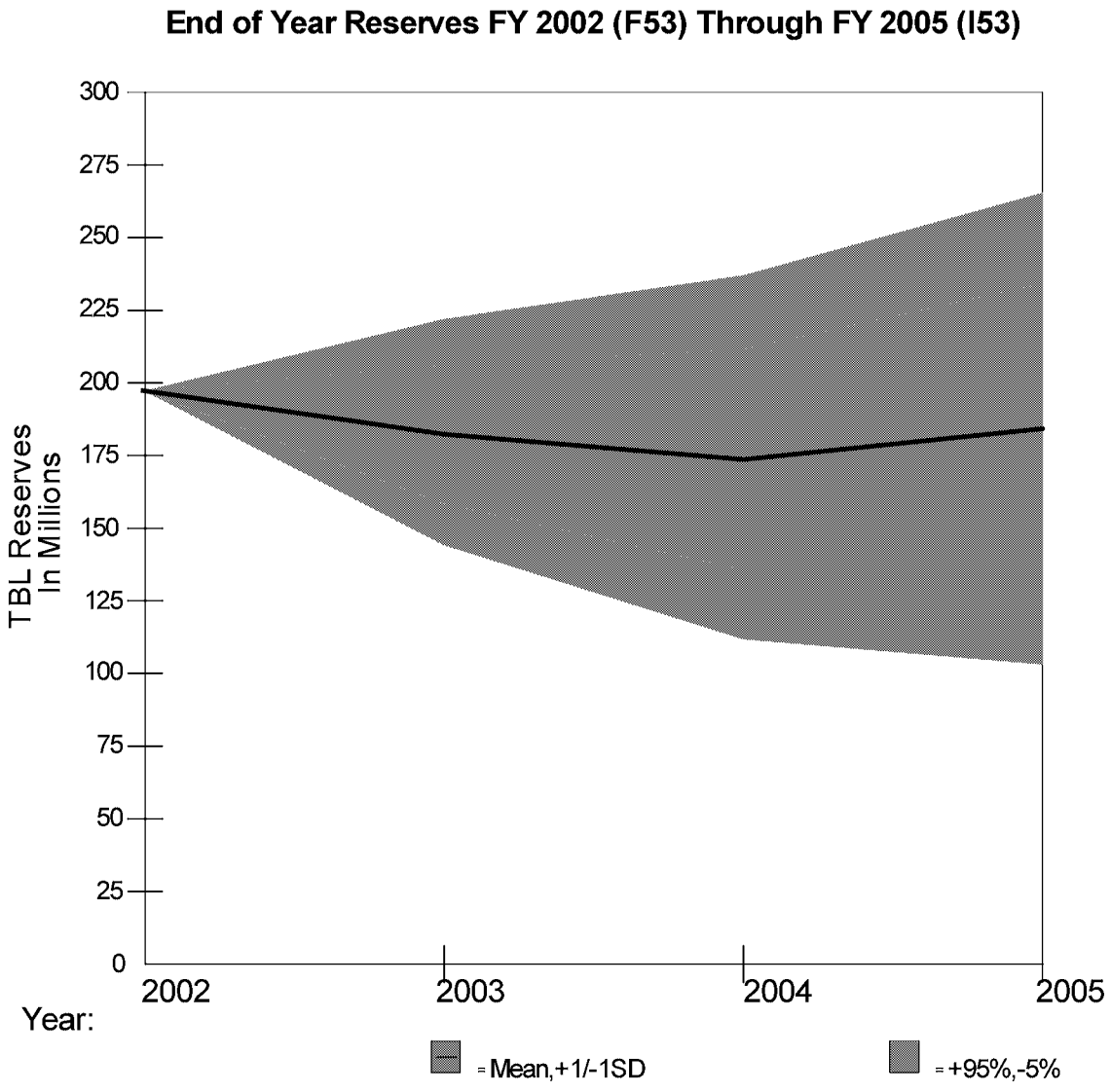

End of Year Reserves FY 2002 (F53) Through FY 2005 (I53)
TBL Reserves In Millions
300
275
250
225
200
175
150
125
100
75
50
25
0
2002
2003
2004
2005
Year:
= Mean,+1/-1SD
= +95%,-5%

TABLE 8.1: Statement of Revenues and Expenses - Transmission Business

	($ millions)	2002	2003	2004	2005
	Operating Revenues				
1.	Transmission Revenues	505.3	471.7	516.5	541.0
2.	Ancillary Services Revenues	136.8	130.1	137.1	143.2
3.	Delivery Segment Revenues	12.0	9.5	6.1	6.2
4.	Fiber & PCS Revenues	16.4	11.6	11.8	12.0
5.	TBL Services Revenues	10.2	10.0	10.0	10.0
6.	Other Revenues & Credits	39.7	30.4	36.9	37.1
7.	**Total Operating Revenues**	**720.4**	**663.3**	**718.4**	**749.5**
	Operating Expenses				
8.	Transmission G&A	19.2	16.0	17.5	17.9
9.	CSRS Pension Expense	27.6	17.6	15.5	13.3
10.	Transmission Marketing	15.0	15.0	15.4	15.8
11.	Transmission Scheduling	8.8	8.2	8.4	8.6
12.	Transmission System Operations	35.2	36.3	37.5	38.4
13.	Transmission System Maintenance	75.1	73.7	80.0	82.0
14.	Transmission System Development	16.2	10.8	12.8	13.1
15.	Wheeling/Leases	5.8	5.9	6.0	6.2
16.	Environment	5.0	4.5	4.5	4.6
17.	Transmission Support Services	16.3	16.0	17.6	18.1
18.	TBL Services Expenses	8.7	10.0	10.0	10.0
19.	Between Business Line Expenses	80.7	84.3	80.3	80.3
20.	Corporate Expenses	51.0	53.8	61.5	64.0
21.	**Total Transmission Operating Expense**	**364.5**	**352.1**	**366.9**	**372.2**
22.	**Net Operating Margin**	**355.9**	**311.2**	**351.5**	**377.3**
23.	Federal Projects Depreciation	161.0	170.4	178.8	190.7
24.	**Total Operating Expense & Depreciation**	**525.6**	**522.4**	**545.7**	**562.9**
25.	**Net Operating Revenue**	**194.8**	**140.9**	**172.7**	**186.6**
	Interest Expense				
26.	Interest on Appropriated Funds	66.9	65.3	63.5	60.8
27.	Interest on Long-Term Debt Issued to Treasury	133.8	145.2	163.0	174.8
28.	Interest Credit on Cash Reserves	(20.6)	(18.3)	(20.0)	(20.3)
29.	Amortization of Capitalized Bond Premiums	3.9	3.9	3.9	3.5
30.	Capitalization Adjustment	(19.6)	(19.8)	(19.8)	(19.0)
31.	AFUDC	(13.6)	(17.8)	(24.5)	(23.5)
32.	Net Interest Expense	150.8	158.5	166.2	176.3
33.	**Total Operating & Net Interest Expenses**	**676.3**	**680.9**	**711.9**	**739.2**
34.	**Net Revenues**	**44.0**	**(17.6)**	**6.5**	**10.3**

TABLE 8.2: Statement of Cash Flows - Transmission Business

	($ millions)	2002	2003	2004	2005
	Cash Provided by Current Operations				
1.	Net Revenues	44.0	(17.6)	6.5	10.3
	Expenses not Requiring Cash				
2.	Depreciation/Amortization	161.0	170.4	178.8	190.7
3.	Amort of Capitalized Bond Premiums	3.9	3.9	3.9	3.5
4.	Capitalization Adjustment	(19.6)	(19.8)	(19.8)	(19.0)
5.	Revenue Recognition (Third AC)	(4.4)	(4.4)	(4.4)	(4.4)
6.	Revenue Recognition (Fiberoptics)	(0.9)	(0.9)	(0.9)	(0.9)
7.	Proceeds from Sale of Assets	6.8	6.3	3.9	4.3
8.	Payments for Stranded Investments/Defaults	4.1			
9.	AFUDC	(13.6)			
10.	Clark Settlement				
11.	Materials & Supplies	0.1			
12.	Cash Provided by Current Operations	181.4	137.9	168.1	184.5
	Cash Used for Capital Investments				
	Investment in				
13.	Gross Utility Plant and CWIP	(261.7)	(322.6)	(335.0)	(284.7)
14.	Cash Used for Capital Investments	(261.7)	(322.6)	(335.0)	(284.7)
	Cash From Borrowing and Appropriations				
15.	Cash from Borrowing & Appropriations	297.3	355.2	320.0	269.7
16.	Debt Reassignment (from Corporate)		219.0		
17.	Repayment of Long-term Debt	(107.8)	(116.6)	(115.9)	(153.5)
18.	Accelerated Repayment of Debt (Debt Mgt.)		(219.0)		
19.	Accelerated Repayment of Debt (Asset Sales)		(9.9)	(7.6)	(3.9)
20.	Repayment of Capital Appropriations	(23.9)	(26.2)	(38.3)	(1.5)
21.	Subtotal Cash from Borrowing & Approp	165.6	202.4	158.2	110.8
22.	**Annual Change in Cash Balance**	85.4	17.7	(8.7)	10.7
23.	Plus Beginning Cash Balance	79.2	164.6	182.3	173.6
24.	Year End Cash Balance	164.6	182.3	173.6	184.3
25.	Deferred Borrowing	32.6	0.0	0.0	0.0
26.	Total Reserves	197.2	182.3	173.6	184.3

27.	Treasury Payment - Annual (1 = Yes, 0 = No):	1	1	1	1
28.	Treasury Payment - Rate Period (1 = Yes, 0 = No):			1	

TABLE 8.3: Transmission Expense Risk

	Operating Expenses	FY 2002	FY 2003	FY 2004	FY 2005
	($1,000)				
1.	**Trans O&M Expense Change From Exp Value**		0.0	0.0	0.0
2.	Total Trans O&M Expense (With Uncertainty)		204,000	215,106	217,897
3.	Transmission O&M Expense Standard Deviation		10,812	11,401	11,549
4.	Sd as pct of mean		5.3%	5.3%	5.3%
	Transmission O&M Expenses (With Uncertainty)				
5.	Transmission G&A	19,221	16,000	17,481	17,918
6.	CSRS Pension Expense	27,600	17,600	15,450	13,250
7.	Transmission Marketing and Scheduling	15,003	15,000	15,373	15,758
8.	Transmission Scheduling	8,826	8,200	8,368	8,578
9.	Transmission System Operations	35,161	36,300	37,455	38,391
10.	Transmission System Maintenance	75,061	73,700	79,996	81,996
11.	Transmission System Development	16,181	10,817	12,824	13,144
12.	Wheeling/Leases	5,769	5,883	6,030	6,181
13.	Environment	5,005	4,500	4,495	4,607
14.	Transmission Support Services	16,280	16,000	17,634	18,075
15.	TBL Services (Reimbursable)	8,713	10,000	10,000	10,000
16.	**Trans Exp excl Corp,BBL & CSRS**	224,105	204,000	215,106	217,897
17.	**TBL Corp & Shared Serv Expense**		53,969	61,972	62,767
18.	TBL Corp & Shared Serv. Expenses (Most Likely)	50,988	53,801	61,498	63,978
19.	Min Corp & Shared Serv Exp		50,000	58,000	55,227
20.	Max Corp & Shared Serv Exp		58,105	66,417	69,096
21.	Between Business Line Expenses	80,705	84,275	80,303	80,303

TABLE 8.4: Network Transmission Revenue Risk

	Operating Revenues	FY 2002	FY 2003	FY 2004	FY 2005
	($1,000)				
	Long Term Firm (Take or Pay)				
1.	Network LT Firm	282,544	277,288	298,779	303,820
2.	Mean	282,544	277,288	298,779	303,820
3.	Standard Deviation	21,332	20,935	22,558	22,938
4.	Sd as pct of mean	7.6%	7.6%	7.6%	7.6%
5.	Min				
6.	Max				
	Long Term Firm (NT Load)				
7.	Network NT Service	85,440	86,641	90,985	92,925
8.	Mean	85,440	86,641	90,985	92,925
9.	Standard Deviation	1,965	1,993	2,093	2,137
10.	Sd as pct of mean	2.3%	2.3%	2.3%	2.3%
	Short Term Firm				
11.	Network ST Firm	16,657	11,107	13,638	17,064
12.	Mean	16,657	11,105	13,637	17,064
13.	Standard Deviation	3,593	2,395	2,942	3,681
14.	Sd as pct of mean	21.6%	21.6%	21.6%	21.6%
15.	Min	3,000	3,000	3,000	1,000
16.	Max	30,000	30,000	35,000	39,449
	Nonfirm				
17.	RNF Short Term (1 to 30 days)	0	0	0	0
18.	ET Hourly	22,589	13,595	24,309	30,943
19.	Network Hourly Nonfirm	22,589	13,595	24,309	30,943
20.	Mean	22,589	13,595	24,309	30,943
21.	Standard Deviation	10,183	6,129	10,959	13,949
22.	Sd as pct of mean	45%	45%	45%	45%
23.	**Network Grand Total**	39,246	24,700	37,946	48,007

TABLE 8.5: Intertie Transmission Revenue Risk

	Operating Revenues	FY 2002	FY 2003	FY 2004	FY 2005
	($1,000)				
	Long Term Firm				
1.	IS LT Firm	86,786	68,825	80,420	80,420
2.	Mean	86,786	67,556	80,430	80,430
3.	Standard Deviation	6,492	5,053	6,016	6,016
4.	Sd as pct of mean	7.5%	7.5%	7.5%	7.5%
5.	min	61,999	62,000	40,000	30,000
6.	max	73,999	100,000	100,000	100,000
	Short Term Firm				
7.	IS ST Firm	10,030	13,298	6,627	12,793
8.	Mean	10,030	13,298	6,627	12,793
9.	Standard Deviation	4,007	5,313	2,648	5,111
10.	Sd as pct of mean	40.0%	40.0%	40.0%	40.0%
	IS Hourly Nonfirm Revenue				
11.	IS Hourly NonFirm Revenue	1,295	912	1,750	3,020
12.	Mean	1,295	912	1,750	3,020
13.	Standard Deviation	285	201	385	665
14.	Sd as pct of mean	22%	22%	22%	22%
15.	**IS Total**	98,111	83,035	88,797	96,233

TABLE 8.6: Ancillary Services Revenue Risk

	Operating Revenues	FY 2002	FY 2003	FY 2004	FY 2005
	($1,000)				
1.	**Scheduling, System Control, & Dispatch**	60,734	52,477	59,800	63,799
2.	Mean	60,734	52,477	59,800	63,799
3.	Standard Deviation	4,585	3,962	4,515	4,817
4.	**Generation Supplied Reactive**	22,830	20,385	23,266	24,801
5.	Mean (Most Likely)	22,830	21,088	24,068	25,657
6.	Min	18,949	17,503	19,976	21,295
7.	Max	24,428	22,564	25,753	27,453
8.	**Regulation and Frequency Response Service**	11,438	12,060	11,705	12,260
9.	Mean (Most Likely)	11,438	12,433	12,079	12,634
10.	Min	8,318	9,313	8,959	9,514
11.	Max	13,438	14,433	14,079	14,634
12.	**Operating Reserve - Spinning Reserve Service**	20,885	22,607	21,188	21,188
13.	**Operating Reserve - Supplemental Reserve Serv.**	20,885	22,607	21,188	21,188
14.	**Energy Imbalance Service**	0	0	0	0
15.	**Generation Imbalance Service**	0	0	0	0
16.	**Total Ancillary Services**	136,773	130,135	137,148	143,237

TABLE 8.7: Delivery Segment Revenue Risk

Operating Revenues ($1,000)	FY 2002	FY 2003	FY 2004	FY 2005
1. Utility	4,784	3,510	2,676	2,728
2. Utility PBL Payments	2,000	2,000	0	0
3. Industrial (UFT Method)	5,178	3,971	3,428	3,493
4. **Delivery Segment Revenue**	11,962	9,481	6,104	6,221
5. Mean		9,481	6,104	6,221
6. Standard Deviation		1,216	783	798
7. Sd as pct of mean		12.83%	12.83%	12.83%

TABLE 8.8: Fiber & PCS Revenue Risk

	Operating Revenues		FY 2002	FY 2003	FY 2004	FY 2005
	($1,000)					
	Fiber					
1.	Fiber&PCS Revenue (With Uncertainty)		16,365	11,630	11,802	11,983
2.	**PCS**		3,176	3,277	3,444	3,620
	Risk Distribution Values					
3.	Min					
4.	Max					
5.	Discrete Value	x1		2,752	2,765	2,781
6.		x2		8,600	8,600	8,600
7.		x3		8,752	8,765	8,781
8.	Discrete Value Probability	p1		0.05	0.05	0.05
9.		p2		0.65	0.65	0.65
10.		p3		0.3	0.3	0.3

TABLE 8.9: Treasury Borrowing Rate Interest Expense Risk

	Bond type	Principal original	Principal outstanding	E(rate)	rate	Bonds due	Bonds issued	annual interest	Fiscal Year Interest Expense Impact 2003	2004	2005	2006	2007	2008
1.	TINT2003	347,997	347,997	6.35%	6.35%	2033	2003	22,098	11,049	22,098	22,098	22,098	22,098	22,098
2.	ZAFW	7,175	7,175	6.50%	6.50%	2018	2003	466	233	466	466	466	466	466
3.	Subtotal								11,282	22,564	22,564	22,564	22,564	22,564
4.	Subtotal Based on E(rate)								11,282	22,564	22,564	22,564	22,564	22,564
5.	Deviation in Net Interest Expense (Bonds Issued in 2003)								-	-	-	-	-	-
6.	TINT2004	312,666	312,666	6.30%	6.30%	2034	2004	19,698		9,849	19,698	19,698	19,698	19,698
7.	ZAFW	7,369	7,369	6.50%	6.50%	2019	2004	479		239	479	479	479	479
8.	Subtotal									10,088	20,177	20,177	20,177	20,177
9.	Subtotal Based on E(rate)									10,088	20,177	20,177	20,177	20,177
10.	Deviation in Net Interest Expense (Bonds Issued in 2004)									-	-	-	-	-
11.	TINT2005	264,292	264,292	6.20%	6.20%	2035	2005	16,386			8,193	16,386	16,386	16,386
12.	ZAFW	5,414	5,414	6.50%	6.50%	2020	2005	352			176	352	352	352
13.	Subtotal										8,369	16,738	16,738	16,738
14.	Subtotal Based on E(Interest Rate)										8,369	16,738	16,738	16,738
15.	Deviation in Net Interest Expense (Bonds Issued in 2005)										-	-	-	-
16.	TINT2006	402,750	402,750	6.20%	6.20%	2036	2006	24,971				24,971	24,971	24,971
17.	ZAFW	5,552	5,552	6.50%	6.50%	2021	2006	361				361	361	361
18.	Subtotal											12,666	25,331	25,331
19.	Subtotal Based on E(Interest Rate)											12,666	25,331	25,331
20.	Deviation in Net Interest Expense (Bonds Issued in 2006)											-	-	-
21.	**Total Annual Variation in Net Interest Expense for New Debt**								-	-	-	-		

	Uncertainty in Treasury Borrowing Rates Δ r	p(Δ r)
22.	-2.00%	0.05
23.	-1.25%	0.1
24.	-0.75%	0.2
25.	0.00%	0.3
26.	0.75%	0.2
27.	1.25%	0.1
28.	2.00%	0.05

TABLE 8.10: Sale of Facilities Risk

	Proceeds from Sale of Delivery Facilities	FY 2003	FY 2004	FY 2005
	($1,000)			
1.	Proceeds from Sale of Facilities	6,259	3,867	4,300
	RiskTriang Distribution Parameters			
2.	Most Likely Value (Deterministic Estimate)	6,259	3400	4700
3.	Mean	6,259	3400	4700
4.	Minimum	5,018	2500	2500
5.	Maximum	7,500	5700	5700

CHAPTER 9

REPAYMENT STUDY INPUT DATA
CURRENT STUDY
FY 2005

BONNEVILLE POWER ADMINISTRATION

TRANSMISSION REPAYMENT STUDY
OCTOBER 1, 2003 - SEPTEMBER 30, 2006 COST EVALUATION PERIOD
2004 RC FINAL PROPOSAL, $15m rf, 15-yr 02 bonds, CapReduc '03 3-17-03

SUMMARY OF INVESTMENTS (1000S) (FY 2005)
HISTORICAL FEDERAL INVESTMENTS

Project	Original Principal	Current Principal	Interest Rate	Due Date	Replacement?	In Service Date	Month
BONNEVILLE POWER ADMINISTRATION	6,812	-	2.500%	1985	No	1940	-
BONNEVILLE POWER ADMINISTRATION	18,906	-	2.500%	1986	No	1941	-
BONNEVILLE POWER ADMINISTRATION	461	-	2.500%	1986	No	1941	-
BONNEVILLE POWER ADMINISTRATION	8,446	-	2.500%	1987	No	1942	-
BONNEVILLE POWER ADMINISTRATION	1,052	-	2.500%	1987	No	1942	-
BONNEVILLE POWER ADMINISTRATION	16,083	-	2.500%	1988	No	1943	-
BONNEVILLE POWER ADMINISTRATION	4,538	-	2.500%	1988	No	1943	-
BONNEVILLE POWER ADMINISTRATION	583	-	2.500%	1989	No	1944	-
BONNEVILLE POWER ADMINISTRATION	249	-	2.500%	1989	No	1944	-
BONNEVILLE POWER ADMINISTRATION	3,366	-	2.500%	1990	No	1945	-
BONNEVILLE POWER ADMINISTRATION	1,306	-	2.500%	1990	No	1945	-
BONNEVILLE POWER ADMINISTRATION	2,488	-	2.500%	1991	No	1946	-
BONNEVILLE POWER ADMINISTRATION	732	-	2.500%	1991	No	1946	-
BONNEVILLE POWER ADMINISTRATION	1,773	-	2.500%	1992	No	1947	-
BONNEVILLE POWER ADMINISTRATION	1,330	-	2.500%	1992	No	1947	-
BONNEVILLE POWER ADMINISTRATION	7,468	-	2.500%	1993	No	1948	-
BONNEVILLE POWER ADMINISTRATION	2,290	-	2.500%	1993	No	1948	-
BONNEVILLE POWER ADMINISTRATION	6,809	-	2.500%	1994	No	1949	-
BONNEVILLE POWER ADMINISTRATION	2,719	-	2.500%	1994	No	1949	-
BONNEVILLE POWER ADMINISTRATION	24,111	-	2.500%	1995	No	1950	-
BONNEVILLE POWER ADMINISTRATION	6,124	-	2.500%	1995	No	1950	-
BONNEVILLE POWER ADMINISTRATION	13,266	-	2.500%	1996	No	1951	-
BONNEVILLE POWER ADMINISTRATION	7,040	-	2.500%	1996	No	1951	-
BONNEVILLE POWER ADMINISTRATION	18,610	-	2.500%	1997	No	1952	-
BONNEVILLE POWER ADMINISTRATION	8,979	-	2.500%	1997	No	1952	-
BONNEVILLE POWER ADMINISTRATION	23,550	-	6.330%	1998	No	1953	-
BONNEVILLE POWER ADMINISTRATION	11,605	-	6.330%	1998	Yes	1953	-
BONNEVILLE POWER ADMINISTRATION	23,614	-	6.510%	1999	No	1954	-
BONNEVILLE POWER ADMINISTRATION	17,370	-	6.510%	1999	No	1954	-
BONNEVILLE POWER ADMINISTRATION	11,827	-	6.620%	2000	No	1955	-
BONNEVILLE POWER ADMINISTRATION	10,283	-	6.620%	2000	Yes	1955	-
BONNEVILLE POWER ADMINISTRATION	32,221	-	6.710%	2001	Yes	1956	-
BONNEVILLE POWER ADMINISTRATION	14,573	-	6.710%	2001	No	1956	-
BONNEVILLE POWER ADMINISTRATION	15,980	-	6.790%	2002	Yes	1957	-
BONNEVILLE POWER ADMINISTRATION	7,933	-	6.790%	2002	No	1957	-
BONNEVILLE POWER ADMINISTRATION	15,593	15,593	6.840%	2003	No	1958	-
BONNEVILLE POWER ADMINISTRATION	10,654	10,654	6.840%	2003	Yes	1958	-
BONNEVILLE POWER ADMINISTRATION	8,863	8,863	6.880%	2004	Yes	1959	-
BONNEVILLE POWER ADMINISTRATION	8,157	8,157	6.880%	2004	No	1959	-
BONNEVILLE POWER ADMINISTRATION	4,218	4,218	6.910%	2005	Yes	1960	-
BONNEVILLE POWER ADMINISTRATION	3,598	3,598	6.910%	2005	No	1960	-
BONNEVILLE POWER ADMINISTRATION	11,271	11,271	6.950%	2006	Yes	1961	-
BONNEVILLE POWER ADMINISTRATION	4,468	4,468	6.950%	2006	No	1961	-
BONNEVILLE POWER ADMINISTRATION	19,597	19,597	6.980%	2007	No	1962	-
BONNEVILLE POWER ADMINISTRATION	4,877	4,877	6.980%	2007	Yes	1962	-
BONNEVILLE POWER ADMINISTRATION	4,876	4,876	7.020%	2008	No	1963	-
BONNEVILLE POWER ADMINISTRATION	4,330	4,330	7.020%	2008	Yes	1963	-
BONNEVILLE POWER ADMINISTRATION	904	904	7.020%	2008	No	1963	-
BONNEVILLE POWER ADMINISTRATION	803	803	7.020%	2008	Yes	1963	-
BONNEVILLE POWER ADMINISTRATION	5,738	5,738	7.060%	2009	Yes	1964	-
BONNEVILLE POWER ADMINISTRATION	4,151	4,151	7.060%	2009	No	1964	-
BONNEVILLE POWER ADMINISTRATION	10,171	10,171	7.090%	2010	Yes	1965	-
BONNEVILLE POWER ADMINISTRATION	7,248	7,248	7.090%	2010	Yes	1965	-
BONNEVILLE POWER ADMINISTRATION	5,202	5,202	7.090%	2010	No	1965	-
BONNEVILLE POWER ADMINISTRATION	3,706	3,706	7.090%	2010	No	1965	-
BONNEVILLE POWER ADMINISTRATION	11,830	11,830	7.130%	2011	No	1966	-
BONNEVILLE POWER ADMINISTRATION	6,647	6,647	7.130%	2011	No	1966	-
BONNEVILLE POWER ADMINISTRATION	3,049	3,049	7.130%	2011	Yes	1966	-
BONNEVILLE POWER ADMINISTRATION	1,714	1,714	7.130%	2011	Yes	1966	-
BONNEVILLE POWER ADMINISTRATION	19,003	19,003	7.160%	2012	No	1967	-
BONNEVILLE POWER ADMINISTRATION	14,300	14,300	7.160%	2012	No	1967	-

BONNEVILLE POWER ADMINISTRATION	4,566	4,566	7.160%	2012	Yes	1967	-
BONNEVILLE POWER ADMINISTRATION	3,436	3,436	7.160%	2012	Yes	1967	-
BONNEVILLE POWER ADMINISTRATION	41,070	41,070	7.200%	2013	No	1968	-
BONNEVILLE POWER ADMINISTRATION	23,202	23,202	7.200%	2013	No	1968	-
BONNEVILLE POWER ADMINISTRATION	8,076	8,076	7.200%	2013	Yes	1968	-
BONNEVILLE POWER ADMINISTRATION	4,562	4,562	7.200%	2013	Yes	1968	-
BONNEVILLE POWER ADMINISTRATION	42,237	42,237	7.230%	2014	No	1969	-
BONNEVILLE POWER ADMINISTRATION	22,537	22,537	7.230%	2014	Yes	1969	-
BONNEVILLE POWER ADMINISTRATION	384	384	7.230%	2014	No	1969	-
BONNEVILLE POWER ADMINISTRATION	205	205	7.230%	2014	Yes	1969	-
BONNEVILLE POWER ADMINISTRATION	64,977	64,977	7.270%	2015	No	1970	-
BONNEVILLE POWER ADMINISTRATION	24,412	24,412	7.270%	2015	No	1970	-
BONNEVILLE POWER ADMINISTRATION	7,995	7,995	7.270%	2015	Yes	1970	-
BONNEVILLE POWER ADMINISTRATION	3,003	3,003	7.270%	2015	Yes	1970	-
BONNEVILLE POWER ADMINISTRATION	17,805	17,805	7.290%	2016	Yes	1971	-
BONNEVILLE POWER ADMINISTRATION	17,766	17,766	7.290%	2016	Yes	1971	-
BONNEVILLE POWER ADMINISTRATION	12,051	12,051	7.290%	2016	No	1971	-
BONNEVILLE POWER ADMINISTRATION	12,025	12,025	7.290%	2016	No	1971	-
BONNEVILLE POWER ADMINISTRATION	29,326	29,326	7.290%	2017	No	1972	-
BONNEVILLE POWER ADMINISTRATION	21,170	21,170	7.290%	2017	Yes	1972	-
BONNEVILLE POWER ADMINISTRATION	3,980	3,980	7.290%	2017	No	1972	-
BONNEVILLE POWER ADMINISTRATION	2,873	2,873	7.290%	2017	Yes	1972	-
BONNEVILLE POWER ADMINISTRATION	33,788	33,788	7.280%	2018	No	1973	-
BONNEVILLE POWER ADMINISTRATION	21,656	21,656	7.280%	2018	Yes	1973	-
BONNEVILLE POWER ADMINISTRATION	16,368	16,368	7.280%	2018	No	1973	-
BONNEVILLE POWER ADMINISTRATION	10,491	10,491	7.280%	2018	Yes	1973	-
BONNEVILLE POWER ADMINISTRATION	21,826	21,826	7.270%	2019	Yes	1974	-
BONNEVILLE POWER ADMINISTRATION	20,984	20,984	7.270%	2019	Yes	1974	-
BONNEVILLE POWER ADMINISTRATION	12,563	12,563	7.270%	2019	No	1974	-
BONNEVILLE POWER ADMINISTRATION	12,079	12,079	7.270%	2019	No	1974	-
BONNEVILLE POWER ADMINISTRATION	32,026	32,026	7.250%	2020	No	1975	-
BONNEVILLE POWER ADMINISTRATION	21,916	21,916	7.250%	2020	Yes	1975	-
BONNEVILLE POWER ADMINISTRATION	17,158	17,158	7.250%	2020	No	1975	-
BONNEVILLE POWER ADMINISTRATION	11,742	11,742	7.250%	2020	Yes	1975	-
BONNEVILLE POWER ADMINISTRATION	61,025	61,025	7.230%	2021	No	1976	-
BONNEVILLE POWER ADMINISTRATION	2,212	2,212	7.230%	2021	Yes	1976	-
BONNEVILLE POWER ADMINISTRATION	33,702	33,702	7.210%	2022	No	1977	-
BONNEVILLE POWER ADMINISTRATION	5,380	5,380	7.210%	2022	Yes	1977	-
BONNEVILLE POWER ADMINISTRATION	4,981	4,981	7.210%	2022	Yes	1977	-
BONNEVILLE POWER ADMINISTRATION	3,948	3,948	7.210%	2022	No	1977	-
BPA PROGRAM	24,222	-	8.950%	2013	Yes	1978	9
BPA PROGRAM	17,770	-	8.950%	2013	No	1978	9
BPA PROGRAM	4,619	-	8.950%	2013	Yes	1978	9
BPA PROGRAM	3,389	-	8.950%	2013	No	1978	9
BPA PROGRAM	21,228	-	9.900%	2014	No	1979	9
BPA PROGRAM	14,340	-	9.900%	2014	Yes	1979	9
BPA PROGRAM	10,610	-	9.900%	2014	No	1979	9
BPA PROGRAM	2,888	-	9.900%	2014	Yes	1979	9
BPA PROGRAM	605	-	9.900%	2014	No	1979	9
BPA PROGRAM	165	-	9.900%	2014	Yes	1979	9
BPA PROGRAM	98	-	9.900%	2014	No	1979	9
BPA PROGRAM	66	-	9.900%	2014	Yes	1979	9
BPA PROGRAM	26,690	-	9.450%	2014	No	1979	6
BPA PROGRAM	21,977	-	9.450%	2014	Yes	1979	6
BPA PROGRAM	9,804	-	9.450%	2014	Yes	1979	6
BPA PROGRAM	7,010	-	9.450%	2014	No	1979	6
BPA PROGRAM	6,026	-	9.450%	2014	Yes	1979	6
BPA PROGRAM	1,870	-	9.450%	2014	Yes	1979	6
BPA PROGRAM	1,371	-	9.450%	2014	No	1979	6
BPA PROGRAM	150	-	9.450%	2014	No	1979	6
BPA PROGRAM	102	-	9.450%	2014	Yes	1979	6
BPA PROGRAM	44,811	-	13.000%	2015	No	1980	9
BPA PROGRAM	39,696	-	13.000%	2015	No	1980	9
BPA PROGRAM	10,806	-	13.000%	2015	Yes	1980	9
BPA PROGRAM	9,292	-	13.000%	2015	No	1980	9
BPA PROGRAM	4,253	-	13.000%	2015	Yes	1980	9
BPA PROGRAM	2,263	-	13.000%	2015	No	1980	9
BPA PROGRAM	1,707	-	13.000%	2015	No	1980	9
BPA PROGRAM	1,469	-	13.000%	2015	Yes	1980	9
BPA PROGRAM	616	-	13.000%	2015	Yes	1980	9
BPA PROGRAM	56	-	13.000%	2015	Yes	1980	9
BPA PROGRAM	21	-	13.000%	2015	No	1980	9
BPA PROGRAM	10	-	13.000%	2015	Yes	1980	9
BPA PROGRAM	119,775	-	16.600%	2016	No	1981	9
BPA PROGRAM	54,821	-	16.600%	2016	Yes	1981	9
BPA PROGRAM	277	-	16.600%	2016	No	1981	9
BPA PROGRAM	127	-	16.600%	2016	Yes	1981	9
BPA PROGRAM	46,980	-	14.400%	2017	No	1982	4
BPA PROGRAM	37,455	-	14.400%	2017	Yes	1982	4

BPA PROGRAM	34,221	-	14.400%	2017	No	1982	12
BPA PROGRAM	15,663	-	14.400%	2017	Yes	1982	12
BPA PROGRAM	9,975	-	14.400%	2017	No	1982	4
BPA PROGRAM	4,566	-	14.400%	2017	Yes	1982	4
BPA PROGRAM	551	-	14.400%	2017	No	1982	4
BPA PROGRAM	439	-	14.400%	2017	Yes	1982	4
BPA PROGRAM	80	-	14.400%	2017	No	1982	12
BPA PROGRAM	36	-	14.400%	2017	Yes	1982	12
BPA PROGRAM	23	-	14.400%	2017	No	1982	4
BPA PROGRAM	11	-	14.400%	2017	Yes	1982	4
BPA PROGRAM	77,807	-	14.150%	2017	No	1982	7
BPA PROGRAM	3,677	-	14.150%	2017	No	1982	7
BPA PROGRAM	2,932	-	14.150%	2017	Yes	1982	7
BPA PROGRAM	402	-	14.150%	2017	No	1982	7
BPA PROGRAM	105	-	14.150%	2017	Yes	1982	7
BPA PROGRAM	43	-	14.150%	2017	No	1982	7
BPA PROGRAM	34	-	14.150%	2017	Yes	1982	7
BPA PROGRAM	37,235	-	12.250%	2018	No	1983	9
BPA PROGRAM	6,708	-	12.250%	2018	Yes	1983	9
BPA PROGRAM	814	-	12.250%	2018	No	1983	9
BPA PROGRAM	203	-	12.250%	2018	No	1983	9
BPA PROGRAM	35	-	12.250%	2018	Yes	1983	9
BPA PROGRAM	4	-	12.250%	2018	No	1983	9
BPA PROGRAM	1	-	12.250%	2018	Yes	1983	9
BPA PROGRAM	29,806	-	11.700%	2018	No	1983	6
BPA PROGRAM	154	-	11.700%	2018	No	1983	6
BPA PROGRAM	40	-	11.700%	2018	Yes	1983	6
BPA PROGRAM	39,741	-	10.850%	2018	No	1983	11
BPA PROGRAM	205	-	10.850%	2018	No	1983	11
BPA PROGRAM	54	-	10.850%	2018	Yes	1983	11
BPA PROGRAM	50,567	-	13.050%	2019	No	1984	9
BPA PROGRAM	9,109	-	13.050%	2019	Yes	1984	9
BPA PROGRAM	276	-	13.050%	2019	No	1984	9
BPA PROGRAM	48	-	13.050%	2019	Yes	1984	9
BPA PROGRAM	25,283	-	12.300%	2019	No	1984	11
BPA PROGRAM	4,555	-	12.300%	2019	Yes	1984	11
BPA PROGRAM	138	-	12.300%	2019	No	1984	11
BPA PROGRAM	24	-	12.300%	2019	Yes	1984	11
BPA PROGRAM	15,182	-	11.250%	2029	Yes	1985	6
BPA PROGRAM	460	-	11.250%	2029	No	1985	6
BPA PROGRAM	80	-	11.250%	2029	Yes	1985	6
BPA PROGRAM	84,278	-	11.250%	2030	No	1985	6
BPA PROGRAM	68,194	-	8.150%	1996	Yes	1986	3
BPA PROGRAM	30,161	-	8.150%	1996	No	1986	3
BPA PROGRAM	870	-	8.150%	1996	No	1986	3
BPA PROGRAM	443	-	8.150%	1996	No	1986	3
BPA PROGRAM	169	-	8.150%	1996	Yes	1986	3
BPA PROGRAM	157	-	8.150%	1996	Yes	1986	3
BPA PROGRAM	5	-	8.150%	1996	No	1986	3
BPA PROGRAM	1	-	8.150%	1996	Yes	1986	3
BPA PROGRAM	180,054	-	8.950%	2031	No	1986	6
BPA PROGRAM	57,354	-	8.950%	2031	Yes	1986	6
BPA PROGRAM	40,000	-	8.950%	2031	Yes	1986	6
BPA PROGRAM	11,668	-	8.950%	2031	Yes	1986	6
BPA PROGRAM	5,161	-	8.950%	2031	No	1986	6
BPA PROGRAM	3,117	-	8.950%	2031	Yes	1986	6
BPA PROGRAM	1,819	-	8.950%	2031	No	1986	6
BPA PROGRAM	722	-	8.950%	2031	Yes	1986	6
BPA PROGRAM	76	-	8.950%	2031	No	1986	6
BPA PROGRAM	29	-	8.950%	2031	Yes	1986	6
BPA PROGRAM	96,519	-	8.350%	1992	No	1987	6
BPA PROGRAM	2,498	-	8.350%	1992	No	1987	6
BPA PROGRAM	983	-	8.350%	1992	No	1987	6
BPA PROGRAM	86,958	-	9.550%	2017	No	1987	7
BPA PROGRAM	4,113	-	9.550%	2017	No	1987	7
BPA PROGRAM	3,274	-	9.550%	2017	Yes	1987	7
BPA PROGRAM	569	-	9.550%	2017	No	1987	7
BPA PROGRAM	48	-	9.550%	2017	No	1987	7
BPA PROGRAM	38	-	9.550%	2017	Yes	1987	7
BPA PROGRAM	37,342	-	9.550%	2032	No	1987	7
BPA PROGRAM	7,903	-	9.550%	2032	No	1987	7
BPA PROGRAM	3,109	-	9.550%	2032	Yes	1987	7
BPA PROGRAM	631	-	9.550%	2032	No	1987	7
BPA PROGRAM	618	-	9.550%	2032	Yes	1987	7
BPA PROGRAM	285	-	9.550%	2032	No	1987	7
BPA PROGRAM	112	-	9.550%	2032	Yes	1987	7

BPA PROGRAM	54,409	-	9.300%	2032	Yes	1987	4
BPA PROGRAM	43,236	-	9.300%	2032	No	1987	4
BPA PROGRAM	1,409	-	9.300%	2032	No	1987	4
BPA PROGRAM	554	-	9.300%	2032	No	1987	4
BPA PROGRAM	281	-	9.300%	2032	No	1987	4
BPA PROGRAM	111	-	9.300%	2032	No	1987	4
BPA PROGRAM	43,417	-	9.500%	2018	No	1988	2
BPA PROGRAM	283	-	9.500%	2018	No	1988	2
BPA PROGRAM	30,004	-	9.900%	2033	Yes	1988	6
BPA PROGRAM	9,018	-	9.900%	2033	No	1988	6
BPA PROGRAM	752	-	9.900%	2033	Yes	1988	6
BPA PROGRAM	226	-	9.900%	2033	No	1988	6
BPA PROGRAM	45,870	-	9.500%	2033	Yes	1988	2
BPA PROGRAM	28,513	-	9.500%	2033	No	1988	2
BPA PROGRAM	27,887	-	9.500%	2033	Yes	1988	2
BPA PROGRAM	22,923	-	9.500%	2033	Yes	1988	2
BPA PROGRAM	20,677	-	9.500%	2033	No	1988	2
BPA PROGRAM	1,725	-	9.500%	2033	Yes	1988	2
BPA PROGRAM	954	-	9.500%	2033	No	1988	2
BPA PROGRAM	933	-	9.500%	2033	Yes	1988	2
BPA PROGRAM	518	-	9.500%	2033	No	1988	2
BPA PROGRAM	56,257	-	8.950%	1999	Yes	1989	5
BPA PROGRAM	16,909	-	8.950%	1999	No	1989	5
BPA PROGRAM	1,410	-	8.950%	1999	No	1989	5
BPA PROGRAM	424	-	8.950%	1999	No	1989	5
BPA PROGRAM	41,894	-	9.250%	2030	No	1990	1
BPA PROGRAM	3,824	-	9.250%	2030	Yes	1990	1
BPA PROGRAM	3,008	-	9.250%	2030	No	1990	1
BPA PROGRAM	1,149	-	9.250%	2030	No	1990	1
BPA PROGRAM	96	-	9.250%	2030	Yes	1990	1
BPA PROGRAM	29	-	9.250%	2030	No	1990	1
BPA PROGRAM	54,145	-	7.550%	1995	No	1991	2
BPA PROGRAM	5,855	-	7.550%	1995	No	1991	2
BPA PROGRAM	80,000	-	6.200%	1995	No	1992	4
BPA PROGRAM	50,000	-	7.000%	1997	No	1992	4
BPA PROGRAM	28,300	-	7.000%	1997	No	1992	4
BPA PROGRAM	107,800	-	6.600%	2000	No	1992	8
BPA PROGRAM	107,700	-	7.250%	2007	No	1992	8
BPA PROGRAM	147,521	-	8.800%	2032	No	1992	4
BPA PROGRAM	2,479	-	8.800%	2032	No	1992	4
BPA PROGRAM	150,000	-	8.130%	2032	No	1992	7
BPA PROGRAM	50,000	-	6.050%	1998	No	1993	10
BPA PROGRAM	99,962	-	8.350%	2033	No	1993	10
BPA PROGRAM	130,000	-	7.800%	2033	No	1993	2
BPA PROGRAM	100,000	-	7.500%	2033	No	1993	4
BPA PROGRAM	110,000	110,000	6.950%	2033	No	1993	8
BPA PROGRAM	49,489	-	7.100%	1998	No	1994	5
BPA PROGRAM	43,155	-	7.100%	1998	No	1994	5
BPA PROGRAM	4,456	-	7.100%	1998	No	1994	5
BPA PROGRAM	55,000	-	7.650%	1999	No	1994	9
BPA PROGRAM	50,000	-	8.200%	2034	No	1994	5
BPA PROGRAM	50,000	50,000	7.050%	2034	No	1994	1
BPA PROGRAM	108,400	108,400	6.850%	2034	No	1994	10
BPA PROGRAM	50,000	50,000	6.850%	2034	No	1994	10
BPA PROGRAM	55,000	-	8.350%	2001	No	1995	1
BPA PROGRAM	65,000	-	7.700%	2025	No	1995	8
BPA PROGRAM	49,933	34,976	7.700%	2025	No	1995	7
BPA PROGRAM	54,378	54,378	5.900%	2003	No	1996	1
BPA PROGRAM	70,000	70,000	7.050%	2006	No	1996	8
BPA PROGRAM	22,600	22,600	6.800%	2004	No	1997	1
BPA PROGRAM	80,000	80,000	6.900%	2005	No	1997	5
BPA PROGRAM	111,254	111,254	6.650%	2007	No	1997	8
BPA PROGRAM	75,300	75,300	6.000%	2008	No	1998	4
BPA PROGRAM	36,819	36,819	5.750%	2008	No	1998	8
BPA PROGRAM	72,700	72,700	6.000%	2009	No	1998	5
BPA PROGRAM	40,000	40,000	6.200%	2011	No	1998	5
BPA PROGRAM	106,600	106,600	5.850%	2023	No	1998	8
BPA PROGRAM	112,300	112,300	5.850%	2028	No	1998	8
BPA PROGRAM	50,000	50,000	6.650%	2029	No	1998	10

BPA PROGRAM	98,900	98,900	6.700%	2032	No	1998	5
BPA PROGRAM	40,000	-	6.200%	2002	No	1999	9
BPA PROGRAM	26,200	26,200	5.950%	2004	No	1999	5
BPA PROGRAM	59,050	59,050	5.900%	2014	No	1999	2
BPA PROGRAM	15,300	15,300	6.850%	2003	No	2000	8
BPA PROGRAM	40,000	40,000	6.400%	2003	No	2000	11
BPA PROGRAM	39,052	39,052	7.000%	2004	No	2000	7
BPA PROGRAM	53,500	53,500	7.150%	2005	No	2000	1
BPA PROGRAM	40,000	40,000	6.750%	2006	No	2000	9
BPA PROGRAM	20,000	20,000	5.650%	2005	No	2001	1
BPA PROGRAM	59,933	59,933	6.050%	2010	No	2001	1
BPA PROGRAM	25,000	25,000	5.950%	2011	No	2001	6
BPA PROGRAM	50,000	50,000	5.750%	2011	No	2001	8
BPA PROGRAM	108,010	108,010	6.060%	2017	No	2002	3
BPA PROGRAM	100,000	100,000	6.060%	2017	No	2002	9
BPA PROGRAM	60,000	60,000	6.060%	2017	No	2002	6
ENVIRONMENT	40,000	40,000	6.950%	2012	No	1997	11
ENVIRONMENT	30,000	30,000	6.050%	2010	No	2001	1
ENVIRONMENT	30,000	30,000	3.050%	2006	No	2002	9

BONNEVILLE POWER ADMINISTRATION

TRANSMISSION REPAYMENT STUDY

OCTOBER 1, 2003 - SEPTEMBER 30, 2006 COST EVALUATION PERIOD

2004 RC FINAL PROPOSAL, $15m rf, 15-yr 02 bonds, CapReduc '03 3-17-03

SUMMARY OF INVESTMENTS (1000S) (FY 2005)
PROJECTED FEDERAL INVESTMENTS

Project	Original Principal	Current Principal	Interest Rate	Due Date	Replacement?	In Service Date	Month
BPA PROGRAM	352,497	352,497	7.010%	2038	No	2003	3
BPA PROGRAM	316,633	316,633	7.180%	2039	No	2004	3
BPA PROGRAM	267,831	267,831	7.100%	2040	No	2005	3
ENVIRONMENT	2,675	2,675	6.560%	2018	No	2003	3
ENVIRONMENT	7,369	7,369	6.770%	2019	No	2004	3
ENVIRONMENT	5,414	5,414	6.690%	2020	No	2005	3

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BONNEVILLE POWER ADMINISTRATION

TRANSMISSION REPAYMENT STUDY

OCTOBER 1, 2003 - SEPTEMBER 30, 2006 COST EVALUATION PERIOD

2004 RC FINAL PROPOSAL, $15m rf, 15-yr 02 bonds, CapReduc '03 3-17-03

SUMMARY OF INVESTMENTS (1000S) (FY 2005)
CAPITALIZED CONTRACT OBLIGATIONS

Date	Capitalized Contract Obligations
9/30/2003	-
9/30/2006	(1,057.00)
9/30/2007	(1,118.00)
9/30/2008	(1,180.00)
9/30/2009	(1,240.00)
9/30/2010	(1,304.00)
9/30/2011	(1,368.00)
9/30/2012	(1,429.00)
9/30/2013	(1,490.00)
9/30/2014	(1,555.00)
9/30/2015	(1,620.00)
9/30/2016	(1,683.00)
9/30/2017	(1,749.00)
9/30/2018	(1,819.00)
9/30/2019	(1,893.00)
9/30/2020	(1,966.00)
9/30/2021	(2,043.00)
9/30/2022	(2,122.00)
9/30/2023	(2,197.00)
9/30/2024	(2,274.00)
9/30/2025	(2,348.00)
9/30/2026	(2,417.00)
9/30/2027	(2,479.00)
9/30/2028	(2,533.00)
9/30/2029	(2,577.00)
9/30/2030	(2,613.00)
9/30/2031	(2,635.00)
9/30/2032	(2,637.00)
9/30/2033	(2,633.00)
9/30/2034	(2,609.00)
9/30/2035	(2,574.00)
9/30/2036	(2,532.00)
9/30/2037	(2,481.00)
9/30/2038	(2,420.00)
9/30/2039	(2,363.00)
9/30/2040	(2,309.00)
Total	(71,267.00)

CHAPTER 10

REPAYMENT STUDY RESULTS
CURRENT STUDY
FY 2005

BONNEVILLE POWER ADMINISTRATION

TRANSMISSION REPAYMENT STUDY
OCTOBER 1, 2003 - SEPTEMBER 30, 2006 COST EVALUATION PERIOD
2004 RC FINAL PROPOSAL, $15m rf, 15-yr 02 bonds, CapReduc '03 3-17-03

SUMMARY OF INTEREST (1000S) (FY 2005)

Project	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BUREAU OF RECLAMATION	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTAL BUREAU	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
CORPS OF ENGINEERS	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTAL CORPS	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
BONNEVILLE POWER ADMINISTRATION	65,279	63,484	60,696	60,696	59,914	56,979	53,917	47,901	43,072	39,981
	-	-	-	-	-	-	-	-	-	-
TOTAL APPROPRIATIONS	65,279	63,484	60,696	60,696	59,914	56,979	53,917	47,901	43,072	39,981
	-	-	-	-	-	-	-	-	-	-
BPA BORROWING	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
BPA PROGRAM	139,171	155,544	168,429	171,426	171,886	172,899	174,968	179,596	185,244	187,962
ENVIRONMENT	5,598	5,935	6,365	6,547	5,632	5,632	5,632	5,632	3,817	3,817
PREMIUMS	391	1,512	-	-	-	-	-	-	-	-
(LESS INTEREST INCOME)	-8,297	-8,892	-8,868	-8,737	-8,747	-8,735	-8,707	-8,641	-8,587	-8,549
	-	-	-	-	-	-	-	-	-	-
TOTAL BPA BORROWING	136,862	154,099	165,927	169,236	168,771	169,796	171,893	176,587	180,474	183,230
	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTALS	202,141	217,583	226,623	229,932	228,685	226,774	225,809	224,488	223,547	223,211

BONNEVILLE POWER ADMINISTRATION

TRANSMISSION REPAYMENT STUDY

OCTOBER 1, 2003 - SEPTEMBER 30, 2006 COST EVALUATION PERIOD

2004 RC FINAL PROPOSAL, $15m rf, 15-yr 02 bonds, CapReduc '03 3-17-03

INTEREST CALCULATION SUMMARY (1000S) (FY 2005)

Date	Project	TYPE	Principal	Rate	Interest	Premium	Total
FY 2003	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	906,471	7.201%	65,279	-	65,279
FY 2003	BPA PROGRAM	HISTORICAL	1,980,272	6.404%	126,816	391	127,207
FY 2003	BPA PROGRAM	NEW	352,497	3.505%	12,355	-	12,355
FY 2003	ENVIRONMENT	HISTORICAL	100,000	5.510%	5,510	-	5,510
FY 2003	ENVIRONMENT	NEW	2,675	3.280%	88	-	88
FY 2003	Float	HISTORICAL	-	-	-8,297	-	-8,297
SUB-TOTAL			3,341,915	-	201,750	391	202,141
FY 2004	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	880,224	7.212%	63,484	-	63,484
FY 2004	BPA PROGRAM	HISTORICAL	2,216,169	6.506%	144,176	1,512	145,689
FY 2004	BPA PROGRAM	NEW	316,633	3.590%	11,367	-	11,367
FY 2004	ENVIRONMENT	HISTORICAL	102,675	5.537%	5,685	-	5,685
FY 2004	ENVIRONMENT	NEW	7,369	3.385%	249	-	249
FY 2004	Float	HISTORICAL	-	-	-8,892	-	-8,892
SUB-TOTAL			3,523,070	-	216,071	1,512	217,583
FY 2005	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	840,407	7.222%	60,696	-	60,696
FY 2005	BPA PROGRAM	HISTORICAL	2,416,896	6.575%	158,921	-	158,921
FY 2005	BPA PROGRAM	NEW	267,831	3.550%	9,508	-	9,508
FY 2005	ENVIRONMENT	HISTORICAL	110,044	5.620%	6,184	-	6,184
FY 2005	ENVIRONMENT	NEW	5,414	3.345%	181	-	181
FY 2005	Float	HISTORICAL	-	-	-8,868	-	-8,868
SUB-TOTAL			3,640,592	-	226,623	-	226,623
FY 2006	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	840,406	7.222%	60,696	-	60,696
FY 2006	BPA PROGRAM	HISTORICAL	2,531,227	6.616%	167,462	-	167,462
FY 2006	ENVIRONMENT	HISTORICAL	115,458	5.670%	6,547	-	6,547
FY 2006	BPA PROGRAM	NEW	111,674	3.550%	3,964	-	3,964
FY 2006	Float	HISTORICAL	-	-	-8,737	-	-8,737
SUB-TOTAL			3,598,765	-	229,932	-	229,932
FY 2007	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	829,157	7.226%	59,914	-	59,914
FY 2007	BPA PROGRAM	HISTORICAL	2,421,227	6.601%	159,827	-	159,827
FY 2007	ENVIRONMENT	HISTORICAL	85,458	6.590%	5,632	-	5,632
FY 2007	BPA PROGRAM	HISTORICAL	111,674	7.100%	7,929	-	7,929
FY 2007	BPA PROGRAM	NEW	116,348	3.550%	4,130	-	4,130
FY 2007	Float	HISTORICAL	-	-	-8,747	-	-8,747
SUB-TOTAL			3,563,864	-	228,685	-	228,685
FY 2008	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	787,852	7.232%	56,979	-	56,979
FY 2008	BPA PROGRAM	HISTORICAL	2,309,973	6.599%	152,429	-	152,429
FY 2008	ENVIRONMENT	HISTORICAL	85,458	6.590%	5,632	-	5,632
FY 2008	BPA PROGRAM	HISTORICAL	228,022	7.100%	16,190	-	16,190
FY 2008	BPA PROGRAM	NEW	120,579	3.550%	4,281	-	4,281
FY 2008	Float	HISTORICAL	-	-	-8,735	-	-8,735
SUB-TOTAL			3,531,884	-	226,774	-	226,774
FY 2009	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	745,440	7.233%	53,917	-	53,917
FY 2009	BPA PROGRAM	HISTORICAL	2,197,854	6.633%	145,793	-	145,793
FY 2009	ENVIRONMENT	HISTORICAL	85,458	6.590%	5,632	-	5,632
FY 2009	BPA PROGRAM	HISTORICAL	348,601	7.100%	24,751	-	24,751
FY 2009	BPA PROGRAM	NEW	124,617	3.550%	4,424	-	4,424
FY 2009	Float	HISTORICAL	-	-	-8,707	-	-8,707
SUB-TOTAL			3,501,970	-	225,809	-	225,809
FY 2010	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	662,583	7.229%	47,901	-	47,901
FY 2010	BPA PROGRAM	HISTORICAL	2,125,154	6.655%	141,431	-	141,431
FY 2010	ENVIRONMENT	HISTORICAL	85,458	6.590%	5,632	-	5,632
FY 2010	BPA PROGRAM	HISTORICAL	473,218	7.100%	33,598	-	33,598
FY 2010	BPA PROGRAM	NEW	128,630	3.550%	4,566	-	4,566
FY 2010	Float	HISTORICAL	-	-	-8,641	-	-8,641
SUB-TOTAL			3,475,043	-	224,488	-	224,488
FY 2011	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	595,574	7.232%	43,072	-	43,072
FY 2011	BPA PROGRAM	HISTORICAL	2,065,221	6.673%	137,806	-	137,806
FY 2011	ENVIRONMENT	HISTORICAL	55,458	6.882%	3,817	-	3,817
FY 2011	BPA PROGRAM	HISTORICAL	601,848	7.100%	42,731	-	42,731
FY 2011	BPA PROGRAM	NEW	132,612	3.550%	4,708	-	4,708
FY 2011	Float	HISTORICAL	-	-	-8,587	-	-8,587
SUB-TOTAL			3,450,713	-	223,547	-	223,547
FY 2012	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	552,626	7.235%	39,981	-	39,981
FY 2012	BPA PROGRAM	HISTORICAL	1,950,221	6.715%	130,963	-	130,963
FY 2012	ENVIRONMENT	HISTORICAL	55,458	6.882%	3,817	-	3,817
FY 2012	BPA PROGRAM	HISTORICAL	734,460	7.100%	52,147	-	52,147
FY 2012	BPA PROGRAM	NEW	136,699	3.550%	4,853	-	4,853
FY 2012	Float	HISTORICAL	-	-	-8,549	-	-8,549
SUB-TOTAL			3,429,464	-	223,211	-	223,211

BONNEVILLE POWER ADMINISTRATION

TRANSMISSION REPAYMENT STUDY
OCTOBER 1, 2003 - SEPTEMBER 30, 2006 COST EVALUATION PERIOD
2004 RC FINAL PROPOSAL, $15m rf, 15-yr 02 bonds, CapReduc '03 3-17-03

SUMMARY OF AMORTIZATION (1000S) (FY 2005)

Project	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BUREAU OF RECLAMATION	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTAL BUREAU	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
CORPS OF ENGINEERS	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTAL CORPS	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
BONNEVILLE POWER ADMINISTRATION	26,247	39,817		1	11,249	41,305	42,413	82,857	67,009	42,947	118,344
	-	-	-	-	-	-	-	-	-	-	-
TOTAL APPROPRIATIONS	26,247	39,817		1	11,249	41,305	42,413	82,857	67,009	42,947	118,344
	-	-	-	-	-	-	-	-	-	-	-
BPA BORROWING	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
BPA PROGRAM	116,600	115,906	153,500	110,000	111,254	112,119	72,700	59,933	115,000	-
ENVIRONMENT	-	-	-	30,000	-	-	-	30,000	-	40,000
	-	-	-	-	-	-	-	-	-	-
TOTAL BPA BORROWING	116,600	115,906	153,500	140,000	111,254	112,119	72,700	89,933	115,000	40,000
	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTALS	142,847	155,723	153,501	151,249	152,559	154,532	155,557	156,942	157,947	158,344

BONNEVILLE POWER ADMINISTRATION

TRANSMISSION REPAYMENT STUDY
OCTOBER 1, 2003 - SEPTEMBER 30, 2006 COST EVALUATION PERIOD
2004 RC FINAL PROPOSAL, $15m rf, 15-yr 02 bonds, CapReduc '03 3-17-03

APPLICATION OF AMORTIZATION (1000S) (FY 2005)

Date	Project	In Service	Due	Original Balance	Amount Available	Rate	Replacement?	Amount Amortized
FY 2003	BPA PROGRAM	2000	2003	15,300	15,300	6.850%	No	15,300
FY 2003	BONNEVILLE POWER ADMINISTRATION	1958	2003	15,593	15,593	6.840%	No	15,593
FY 2003	BONNEVILLE POWER ADMINISTRATION	1958	2003	10,654	10,654	6.840%	Yes	10,654
FY 2003	BPA PROGRAM	2000	2003	40,000	40,000	6.400%	No	40,000
FY 2003	BPA PROGRAM	1996	2003	54,378	54,378	5.900%	No	54,378
FY 2003	BPA PROGRAM	1995	2025	49,933	34,976	7.700%	No	6,922
SUB-TOTAL		-	-	185,858	170,901	-	Yes	142,847
FY 2004	BPA PROGRAM	2000	2004	39,052	39,052	7.000%	No	39,052
FY 2004	BONNEVILLE POWER ADMINISTRATION	1959	2004	8,157	8,157	6.880%	No	8,157
FY 2004	BONNEVILLE POWER ADMINISTRATION	1959	2004	8,863	8,863	6.880%	Yes	8,863
FY 2004	BPA PROGRAM	1997	2004	22,600	22,600	6.800%	No	22,600
FY 2004	BPA PROGRAM	1999	2004	26,200	26,200	5.950%	No	26,200
FY 2004	BONNEVILLE POWER ADMINISTRATION	1960	2005	3,598	3,598	6.910%	No	3,597
FY 2004	BONNEVILLE POWER ADMINISTRATION	1960	2005	4,218	4,218	6.910%	Yes	4,218
FY 2004	BONNEVILLE POWER ADMINISTRATION	1961	2006	11,271	11,271	6.950%	Yes	4,490
FY 2004	BONNEVILLE POWER ADMINISTRATION	1971	2016	17,805	17,805	7.290%	Yes	10,492
FY 2004	BPA PROGRAM	1995	2025	49,933	28,054	7.700%	No	28,054
SUB-TOTAL		-	-	191,697	169,818	-	Yes	155,723
FY 2005	BPA PROGRAM	2000	2005	53,500	53,500	7.150%	No	53,500
FY 2005	BONNEVILLE POWER ADMINISTRATION	1960	2005	3,598	1	6.910%	No	1
FY 2005	BPA PROGRAM	1997	2005	80,000	80,000	6.900%	No	80,000
FY 2005	BPA PROGRAM	2001	2005	20,000	20,000	5.650%	No	20,000
SUB-TOTAL		-	-	157,098	153,501	-	No	153,501
FY 2006	BPA PROGRAM	1996	2006	70,000	70,000	7.050%	No	70,000
FY 2006	BONNEVILLE POWER ADMINISTRATION	1961	2006	4,468	4,468	6.950%	No	4,468
FY 2006	BONNEVILLE POWER ADMINISTRATION	1961	2006	11,271	6,781	6.950%	Yes	6,781
FY 2006	BPA PROGRAM	2000	2006	40,000	40,000	6.750%	No	40,000
FY 2006	ENVIRONMENT	2002	2006	30,000	30,000	3.050%	No	30,000
SUB-TOTAL		-	-	155,739	151,249	-	Yes	151,249
FY 2007	BONNEVILLE POWER ADMINISTRATION	1962	2007	19,597	19,597	6.980%	No	19,597
FY 2007	BONNEVILLE POWER ADMINISTRATION	1962	2007	4,877	4,877	6.980%	Yes	4,877
FY 2007	BPA PROGRAM	1997	2007	111,254	111,254	6.650%	No	111,254
FY 2007	BONNEVILLE POWER ADMINISTRATION	1971	2016	12,051	12,051	7.290%	No	9,518
FY 2007	BONNEVILLE POWER ADMINISTRATION	1971	2016	17,805	7,313	7.290%	Yes	7,313
SUB-TOTAL		-	-	165,584	155,092	-	Yes	152,559
FY 2008	BONNEVILLE POWER ADMINISTRATION	1963	2008	4,876	4,876	7.020%	No	4,876
FY 2008	BONNEVILLE POWER ADMINISTRATION	1963	2008	4,330	4,330	7.020%	Yes	4,330
FY 2008	BONNEVILLE POWER ADMINISTRATION	1963	2008	904	904	7.020%	No	904
FY 2008	BONNEVILLE POWER ADMINISTRATION	1963	2008	803	803	7.020%	Yes	803
FY 2008	BPA PROGRAM	1998	2008	75,300	75,300	6.000%	No	75,300
FY 2008	BPA PROGRAM	1998	2008	36,819	36,819	5.750%	No	36,819
FY 2008	BONNEVILLE POWER ADMINISTRATION	1971	2016	12,025	12,025	7.290%	No	11,200
FY 2008	BONNEVILLE POWER ADMINISTRATION	1971	2016	17,766	17,766	7.290%	Yes	17,766
FY 2008	BONNEVILLE POWER ADMINISTRATION	1971	2016	12,051	2,533	7.290%	No	2,533
SUB-TOTAL		-	-	164,874	155,356	-	Yes	154,532
FY 2009	BONNEVILLE POWER ADMINISTRATION	1964	2009	4,151	4,151	7.060%	No	4,151
FY 2009	BONNEVILLE POWER ADMINISTRATION	1964	2009	5,738	5,738	7.060%	Yes	5,738
FY 2009	BPA PROGRAM	1998	2009	72,700	72,700	6.000%	No	72,700
FY 2009	BONNEVILLE POWER ADMINISTRATION	1971	2016	12,025	825	7.290%	No	825
FY 2009	BONNEVILLE POWER ADMINISTRATION	1972	2017	29,326	29,326	7.290%	No	29,326
FY 2009	BONNEVILLE POWER ADMINISTRATION	1972	2017	21,170	21,170	7.290%	Yes	21,170
FY 2009	BONNEVILLE POWER ADMINISTRATION	1972	2017	3,980	3,980	7.290%	No	3,980
FY 2009	BONNEVILLE POWER ADMINISTRATION	1972	2017	2,873	2,873	7.290%	Yes	2,873
FY 2009	BONNEVILLE POWER ADMINISTRATION	1973	2018	16,368	16,368	7.280%	No	4,303
FY 2009	BONNEVILLE POWER ADMINISTRATION	1973	2018	10,491	10,491	7.280%	Yes	10,491
SUB-TOTAL		-	-	178,822	167,622	-	Yes	155,557
FY 2010	BONNEVILLE POWER ADMINISTRATION	1965	2010	3,706	3,706	7.090%	No	3,706
FY 2010	BONNEVILLE POWER ADMINISTRATION	1965	2010	7,248	7,248	7.090%	Yes	7,248
FY 2010	BONNEVILLE POWER ADMINISTRATION	1965	2010	5,202	5,202	7.090%	No	5,202
FY 2010	BONNEVILLE POWER ADMINISTRATION	1965	2010	10,171	10,171	7.090%	Yes	10,171
FY 2010	ENVIRONMENT	2001	2010	30,000	30,000	6.050%	No	30,000
FY 2010	BPA PROGRAM	2001	2010	59,933	59,933	6.050%	No	59,933
FY 2010	BONNEVILLE POWER ADMINISTRATION	1973	2018	33,788	33,788	7.280%	No	6,961

FY 2010	BONNEVILLE POWER ADMINISTRATION	1973	2018	21,656	21,656	7.280%	Yes	21,656
FY 2010	BONNEVILLE POWER ADMINISTRATION	1973	2018	16,368	12,065	7.280%	No	12,065
SUB-TOTAL		-	-	188,072	183,769	-	Yes	156,942
FY 2011	BONNEVILLE POWER ADMINISTRATION	1966	2011	11,830	11,830	7.130%	No	11,830
FY 2011	BONNEVILLE POWER ADMINISTRATION	1966	2011	3,049	3,049	7.130%	Yes	3,049
FY 2011	BONNEVILLE POWER ADMINISTRATION	1966	2011	6,647	6,647	7.130%	No	6,647
FY 2011	BONNEVILLE POWER ADMINISTRATION	1966	2011	1,714	1,714	7.130%	Yes	1,714
FY 2011	BPA PROGRAM	1998	2011	40,000	40,000	6.200%	No	40,000
FY 2011	BPA PROGRAM	2001	2011	25,000	25,000	5.950%	No	25,000
FY 2011	BPA PROGRAM	2001	2011	50,000	50,000	5.750%	No	50,000
FY 2011	BONNEVILLE POWER ADMINISTRATION	1973	2018	33,788	26,827	7.280%	No	19,707
SUB-TOTAL		-	-	172,028	165,067	-	Yes	157,947
FY 2012	BONNEVILLE POWER ADMINISTRATION	1967	2012	19,003	19,003	7.160%	No	19,003
FY 2012	BONNEVILLE POWER ADMINISTRATION	1967	2012	4,566	4,566	7.160%	Yes	4,566
FY 2012	BONNEVILLE POWER ADMINISTRATION	1967	2012	14,300	14,300	7.160%	No	14,300
FY 2012	BONNEVILLE POWER ADMINISTRATION	1967	2012	3,436	3,436	7.160%	Yes	3,436
FY 2012	ENVIRONMENT	1997	2012	40,000	40,000	6.950%	No	40,000
FY 2012	BONNEVILLE POWER ADMINISTRATION	1970	2015	64,977	64,977	7.270%	No	34,510
FY 2012	BONNEVILLE POWER ADMINISTRATION	1970	2015	7,995	7,995	7.270%	Yes	7,995
FY 2012	BONNEVILLE POWER ADMINISTRATION	1970	2015	24,412	24,412	7.270%	No	24,412
FY 2012	BONNEVILLE POWER ADMINISTRATION	1970	2015	3,003	3,003	7.270%	Yes	3,003
FY 2012	BONNEVILLE POWER ADMINISTRATION	1973	2018	33,788	7,119	7.280%	No	7,119
SUB-TOTAL		-	-	215,480	188,811	-	Yes	158,344
FY 2013	BONNEVILLE POWER ADMINISTRATION	1968	2013	41,070	41,070	7.200%	No	41,070
FY 2013	BONNEVILLE POWER ADMINISTRATION	1968	2013	8,076	8,076	7.200%	Yes	8,076
FY 2013	BONNEVILLE POWER ADMINISTRATION	1968	2013	23,202	23,202	7.200%	No	23,202
FY 2013	BONNEVILLE POWER ADMINISTRATION	1968	2013	4,562	4,562	7.200%	Yes	4,562
FY 2013	BONNEVILLE POWER ADMINISTRATION	1970	2015	64,977	30,467	7.270%	No	30,467
FY 2013	BONNEVILLE POWER ADMINISTRATION	1974	2019	20,984	20,984	7.270%	Yes	18,019
FY 2013	BONNEVILLE POWER ADMINISTRATION	1974	2019	12,563	12,563	7.270%	No	12,563
FY 2013	BONNEVILLE POWER ADMINISTRATION	1974	2019	21,826	21,826	7.270%	Yes	21,826
SUB-TOTAL		-	-	197,260	162,750	-	Yes	159,785
FY 2014	BONNEVILLE POWER ADMINISTRATION	1969	2014	42,237	42,237	7.230%	No	42,237
FY 2014	BONNEVILLE POWER ADMINISTRATION	1969	2014	22,537	22,537	7.230%	Yes	22,537
FY 2014	BONNEVILLE POWER ADMINISTRATION	1969	2014	384	384	7.230%	No	384
FY 2014	BONNEVILLE POWER ADMINISTRATION	1969	2014	205	205	7.230%	Yes	205
FY 2014	BPA PROGRAM	1999	2014	59,050	59,050	5.900%	No	59,050
FY 2014	BONNEVILLE POWER ADMINISTRATION	1974	2019	12,079	12,079	7.270%	No	12,079
FY 2014	BONNEVILLE POWER ADMINISTRATION	1974	2019	20,984	2,965	7.270%	Yes	2,965
FY 2014	BONNEVILLE POWER ADMINISTRATION	1975	2020	17,158	17,158	7.250%	No	9,900
FY 2014	BONNEVILLE POWER ADMINISTRATION	1975	2020	11,742	11,742	7.250%	Yes	11,742
SUB-TOTAL		-	-	186,376	168,357	-	Yes	161,099
FY 2015	BONNEVILLE POWER ADMINISTRATION	1970	2015	64,977	-0	7.270%	No	-0
FY 2015	BONNEVILLE POWER ADMINISTRATION	1975	2020	32,026	32,026	7.250%	No	32,026
FY 2015	BONNEVILLE POWER ADMINISTRATION	1975	2020	21,916	21,916	7.250%	Yes	21,916
FY 2015	BONNEVILLE POWER ADMINISTRATION	1975	2020	17,158	7,258	7.250%	No	7,258
FY 2015	BONNEVILLE POWER ADMINISTRATION	1976	2021	61,025	61,025	7.230%	No	61,025
FY 2015	BONNEVILLE POWER ADMINISTRATION	1976	2021	2,212	2,212	7.230%	Yes	2,212
FY 2015	BONNEVILLE POWER ADMINISTRATION	1977	2022	33,702	33,702	7.210%	No	32,042
FY 2015	BONNEVILLE POWER ADMINISTRATION	1977	2022	4,981	4,981	7.210%	Yes	4,981
SUB-TOTAL		-	-	237,997	163,120	-	Yes	161,460
FY 2016	BONNEVILLE POWER ADMINISTRATION	1971	2016	12,025	-0	7.290%	No	-0
FY 2016	BONNEVILLE POWER ADMINISTRATION	1971	2016	12,051	0	7.290%	No	0
FY 2016	BONNEVILLE POWER ADMINISTRATION	1971	2016	17,805	0	7.290%	Yes	0
FY 2016	BPA PROGRAM	2002	2017	108,010	108,010	6.060%	No	106,492
FY 2016	BONNEVILLE POWER ADMINISTRATION	1977	2022	3,948	3,948	7.210%	No	3,948
FY 2016	BONNEVILLE POWER ADMINISTRATION	1977	2022	5,380	5,380	7.210%	Yes	5,380
FY 2016	BONNEVILLE POWER ADMINISTRATION	1977	2022	33,702	1,660	7.210%	No	1,660
FY 2016	BPA PROGRAM	2004	2039	316,633	316,633	7.180%	No	42,355
SUB-TOTAL		-	-	509,554	435,631	-	Yes	159,835
FY 2017	BPA PROGRAM	2002	2017	60,000	60,000	6.060%	No	60,000
FY 2017	BPA PROGRAM	2002	2017	100,000	100,000	6.060%	No	100,000
FY 2017	BPA PROGRAM	2002	2017	108,010	1,518	6.060%	No	1,518
SUB-TOTAL		-	-	268,010	161,518	-	No	161,518

FY 2018 BONNEVILLE POWER ADMINISTRATION	1973	2018	16,368	0	7.280%	No	0
FY 2018 ENVIRONMENT	2003	2018	2,675	2,675	6.560%	No	2,675
FY 2018 BPA PROGRAM	2004	2039	316,633	274,278	7.180%	No	150,823
SUB-TOTAL	-	-	335,676	276,953	-	No	153,498
FY 2019 BONNEVILLE POWER ADMINISTRATION	1974	2019	20,984	0	7.270%	Yes	0
FY 2019 ENVIRONMENT	2004	2019	7,369	7,369	6.770%	No	7,369
FY 2019 BPA PROGRAM	2004	2039	316,633	123,455	7.180%	No	123,455
FY 2019 BPA PROGRAM	2005	2040	267,831	267,831	7.100%	No	22,579
SUB-TOTAL	-	-	612,817	398,655	-	Yes	153,403
FY 2020 ENVIRONMENT	2005	2020	5,414	5,414	6.690%	No	5,414
FY 2020 BPA PROGRAM	2005	2040	267,831	245,252	7.100%	No	147,161
SUB-TOTAL	-	-	273,245	250,666	-	No	152,575
FY 2021 BPA PROGRAM	2005	2040	267,831	98,091	7.100%	No	98,091
FY 2021 BPA PROGRAM	2006	2041	111,674	111,674	7.100%	Yes	53,204
SUB-TOTAL	-	-	379,505	209,765	-	Yes	151,295
FY 2022 BONNEVILLE POWER ADMINISTRATION	1977	2022	33,702	-0	7.210%	No	-0
FY 2022 BPA PROGRAM	2006	2041	111,674	58,470	7.100%	Yes	58,470
FY 2022 BPA PROGRAM	2007	2042	116,348	116,348	7.100%	Yes	91,174
SUB-TOTAL	-	-	261,724	174,818	-	Yes	149,644
FY 2023 BPA PROGRAM	1998	2023	106,600	106,600	5.850%	No	106,600
FY 2023 BPA PROGRAM	2007	2042	116,348	25,174	7.100%	Yes	25,174
FY 2023 BPA PROGRAM	2008	2043	120,579	120,579	7.100%	Yes	20,034
SUB-TOTAL	-	-	343,527	252,353	-	Yes	151,808
FY 2024 BPA PROGRAM	2008	2043	120,579	100,545	7.100%	Yes	100,545
FY 2024 BPA PROGRAM	2009	2044	124,617	124,617	7.100%	Yes	43,954
SUB-TOTAL	-	-	245,196	225,162	-	Yes	144,499
FY 2025 BPA PROGRAM	2009	2044	124,617	80,663	7.100%	Yes	80,663
FY 2025 BPA PROGRAM	2010	2045	128,630	128,630	7.100%	Yes	61,083
SUB-TOTAL	-	-	253,247	209,293	-	Yes	141,746
FY 2026 BPA PROGRAM	2010	2045	128,630	67,547	7.100%	Yes	67,547
FY 2026 BPA PROGRAM	2011	2046	132,612	132,612	7.100%	Yes	71,075
SUB-TOTAL	-	-	261,242	200,159	-	Yes	138,622
FY 2027 BPA PROGRAM	2011	2046	132,612	61,537	7.100%	Yes	61,537
FY 2027 BPA PROGRAM	2012	2047	136,699	136,699	7.100%	Yes	73,584
SUB-TOTAL	-	-	269,311	198,236	-	Yes	135,121
FY 2028 BPA PROGRAM	1998	2028	112,300	112,300	5.850%	No	112,300
FY 2028 BPA PROGRAM	2012	2047	136,699	63,115	7.100%	Yes	23,229
SUB-TOTAL	-	-	248,999	175,415	-	Yes	135,529
FY 2029 BPA PROGRAM	1998	2029	50,000	50,000	6.650%	No	50,000
FY 2029 BPA PROGRAM	2012	2047	136,699	39,886	7.100%	Yes	39,886
FY 2029 BPA PROGRAM	2013	2048	140,962	140,962	7.100%	Yes	38,014
SUB-TOTAL	-	-	327,661	230,848	-	Yes	127,900
FY 2030 BPA PROGRAM	1994	2034	50,000	50,000	7.050%	No	3,735
FY 2030 BPA PROGRAM	2013	2048	140,962	102,948	7.100%	Yes	102,948
FY 2030 BPA PROGRAM	2014	2049	145,372	145,372	7.100%	Yes	14,698
SUB-TOTAL	-	-	336,334	298,320	-	Yes	121,381
FY 2031 BPA PROGRAM	1993	2033	110,000	110,000	6.950%	No	44,998
FY 2031 BPA PROGRAM	1994	2034	50,000	46,265	7.050%	No	46,265
FY 2031 BPA PROGRAM	2003	2038	352,497	352,497	7.010%	No	28,222
SUB-TOTAL	-	-	512,497	508,762	-	No	119,485
FY 2032 BPA PROGRAM	1998	2032	98,900	98,900	6.700%	No	98,900
FY 2032 BPA PROGRAM	1993	2033	110,000	65,002	6.950%	No	15,522
FY 2032 BPA PROGRAM	2003	2038	352,497	324,275	7.010%	No	19
SUB-TOTAL	-	-	561,397	488,177	-	No	114,442
FY 2033 BPA PROGRAM	1993	2033	110,000	49,479	6.950%	No	49,479
FY 2033 BPA PROGRAM	1994	2034	108,400	108,400	6.850%	No	58,327
SUB-TOTAL	-	-	218,400	157,879	-	No	107,806
FY 2034 BPA PROGRAM	1994	2034	50,000	-0	7.050%	No	-0
FY 2034 BPA PROGRAM	1994	2034	50,000	50,000	6.850%	No	50,000
FY 2034 BPA PROGRAM	1994	2034	108,400	50,073	6.850%	No	50,073
FY 2034 BPA PROGRAM	2003	2038	352,497	324,256	7.010%	No	913
SUB-TOTAL	-	-	560,897	424,330	-	No	100,986

FY 2035 BPA PROGRAM	2003	2038	352,497	323,343	7.010%	No	92,969
SUB-TOTAL	-	-	352,497	323,343	-	No	92,969
FY 2036 BPA PROGRAM	2003	2038	352,497	230,374	7.010%	No	85,282
SUB-TOTAL	-	-	352,497	230,374	-	No	85,282
FY 2037 BPA PROGRAM	2003	2038	352,497	145,091	7.010%	No	77,002
SUB-TOTAL	-	-	352,497	145,091	-	No	77,002
FY 2038 BPA PROGRAM	2003	2038	352,497	68,089	7.010%	No	68,089
SUB-TOTAL	-	-	352,497	68,089	-	No	68,089
FY 2039 BPA PROGRAM	2004	2039	316,633	-0	7.180%	No	-0
FY 2039 BPA PROGRAM	2014	2049	145,372	130,674	7.100%	Yes	57,259
SUB-TOTAL	-	-	462,005	130,674	-	Yes	57,259
FY 2040 BPA PROGRAM	2014	2049	145,372	73,415	7.100%	Yes	47,179
SUB-TOTAL	-	-	145,372	73,415	-	Yes	47,179
FY 2041 BPA PROGRAM	2006	2041	111,674	-0	7.100%	Yes	-0
FY 2041 BPA PROGRAM	2014	2049	145,372	26,235	7.100%	Yes	26,235
FY 2041 BPA PROGRAM	2015	2050	149,712	149,712	7.100%	Yes	14,854
SUB-TOTAL	-	-	406,758	175,947	-	Yes	41,090
GRAND TOTAL	-	-	11,600,247	8,579,287	-	Yes	5,111,509

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CHAPTER 11

REPAYMENT STUDY RESULTS
REVISED STUDY
FY 2005

BONNEVILLE POWER ADMINISTRATION

TRANSMISSION REPAYMENT STUDY

OCTOBER 1, 2003 - SEPTEMBER 30, 2006 COST EVALUATION PERIOD

2004 FP, $15m rf, 15-yr 02 bnd, CapRed '03, $1.5m Shift 04 to 05 3-27-03

SUMMARY OF INTEREST (1000S) (FY 2005)

Project	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BUREAU OF RECLAMATION	-	-	-	-	-	-	-	-	-	-
TOTAL BUREAU	-	-	-	-	-	-	-	-	-	-
CORPS OF ENGINEERS	-	-	-	-	-	-	-	-	-	-
TOTAL CORPS	-	-	-	-	-	-	-	-	-	-
BONNEVILLE POWER ADMINISTRATION	65,279	63,484	60,790	60,681	58,482	54,012	49,303	41,530	34,816	29,700
TOTAL APPROPRIATIONS	65,279	63,484	60,790	60,681	58,482	54,012	49,303	41,530	34,816	29,700
BPA BORROWING	-	-	-	-	-	-	-	-	-	-
BPA PROGRAM	139,171	155,544	168,429	171,426	171,886	172,899	174,968	179,596	185,244	187,962
ENVIRONMENT	5,598	5,935	6,365	6,547	5,632	5,632	5,632	5,632	3,817	3,817
PREMIUMS	391	1,512	-	-	-	-	-	-	-	-
(LESS INTEREST INCOME)	-8,297	-8,804	-8,914	-9,305	-9,315	-9,303	-9,275	-9,209	-9,154	-9,117
TOTAL BPA BORROWING	136,862	154,186	165,881	168,668	168,203	169,228	171,325	176,019	179,907	182,662
TOTALS	202,141	217,670	226,671	229,349	226,685	223,240	220,628	217,550	214,723	212,362

BONNEVILLE POWER ADMINISTRATION

TRANSMISSION REPAYMENT STUDY

OCTOBER 1, 2003 - SEPTEMBER 30, 2006 COST EVALUATION PERIOD

2004 FP, $15m rf, 15-yr 02 bnd, CapRed '03, $1.5m Shift 04 to 05 3-27-03

INTEREST CALCULATION SUMMARY (1000S) (FY 2005)

Date	Project	TYPE	Principal	Rate	Interest	Premium	Total
FY 2003	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	906,471	7.201%	65,279	-	65,279
FY 2003	BPA PROGRAM	HISTORICAL	1,980,272	6.404%	126,816	391	127,207
FY 2003	BPA PROGRAM	NEW	352,497	3.505%	12,355	-	12,355
FY 2003	ENVIRONMENT	HISTORICAL	100,000	5.510%	5,510	-	5,510
FY 2003	ENVIRONMENT	NEW	2,675	3.280%	88	-	88
FY 2003	Float	HISTORICAL	-	-	-8,297	-	-8,297
SUB-TOTAL			3,341,915	-	201,750	391	202,141
FY 2004	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	880,224	7.212%	63,484	-	63,484
FY 2004	BPA PROGRAM	HISTORICAL	2,216,169	6.506%	144,176	1,512	145,689
FY 2004	BPA PROGRAM	NEW	316,633	3.590%	11,367	-	11,367
FY 2004	ENVIRONMENT	HISTORICAL	102,675	5.537%	5,685	-	5,685
FY 2004	ENVIRONMENT	NEW	7,369	3.385%	249	-	249
FY 2004	Float	HISTORICAL	-	-	-8,804	-	-8,804
SUB-TOTAL			3,523,070	-	216,158	1,512	217,670
FY 2005	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	841,907	7.221%	60,790	-	60,790
FY 2005	BPA PROGRAM	HISTORICAL	2,416,896	6.575%	158,921	-	158,921
FY 2005	BPA PROGRAM	NEW	267,831	3.550%	9,508	-	9,508
FY 2005	ENVIRONMENT	HISTORICAL	110,044	5.620%	6,184	-	6,184
FY 2005	ENVIRONMENT	NEW	5,414	3.345%	181	-	181
FY 2005	Float	HISTORICAL	-	-	-8,914	-	-8,914
SUB-TOTAL			3,642,092	-	226,671	-	226,671
FY 2006	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	840,406	7.220%	60,681	-	60,681
FY 2006	BPA PROGRAM	HISTORICAL	2,531,227	6.616%	167,462	-	167,462
FY 2006	ENVIRONMENT	HISTORICAL	115,458	5.670%	6,547	-	6,547
FY 2006	BPA PROGRAM	NEW	111,674	3.550%	3,964	-	3,964
FY 2006	Float	HISTORICAL	-	-	-9,305	-	-9,305
SUB-TOTAL			3,598,765	-	229,349	-	229,349
FY 2007	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	809,515	7.224%	58,482	-	58,482
FY 2007	BPA PROGRAM	HISTORICAL	2,421,227	6.601%	159,827	-	159,827
FY 2007	ENVIRONMENT	HISTORICAL	85,458	6.590%	5,632	-	5,632
FY 2007	BPA PROGRAM	HISTORICAL	111,674	7.100%	7,929	-	7,929
FY 2007	BPA PROGRAM	NEW	116,348	3.550%	4,130	-	4,130
FY 2007	Float	HISTORICAL	-	-	-9,315	-	-9,315
SUB-TOTAL			3,544,222	-	226,685	-	226,685
FY 2008	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	747,153	7.229%	54,012	-	54,012
FY 2008	BPA PROGRAM	HISTORICAL	2,309,973	6.599%	152,429	-	152,429
FY 2008	ENVIRONMENT	HISTORICAL	85,458	6.590%	5,632	-	5,632
FY 2008	BPA PROGRAM	HISTORICAL	228,022	7.100%	16,190	-	16,190
FY 2008	BPA PROGRAM	NEW	120,579	3.550%	4,281	-	4,281
FY 2008	Float	HISTORICAL	-	-	-9,303	-	-9,303
SUB-TOTAL			3,491,185	-	223,240	-	223,240
FY 2009	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	682,149	7.228%	49,303	-	49,303
FY 2009	BPA PROGRAM	HISTORICAL	2,197,854	6.633%	145,793	-	145,793
FY 2009	ENVIRONMENT	HISTORICAL	85,458	6.590%	5,632	-	5,632
FY 2009	BPA PROGRAM	HISTORICAL	348,601	7.100%	24,751	-	24,751
FY 2009	BPA PROGRAM	NEW	124,617	3.550%	4,424	-	4,424
FY 2009	Float	HISTORICAL	-	-	-9,275	-	-9,275
SUB-TOTAL			3,438,679	-	220,628	-	220,628
FY 2010	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	575,054	7.222%	41,530	-	41,530
FY 2010	BPA PROGRAM	HISTORICAL	2,125,154	6.655%	141,431	-	141,431
FY 2010	ENVIRONMENT	HISTORICAL	85,458	6.590%	5,632	-	5,632
FY 2010	BPA PROGRAM	HISTORICAL	473,218	7.100%	33,598	-	33,598
FY 2010	BPA PROGRAM	NEW	128,630	3.550%	4,566	-	4,566
FY 2010	Float	HISTORICAL	-	-	-9,209	-	-9,209
SUB-TOTAL			3,387,514	-	217,550	-	217,550
FY 2011	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	482,049	7.223%	34,816	-	34,816
FY 2011	BPA PROGRAM	HISTORICAL	2,065,221	6.673%	137,806	-	137,806
FY 2011	ENVIRONMENT	HISTORICAL	55,458	6.882%	3,817	-	3,817
FY 2011	BPA PROGRAM	HISTORICAL	601,848	7.100%	42,731	-	42,731
FY 2011	BPA PROGRAM	NEW	132,612	3.550%	4,708	-	4,708
FY 2011	Float	HISTORICAL	-	-	-9,154	-	-9,154
SUB-TOTAL			3,337,188	-	214,723	-	214,723
FY 2012	BONNEVILLE POWER ADMINISTRATION	HISTORICAL	411,221	7.222%	29,700	-	29,700
FY 2012	BPA PROGRAM	HISTORICAL	1,950,221	6.715%	130,963	-	130,963
FY 2012	ENVIRONMENT	HISTORICAL	55,458	6.882%	3,817	-	3,817
FY 2012	BPA PROGRAM	HISTORICAL	734,460	7.100%	52,147	-	52,147
FY 2012	BPA PROGRAM	NEW	136,699	3.550%	4,853	-	4,853
FY 2012	Float	HISTORICAL	-	-	-9,117	-	-9,117
SUB-TOTAL			3,288,059	-	212,362	-	212,362

BONNEVILLE POWER ADMINISTRATION

TRANSMISSION REPAYMENT STUDY
OCTOBER 1, 2003 - SEPTEMBER 30, 2006 COST EVALUATION PERIOD
2004 FP, $15m rf, 15-yr 02 bnd, CapRed '03, $1.5m Shift 04 to 05 3-27-03

SUMMARY OF AMORTIZATION (1000S) (FY 2005)

Project	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BUREAU OF RECLAMATION	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTAL BUREAU	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
CORPS OF ENGINEERS	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTAL CORPS	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
BONNEVILLE POWER ADMINISTRATION	26,247	38,317	1,501	30,891	62,362	65,004	107,095	93,004	70,828	148,250
	-	-	-	-	-	-	-	-	-	-
TOTAL OTHER APPROPRIATIONS	26,247	38,317	1,501	30,891	62,362	65,004	107,095	93,004	70,828	148,250
	-	-	-	-	-	-	-	-	-	-
BPA BORROWING	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
BPA PROGRAM	116,600	115,906	153,500	110,000	111,254	112,119	72,700	59,933	115,000	-
ENVIRONMENT	-	-	-	30,000	-	-	-	30,000	-	40,000
	-	-	-	-	-	-	-	-	-	-
TOTAL BPA BORROWING	116,600	115,906	153,500	140,000	111,254	112,119	72,700	89,933	115,000	40,000
	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
TOTALS	142,847	154,223	155,001	170,891	173,616	177,123	179,795	182,937	185,828	188,250

BONNEVILLE POWER ADMINISTRATION

TRANSMISSION REPAYMENT STUDY
OCTOBER 1, 2003 - SEPTEMBER 30, 2006 COST EVALUATION PERIOD
2004 FP, $15m rf, 15-yr 02 bnd, CapRed '03, $1.5m Shift 04 to 05 3-27-03

APPLICATION OF AMORTIZATION (1000S) (FY 2005)

Date	Project	In Service	Due	Original Balance	Amount Available	Rate	Replacement?	Amount Amortized
FY 2003	BPA PROGRAM	2000	2003	15,300	15,300	6.850%	No	15,300
FY 2003	BONNEVILLE POWER ADMINISTRATION	1958	2003	15,593	15,593	6.840%	No	15,593
FY 2003	BONNEVILLE POWER ADMINISTRATION	1958	2003	10,654	10,654	6.840%	Yes	10,654
FY 2003	BPA PROGRAM	2000	2003	40,000	40,000	6.400%	No	40,000
FY 2003	BPA PROGRAM	1996	2003	54,378	54,378	5.900%	No	54,378
FY 2003	BPA PROGRAM	1995	2025	49,933	34,976	7.700%	No	6,922
SUB-TOTAL		-	-	185,858	170,901	-	Yes	142,847
FY 2004	BONNEVILLE POWER ADMINISTRATION	1959	2004	8,157	8,157	6.880%	No	8,157
FY 2004	BONNEVILLE POWER ADMINISTRATION	1959	2004	8,863	8,863	6.880%	Yes	8,863
FY 2004	BPA PROGRAM	1997	2004	22,600	22,600	6.800%	No	22,600
FY 2004	BPA PROGRAM	1999	2004	26,200	26,200	5.950%	No	26,200
FY 2004	BPA PROGRAM	2000	2004	39,052	39,052	7.000%	No	39,052
FY 2004	BONNEVILLE POWER ADMINISTRATION	1960	2005	3,598	3,598	6.910%	No	3,598
FY 2004	BONNEVILLE POWER ADMINISTRATION	1960	2005	4,218	4,218	6.910%	Yes	4,218
FY 2004	BONNEVILLE POWER ADMINISTRATION	1971	2016	17,805	17,805	7.290%	Yes	13,481
FY 2004	BPA PROGRAM	1995	2025	49,933	28,054	7.700%	No	28,054
SUB-TOTAL		-	-	180,426	158,547	-	Yes	154,223
FY 2005	BPA PROGRAM	1997	2005	80,000	80,000	6.900%	No	80,000
FY 2005	BPA PROGRAM	2000	2005	53,500	53,500	7.150%	No	53,500
FY 2005	BPA PROGRAM	2001	2005	20,000	20,000	5.650%	No	20,000
FY 2005	BONNEVILLE POWER ADMINISTRATION	1971	2016	17,805	4,324	7.290%	Yes	1,501
SUB-TOTAL		-	-	171,305	157,824	-	Yes	155,001
FY 2006	BPA PROGRAM	1996	2006	70,000	70,000	7.050%	No	70,000
FY 2006	BONNEVILLE POWER ADMINISTRATION	1961	2006	4,468	4,468	6.950%	No	4,468
FY 2006	BONNEVILLE POWER ADMINISTRATION	1961	2006	11,271	11,271	6.950%	Yes	11,271
FY 2006	BPA PROGRAM	2000	2006	40,000	40,000	6.750%	No	40,000
FY 2006	ENVIRONMENT	2002	2006	30,000	30,000	3.050%	No	30,000
FY 2006	BONNEVILLE POWER ADMINISTRATION	1971	2016	17,766	17,766	7.290%	Yes	278
FY 2006	BONNEVILLE POWER ADMINISTRATION	1971	2016	12,051	12,051	7.290%	No	12,051
FY 2006	BONNEVILLE POWER ADMINISTRATION	1971	2016	17,805	2,823	7.290%	Yes	2,823
SUB-TOTAL		-	-	203,361	188,379	-	Yes	170,891
FY 2007	BONNEVILLE POWER ADMINISTRATION	1962	2007	19,597	19,597	6.980%	No	19,597
FY 2007	BONNEVILLE POWER ADMINISTRATION	1962	2007	4,877	4,877	6.980%	Yes	4,877
FY 2007	BPA PROGRAM	1997	2007	111,254	111,254	6.650%	No	111,254
FY 2007	BONNEVILLE POWER ADMINISTRATION	1971	2016	12,025	12,025	7.290%	No	12,025
FY 2007	BONNEVILLE POWER ADMINISTRATION	1971	2016	17,766	17,488	7.290%	Yes	17,488
FY 2007	BONNEVILLE POWER ADMINISTRATION	1972	2017	21,170	21,170	7.290%	Yes	1,522
FY 2007	BONNEVILLE POWER ADMINISTRATION	1972	2017	3,980	3,980	7.290%	No	3,980
FY 2007	BONNEVILLE POWER ADMINISTRATION	1972	2017	2,873	2,873	7.290%	Yes	2,873
SUB-TOTAL		-	-	193,542	193,264	-	Yes	173,616
FY 2008	BONNEVILLE POWER ADMINISTRATION	1963	2008	4,876	4,876	7.020%	No	4,876
FY 2008	BONNEVILLE POWER ADMINISTRATION	1963	2008	4,330	4,330	7.020%	Yes	4,330
FY 2008	BONNEVILLE POWER ADMINISTRATION	1963	2008	904	904	7.020%	No	904
FY 2008	BONNEVILLE POWER ADMINISTRATION	1963	2008	803	803	7.020%	Yes	803
FY 2008	BPA PROGRAM	1998	2008	75,300	75,300	6.000%	No	75,300
FY 2008	BPA PROGRAM	1998	2008	36,819	36,819	5.750%	No	36,819
FY 2008	BONNEVILLE POWER ADMINISTRATION	1972	2017	29,326	29,326	7.290%	No	29,326
FY 2008	BONNEVILLE POWER ADMINISTRATION	1972	2017	21,170	19,648	7.290%	Yes	19,648
FY 2008	BONNEVILLE POWER ADMINISTRATION	1973	2018	10,491	10,491	7.280%	Yes	5,117
SUB-TOTAL		-	-	184,019	182,497	-	Yes	177,123
FY 2009	BONNEVILLE POWER ADMINISTRATION	1964	2009	4,151	4,151	7.060%	No	4,151
FY 2009	BONNEVILLE POWER ADMINISTRATION	1964	2009	5,738	5,738	7.060%	Yes	5,738
FY 2009	BPA PROGRAM	1998	2009	72,700	72,700	6.000%	No	72,700
FY 2009	BONNEVILLE POWER ADMINISTRATION	1970	2015	24,412	24,412	7.270%	No	17,017
FY 2009	BONNEVILLE POWER ADMINISTRATION	1970	2015	3,003	3,003	7.270%	Yes	3,003
FY 2009	BONNEVILLE POWER ADMINISTRATION	1973	2018	33,788	33,788	7.280%	No	33,788
FY 2009	BONNEVILLE POWER ADMINISTRATION	1973	2018	21,656	21,656	7.280%	Yes	21,656

FY 2009	BONNEVILLE POWER ADMINISTRATION	1973	2018	16,368	16,368	7.280%	No	16,368
FY 2009	BONNEVILLE POWER ADMINISTRATION	1973	2018	10,491	5,374	7.280%	Yes	5,374
SUB-TOTAL		-	-	192,307	187,190	-	Yes	179,795
FY 2010	BONNEVILLE POWER ADMINISTRATION	1965	2010	3,706	3,706	7.090%	No	3,706
FY 2010	BONNEVILLE POWER ADMINISTRATION	1965	2010	7,248	7,248	7.090%	Yes	7,248
FY 2010	BONNEVILLE POWER ADMINISTRATION	1965	2010	5,202	5,202	7.090%	No	5,202
FY 2010	BONNEVILLE POWER ADMINISTRATION	1965	2010	10,171	10,171	7.090%	Yes	10,171
FY 2010	ENVIRONMENT	2001	2010	30,000	30,000	6.050%	No	30,000
FY 2010	BPA PROGRAM	2001	2010	59,933	59,933	6.050%	No	59,933
FY 2010	BONNEVILLE POWER ADMINISTRATION	1970	2015	64,977	64,977	7.270%	No	51,288
FY 2010	BONNEVILLE POWER ADMINISTRATION	1970	2015	7,995	7,995	7.270%	Yes	7,995
FY 2010	BONNEVILLE POWER ADMINISTRATION	1970	2015	24,412	7,395	7.270%	No	7,395
SUB-TOTAL		-	-	213,644	196,627	-	Yes	182,937
FY 2011	BONNEVILLE POWER ADMINISTRATION	1966	2011	11,830	11,830	7.130%	No	11,830
FY 2011	BONNEVILLE POWER ADMINISTRATION	1966	2011	3,049	3,049	7.130%	Yes	3,049
FY 2011	BONNEVILLE POWER ADMINISTRATION	1966	2011	6,647	6,647	7.130%	No	6,647
FY 2011	BONNEVILLE POWER ADMINISTRATION	1966	2011	1,714	1,714	7.130%	Yes	1,714
FY 2011	BPA PROGRAM	1998	2011	40,000	40,000	6.200%	No	40,000
FY 2011	BPA PROGRAM	2001	2011	25,000	25,000	5.950%	No	25,000
FY 2011	BPA PROGRAM	2001	2011	50,000	50,000	5.750%	No	50,000
FY 2011	BONNEVILLE POWER ADMINISTRATION	1970	2015	64,977	13,689	7.270%	No	13,689
FY 2011	BONNEVILLE POWER ADMINISTRATION	1974	2019	12,563	12,563	7.270%	No	12,073
FY 2011	BONNEVILLE POWER ADMINISTRATION	1974	2019	21,826	21,826	7.270%	Yes	21,826
SUB-TOTAL		-	-	237,606	186,318	-	Yes	185,828
FY 2012	BONNEVILLE POWER ADMINISTRATION	1967	2012	19,003	19,003	7.160%	No	19,003
FY 2012	BONNEVILLE POWER ADMINISTRATION	1967	2012	4,566	4,566	7.160%	Yes	4,566
FY 2012	BONNEVILLE POWER ADMINISTRATION	1967	2012	14,300	14,300	7.160%	No	14,300
FY 2012	BONNEVILLE POWER ADMINISTRATION	1967	2012	3,436	3,436	7.160%	Yes	3,436
FY 2012	ENVIRONMENT	1997	2012	40,000	40,000	6.950%	No	40,000
FY 2012	BONNEVILLE POWER ADMINISTRATION	1974	2019	12,079	12,079	7.270%	No	12,079
FY 2012	BONNEVILLE POWER ADMINISTRATION	1974	2019	20,984	20,984	7.270%	Yes	20,984
FY 2012	BONNEVILLE POWER ADMINISTRATION	1974	2019	12,563	490	7.270%	No	490
FY 2012	BONNEVILLE POWER ADMINISTRATION	1975	2020	32,026	32,026	7.250%	No	22,576
FY 2012	BONNEVILLE POWER ADMINISTRATION	1975	2020	21,916	21,916	7.250%	Yes	21,916
FY 2012	BONNEVILLE POWER ADMINISTRATION	1975	2020	17,158	17,158	7.250%	No	17,158
FY 2012	BONNEVILLE POWER ADMINISTRATION	1975	2020	11,742	11,742	7.250%	Yes	11,742
SUB-TOTAL		-	-	209,773	197,700	-	Yes	188,250
FY 2013	BONNEVILLE POWER ADMINISTRATION	1968	2013	41,070	41,070	7.200%	No	41,070
FY 2013	BONNEVILLE POWER ADMINISTRATION	1968	2013	8,076	8,076	7.200%	Yes	8,076
FY 2013	BONNEVILLE POWER ADMINISTRATION	1968	2013	23,202	23,202	7.200%	No	23,202
FY 2013	BONNEVILLE POWER ADMINISTRATION	1968	2013	4,562	4,562	7.200%	Yes	4,562
FY 2013	BONNEVILLE POWER ADMINISTRATION	1969	2014	42,237	42,237	7.230%	No	42,237
FY 2013	BONNEVILLE POWER ADMINISTRATION	1969	2014	22,537	22,537	7.230%	Yes	22,537
FY 2013	BONNEVILLE POWER ADMINISTRATION	1969	2014	384	384	7.230%	No	384
FY 2013	BONNEVILLE POWER ADMINISTRATION	1969	2014	205	205	7.230%	Yes	205
FY 2013	BONNEVILLE POWER ADMINISTRATION	1975	2020	32,026	9,450	7.250%	No	9,450
FY 2013	BONNEVILLE POWER ADMINISTRATION	1976	2021	61,025	61,025	7.230%	No	37,914
FY 2013	BONNEVILLE POWER ADMINISTRATION	1976	2021	2,212	2,212	7.230%	Yes	2,212
SUB-TOTAL		-	-	237,536	214,960	-	Yes	191,849
FY 2014	BPA PROGRAM	1999	2014	59,050	59,050	5.900%	No	59,050
FY 2014	BONNEVILLE POWER ADMINISTRATION	1976	2021	61,025	23,111	7.230%	No	23,111
FY 2014	BONNEVILLE POWER ADMINISTRATION	1977	2022	3,948	3,948	7.210%	No	3,948
FY 2014	BONNEVILLE POWER ADMINISTRATION	1977	2022	5,380	5,380	7.210%	Yes	5,380
FY 2014	BONNEVILLE POWER ADMINISTRATION	1977	2022	33,702	33,702	7.210%	No	33,702
FY 2014	BONNEVILLE POWER ADMINISTRATION	1977	2022	4,981	4,981	7.210%	Yes	4,981
FY 2014	BPA PROGRAM	2004	2039	316,633	316,633	7.180%	No	62,094
SUB-TOTAL		-	-	484,719	446,805	-	Yes	192,266
FY 2015	BONNEVILLE POWER ADMINISTRATION	1970	2015	64,977	-0	7.270%	No	-0
FY 2015	BONNEVILLE POWER ADMINISTRATION	1970	2015	24,412	-0	7.270%	No	-0
FY 2015	BPA PROGRAM	2004	2039	316,633	254,539	7.180%	No	188,786
SUB-TOTAL		-	-	406,022	254,539	-	No	188,786

FY 2016 BPA PROGRAM	2002	2017	108,010	108,010	6.060%	No	64,839
FY 2016 BPA PROGRAM	2004	2039	316,633	65,753	7.180%	No	65,753
FY 2016 BPA PROGRAM	2005	2040	267,831	267,831	7.100%	No	63,896
SUB-TOTAL	-	-	692,474	441,594	-	No	194,487
FY 2017 BPA PROGRAM	2002	2017	60,000	60,000	6.060%	No	60,000
FY 2017 BPA PROGRAM	2002	2017	100,000	100,000	6.060%	No	100,000
FY 2017 BPA PROGRAM	2002	2017	108,010	43,171	6.060%	No	43,171
SUB-TOTAL	-	-	268,010	203,171	-	No	203,171
FY 2018 ENVIRONMENT	2003	2018	2,675	2,675	6.560%	No	2,675
FY 2018 BPA PROGRAM	2005	2040	267,831	203,935	7.100%	No	192,927
SUB-TOTAL	-	-	270,506	206,610	-	No	195,602
FY 2019 BONNEVILLE POWER ADMINISTRATION	1974	2019	12,563	-0	7.270%	No	-0
FY 2019 ENVIRONMENT	2004	2019	7,369	7,369	6.770%	No	7,369
FY 2019 BPA PROGRAM	2005	2040	267,831	11,009	7.100%	No	11,009
FY 2019 BPA PROGRAM	2006	2041	111,674	111,674	7.100%	Yes	111,674
FY 2019 BPA PROGRAM	2007	2042	116,348	116,348	7.100%	Yes	67,885
SUB-TOTAL	-	-	515,785	246,400	-	Yes	197,937
FY 2020 ENVIRONMENT	2005	2020	5,414	5,414	6.690%	No	5,414
FY 2020 BPA PROGRAM	2007	2042	116,348	48,463	7.100%	Yes	48,463
FY 2020 BPA PROGRAM	2008	2043	120,579	120,579	7.100%	Yes	120,579
FY 2020 BPA PROGRAM	2009	2044	124,617	124,617	7.100%	Yes	25,305
SUB-TOTAL	-	-	366,958	299,073	-	Yes	199,760
FY 2021 BPA PROGRAM	2009	2044	124,617	99,312	7.100%	Yes	99,312
FY 2021 BPA PROGRAM	2010	2045	128,630	128,630	7.100%	Yes	101,960
SUB-TOTAL	-	-	253,247	227,942	-	Yes	201,272
FY 2022 BPA PROGRAM	2010	2045	128,630	26,670	7.100%	Yes	26,670
FY 2022 BPA PROGRAM	2011	2046	132,612	132,612	7.100%	Yes	132,612
FY 2022 BPA PROGRAM	2012	2047	136,699	136,699	7.100%	Yes	43,639
SUB-TOTAL	-	-	397,941	295,981	-	Yes	202,920
FY 2023 BPA PROGRAM	1998	2023	106,600	106,600	5.850%	No	106,600
FY 2023 BPA PROGRAM	2012	2047	136,699	93,060	7.100%	Yes	93,060
FY 2023 BPA PROGRAM	2013	2048	140,962	140,962	7.100%	Yes	9,970
SUB-TOTAL	-	-	384,261	340,622	-	Yes	209,631
FY 2024 BPA PROGRAM	2013	2048	140,962	130,992	7.100%	Yes	130,992
FY 2024 BPA PROGRAM	2014	2049	145,372	145,372	7.100%	Yes	74,266
SUB-TOTAL	-	-	286,334	276,364	-	Yes	205,257
FY 2025 BPA PROGRAM	2014	2049	145,372	71,106	7.100%	Yes	71,106
FY 2025 BPA PROGRAM	2015	2050	149,712	149,712	7.100%	Yes	135,513
SUB-TOTAL	-	-	295,084	220,818	-	Yes	206,619
FY 2026 BPA PROGRAM	2015	2050	149,712	14,199	7.100%	Yes	14,199
FY 2026 BPA PROGRAM	2016	2051	153,948	153,948	7.100%	Yes	153,948
FY 2026 BPA PROGRAM	2017	2052	158,066	158,066	7.100%	Yes	39,667
SUB-TOTAL	-	-	461,726	326,213	-	Yes	207,814
FY 2027 BPA PROGRAM	2017	2052	158,066	118,399	7.100%	Yes	118,399
FY 2027 BPA PROGRAM	2018	2053	161,972	161,972	7.100%	Yes	90,579
SUB-TOTAL	-	-	320,038	280,371	-	Yes	208,977
FY 2028 BPA PROGRAM	1998	2028	112,300	112,300	5.850%	No	112,300
FY 2028 BPA PROGRAM	2018	2053	161,972	71,393	7.100%	Yes	71,393
FY 2028 BPA PROGRAM	2019	2054	165,862	165,862	7.100%	Yes	32,025
SUB-TOTAL	-	-	440,134	349,555	-	Yes	215,718
FY 2029 BPA PROGRAM	1998	2029	50,000	50,000	6.650%	No	50,000
FY 2029 BPA PROGRAM	2019	2054	165,862	133,837	7.100%	Yes	133,837
FY 2029 BPA PROGRAM	2020	2055	169,724	169,724	7.100%	Yes	29,046
SUB-TOTAL	-	-	385,586	353,561	-	Yes	212,883
FY 2030 BPA PROGRAM	2020	2055	169,724	140,678	7.100%	Yes	140,678
FY 2030 BPA PROGRAM	2021	2056	173,415	173,415	7.100%	Yes	70,697
SUB-TOTAL	-	-	343,139	314,093	-	Yes	211,375

FY 2031 BPA PROGRAM	2021	2056	173,415	102,718	7.100%	Yes	102,718
FY 2031 BPA PROGRAM	2022	2057	176,899	176,899	7.100%	Yes	109,568
SUB-TOTAL	-	-	350,314	279,617	-	Yes	212,286
FY 2032 BPA PROGRAM	1998	2032	98,900	98,900	6.700%	No	98,900
FY 2032 BPA PROGRAM	2022	2057	176,899	67,331	7.100%	Yes	67,331
FY 2032 BPA PROGRAM	2023	2058	180,232	180,232	7.100%	Yes	51,883
SUB-TOTAL	-	-	456,031	346,463	-	Yes	218,115
FY 2033 BPA PROGRAM	1993	2033	110,000	110,000	6.950%	No	110,000
FY 2033 BPA PROGRAM	2023	2058	180,232	128,349	7.100%	Yes	109,637
SUB-TOTAL	-	-	290,232	238,349	-	Yes	219,637
FY 2034 BPA PROGRAM	1994	2034	50,000	50,000	7.050%	No	50,000
FY 2034 BPA PROGRAM	1994	2034	50,000	50,000	6.850%	No	50,000
FY 2034 BPA PROGRAM	1994	2034	108,400	108,400	6.850%	No	108,400
FY 2034 BPA PROGRAM	2023	2058	180,232	18,712	7.100%	Yes	17,167
SUB-TOTAL	-	-	388,632	227,112	-	Yes	225,567
FY 2035 BPA PROGRAM	2023	2058	180,232	1,545	7.100%	Yes	1,545
FY 2035 BPA PROGRAM	2024	2059	183,355	183,355	7.100%	Yes	183,355
FY 2035 BPA PROGRAM	2025	2060	186,194	186,194	7.100%	Yes	32,205
SUB-TOTAL	-	-	549,781	371,094	-	Yes	217,105
FY 2036 BPA PROGRAM	2025	2060	186,194	153,989	7.100%	Yes	153,989
FY 2036 BPA PROGRAM	2026	2061	188,754	188,754	7.100%	Yes	64,126
SUB-TOTAL	-	-	374,948	342,743	-	Yes	218,114
FY 2037 BPA PROGRAM	2003	2038	352,497	352,497	7.010%	No	120,908
FY 2037 BPA PROGRAM	2026	2061	188,754	124,628	7.100%	Yes	103,840
SUB-TOTAL	-	-	541,251	477,125	-	Yes	224,748
FY 2038 BPA PROGRAM	2003	2038	352,497	231,589	7.010%	No	231,589
FY 2038 BPA PROGRAM	2026	2061	188,754	20,788	7.100%	Yes	1
SUB-TOTAL	-	-	541,251	252,377	-	Yes	231,590
FY 2039 BPA PROGRAM	2026	2061	188,754	20,787	7.100%	Yes	20,787
FY 2039 BPA PROGRAM	2027	2062	191,075	191,075	7.100%	Yes	191,075
FY 2039 BPA PROGRAM	2028	2063	193,239	193,239	7.100%	Yes	11,293
SUB-TOTAL	-	-	573,068	405,101	-	Yes	223,156
FY 2040 BPA PROGRAM	2005	2040	267,831	-0	7.100%	No	-0
FY 2040 BPA PROGRAM	2028	2063	193,239	181,946	7.100%	Yes	181,946
FY 2040 BPA PROGRAM	2029	2064	195,064	195,064	7.100%	Yes	42,613
SUB-TOTAL	-	-	656,134	377,010	-	Yes	224,558
FY 2041 BPA PROGRAM	2029	2064	195,064	152,451	7.100%	Yes	152,451
FY 2041 BPA PROGRAM	2030	2065	196,662	196,662	7.100%	Yes	78,274
SUB-TOTAL	-	-	391,726	349,113	-	Yes	230,726
GRAND TOTAL	-	-	13,894,709	10,784,024	-	Yes	7,802,440

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CHAPTER 12

REPAYMENT STUDY
THEORY AND OPERATION

Repayment Theory of Operation

Introduction

The BPA is required to collect revenues sufficient to meet BPA's annual transmission expenses and cover the long-term obligations of the Federal Columbia River transmission system (FCRTS).

The Repayment Program is used to determine whether a given set of annual revenues is sufficient to meet a given set of annual expenses and cover a given set of long-term obligations when applied in accordance with the requirements of Department of Energy (DOE) Order RA 6120.2. The Program is also used to determine by the minimum factor future revenues can be multiplied by to obtain a new set of revenues which will be sufficient to recover amortization costs.

The revenues and the expenses of the cost evaluation year will be assigned to all future years. This will have the effect of assigning the net operating revenue of the cost evaluation year to all future years. This has the effect of levelizing the long-term obligations over all future years.

This discussion presents the basic theory upon which the operation of the Program is based, using a minimum of terms for clarity. The complications, how they are incorporated into the program and the effects they have upon the operation of the Program are discussed.

Basic Theory

Given sets of annual revenues and annual expenses, a set of (annual) net operating revenues can be immediately obtained by subtracting the expenses from the revenues. These net operating revenues will be used for paying interest expenses and amortization payments on the long-term obligations.

Compliance with RA 6120.2 requires satisfying, for each year (i), the equation:

(1) net revenues(i) = interest expense(i) + $\sum_{j}$ payment(i, j) i= 1, 2, . . ., n

Note that for each year the payments have been summed over all obligations.

For each obligation (j) the equation:

(2) $\sum_{i=1}^{k}$ payment(i, j) < principle(j) j= 1,2, . . ., m,

for all k

must be satisfied. Note that for each obligation the payments have been summed over the years.

This set of equations has too many unknowns (payments on the principle balances) to solve simultaneously. RA 6120.2 requires that "to the extent possible, while still complying with the repayment periods established for each investment, amortization of the investment will be accompanied by application to the highest interest-bearing investment first." A method will be established for "complying with the repayment periods established for each investment" and then the investments will be amortized by "application to the highest-interest-bearing investment first" to the extent that compliance permits.

The first equation above is defined for each year and the payments are summed over the investments. The second equation is defined for each investment and the payments are summed over the years. This suggests that if the first set of equations is summed over the years and the second set of equations is summed over the investments, then it may be possible to eliminate the unknown payments between the two sets of equations:

(3) $\sum_{i=1}^{k}$ net revenues(i) - $\sum_{i=1}^{k}$ interest expense(i) k is the year the study is working on

$$= \sum_{i=1}^{k} \sum_{j} \text{payment}(i, j) \qquad k = 1, 2, \ldots, n,$$

$$= \sum_{j} \sum_{i=1}^{k} \text{payment}(i, j) \qquad k = 1, 2, \ldots, n,$$

$$= \sum_{due} \sum_{i=1}^{k} \text{payment}(i, j) + \sum_{not\ due} \sum_{j=1}^{k} \text{payment}(i, j) \qquad k = 1, 2, \ldots, n,$$

$$= \sum_{due} \text{payment}(i, j) + \sum_{not\ due} \sum_{j=1}^{k} \text{payment}(i, j) \qquad k = 1, 2, \ldots, n.$$

Thus we obtain the *predictor* equation:

$$(4) \sum_{i=1}^{k} \text{net revenues}(i) - \sum_{i=1}^{k} \text{interest expense}(i) - \sum_{due} \text{principle}(j)$$

$$= \sum_{not\ due} \sum_{i=1}^{k} \text{payment}(i, j) \qquad k = 1, 2, \ldots, n.$$

For each of the future years the right-hand side of the above equation represents the amount of the accumulated payments on “not due,” i.e., "highest interest" investments. The left side indicates how the amount of payments which can be made on these investments in compliance with RA 6120.2 can be evaluated. If, for some future year, this amount is evaluated as being zero or negative, then this equation implies that no payment can be made on an investment which is "not due" until a later year and still comply with RA 6120.2. Accordingly, if the amount is evaluated as being zero or negative for any future year, then payments can be made only on "highest interest" investments which come due on or before the first such year.

Thus, a new equation is obtained for each year (k). Payments will be made on the highest interest-bearing investment which permits compliance with sets of equations (1), (2) and (4).

The amount paid will be the maximum amount which permits compliance with these three sets of equations.

Application

The fourth set of equations has the problem that a payment made in the current year will affect interest expenses in future years since interest will no longer have to be paid on that portion of the investment. This problem is currently solved by using an iterative approach (i.e., a method of successive approximations). The program finally includes no future interest in evaluating the left-hand side of the fourth set of equations. Consequently, the evaluation of revenues available for "not due" payments will be excessive. As the years are processed and the interest of a given year becomes known, it is used in the fourth set of equations for all later years. The fourth set of equations is thus modified, and the evaluation of revenues available for "not due" payments is reduced. Amortizing some investment on its due date could violate equations of the first and fourth sets; then a negative balance will occur. A second iteration will be necessary.

In the second iteration, the interest payments from the first iteration will be used for future years. Since "not due" payments were excessive in the first iteration, the interest payments of the first iteration will be less than the true interest payments. But they will be more accurate than no interest at all and negative balances will be reduced.

If the revenues are sufficiently high, then with successive iterations the interest expenses will converge and the balances will be reduced to zero. A solution is found. But, if the revenues are not sufficiently high, then compliance with the fourth set of equations will force payments on high-interest obligations to be delayed into the future. This will cause an increase in the interest charges leaving still less revenues available for the high-interest obligations. With successive

iterations, interest expenses will converge and negative balances will increase. No solution is found.

Deferral of Annual Expenses

If a set of revenues determined by a set of basic revenues and an assumed rate change cause deferral of annual expenses in any given year, it is necessary to modify the revenue equation for that year to the form:

deferral + net revenue = interest expense

and, for one or more later years, to the form:

net revenue = interest expense + payment on deferral + amortization.

Any change in the revenue equation will manifest itself in the predictor equation, and equation (4) must be modified accordingly.

These deferrals and payments on deferral are initially assumed to be zero. When their values are actually determined, they are used in equation (4) for future years and they are saved in tables so that in case another iteration is necessary, the deferrals and payments from this iteration can be used in the place of future deferrals and payments for the next iteration.

Historical deferrals are processed similar to other investments with the exception that in accordance with RA 6120.2, they are amortized before any other investment.

Calculation of Interest Expense

Annual interest is computed by applying the applicable interest rate (r) to that portion of the principle (p) which was unpaid at the beginning of the year in accordance with RA 6120.2. The interest on a new obligation is half this amount as specified.

BPA is authorized to accrue an interest credit on its cash balance as an offset against its interest expense. For lack of more detailed information, the net revenues are assumed to accumulate, at a uniform rate throughout the year, except for the interest paid on the bonds at midyear.

If it were assumed that the half-year's interest on new obligations implied that all new obligations came at midyear, then there would never be any mid-year interest on a new bond. It will, instead, be assumed that new bonds have a uniform probability of I/T of coming in at any time of the year, where T is equal to one year. Then the probability that the bond will come in by the time (t) is

$$\int_0^t (1/T)dt = t/T \Big|_{t=0}^{t=t} = t/T.$$

The probability that it will come in by the end of the year T is T/T = 1.
(This result can be seen without calculus). Assume that t and T are expressed in days and the year is not a leap year. By assumption the probability that the bond will come in on any particular day is 1/365. Thus, the probability that the bond has come in on or before day t is

(t)(1/365) = t/365 = t/T.

For example, suppose that we want to find the probability that a given bond came in on or before the 100th day of the year. The desired probability is

(100)(1/365) = 100/365 = t/T.

The amount of interest that the bond will probably incur during a time interval (dt) coming at time (t) is the probability that the bond has come in multiplied by the amount of interest that the bond would incur in that interval:

$$di = (t/T)rpdt.$$

The amount of interest which will probably be incurred by time (t) is:

$$i = \int_0^t di = \int_0^t (t/T)rp\, dt = (t^2/2T)\, rp \Big|_{t=0}^{t=t} = (t^2/2T)\, rp.$$

In particular, the amount of interest incurred by midyear (T/2) would be rpT/8; and the amount incurred by the end of the year would be rpT/2, which is consistent with RA 6120.2. (Midyear and end-of-year interest on new bonds can also be derived without calculus. We will consider the midyear interest first. To compute probable midyear interest on new bonds, note that the probability of the bond issue date being in the first half year is 1/2. If the bond issue date is in the first half year, it will, on the average, accrue interest for half of the first half the first year. Midyear interest on new bonds will be only 1/2 of the interest of a full year. Since interest for an entire year is

$$i = rpT,$$

mid-year interest on a new bond will be

$$i = (1/2)^3\, rpT = rpT/8.$$

Interest on new bonds for the whole year is

$$i = rpT/2$$

because, on average, the bond will have incurred interest for only half of the year.)

Premiums and Call Provisions

BPA's current bonds either have a provision that they cannot be redeemed for at least five years and that a premium must be paid if they are redeemed before the due date; a provision that they cannot be redeemed for at least five years and that a premium must be paid if they are redeemed

five years before the due date; or, a provision that they can be called within five years without paying a premium. The premium calculation is a fraction of one year's interest which is proportional to the life of the bond. This premium must be included in the revenue equation and, as a consequence, will manifest itself in the predictor equation.

The first method used for incorporating the premiums in the solution method was to save the annual premiums between iterations and use those of the previous iteration to predict the future annual premiums. This resulted in some instability when premiums shifted from one year to another. It resulted in an inability to solve when the revenues were close to the minimum revenues.

The second method was to consider the premium as being the amount which *would be* paid in the current year, but as being "due" when the principle was due. But, since the *would-be* premium decreased each year until actually paid, the predictor equation was adjusted each year to reflect the reduction in the premiums. This tended to introduce an inaccuracy in the predictor equation. Adjustment of the predictor equation for changes in premiums would make a small amount of revenues available in the following year for amortizing high-interest investments.

The premium actually paid is still stored by the year it is paid, for use in the output routines. The premium *actually paid* is now also stored by the year that the principle is due. 'This "predicted penalty" is used in the predictor equation for the following iteration. With this modification any change in premium always affects the predictor equation in the same year, the year that the principle is due. This change only occurs when the premium is actually paid, and the amount of this change decreases as the solution converges.

The premiums also affect the "highest interest first" selection process. If the life of the bond is (T) and the time of redemption is (t), then the premium is given by the equation:

$$\text{premium} = rp(T-t)/T.$$

or if the bond has a callable at par provision in the remaining (t1) Years of its life, the premium is given by the equation:

$$\text{premium} = rp(T-t-t1)/(T-t1) \quad \text{if} \quad t \leq (T-t1) \text{ otherwise premium} = 0$$

The total interest paid on the bond is given by the equation:

$$\text{interest} = rpt.$$

Combining the two we get:

$$\text{interest} + \text{premium} = rpt + rp(T-t)/T$$

$$= rpt(1-1/T) + rp.$$

or, in the case of the bond callable at par

$$\text{interest} + \text{premium} = rpt + rp(T-t-t1)/(T-t1)$$

$$= rpt(1-1/(T-t1)) + rp$$

$$\text{if } t > T-t1 \quad \text{then} \quad = rpt$$

Thus, such a premium is equivalent to a fixed premium together with a reduced interest rate. This fixed premium must be paid (unless bond is callable at par) regardless of when the bond is redeemed. This "reduced" interest rate will be used when comparing obligations to determine

which one should be retired first.

Surplus Revenues

In the later years of the Study (and conceivably at any time during the Study), there may be revenues available but nothing on which to expend them on. Thus, a "surplus" term must be included in the revenue equation and will consequently manifest itself in the predictor equation. Since the surplus is not obligatory, it will be carried on the right-hand side of the predictor equation.

Minimizing Revenues

The repayment program has provisions for determining a set of minimum revenues sufficient to meet a given set of annual expenses and cover a given set of long-term obligations.

If unequal maximum and minimum revenue change parameters are supplied to the program, or if the (unequal) default parameters are used, then the program will perform a *binary search* to determine the minimum sufficient revenues. The set of revenues is multiplied by the minimum revenue change and the resulting revenues are tested for sufficiency. If revenues are not sufficient, this is indeed a minimum revenue change, e.g., no lower change will provide sufficient revenues. If sufficient, then this revenue becomes a maximum; it is divided by two to obtain a new minimum candidate and this cycle is repeated, if necessary, until a minimum change is obtained.

If a maximum has not yet been determined, then the given revenues are multiplied by the maximum revenue change and the resulting revenues are tested for sufficiency. If sufficient, this is indeed a maximum revenue change, i.e., the maximum of the range we must consider. If insufficient, then this revenue change becomes a new minimum: it is multiplied by two to obtain

a new maximum candidate and this cycle is repeated, if necessary, until a maximum change is obtained.

A revenue change halfway between the present maximum and minimum is now determined and the resulting revenues are tested for sufficiency. If sufficient, this midpoint becomes a new maximum; if insufficient, it becomes a new minimum. In either case, the difference between the maximum and the minimum is only half of what it was previously. If this difference is greater than some specified (or default) accuracy, then this cycle is repeated until the difference is less than the specified accuracy. When this difference is less than the specified accuracy, then the current maximum rate change provides the *minimum sufficient* revenues at this accuracy.

REPAYMENT PROGRAM LOGIC

The diagrams on the following pages show the flow of logic in BPA's repayment program. The first diagram shows the logic of the binary search used to locate minimum sufficient revenues. A necessary part of this search is the test for sufficiency. The logic of the test for sufficiency is shown on the remaining two diagrams.

The equations which are referred to are:

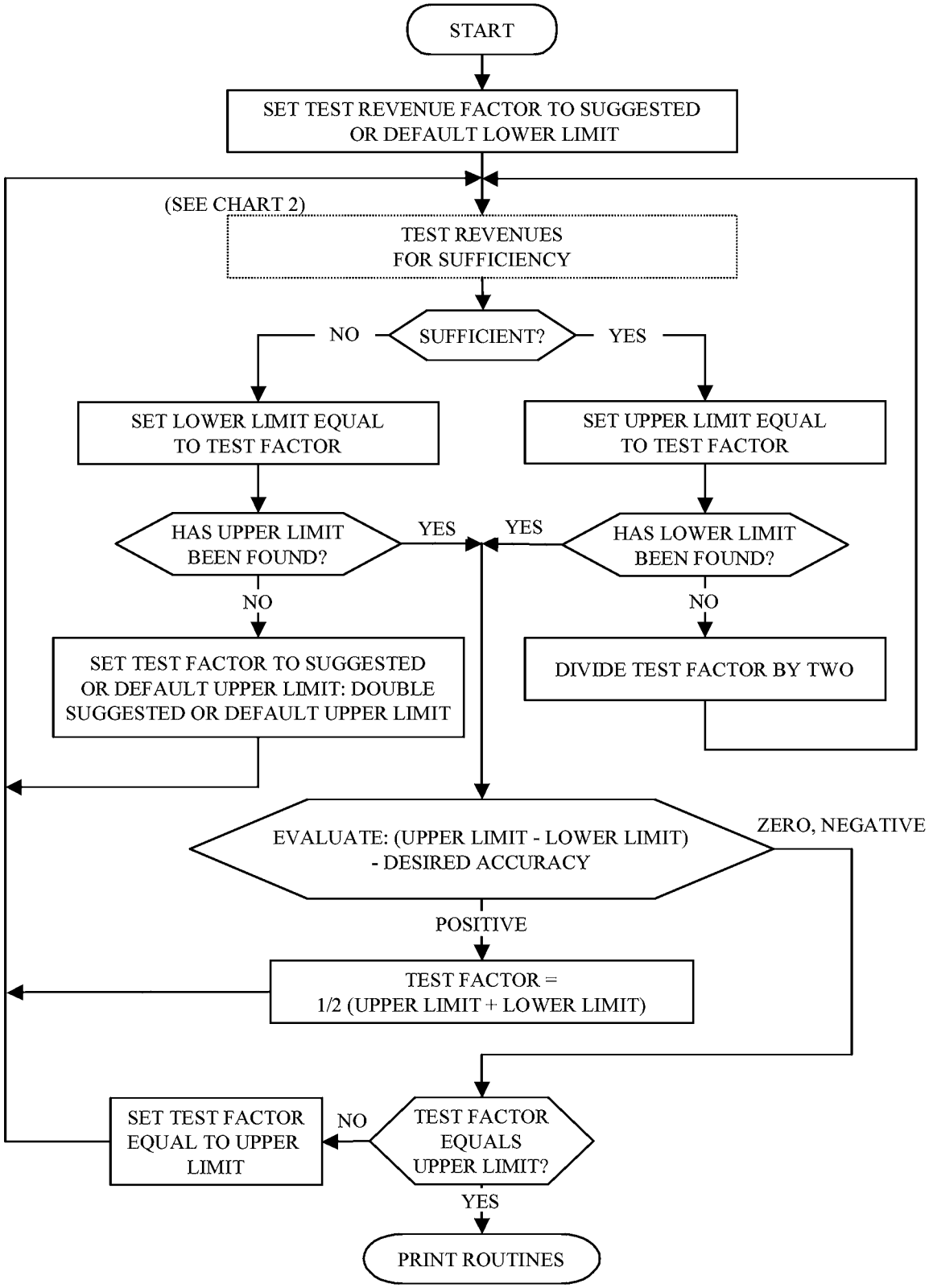
Revenue Equation: Net revenues of each year are expended on interest and payments on the principles.

Investment equation: The payments on each investment are less than or equal to the principle of that investment (and equal to the principle of that investment after the investment is due).

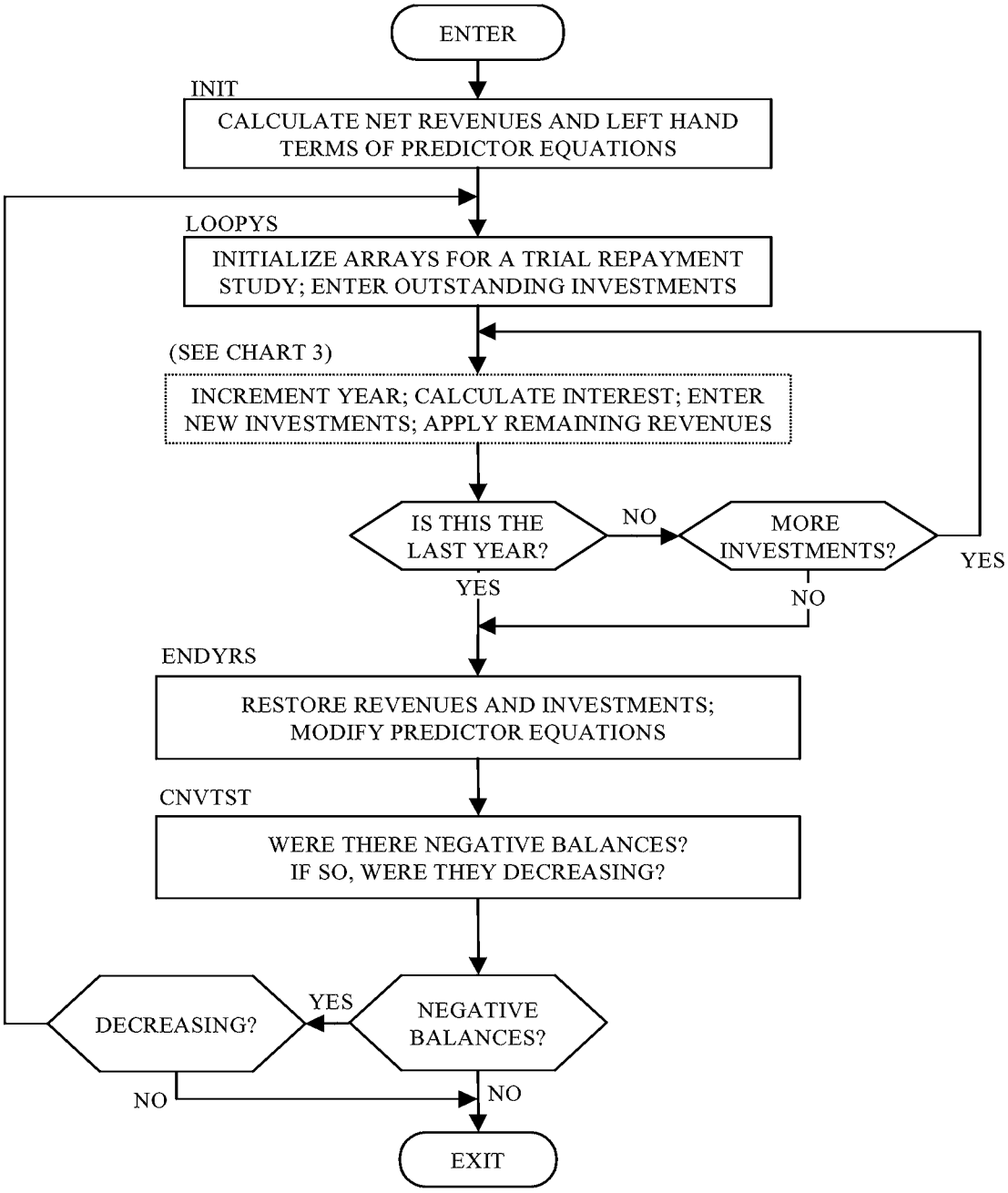
Predictor equation: For each future year the accumulated revenues less the accumulated interest less the accumulated investments due is equal to the accumulated payments on high interest rate investments which are not due.

These equations are developed in more detail elsewhere in both the Study and the Documentation.

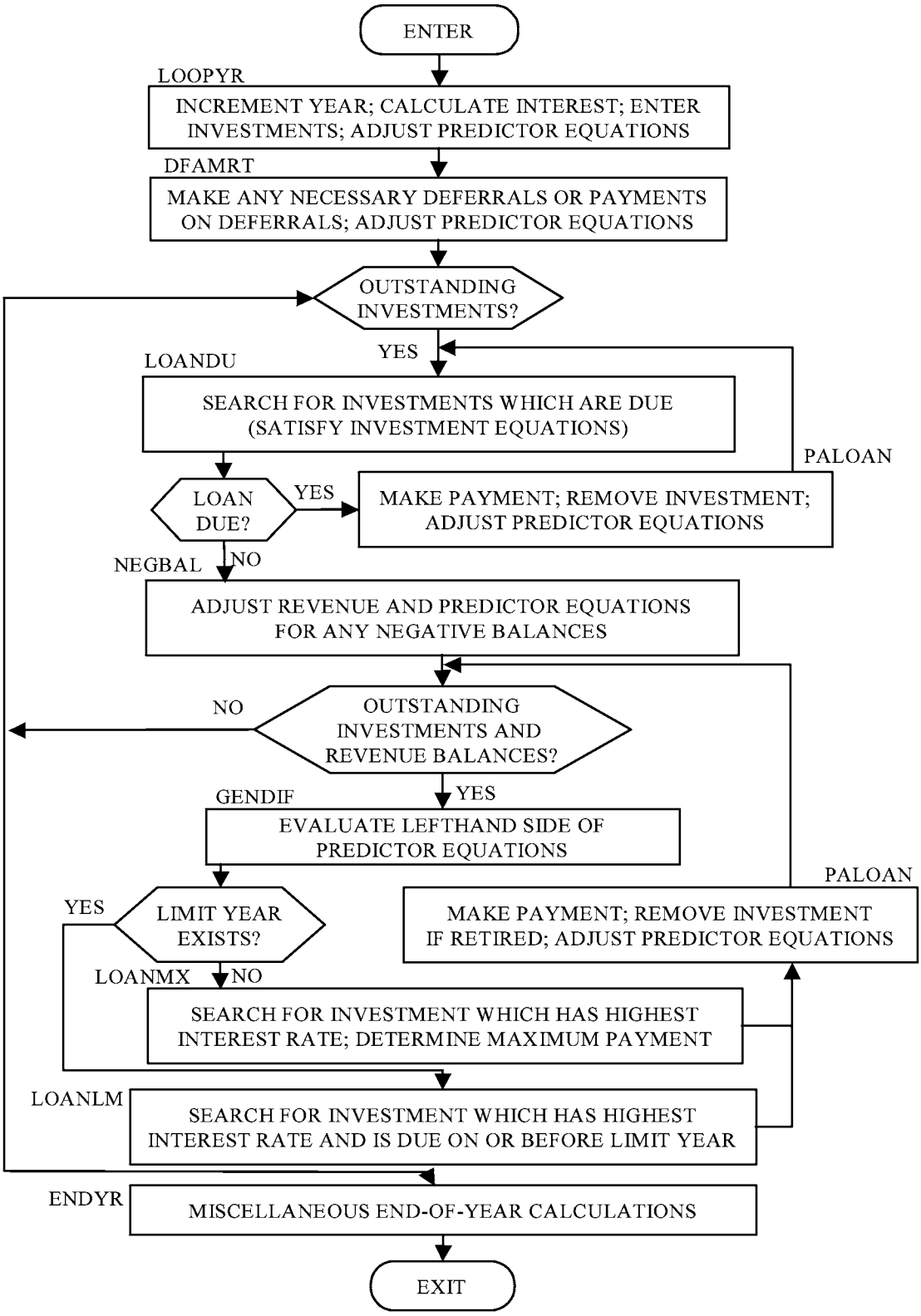
REPAYMENT PROGRAM
(BINARY SEARCH)
CHART 1



REPAYMENT PROGRAM
(TEST FOR SUFFICIENCY)
CHART 2



REPAYMENT PROGRAM
(APPLICATION OF REVENUES)
CHART 3



CHAPTER 13

TRANSMISSION REVENUE FORECAST

TRANSMISSION REVENUE FORECAST AT CURRENT RATES

			(A) RateLevel	(B) RateUnits	(C) FY2003 ($000)	(D) FY2004 ($000)	(E) FY2005 ($000)
	Long-Term						
	Network						
1	FPT.1	Formula Power Transmission	0.942	($/kW-mo.)	29,023	28,710	26,311
2	FPT.3	Formula Power Transmission	0.739	($/kW-mo.)	6,347	6,347	6,347
3	IR	Integration of Resources	1.243	($/kW-mo.)	68,393	68,393	68,393
4	PTP	Point to Point	1.013	($/kW-mo.)	173,525	191,082	198,263
5	NT	Network Integration Transmission, Base Charge	1.013	($/kW-mo.)	59,600	61,061	62,524
6	NT	Network Integration Transmission, Load Shaping	0.404	($/kW-mo.)	27,041	27,586	28,019
	PSW Intertie						
7	IS	Intertie South Assured Delivery	1.159	($/kW-mo.)	5,104	5,219	5,181
8	IS	Intertie South	1.159	($/kW-mo.)	62,452	74,049	74,087
	Short-Term						
	Network						
9	PTP	Monthly,Weekly,Daily Block 1	0.046	($/kW-day)	1,595	5,201	6,476
10	PTP	Monthly,Weekly,Daily Block 2	0.034	($/kW-day)	9,509	8,085	10,148
11	PTP	Hourly	2.92	($/MWh)	13,595	23,981	30,525
	PSW Intertie						
12	IS	Monthly,Weekly,Daily Block 1	0.053	($/kW-day)	1,720	717	2,002
13	IS	Monthly,Weekly,Daily Block 2	0.039	($/kW-day)	11,578	5,749	10,484
14	IS	Hourly	3.34	($/MWh)	913	1,724	2,975
	Delivery						
15	NT/PTP	Utility	0.932	($/kW-mo.)	3,510	2,636	2,687
16	UFT	Industry		($/kW-mo.)	3,971	3,428	3,493
	Ancillary and Control Area Services (ACS)						
	Scheduling Control & Dispatch						
17		Annual	0.164	($/kW-mo.)	47,743	52,037	53,437
18		Monthly,Weekly,Daily Block 1	0.008	($/kW-day)	537	1,013	1,429
19		Monthly,Weekly,Daily Block 2	0.005	($/kW-day)	1,899	1,926	2,837
20		Hourly	0.47	($/MWh)	2,298	4,102	5,332
	Generation Supplied Reactive						
21		Annual	0.066	($/kW-mo.)	19,176	20,942	21,505
22		Monthly,Weekly,Daily Block 1	0.003	($/kW-day)	201	380	536
23		Monthly,Weekly,Daily Block 2	0.002	($/kW-day)	751	770	1,135
24		Hourly	0.19	($/MWh)	960	1,658	2,155
	Operating Reserves						
25		Spinning	8.27	($/MWh)	22,607	20,885	20,885
26		Supplemental	8.27	($/MWh)	22,607	20,885	20,885
27		Contingency			0	0	0
28	**Regulation and Frequency Response**		0.30	($/MWh)	12,433	12,079	12,634
29	**Generation Imbalance**				0	0	0
30	**Energy Load Imbalance**				0	0	0
	Revenue Credits						
31	AC/NFPDEPR	AC rate and NFP Depreciation			5,475	5,780	5,780
32	CSPE/SUPCAP	Columbia Storage Pwr Exchange			156	0	0
33	DIRCBUR	Direct Corp and Bureau			1,854	1,854	1,854
34	FIBER	Fiber			11,905	12,765	2,781
35	GI	Generation Integration Costs			7,235	7,235	7,235
36	O&M	Operation and Maintenance Srvcs			843	1,035	1,084
37	PCW	Wireless Personal Communications			3,277	3,444	3,620
38	PFP	Power Factor Penalty			3,190	2,332	2,332
39	RAS	PSW Remedial Action Scheme			139	139	139
40	RSRV CHRG	Long-Term Reservation Fees			1,136	1,295	1,302
41	TGT	Townsend Garrison Transmission			9,796	9,840	9,840
42	UDU	Utility Delivery Underrecovery			2,000	0	0
43	UFT	Use of Facilities (utility)			7,701	7,353	7,493
44	Other	Aircraft, Land & Misc Leases			4,089	0	0
45		**Subtotal Network**			**388,628**	**420,446**	**437,007**
46		**Subtotal Intertie**			**81,767**	**87,457**	**94,729**
47		**Subtotal Delivery**			**7,481**	**6,064**	**6,180**
48		**Subtotal Ancillary**			**131,212**	**136,678**	**142,769**
49		**Subtotal Revenue Credits**			**58,796**	**53,072**	**43,460**
50		**Total TBL**			**667,884**	**703,717**	**724,145**

TRANSMISSION REVENUE FORECAST AT PROPOSED RATES

			(A) RateLevel	(B) RateUnits	(C) FY2004 ($000)	(D) FY2005 ($000)
Long-Term						
Network						
1	FPT.1	Formula Power Transmission	0.956	($/kW-mo.)	29,137	26,702
2	FPT.3	Formula Power Transmission	0.761	($/kW-mo.)	6,347	6,536
3	IR	Integration of Resources	1.261	($/kW-mo.)	69,383	69,383
4	PTP	Point to Point	1.028	($/kW-mo.)	193,912	201,199
5	NT	Network Integration Transmission, Base Charge	1.028	($/kW-mo.)	61,965	63,450
6	NT	Network Integration Transmission, Load Shaping	0.425	($/kW-mo.)	29,020	29,476
PSW Intertie						
7	IS	Intertie South Assured Delivery	1.176	($/kW-mo.)	5,296	5,257
8	IS	Intertie South	1.176	($/kW-mo.)	75,135	75,173
Short-Term						
Network						
9	PTP	Monthly,Weekly,Daily Block 1	0.047	($/kW-day)	5,314	6,617
10	PTP	Monthly,Weekly,Daily Block 2	0.035	($/kW-day)	8,323	10,447
11	PTP	Hourly	2.96	($/MWh)	24,309	30,943
PSW Intertie						
12	IS	Monthly,Weekly,Daily Block 1	0.054	($/kW-day)	730	2,040
13	IS	Monthly,Weekly,Daily Block 2	0.040	($/kW-day)	5,897	10,753
14	IS	Hourly	3.39	($/MWh)	1,750	3,020
Delivery						
15	NT/PTP	Utility	0.946	($/kW-mo.)	2,676	2,728
16	UFT	Industry		($/kW-mo.)	3,428	3,493
Ancillary						
Scheduling Control & Dispatch						
17		Annual	0.166	($/kW-mo.)	52,672	54,088
18		Monthly,Weekly,Daily Block 1	0.008	($/kW-day)	1,013	1,429
19		Monthly,Weekly,Daily Block 2	0.005	($/kW-day)	1,926	2,837
20		Hourly	0.48	($/MWh)	4,190	5,445
Generation Supplied Reactive						
21		Annual	0.067	($/kW-mo.)	21,259	21,831
22		Monthly,Weekly,Daily Block 1	0.003	($/kW-day)	380	536
23		Monthly,Weekly,Daily Block 2	0.002	($/kW-day)	770	1,135
24		Hourly	0.19	($/MWh)	1,658	2,155
Operating Reserves						
25		Spinning	8.39	($/MWh)	21,188	21,188
26		Supplemental	8.39	($/MWh)	21,188	21,188
27		Contingency			0	0
28	**Regulation and Frequency Response**		0.30	($/MWh)	12,079	12,634
29	**Generation Imbalance**				0	0
30	**Energy Load Imbalance**				0	0
Revenue Credits						
31	AC/NFPDEPR	AC-xx/NFP Depreciation			5,780	5,780
32	CSPE/SUPCAP	Columbia Storage Pwr Exchange			0	0
33	DIRCBUR	Direct Corp and Bureau			1,854	1,854
34	FIBER	Fiber			12,765	2,781
35	GI	Generation Integration Costs			7,235	7,235
36	O&M	Operation and Maintenance Srvcs			1,035	1,084
37	PCW	Wireless Personal Communications			3,444	3,620
38	PFP	Power Factor Penalty			2,332	2,332
39	RAS	PSW Remedial Action Scheme			139	139
40	RSRV CHRG	Long-Term Reservation Fees			1,295	1,302
41	TGT	Townsend Garrison Transmission			9,840	9,840
42	UDU	Utility Delivery Underrecovery			0	0
43	UFT	Use of Facilities (utility)			7,353	7,493
44		**Subtotal Network**			**427,710**	**444,752**
45		**Subtotal Intertie**			**88,807**	**96,243**
46		**Subtotal Delivery**			**6,104**	**6,221**
47		**Subtotal Ancillary**			**138,324**	**144,466**
48		**Subtotal Revenue Credits**			**53,072**	**43,460**
49		**Total TBL**			**714,016**	**735,142**

Bonneville Power Administration

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