

Electric Distribution R&D Peer Review 2006 Project Summary

YOUR ORGANIZATION:	Pacific Northwest National Laboratory
PROJECT TITLE:	GridWise Architecture
PRESENTERS:	Steve Widergren
FY 2005 FUNDING:	\$750,000
FY 2006 FUNDING:	\$600,000
START/COMPLETION DATES:	October, 2004 – September 2009 ¹

Overall Project Purpose and Objectives: The project's mission is to align stakeholder mindshare behind a strategic approach that facilitates the communication and control of the growing number of intelligent systems that participate in the electric energy system. To accomplish this mission an architecture council with broad cross-industry representation (including electric power, information technology, telecommunications, industrial systems controls, commercial and residential end use, markets and economic systems, policy and regulation) serves as a visionary body to articulate the interoperability requirements and characteristics of an information aware, collaborative electric system. The GridWise Architecture Council (GWAC) has been formed for this purpose. The initial goals of the GWAC are to establish fundamental principles that interoperability strategies must address, and to articulate and foster a shared definition and appreciation for the levels of agreement needed to achieve interoperability. Establishing these concepts will frame the debate on steps to be taken in standards, trade, and policy communities to enhance interoperation for a more efficient and reliable electric system.

The Nation's economy and security requires a dependable electric system, able to adapt to changing energy supplies and resilient to acts of nature or sabotage. The future of the electric system depends upon judicious use of information technology that is pervading our society and raising our standard of living even under threatening world circumstances.

FY 2005 and FY 2006 Results and Accomplishments:

Milestone	Description	Completion	Status
Form GWAC	Develop structure for GWAC, solicit and select candidates, hold first meeting.	May 2004	Complete
Interoperability Constitution	Draft fundamental principles of business, usage, technology, regulation, and governance that will form the foundation for interoperability strategies.	Jan 2005 Sep 2005	Interoperability Constitution drafted Whitepaper released
GridWise Constitutional Convention	Interview and brief important stakeholders on constitution and hold forum to engage larger audience for their participation in next steps	Dec 2005	Convention attendance ~110 people
Interoperability Path Forward	Draft definition and challenges to interoperability to identify concrete areas for community agreement and standards engagement.	Oct 2005 May 2006	Whitepaper released Presentation made at GridWise Expo
Interoperability Forum 1	Engage and encourage larger community in interoperability issues and participation for resolution.	May 2006	1 st GridWise Expo held (original target Jan 2007)
Framework for Interoperability Issues	Provide structure to complex interoperability issues to facilitate discussion and participation.	Sep 2006 Draft	Example frameworks being researched. Task force being assembled.

¹ Note, we anticipate the work of the Architecture Council will continue for several years. The support for this organization and related activity is to transition to industry.

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FY 2007 Plans and Expectations:

Milestone	Description	Planned Date	Status
Framework for Interoperability Issues	Provide structure to complex interoperability issues to facilitate discussion and participation.	Sep 2006 Draft Jan 2007 revise	Example frameworks being researched. Task force being assembled.
Interoperability Forum 2	Engage and encourage larger community in interoperability issues and participation for resolution.	Jan 2007	In discussion
Prioritize Interoperability Issues	Identify and describe best areas of interoperability with potential for progress in standards arena	Jun 2007	Task force on identification issue initiated
Transition First Issues to Standards/Policy Organizations	Engage relevant parties and identify appropriate organizations to host work to address first related standard or policy.	Nov 2007	Not started
Interoperability Forum 3	Share progress in industry implementations and related standards efforts. Engage participation in next steps.	Feb 2008	Not started
First Standards/Policy Draft	A first draft of a GWAC influenced standard or policy.	Nov 2008	Not started
Interoperability Forum 4	Share progress in industry implementation and related standards efforts. Lay groundwork to transition GWAC to industry.	Mar 2009	Not started
Transition GWAC to Industry	Industry assumes sponsorship of the GWAC. DOE support diminishes.	Sep 2009	Not started

Challenges: The electric energy system today has its roots in the master/slave communications and control paradigm of the industrial systems world. These systems are being influenced by new communications and information technology products and approaches; however, the comfort that comes from a centralized control point of view will be a challenge to dislodge. Visionaries in the area see distributed control schemes as being far more scalable and resilient to failures; however, the behavior of such complex systems, particularly as applied to the power system, is not fully understood.

Electricity is also a highly regulated industry. The rules that protect consumers from monopolistic abuse can become obstacles to change. Changes in policy and regulation can provide incentive for new structures to deliver more diverse services to consumers with a variety of needs. Even with the best intentions, developing a fair path to the future is complicated, particularly considering the importance of electricity to the Nation's economy and well-being.

Public/Private Partnerships: The Architecture Council members are selected for both their ability to represent their targeted areas at council meetings as well as their ability to reach out into their communities. Members have spread the word about interoperability at various conferences and meetings with select organizations. Examples of liaisons and partnerships that have been forged over the past two years include working with EPRI's IntelliGrid to review their projects and open discussions on future research, proposing research ideas to the California Energy Commission, collaborating with the Bonneville Power Administration on their EnergyWeb and Pacific Northwest initiatives, and advising Southern California Edison on advanced metering directions. The automated buildings community has been engaged through the submission of several articles and coordination with organizations such as CABA. The work on the interoperability constitution alone involved interviews and discussions with over 100 people across the diverse sectors of relevance. The GridWise Constitutional Convention and GridWise Expo attracted new participation from organizations involved in buildings automation, demand response aggregators, electric power automation, and regulators. Influence across the electric community requires continued emphasis on developing a clear message about the issues, listening to stakeholder feedback, and spreading the word.

Organizations collaborating with the Architecture Council include SCE, BPA, IBM, Areva T&D, Drummond Group, Infotility, EnerNex, eMeter, Energy Control, Inc., Cummins, Emerson Network Management, Colorado State University, SAIC, Becker Capital, EPRI, NRECA, CECA, CABA, OPC Foundation, California Energy Commission, and the GridWise Alliance.