

INDEX

REBUTTAL TESTIMONY OF

SIDNEY L. CONGER, ARNOLD L. WAGNER, EDWARD L. BLEIFUSS,
ROBERT J. PETTY, ROBERT W. ANDERSON, MARK H. EBBERTS, JON A. HIRSCH,
ELIZABETH A. EVANS, CARL T. BUSKUHL, AND JUERGEN M. BERMEJO

Witnesses for Bonneville Power Administration

SUBJECT: Rebuttal Testimony for Risk Analysis Study and No-Slice Risk Analysis

	Page
Section 1. Introduction and Purpose of Testimony	1
Section 2. Non-Treaty Storage Operations in the Operating Risk Analysis Model.....	2
Section 3. Modeling Anomaly in the Operating Risk Analysis Model	3
Section 4. Operating Risk Analysis Model Computations	6
 Attachment 1. Energy Surplus/Deficit Analysis by the Industrial Customers of the Northwest Utilities	
 Attachment 2. Energy Surplus/Deficit Analysis by BPA	

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5
6 **SUBJECT: REBUTTAL TESTIMONY FOR RISK ANALYSIS STUDY AND**
7 **NO-SLICE RISK ANALYSIS**

8 **Section 1. Introduction and Purpose of Testimony**

9 *Q. Please state your names and qualifications.*

10 A. My name is Sidney L. Conger, Jr. My qualifications are contained in WP-02-Q-BPA-14.

11 A. My name is Arnold L. Wagner. My qualifications are contained in WP-02-Q-BPA-67.

12 A. My name is Edward L. Bleifuss. My qualifications are contained in WP-02-Q-BPA-04.

13 A. My name is Robert J. Petty. My qualifications are contained in WP-02-Q-BPA-58.

14 A. My name is Robert W. Anderson. My qualifications are contained in WP-02-Q-BPA-01.

15 A. My name is Mark H. Ebberts. My qualifications are contained in WP-02-Q-BPA-18.

16 A. My name is Jon A. Hirsch. My qualifications are contained in WP-02-Q-BPA-28.

17 A. My name is Elizabeth A. Evans. My qualifications are contained in WP-02-Q-BPA-69

18 A. My name is Carl T. Buskuhl. My qualifications are contained in WP-02-Q-BPA-09.

19 A. My name is Juergen M. Bermejo. My qualifications are contained in WP-02-Q-BPA-73.

20 *Q. Have you previously filed testimony in this proceeding?*

21 A. Yes. With the exception of Juergen M. Bermejo, who replaced Jeffrey W. Chow, we
22 filed direct testimony regarding the Risk Analysis Study and No-Slice Risk Analysis
23 (WP-02-E-BPA-71).

24 *Q. Please state the purpose of your rebuttal testimony.*

25 A. The purpose of this testimony is to respond to the direct testimony of the various rate case
26 parties regarding the modeling of net revenue risk in the Operating Risk Analysis Model

1 (RiskMod) and Non-Operating Risk Model (NORM) in the Risk Analysis Study and
2 No-Slice Risk Analysis (Chapters 2 and 3 in WP-02-E-BPA-58) and Testimony
3 (WP-02-E-BPA-71).

4 *Q. How is your testimony organized?*

5 A. This testimony contains four sections including this introductory section. Section 2
6 responds to arguments regarding Non-Treaty Storage Operations in RiskMod. Section 3
7 responds to arguments regarding an alleged modeling anomaly in RiskMod. Finally,
8 Section 4 responds to arguments that the results from RiskMod are not verifiable.

9 **Section 2. Non-Treaty Storage Operations in the Operating Risk Analysis Model**

10 *Q. The Industrial Customers of Northwest Utilities (ICNU) asserts that, rather than refilling*
11 *storage based solely on engineering or fish concerns, Bonneville Power Administration*
12 *(BPA) should consider the economic cost of refill and the timing of refill purchases when*
13 *achieving this goal. Wolverton, WP-02-E-IN-02, at 9-10. What is BPA's response to*
14 *ICNU's testimony?*

15 A. The BPA testimony (WP-02-E-BPA-71, at 5, lines 20-24) cited in ICNU's testimony
16 (WP-02-E-IN-02, at 9, lines 15-17) only addressed a revision in RiskMod for the
17 projected Non-Treaty Storage level on October 1, 2001. Since ICNU only makes
18 reference to storage, it is unclear whether or not their testimony is in regard to
19 Non-Treaty Storage or storage in general. Storage operations for the Federal Columbia
20 River Power System (FCRPS), which includes Columbia River Treaty Storage, are
21 governed by operational rules, constraints, treaties, and contracts. Determining how to
22 refill storage for the FCRPS in the most economical manner is very complex. Storage
23 operations for the FCRPS are modeled in the rate case in the Hydro Regulation Study.
24 See WP-02-FS-BPA-01A, at 14-29. In contrast, the use of Non-Treaty Storage by BPA
25 is more discretionary, depending on circumstances. Given the projected low streamflow
26 and reservoir conditions for Fiscal Year (FY) 2001 and high market prices in FY 2002, it

1 seems likely that BPA will deviate from its typical Non-Treaty Storage operations in
2 FY 2002. Accordingly, BPA proposes to reflect Non-Treaty Storage operations that are
3 more indicative of FY 2002 conditions in the Final Record of Decision for the Power
4 Rate Proposal in June 2001 (June Final ROD).

5 **Section 3. Modeling Anomaly in the Operating Risk Analysis Model**

6 *Q. ICNU performed an analysis that they claim shows a significant shortfall in the*
7 *availability of power in the second year (FY 2003) of the series of years used to analyze*
8 *BPA finances in RiskMod. Wolverton, WP-02-E-IN-02, at 10-13. Has BPA reviewed the*
9 *analysis performed by ICNU?*

10 A. Yes, BPA received an electronic copy of the ICNU analysis (Data Requests: BPA-IN:01
11 and BPA-IN:02) and reviewed how it was performed.

12 *Q. How did ICNU perform its analysis?*

13 A. BPA found that the ICNU analysis was performed using five fiscal year sequences of
14 annual BPA net revenues and flat annual average spot market prices calculated by
15 RiskMod for one of BPA's price and load scenarios in the Supplemental Proposal. The
16 specific load and price scenario used in the ICNU analysis was a scenario with annual
17 average electricity prices in FY 2002 of \$210/megawatthour, 2,000 average megawatts
18 (aMW) of Slice, and 1,500 aMW of load reduction. The ICNU analysis divided all of the
19 simulated annual net revenues (revenues minus costs) calculated by RiskMod for
20 FY 2002–2006 by the associated simulated flat annual average spot market prices to
21 derive the amount of energy surpluses/deficits in aMW for each Water Year and fiscal
22 year of the rate period. The ICNU analysis calculated these values using all 13 Fish and
23 Wildlife Alternatives. The results from the ICNU analysis were summarized in
24 Attachment 3 of ICNU's Direct Testimony (WP-02-E-IN-02) and a copy has been
25 provided in Attachment 1 of this testimony.

1 Q. What is BPA's assessment of the ICNU analysis?

2 A. Contrary to ICNU's claim, dividing the annual net revenues estimated by RiskMod by
3 flat annual average spot market prices does not yield valid estimates of energy
4 surpluses/deficits. There are several reasons why ICNU's computations are flawed. As
5 BPA indicated on page 2-18, lines 4-7, at 3-2, lines 13-16 in the 2002 Supplemental
6 Power Rate Study (WP-02-E-BPA-67), the net revenues calculated by RiskMod do not
7 include the revenues from the Load-Based (LB) Cost Recovery Adjustment Clause
8 (CRAC), Financial-Based (FB) CRAC, and interest earned on cash reserves. The
9 revenues associated with the LB CRAC, FB CRAC, and interest earned on cash reserves
10 are calculated in the ToolKit Model, not in RiskMod. By not accounting for these
11 revenues in their calculation, ICNU produced relatively large negative values for the first
12 and second years of the rate period (FY 2002 and 2003). See Attachment 1 of this
13 testimony. The percentage rate increases for the LB CRAC calculated in the ToolKit
14 Model for FY 2002 and 2003 are 121 percent and 43 percent for this load and price
15 scenario, and these increases are substantially higher than the percentage rate increases
16 for the LB CRAC for FY 2004-2006, which are 9 percent, 8 percent, and 11 percent. See
17 WP-02-E-BPA-69, at 5-33.

18 Another flaw in the ICNU analysis is their attempt to calculate energy
19 surpluses/deficits using annual average flat energy prices calculated by RiskMod. The
20 annual average flat energy prices used by ICNU were calculated in RiskMod by taking
21 the simple average of 12 monthly flat energy prices. However, the prices that BPA
22 receives from selling surplus energy and pays for power purchases are not the same as the
23 annual average flat energy prices that ICNU used in its analysis. BPA's surplus energy
24 sales and power purchase expenses are shaped diurnally and monthly. In addition,
25 changes in the monthly shape of prices from one year to the next will produce different
26 surplus energy revenues and power purchase expenses, which further distort the energy

1 surplus/deficit calculations using annual average flat energy prices. This is especially
2 important when computing values for FY 2002 and 2003, since the monthly shape of the
3 expected spot market prices in FY 2002 is substantially different than those for FY 2003.
4 *See* WP-02-E-BPA-67, at 2-10, Table 2-3 and Table 2-4.

5 *Q. Did BPA perform its own analysis to see if there is a significant shortfall in the*
6 *availability of power in the second year (FY 2003) of the series of years used to analyze*
7 *BPA finances in RiskMod?*

8 *A. Yes, BPA performed its own analysis by running RiskMod for Fish and Wildlife*
9 *Alternative No. 1 and did not find a significant shortfall in the availability of power*
10 *between the first (FY 2002) and second (FY 2003) year of the series of years. BPA*
11 *found that, for the same load and price scenario as the ICNU analysis, the average energy*
12 *surpluses/deficits (which were derived by subtracting power purchases from surplus*
13 *energy sales) are 1,688, 1,630, 1,659, 1,578, and 1,661 aMW. See Attachment 2 of this*
14 *testimony. In contrast, BPA calculated, using the data in Attachment 1, that the average*
15 *energy surpluses/deficits computed by ICNU were -843, -836, 243, 390, and 277 aMW in*
16 *the first through fifth year (FY 2002–2006). Thus, a comparison of the results between*
17 *the ICNU analysis in Attachment 1 and BPA’s analysis in Attachment 2 reveals that*
18 *ICNU’s estimates of BPA’s energy surpluses/deficits from one year to the next are*
19 *flawed.*

20 *Q. ICNU’s analysis was based on computations using all 13 Fish and Wildlife Alternatives*
21 *while BPA’s analysis was based on computations using Fish and Wildlife Alternative*
22 *No. 1. Would this difference affect the energy surpluses/deficits from one year to the next*
23 *year during the 5-year rate period?*

24 *A. No. As BPA stated in Direct Testimony for the 2002 Initial Power Rate Proposal*
25 *(WP-02-E-BPA-15) on page 13, lines 4-15, BPA used, for each fish and wildlife*
26 *alternative, the same five year average monthly hydro generation impacts for all the fiscal*

1 years in the rate period. Thus, how many of the 13 Fish and Wildlife Alternatives are
2 used in an analysis will have no impact on hydro generation and energy surpluses/deficits
3 from one year to the next.

4 *Q. What is BPA's conclusion regarding ICNU's assertion that there is a significant shortfall*
5 *in the availability of power in the second year (FY 2003) of the series of years used to*
6 *analyze BPA finances in RiskMod?*

7 *A. BPA disagrees with ICNU's claim that there is a significant shortfall in the availability of*
8 *power in the second year (FY 2003) of the series of years used to analyze BPA finances*
9 *in RiskMod.*

10 **Section 4. Operating Risk Analysis Model Computations**

11 *Q. The Springfield Utility Board (SUB) states in its testimony that RiskMod contains*
12 *300 starting reserve level assumptions and 13 fish scenarios (300 x 13 = 3,900 games),*
13 *with each of the 3,900 games containing operating risk data for five years of the rate*
14 *period for a total of 19,500 (3,900 x 5) discrete data points, which are fed into the*
15 *ToolKit. SUB claims that it is difficult, if not impossible, to verify the mathematical logic*
16 *that went into deriving the results from RiskMod because RiskMod does not use formulas,*
17 *but instead uses fixed values to produce its results. Nelson, WP-02-E-SP-02, at 10. Does*
18 *BPA agree with SUB's claim?*

19 *A. BPA does not agree with SUB's claim. SUB's testimony reflects a misunderstanding*
20 *about the components of RiskMod and how each of these components are used to*
21 *perform the Risk Analysis Study. RiskMod is comprised of the following three*
22 *components: (1) a set of risk simulation models collectively referred to as RiskSim; (2) a*
23 *collection of computer programs that manages data referred to as Data Manager; and*
24 *(3) a model that calculates net revenues referred to as RevSim. See*
25 *WP-02-FS-BPA-03A, at 5. The RiskSim combine the use of logic, econometrics, and*
26 *probability distributions to quantify the operational risks that BPA faces. See*

1 WP-02-FS-BPA-03A, at 6. The Data Manager facilitates the formatting and movement
2 of data that flows to and from RiskSim, RevSim, and the AURORA model. *See*
3 WP-02-FS-BPA-03A, at 5. The Data Manager inputs the simulated risk data from
4 RiskSim and AURORA into RevSim. RevSim uses logic and equations to calculate
5 BPA's net revenue risk using the simulated risk data. The Data Manager outputs the net
6 revenue risk data from RevSim into computer files for use in the ToolKit model. *See*
7 WP-02-FS-BPA-03A, at 98. BPA provided a detailed explanation of the components of
8 RiskMod and how they are used in the Risk Analysis Study and Documentation for the
9 2002 Final Rate Power Rate Proposal (WP-02-FS-BPA-03/03A). Thus, contrary to
10 SUB's claim, RiskMod does use formulas to determine its results and the mathematical
11 logic that produced those results can be verified.

12 *Q. Does this conclude your testimony?*

13 *A. Yes.*

Attachment 1. Energy Surplus/Deficit Analysis by the Industrial Customers of the Northwest Utilities

Source: WP-02-E-IN-02, Attachment 3

Note: Annual average values for each year were computed by BPA

Sorted Water Year Data

Year	Average MW Sales/Purchases Over 78 Games for Each				
	as 1st Year	as 2nd Year	as 3rd Year	as 4th Year	as 5th Year
1929	-844.9020828	0	0	0	0
1930	-934.9720133	-873.1987802	0	0	0
1931	-740.1200754	-976.8642543	232.4834317	0	0
1932	-782.1117222	-630.6434935	179.7653673	408.2118509	0
1933	-718.9030199	-841.8498301	280.5416932	410.0423455	238.0237949
1934	-935.6020366	-762.4217668	328.3275031	359.1414277	101.8891918
1935	-718.3650598	-900.3310215	356.0455376	411.580412	422.5665472
1936	-768.8221053	-715.397454	276.5512379	531.7004372	333.968653
1937	-724.383057	-764.1795282	388.4822337	485.8496132	356.8340111
1938	-899.6061143	-762.6242754	371.6815524	434.2529707	222.1571615
1939	-800.7481979	-785.2982044	241.7745507	509.812334	492.1101967
1940	-698.694297	-793.3672585	230.5329336	448.4912078	345.7562969
1941	-754.3243661	-861.2038243	360.1905443	440.7243258	273.2657498
1942	-801.8011527	-634.8508697	282.735866	386.7303857	216.108498
1943	-808.6302546	-773.079626	291.6733941	482.8063829	469.6706853
1944	-747.4597931	-722.369202	247.126708	450.2115162	281.1329413
1945	-833.5744022	-817.2703083	383.1585478	462.6837203	254.0023204
1946	-800.2752916	-686.8446639	319.9232553	298.1459271	312.180212
1947	-834.9987013	-820.4902441	203.5990028	528.8980072	461.2128031
1948	-776.6155973	-824.0940116	201.0722727	405.4523244	280.9838892
1949	-948.3749066	-865.6192179	338.694372	390.5509316	166.6889638
1950	-791.7522367	-815.7091834	266.9658436	310.4110365	283.8617397
1951	-750.646608	-850.4275236	191.7204129	451.2819045	403.3316616
1952	-817.3935282	-737.8869127	202.1802693	416.4958399	258.0643792
1953	-1108.651433	-873.6793167	389.2734817	412.2139218	135.4245922
1954	-730.0059614	-1011.056011	149.8557784	371.4741633	274.0336956
1955	-735.2136838	-747.4183187	158.6689746	364.1882707	419.7334621
1956	-908.4700919	-772.465652	241.935554	291.2222094	157.0469294
1957	-1061.71105	-901.6944955	301.8695581	402.9212179	109.3348906
1958	-731.2170936	-1101.786297	152.4142931	331.0558934	380.939385
1959	-796.7485872	-620.0266633	131.5472328	324.9042392	336.408342
1960	-855.5857889	-872.1048703	272.1586199	334.7443907	54.88337486
1961	-968.6125419	-792.0126958	211.690538	347.6030564	144.5007716
1962	-769.0478508	-1076.863197	216.9218097	348.8282826	410.398778
1963	-840.3577537	-780.6629436	136.7743955	358.6322251	230.5266347
1964	-797.3782173	-835.0307805	317.0738973	379.2288066	182.4628441
1965	-890.0521088	-774.8539592	263.9633355	353.3405369	147.7452431
1966	-773.31475	-818.1055754	251.5684659	387.6015207	409.0666965
1967	-730.255134	-807.4403812	224.1461491	432.4914502	234.5666854
1968	-833.9190518	-855.2869382	305.7894585	440.0682249	241.5145335
1969	-845.4095415	-679.7617921	277.2111896	319.4630353	216.6952068
1970	-833.8385171	-858.3440211	237.0983744	463.9291595	428.2565669
1971	-934.4480451	-810.1361361	194.4166545	387.8609814	277.7490447
1972	-870.4145441	-909.5840848	312.8252662	429.8141072	174.7851644
1973	-807.9164782	-854.2321758	133.4232579	287.3414685	268.1499237
1974	-826.7098739	-845.316434	202.4115725	320.7504503	402.795987
1975	-1058.824112	-864.4007114	185.379454	399.5984901	32.45305852
1976	-1202.393776	-1082.632905	331.763163	367.4616172	215.712822
1977	-1042.844297	-1077.12533	-68.45579069	348.146921	264.105643
1978	-982.8871083	-1138.453198	-54.04946807	113.0289809	409.6481032
Average	-843	-836	243	390	277

Attachment 2. Energy Surplus/Deficit Analysis by BPA			
Source: RiskMod			
	Surplus		Energy
	Energy	Power	Surpluses/
	Sales	Purchases	Deficits
	(aMW)	(aMW)	(aMW)
FY 2002	1790	103	1688
FY 2003	1753	123	1630
FY 2004	1786	127	1659
FY 2005	1679	101	1578
FY 2006	1754	94	1661
Average	1753	110	1643