

W. Bill Booth
Chair
Idaho

James A. Yost
Idaho

Tom Karier
Washington

Dick Wallace
Washington



Bruce A. Measure
Vice-Chair
Montana

Rhonda Whiting
Montana

Melinda S. Eden
Oregon

Joan M. Dukes
Oregon

April 2, 2009

MEMORANDUM

TO: Power Committee

FROM: Ken Corum

SUBJECT: Draft of Appendix K of the 6th Power Plan

Appendix K takes up the subject of “Smart Grid” technologies. This is a loosely defined set of technologies that could revolutionize the operation and planning of the power system. Some have compared the potential of smart grid technologies on the power system to that of the Internet on information and communication. These technologies could affect many aspects of the power system, but their ultimate impact is difficult to envision from today’s perspective. It will likely take many years for the full potential of smart grid technologies to be realized.

One of the most promising potential effects of a smart grid is to enhance demand response by greatly expanding the possibilities for communication and the control of energy use. Appendix K describes smart grid technologies, the areas of potential benefits and difficulties, and presents some specific examples of innovation in the operation of the power system that could result from these technologies.

Appendix K – the Smart Grid

Ken Corum
Power Committee Meeting
April 9, 2009



Structure of Appendix K

- Definition of smart grid technology
- Description of potential benefits
- Needed developments
- Vision



Definition

- Cheaper and more capable:
 - Metering
 - Communication
 - Intelligence and Control



3



Potential Benefits

- Enabling demand response
- Operational savings
- Energy efficiency
- Capital savings



4



Enabling Demand Response

- Extension of control to more devices
- Cheaper
- More & better information to guide control



5



Operational Savings

- Remote connect/disconnect
- Faster recognition, location, and repair of outage
- Remote monitoring of e.g. transformer condition



6



Energy Efficiency

- Conservation voltage reduction
- Immediate evaluation of program results



7



Capital Savings

- Better monitoring of equipment condition
- With better control, system can be run closer to capacity



8



Needed Developments

- Interoperability (“plug and play”)
 - Gridwise Architecture Council
- Simplified participation by consumers
 - e.g. don’t ask consumers to watch real time prices – let their IGrid handle responses
- Grid operators’ experience with new possibilities



9



Vision

- Adaptable response to peak loads – sharing temporary reductions among many users
- Integration of plug-in hybrid vehicles
 - Charge off-peak
 - Discharge on-peak
- Water heaters as
 - peaking resource
 - reserves
 - load following
 - storage



10



Future

- Monitor developments in technology
- Advocate appliance standards incorporating smart grid technology

