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Power Administration

Transmission Assessment

Briefing for Washington DC
March 23, 2001

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Bonneville Power Administration

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Summary

Current Situation

- The system is in crisis
- System constraints are affecting our ability to utilize & care for the system
- Approximately 20,000 MW of generation is potentially being sited in the Northwest
  - The existing transmission system needs to be upgraded to integrate new generation to serve a fast growing load

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The System is in Crisis

Assumptions (A) and Fact (F)

- (A) RTO will begin operation in FY04, at the earliest (sets time baseline)
- (F) The transmission system is stressed because it is operating at or near capacity
- (A) System will become more stressed with the addition of generation if nothing is done to reinforce the existing network
- (A) Likelihood of system failure is increasing

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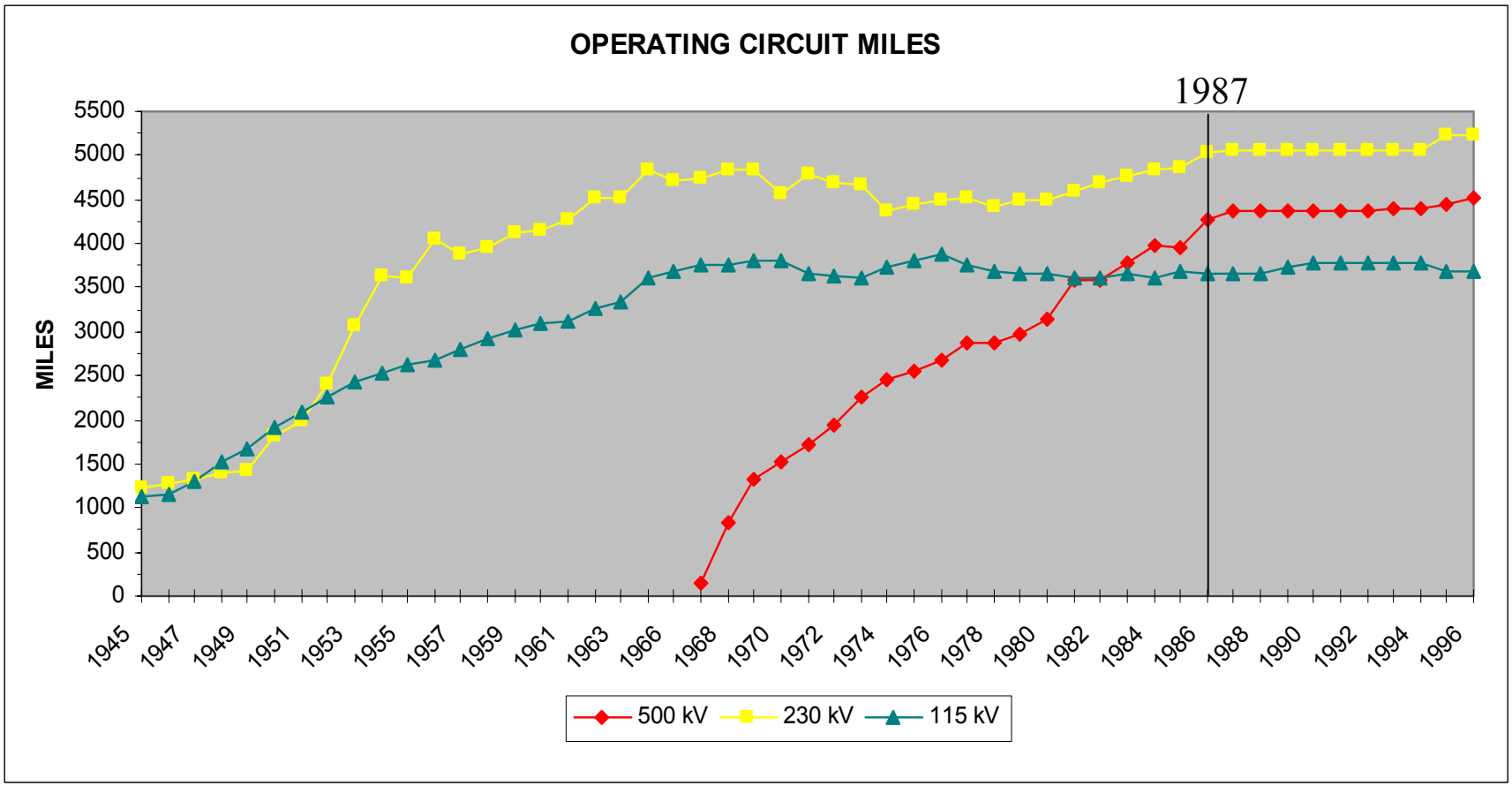
Transmission Line Construction



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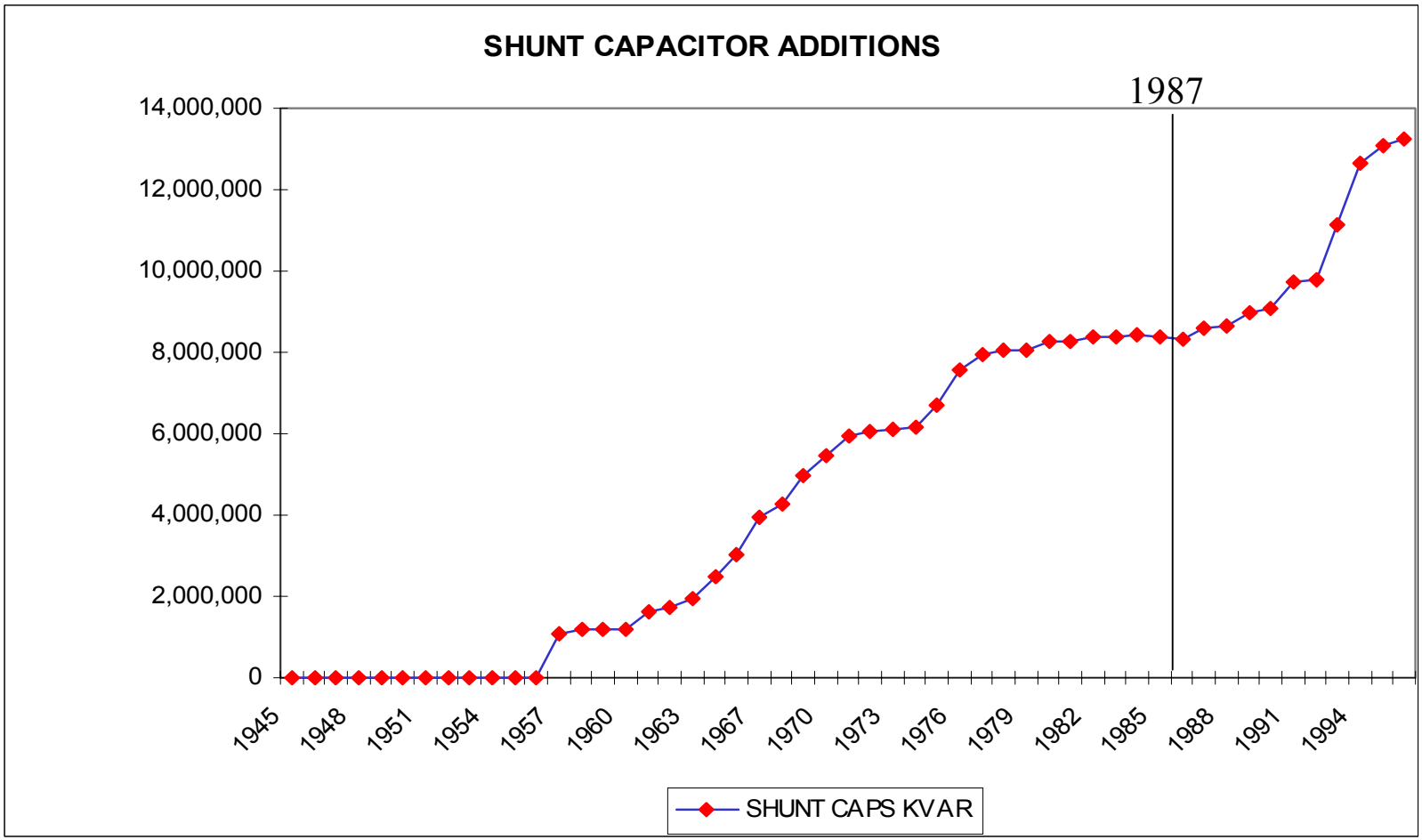
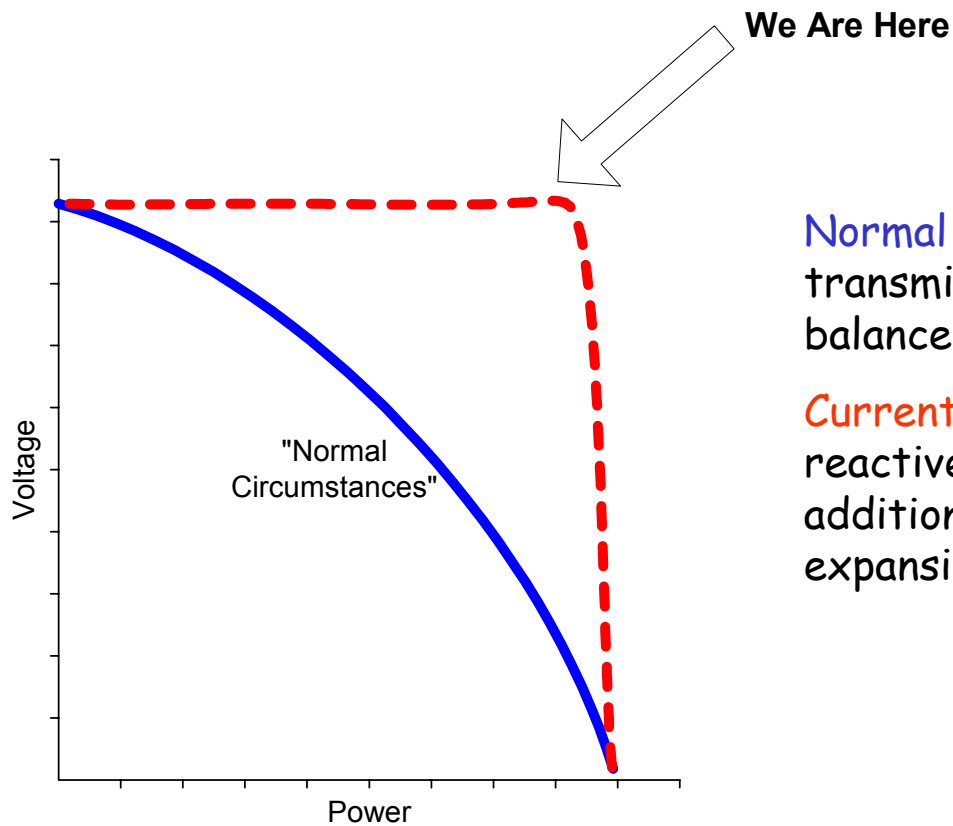
Reactive Support Additions



System Stress



Normal circumstances: When transmission capacity is in balance with load

Current circumstances: When reactive is used to support additional load without grid expansion

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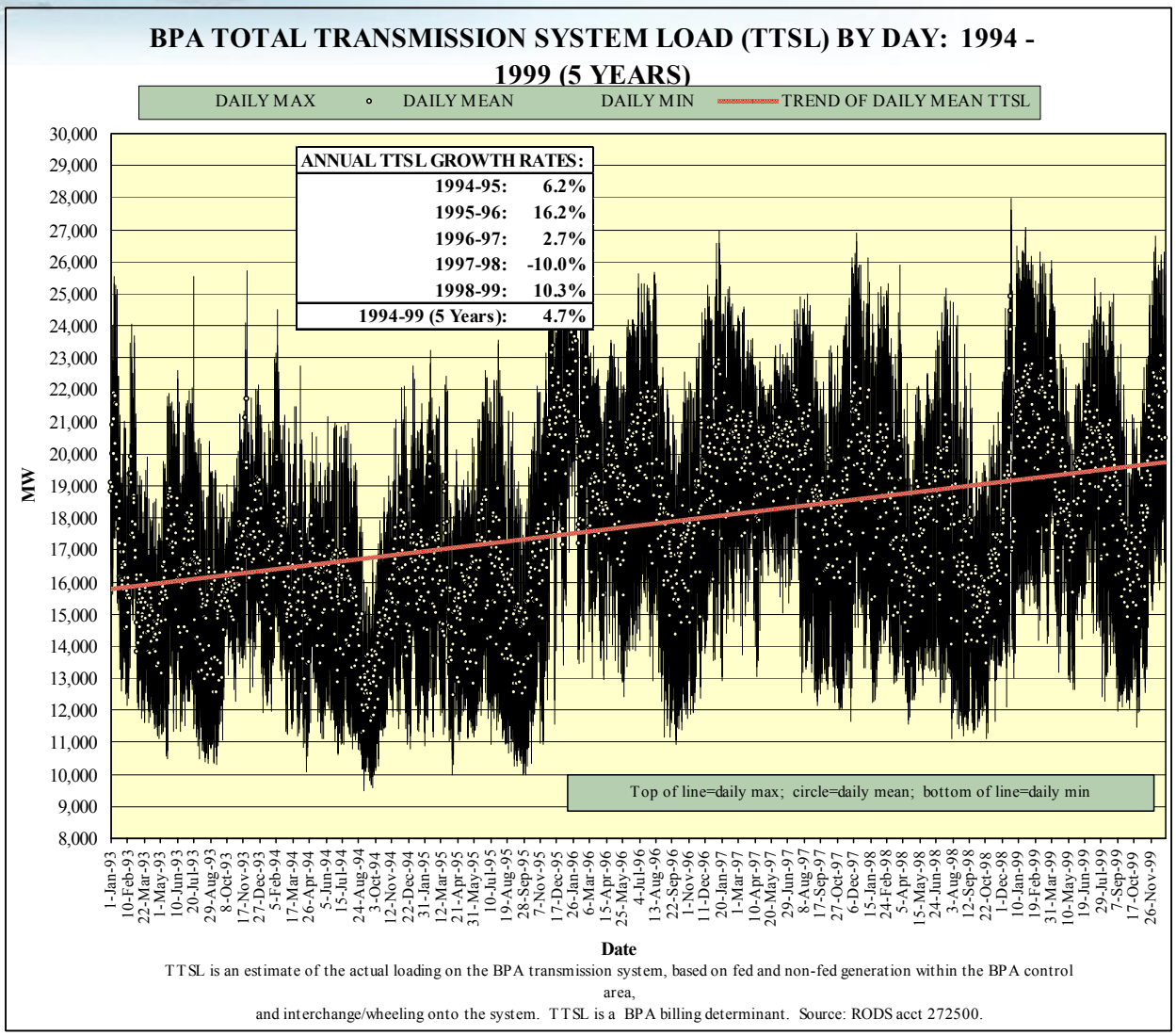

TTSL is an estimate of the actual loading on the BPA transmission system, based on fed and non-fed generation within the BPA control area,
and interchange/wheeling onto the system. TTSL is a BPA billing determinant. Source: RODS acct 272500.

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The System is in Crisis

Observations

- We are seeing unexpected "wiggles" on the system which indicates lack of stability
- System studies are revealing more constraints
- There is little or no system margin left

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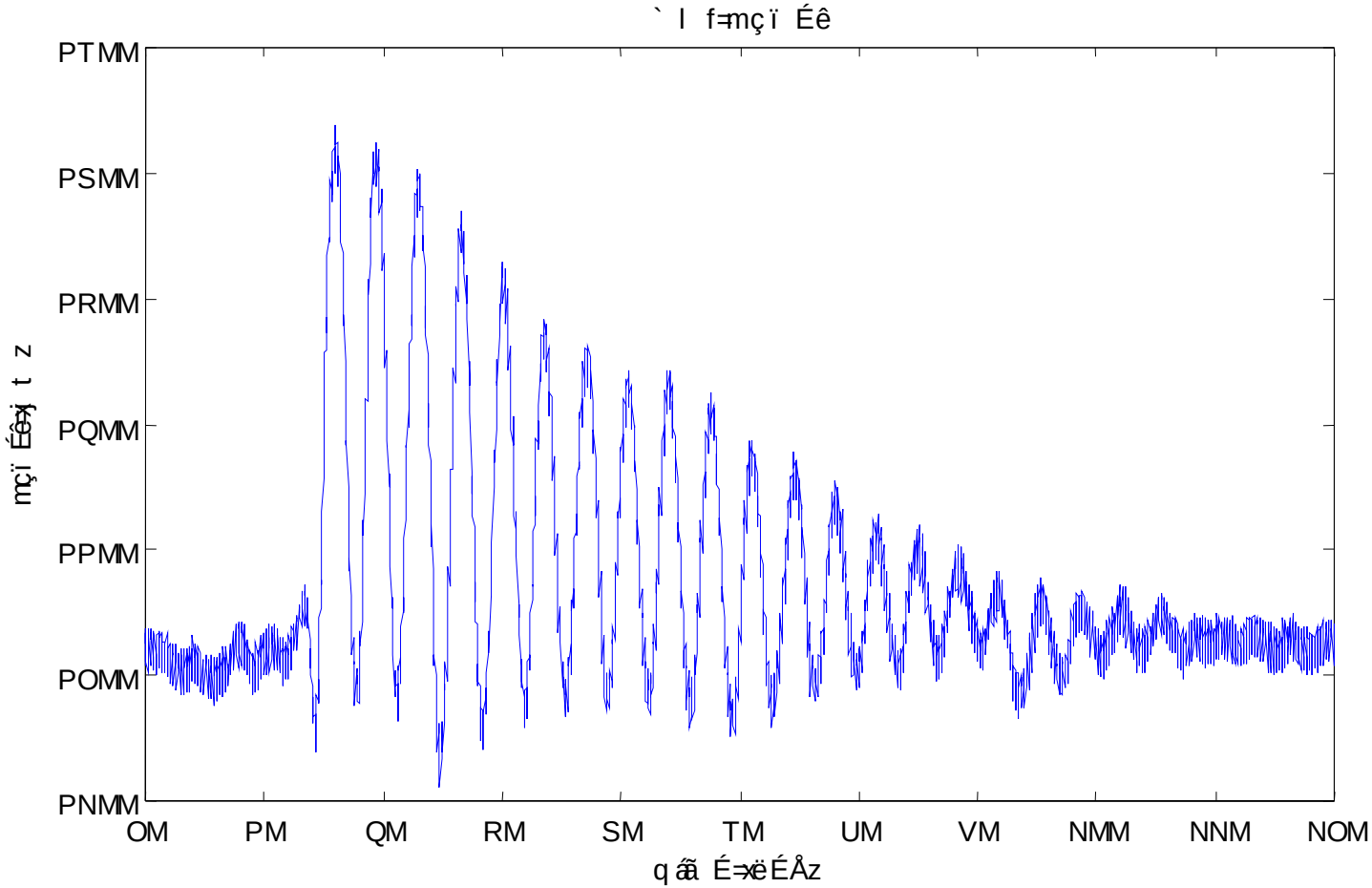
This Is What Actually Happened

August 4, 2000 Oscillation - Alberta Separation



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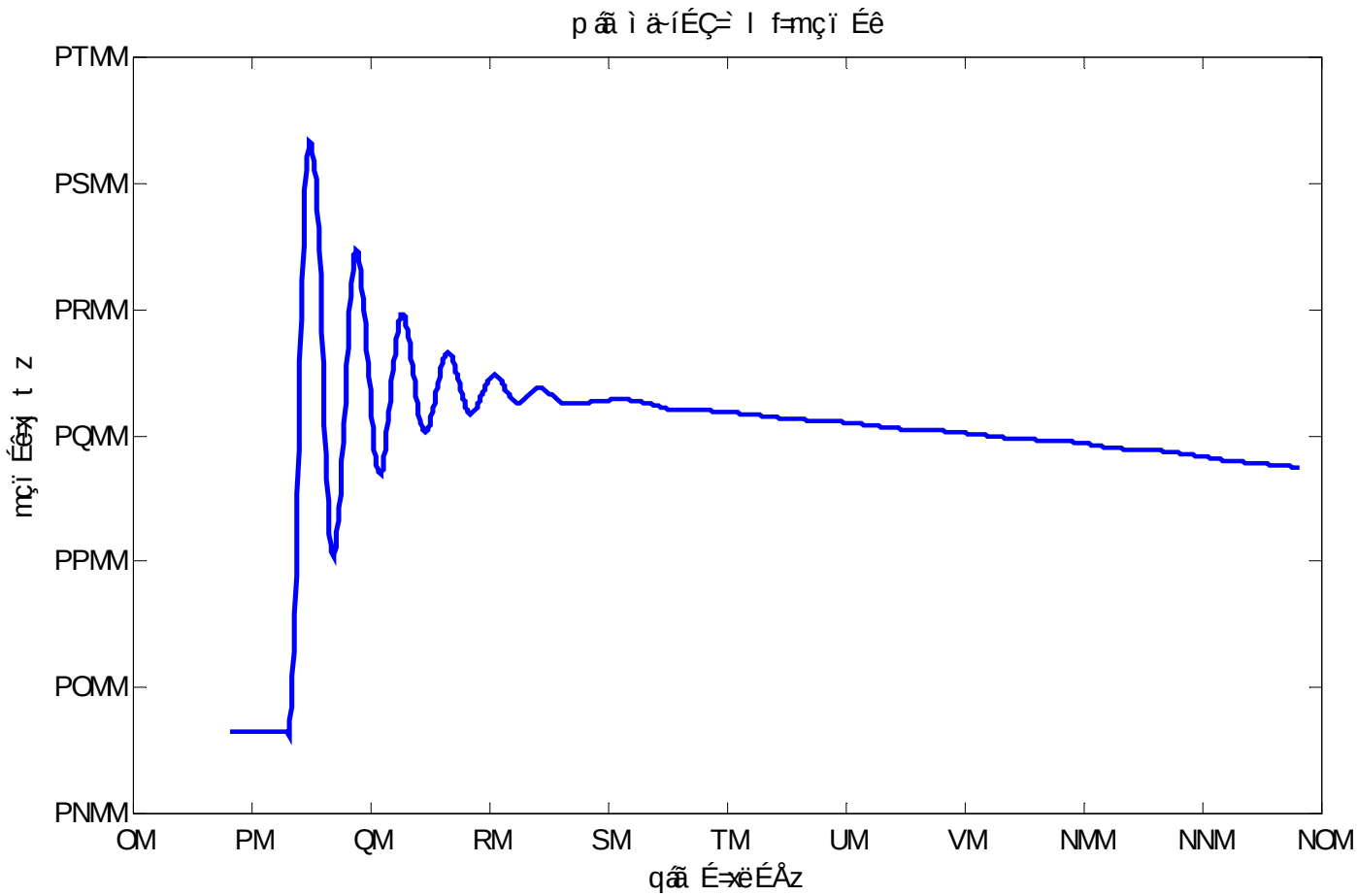
This Is What We Thought Would Happen



How Did We Get Here?

- Excess Capacity Has been used Up
  - We have built no major transmission since Colstrip in 1987
    - We have made incremental additions to reliably use the margin built into the system, but that margin is now gone
  - Utilization of the system has increased by 1.3% per year since 1987
  - California Market conditions are stressing the interties and existing congested paths

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Regional Transmission Is Not Keeping Up With Needs

(From NW Power Pool 10 - YR Forecast)

	1998	2008	% Increase
Winter Peak Load - MW	59,972	66,952	12%
Transmission Circuit Miles	61,415	62,352	2%

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System Stress

Additional Factors

- Reliability criteria changes due to market pressures
- Gaming may occur which could be detrimental to system
- Availability pressures exists to run the system harder
  - Outages for Maintenance & Construction are more difficult to obtain and are compressed in time, due to high utilization by the markets.
- The system facilities are aging
  - 500kv grid is over 30 years old

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Solutions

- Recognize that transmission investments are needed now
- Encourage Generation be built near load or uncongested paths as possible
- Seek all conservation & renewable resources available to reduce & manage loads

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Solutions

- Understand the problem has been building over the last decade and there are no quick fixes.
  - It takes two to five years to plan, site & build a major transmission line.
- Seek cooperation and support of other transmission owners (IOU's & Publics) in the Pacific Northwest to meet this challenge.

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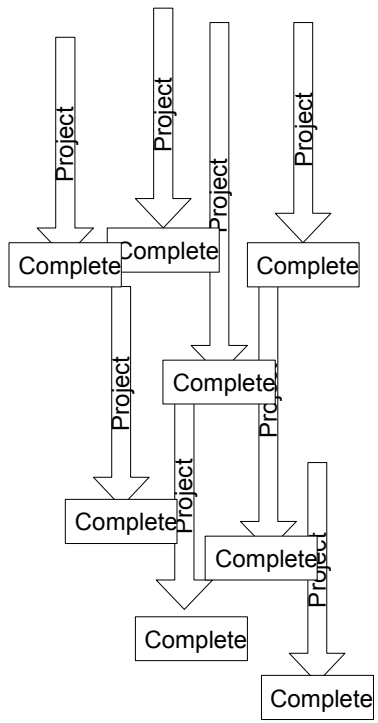
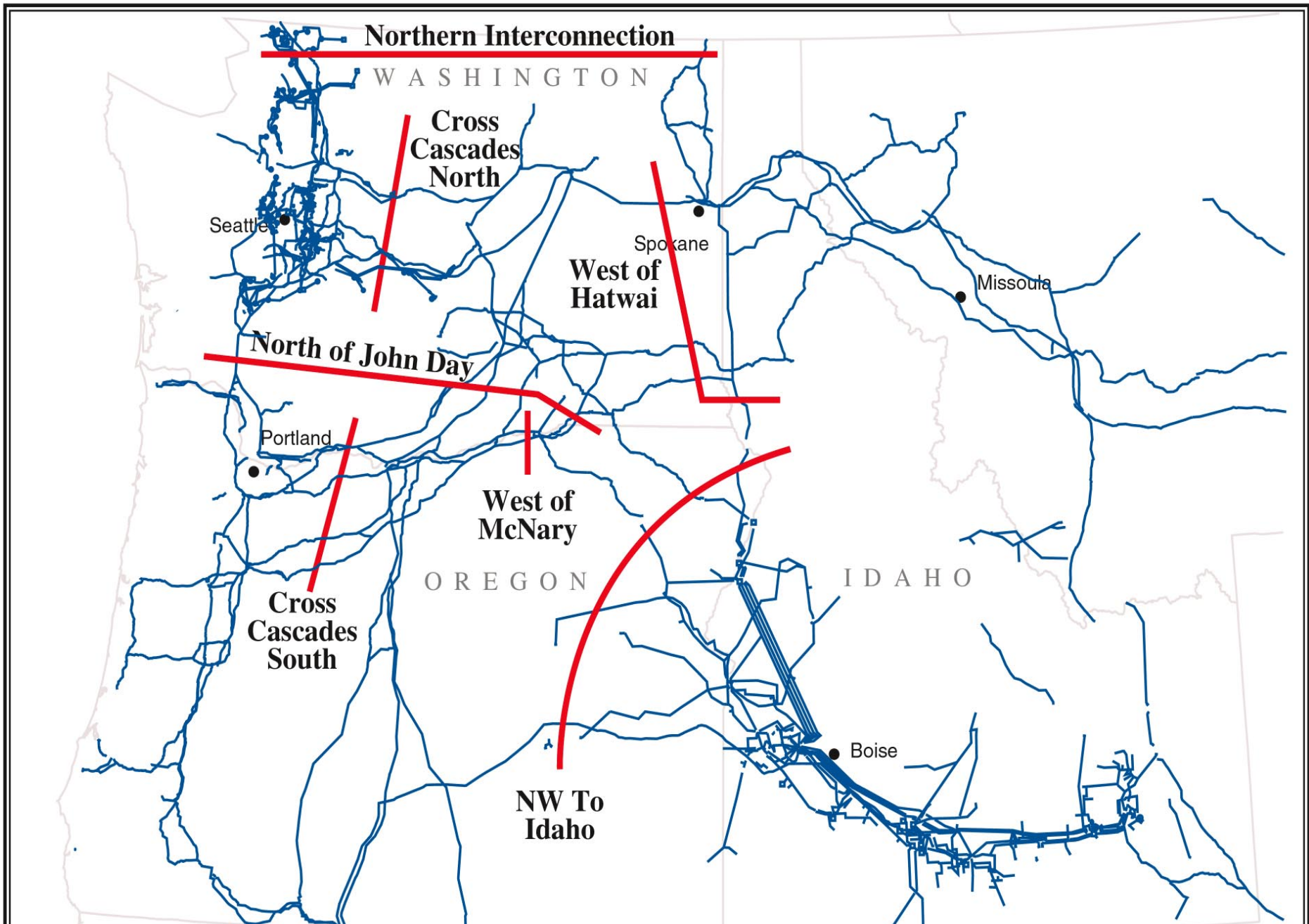
We must Act Now

Ability to Respond

	RTO Timeline	"TBL" Timeline
2001		
	Transition	
2004	RTO Forms	
2006	Able to Expand Transmission	
2010	Transmission Builds Complete	



NW Constrained Paths



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We Need A Bunch of Wire

- Infrastructure Proposal
  - Puget Sound I-5 Corridor
    - Seattle Area Load Service
    - Canadian Entitlement
  - North of John Day Relief
    - Allows Use of Southern Intertie
    - Bi-Op Commitment
    - Adds Flexibility for Low Water Years
  - West of McNary
    - Somebody Will Site Near Hermiston

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We Need A Bunch of Wire

- Infrastructure Proposal
  - West of Hatwai and Idaho to the NW
    - California Won't Help Us Any Time Soon
    - That Makes Montana and Idaho Imports More Critical To Meeting Regional Winter Peak
  - De-Couple From Sub-Grid
    - Minimizes Effects of Main Grid Outages on Underlying Sub-Grid and distribution Systems

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We Need A Bunch of Wire

- Proposal Assumes Some Generators Integrate -- But Not All
  - Depending on Which Ones Site and Their Location:
  - Between 8000 to 12000 MW Can Be Integrated
- Relieves Crippling Congestion
  - We Don't Want Our Own Path 15

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We Need A Bunch of Wire

- Puts A Little Margin Back Into the Grid
  - Needed For A Competitive Market To Work
  - So We Can Meet Regional Load During Outages
  - So We Can Meet Load and Move Power When Load Goes Away
  - So We Can Actually Do Some Maintenance Without Harming the Market
  - So the RTO Doesn't Start with the Regional Grid heavily congested.

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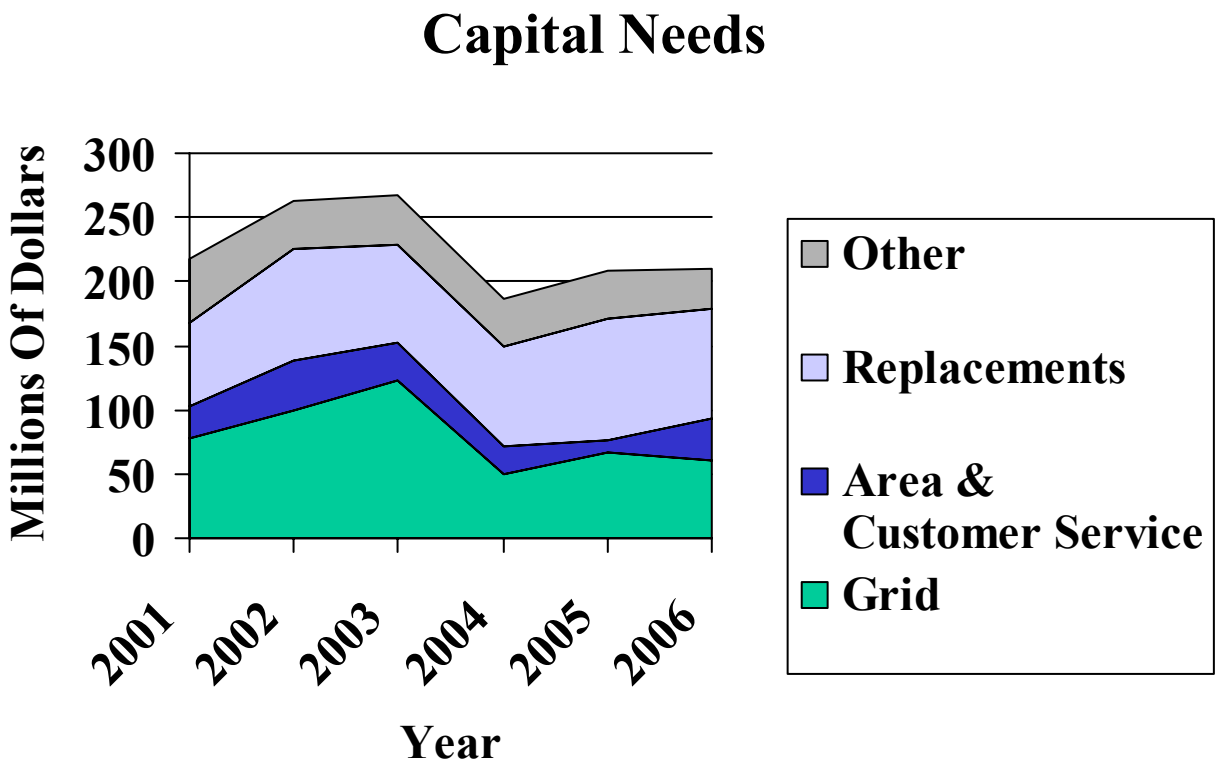
How Does This Get Paid For?

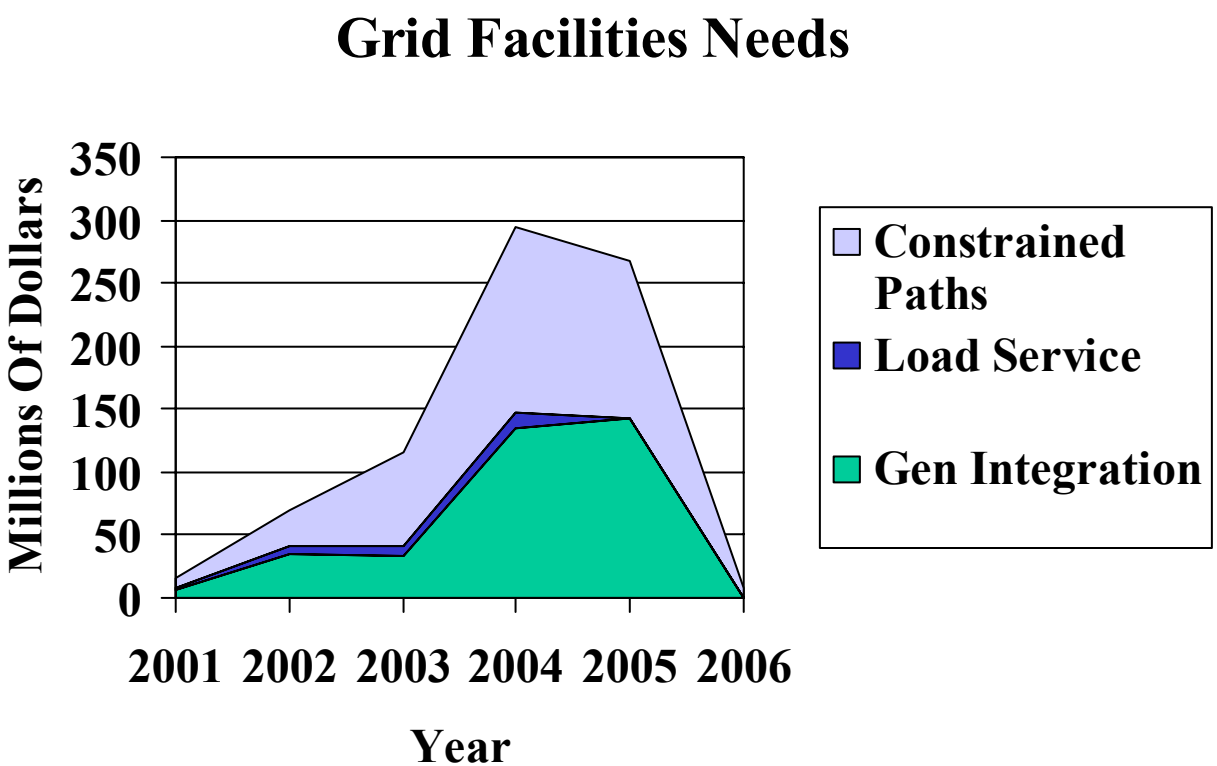
- This infrastructure plan reflects an additional $775 over our current expenditure plan for 2002-2006 of $1.3B
- The integration of between 5000 - 5500 MW of generation -- and corresponding use of the transmission system recovers the cost of the new wires
- More generation than that should lower rates

Current Expenditure Plan



BPA's Current Capital Budget requests total $1,353 Billion.

Additional Capital Needs



BPA will need an additional $775 Million

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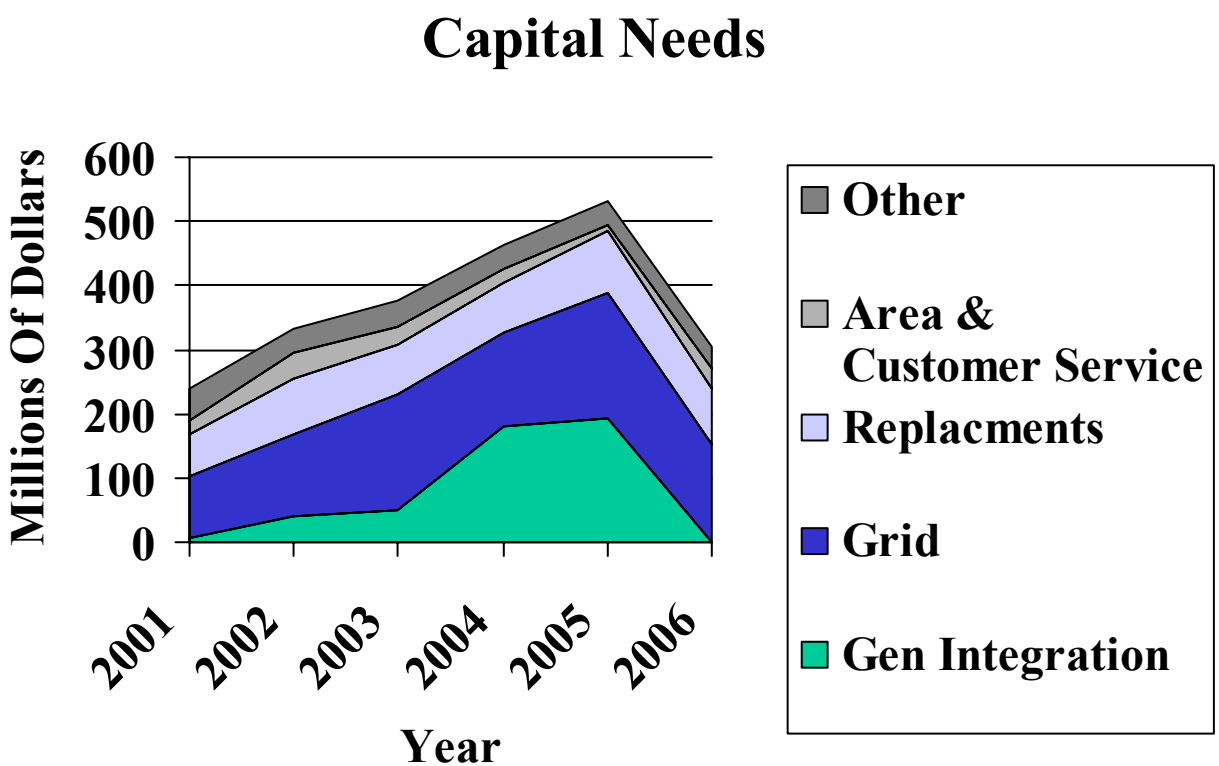
Total Capital Needs



Combined Capital Needs will be $2.2 Billion

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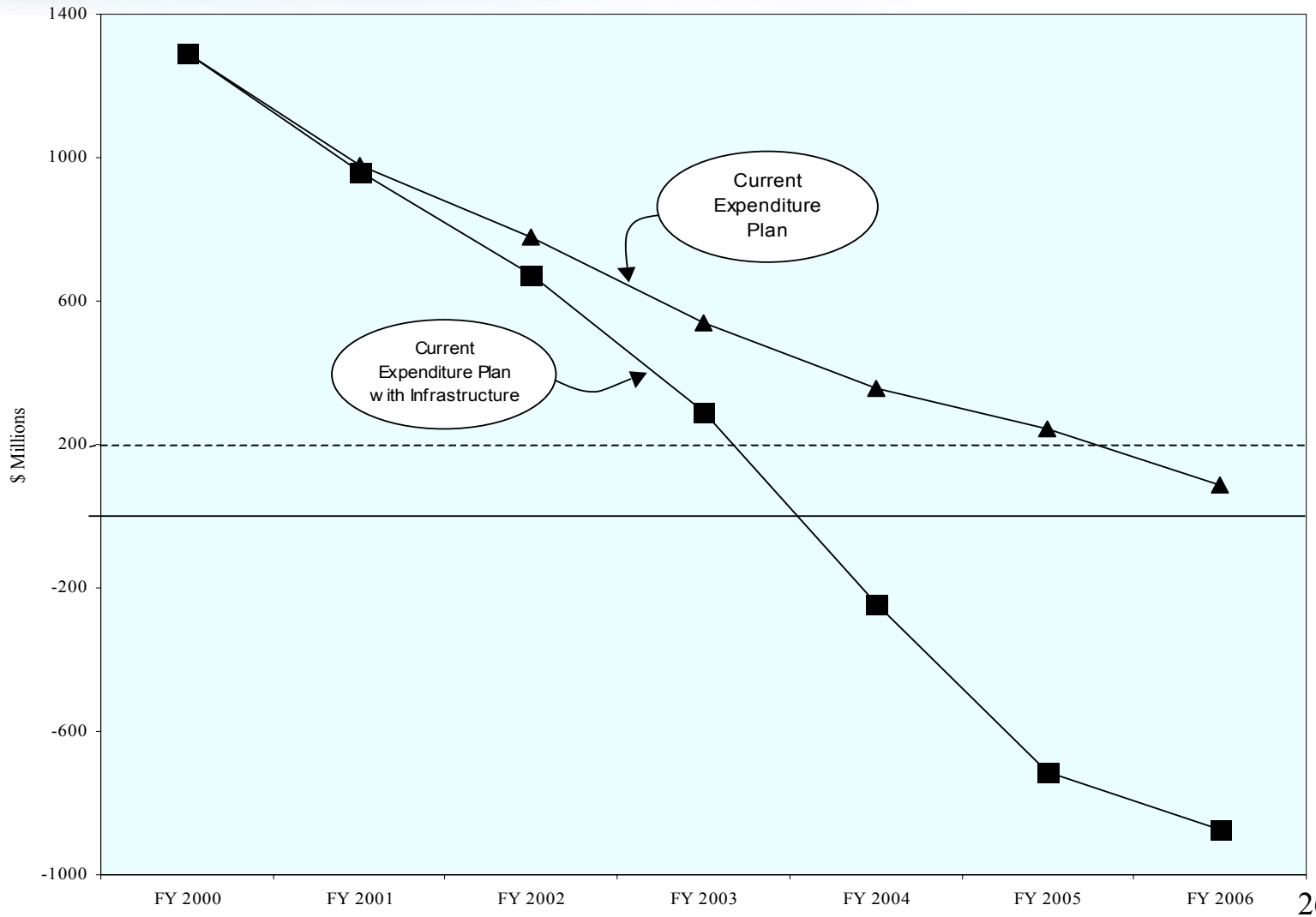
Bonneville's Remaining Borrowing Authority



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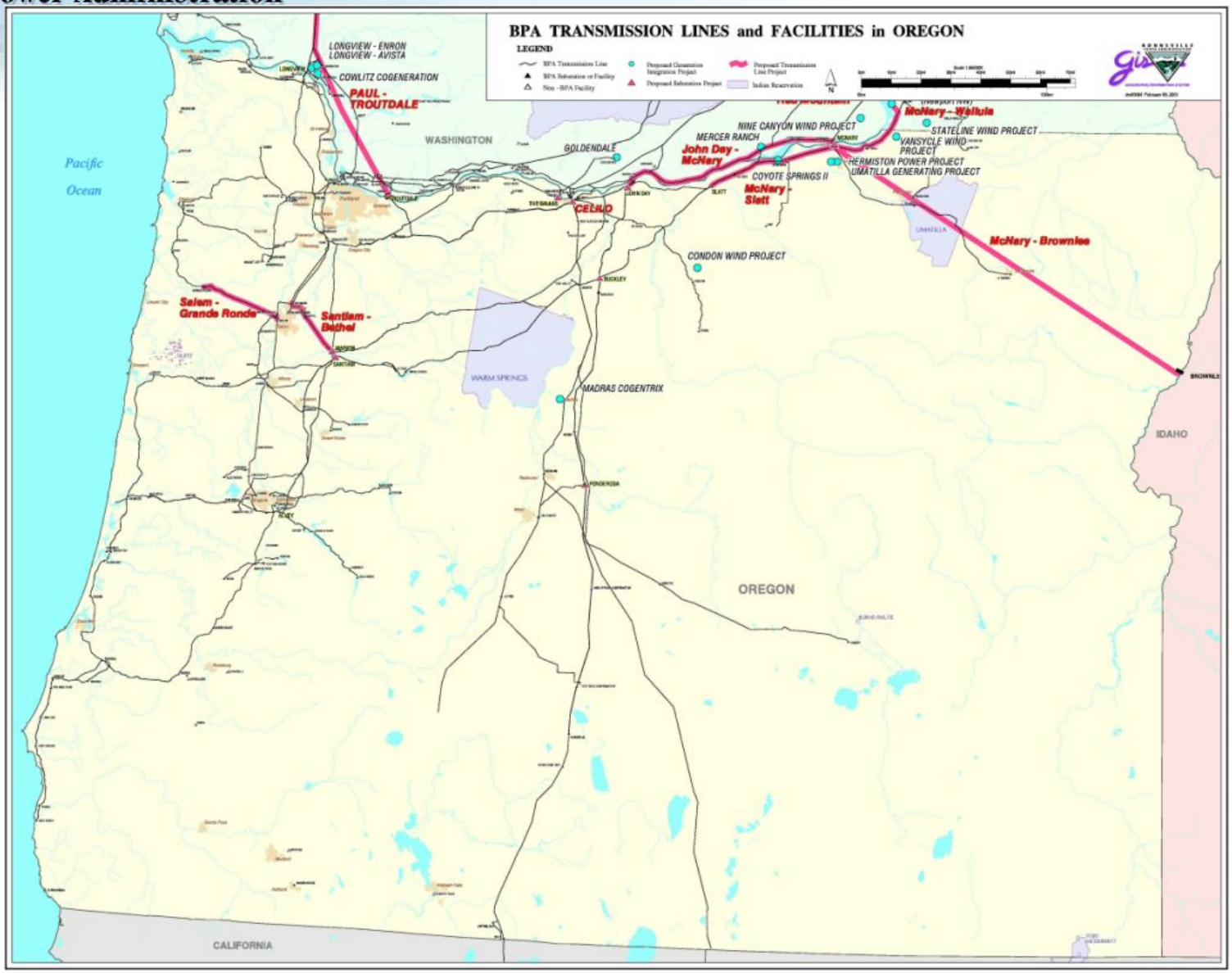

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Our Concerns

- Resource Requirements will be large
  - Capital
  - Staff
  - System & Processes
- Keeping the system going as we address these issues will be difficult
- The system may fail before we can act

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- For the list of TBL Infrastructure projects now under discussion in BPA please go to: www.transmission.bpa.gov
- Click on OASIS
- Click on Latest OASIS Postings
- Click on Draft Transmission Infrastructure Improvement Plan