

Submission Date: Feb 15, 2008

Priority: 1 of 1



Ted Stevens

United States Senator for Alaska

Please Note:

- Fill out one request form for each request
- This form (and any attachments) can be returned via:

Fax - (202) 224-2354
 Mail - The Honorable Ted Stevens
 United States Senate
 522 Hart Senate Office Bldg.
 Washington, D.C. 20510

- Requests are due by February 15, 2008.

FISCAL YEAR 2009 PROJECT REQUEST FORM

Project Name: Rural Electric Interties and High Voltage Direct Current (HVDC) Transmission System Demonstration Project

Project Location: Teller-Brevig Mission; Stebbins-St. Michael; Emmonak-Alakanuk AC Interties and St. Mary's-Mtn. Village HVDC Intertie

Project Description (please attach additional pages as required):

Alaska Village Electric Cooperative, Inc. proposes to construct three conventional AC electric interties in conjunction with power plant upgrades in three communities which will reduce the number diesel plants and operating engines by half. AVEC proposes to construct conventional interties of less than 15 miles in length and to examine new adaptation of technology (HVDC) for systems great than 15 miles in length. The three conventional AC interties would connect the following villages:

Teller and Brevig Mission - 6.6 miles; Stebbins and St. Michael - 10.2 miles; and Emmonak and Alakanuk - 9.0 miles.

The HVDC demonstration project with Polarconsult Alaska, Inc. would include Phase II prototyping and testing efforts, and Phase III, construction of a 25-mile intertie between St. Mary's and Mountain Village on the lower Yukon River. Additional description is provided on the attached pages.

Related Appropriations Bill: Unknown

Amount of federal funding requested for FY09: \$9,325,000

Total funding to complete this project: \$12,925,000

Number of years to fund this project: 2

Matching funds from the State of Alaska: Full FY09 Funds Rec

Matching funds from local and private entities:

AVEC & Polarconsult have contributed over \$140k to the HVDC project; AVEC has pledged \$164k to the Teller-Brevig Mission Intertie.

If this project was funded in prior appropriations bills (within the last five years), list each bill and the amount funded:

The Denali Commission funded Phase I of the HVDC project (\$700,000) in FY 2008. The Denali Commission has pledged \$1,995,000 to the Teller-Brevig Mission intertie.

Amount included in the President's FY09 Budget: \$0

Amount included in the State of Alaska FY09 Budget: \$0 (full \$ requested)

Check this box if state funding was sought but not provided.

List legislation that authorizes this project:

Energy Policy Act of 2005

Check all that apply:

- A change in the current law is necessary in order to proceed with the project. (If so, attach language and a list of laws that need to be amended)
- Bill or report language is needed. (If so, attach requested language)

**TED STEVENS, UNITED STATES SENATOR FOR ALASKA
FISCAL YEAR 2009 PROJECT REQUEST FORM**

ADDITIONAL PROJECT DESCRIPTION (2 PAGES)

INTERTIES are electrical interconnections that connect two or more load centers to a single power generation facility. Interties are a common means of improving efficiency and reducing the cost of electric energy in the lower 48 states. However, in Alaska many load centers are separated by substantial distances. These same load centers or villages are not normally interconnected by a road. These same load centers or villages normally have their own separate diesel power plants that are sized to just serve the one village. If additional load can be added to a small diesel plant by consolidating the loads of several villages improved efficiencies and reduced maintenance costs can be realized.

Alaska Village Electric Cooperative proposes to construct three conventional AC electric interties in conjunction with power plant upgrades in three communities which will reduce the number diesel plants and operating engines by half. AVEC proposes to construct conventional interties of less than 15 miles in length and to examine new adaptation of technology (HVDC) for systems great than 15 miles in length.

The three conventional AC interties would connect the following villages:

Teller and Brevig Mission-- 6.6 miles
Stebbins and St. Michael----10.2 miles
Emmonak-Alakanuk ---- 9.0 miles

The HVDC adaptation assessment for a longer 25 mile intertie between St. Mary's to Mt. Village, would involve an innovative new high voltage direct current (HVDC) system similar to those that have been in service around the world for decades. The key differences between the adapted system and existing HVDC systems are twofold:

- 1) A new cost-effective converter technology that is economical at the small (under one megawatt) capacities needed for rural Alaskan interties. Most existing HVDC systems are generally economical only for large interties, transmitting hundreds of megawatts over hundreds of miles.
- 2) A new transmission hardware system that can be more easily transported, erected, and maintained by personnel and equipment commonly available in rural villages. Existing transmission hardware is expensive to ship to rural projects, and can require that special equipment be shipped to the project for construction.

The cost advantages of this HVDC system will be most dramatic for interties of approximately 15 or more miles in length. For shorter interties, the cost of the converter modules at each end begin to cancel out the savings of the less costly single-wire transmission line. The adapted system may lower the construction costs of medium to long rural interties by as much as 25 to 50%.

By lowering intertie costs, more interties will be economically feasible to construct, enabling

communities to eliminate or reduce the size of redundant bulk fuel facilities and power plants. Larger generators operating at higher efficiencies can serve the combined loads, increasing fuel efficiency and lowering electricity rates. The availability of low-cost interties will also foster development of alternative energy systems such as hydro, geothermal, wind, gas, coal bed methane, and other non-conventional options by enabling these plants to reach larger markets and realize economies of scale.

According to a 1997 study, 171 Alaskan villages would benefit from local or regional interties. These interties will allow electricity to be transported from lower cost generation sources to higher cost generation sources, reducing costs and improving reliability. Some of these isolated communities are currently flying in fuel in because reliable surface transportation is not available.

Since DC technology requires only one or two wires rather than the three or four wires required by AC systems, transmission construction costs can be reduced. Unlike conventional AC cable systems, HVDC cable systems do not develop reactive losses or require devices to compensate for reactive losses. We intend to test prototype technology and see if it can be adapted to longer interconnections in our system involving villages along the Yukon such as St. Mary's and Mt. Village (25 miles) and along the Kobuk such as Ambler and Shungnak (30+ miles). This technology could significantly simplify interconnections not just between AVEC-served communities, but for many communities throughout Alaska, such as between the Tazimina hydroplant and communities across Iliamna Lake. Also, several currently planned interties in southeastern Alaska might be constructed using HVDC undersea cables at significantly lower cost than for the overland AC systems currently envisioned. These include interties such as from the Greens Creek Mine to Hoonah.

BUDGET SUMMARY

Conventional Intertie construction for **FY09** request:

Teller to Brevig Mission –6.6 miles (Balance to complete)	\$1,600,000
Stebbins to St. Michael -10.2 miles	\$3,200,000
Emmonak to Alakanuk – 9.0 miles	\$2,700,000

The HVDC transmission technology element of the request consists of:

Phase 1: Converter and transmission system design	[FUNDED FY08]	\$700,000
Phase 2: Construct and test prototypes	FY 09 Request	\$1,825,000
Phase 3: Install and operate a demonstration system between St. Mary's and Mountain Village on the lower Yukon River	FY10	\$3,500,000
Project Total:		\$5,950,000

Total Request for new FY 09 funds	\$9,325,000
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