

**Wind/Hydro Feasibility Study Meeting (Section 2606)**

Rushmore Electric Cooperative, Rapid City, South Dakota -- June 1, 2007

Mike Radecki (Western Area Power Administration) opened the meeting at 8am.

**Attendees**

Mike Radecki, Jody Farhat (U.S. Army Corp of Engineers), Trevor McDonald (U.S. Army Corps of Engineers), Warren Mackey (Santee Sioux Nation), Vic Simmons (Rushmore Electric), Mike Costantini (Mitney-Frantz Engineering / Blackfeet Nation), Steve Wegman (SD PUC), Mark Messerli (WAPA power marketing – Watertown), Matt Schuerger (ESCS/National Renewable Energy Laboratory), Walter Whitefoot Feathertail (Ft. Peck Tribal Energy Dept), Tom Weaver (consultant – Ft Peck Tribes), Tom Wind (ICOUP), Pat Spears (ICOUP); Bill Schumacher (ICOUP), On the phone: Bob Gough (ICOUP), Paulette Schaefer (U.S. Bureau of Reclamation), Karl Wunderlich (U.S. Bureau of Reclamation), Scott Doig (U.S. Bureau of Indian Affairs)

**Background**

- Contract for study has been awarded to Stanley Consulting (about \$700k, based on Section 2606); Stanley will be prime and will pull in subcontractors as needed;
- The study will focus on physical integration, operational integration, and economics (costs of integration, costs to Western and to Western's customers);
- Reviewed key areas of the enabling legislation (Section 2606) which includes assessment of economic & engineering feasibility, costs & benefits, review of Western's historical & projected requirements, assessment of potential and costs over 30 years, determination of seasonal capacity, analysis of costs & benefits to customers of Western through combined wind and hydropower, economic & environmental evaluation of combined wind and hydropower, feasibility determination & recommendation for a demonstration project;
- Reviewed the Dakotas Wind Transmission study;
- WHFS study will focus on wind energy delivered to Western's customers in the Upper Great Plains Region (UGPR); includes all of Upper Great Plains region (Dakotas and Montana); Eastern interconnect control area (Dakotas, WAPA Integrated System) has about 3500 MW of peak load and regulates with one or two units at Oahe, western interconnect control area (Montana) has about 120 MW of peak load and regulates with 40 MW at Ft Peck;
- Western views wind generation as displacement energy – that is that it will displace energy purchased from other generation sources
- The Corp (Jody Farhat) and Western (Mark Messerli) talked about constraints with the Missouri River System;
  - No ability to store water over longer periods;

- River operating plan – Corps moves water daily regardless of what’s happening on Western’s system, bird season (May to August) restricts about 200 MW, wind will not “save water” in the Missouri;
- There is some flexibility within a 24 hour period and over multiple days as long as the three week target is met, the hierarchy of uses is met (electricity production is last of 6 uses), and the Master Manual requirements (e.g. flow restrictions for bird nesting) are met;
- Western currently does some “hydro shaping” to optimize time of power purchases (peak/ off-peak) within a 24 hour period and to work around transmission constraints over multiple days (the same with MISO has led to increased TLR restrictions on key corridors).
- Western purchases a large amount of energy, even in the best hydro years;
  - In a normal year Western markets about 10,000 GWh in the UGPR;
  - In a minimal hydro year the Missouri River system produces about 6,000 GWh; in a max river year about 15,000 GWh
  - This year WAPA is buying about 40% (about 4,000 GWh) of their needs; WAPA purchases power (about 5%) even in best hydro years due to timing of hydro production and customer needs,

Analysis of operating impacts was discussed extensively

- Discussed current best practices including the need to analyze net wind & load in the context of the overall power system and the importance of high quality wind modeling that is time synchronized with load data; discussed importance of large scale meteorological wind models for operating impacts (versus simply scaling up met tower data)
- Recent wind integration studies were discussed including the Pacific Northwest Wind Integration Study, the Minnesota Wind Integration Study, and UWIG work
- The group discussed whether operating impacts were likely to be an issue with the level of wind generation in this study
- Western and the study group agreed that the study work plan will incorporate current best practices of evaluating operating impacts as documented by NREL and UWIG

Key issues for the study work plan were broadly discussed

- Wind integration is possible , wind is already on the system; potential exists for more – how much, where, and at what cost
- Need to know planned and potential wind generation on Tribal lands; Western is asking Tribes to send in proposed projects; Western will look at and consider for study all Tribal projects that are brought forward
- Evaluate net of costs and benefits
- Question about return on wind generation investments made by Tribes – through power purchase contracts. The current assumption is that any contract between Western and Tribe(s) would be based on the economics

- and that assumes the Tribe would receive sufficient revenue to meet the projects revenue requirements.
- Unclear how recommendation of demonstration project will be funded, will be contracted, will be handled in open access transmission rules
  - 12 month time frame for study project
  - Work plan will go out for public comment (Federal Register) after review by the study group;
  - There will be technical review during study for critical path elements including methods/assumptions, preliminary results, preliminary results, and draft report.
  - The report will include a recommendation to Congress to do or to not do a demonstration project; Western is currently neither prohibited from nor tasked to do a demonstration project.
  - Analysis will cover Western's two UGPR control areas (east and west interconnect)
  - Key study components include:
    - Western's needs (historical and projected purchases) –20 year history, starting with monthly for overall wind level, then daily and less for integration; historically what has Western paid for power and what are they projected to pay
    - Tribal projects – how much, where, cost (develop Tribal Project questionnaire – size MW, wind speed, interconnection cost )
    - Transmission upgrades – evaluate each of the Tribal projects for impacts on and analysis of needs for transmission to deliver to Western's load; geographic diversity benefits be captured in the operating impacts analysis; not an optimization, proposed sites will be evaluated for impacts and costs / benefits (by purchasing wind power will Western save money or will it cost more);
    - Western's Integrated System (eastern interconnect control area) is working on a load serving study (work is being done by Basin).
    - Power system modeling likely will focus on Security Constrained Economic Dispatch modeling (e.g. PROMOD) in order to best represent the diurnal and seasonal characteristics of wind generation and the transmission loading throughout the year; important that Stanley's subcontractor for this portion have strong experience with modeling wind generation and a solid understanding of current best practices
    - Best practices of evaluating operation impacts as documented by NREL and UWIG will be incorporated into the work plan; build on relevant prior studies;
    - Climate change, costs in carbon constrained world?
    - Address environmental externalities as part of benefits?
  - A Programmatic EIS (PEIS -covers wind within UGP region/Eastern Pick sloan) is being worked on now, site specific could be added. *Followup discussion with UGP Environmental Manager on 6/4/07 – Initial funds for the PEIS have been identified. Internal discussions have begun on the*

*development of a purpose and needs statement. The PEIS will address the cumulative / large effects of dispersed wind projects within the region. No schedule currently available.*

**Next steps:**

- Mike Radecki will meet with Stanley next week; Stanley will draft work plan in next 30 days which will then be posted to the web for study group review and comment; need to focus and prioritize tasks for added value, actionable
- Next meeting – late July? May be via conference call..

**Action items:**

- Pat Spears will provide revised contact list for Tribes
- Tom Wind, Mike Costantini, & Tom Weaver are going to draft a form for questionnaire by June 15<sup>th</sup>
- Jody Farhat will distribute overview of Missouri River issues and provide links for operating summary
- Mike Radecki will post UWIG link
- Matt Schuerger will provide information on best practices of evaluating operating impacts of wind



- June 1, 2007 Wind Hydro Integration - Workshop Meeting
- Jody Farhart Corps of Engineers
  - Trevor McDonald Corps of Engineers
  - Warren Mackey Santee Sioux Nation / Santee Sioux Housing
  - Vic Simmons Rushmore Electric
  - Mike Constant Motney-Fritz Engineering / Blackfoot Nation
  - Steve Wegman So. Dakota Public Utilities Commission
  - Mark Messerli WAPA - Watertown, SD
  - Matt Schmeier ESCS / NREL
  - Walter White Tail Feather Fort Peck Tribal Energy Department
  - Tom Wind Wind Utility Consulting - ICUP
  - Tom Weaver Consultant - Fort Peck Tribes
  - Stoney Anketell Fort Peck Tribal Councilman
  - Bill Schumacher Intertribal COUP
  - Pat Spears Intertribal COUP
  - Milo Padecki Western Area Power Administration

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