# BPA Rate Case Customer Meeting: Rate Design, Risk Analysis & Incremental Rates

*Sponsored by*
*Transmission Services*

November 9, 2009

# Schedule of Transmission Rate Meetings

The purpose of these scheduled meetings is to satisfy the obligation of the 2010 Partial Transmission Settlement agreement to hold discussions with interested parties regarding Segmentation, Cost of Service Analysis methodology, and Transmission Rate Design.

- September 9, 2009 - Segmentation Analysis
- October 7, 2009 - Cost of Service Analysis
- November 9, 2009 – Transmission Rate Design, Risk Analysis, and a preliminary discussion on Incremental Rate Design

# Key Messages

- These meetings are preliminary informal discussions related to transmission rates.

- All new information shared is pre-decisional and not indicative of any particular rate case outcome.

- Please feel free to ask questions and provide input as we move through these materials.

# Meeting Objectives

1. Discuss the high level approach to transmission rate design.
2. Discuss the approach and measures used to conduct transmission risk analysis.
3. Discuss a potential path forward for incremental rates. Discuss examples for the Intertie and Network expansion to illustrate potential rate impacts.
4. Discuss the parking lot of customer issues and follow-up from prior meetings on transmission rate development.

# What are the Rate Making Principles for Transmission?

- Full and timely cost recovery
- Lowest possible rates consistent with sound business principles
- Cost causation—fairly allocate costs to customer classes based on proportionate use
- Statutory requirement of equitable allocation
- Simplicity, understandability, public acceptance, and feasibility of application
- Avoidance of rate shock and rate stability from rate period to rate period (eg. magnitude of rates and rate design)

*Note: Principles are adapted from James Bonbright Principles of Public Utility Rates, 1968.*

# Transmission Parking Lot Protocols

- BPA will identify if the issue is within the scope of the rate case.  If out of scope, BPA will point customers to the appropriate forum, if known and remove the issue from the parking lot.

- Pending written consent from the customer, BPA will post customer comments related to transmission rates on the corporate rates website.

- Transmission Account Executives will remain the first line of communication for customers.

# Follow-up from Cost of Service Analysis Meeting on Oct. 7th

1. Where possible, provide "before" and "after" rate comparisons to facilitate understanding of the magnitude and drivers of change.

2. Provide the 2010 Revenue Requirement Final Study Table 2.1 Transmission Program Spending Forecast ($000s). Also, provide a comparison of 2002 to 2010 Transmission Program Spending forecasts.

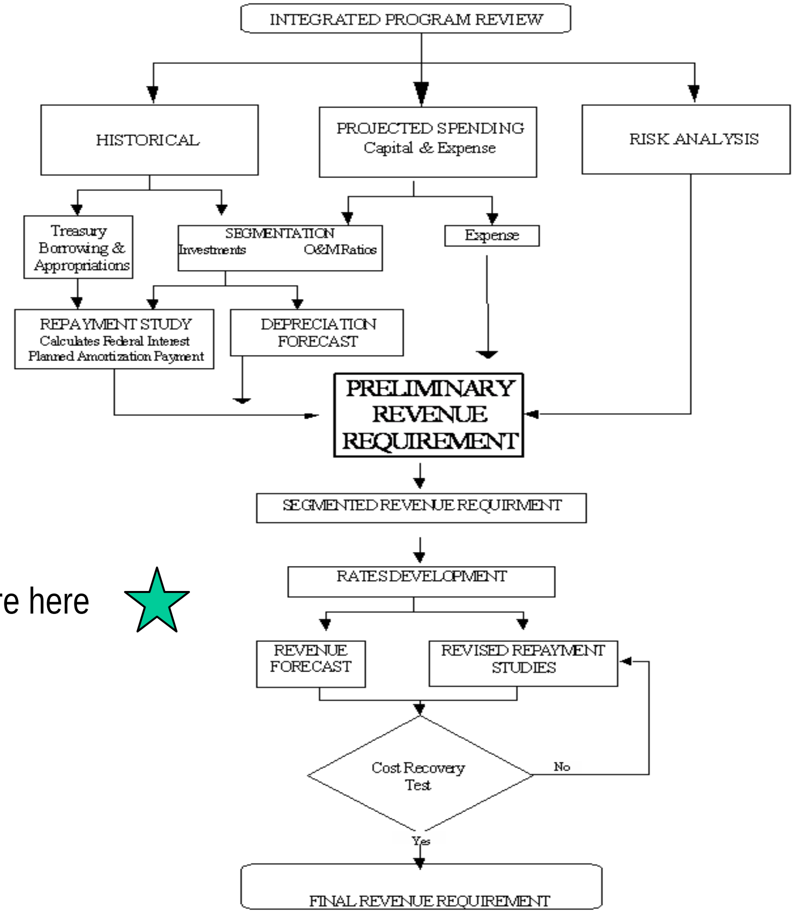
3. What criteria are used to treat costs as incremental or embedded, rolled in costs to the transmission system?

4. What is the open season timeframe for Intertie expansion: how/when will the Revenue Requirement be updated to reflect such facilities; when will the NOS "Plants in Service" hit transmission rates?; any precedent in prior transmission rate case related to the 3rd AC Intertie? (see Appendix)

5. Discuss parking lot for TR-12 rate case customer issues.

# Transmission Rate Study

# Overview of Transmission Rates Process

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# What is the Transmission Rate Study?

- The Transmission Rate Study (TRS) is an integral part of the Transmission Rate Case.
- The purpose of the TRS is to calculate rates such that revenues from proposed rates match the cost of providing service.
- In general, the TRS divides the segmented costs by the corresponding segmented sales to determine rate levels such that revenue from sales recovers the costs of each segment.
- The TRS determines proposed rates for the rate period and compares the proposed rates to existing rates.
- The TRS also summarizes and compares the revenue forecast from the current rates with the revenue forecast from the proposed rates.

# What is the “Transmission Rate Study”?

- The TRS consists of three parts:
  - detailed discussion of the rates and rate setting methodology
  - a rates model, presented in the TRS as a series of tables
  - appendices of detailed inputs into the rates model
- The last published TRS was for the 2002 Transmission Rate Case.
- The rest of this presentation will follow through and explain the tables identified in the rates model.
- Examples will be shown from the 2002 rate case, with generalized comparisons of more recent analysis where possible.

# Inputs to the Transmission Rate Study

- Revenue Requirement Study Data
  - Yearly segmented FCRTS investment base (Net Plant)
  - Yearly segmented revenue requirement
  - Yearly generation input costs from BPA Power Services
- Revenue Forecast Information
  - Yearly Forecast of Revenue from sources other than sales of transmission capacity. These are identified as “Revenue Credits” against the segmented costs for rate making purposes (not to be confused with customer credits such as under LGIAs).
  - Monthly Forecast of Transmission Sales quantities, typically expressed in MegaWatts (MW) or KiloWatts (kW) for capacity, or in terms of energy such as kW-mo.

# Segmented Revenue Requirement and Segmented Net Plant

- The primary input to the rate model is a copy from the revenue requirement study of the segmented Revenue Requirement and segmented net plant for each year of the rate period.
- For information purposes, a break-down into major groupings of the Revenue Requirement is also identified.
  - Operations & Maintenance
  - Transmission Acquisition & Ancillary Services
  - Non-Federal Debt Service
  - Depreciation
  - Net Interest Expense
  - Planned Net Revenues
- The annual average for the rate period is calculated.

# 2002 Transmission Rate Case Segmented Revenue Requirement
($000)

| | | (A) TBL | (B) Generation | (C) | (D) Delivery | (E) Delivery | (F) Intertie | (G) Intertie | (H) Ancillary |
|---|---|---|---|---|---|---|---|---|---|
| | | Total | Integration | Network | Utility | Industry | Southern | Eastern | Services |
| | **FY 2002** | | | | | | | | |
| 1. 1 | Gross Plant | 4,801,203 | 62,361 | 3,485,401 | 67,147 | 59,577 | 689,410 | 123,670 | 313,637 |
| 1. 2 | Lines | 2,187,952 | 16,398 | 1,867,778 | 1,260 | 1,200 | 202,494 | 98,822 | |
| 1. 3 | Stations | 2,299,614 | 45,963 | 1,617,623 | 65,887 | 58,377 | 486,916 | 24,848 | |
| 1. 4 | Net Plant | 3,136,059 | 49,881 | 2,265,598 | 56,451 | 49,691 | 418,586 | 80,001 | 215,851 |
| 1. 5 | Operating Expenses | 228,419 | 2,335 | 147,587 | 4,509 | 2,559 | 25,476 | 2,048 | 43,905 |
| 1. 6 | Generation Inputs | | | | | | | | |
| 1. 7 | Ancillary Services | 71,664 | | | | | | | 71,664 |
| 1. 8 | Station Service | 1,724 | 30 | 1,133 | 98 | 56 | 399 | 8 | |
| 1. 9 | Corp/Bureau | 3,701 | | 3,478 | 223 | | | | |
| 1.10 | Remedial Action Scheme (RAS) | 231 | | | | | 231 | | |
| 1.11 | Gen'l Transfer Agrmnts for nonfederal pwr | 2,000 | | 2,000 | | | | | |
| 1.12 | Leases | 5,267 | | 5,188 | 79 | | | | |
| 1.13 | Depreciation | 181,734 | 2,402 | 119,986 | 2,675 | 2,427 | 26,371 | 4,062 | 23,811 |
| 1.14 | Interest Credit from Facilities Sales | -752 | 0 | 0 | -376 | -376 | 0 | 0 | 0 |
| 1.15 | Interest | 177,060 | 2,816 | 127,914 | 3,187 | 2,806 | 23,633 | 4,517 | 12,187 |
| 1.16 | Net Revenues for Risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1.17 | Total Cost | 671,048 | 7,583 | 407,286 | 10,395 | 7,472 | 76,110 | 10,635 | 151,567 |

# 2002 Transmission Rate Case Segmented Revenue Requirement
## ($000)

| | | (A) TBL Total | (B) Generation Integration | (C) Network | (D) Delivery Utility | (E) Delivery Industry | (F) Intertie Southern | (G) Intertie Eastern | (H) Ancillary Services |
|---|---|---|---|---|---|---|---|---|---|
| | **FY 2003** | | | | | | | | |
| 1.18 | Gross Plant | 4,929,534 | 63,020 | 3,678,284 | 69,046 | 61,476 | 694,354 | 26,750 | 336,604 |
| 1.19 | Lines | 2,190,961 | 16,511 | 1,965,664 | 1,656 | 1,596 | 203,938 | 1,596 | |
| 1.20 | Stations | 2,401,969 | 46,509 | 1,712,620 | 67,390 | 59,880 | 490,416 | 25,154 | |
| ★ 1.21 | Net Plant | 3,206,660 | 48,224 | 2,359,217 | 56,001 | 49,506 | 400,961 | 76,598 | 216,153 |
| 1.22 | Operating Expenses | 222,543 | 2,276 | 143,848 | 4,394 | 2,494 | 24,832 | 1,996 | 42,703 |
| 1.23 | Generation Inputs | | | | | | | | |
| 1.24 | Ancillary Services | 71,664 | | | | | | | 71,664 |
| 1.25 | Station Service | 1,724 | 30 | 1,133 | 98 | 56 | 399 | 8 | |
| 1.26 | Corp/Bureau | 3,684 | | 3,458 | 226 | | | | |
| 1.27 | Remedial Action Scheme (RAS) | 231 | | | | | 231 | | |
| 1.28 | Gen'l Transfer Agrmnts for nonfederal pwr | 2,000 | | 2,000 | | | | | |
| 1.29 | Leases | 5,267 | | 5,188 | 79 | | | | |
| 1.30 | Depreciation | 194,009 | 2,473 | 128,861 | 2,803 | 2,548 | 27,065 | 4,161 | 26,098 |
| 1.31 | Interest Credit from Facilities Sales | -750 | 0 | 0 | -375 | -375 | 0 | 0 | 0 |
| 1.32 | Interest | 178,865 | 2,690 | 131,595 | 3,124 | 2,761 | 22,365 | 4,273 | 12,057 |
| 1.33 | Net Revenues for Risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ★ 1.34 | Total Cost | 679,237 | 7,469 | 416,083 | 10,349 | 7,484 | 74,892 | 10,438 | 152,522 |
| | **Average FY 2002 and FY 2003** | | | | | | | | |
| ★ 1.35 | Total Cost | 675,143 | 7,526 | 411,685 | 10,372 | 7,478 | 75,501 | 10,537 | 152,045 |

# Comparison with 2010 Tx Rate Case Revenue Requirement
## ($000)

**2010 Rate Case Revenue Requirement Study (Table 3)**

| | | FY 2010 | FY 2011 |
|---|---|---|---|
| 9 | Operating Expenses | 618,661 | 627,390 |
| 20 | Net Interest Expense | 154,196 | 173,579 |
| 22 | Minimum Required Net Revenues (MRNR) | 74,517 | 75,641 |
| 25 | Total Revenue Requirement | 847,374 | 876,610 |

| | | (A) | (B) | (C) | (D) | (E) | (F) | (G) | (H) |
|---|---|---|---|---|---|---|---|---|---|
| | | | Generation | | Intertie | | Delivery | | Ancillary |
| | | Total | Integration | Network | Southern | Eastern | Utility | Industry | Services |
| 1.35 | **2002 Rate Case Annual Average** | 675,143 | 7,526 | 411,685 | 75,501 | 10,537 | 10,372 | 7,478 | 152,045 |
| 14 | **2010 Preliminary Workshop (Oct 8, 2008)** | 873,334 | 8,781 | 580,413 | 85,413 | 8,895 | 4,743 | 7,945 | 177,146 |
| X.1 | **2010 Final Average, allocated proportionally** | 861,992 | 8,666 | 572,875 | 84,304 | 8,779 | 4,681 | 7,841 | 174,845 |
| | **Percent change** (X.1 / 1.35 - 1) | 28% | 15% | 39% | 12% | -17% | -55% | 5% | 15% |

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# Allocation of Revenue Credits to Revenue Segments

- Direct allocations based on segmented facilities
  - O&M, UFT, COE/BOR, TGT
- Southern Intertie Contracts
  - Non-Federal O&M, Replacements, and Amortization, $3^{rd}$ AC RAS
- Network Contracts
  - PTP Reservation Fees, Power Factor Penalties, Transmission Share of IPP
- Net Plant Allocation
  - Land Use, Lease and Sales, Other Leases, Fiber Leases and O&M, Telecommunication Systems

# 2002 Transmission Rate Case Revenue Credits

| | | (A) FY 2002 ($000) | (B) FY 2003 ($000) | (C) AVERAGE ($000) |
|---|---|---|---|---|
| | **Transmission Revenue Credit** | | | |
| 2. 1 | AC Rate | 1,375 | 1,375 | 1,375 |
| 2. 2 | CSPE Whlg | 268 | 127 | 198 |
| 2. 3 | Fiber | 15,500 | 17,500 | 16,500 |
| 2. 4 | Fiber Depreciation | 696 | 696 | 696 |
| 2. 5 | Irrigation Pumping Power | 1,288 | 1,288 | 1,288 |
| 2. 6 | NFP Depreciation | 3,335 | 3,335 | 3,335 |
| 2. 7 | Operations and Maintenance | 675 | 675 | 675 |
| 2. 8 | PC Wireless | 4,070 | 4,430 | 4,250 |
| 2. 9 | Power Factor Penalty Charge | 5,000 | 5,000 | 5,000 |
| 2.10 | Remedial Action Scheme (RAS) | 597 | 597 | 597 |
| 2.11 | Supplemental Capacity Whlg | 62 | 27 | 45 |
| 2.12 | TGT | 10,136 | 10,136 | 10,136 |
| 2.13 | Use of Facilities (UFT) | 5,679 | 5,679 | 5,679 |
| 2.14 | Reservation Fee | 828 | 1,656 | 1,242 |
| 2.15 | PBL Delivery Credit | 2,000 | 2,000 | 2,000 |
| 2.16 | Total | 48,681 | 50,865 | 49,773 |

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# Comparison to 2010 Tx Rate Case Forecast of Revenue Credits

| | 2002 Transmission Rate Study | | 2010 Rate Case Forecast (Revenue Requirement Table 14) | |
|---|---|---|---|---|
| 1 | Use of Facilities (UFT) | 5,679 | UFT Fixed Dollar Amount | 6,416 |
| 2 | | | UFT Variable Service Amt | |
| 3 | | | COE/BOR Project Revenue | |
| 4 | TGT | 10,136 | TGT Firm Demand | 9,796 |
| 5 | Operations and Maintenance | 675 | O&M Non-Federal Facility | 1,133 |
| 6 | | | O&M Federal Facility | |
| 7 | Reservation Fee | 1,242 | PTP Reservation Fee | 1,229 |
| 8 | Power Factory Penalty Charge | 5,000 | Power Factor Penalty Lagging | 4,402 |
| 9 | | | Power Factor Penalty Leading | |
| 10 | | | PFP Lagging Ratchet | |
| 11 | | | PFP Leading Ratchet | |
| 12 | **Not identified as a credit | 5,790 | DSI Delivery Charge | 1,765 |
| 13 | PC Wireless | 4,250 | PCS Wireless Leases | 5,205 |
| 14 | | | PCS Construction | |
| 15 | | | PCS Application Fee | |
| 16 | | | Use of Communication Equipmt | |
| 17 | Fiber | 16,500 | Fiber Leases | 7,188 |
| 18 | Fiber Depreciation | 696 | Fiber Operations & Maintenance | 905 |
| 19 | AC Rate | 1,375 | SINT AC Non Federal O&M | 1,891 |
| 20 | | | SINT AC Non Fed Replacements | |
| 21 | Remedial Action Scheme (RAS) | 597 | 3rd AC Remedial Action Sceme | 51 |
| 22 | Irrigation Pumping Power | 1,288 | Transmission Share of IPP | 382 |
| 23 | NFP Depreciation | 3,335 | Amort NonFed PNW AC Intertie | 3,065 |
| 24 | CSPE Whlg | 198 | *N/A* | |
| 25 | Supplemental Capacity Whlg | 45 | | |
| 26 | PBL Delivery Credit | 2,000 | | |
| 27 | **Unknown | | Land Use/Lease/Sale | 463 |
| 28 | | | Misc Leases | |
| 29 | | | Right-Of-Way Lease | |
| 30 | **Total** | **58,805** | **Total** | **43,891** |

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# 2010 Tx Rate Case Preliminary Percentage Allocation of Revenue Credits

| | Credit Segmentation Factors | (A) | (B) | (C) | (D) | (E) | (F) | (G) | (H) |
|---|---|---|---|---|---|---|---|---|---|
| | | | Generation | | Intertie | | Delivery | | Ancillary |
| | | Basis | Integration | Network | Southern | Eastern | Utility | Industrial | Services |
| 2.B01 | UFT Fixed Dollar Amount | direct | 0.12% | 71.45% | 15.60% | 7.86% | 4.97% | - | - |
| 2.B02 | UFT Variable Service Amt | direct | 0.12% | 71.45% | 15.60% | 7.86% | 4.97% | - | - |
| 2.B03 | TGT Firm Demand | direct | - | 3.32% | - | 96.68% | - | - | - |
| 2.B04 | O&M Non-Federal Facility | direct | 1.19% | 92.47% | 0.38% | - | 0.87% | 5.09% | - |
| 2.B05 | O&M Federal Facility | direct | 1.19% | 92.47% | 0.38% | - | 0.87% | 5.09% | - |
| 2.B06 | PTP Reservation Fee | network | - | 100.00% | - | - | - | - | - |
| 2.B07 | SINT AC Non Federal O&M | southern | - | - | 100.00% | - | - | - | - |
| 2.B08 | SINT AC Non Fed Replacements | southern | - | - | 100.00% | - | - | - | - |
| 2.B09 | Power Factor Penalty Lagging | network | - | 100.00% | - | - | - | - | - |
| 2.B10 | Power Factor Penalty Leading | network | - | 100.00% | - | - | - | - | - |
| 2.B11 | PFP Lagging Ratchet | network | - | 100.00% | - | - | - | - | - |
| 2.B12 | PFP Leading Ratchet | network | - | 100.00% | - | - | - | - | - |
| 2.B13 | DSI Delivery Charge | industry | - | - | - | - | - | 100.00% | - |
| 2.B14 | PCS Wireless Leases | net plant | 0.92% | 65.34% | 8.92% | 1.55% | 0.41% | 0.30% | 22.56% |
| 2.B15 | PCS Construction | net plant | 0.92% | 65.34% | 8.92% | 1.55% | 0.41% | 0.30% | 22.56% |
| 2.B16 | PCS Application Fee | net plant | 0.92% | 65.34% | 8.92% | 1.55% | 0.41% | 0.30% | 22.56% |
| 2.B17 | Fiber Leases | net plant | 0.92% | 65.34% | 8.92% | 1.55% | 0.41% | 0.30% | 22.56% |
| 2.B18 | Fiber Operations & Maintenance | net plant | 0.92% | 65.34% | 8.92% | 1.55% | 0.41% | 0.30% | 22.56% |
| 2.B19 | Land Use/ Lease/ Sale | net plant | 0.92% | 65.34% | 8.92% | 1.55% | 0.41% | 0.30% | 22.56% |
| 2.B20 | Misc Leases | net plant | 0.92% | 65.34% | 8.92% | 1.55% | 0.41% | 0.30% | 22.56% |
| 2.B21 | Right-Of-Way Lease | net plant | 0.92% | 65.34% | 8.92% | 1.55% | 0.41% | 0.30% | 22.56% |
| 2.B22 | COE/ BOR Project Revenue | direct | 71.86% | 27.58% | - | - | 0.56% | - | - |
| 2.B23 | 3rd AC Remedial Action Sceme | southern | - | - | 100.00% | - | - | - | - |
| 2.B24 | Transmission Share of IPP | network | - | 100.00% | - | - | - | - | - |
| 2.B25 | Use of Communication Equipmt | net plant | 0.92% | 65.34% | 8.92% | 1.55% | 0.41% | 0.30% | 22.56% |
| 2.B26 | Amort NonFed PNW AC Intertie | southern | - | - | 100.00% | - | - | - | - |

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# 2002 Transmission Rate Case - Rate Design Costs

## ($000)

| | | (A) | (B) | (C) | (D) | (F) | (G) | (H) |
|---|---|---|---|---|---|---|---|---|
| | | Generation | | Intertie | | Delivery | | Ancillary |
| | | Integration | Network | Southern | Eastern | Utility | Industry | Services |
| | **FY 2002** | | | | | | | |
| 3. 1 | Unadjusted Costs (Table 1) | 7,583 | 407,286 | 76,110 | 10,635 | 10,395 | 7,472 | 151,567 |
| 3. 2 | Revenue Credits (Table 2) | -215 | -25,074 | -7,912 | -10,593 | -2,506 | -188 | -5,021 |
| 3. 3 | DSI Stability Reserves 1/ | 0 | 0 | 542 | 0 | 0 | 0 | 0 |
| 3. 4 | Eastern Intertie Adjustment 2/ | 1 | 31 | 6 | -42 | 1 | 1 | 3 |
| 3. 5 | DSI Delivery Underrecovery | 0 | 1,495 | 0 | 0 | 0 | -1,495 | 0 |
| 3. 6 | Total | 7,369 | 383,738 | 68,746 | 0 | 7,889 | 5,790 | 146,549 |
| | **FY 2003** | | | | | | | |
| 3. 7 | Unadjusted Costs (Table 1) | 7,469 | 416,083 | 74,892 | 10,438 | 10,349 | 7,484 | 152,522 |
| 3. 8 | Revenue Credits (Table 2) | -231 | -27,009 | -8,269 | -10,629 | -2,531 | -211 | -5,641 |
| 3. 9 | DSI Stability Reserves 1/ | 0 | 0 | 544 | 0 | 0 | 0 | 0 |
| 3. 10 | Eastern Intertie Adjustment 2/ | -3 | -144 | -25 | 191 | -3 | -3 | -13 |
| 3. 11 | DSI Delivery Underrecovery | 0 | 1,480 | 0 | 0 | 0 | -1,480 | 0 |
| 3. 12 | Total | 7,235 | 390,410 | 67,143 | 0 | 7,815 | 5,790 | 146,868 |
| | **Average FY 2002 and FY 2003** | | | | | | | |
| 3.12 | Unadjusted Costs (Table 1) | 7,526 | 411,685 | 75,501 | 10,537 | 10,372 | 7,478 | 152,045 |
| 3.13 | Revenue Credits (Table 2) | -223 | -26,041 | -8,090 | -10,611 | -2,519 | -199 | -5,331 |
| 3.14 | DSI Stability Reserves 1/ | 0 | 0 | 543 | 0 | 0 | 0 | 0 |
| 3.15 | Eastern Intertie Adjustment 2/ | -1 | -56 | -9 | 75 | -1 | -1 | -5 |
| 3.16 | DSI Delivery Underrecovery | 0 | 1,487 | 0 | 0 | 0 | -1,487 | 0 |
| 3.17 | Total | 7,302 | 387,074 | 67,944 | 0 | 7,852 | 5,790 | 146,709 |

1/ Stability reserves credit based on DSI smelter load of MW (2002) and MW (2003) times credit of $/kW-mo.
2/ Eastern Intertie adjustment (cost - revenue) segmented on Table 1 net plant percentages.

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# Adjustments to Segmented Costs

1. DSI Stability reserves adjustment was only for 2002 – now included in the revenue requirement.
2. Eastern/Montana Intertie allocation
   - Proposed IM Rate established by TGT contract levels (discussed later in presentation)
   - Revenues from IM sales credited to the Eastern Intertie segment
   - Remaining costs (credits) allocated to other segments based on net plant
3. Industry Delivery allocation
   - DSI rates are Use of Facilities rates specific to each facility
   - Revenues from DSI Delivery are (in recent analysis) shown as revenue credits
   - Remaining costs allocated to other segments based on net plant (in recent analysis)

# Transmission Rate Design Cost Comparison
# 2002 Rate Case to 2010 Rate Case Preliminary Calculations
($000)

| | | (A) | (B) | (C) | (D) | (F) | (G) | (H) |
|---|---|---|---|---|---|---|---|---|
| | | Generation Integration | Network | Intertie Southern | Intertie Eastern | Delivery Utility | Delivery Industry | Ancillary Services |
| 3.17 | **2002 Rate Case Total** | **7,302** | **387,074** | **67,944** | **0** | **7,852** | **5,790** | **146,709** |
| | **Average FY 2010 and FY 2011** | | | | | | | |
| 1 | Allocated Unadjusted Costs 1/ ..... | 8,666 | 572,875 | 84,304 | 8,779 | 4,681 | 7,841 | 174,845 |
| 2 | Revenue Credits (Prelim. Alloc.)... | -88 | -22,571 | -6,955 | -10,198 | -411 | -1,791 | -1,877 |
| 3 | IM Tx Revenues.............................. | | | | -237 | | | |
| 4 | Eastern Intertie Adjustment 2/ ...... | -17 | -1,112 | -164 | 1,655 | -9 | -15 | -339 |
| 5 | Industry Delivery Adjustment 2/ . | 62 | 4,090 | 602 | | 33 | -6,035 | 1,248 |
| 6 | **Total (Preliminary Inputs)** | **8,624** | **553,282** | **77,787** | **0** | **4,295** | **0** | **173,877** |
| 7 | Percent change | 18% | 43% | 14% | N/ A | -45% | N/ A | 19% |

1/ Allocated costs based on 2010 published costs proportionally allocated by preliminary workshop segmentation.

2/ Eastern Intertie and Industry Delivery adjustment (cost - revenue) segmented on Revenue Requirement net plant percentages.

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# Forecast of Long-Term Sales

- PTP Sales (both network and interties) are forecasted for the rate period based on existing sales and analysis of assumed future sales coordinated with customer Account Executives (AEs).
- Legacy Sales (FPT and IR) are forecasted for the rate period based on existing sales and analysis of conversions to OATT contracts upon expiration of legacy contract coordinated with AEs.
- NT Sales are forecasted for the rate period based on forecasts of customer loads incorporating known changes in load and assumptions regarding economy and weather patterns. Load forecasts are developed by BPA's Load Forecasting Group.
  - Loads are forecasted coincident with BPA's peak total transmission system load (TTSL).
- Forecast details are identified in an Appendix, with a summary table shown in the model.

# 2002 Transmission Rate Case Forecast of Long-Term Sales
## (MW)

| | | | (A) | (B) | (C) | (D) | (E) | (F) | (G) | (H) | (I) | (J) | (K) | (L) | (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Transmission Rate Schedule** | **Units 1/** | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Jul** | **Aug** | **Sep** | **Annual** |
| | **Network** | | | | | | | | | | | | | | |
| | **FY 2002** | | | | | | | | | | | | | | |
| 4. 1 | Formula Power Transmission (FPT) | a_cd | 3,429 | 3,429 | 3,396 | 3,396 | 3,396 | 3,396 | 3,396 | 3,396 | 3,396 | 3,396 | 3,396 | 3,429 | **3,405** |
| 4. 2 | Integration of Resources (IR) | a_cd | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | **4,542** |
| 4. 3 | Point to Point (PTP) | a_cd | 10,881 | 10,881 | 10,881 | 10,886 | 10,886 | 11,156 | 11,156 | 11,156 | 11,156 | 11,156 | 11,156 | 11,156 | **11,042** |
| 4. 4 | Point to Point (PTP) 2/ | m_cd | 1,645 | 1,557 | 1,557 | 1,557 | 1,557 | 1,557 | 1,579 | 1,682 | 1,710 | 1,549 | 1,387 | 1,387 | **1,560** |
| 4. 5 | Network Integration (Base Charge) | cp | 4,990 | 5,046 | 6,063 | 6,291 | 6,272 | 5,090 | 4,590 | 4,194 | 4,016 | 4,419 | 4,528 | 4,145 | **4,970** |
| 4. 6 | Subtotal Network | | 25,488 | 25,456 | 26,440 | 26,673 | 26,654 | 25,742 | 25,264 | 24,971 | 24,821 | 25,063 | 25,010 | 24,660 | **25,520** |
| | **FY 2003** | | | | | | | | | | | | | | |
| 4. 7 | Formula Power Transmission (FPT) | a_cd | 3,429 | 3,429 | 3,396 | 3,396 | 3,396 | 3,396 | 3,396 | 3,396 | 3,396 | 3,396 | 3,396 | 3,429 | **3,405** |
| 4. 8 | Integration of Resources (IR) | a_cd | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | 4,542 | **4,542** |
| 4. 9 | Point to Point (PTP) | a_cd | 11,831 | 11,831 | 11,831 | 11,645 | 11,645 | 11,645 | 11,645 | 11,645 | 11,645 | 11,535 | 11,535 | 11,535 | **11,664** |
| 4.10 | Point to Point (PTP) 2/ | m_cd | 1,519 | 1,431 | 1,431 | 1,431 | 1,431 | 1,431 | 1,981 | 2,084 | 2,112 | 1,973 | 1,957 | 1,957 | **1,728** |
| 4.11 | Network Integration (Base Charge) | cp | 5,059 | 5,126 | 6,155 | 6,376 | 6,365 | 5,164 | 4,671 | 4,273 | 4,092 | 4,500 | 4,606 | 4,216 | **5,050** |
| 4.12 | Subtotal Network | | 26,380 | 26,360 | 27,356 | 27,391 | 27,380 | 26,179 | 26,235 | 25,941 | 25,788 | 25,947 | 26,037 | 25,680 | **26,390** |
| 4.13 | Average FY 2002 and FY 2003 Network | | 25,934 | 25,908 | 26,898 | 27,032 | 27,017 | 25,961 | 25,750 | 25,456 | 25,304 | 25,505 | 25,523 | 25,170 | **25,955** |
| 4.14 | Network Integration (Load Shaping) FY 2002 | cp | 5,538 | 5,666 | 6,663 | 6,846 | 6,906 | 5,617 | 5,007 | 4,731 | 4,544 | 4,745 | 4,896 | 4,574 | **5,478** |
| 4.15 | Network Integration (Load Shaping) FY 2003 | cp | 5,602 | 5,740 | 6,750 | 6,929 | 6,998 | 5,690 | 5,073 | 4,796 | 4,606 | 4,812 | 4,960 | 4,631 | **5,549** |
| | **Southern Intertie** | | | | | | | | | | | | | | |
| | **FY 2002** | | | | | | | | | | | | | | |
| 4.16 | Intertie South (IS), North to South | m_cd | 129 | 129 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 129 | **104** |
| 4.17 | Intertie South (IS), South to North | m_cd | 271 | 271 | 271 | 271 | 271 | 271 | 271 | 271 | 271 | 271 | 271 | 271 | **271** |
| 4.18 | Point to Point Service | a_cd | 2,641 | 2,641 | 2,641 | 2,641 | 2,641 | 2,641 | 3,036 | 3,752 | 3,852 | 3,852 | 3,852 | 2,637 | **3,069** |
| 4.19 | Point to Point Service 2/ | m_cd | 405 | 317 | 317 | 317 | 317 | 317 | 317 | 420 | 448 | 462 | 462 | 462 | **380** |
| 4.20 | Subtotal Southern Intertie | | 3,446 | 3,358 | 3,325 | 3,325 | 3,325 | 3,325 | 3,720 | 4,539 | 4,667 | 4,681 | 4,681 | 3,499 | **3,824** |
| | **FY 2003** | | | | | | | | | | | | | | |
| 4.21 | Intertie South (IS), North to South | m_cd | 129 | 129 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 129 | **104** |
| 4.22 | Intertie South (IS), South to North | m_cd | 271 | 271 | 271 | 271 | 271 | 271 | 271 | 271 | 271 | 271 | 271 | 271 | **271** |
| 4.23 | Point to Point Service | a_cd | 2,637 | 2,637 | 2,637 | 2,437 | 2,437 | 2,437 | 2,437 | 2,836 | 2,836 | 2,781 | 2,781 | 2,381 | **2,606** |
| 4.24 | Point to Point Service 2/ | m_cd | 419 | 331 | 331 | 331 | 331 | 331 | 331 | 434 | 462 | 498 | 498 | 498 | **400** |
| 4.25 | Subtotal Southern Intertie | | 3,456 | 3,368 | 3,335 | 3,135 | 3,135 | 3,135 | 3,135 | 3,637 | 3,665 | 3,646 | 3,646 | 3,279 | **3,381** |
| 4.26 | Average FY 2002 and FY 2003 Southern Intertie | | 3,451 | 3,363 | 3,330 | 3,230 | 3,230 | 3,230 | 3,428 | 4,088 | 4,166 | 4,164 | 4,164 | 3,389 | **3,603** |

**1/** Annual contract demand (a_cd), monthly contract demand (m_cd), or coincidental peak (cp) which denotes contribution to TBL transmission system peak load.
**2/** Monthly demands from PBL grandfathered agreements.

Predecisional/For Discussion Purposes Only

# Long-Term Sales Comparison 2002 to 2010

| | Transmission Rate Schedule | | 2002 Rate Study (A) | (B) | (C) | 2010 Revenue Requirement Table 14.1 (D) | (E) | (F) | (G) | (H) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Network | Units | FY 2002 | FY 2003 | 2002 Rate Case | FY 2009 | FY 2010 | FY 2011 | 2010 Rate Case | Change 2010/2002 |
| 1 | Formula Power Transmission (FPT) | aMW | 3,405 | 3,405 | **3,405** | 1,887 | 1,524 | 1,497 | **1,511** | -56% |
| 2 | Integration of Resources (IR) | aMW | 4,542 | 4,542 | **4,542** | 4,052 | 2,168 | 1,456 | **1,812** | -60% |
| 3 | Point to Point (PTP) | aMW | 11,042 | 11,664 | | | | | | |
| 4 | PS Legacy Point to Point (PTP) | aMW | 1,560 | 1,728 | | | | | | |
| 5 | CONFIRMED Sales | | | | | 18,822 | 18,183 | 16,218 | | |
| 6 | CONFIRMED Short Distance Discount (SDD) | | | | | -357 | -284 | -159 | | |
| 7 | STUDY Sales | | | | | 26 | 338 | 588 | | |
| 8 | Expected Sales | | | | | 128 | 3,491 | 6,652 | | |
| 9 | Expected SDD | | | | | 81 | -49 | -261 | | |
| 10 | Subtotal Long-term PTP | | 12,603 | 13,392 | **12,998** | 18,700 | 21,679 | 23,037 | **22,358** | 72% |
| 11 | Network Integration (Base Charge) | cp | 4,970 | 5,050 | **5,010** | 5,985 | 6,063 | 6,276 | **6,170** | 23% |
| 12 | **Subtotal Network** | | **25,520** | **26,390** | **25,955** | **31,482** | **32,325** | **33,157** | **32,741** | 26% |
| 13 | Network Integration (Load Shaping) | cp | 5,478 | 5,549 | **5,513** | 5,890 | 6,320 | 6,533 | **6,426** | 17% |
| | **Southern Intertie** | | | | | | | | | |
| 14 | Intertie South (IS), North to South | aMW | 104 | 104 | | | | | | |
| 15 | Intertie South (IS), South to North | aMW | 271 | 271 | | | | | | |
| 16 | Point to Point Service | aMW | 3,069 | 2,606 | | | | | | |
| 17 | PS Legacy Point to Point Service | aMW | 380 | 400 | | | | | | |
| 18 | CONFIRMED Sales | | | | | 5,340 | 3,596 | 3,344 | | |
| 19 | STUDY Sales | | | | | 0 | 450 | 450 | | |
| 20 | Expected Sales | | | | | 87 | 1,365 | 1,586 | | |
| 21 | **Subtotal Southern Intertie** | | **3,824** | **3,381** | **3,603** | **5,427** | **5,411** | **5,380** | **5,396** | 50% |

- We expect legacy contracts to continue to convert to OATT service

# Forecast of Short-Term Sales

- PTP short-term sales are forecasted for both network and intertie, and include sales made a day ahead and earlier for up to one-year in length, as well as hourly sales made in the real-time market.
- The forecast of short-term sales is developed primarily by averaging historical short-term sales. Consideration may be given to customer changes, historical streamflow levels, and historical and future estimates of market conditions.
- The sales are converted to average monthly sales amounts for each of four classes of sales.
  - Block 1 – Days one to five of a daily, weekly, or monthly reservation.
  - Block 2 – Days six and beyond of a daily, weekly, or monthly reservation.
  - Hourly Firm
  - Hourly Non-Firm

# 2002 Transmission Rate Case Forecast of Short-Term Sales
## (MW)

| | Short-term Product | Comment | Units | (A) Oct. | (B) Nov. | (C) Dec. | (D) Jan. | (E) Feb. | (F) Mar. | (G) Apr. | (H) May | (I) Jun. | (J) Jul. | (K) Aug. | (L) Sep. | (M) Annual Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Network** | | | | | | | | | | | | | | | |
| | **FY 2002** | | | | | | | | | | | | | | | |
| 5. 1 | Daily Block1 Product | 1st 5 Days of Reservations | MW-mos. | 282 | 195 | 280 | 962 | 501 | 550 | 394 | 382 | 494 | 589 | 410 | 294 | **445** |
| 5. 2 | Daily Block2 Product | Reservations beyond 5th day | MW-mos. | 603 | 696 | 1,282 | 3,317 | 1,981 | 2,299 | 1,945 | 1,991 | 2,134 | 2,381 | 2,224 | 1,197 | **1,837** |
| 5. 3 | Hourly | | aMW | 367 | 380 | 648 | 1,776 | 1,123 | 1,182 | 998 | 985 | 1,121 | 1,232 | 1,093 | 636 | **962** |
| 5. 4 | | | | | | | | | | | | | | | | **3,244** |
| | **FY 2003** | | | | | | | | | | | | | | | |
| 5. 5 | Daily Block1 Product | 1st 5 Days of Reservations | MW-mos. | 290 | 202 | 288 | 1,004 | 527 | 573 | 382 | 369 | 477 | 575 | 391 | 277 | **446** |
| 5. 6 | Daily Block2 Product | Reservations beyond 5th day | MW-mos. | 621 | 720 | 1,318 | 3,459 | 2,082 | 2,398 | 1,883 | 1,922 | 2,060 | 2,325 | 2,116 | 1,127 | **1,836** |
| 5. 7 | Hourly | | aMW | 378 | 393 | 667 | 1,852 | 1,180 | 1,233 | 967 | 951 | 1,083 | 1,204 | 1,040 | 599 | **962** |
| 5. 8 | | | | | | | | | | | | | | | | **3,245** |
| | **Average FY2002/2003** | | | | | | | | | | | | | | | |
| 5. 9 | Daily Block1 Product | 1st 5 Days of Reservations | MW-mos. | 286 | 199 | 284 | 983 | 514 | 562 | 388 | 375 | 485 | 582 | 401 | 286 | **445** |
| 5.10 | Daily Block2 Product | Reservations beyond 5th day | MW-mos. | 612 | 708 | 1,300 | 3,388 | 2,032 | 2,349 | 1,914 | 1,957 | 2,097 | 2,353 | 2,170 | 1,162 | **1,837** |
| 5.11 | Hourly | | aMW | 373 | 387 | 657 | 1,814 | 1,151 | 1,208 | 982 | 968 | 1,102 | 1,218 | 1,067 | 618 | **962** |
| 5.12 | | | | | | | | | | | | | | | | **3,244** |
| | **Southern Intertie** | | | | | | | | | | | | | | | |
| | **FY 2002** | | | | | | | | | | | | | | | |
| 5.13 | Daily Block1 Product | 1st 5 Days of Reservations | MW-mos. | 103 | 72 | 62 | 281 | 26 | 92 | 173 | 39 | 93 | 393 | 233 | 141 | **142** |
| 5.14 | Daily Block2 Product | Reservations beyond 5th day | MW-mos. | 253 | 166 | 214 | 840 | 412 | 576 | 1,206 | 1,241 | 1,270 | 1,719 | 1,819 | 755 | **873** |
| 5.15 | Hourly | | aMW | 64 | 43 | 49 | 201 | 84 | 119 | 252 | 229 | 249 | 378 | 367 | 164 | **183** |
| 5.16 | | | | | | | | | | | | | | | | **1,198** |
| | **FY 2003** | | | | | | | | | | | | | | | |
| 5.17 | Daily Block1 Product | 1st 5 Days of Reservations | MW-mos. | 102 | 71 | 62 | 318 | 28 | 98 | 201 | 48 | 117 | 490 | 284 | 150 | **164** |
| 5.18 | Daily Block2 Product | Reservations beyond 5th day | MW-mos. | 251 | 165 | 212 | 950 | 434 | 613 | 1,408 | 1,539 | 1,608 | 2,141 | 2,223 | 806 | **1,029** |
| 5.19 | Hourly | | aMW | 63 | 43 | 49 | 227 | 88 | 127 | 294 | 284 | 315 | 471 | 448 | 175 | **215** |
| 5.20 | | | | | | | | | | | | | | | | **1,409** |
| | **Average FY2002/2003** | | | | | | | | | | | | | | | |
| 5.21 | Daily Block1 Product | 1st 5 Days of Reservations | MW-mos. | 103 | 72 | 62 | 300 | 27 | 95 | 187 | 43 | 105 | 442 | 259 | 145 | **153** |
| 5.22 | Daily Block2 Product | Reservations beyond 5th day | MW-mos. | 252 | 165 | 213 | 895 | 423 | 594 | 1,307 | 1,390 | 1,439 | 1,930 | 2,021 | 781 | **951** |
| 5.23 | Hourly | | aMW | 63 | 43 | 49 | 214 | 86 | 123 | 273 | 256 | 282 | 424 | 408 | 169 | **199** |
| 5.24 | | | | | | | | | | | | | | | | **1,303** |

# Short-Term Sales Comparison 2002 to 2010

| | | | 2002 Rate Study | | | 2010 Revenue Requirement Table 14.1 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Transmission Rate Schedule** | | (A) | (B) | (C) | (D) | (E) | (F) | (G) | (H) |
| | **Network** | **Units** | **FY 2002** | **FY 2003** | **2002 Rate Case** | **FY 2009** | **FY 2010** | **FY 2011** | **2010 Rate Case** | **Change 2010/2002** |
| 1 | Daily Block1 Product | aMW | 445 | 446 | **445** | | | | | |
| 2 | Daily Block2 Product | aMW | 1,837 | 1,836 | **1,837** | | | | | |
| 3 | Hourly | aMW | 962 | 962 | **962** | | | | | |
| 4 | **Subtotal Network** | | **3,244** | **3,245** | **3,244** | **858** | **891** | **891** | **891** | -73% |
| | **Southern Intertie** | | | | | | | | | |
| 5 | Daily Block1 Product | aMW | 142 | 164 | **153** | | | | | |
| 6 | Daily Block2 Product | aMW | 873 | 1,029 | **951** | | | | | |
| 7 | Hourly | aMW | 183 | 215 | **199** | | | | | |
| 8 | **Subtotal Southern Intertie** | | **1,198** | **1,409** | **1,303** | **207** | **209** | **209** | **209** | -84% |

- The increase in long-term sales has reduced our expectation of short-term sales

# Formula Power Transmission (FPT) Rate Calculation

- FPT has various components that make up the rate.  Actual costs to establish rates for each component were developed in the 1996 rate study.
- FPT sales are legacy sales. The forecast considers the expiration dates of the existing contracts and assumptions are made regarding conversions to OATT service.  FPT sales projections are calculated by dividing projected revenue by the calculated “compensation factor” for each contract path to identify a nominal sales quantity for rate setting purposes.
- The current approach to setting the FPT rates is to determine the average percentage change in the overall network rates, and apply this percentage to the existing component rates to determine the proposed rates.

# Network Segment Rate Calculation, Part 1 (Base Charge)

- The network segment rate development costs are allocated to all network transmission services based on their annual average sales as identified in the long-term and short-term sales forecast.
- Network Integration (NT) is annualized based on the annual peak demand (1cp).
- Short-term point-to-point sales are adjusted to reflect higher charges for block 1 sales (7 days for a 5 day period), and hourly sales (24 hours over 7 days for a 16 hour heavy-load period over 5 days).
- Dividing the annual costs by the annual average sales (i.e. rate design Megawatts) results in an annual network base charge.

# Network Segment Rate Calculation, Part 2 (PTP rates)

- The long-term point-to-point (PTP) monthly rate is set by dividing the annual network base charge by 12 months.
- The block 2 short-term PTP daily rate is set by dividing the annual network base charge by 365 days.
- The block 1 short-term PTP daily rate is the block 2 rate times 7/5.
- The hourly PTP rates (both firm and non-firm) are set by dividing the block 1 rate by 24 hours times 24/16 time 1000 to convert to mills/kWh.

# Network Segment Rate Calculation, Part 3 (NT Rates)

- The Network Integration (NT) monthly base rate is set by dividing the annual network base charge by 12 months.
- Because NT is billed based on a monthly peak (rather than the annual peak), the revenue from the NT base rate charges, which are derived from the monthly peak sales, will not fully recover the costs allocated according to the NT annual peak usage used to calculate the annual base rate.
- The NT Load shaping charge is therefore calculated as the unrecovered cost divided by the average NT sales forecast.

# Network Segment Rate Calculation, Part 4 (IR Rate)

- The Integration of Resources (IR) monthly base rate is set by dividing the annual network base charge by 12 months and adding the monthly SCD and GSR rates (to be discussed later).

# Intertie Segment Rate Calculation, Part 1 (Base Charge)

- The Intertie segment rate development costs are allocated to all intertie transmission services based on their annual average sales as identified in the long-term and short-term sales forecast.
- Short-term intertie sales are adjusted to reflect higher charges for block 1 sales (7 days for a 5 day period), and hourly sales (24 hours over 7 days for a 16 hour heavy-load period over 5 days).
- Dividing the annual costs by the annual average sales (i.e. rate design Megawatts) results in an annual intertie base charge.

# Intertie Segment Rate Calculation, Part 2 (Rates)

- The long-term Southern Intertie (IS) monthly rate is set by dividing the annual intertie base charge by 12 months.
- The block 2 short-term IS daily rate is set by dividing the annual intertie base charge by 365 days.
- The block 1 short-term IS daily rate is the block 2 rate times 7/5.
- The hourly IS rates (both firm and non-firm) are set by dividing the block 1 rate by 24 hours times 24/16, times 1000 to convert to mills/kWh.

# Montana Intertie Rate Calculation

- The Montana Intertie (IM) base charge is established based on dividing the annual payments made by TS (costs) as defined in the Townsend-Garrison Transmission contract divided by the total capacity made available through the contract (185 MW).
- The Monthly, Block 1, Block 2, and Hourly rates are set similar to the network and Southern Intertie rates from the base charge.
- Because only one long-term sale is identified on the Montana Intertie (and no short-term is expected), the revenues from the sale are treated as a revenue credit.

# Utility Delivery Segment

- The Utility Delivery segment rates are established by dividing the Rate Development Costs for this segment by the load forecast (average of the monthly peak coincident with the TTSL peak for each point of delivery).
- Both costs and forecasted load for delivery facilities, subject to the delivery charge, have been significantly reduced to reflect sales of delivery facilities.
- 2002 Rate Case forecast is 645MW.
- 2010 Rate Case forecast is 190MW; a 70% reduction.

# Ancillary Services Rate Calculation

- The Ancillary Services segment includes the SCD and GSR services as well as the Generation Inputs provided by BPA Power Services.
- Scheduling, Control, and Dispatch (SCD), and Generation-Supplied Reactive (GSR) support all transmission on the BPA system.
- Generation Inputs include Operating Reserves (OR), Regulation and Frequency Response (RFR), and Wind Balancing Service (WI) which are specific to the type of service being provided.
- For rate purposes, other generation inputs are forecasted at zero, such as energy and generation imbalance (eg. pass through from transmission to power), or are included in other segmented costs.

# Ancillary Services Rate Calculation, SCD & GSR

- The rates for Scheduling, Control, and Dispatch (SCD), and Generation-supplied Reactive (GSR) support are established by dividing the costs associated with each service by the total transmission sales across all transmission segments (including Network, Southern Intertie, and Montana Intertie).
- The SCD rates have typically been about 15% to 20% of the transmission rates.
- There are currently no Generation-supplied Reactive costs, therefore the rate is zero.
- The SCD rates are applied to all long-term services.
  - The rate is bundled in the IR rate.
  - FPT assumes the SCD is included in the component rates.

# Ancillary Services Rate Calculation, Generation Inputs

- BPA Transmission determines the required quantity amount of generation inputs needed to support its Balancing Area Authority.
- The generation input costs are established through the power rate case and used by Transmission to establish ancillary and control area service rates in the transmission rate case.
- The Partial Transmission Settlement Agreement included two of the required ancillary services: Scheduling, System Control, and Dispatch Service and Reactive Supply and Voltage Control from Generation Sources Service.

# 2010 Transmission Rate Case Generation Input Rates

| | | Source | (A) FY10 ($000) | (B) FY11 ($000) | (C) FY10/11 ($000) | (D) Rates | Units |
|---|---|---|---|---|---|---|---|
| 1.01 | **Regulation & Frequency Response....................................** | Rev Rqmt 2/ | 7,595 | 7,802 | **7,699** | | ($000) |
| 1.02 | FY10/ 11 Balancing Authority Load Forecast................... | Load Forecast 1/ | 5,886.6 | 6,047.2 | **5,966.9** | | MW |
| 1.03 | Rate.......................................................................... | Row 1.01 / Row 1.02 / 8.760 | | | | **0.15** | mills/ kWh |
| 1.04 | **Within-hour Balancing for Wind......................................** | Rev Rqmt 2/ | 38,573 | 56,247 | **47,410** | | ($000) |
| 1.05 | Average Installed Wind (MW) during Rate Period......... | From Studies | 2,483.7 | 3,621.7 | **3,052.7** | | MW |
| 1.06 | Rate (30-min Persistence Assumption)........................... | Row 1.04 / Row 1.05 / 12 mo | | | | **1.29** | $/ kW month |
| 1.07 | Regulation.............................................................. | Rev Rqmt 1/ | | | 1,930 | 0.05 | $/ kW month |
| 1.08 | Following............................................................... | Rev Rqmt 1/ | | | 9,595 | 0.26 | $/ kW month |
| 1.09 | Imbalance.............................................................. | Rev Rqmt 1/ | | | 35,885 | 0.98 | $/ kW month |
| 1.10 | Alternate WI (45-min Persistence Assumption)................. | 1.12 + 1.13 + 1.14 | | | **57,806** | | |
| 1.11 | Rate.......................................................................... | 1.10 / 1.05 / 12 mo | | | | **1.58** | $/ kW month |
| 1.12 | Regulation.............................................................. | Rev Rqmt 1/ | | | 1,944 | 0.05 | $/ kW month |
| 1.13 | Following............................................................... | Rev Rqmt 1/ | | | 9,699 | 0.26 | $/ kW month |
| 1.14 | Imbalance.............................................................. | Rev Rqmt 1/ | | | 46,163 | 1.26 | $/ kW month |
| | **Operating Reserve** | | | | | | |
| 1.15 | Total Reserve Obligation ..................................................... | From Studies | **428.1** | **358.7** | **393.4** | | MW |
| 1.16 | Spinning Reserve Obligation............................................. | Row 1.15 * 0.5 | 214.0 | 179.3 | 196.7 | | MW |
| 1.17 | Supplemental Reserve Obligation | Row 1.15 * 0.5 | 214.0 | 179.3 | 196.7 | | MW |
| 1.18 | **Operating Reserve - Spinning.........................................** | Rev Rqmt 2/ | 15,985 | 13,393 | **14,689** | | ($000) |
| 1.19 | Rate.......................................................................... | Row 1.18 / Row 1.16 / 8.760 | | | | **8.53** | mills/ kWh |
| 1.20 | Default Rate.............................................................. | Row 1.19 * 1.15 | | | | **9.80** | mills/ kWh |
| 1.21 | **Operating Reserve - Supplemental................................** | Rev Rqmt 2/ | 15,447 | 12,943 | **14,195** | | ($000) |
| 1.22 | Rate.......................................................................... | Row 1.21 / Row 1.17 / 8.760 | | | | **8.24** | mills/ kWh |
| 1.23 | Default Rate.............................................................. | Row 1.22 * 1.15 | | | | **9.47** | mills/ kWh |
| 1.24 | **Generation/Energy Imbalance..........................................** | No Rqmt | 0 | 0 | 0 | **Market Based** | |

1/ Dollars from Generation Inputs from PS Gen Inputs Final Forecast of July 10, 2009
2/ Load Forecast from June 4, 2009
3/ Installed wind estimate from reserve forecast study developed in April, 2009
4/ Reserve Forecast based on 6 months at existing standard (5/ 7), and 18 months on new standard (3/ 3); Reserve Forecast developed in March, 2009

Predecisional/For Discussion Purposes Only

# Summary of Current and Proposed Rates

| | | Units | (A) 1996 Rates | (B) 2002 Rates | (C) Percent Change (B) / (A) | (D) 2010 Rates | (E) Percent Change (D) / (B) |
|---|---|---|---|---|---|---|---|
| | **FPT-02.1 and FPT-02.3 Formula Power Transmission** | | | | | | |
| 10. 1 | M-G Distance | ($/kW-mi-yr) | 0.0405 | 0.0503 | 24.2% | 0.0587 | 16.7% |
| 10. 2 | M-G Miscellaneous Facilities | ($/kW-yr) | 2.31 | 2.87 | 24.2% | 3.35 | 16.7% |
| 10. 3 | M-G Terminal | ($/kW-yr) | 0.47 | 0.58 | 23.4% | 0.68 | 17.2% |
| 10. 4 | M-G Interconnection Terminal | ($/kW-yr) | 0.42 | 0.52 | 23.8% | 0.61 | 17.3% |
| 10. 5 | S-S Transformation | ($/kW-yr) | 4.35 | 5.41 | 24.4% | 6.31 | 16.6% |
| 10. 6 | S-S Interconnection Terminal | ($/kW-yr) | 1.19 | 1.48 | 24.4% | 1.73 | 16.9% |
| 10. 7 | S-S Intermediate Terminal | ($/kW-yr) | 1.68 | 2.09 | 24.4% | 2.44 | 16.7% |
| 10. 8 | S-S Distance | ($/kW-mi-yr) | 0.3980 | 0.4947 | 24.3% | 0.5772 | 16.7% |
| 10. 9 | Overall FPT Rate | ($/kW-yr) | 8.99 | 11.18 | 24.3% | 16.110 | 44.1% |
| 10.10 | Overall FPT Rate | ($/kW-mo) | 0.749 | 0.932 | 24.3% | 1.34 | 44.2% |
| | **IR-02 Integration of Resources** | | | | | | |
| 10.11 | Demand | ($/kW-mo) | 1.000 | 1.243 | 24.3% | 1.498 | 20.5% |
| | **NT-02 Network Integration** | | | | | | |
| 10.12 | Base Rate ($/kW-mo) | ($/kW-mo) | 1.000 | 1.013 | 1.3% | 1.298 | 28.1% |
| 10.13 | Load Shaping ($/kW-mo) | ($/kW-mo) | 0.539 | 0.404 | -25.0% | 0.367 | -9.2% |
| 10.14 | Base plus Load Shaping | ($/kW-mo) | 1.539 | 1.417 | -7.9% | 1.665 | 17.5% |
| | **PTP-02 Point-to-Point** | | | | | | |
| 10.15 | Demand | ($/kW-mo) | 1.000 | 1.013 | 1.3% | 1.298 | 28.1% |
| 10.16 | Daily Block 1 (day 1 thru 5) | ($/kW-day) | 0.046 | 0.046 | 0.0% | 0.060 | 30.4% |
| 10.17 | Daily Block 2 (day 6 and beyond) | ($/kW-day) | 0.033 | 0.034 | 3.0% | 0.046 | 35.3% |
| 10.18 | Hourly | (mills/kWh) | 2.52 | 2.92 | 15.9% | 3.74 | 28.1% |
| | **Utility Delivery** | | | | | | |
| 10.20 | Demand | ($/kW-mo) | 0.750 | 0.932 | 24.3% | 1.119 | 20.1% |

# Summary of Current and Proposed Rates

| | | Units | (A) 1996 Rates | (B) 2002 Rates | (C) Percent Change (B) / (A) | (D) 2010 Rates | (E) Percent Change (D) / (B) |
|---|---|---|---|---|---|---|---|
| | **IS-02 Southern Intertie** | | | | | | |
| 10.21 | Demand | ($/kW-mo) | 1.274 | 1.159 | -9.0% | 1.293 | 11.6% |
| 10.22 | Daily Block 1 (day 1 thru 5) | ($/kW-day) | 0.059 | 0.053 | -9.9% | 0.060 | 13.2% |
| 10.23 | Daily Block 2 (day 6 and beyond) | ($/kW-day) | 0.042 | 0.039 | -7.1% | 0.045 | 15.4% |
| 10.24 | Hourly | (mills/kWh) | 2.54 | 3.34 | 31.5% | 3.72 | 11.4% |
| | **IM-02 Montana Intertie** | | | | | | |
| 10.25 | Demand | ($/kW-mo) | 1.234 | 1.239 | 0.4% | 1.312 | 5.9% |
| 10.26 | Daily Block 1 (day 1 thru 5) | ($/kW-day) | 0.057 | 0.057 | 0.0% | 0.061 | 7.0% |
| 10.27 | Daily Block 2 (day 6 and beyond) | ($/kW-day) | 0.041 | 0.041 | 0.0% | 0.043 | 4.9% |
| 10.28 | Hourly | (mills/kWh) | 3.56 | 3.56 | 0.0% | 3.78 | 6.2% |
| | **Eastern Intertie** | | | | | | |
| 10.29 | IE-02 | (mills/kWh) | 1.68 | 1.38 | -17.9% | 1.13 | -18.1% |
| | **Power Factor Penalty Charge** | | | | | | |
| 10.30 | Demand -- Lagging | ($/kVAr-mo) | 0.08 | 0.28 | 250.0% | 0.28 | 0.0% |
| 10.31 | Demand -- Leading | ($/kVAr-mo) | 0.06 | 0.24 | 300.0% | 0.24 | 0.0% |
| | **Scheduling, System Control and Dispatch** | | | | | | |
| 10.33 | Demand | ($/kW-mo) | n.a. | 0.164 | n.a. | 0.203 | 23.8% |
| 10.34 | Daily Block 1 (day 1 thru 5) | ($/kW-day) | n.a. | 0.008 | n.a. | 0.010 | 25.0% |
| 10.35 | Daily Block 2 (day 6 and beyond) | ($/kW-day) | n.a. | 0.005 | n.a. | 0.006 | 20.0% |
| 10.36 | Hourly | (mills/kWh) | n.a. | 0.47 | n.a. | 0.59 | 25.5% |
| | **Regulation and Frequency Response** | | | | | | |
| 10.41 | Hourly | (mills/kWh) | n.a. | 0.30 | n.a. | 0.27 | -10.4% |
| | **Operating Reserves** | | | | | | |
| 10.43 | Spinning | (mills/kWh) | n.a. | 8.27 | n.a. | 11.14 | 34.8% |
| 10.44 | Supplemental | (mills/kWh) | n.a. | 8.27 | n.a. | 9.85 | 19.1% |

# Revenues at Current and Proposed Rates

### 2002 Rate Case Estimated Revenue from Revised Rates

| | Service | Rate Schedule | (A) FY 2002 | (B) FY 2003 | (C) 2-Yr Total |
|---|---|---|---|---|---|
| | **General Transmission** | | | | |
| 1 | Formula Power Transmission | FPT-02 | 38,017 | 38,017 | 76,033 |
| 2 | Integration of Resources | IR-02 | 68,315 | 68,315 | 136,630 |
| 5 | Point to Point, Long-term Contracts | PTP-02 | 152,657 | 162,253 | 314,911 |
| 3 | Network Transmission, Base | NT-02 | 60,421 | 61,392 | 121,813 |
| 4 | Network Transmission, Load Shaping | NT-02 | 26,556 | 26,901 | 53,457 |
| 10 | Southern Intertie, Long-term Contracts | IS-02 | 53,188 | 47,023 | 100,211 |
| 15 | Montana Intertie | IM-02 | **0** | **0** | **0** |
| 16 | Intertie East | IE-02 | **0** | **0** | **0** |
| 6 | Point to Point, Daily Block 1 | PTP-02 | 7,474 | 7,502 | 14,976 |
| 7 | Point to Point, Daily Block 2 | PTP-02 | 22,834 | 22,813 | 45,647 |
| 8 | Point to Point, Hourly | PTP-02 | 24,620 | 24,624 | 49,244 |
| 11 | Southern Intertie, Daily Block 1 | IS-02 | 2,775 | 3,203 | 5,978 |
| 12 | Southern Intertie, Daily Block 2 | IS-02 | 12,479 | 14,725 | 27,204 |
| 13 | Southern Intertie, Hourly | IS-02 | 5,385 | 6,333 | 11,717 |
| 17 | Utility Delivery Charge | Delv | **9,161** | **9,268** | **18,429** |
| 18 | DSI Delivery Charge | Delv | **5,790** | **5,790** | **11,581** |
| | **Ancillary** | | | | |
| 36 | Scheduling Control & Dispatch | | 53,609 | 55,062 | 108,671 |
| 37 | Generation Reactive | | 20,633 | 21,257 | 41,890 |
| 40 | Operating Reserves - Spinning | | 18,996 | 17,903 | 36,899 |
| 41 | Operating Reserves - Supplemental | | 18,996 | 17,889 | 36,885 |
| 38 | Regulation & Frequency Response | | 16,038 | 15,663 | 31,701 |
| 39 | Energy Imbalance | | 0 | 0 | 0 |

### 2010 Rate Case (Revenue Requirement Table 14)

| | | Current Rates | | | Proposed Rates | | | |
|---|---|---|---|---|---|---|---|---|
| | | (D) | (E) | (F) | (G) | (H) | (I) | (J) |
| | **Long-Term** | **FY2009** | **FY2010** | **FY2011** | **FY2010** | **FY2011** | **2-Yr Total** | **% Change** |
| | **Network** | | | | | | | **(I)/(C)** |
| 1 | Formula Power Transmission, one yr rate........... | 28,845 | 24,549 | 24,124 | 24,549 | 24,124 | 48,673 | -36% |
| 3 | Integration of Resources...................................... | 72,406 | 38,887 | 26,171 | 38,887 | 26,171 | 65,058 | -52% |
| 4 | Point to Point.......................................................... | 288,690 | 337,672 | 358,823 | 337,672 | 358,823 | 696,495 | 121% |
| 5 | Network Integration, Base Charge...................... | 88,774 | 94,433 | 97,757 | 94,433 | 97,757 | 192,191 | 58% |
| 6 | Network Integration, Load Shaping.................... | 25,306 | 27,833 | 28,772 | 27,833 | 28,772 | 56,605 | 6% |
| | **Interties** | | | | | | | |
| 7 | Intertie South.......................................................... | 82,333 | 83,960 | 83,479 | 83,960 | 83,479 | 167,439 | 67% |
| 8 | Montana Intertie...................................................... | 252 | 252 | 252 | 252 | 252 | 504 | N/A |
| | **Short-Term** | | | | | | | |
| 9 | Network.................................................................... | 20,975 | 21,181 | 21,181 | 21,181 | 21,181 | 42,361 | -61% |
| 10 | PSW Intertie............................................................ | 4,407 | 4,438 | 4,438 | 4,438 | 4,438 | 8,876 | -80% |
| | **Delivery** | | | | | | | |
| 11 | Utility........................................................................ | 2,583 | 2,664 | 2,424 | 2,664 | 2,424 | 5,088 | -72% |
| 12 | Industry..................................................................... | 1,828 | 1,765 | 1,765 | 1,765 | 1,765 | 3,529 | -70% |
| | **Ancillary** | | | | | | | |
| 13 | Scheduling Control & Dispatch......................... | 76,344 | 84,680 | 88,432 | 84,680 | 88,432 | 173,112 | 59% |
| 14 | Generation Supplied Reactive............................ | 0 | 0 | 0 | 0 | 0 | 0 | -100% |
| 15 | Operating Reserves.............................................. | 34,205 | 35,011 | 36,262 | 46,345 | 48,000 | 94,345 | 28% |
| 16 | Regulation and Frequency Response.................. | 14,296 | 17,603 | 18,219 | 14,364 | 14,866 | 29,230 | -8% |
| 17 | Wind Integration - Within-hour Balancing......... | 15,714 | 26,082 | 34,984 | 104,346 | 139,960 | 244,306 | N/A |
| 18 | Generation and Load Imbalances....................... | 1,036 | 0 | 0 | 0 | 0 | 0 | N/A |

# Revenues at Current and Proposed Rates

| | **2002 Rate Case Estimated Revenue from Revised Rates** | | | | | | **2010 Rate Case (Revenue Requirement Table 14)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | **Current Rates** | | | **Proposed Rates** | | | |
| | | | (A) | (B) | (C) | | | (D) | (E) | (F) | (G) | (H) | (I) | (J) |
| | **Service** | **Rate Schedule** | **FY 2002** | **FY 2003** | **2-Yr Total** | | **Long-Term** | **FY2009** | **FY2010** | **FY2011** | **FY2010** | **FY2011** | **2-Yr Total** | **% Change** |
| | **Other** | | | | | | **Revenue Credits** | | | | | | | |
| 21 | Columbia Storage Power Exchange | | 268 | 127 | 395 | | | | | | | | | N/A |
| 32 | Supplemental Capacity Wheeling | | 62 | 27 | 89 | | | | | | | | | N/A |
| 34 | Use of Facilities | | 5,679 | 5,679 | 11,358 | 19 | UFT Fixed Dollar Amount | 4,513 | 4,530 | 4,435 | 4,530 | 4,435 | 8,965 | 13% |
| | | | | | | 20 | UFT Variable Service Amt................................ | 1,215 | 992 | 967 | 992 | 967 | 1,960 | add to 19 |
| 33 | Townsend Garrison Transmission | | 10,136 | 10,136 | 20,271 | 21 | TGT Firm Demand........................................... | 9,796 | 9,796 | 9,796 | 9,796 | 9,796 | 19,593 | -3% |
| 27 | Operations and Maintenance | | 675 | 675 | 1,350 | 22 | O&M Non-Federal Facility................................ | 777 | 784 | 784 | 784 | 784 | 1,568 | 68% |
| | | | | | | 23 | O&M Federal Facility........................................ | 368 | 337 | 361 | 337 | 361 | 698 | add to 22 |
| 31 | Reservation Fee | | 828 | 1,656 | 2,483 | 24 | PTP Reservation Fee......................................... | 1,310 | 792 | 1,666 | 792 | 1,666 | 2,458 | -1% |
| 20 | AC Rate | | 1,375 | 1,375 | 2,751 | 25 | SINT AC Non Federal O&M.............................. | 1,412 | 1,391 | 1,391 | 1,391 | 1,391 | 2,782 | 37% |
| | | | | | | 26 | SINT AC Non Fed Replacements...................... | 421 | 500 | 500 | 500 | 500 | 1,000 | add to 25 |
| 29 | Power Factor Penalty Charge | | 5,000 | 5,000 | 10,000 | 27 | Power Factor Penalty Lagging.......................... | 304 | 317 | 317 | 317 | 317 | 633 | -12% |
| | | | | | | 28 | Power Factor Penalty Leading.......................... | 41 | 31 | 31 | 31 | 31 | 61 | add to 27 |
| | | | | | | 29 | PFP Lagging Ratchet........................................ | 3,676 | 3,552 | 3,552 | 3,552 | 3,552 | 7,104 | add to 27 |
| | | | | | | 30 | PFP Leading Ratchet........................................ | 520 | 503 | 503 | 503 | 503 | 1,005 | add to 27 |
| 28 | Personal Communications Wireless | | 4,070 | 4,430 | 8,500 | 31 | PCS Wireless Leases......................................... | 4,456 | 4,397 | 4,397 | 4,397 | 4,397 | 8,794 | 22% |
| | | | | | | 32 | PCS Construction.............................................. | 616 | 671 | 671 | 671 | 671 | 1,342 | add to 31 |
| | | | | | | 33 | PCS Application Fee......................................... | 0 | 50 | 50 | 50 | 50 | 100 | add to 31 |
| 22 | Fiber | | 15,500 | 17,500 | 33,000 | 34 | Fiber Leases..................................................... | 7,365 | 7,287 | 7,090 | 7,287 | 7,090 | 14,376 | -56% |
| 23 | Fiber Depreciation | | 696 | 696 | 1,392 | 35 | Fiber Operations & Maintenance....................... | 1,020 | 901 | 909 | 901 | 909 | 1,809 | 30% |
| | | | | | | 36 | Land Use/Lease/Sale.......................................... | 220 | 216 | 216 | 216 | 216 | 432 | N/A |
| | | | | | | 37 | Misc Leases....................................................... | 157 | 164 | 160 | 164 | 160 | 324 | N/A |
| | | | | | | 38 | Right-Of-Way Lease.......................................... | 87 | 84 | 84 | 84 | 84 | 169 | N/A |
| | | | | | | 39 | COE/BOR Project Revenue................................ | 954 | 954 | 954 | 954 | 954 | 1,908 | add to 19 |
| 30 | Remedial Action Scheme | | 597 | 597 | 1,194 | 40 | 3rd AC Remedial Action Sceme......................... | 51 | 51 | 51 | 51 | 51 | 103 | -91% |
| 25 | Irrigation Pumping Power | | 1,288 | 1,288 | 2,577 | 41 | Transmission Share of IPP................................ | 383 | 382 | 382 | 382 | 382 | 764 | -70% |
| | | | | | | 42 | Use of Communication Equipmt....................... | 101 | 97 | 77 | 97 | 77 | 174 | add to 31 |
| 26 | Nonfederal Participation Depreciation | | 3,335 | 3,335 | 6,670 | 43 | Amort NonFed PNW AC Intertie....................... | 3,065 | 3,065 | 3,065 | 3,065 | 3,065 | 6,131 | -8% |
| 24 | Generation Integration | | 7,369 | 7,235 | 14,603 | 44 | Generation Integration...................................... | 6,815 | 8,000 | 8,000 | 8,471 | 8,304 | 16,775 | 15% |

# Revenues at Current and Proposed Rates

**2002 Rate Case Estimated Revenue from Revised Rates**

| | | | (A) | (B) | (C) |
|---|---|---|---|---|---|
| | Service | Rate Schedule | FY 2002 | FY 2003 | 2-Yr Total |
| 9 | Subtotal, Network | | 400,894 | 411,817 | 812,711 |
| 14 | Subtotal, Southern Intertie | | 73,826 | 71,284 | 145,110 |
| X | Subtotal, Delivery | | 14,952 | 15,058 | 30,010 |
| 42 | Subtotal Ancillary Services | | 128,273 | 127,773 | 256,046 |
| 35 | Subtotal Other Transmission | | 56,877 | 59,755 | 116,633 |
| 43 | Total Revenue | | 674,822 | 685,687 | 1,360,509 |
| 19 | Subtotal Transmission Rates | | 489,672 | 498,159 | 987,831 |

**2010 Rate Case (Revenue Requirement Table 14)**

| | | Current Rates | | | Proposed Rates | | | |
|---|---|---|---|---|---|---|---|---|
| | | (D) | (E) | (F) | (G) | (H) | (I) | (J) |
| | Long-Term | FY2009 | FY2010 | FY2011 | FY2010 | FY2011 | 2-Yr Total | % Change |
| 45 | Subtotal Network.......................................... | 524,996 | 544,555 | 556,828 | 544,555 | 556,828 | 1,101,383 | 36% |
| 46 | Subtotal Interties.......................................... | 86,992 | 88,650 | 88,168 | 88,650 | 88,168 | 176,818 | 22% |
| 47 | Subtotal Delivery.......................................... | 4,411 | 4,429 | 4,189 | 4,429 | 4,189 | 8,617 | -71% |
| 48 | Subtotal Ancillary.......................................... | 141,595 | 163,376 | 177,897 | 249,735 | 291,258 | 540,993 | 111% |
| 49 | Subtotal Revenue Credits.............................. | 49,644 | 49,844 | 50,410 | 50,315 | 50,713 | 101,028 | -13% |
| 50 | Total TS.......................................................... | 807,638 | 850,853 | 877,492 | 937,683 | 991,157 | 1,928,840 | 42% |
| Y | Subtotal Transmission Rates......................... | 616,399 | 637,633 | 649,186 | 637,633 | 649,186 | 1,286,819 | 30% |

# Transmission Risk Analysis

# Risk Analysis in TS Rate Cases

- Overview of the risk analysis
- BPA's risk standard – TPP (Treasury Payment Probability)
- BPA's quantitative methodology
- How risk analysis results are used
- Illustrative numbers

# Overview of the Risk Analysis

- The main purpose of the risk analysis is to assure that BPA is meeting its financial risk standard, Treasury Payment Probability (TPP).
- That is, the purpose is to find out if there is a 95% probability that TS can meet its rate period financial obligations, given:
  - The starting level of financial reserves available for risk;
  - The expected value of the rate period cash flow; and
  - The anticipated variability in cash flows.
- If TPP is < 95%, rates need to rise to increase cash flow.

# What are "financial reserves available for risk"?

- BPA receives some funds from other parties that are dedicated to specific purposes; some of these are essentially deposits by customers:
  - LGIA deposits;
  - Other non-LGIA construction-related funds; and
  - Funds obtained via Master Leases for construction.
- These funds are not considered to be "available for risk" and are excluded from TPP assessments.

# What is the "expected value of cash flow"?

- BPA's rates need to meet two slightly different requirements:
  - They need to be high enough to generate revenue that will cover BPA's expenses (an accrual-accounting metric); and
  - They need to be high enough to generate enough cash to cover BPA's cash disbursement obligations (a cash metric).
- These measures might differ; for example, depreciation of assets, a non-cash expense, is often different from debt repayment obligation, a use of cash that is not an expense.

# Cash flow, cont'd

- BPA's rates will be high enough to cover cash obligations, so cash flow will not be negative.
- Rates might need to be higher than needed to cover cash requirements in order to meet the accrual-accounting test, so cash flow might be positive.

# What is the "anticipated variability in cash flows"?

- This is the core of the risk analysis.
- BPA assesses the probability that anticipated revenues or expenses during the next rate period will be different from the forecast values used to set "base rates."
- The probability distributions for the revenue and expense items BPA can model are combined to determine the probability that financial reserves will drop below the minimum acceptable level at the end of each year of the rate period.

# What is the "minimum level of reserves"?

- Because the timing of BPA's receipts of cash and disbursements of cash are not certain, mismatches can occur, and BPA needs to maintain a cash (reserves) buffer against this possibility.
- Since BPA has been calculating TPP separately for Power and Transmission, it has assumed that the size of the cash buffer Transmission needs to start each fiscal year with is $20 million.
- This is referred to as the "liquidity reserve level" – the amount of financial reserves that needs to be kept available to ensure adequate liquidity on a day-to-day and month-to-month basis throughout the rate period, until rates can be reset.

# How are the results of the Transmission Risk Analysis used?

- The main rate case purpose of the risk analysis is to ensure that rates are set high enough to meet the TPP standard.
- If the results of the first iteration of the risk analysis demonstrate this, nothing else needs to happen.
- If TPP is too low, then the risk mitigation needs to be increased. Financial reserves are the primary risk mitigation tool, so reserves need to be increased. This means cash flow during the rate period needs to be increased.
- This is accomplished by adding Planned Net Revenues for Risk (PNRR) to the revenue requirement – rates go up => cash flow goes up => reserves go up => TPP goes up.

# Origin of the TPP standard

- 1970s & 80s – poor Treasury repayment
- 1974 – 83: 10 misses in a row
- Increasing external & internal pressure to provide greater certainty of payment
- Culmination: 10-Year Financial Plan, adopted in 1993 in the 1993 rate case.

# The TPP Standard

Probability of Meeting Treasury Payments - BPA shall establish rates to maintain a level of financial reserves sufficient to achieve a 95 percent probability of making its U.S. Treasury payments in full and on time for each 2-year rate period. [from the 10-Year Financial Plan]

# TPP: What are "financial reserves"?

- Financial reserves are mostly cash, but not entirely.
- BPA keeps its cash in the "Bonneville Fund", an account at the U.S. Treasury.
- Since the beginning of 2009, BPA also keeps some "Treasury Specials," non-cash investment instruments, in the Bonneville Fund. (By 2018, BPA will phase out cash and all of BPA's reserves in the Bonneville Fund will be in the form of Treasury Specials.)
- Deferred borrowing also counts as financial reserves: when BPA earns the right to borrow from Treasury for construction, but defers completing the borrowing because it has enough cash for the meantime, it accrues "deferred borrowing" which can be converted to cash very rapidly.

# Features of the TPP Standard

- The standard applies to *rate periods* rather than years.
- 95% probability of making *both (all)* Treasury payments in a rate period.
- Calculations of TPP do not distinguish between rate periods with one deferral and rate periods with more than one.
- BPA does not have a within-year TPP standard, and does not have tools for adhering to one.
- It is really a *rate-setting* standard.

# TPP Features, cont’d.

- The standard has always been considered as applying to the year-end Treasury payments,
- Even though BPA has bond payments during years, and
- Direct funding payments to Corps and Bureau O&M are made throughout the year.

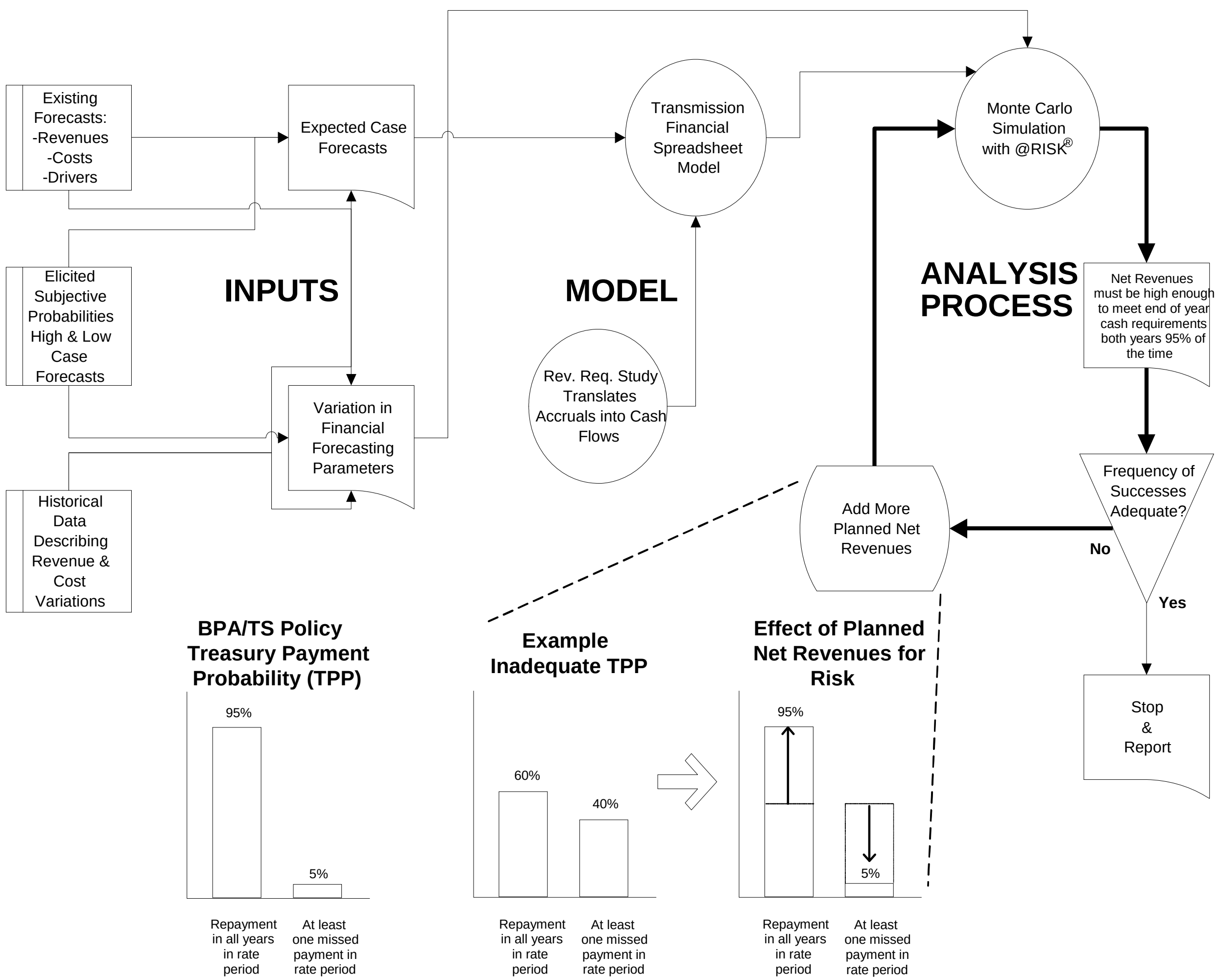
# The quantitative analysis

- BPA uses Monte Carlo simulations to capture the effects of uncertainty in costs and revenues.
- Each "game" in the simulation starts with the reserves available for risk that are attributed to Transmission at the start of the year before the rate period.
- Forecast cash flows are added (or subtracted) for each year, with the variability reflected by adding or subtracting random amounts drawn from the probability distributions for each of the items modeled in the risk analysis.
- Successful Treasury payment is deemed to occur when the end-of-year reserves, after Treasury payments are made, are at least as large as the transmission liquidity reserve level.
- The Treasury Payment Probability is the fraction of the games in which the Treasury payment was made in BOTH years in the rate period.

# What is Monte Carlo modeling?

- A technique for quantitative analysis based on *random sampling*, usually using *computer simulation*.
- Commonly used when significant factors are *random* but some characteristics of that randomness are known or can be approximated.
- The random factors are represented by *probability distributions*, such as normal, log-normal, binomial, Poisson, exponential, or discrete distributions. A BPA simulation might use probability distributions to reflect uncertainty in customer demand, weather, gas or electricity prices, interest rates, etc.
- Many (perhaps very many) *iterations* or *games* are performed, with results accumulated for later examination.
- The resulting distributions might be described by measures of *central tendency*, such as the median or the mean (a.k.a. average or expected value), by measures of *dispersion*, such as standard deviation, percentiles, or confidence intervals, and by other statistics or graphs.

# Diagram of the Transmission Risk Analysis Process




Source: TR-10-FS-BPA-01 Transmission Revenue Requirement Study (pg. 56)

Predecisional/For Discussion Purposes Only

# Illustrative numbers

- "Real" numbers won't be available until the release of the initial proposal, roughly a year from now.
- Expense and revenue variability will be re-assessed between now and then.
- "Base" numbers are generally forecast outside the risk analysis – the potential for expense or revenue items to vary from the forecast is the focus of the risk analysis.
- But we can use some figures from the 2010 rate case to illustrate the expense and revenue variability that we are likely to see when we get farther into the 2012 rate case.

# Risk categories

- In 2010 rate case, 3 groups of risks:
  - Expenses
  - Generation Inputs revenue
  - Other revenue types
- Expenses were lumped together in one “operating expense” risk factor.

# Operating expense risk (TR-10)

- Operating expenses were modeled using a triangular distribution (average of 2010 and 2011):
  - Most likely value: $340 million
  - 75th percentile: $357 million
  - 25th percentile: $329 million
  - Interquartile range: $28 million

# Future break-down of operating expense risk

- BPA will assess the variability of subcategories within "operating expense" such as:
  - System operations
  - Marketing
  - Maintenance
  - Environment
  - Development
  - Support services
  - Scheduling
  - TS transmission acquisition
  - Shared services
  - Corporate overhead

# Generation Input Revenue Risk

- For example, the revenue risk arises from uncertainty over the total size of the wind fleet installed in BPA’s balancing area, and the uncertainty over the fraction of the wind fleet that would self-supply in 2011.
- BPA had made a decision that the uncertainty in such revenue would be shared equally by PS and TS.
- Both risks were asymmetrical – shortfalls in revenue more likely than surpluses.

# Wind Balancing Service transmission risk results (TR-10)

| ($ millions) | 2010 | 2011 |
|---|---|---|
| Most likely | -$0.17 | -$2.32 |
| 75th percentile | -$0.03 | -$0.77 |
| 25th percentile | -$0.44 | -$4.14 |
| Interquartile range | $0.41 | $3.37 |

# BPA Transmission Services Revenue Forecast Risk Range for FY 2010 Rate Case

| BPA TS Revenue Product Category | Rate Case FY 2010 Forecast ($ millions) | Inter-Quartile Risk Range[1] |
|---|---|---|
| Point-to-Point Short Term (PTP ST) | $ 21.2 | $ 13.5 |
| Point-to-Point Long Term (PTP LT) | $ 337.7 | $ 8.6 |
| Network Integration (NT) | $ 122.3 | $ 5.7 |
| Southern Intertie Long Term (IS LT) | $ 84.0 | $ 2.1 |
| Southern Intertie Short Term (IS ST) | $ 4.4 | $ 1.2 |
| | $ 569.6 | $ 31.1 |

[1] Inter-Quartile Range (IQR) represents 50% of the distribution between the 25th and 75th percentiles.

# Point-to-Point Short Term (PTP ST)

| | | Revenue ($ in millions) |
|---|---|---|
| a | **Rate Case FY 2010 Revenue Forecast** | $ 21.2 |
| b | **Upper Range ($75^{th}$ Percentile)** | $ 32.2 |
| c | **Lower Range ($25^{th}$ Percentile)** | $ 18.7 |
| d=b-c | **Inter-Quartile Risk Range** | $ 13.5 |

## Key Drivers Modeled for Revenue Risk:

- Streamflow
- Market index price spreads

# Point-to-Point Long Term (PTP LT)

| | | Revenue ($ in millions) |
|---|---|---|
| a | **Rate Case FY 2010 Revenue Forecast** | $ 337.7 |
| b | **Upper Range ($75^{th}$ Percentile)** | $ 342.0 |
| c | **Lower Range ($25^{th}$ Percentile)** | $ 333.5 |
| d=b-c | **Inter-Quartile Risk Range** | $ 8.6 |

## Key Drivers Modeled for Revenue Risk:

- TSR Deferrals, Renewals, and Conversions

# Network Integration (NT)

| | | Revenue ($ in millions) |
|---|---|---|
| a | **Rate Case FY 2010 Revenue Forecast** | $ 122.3 |
| b | **Upper Range ($75^{th}$ Percentile)** | $ 125.0 |
| c | **Lower Range ($25^{th}$ Percentile)** | $ 119.2 |
| d=b-c | **Inter-Quartile Risk Range** | $ 5.7 |

Key Drivers Modeled for Revenue Risk:

- Load center temperature departures from normal
- Regional economics (i.e. GDP)

# Southern Intertie Long Term (IS LT)

| | | Revenue ($ in millions) |
|---|---|---|
| a | **Rate Case FY 2010 Revenue Forecast** | $ 84.0 |
| b | **Upper Range ($75^{th}$ Percentile)** | $ 84.9 |
| c | **Lower Range ($25^{th}$ Percentile)** | $ 82.8 |
| d=b-c | **Inter-Quartile Risk Range** | $ 2.1 |

## Key Drivers Modeled for Revenue Risk:

- TSR Renewals

# Southern Intertie Short Term (IS ST)

| | | Revenue ($ in millions) | |
|---|---|---|---|
| a | **Rate Case FY 2010 Revenue Forecast** | $ | 4.4 |
| b | **Upper Range ($75^{th}$ Percentile)** | $ | 5.0 |
| c | **Lower Range ($25^{th}$ Percentile)** | $ | 3.7 |
| d=b-c | **Inter-Quartile Risk Range** | $ | 1.2 |

Key Drivers Modeled for Revenue Risk:

- Market index price spreads

# What are the Results of the Transmission Risk Analysis?

- The end-of-year (EOY) reserves available for risk during the rate period are the main outcome of interest in the model. In the TR-10 rate case, the EOY reserves were forecast to be:

| FY 2009 | FY 2010 | FY 2011 |
|---|---|---|
| $421.9m | $365.7m | $289.4m |

- For the 2010 Transmission Rate Case, it was demonstrated that BPA achieved the 95% TPP for the two year rate period.
- The risk analysis simulation included the use of the up to $70 million in transmission reserves to partially fund O&M expenses and capital projects.

Source: TR-10-A-02: Chapter 19 – Transmission Revenue Requirement (pg. 458)