

**AK BC INTERTIE
DISCUSSION WITH WORK GROUP
14 NOVEMBER 2006
KETCHIKAN & TELECONFERENCE**

PARTICIPANTS:

Alaska Energy Authority (AEA)

Jim Strandberg, AEA Project Manager for AK BC Intertie

David Lockard, Associate Project Manager for AK BC Intertie

Alaska Department of Transportation (DOT) – Mark Taylor

Four Dam Pool Power Agency (FDPPA) – Dave Carlson, CEO (AK BC Work Group)

Alaska Electric Light & Power (AELP) – David Stone (Southeast Conference (SEC)
Energy Com)

Craig, Prince of Wales – Jon Boling (SEC Energy Committee)

Ketchikan Public Utilities (KPU) – Jay Hanson (AK BC Technical Group)

Petersburg Municipal Power & Light (PMPL)

Dennis Lewis, Past Supt. PMP&L

Joe Nelson, Supt. PMPL (AK BC Technical Group)

JC Conley – Southeast Conference (AK BC Work Group)

Thom Fischer, Bellingham - developer

Hatch Acres Team

Bob Griesbach

Dick Griffith

Nan Nalder

Ken Salmon

Randy Hardy, Hardy Consulting

ACTION ITEMS:

- Compile loads and resources information for Southern Southeast Alaska communities by end of November 2006
- Convene a meeting of Work Group and representatives from utilities in region in December. JC Conley will look into potential of SE Conference role in assisting here.
- Identify and convene a staff-level working group comprised of representatives from Alaska and British Columbia to work with the Hatch Acres team. Randy Hardy and Jim Strandberg will discuss further and report back in December.

SUMMARY OF DISCUSSION:

OVERVIEW OF AK BC INTERTIE PROJECT

Nan Nalder led discussion

We understand that the overall AK BC Intertie Project concept is to:

- Construct transmission segments in Southeast Alaska:
 - Lake Tyee Project to Swan Lake Project – transmit surplus energy to Ketchikan; essential link in AK-BC Intertie as it will interconnect Ketchikan and Metlakatla and encourage new hydro development to export over the Bradfield Intertie
 - Petersburg to Kake – replace high-cost power from diesel generation with low-cost hydro power from Lake Tyee
 - Ketchikan to Metlakatla – provide a path to export surplus power; encourage new hydro development
 - Thomas Bay Projects to Petersburg – transmit power generated at Thomas Bay to Petersburg to link with Tyee and the Bradfield Intertie
- Construct the Bradfield Intertie from the Lake Tyee Project to an interconnection point at the border to provide a path for export of surplus power to Canada and the lower 48 states.
- Encourage development of upgrades at existing hydropower projects, and new hydropower and renewable electricity generating facilities in SE Alaska for purposes of export
- Provide access to clean hydropower generation to remote communities presently solely dependent on diesel generation

We expect that discussions with the Work Group today will enhance our understanding of the Swan-Tyee Intertie; the proposed “Bradfield Intertie” segment; and the overall development of the AK BC Intertie System.

TRANSMISSION – SWAN TYEE INTERTIE & AK BC INTERTIE

SWAN-TYEE INTERTIE (STI)

Dave Carlson led discussion:

Purpose of the Swan-Tyee Intertie is twofold:

- Near-term purpose is to transmit approximately 60,000 MWh of Lake Tyee Project annual energy generation surplus to needs of the interconnected Petersburg and Wrangell electric systems for potential use in Ketchikan area
- Long-term purpose is to provide a path for transmission of surplus energy from Ketchikan and ultimately Metlakatla for export to Canada and the lower 48 across the proposed AK BC Intertie.

Purpose of other potential near-term in-State Intertie Segments under consideration include:

- Kake-Petersburg Segment would provide a path to deliver low-cost power to communities who are presently solely reliant on diesel generation

- Metlakatla-Ketchikan Segment would enable development of additional hydro potential for export

Discussion notes:

- 57-mile transmission line; 10 years in development
- FDPPA acquired STI when the Swan Lake and Lake Tye hydro projects were transferred from the State to the FDPPA
- The FDPPA also owns and operates the transmission segments from Tye to Petersburg and from Swan Lake to Ketchikan
- 46.2 million in proposed 2007 budget; \$57 million to complete – remainder available in grants
- Cost estimate updated by Dryden & LaRue for the FDPPA in April/May 2006 includes 15% contingency (David Lockard expects to see a 15 – 20% per year escalation based on his experience as a contractor)
- Currently Tye has 60 – 80 million kWh surplus that could go to Ketchikan across the STI; in future could be available for export
- Foundations - half installed; materials stored in Ketchikan
- Projected Schedule:
 - 2008 – complete foundations & sitework, final design & order towers
 - 2009 – install towers, construct substation, string wires
- If funding provided in 2007, could energize the line by end of 2009

AK BC INTERTIE

Purpose of the proposed Bradfield Intertie is;

- To establish a link between electric transmission systems in Alaska and British Columbia
- To provide a path to export current surplus clean hydropower generated at the existing Tye Project for sale to Canada and/or the lower 48 states
- To provide Southeast Alaska hydropower and renewable resource producers with access to power markets in Canada and the United States. Proposed line could export up to approximately 105 MW at 69-kV; and 185 MW at 138 kV

Description

- 26.5 mile Bradfield Intertie Segment would run from the Lake Tye Project to an interconnection at the border with Canada.
- Single wood pole, single circuit 138-kV line with A-frame structures to support extremely long spans
- Cost estimate in 2006 dollars is between \$21.4 - \$26.8 million
- Annual O&M cost estimate in 2006 dollars is approximately \$281,000 for routine inspections, ROW clearing, and regular repairs. Costs due to damage from tree strikes, landslides, avalanches, and other events are not included.
- Construction timeline is not defined
- Access to Bradfield Intertie is generally limited to helicopters.

NORTHWEST BRITISH COLUMBIA INTERCONNECTION

- Current status of transmission system in area of proposed AK BC Intertie

- British Columbia Transmission Corporation (BCTC) has prepared analyses of the potential to add a 287-kV transmission segment between Meziadin Junction and the area around Iskut in vicinity of proposed mining and IPP hydro project developments.
- BCTC actively considering extension of system driven by proposed mining and IPP hydropower project development and is interested in discussing interconnection with Alaska – estimated distance 145 mile.

DISCUSSION

Randy Hardy led discussion:

- Referred to his conversation with Doug Little, VP Transmission Operations, BCTC
- Province likely to make a decision in next few months for at least Meziadin Junction to Bob Quinn; perhaps to the border
- BCTC could not necessarily justify its own investment based on tariffs, but government could intervene
- Randy noted that there was confusion between Alaska and BC as to who is doing what and recommended that a staff-level group representing interests in AK and BC be formed as soon as practicable to facilitate discussions.
- Jim Strandberg noted that Rohan Soulsby, BCTC, is ongoing liaison with AEA. Rohan's contact with NovaGold indicate interest in a joint effort on transmission. Wrangell has also been in contact with people in BC.
- Discussed need to coordinate with new Governor Palin's transition team on the project – Jim said Mike Tibbles will head the transition team, and AEA will pursue contacting him on this matter.
- Jim Strandberg stated that he has a standing invitation to BC and will look into scheduling a visit

Ken Salmon led discussion:

- BCTC projecting 260 MW of new loads and new IPP generation of some 200 MW
- Series of studies done by BCTC for upgrades from Skeena (500 kV) north to Meziadin Junction
 1. upgrade to 138 kV
 2. new 230 kV
 3. new 287 kV - \$535 million estimated cost
- BCTC favored #3 – 287 kV + 87 km line of 287 kV to Bob Quinn and further north to Iskut (Galore area); and a 287 kV line from Bob Quinn to the border
- Discussed transfer of interest in IPP projects and transmission ROW from Coast Mountain to NovaGold
- Forrest Kerr 115 MW hydro project represents a potential connection point closer to Alaska border
 - NovaGold current plans are not congruent with potential BCTC plans for transmission expansion to the Northwest:
 - NovaGold current plan is to construct a 138 kV line from Meziadin Junction to Forrest Kerr. Back to back DC line 115 MW limit now modified to 138 kV at Bob Quinn – line

has deliberate bottleneck built in as primary intent is to serve a \$2 billion investment in mining operation currently under construction.

- NovaGold current plan is to construct a 138 kV line from Bob Quinn to Galore Cr mine with load of 90 MW
 - o Time is a major factor for NovaGold and they may not be able to wait for BCTC action
 - o Jim Strandberg requested clarification of Hatch Acres role in NovaGold. Ken Salmon responded that they are reviewing the earlier Forrest Kerr study and performing an abbreviated feasibility study on a rigid timeframe for the generation station.
- Mahoney is the negotiator for BC government and we understand he will prepare a report by year end regarding the situation in the Northwest sector of BC
- BCTC study will allow backfeed through the DC station
- To date BCTC studies do not include Bob Quinn
- Thom Fischer, Tollhouse, stated that: "A potential private sector proposal that he is part of would develop transmission lines north of Skeena." Fischer stated that the government is reviewing the proposal and he stated that he will provide the Executive Summary, (*NOTE: following this discussion Fischer did provide a map, but no text*)

CONTINUED DISCUSSION:

General discussion of the D. Hittle Report characterized as a "reconnaissance level" study rather than a true "feasibility" study. The Hittle report includes estimates of up to \$27 million that appears to be the basis of the Governor's estimate for the 2007 budget.

Asked how the Work Group feels the cost should be described to the Governor in budget briefings given that the Hatch Acres Team has not had time to investigate independently the proposed budget.

JC Conley recommended that we go forward with the \$27 million estimate as a placeholder in the Governor's budget proposal. JC noted that Linda Hay had related to him that the Governor's figure of \$69 million should be \$73.2 million as the Swan Lake estimate was transposed and showed \$42.6 million as opposed to the correct number of \$46.2 million.

The Work Group agreed with JC's recommendation. The Work Group understands that the estimate for the "Bradfield" segment will be refined during Phase I and Phase II of the AEA funded study.

GENERATION PROJECTS – HYDRO AND RENEWABLES

Power supply needs of communities in Southeast Alaska are currently met by generation produced by hydropower projects and diesel generation units. Most electric systems that serve communities in Southeast Alaska are isolated from each other and dependent on generation produced in close proximity to load. At present, over half of the annual energy generation potential at the Lake Tyee Project continues to be surplus to needs of

Wrangell and Petersburg. The proposed Swan-Tyee Intertie would provide a path to deliver a portion of this surplus to Ketchikan.

GENERATION

- Potential Hydropower Projects Available for Export in 2007 – 2011 Timeframe
 - Lake Tyee Project current surplus and add third unit – 20 MW
 - Mahoney Lake Project – licensed and on hold pending opportunity to sell power – 9.6 MW
- Potential Hydropower Projects Available for Export in 2012 – 2018 Timeframe
 - Cascade Creek Project at Thomas Bay – 80 MW
 - Ruth Lake Project at Thomas Bay – 20 MW
 - Scenery Creek Project at Thomas Bay 40 – 80 MW
 - Wrangell Narrows Tidal Energy Project – 10 – 100 MW
- Renewable Resource Projects – Online Date Unknown at Present
 - Geothermal Development near Swan-Tyee Line

DISCUSSION:

Dick Griffith led Discussion:

There was a brief discussion regarding the sizing of the transmission line – should it be 138 kV or 287 kV given that BCTC is investigating the 287 kV configuration.

Dick Griffith reviewed the information in the packet regarding the two sets of near-term projects. Discussion also touched on some small hydro development (total 16 MW) near Hyder, Alaska, that could be transmitted across the border to Stewart, B.C.

Dick Griffith discussed the identified hydro and other projects that have reached a certain level of review – existing surplus and potential addition of the 3rd unit at Tyee; the licensed Mahoney Hydro Project near Ketchikan as near-term potential; and the next tier that would include the Thomas Bay Projects, a tidal project, and a geothermal project.

Jim Strandberg asked the Consultant team whether an Alaskan developer would be able to profitably develop Forrest Kerr if the mining company elected not to go ahead with the hydro project.

Ken Salmon stated that NovaGold is proceeding with Forrest Kerr. He also discussed several projects in the vicinity (shown on the map in the packet - Coast Mountain website still has information posted) that are part of an earlier BC Hydro procurement effort and stated concern that BC lines could be fully used by Canadian IPPs selling into the BC market.

- Forrest Kerr – 115 MW – 2009 online
- More Creek – 55 MW – 2011 online (NE of Forrest Kerr)
- McLymount Creek – 60 MW – 2011 online (W of Forrest Kerr)
- Anyox – 30 MW – 2008 – in early stages of construction
- Kitsault & Homestake – 26 MW – 2008 – in early stages of construction
- Wind Farm at Prince Rupert to interconnect at Skeena – 25 MW – 2008 online

Ken also noted that it is highly probably that the next BC Hydro energy call will result in more projects in the general area.

Process of licensing hydro projects in BC (Provincial Water License) is considerably more efficient and shorter than the US FERC hydropower licensing program. There was discussion of Alaskan power companies developing projects in BC.

Renewable Resources – David Lockard

- Geothermal project near the STI – Stanley-Wilson holds lease agreements; permits are in place; very interested in developing the project; no information re power generation capability; 300 degree F field will result in a multi-MW project
- Tidal proposal (Dick touched on it)
- Offshore wind – Martina Dobo at a recent tidal energy conference stated that there is a good offshore wind regime in Southeast and expects project development in near term

KPU is hosting a Tidal Energy Conference January 23 – 24, 2007 in Ketchikan. Roger Bedard, EPRI, is doing a small study and will present results at the conference. Trey Taylor, Verdant Energy, is planning to attend and will discuss their projects currently underway on the East Coast.

Thom Fischer added that his companies are involved in:

- 16 MW project at Long Lake similar to Anyox
- 340 MW mine-mouth coal proposed project near Kleppan, Iskut, BC.

BUSINESS STRUCTURE

The Consultant team expressed interest in discussing with Dave Carlson the transmission cooperative structure selected for KWETICO and how that might apply to the AK BC Intertie.

Nan stated that potential business structure options include:

- Transmission Cooperative – (KWETICO model)
- For-Profit Corporation
- Non-Profit Corporation
- Limited Liability Company (LLC)
- Unified System Operator
- State Ownership – our understanding is that the State will provide financing, but another entity (could be in partnership with the State) will own and operate the system
- Joint Action Agency Regional Operator – review lessons learned in earlier investigations for the Southeast Alaska Intertie Project – in order for the JAA to be tax-exempt under federal law, investor-owned utilities (IOU) could not be members

Nan indicated the Consultant analysis will consider:

- Management stability
- Ability to capitalize using long-term debt

- Appropriate governance by shareholders and users
- Isolation from political forces
- Financial accountability
- Regulatory considerations, including structures under FERC jurisdiction and avoid FERC regulation (ERCOT Model)

DISCUSSION

Dave Carlson led off the discussion with a description of the KWETICO model and the analyses and process that arrived at a decision to go with a Transmission Cooperative Model for the transmission in vicinity of Juneau and a link to Admiralty Island. The Southeast Conference played a strategic planning role.

- Utility owner/operators are AELP (IOU) and IPEC (Cooperative).
- Will deliver power to Greens Creek Mine on Admiralty Island
- Currently seeking funding for a link to Hoonah.

Transmission Cooperative Model

- Easy to create
- Dave stressed that the structure is important to enable all potential types of member entities to participate – Investor-owned utilities, municipalities, and rural electric cooperatives.
- Referred to matrix (available on AEA website and included in handout for the meeting)

David Stone, AELP stated that

- KWETICO is working well and could pick up other lines in Southeast.
- KWETICO has limited membership and cannot provide strategic planning
- Look to SE Conference for strategic planning role

Other options will be reviewed by the Hatch Acres Team.

Jim Strandberg noted that we should not take any options off the table at this time. Jim mentioned AEA's ownership of Intertie Segments in the railbelt. Jim spoke about a Unified System Operator.

Dave Carlson noted that the FDPPA is a JAA, also referenced the earlier discussion in 1998 about forming a JAA for the Southeast Intertie SYSTEM. JAA structure would not work in that case due to limited options for membership – IOUs could not participate.

JC Conley and David Stone discussed convening a meeting of utilities, potentially under the umbrella of the Southeast Conference in early December.

BCTC needs to also be involved in discussion of the business structure. Thom Fischer related a discussion he had with a statement that "BCTC offered to manage the Southeast transmission."

Jim Strandberg stated that operating agreements with BCTC would be important and the different approaches available should be considered by the Consultant team.

Nan Nalder briefly discussed the pros and cons of being under FERC's jurisdiction and the potential to adopt the "ERCOT" (NERC Region in Texas that is exempt due to asynchronous interconnections with neighboring states). FERC jurisdiction means that electric power rates for bulk power transactions (sales for resale) are determined by the FERC for investor-owned and rural electric cooperatives. Municipal utilities are exempt.

Jim Strandberg recommends that we talk with BCTC and BC Hydro about their adoption of the FERC market rules. Nan noted that FERC does not regulate distribution sales from utilities, as this remains under state Commission jurisdiction. FERC regulates open access of transmission under FERC Order 888..

There was a brief discussion (to be continued) regarding asynchronous vs synchronous interconnection and questions about treatment of ancillary services. Jim Strandberg said it is important that ability to deliver power products under the different interconnection modes be considered by the Consultant Team. He expressed concern that some of the ancillary services associated with sale of firm power might not be able to flow through a DC asynchronous interconnection. Randy said he would consider that.

Dennis Lewis noted the need to consider the opinions of existing hydro project operators regarding more FERC jurisdiction in Alaska. He was specifically concerned that establishing a FERC regulated network that interconnects with the four dam pool could bring the 4 dam pool operation under FERC regulation, and asked for the Consultant team to consider this.

ECONOMIC BASIS FOR EXPORT OF ALASKA POWER

- Overview of the key players
 - British Columbia – BCTC, BC Hydro, Powerex
 - Alaska – AEA, RCA, Intertie owner/operators, generation owner/operators
 - Pacific Northwest – purchasing utilities
- Overview of the current market in British Columbia and the Pacific Northwest
- Essential facilities & factors - elements for success
 - Transmission infrastructure
 - Reasonable wheeling tariffs
 - Timely development of new generation for export
 - Reasonable cost of power for export

Randy Hardy led discussion:

- Stated that the Hittle Export Report is reasonable on point; however, considered NovaGold as operator and assumed open access for wheeling Alaskan power
- BCTC is a government crown corporation similar in many respects to BPA, and serves as transmission operator for British Columbia
- BC Hydro owns the grid; BCTC operates and maintains
- Thom Fischer stated that BCTC has; expressed interest in operating the AK BC Intertie for a 20-year timeframe
- BC is a net importer of power; BC Hydro invites proposals annually to address future needs – most recent call for power resulted in average cost of \$70 Canadian. 38 proposals, contract negotiations underway.

- Current cost of power in PNW is \$60 - \$70 mWh. Noted that Hittle reference to \$53 - \$58 is firm energy, not capacity.
- Resource mix and related future issues in PNW is:
 - Hydropower
 - Coal – pulverized coal reserves in Montana and Wyoming; may include future carbon tax (cap & trade; straight tax); would need major transmission addition to efficiently move power from coal to west side markets
 - Gas-fired generation – some link to world oil price and not likely to go down; developing markets in India and China will influence future supply
 - Renewables
- Pacific Northwest investor-owned utilities are seeking power – in particular Puget Sound Energy
- Bonneville Power Administration (BPA) System:
 - System is surplus at present and by 2011 will be in load/resource balance
 - \$60 mWh has been cost over past 2 years; hard to project 5 years out
 - Beginning in 2011, BPA will no longer pursue acquisition of additional generation resources and will continue to serve power from the federal system and resources acquired prior to 2011
 - By 2011, public agencies that buy power from BPA will continue to purchase from BPA, but will need to seek additional resources on their own as BPA will be out of the resource acquisition mode
 - By 2011/2012 both BC and PNW utilities will be in a power acquisition mode at marginal cost.
- Regarding import of Alaskan-generated power and transmission;
 - Link to Canada and PNW does not exist at present
 - Transmission charges and line losses need to be taken into consideration:

DELIVERY TO	AK INTERTIE TARIFF	BCTC TARIFF(1)	BPA TARIFF	TOTAL(2)
British Columbia	\$2	\$5	NA	\$ 7
Pacific Northwest	\$2	\$5	\$3	\$ 10

(1) If NovaGold operates a merchant transmission segment in northwest BC, could add \$5 - \$9 to cost (pancaked rate)

(2) Does not include line losses to access PNW market

- Future issues regarding sale of Alaska-generated power
 - Cost of transmission and transmission line losses (see above table)
 - Timing of new project development in Southeast Alaska – likely not to see significant blocks of power available until 2015 – 2020 timeframe
 - Potential that projects encouraged by the BC Hydro call for power could absorb capacity of line in BC before AK projects are available
 - 2006 timeframe hydro projects would need to come in at \$53 - \$58 Mwh to be competitive
 - Recently approved Initiative to establish a Washington State Renewable Energy Portfolio Standard requiring utilities to include 15% renewables by

- 2020 does not consider hydro a renewable; between 2015 and 2020 will still be a niche market for AK green power
- Specialty power product market in California is not likely to be available due to distance
- Potential to bid hydro as a partner to wind – load shaping, load following
- Exchange power with BC? Storage capability in Southeast Alaska will help
- Ancillary services market – could shape delivery for ROR BC projects
- Jon Bolling noted that a public benefits tax on transmission over major interties could result in revenue to fund additional intertie segments to serve small communities currently hit with high cost diesel as only generation source (e.g. Kake)
- Ken Salmon asked whether there was a water license fee that could be tapped – Nan explained that FERC levies annual charges on licensees.
- Thom Fischer noted that he has information on selling power from Montana to California and that transmission charges and line losses are not problems so why would there be a problem from Alaska to California?

Randy Hardy recommends that we have detailed discussions with BCTC, BC Hydro & Powerex as soon as possible. Randy will take first step to meet with individuals this month and set the stage for a get-together with Alaska entities in near future. BC may be interested in 100 MW where they can shape and deliver better than AK can do unilaterally. Discussed need for basic data re the runoff pattern and load shape.

JC Conley asked whether 20 years out when the hydro projects become a “cash cow”, is there potential to design cost of power to recognize this and build a fund to support additional transmission line segments to remote communities (Kake). He reflected on benefits to Alaska and the political debate:

- Why are we (Alaska) giving our resources away?
- Should there be a charge to developers who are using a public resource to make money (water use tax)?

LOADS AND RESOURCES

- Discussion of FDPPA proposal to use space heating load (replace current oil heat) as a bridge. FDPPA will refine proposal at its December 14th Board meeting and likely come up with a price. Could likely serve government services load in Petersburg and Wrangell in near term and Ketchikan once the STI is in place
- David Stone noted that AELP has effectively implemented space heating using remote control hybrid air & ground source heat pumps
- Jon Bolling noted that a public benefits tax on transmission over major interties could result in revenue to fund additional intertie segments to serve small communities currently hit with high cost diesel as only generation source (e.g. Kake). Asked whether project can stand “public benefits” surcharge.
- Discussion of the need to have an estimate of loads and resources for participating entities for the December meeting.

NEXT STEPS

- Convene a meeting of Work Group and representatives from utilities in region in December. JC Conley will look into potential of SE Conference role in assisting here.
 - Need loads and resources information from KPU, PMPL, & Wrangell
 - Discuss demand side from perspective of industrial customers
- Identify and convene a staff-level working group comprised of representatives from Alaska and British Columbia to work with the Hatch Acres team. Randy Hardy and Jim Strandberg will discuss further and report back in December.
- Define economic feasibility for purposes of Phase I of AK BC Intertie Feasibility Study – Nan Nalder/Bob Griesbach in discussion with Jim Strandberg