

**EXHIBIT NO. ___(EMM-8C)
DOCKET NO. UE-06___/UG-06___
2006 PSE GENERAL RATE CASE
WITNESS: ERIC M. MARKELL**

**BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

PUGET SOUND ENERGY, INC.,

Respondent.

**Docket No. UE-06___
Docket No. UG-06___**

**SEVENTH EXHIBIT (CONFIDENTIAL) TO THE
PREFILED DIRECT TESTIMONY OF
ERIC M. MARKELL
ON BEHALF OF PUGET SOUND ENERGY, INC.**

**REDACTED
VERSION**

FEBRUARY 15, 2006

Request for Approval by Energy Resources Committee of Proposed Energy Resource Acquisition

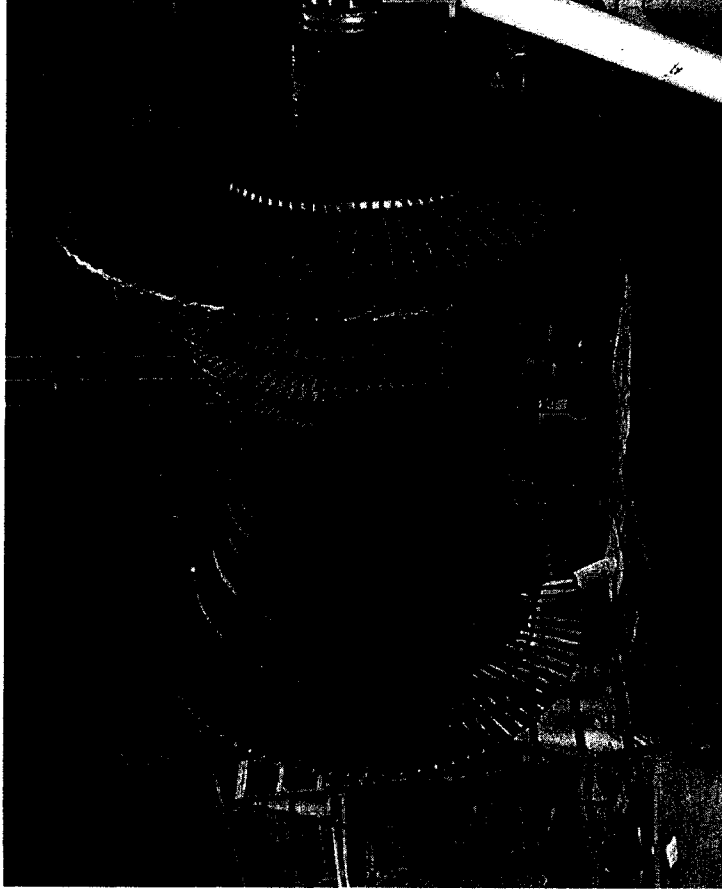
Approve proceeding with upgrade of the
Colstrip Steam Turbines to obtain an
additional 28.5 MW of coal-fired capacity at
a capital cost of \$10.4 million with no
additional O & M or fuel costs and no air
emissions increase.



Colstrip Turbine Upgrade

Exhibit No. ___ (EMM-8C) □
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Project Description



PPL-Montana, the Colstrip Operator, has recommended installing new steam turbine components to increase energy conversion efficiency.

Units 1 & 2: Replace the combined High Pressure (HP) and Intermediate Pressure (IP) turbine rotors and shells.

Units 3 & 4: Replace HP turbine rotors and shells.

Energy Resources Committee, February 16, 2005

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PUGET SOUND ENERGY
pse.com

The energy to do great things

Colstrip Turbine Upgrade Proposal

Summary of Benefits

- Compares favorably to 2004 All Source RFP results
- PSE Portfolio Screening Model shows NPV of \$47 million
- Increases capacity of a dispatchable, baseload plant
- Increases are based on efficiency improvements, no additional air emissions

Colstrip Turbine Upgrade Proposal

Equipment History

Colstrip Unit 1 & 2 (307 MW net each)

- Turbine-generators were supplied by General Electric and placed in service in 1975 and 1976
- No upgrades to turbines

Colstrip Unit 3 & 4 (740 MW net each)

- Turbine-generators were supplied by Westinghouse (now Siemens-Westinghouse) and placed in service in 1984 and 1986
- Colstrip Unit 3 & 4 were upgraded in the 1990's by replacement of the original low pressure turbine rotors due to original design problems



Colstrip Turbine Upgrade Proposal Current and Upgraded Performance

Colstrip Units 1 & 2

Increase HP efficiency from 77.6% to 90.1%

Increase IP efficiency from 89.1% to 92.8%

PSE Output Increase: 8 MW each unit

Colstrip Units 3 & 4

Increase HP efficiency from 80.5% to 90.3%

PSE Output Increase: 6.25 MW each unit



Colstrip Turbine Upgrade Proposal Cost and Schedule for Equipment Upgrade

REDACTED

Colstrip Units 1 & 2

Completion: Unit 1-October 2006
 Unit 2-June 2008

GE Bid	\$ []	Balance of	Projected
Plant Study	\$ []	Contingency	Total
			\$13,600,500

Original Budget Request was \$14.2 million
PSE share is 50% or \$7.1 million

Text in boxes is □
confidential

CONFIDENTIAL per □
WAC 480-07-160

Colstrip Turbine Upgrade Proposal Cost and Schedule for Equipment Upgrade

Colstrip Units 3 & 4

REDACTED

Completion: Unit 3-June 2007
 Unit 4-June 2006

	Projected
S-W Bid	Total
\$ []	\$12,726,375
Balance of Plant Study	Contingency
\$ []	\$ []

Original Budget Request was \$13.3 million
PSE share is 25% or \$3.3 million

CONFIDENTIAL per □
WAC 480-07-160

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Colstrip Turbine Upgrade Proposal Conformity with 2003 LCP Energy Need

2008 Energy Need (2003 LCP)	355 aMW
Mid-C Hydro Adjustments	<u>27 aMW</u>
Updated Need	382 aMW

Additions from 2004 RFP

Wild Horse, Hopkins Ridge & ORMAT	129 aMW
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Colstrip Turbine Upgrade

	<u>28.5 aMW</u>
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Remaining Need

	225 aMW
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Colstrip Turbine Upgrade Proposal Conformity with RFP Criteria

Comformity with Need	Provides additional 28.5 aMW of dispatchable baseload energy
Cost Minimization	Increased efficiency, no incremental O&M or fuel cost
Risk Management	Utilizes existing transmission rights, power plant assets, fuel contracts. No credit requirements
Public Benefits	No additional air emissions, no increases in Greenhouse gases
Strategic & Financial	Enhances PSE ownership, fixed-price contracts with performance

Colstrip Turbine Upgrade Proposal

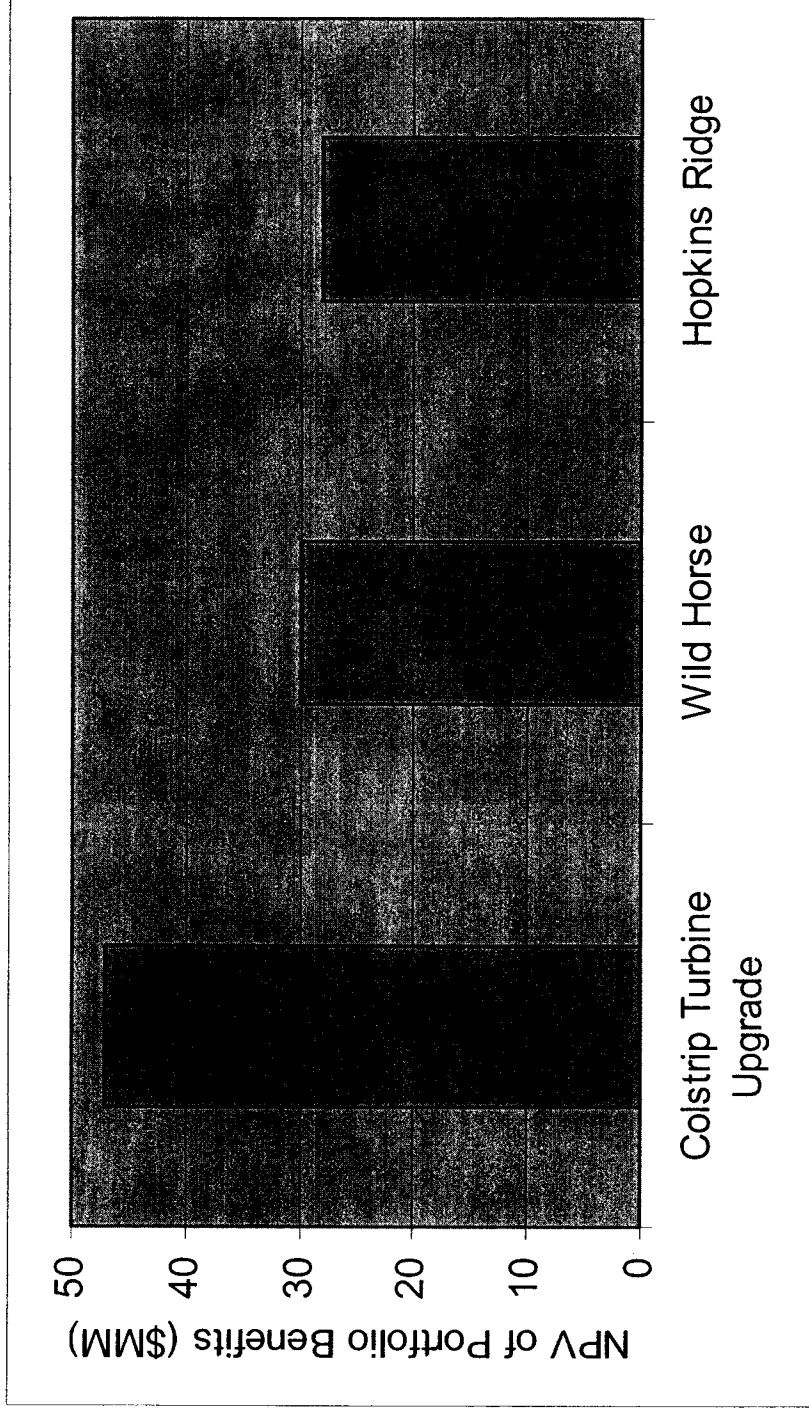
Summary of Financial Analyses

- Compares favorably to 2004 All Source RFP results
- PSE Asset Screening Model- \$11.32/MWh
(20-Year Levelized Energy Cost)
- PSE Portfolio Screening Model shows NPV of \$47 million (includes impact of potential reduced deliverability due to transmission limitations)
- Pay-back Period: 2 Years



Colstrip Turbine Upgrade Proposal

Compares Favorably to RFP Results



Colstrip Turbine Upgrade Proposal Transmission System Considerations

- Adequate capacity in PSE share of jointly-owned Colstrip Transmission System across central Montana.
- Requires additional BPA transmission. Expect BPA to provide only non-firm service.
- Economic analyses have been based on historical transmission limitations. No value assumed for sales within Montana when transmission to PSE is limited.



Colstrip Turbine Upgrade Proposal

Environmental & Other Considerations

- Balance of Plant (BOP) impact studies being performed for all units. Provision in equipment contracts to terminate if adverse impacts are identified.
- Initial review determined that Clean Air Act's New Source Review (NSR) requirements would not apply. Notification to be submitted to Montana DEQ. Final review for NSR impacts to be completed after BOP studies.
- No emission increases; no life extension.



Colstrip Turbine Upgrade Proposal- Commercial Terms & Guarantees

- Competitive solicitation. Awards after least cost evaluation to original equipment suppliers.
- Within approved budgets which include contractors' installation and support costs, BOP study costs and contingency.
- Contracts include liquidated damages for failure to meet efficiency guarantees.
- Warranties on components furnished & workmanship for 5 years by GE and for 10 years by S-W.



Colstrip Turbine Upgrade Proposal

Requested Action

Approve proceeding with upgrade of the Colstrip Steam Turbines to obtain an additional 28.5 MW of coal-fired capacity at a capital cost of \$10.4 million with no additional O & M or fuel costs and no air emissions increase

