


Kake Petersburg Intertie Study Update

Kake - Petersburg Intertie Study Update



Wrangell Narrows looking south from Petersburg.

D. HITTLE & ASSOCIATES, INC.
Engineers and Consultants

January 16, 2009

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Introduction

- Study undertaken by Southeast Conference in January 2009 as update to 2005 Kake-Petersburg Intertie study
- Study Participants:
 - D. Hittle & Associates, Inc. - prime contractor
 - Subcontractors: Commonwealth Associates, Tetra Tech
- Initial Draft report completed – under review

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What's New Since 2005 Intertie Study

- Renewed interest in Kake to Petersburg road
- Swan-Tyee Intertie construction underway
 - Completion expected at end of 2009
- Four Dam Pool reorganization in February 2009
- Much higher fuel oil prices
- Lower power requirements in Kake

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Study Objectives

- Provide updated assessment of previous route alternatives
- Evaluate Northern route alternative more extensively
- Update construction and operating cost estimates
- Define power supply requirements and regional generation capability
- Outline permitting and environmental issues
- Perform economic analysis – Do benefits exceed costs?

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Intertie Funding

- Initial construction costs to be grant funded
- Operating costs to be paid by Intertie users
 - Inside Passage Electric Cooperative (IPEC)
 - Private developers
 - Others

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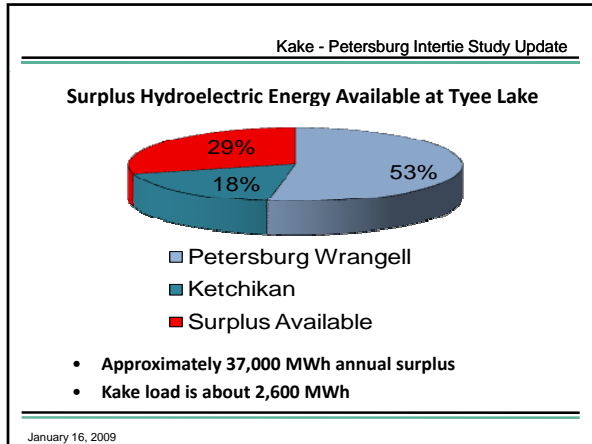
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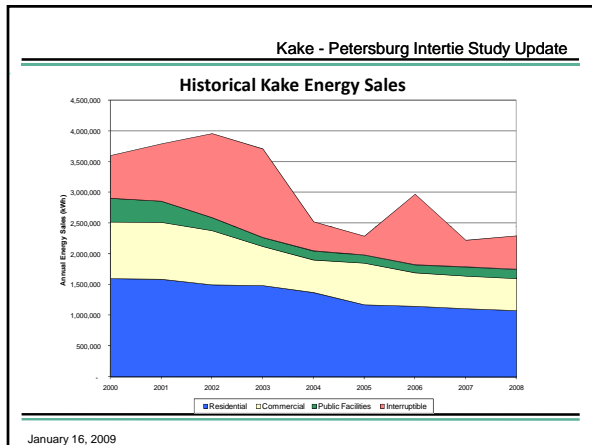
Power System in Kake

- Kake has an Isolated electric system
- Local generation is diesel fueled
 - 2.6 MW installed capacity currently (3 units)
- Electricity is crucial to economic development
 - Average residential consumption of 366 kWh per year
 - About 1/3 of residential consumption in Ketchikan
- High cost of retail electric service
 - Approximately 60 cents/kWh

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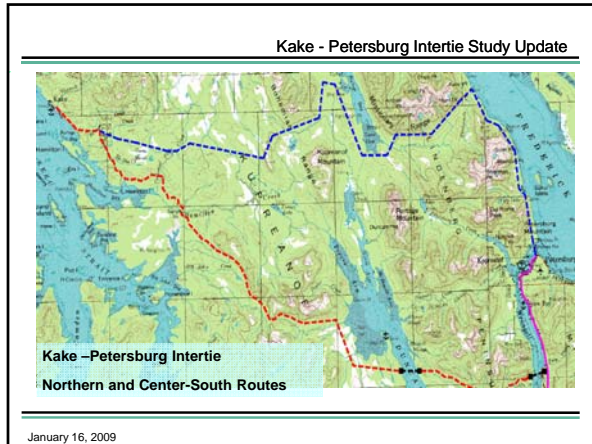
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Kake-Petersburg Route Alternatives

- Center – South route
 - 52 miles total, 2 marine crossings
 - 50 miles overhead, 748 structures
- Northern route
 - 60 miles total, one marine crossing
 - 1,042 structures
 - Follows within right of way of permanent road

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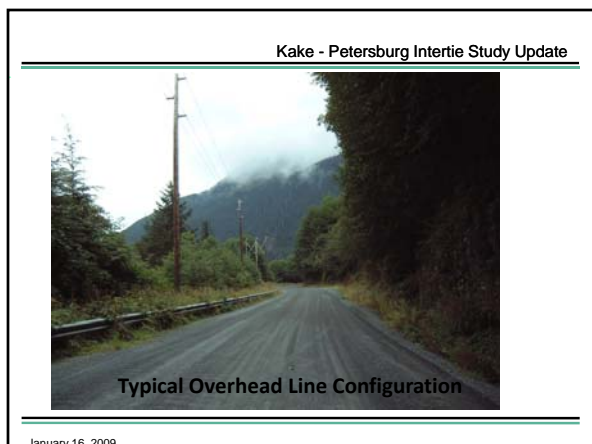


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Proposed System Configuration

- 138-kV, single pole overhead construction
- Bundled three phase submarine cables
- Follow existing USFS roads or permanent road where possible
- Coordinate with regional road development
- Integrate with fiber optic telecommunication system components
- 2-3 year construction, 5 years total development

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Estimated Total Cost of Construction (\$000)

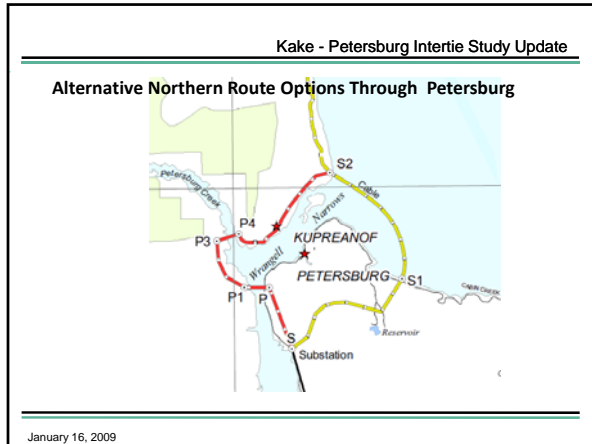
	Center -South	Northern
Overhead Line	\$ 18,735	\$ 25,747
Clearing and Road Construction	3,765	1,602
Submarine Cables	8,138	8,850
Switchyards and Substations	2,067	1,682
Subtotal - Direct Costs	\$ 32,704	\$ 37,881
Indirect Costs	3,270	3,788
Contingency	5,396	6,250
Total	\$ 41,371	\$ 47,919

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- Cost Impacts Since 2005**
- Higher transmission material costs
 - Higher labor costs
 - Much higher submarine cable costs
 - Freight costs, metals prices
 - Competition with other transmission projects in the Western US
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- Alternative for Northern Route**
- Directional bore under Wrangell Narrows and Petersburg Creek
 - Power cable in pipe – about 7inch diameter
 - Overhead line on Kupreanof Island
 - Could reduce cost by about \$3 million
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**Estimated Annual Intertie Operation & Maintenance Cost
(Years 11-15)**

	Center-South	Northern
Inspection & Minor Maintenance	\$ 76,500	\$ 104,400
Materials	12,750	17,400
Helicopter Insp. & Survey (every 5 years)	6,000	6,000
Right of Way Maintenance and Clearing	114,000	89,880
Miscellaneous & Catastrophic	18,000	22,400
Annual Average Costs	\$ 227,250	\$ 240,080
Per mile cost	\$ 4,545	\$ 4,205

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- Economic Analysis**
- Determine savings to Kake with Intertie
 - Offset of diesel generation
 - Diesel fuel price averaged \$3.79 in 2008
 - Cost of diesel power production estimated to be about 27 cents per kWh, not including depreciation
 - Compare to cost of power with Intertie
 - O&M and Purchased Power
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**Estimated Annual Costs with Intertie
(Year 1, 2013)**

Operation & Maintenance	\$	153,000
Administrative & General		66,000
Renewals & Replacements		54,000
Total Annual Costs	\$	273,000
Unit Cost (cents/kWh)		9.8
Cost of Power		6.8
Total Unit Cost (cents/kWh)		16.6

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Economic Analysis

- Net present value benefits to IPEC with Intertie of between \$5.3 million over first 20 years
- Benefits increase to \$9.5 million if other entities pay annual operating costs
 - Thomas Bay projects
 - Integration with SEAPA system – additional revenue to SEAPA from power sales
- Benefits to other potential Intertie users not quantified yet
 - Developers of other regional power generation projects

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Economic Analysis – Other Factors

- IPEC has system-wide rates
- PCE may limit benefits realized by residential customers with Intertie
- Power production costs become more stable
- Reduced fuel deliveries

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