INDEX

TESTIMONY OF

BYRNE E. LOVELL, EDWARD L. BLEIFUSS, JAMES C. SAPP,
AND VALERIE A. LEFLER

Witnesses for Bonneville Power Administration

SUBJECT: Risk Mitigation

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Section 1. Introduction and Purpose of Testimony

Q. Please state your names and qualifications.

A. My name is Byrne E. Lovell and my qualifications are contained in WP-02-Q-BPA-44.

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

A. My name is James C. Sapp and my qualifications are contained in WP-02-Q-BPA-62.

A. My name is Valerie A. Lefler and my qualifications are contained in WP-02-Q-BPA-43.

Q. Please state the purpose of your testimony.

A. The purpose of our testimony is to describe the risk mitigation tools used in this rate case, and the calculation of the probability of making U.S. Treasury (Treasury) payments on time and in full during the five-year rate period for this rate proceeding.

Q. How is your testimony organized?

A. This testimony contains seven sections including this introductory section. Section 2 summarizes the methodology for calculating the probability of making all Treasury payments in full and on time. Section 3 discusses the risk mitigation tools used in the ToolKit Model. Section 4 describes the Cost Recovery Adjustment Clause (CRAC). In Section 5, Planned Net Revenues for Risk (PNRR) are discussed. Section 6 discusses the calculation of Treasury Payment Probability (TPP). Lastly, in Section 7, we describe possible adjustments that could occur prior to the final rate proposal.

Section 2. Treasury Payment Probability Methodology

Q. Bonneville Power Administration (BPA) estimates its potential for recovering costs, given all its risks and risk management tools, using Treasury Payment Probability (TPP). Why is TPP used as the indicator?

A. Payments to Treasury, in particular principal payments to Treasury, are the lowest priority in BPA's priority of payments. If BPA meets its Treasury repayment obligations, it will have met all its other financial obligations as well. For this reason, TPP serves as the key measure of the potential to recover all costs.

Q. How are determinations of the probability of making Treasury payments in full and on time made?

A. Treasury Payment Probability calculations are performed by using the ToolKit Model--an Excel spreadsheet that has been modified and improved since the 1996 rate case. *See* Volume 1, Chapter 12 of Documentation for the Revenue Requirement Study, WP-02-E-BPA-02A.

Q. How has the ToolKit Model been changed?

A. The major change has been to rewrite the ToolKit in the Visual Basic for Applications language that is included with Excel 97. The display of inputs and outputs, including a graph of the frequencies of projected financial reserve levels, has been reorganized for clarity. Projections of the starting reserve balance and net revenues continue to be major inputs to the ToolKit. Distributions describing the impacts of operating risks on revenues are now developed using the Risk Analysis Model (RiskMod), which has replaced the Short-Term Risk Evaluation and Assessment Model (STREAM). Distributions of non-operating risks on those revenues are developed using a new model, the Non-Operating Risk Model (NORM). *See* Conger, *et al.*, WP-02-E-BPA-15 on Risk Analysis for discussion of the RiskMod and the NORM.

Q. What level of Treasury Payment Probability is BPA targeting?

A. In this rate proposal, BPA is implementing its long-standing TPP standard that risks be identified and quantified, risk mitigation tools be designed, and rates be set to achieve an 88 percent probability that all payments to Treasury be made on time and in full over the five-year rate period. *See* Section 4 of Lefler, *et al.,* WP-02-E-BPA-13.

Section 3. Risk Mitigation Tools in the ToolKit Model

Q. What tools is BPA implementing to achieve the 88 percent probability goal?

A. As part of its Subscription Strategy, BPA identified a list of potential risk management tools to be used as part of a comprehensive risk management plan. The Strategy stated that the specific mix and design of these tools are to be determined, as appropriate, in the rate case and the Subscription process. The tools are intended to address the uncertainties BPA is facing for the fiscal years (FY) 2002 - 2006 period, particularly hydro conditions, market prices, operating costs, and fish and wildlife cost uncertainties. The Subscription Strategy listed several potential risk mitigation tools. Some of these tools are described in the Risk Analysis Study, WP-02-E-BPA-03. The tools that are included in the ToolKit are starting financial reserves, Fish Cost Contingency Fund (FCCF) credits, a CRAC, and PNRR.

Q. Are you using the term "reserves" the same way in this rate proposal as you have in past rate cases?

A. No. Because this rate proposal covers wholesale power rates only, we are now speaking only of financial reserves attributable to the generation function. *See* definition, Volume 1, Chapter 12 of Documentation for Revenue Requirement Study, WP-02-E-BPA-02A. On the basis of staff expert judgment, we have concluded that the agency-level 88 percent five-year TPP standard will be met if each of the generation and transmission functions target 88 percent standards when setting rates. BPA has not yet conducted its transmission rate case for the FY 2002 - 2006 period.

Q. Please explain how financial reserves are modeled as a risk mitigation tool.

A. Financial reserves are BPA's central risk mitigation tool. Financial reserves comprise cash in the BPA Fund and cash equivalents in the form of a deferred borrowing balance. The first step in modeling financial reserves is to project the level of reserves for the beginning of the rate period. Projected reserves for the generation function at the end of FY 1999 total $645.8 million. Reserves for the start of the next rate period (October 2001) are forecast to be about $725 million with no adjustment for risk. A probabilistic distribution of net revenues for FY 2000 - 2001, prepared using STREAM for the 1996 rate case, was utilized in the ToolKit Model to project a distribution of ending reserves for the remaining years in the current rate period (FY 2000 - 2001). The 300 values in this ending reserves distribution served as the starting points for assessing TPP in the FY 2002 - 2006 rate period. The average value for this risk-adjusted distribution of starting reserves is $685.5 million.

Q. Why were STREAM rater than RiskMod net revenue deviations from the 1996 rate case used to estimate cash reserve variability for FY 2000 - 2001?

A. For consistency purposes with the 1996 rate case, the net revenue deviations from STREAM were used to estimate cash reserve variability for FY 2000 - 2001 in the ToolKit.

Q. Please explain the FCCF. Hasn't a portion of this expired?

A. The FCCF is comprised of section 4(h)(10)(C) credits that BPA earned prior to 1994, but has not yet exercised. (*See* 96 record Testimony of DeWolf, *et al.*, WP-02-E-BPA-69, also *see* Volume 1, Chapter 12, Attachment 3 of Documentation for Revenue Requirement Study, WP-02-E-BPA-02A.) Access to the Fund is regulated by an Interagency Memorandum of Agreement that expires at the end of FY 2001. However, in the Fish and Wildlife Funding Principles announced by Vice President Al Gore in September 1998, the Administration confirmed continued access through FY 2006 to any

funds remaining in the FCCF fund on September 30, 2001, on the same terms as those established for FY 1996 - 2001.

Q. *How large is the FCCF?*

A. The FCCF was established in 1996 with $325 million in credits. As of August 1999, no credits have been used. The balance of the FCCF on the first day of FY 2002 may be as high as the current $325 million or as low as zero, depending on whether conditions have caused BPA to access the fund in FY 2000 or 2001. *Id*.

Q. *Are the calculations for the FY 2002 to 2006 period identical to those for the FY 1997 to 2001 period?*

A. No, the data and models have all been updated. The steps in the process, however, are the same. *Id*.

Q. *How much of the FCCF is assumed to be used in the FY 2002 - 2006 rate period?*

A. The revenue forecast includes a five-year annual average of $22 million of FCCF credits being used during the rate period. *See* Section 6.2.3.4 in the Wholesale Power Rate Development Study, WP-02-E-BPA-05.

Q. *How did the ToolKit deal with the proposed fish and wildlife recovery alternatives?*

A. The RiskMod and NORM distributions used by the ToolKit reflect 13 distinct Fish and Wildlife Alternatives, five of which have adjusted and unadjusted schedules. RiskMod and NORM modeled 300 games for each of the 13 Fish and Wildlife Alternatives. For the five Alternatives that displayed adjusted and unadjusted schedules, the unadjusted schedule was given a 10 percent probability of occurrence and the adjusted schedule was given a 90 percent probability of occurrence. Accordingly, input files for these Alternatives were edited to include 30 scenarios from the unadjusted scenario and 270 from the adjusted scenario. The operational impacts are modeled in RiskMod; the capital recovery expenses and operations and maintenance for both BPA and other entities are modeled in NORM.

Thus, each of the 13 Fish and Wildlife Alternatives was represented by a set of 300 scenarios. These sets of scenarios were then stacked into one large 3,900 - case input file used by the ToolKit to calculate TPPs. This meant that each Alternative was given equal weight in influencing the likelihood of BPA making its Treasury payment.

Section 4. Cost Recovery Adjustment Clause (CRAC)

Q. Please describe the CRAC.

A. This rate proposal includes a CRAC; a temporary upward adjustment to posted power prices if Actual Accumulated Net Revenues (AANR) fall substantially below the rate case plan.

Posted rates will be adjusted upward if BPA's AANR for the generation function fall below a threshold level, shown in the Table A, Attachment 1. The adjustment will be made by a percentage increase in rates to restore cumulative net revenues to the lower of the threshold level or the maximum amount.

Q. Please explain the timing of the CRAC adjustment.

A. If the CRAC threshold is crossed at the end of FY 2001, 2002, 2003, 2004, or 2005 an adjustment will be made to covered rates beginning the following April. (The delay is necessary to obtain audited actuals and conduct a public comment process on the calculations.) Adjustments will be made for a 12-month period, *i.e.*, April through March of the subsequent year. An adjustment beginning in April of FY 2006, will be in place only through September 2006, since new rates should be in place beginning October 1, 2006.

Q. How does the CRAC design differ from the Interim Rate Adjustment (IRA) that was in the 1993 rate proposal?

A. The 1993 Final Proposal included an IRA that was designed to serve the same purpose as the CRAC, to raise rates temporarily if financial conditions jeopardize the ability to make Treasury payments on time and in full. The CRAC triggers based on AANR rather than

projected reserve levels, as with the IRA. The CRAC has been developed for a five-year rate period rather than a two-year rate period, and can trigger up to five times, not just once. The CRAC threshold is substantially higher (depending on the specific year, CRAC triggers at the equivalent of $300 to $500 million in reserves, versus the IRA triggering at about $150 million.) The CRAC is also less likely to trigger about 12 percent annual average probability of triggering versus about 20 percent probability for the IRA. The CRAC's maximum recovery amount changes each year.

Q. Why is the trigger based on actual accumulated net revenues rather than reserves?

A. The CRAC triggers on the basis of AANR because accumulated net revenues are subject to financial audit, thus allowing independent verification of actual results. Net revenues are more readily segregated by generation and transmission function than reserves because of financial systems design and financial reporting practices. *See* Volume 1, Chapter 12 of Documentation for Revenue Requirement Study, WP-02-E-BPA-02A.

Q. How were these thresholds arrived at?

A. The threshold was originally developed in terms of reserves of about $300 million. The AANR thresholds have been calibrated from reserves, as follows: The ending FY 1998 accumulated net revenues, the last actual data available, were deemed to be $0, so only net revenues accumulating since 1998 are considered. Ending FY 1998/beginning FY 1999 cash reserves were $561 million. For each year from FY 1999 through FY 2001, forecasts of net revenues and contributions to reserves were used to project both ending reserves and ending accumulated net revenues for each year of the current rate period.

This procedure results in ending FY 2001/beginning FY 2002 AANR of $96.5 million and cash reserves of $725 million (not adjusted for risk). For the resulting cash reserves to get down to the $300 million threshold, they would have to decrease by $425 million. The resulting AANR is then decreased by $425 million to arrive at the

equivalent threshold, *i.e.*, $96.5 million minus $425 million = -$328.5 million, the ending 2001 AANR threshold. This process is then carried through for each fiscal year through FY 2005.

Q. How is the total amount to be recovered determined?

A. The total amount to be recovered is the amount by which AANR is below the threshold or the maximum recovery amount shown in Attachment 1.

Q. How is the amount of rate increase calculated?

A. The total amount to be recovered is divided by the CRAC Revenue Base. This results in the CRAC Percentage, which is then applied to each applicable rate.

Q. Explain the CRAC Revenue Base.

A. The CRAC Revenue Base is the average actual total revenue in the generation function over the three prior years for the loads subject to CRAC plus any Slice loads.

Q. Why are actuals used in this calculation rather than current projections for the year the adjustment begins?

A. The use of actuals eliminates dependency on the timing of forecasts and debate over the accuracy of forecasts.

Q. Why are Slice loads included?

A. If there is Slice load, this results in an actual amount of additional revenue generated that is less than the Revenue Amount would be if there were no Slice load. Calculating the Revenue Amount by dividing only by the forecasted non-Slice load would mean that the CRAC Percentage would be higher if the amount of Slice load increased, which was not intended. The proposed calculation preserves the relationship between the Revenue Amount and the CRAC Percentage. Without any Slice load, the annual CRAC maximum could cause customer rates to increase by no more than approximately 10 percent, and that is still the approximate maximum rate impact no matter what amount of Slice load customers sign up for.

Q. If you collect more or less than the amount needed to get up to the threshold, or the annual cap, is there a true-up?

A. No. The adjustment is made based on the intended revenue amount, with no true-up.

Q. Why haven't you designed the CRAC to be more robust?

A. The design of the CRAC is, in fact, fairly robust. It can trigger up to all five years of the rate period, and up to a maximum of between $125 and $150 million in FY 2001 - 2004 and $87.5 million in FY 2005. And the trigger level is substantially above the level at which we would have a deferral.

The CRAC must be designed such that political constraints do not prevent the mechanism from being implemented as modeled. A more robust CRAC could well be so objectionable or so onerous that BPA is effectively precluded from carrying it out as designed. The effect could be to shift risk to Treasury.

Section 5. Planned Net Revenues for Risk (PNRR)

Q. Why are additional planned net revenues needed for risk?

A. PNRR is a component of revenue requirements that is added to annual expenses to bolster reserves and mitigate operating and non-operating risks. *See* definition in Volume 1, Chapter 12 of Documentation for Revenue Requirement Study, WP-02-E-BPA-02A. PNRR is included when the projections of revenues, expenses, financial risks, and risk mitigation measures fail to meet the 88 percent TPP goal. Increasing the PNRR component of revenue requirements forces the rate level up, which generates additional revenue and higher reserves, which improves our ability to make Treasury payments in years when hydro, market price, and other risks depress our financial performance.

Q. What is the relationship between PNRR and other risk mitigation tools BPA will be using?

A. The amount of PNRR included in revenue requirements is determined only after the impacts of other risk mitigation measures, such as the starting reserves and CRAC, have first been assessed.

The following four figures illustrate how the ToolKit Model is used to test the effectiveness of risk mitigation strategies and determine the amount of PNRR needed to meet the 88 percent TPP standard.

To begin the process of determining the level of PNRR needed, a set of rate assumptions are prepared that do not take into account any risk mitigation measures. In effect, these rate assumptions would be sufficient to meet revenue requirements for the FY 2002 - 2006 period under average conditions--that is average water, average thermal plant performance, planned spending levels, expected market prices, etc. The operating and non-operating risk distributions produced by RiskMod and NORM, respectively, are applied to the expected net revenues, which result from these initial "average" assumptions. This results in a set of net revenues that are read by ToolKit. ToolKit then adds these net revenue values to internal cash flows for the generation function to develop a set of annual ending reserve values. If no risk mitigation measures were employed (other than FCCF and section 4(h)(10)(C)) credits which are handled in the RiskMod distributions), the generation function's predicted ending reserves for FY 2006 would range from -$3.5 billion to $3.3 billion with a mean value of $372 million. This distribution is shown in Figure 1 in Attachment 2.

However, a $100 million working capital reserve for the generation function is considered to be the minimum level of reserves, of which up to $50 million may be provided by a note that BPA may issue to the Treasury. Treasury payments are deemed to be missed to the extent that the balance of financial reserves falls below a $50 million trigger point at the end of any fiscal year. Therefore, ToolKit will not allow the ending reserve balance to fall below $50 million in any year of the rate period it models. When that restriction is applied, the resulting distribution displays the same maximum ending reserves values as Figure 1, but has a minimum value of $50 million and a higher mean value ($652 million in FY 2006). Figure 2 in Attachment 2 illustrates the new

distribution of ending reserves when the $50 million floor is placed on reserves. With no further risk mitigation measures in place, deferrals occur in 39.5 percent of the 3,900 five-year games or scenarios, which means the TPP is 60.5 percent.

In the next diagram (Figure 3 in Attachment 2), CRAC is assumed to operate ($300 million cash reserves threshold the first two years, $500 million threshold the last three years, with the maximum recovery amount increasing over time, as shown in Table A at the beginning of section 4). As can be seen in Figure 3, this raises the lower end of the distributions while leaving the upper end unaffected. With the addition of CRAC, the TPP becomes 67.9 percent and the mean ending reserves for FY 2006 increases to $696 million.

To meet the 88 percent probability standard, it is necessary to add PNRR to the revenue requirement. Through a process of trial-and-error, different values for PNRR are added to the net revenues for each of the ToolKit scenarios until one is identified for which only 12 percent of the 3,900 five-year games hit the $50 million deferral threshold in at least one of the years in the rate period. For this proposal, a $127 million PNRR was required to meet the TPP standard (on top of the CRAC described above). The net effect of adding PNRR is to increase both the maximum and average ending reserves (to $4.1 billion and $1.26 billion, respectively, in FY 2006) while decreasing the number of times the deferral threshold is reached. (NOTE: BPA has proposed a Dividend Distribution Clause (DDC) as part of this Rate Proposal. If reserves rise to $1.2 billion, then the Administrator will forecast revenues, expenses, and TPP, and distribute dividends to firm power customers and to other stakeholders any amount over the 88 percent TPP.) Figure 4 in Attachment 2 depicts this graphically.

Q. Isn't an average ending reserve level of $1.2 billion awfully high?

A. First, to clarify, the $1.25 billion reserve amount for ending FY 2006 is a midpoint, or average, of a wide range of possible reserve outcomes. This is an outcome (not a target

or plan) that is a result of PNRR, CRAC and other risk mitigation measures designed to ensure costs can still be met if hydro conditions deteriorate, market prices for power purchases rise above expectations, or other uncertainties materialize.

The high expected value is largely due to several changes since the last rate case. First, BPA is targeting an 88 percent TPP rather than an 80 percent TPP. Additionally, natural gas price forecasts are extremely volatile compared to the forecasts during the last rate case. This causes large uncertainties in power purchase costs. There are also increased hydro constraints. (*See* Risk Analysis Study, WP-02-E-BPA-03.) We are also modeling non-operating risks, including non-operations fish and wildlife costs, which have not been modeled before. *Id*., Chapter 2.

Q. Are you assuming a transmission surcharge will be available as a risk mitigation tool?

A. No. This rate proposal does not include an assumption that it will surcharge transmission customers for power costs.

Section 6. Treasury Payment Probability Results

Q. What amount of Planned Net Revenues for Risk would be required to achieve a five-year TPP of 88 percent?

A. The most straightforward method of determining the required planned net revenues for risk is to assume that the incremental quantities of cash (*i.e.*, PNRR) to be obtained each year are equal. Working on this basis, BPA has calculated that $127 million is required each year to achieve the desired 88 percent TPP for the five-year rate period.

Q. Isn't this a higher level of PNRR than you have had in the past?

A. This is a larger than normal level of PNRR, because risks in BPA generation function are very substantial, largely due to market prices, fish recovery cost, hydro, and other factors outside BPA's control. Drought conditions and unanticipated fish and wildlife recovery costs contributed to a $670 million decline in BPA's reserves in the two-year period from FY 1991 to FY 1993 alone. BPA's revenues and reserve levels may go down by more

than $300 million from one year to the next. The $127 million for PNRR is the amount necessary, together with CRAC and other measures, to mitigate the wide uncertainties we face to achieve the 88 percent TPP standard. PNRR, however, is only one component of the total cash-flow for risk. Table B illustrates the total cash flows for risk mitigation for the last seven rate cases and reveals that while PNRR values are noticeably higher for the current rate case compared to earlier ones, the Average Annual Cash for Risk values (a more complete measure of the cost of risk mitigation) are much more comparable, particularly when differences in TPP are taken into account.

Section 7. Possible Adjustments

Q. What changes might be made in the final rate proposal with respect to the risk analysis?

A. It may be possible to calculate an accrual-to-cash adjustment for each of the years in the rate period. Any changes to the proposed rate schedule, revenue requirement expense levels, or to the load forecast could affect the amount of cash for risk that is anticipated, which would change the probability results. An updated net revenue distribution from RiskMod could be required if there are major shifts in the risk factors used in RiskMod, such as the natural gas forecast, and a new net revenue distribution could change the probability results. NORM distributions could also change. A change in the projected financial reserves on hand at the end of FY 1999 would affect the probability results. We could also re-calibrate the CRAC and DDC thresholds if 1999 actuals are available prior to the Final Proposal. New risk mitigation tools or measures (*e.g.*, water insurance) could be added to the analysis.

Q. Does this conclude your testimony?

A. Yes.

Attachment 1: Tables for Risk Mitigation Testimony

Table A. CRAC Thresholds and Maximum Recovery

(million $)

Ending Fiscal Year	CRAC Threshold (AANR)	Maximum Planned Recovery Amount (annual)
2001	-350	125
2002	-350	135
2003	-350	150
2004	-200	150
2005	-200	87.5

Table B: Cash-Flows for Risk Mitigation

(million $)

Rate Case	Fiscal Year	Net Revenues For Risk	Internal Cash	Total Cash For Risk	Average Annual Cash	TPP Over Rate Period	TPP 1-yr. Equiv.
1987	1988	12.9	24.6	37.5			
	1989	19.3	30.1	49.4	**43.5**	N/A	N/A
1989 [1]	1990	70.6	55.3	125.9			
	1991	80.9	50.7	131.6	**128.8**	N/A	N/A
1991	1992	30.1	28.1	58.2			
	1993	33.0	21.6	54.6	**56.4**	N/A	N/A
1993	1994	61.5	1.2	62.7			
	1995	37.8	25.1	62.9	**62.8**	85% (2 yr.)	92.5%
1995 [2]	1996	100.8	2.5	103.3	**103.3**	97.5%	97.5%
1996	1997	13.3	1.5	14.8			
	1998	13.7	32.0	45.7			
	1999	13.7	108.1	121.8			
	2000	13.8	114.5	128.3			
	2001	13.8	106.2	120.0			
	AVG	13.7	72.5	86.1	**86.1**	80% (5 yr.)	96.0%
2002 [3]	2002	127.0	20.3	147.3			
	2003	127.0	56.2	183.2			
	2004	127.0	32.2	159.2			
	2005	127.0	0	127.0			
	2006	127.0	0	127.0			
	AVG	127.0	21.7	148.7	**148.7**	88% (5 yr.)	97.5%

[1] Result from extending 1987 rates.
[2] Result from surcharging 1993 rates.
[3] Net Revenues assume CRAC
Internal cash derived from non-cash expense less planned amortization/irrigation payments.

Attachment 2: Figures for Risk Mitigation Testimony

Figure 1: RANGE OF RESERVES
(No Risk Mitigation)

Figure 2: RANGE OF RESERVES
(Rate Assumption of No Risk Mitigation, $50M Floor on Reserves)

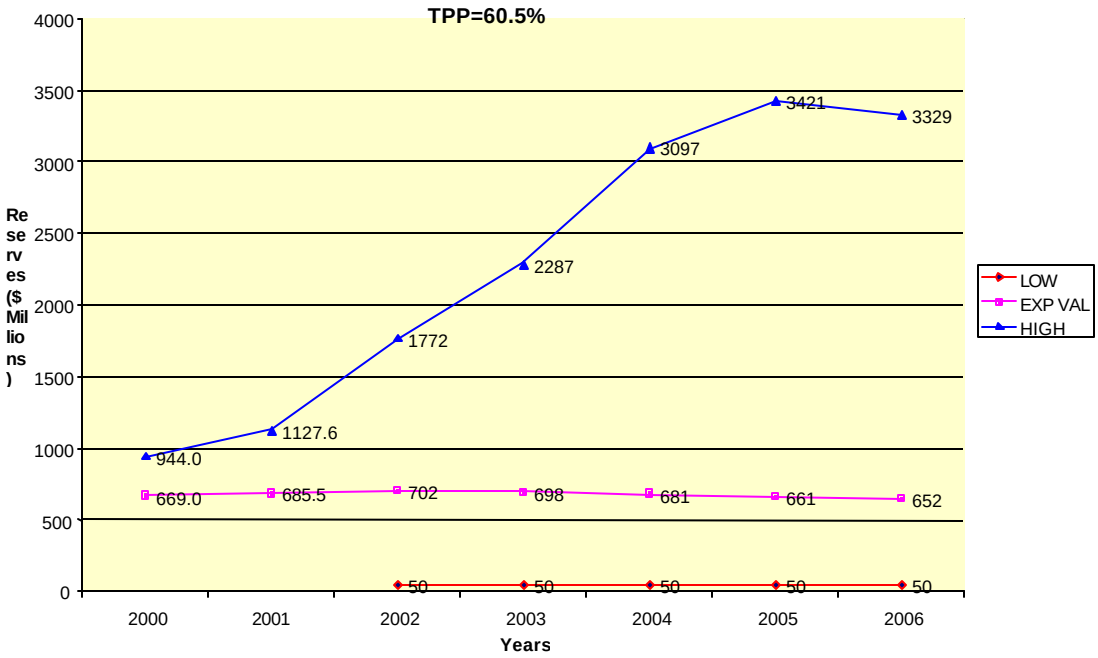

Figure 3: RANGE OF RESERVES
(CRAC, $50M Floor)

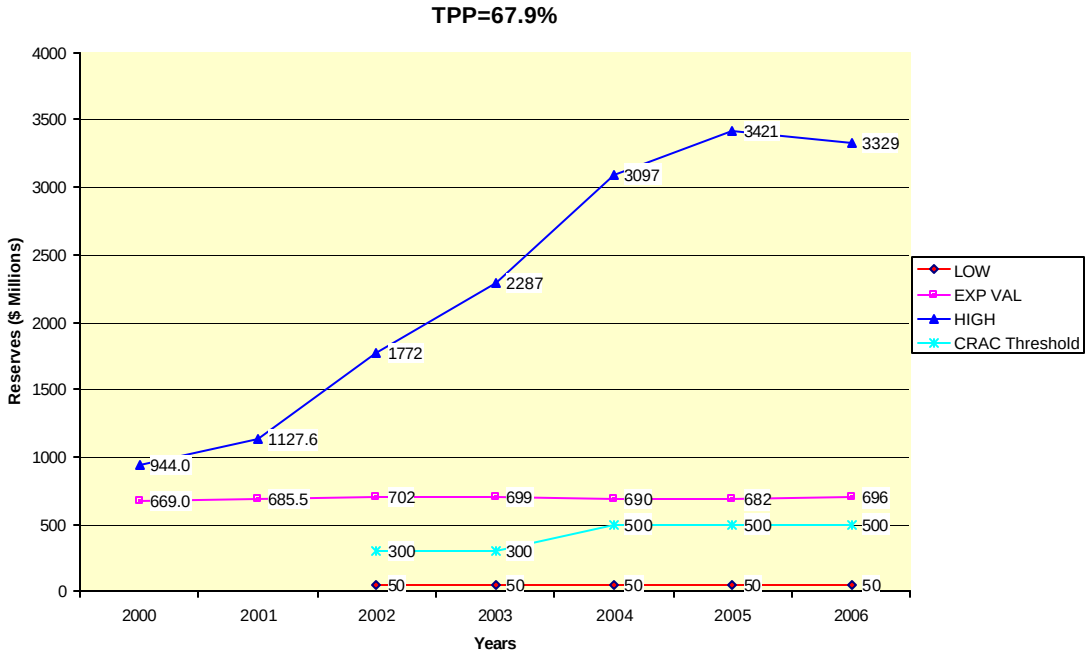

Figure 4: RANGE OF RESERVES
($127M PNRR, $50M Floor, CRAC)