

*Project: HVDC Transmission Systems for Rural Alaskan Applications Phase II – Prototyping and Testing*  
*Funding Agency: The Denali Commission*  
*Project Manager: The Alaska Center for Energy and Power*  
*Contractor: Polarconsult Alaska, Inc.*

### Background Information

The purpose of the Stakeholder Advisory Committee (SAG) is to provide independent comments, feedback, review, and recommendations to the High Voltage Direct Current (HVDC) project, awarded by the Denali Commission (Commission), managed by the Alaska Center for Energy and Power (ACEP), and contracted to Polarconsult Alaska, Inc. (PCA).

The HVDC project seeks to investigate the possibility of applying HVDC transmission systems to remote Alaskan applications. HVDC technology has the potential to significantly reduce the cost of remote Alaskan interties, reducing the costs to interconnect remote villages and/or develop local energy resources. Such interties would help to lower the extreme energy costs common in many villages. In addition to capital cost savings, HVDC interties also permit asynchronous interties and long-distance overland or submarine cables. These unique attributes make HVDC very attractive for many remote Alaska applications.

The Commission previously funded Phase I of this project which included feasibility analysis of the proposed HVDC system and construction and testing of a prototype 250 kW 12.5 kV HVDC converter to confirm that the technology meets key performance benchmarks. Phase I was completed in 2009 and the final report is attached.

Phase II of the HVDC Transmission System project includes design, fabrication and testing of fully functional prototypes of the converter system and transmission system elements. This effort will validate the design and functionality of these systems, and will also validate the efficiencies and feasibility necessary to make HVDC systems successful in remote Alaska intertie applications. The information gained in Phase II shall be used to further develop construction cost estimates and refine the economic analysis of the technology developed in Phase I.

### Role of the SAG

The SAG is to play a very important role in this project. There are many challenges to implementing HVDC technology in rural Alaska; the input and involvement of Alaska's rural electric utility industry and related professionals is invaluable. Specifically, the SAG will provide independent professional advice, comments, feedback, and opinion to various technology, policy, and other project topics. Feedback from the SAG may also be used in project scoping.

Some topics that will be put to the SAG include:

- Examination of current Alaska electrical codes. Given the potential of HVDC technology and the unique conditions in Alaska, do they merit modification? What information, testing, or demonstration would be needed to justify code modifications?

Stakeholder Advisory Committee  
HVDC Transmission Systems for Rural Alaskan Applications Phase II – Prototyping and Testing

- What are the envisioned regional interties or local energy resources that lower-cost HVDC interties might enable? How much power would these HVDC interties move?
- What lessons do existing interties and utility experience offer for design, logistics, and construction of HVDC interties?
- What are potential sites for possible Phase III demonstration activities?
- Feedback on transmission system and component design and demonstration.
- Feedback on project scoping questions, such as appropriate size for converters.

Design of the SAG

The SAG will be chaired by the Denali Commission, and consist of up to 30 members. The SAG will meet formally 3 times over the course of the project (January 1<sup>st</sup> 2010 – October 3<sup>rd</sup> 2011), tentatively scheduled for around 4/29/2010, 12/1/2010, and 7/15/2011, to discuss project issues and provide formal feedback to the project. These formal meetings will take place in Fairbanks, Anchorage, or at another convenient location, and also be teleconferenced. The project budget cannot support travel costs or per diem at this time.

Outside of these formal meetings, the SAG membership will receive periodic communications, project updates, questions, or requests for feedback via an electronic mailing list. ACEP and the Denali Commission understand the work load and individual commitments of the SAG membership, and will keep communication and requests for feedback to a respectful level (estimated to be once a month).

SAG Candidate Organizations

The following organizations have been invited to participate:

Alaska Energy Authority	Kotzebue Electric Association
Central Council of Tlingit/Haida Tribes of Alaska	Matanuska Electric Association
Alaska Village Electric Cooperative	Golden Valley Electric Association
Inside Passage Electric Cooperative	Nome Chamber Of Commerce
Alaska Power and Telephone	Bering Straits Native Corp
North Slope Borough	Bethel Electric Utility
Naknek Electric Association	Alaska Department of Labor
Copper Valley Electric Association	Alaska Power Association
Homer Electric Association	Institute of Northern Engineering, UAF
USDA-RUS	Cooperative Research Network, NRECA
Nome Joint Utilities	Northwest Arctic Borough
Kodiak Electric Association	

Further organizations may be invited, per the recommendation of the SAG or invitation from the Denali Commission.