

Meeting Minutes

April 17, 2019

GWAC Members

David Forfia, Director, Enterprise Architecture & IT Transformation, Electric Reliability Council, TX

Ron Ambrosio, Chief Scientist, Utopus Insights, Inc.

Tanya Barham, Director of Operations, PECl

Ron Bernstein, President, RBCG, LLC

Joe Hagerman, Deputy Chief Scientist, NRECA

Doug Houseman, Grid Modernization Lead, Burns & McDonnell

Stephen Knapp, Vice President of Quality Assurance & Energy Markets, Power Analytics Corporation

James Mater, Co-Founder and Director, QualityLogic, Inc.

Farrrokh Rahimi, Senior Vice President, Open Access Technology International, Inc.

Leonard Tillman, Partner, Balch & Bingham, LLP

GWAC Members not present

Gerald R. Gray, Sr. Program Manager, Electric Power Research Institute (EPRI)

Lorenzo Kristov, Principal, Electric System Policy, Structure, Market Design

GWAC Associates & Emeritus

Robert Burke, Robert Burke Consulting

Ron Cunningham, AEP

Jeff Morris, Principal, Horizon Energy Corp.

Ken Wacks, Home, Building and Utility Systems

Chris Villarreal, President, Plugged In Strategies

GWAC Guests

Rahul Bahadur, VMware

Rolf Bienert, Open ADR

Ward Camp, EBC

Phil Davis, Schneider Electric

Larissa Dobriansky, Dobriansky Consultancy/General Microgrids

Trevor Gionet, Introspective Systems, LLC

Mark Knight, Burns and McDonnell

Dave LeVee, PwrCast

Stuart McCafferty, Black & Veatch

Rob Pratt, PNNL

Aaron Snyder, EnerNex

Stuart McCafferty, Black & Veatch

David Wollman, NIST

PNNL Support

Ron Melton, GWAC Administrator

Susan McGuire, GWAC Coordinator

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Ken Wacks followed up with Ron Melton about a document needed for the ISO/IEC technical report abstract submission that he had emailed Ron about on April 1.

Ron Melton opened the meeting and checked attendee names until a quorum was reached was reached at 10:08 PST.

Ron read the proprietary information notice.

David welcomed the group to the April meeting.

Ron Melton reviewed the agenda. He noted that Rob Pratt, PNNL would join the meeting part way through and give a report on the PNNL TE project DSO-TSO Modeling task.

Action Items

Ron Cunningham had an action to work with Lorenzo Kristov, Trevor Gionet, Leonard Tillman, and Dave LeVeve on the next steps in Grid 3.0 as a GWAC activity (next steps, identify a deliverable). This is complete.

Ron Melton needs to have a call with Joe Hagerman, and Ron Bernstein, to discuss the smart buildings as a transactive hubs white paper.

Ken Wacks followed up with Ron Melton about a document needed for the ISO/IEC technical report abstract submission regarding the GWAC Roadmap that he had emailed Ron about on April 1.

Ron Melton and Rahul Bahadur were to have a call to discuss the Economic Reliability white paper.

This may be done? Farrokh would like to be involved also. He asked about a matrix that shows use cases - he wants to make sure that there is agreement on the use cases. Mark Knight verified that a call was made and that the scope of the paper is being developed as a white paper. The matrix is part of the framework for the paper. Stephen Knapp agreed, saying everyone has their assignments and a white paper is in development. Mark Knight gave the paper title, *"Economic reliability and resilience consideration for TE Systems."*

Ron Melton will review the GWAC Activities matrix submitted last month by Ron Bernstein; he will check for any needed corrections and will get it loaded to the GridArch Sharepoint site. The group discussed if a version could be located on the GWAC website, but without names of people. James Mater thought that would be a good PR move for GWAC to have it on the website, it could be a shorted, public version.

James Mater then asked who has the responsibility to keep the GWAC matrix updated. Ron Melton said that it's probably his job to keep it introduced at the meetings and to keep it updated on a regular basis. Ron Melton also said that each activity leader on the matrix could be tasked as responsible to keep their column up to date. James Mater felt it should be kept up to date or it will not be of value.

Ron Bernstein said his original idea was for the matrix to exceed two slides and be easy to review. He wants it to be informative for the GWAC meeting but not be a document for activity management.

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Ron Bernstein has an action to follow up with Ron Cunningham about the Grid 3.0 white paper.

Upcoming events

TESC19, Minneapolis, MN July 8 – 10

Grid Evolution Summit July 29 – Aug 1 in Wash DC

IEEE PES General Meeting, Atlanta Aug 4 – 8, 2019

AHR Expo 2020, Orlando FL Feb. 3 – 5, 2020

ISGT 2020, Washington DC, Feb. 17 – 20, 2020

EMSO (houseman) EMS Operators conference

GWAC Website update

A cost estimate came back from PNNL but the cost is high, over \$200K

Ron Melton is working with PNNL staff to explore alternatives. They may break it into two phases over two years. The site is hosted on PNNL servers. It could be moved off those servers and move to Word Press hosting services. Ron Bernstein works with that group and is familiar with it. He said that based on his experience they are cost effective.

Ron Bernstein suggested an external site with a GWAC PR committee of volunteers to maintain the website.

Ron Melton asked how important it would be to retain archive documents.

Doug Houseman suggested that the new site could point to the existing website.

Ron Melton said the documents would then have the same URLs.

James Mater and Stephen Knapp both expressed that the historical documents are important. David Forfia said the URL could change and a redirect could be provided.

Farrokh said that existing publications may reference the URLs and felt they are important.

David Forfia asked for a motion of approval of the March meeting minutes. Doug Houseman gave the motion to accept the March minutes. Stephen Knapp seconded the motion. Ken Wacks noted that he had sent Susie a change and the minutes will be updated to include this. There was no further discussion and the motion was approved.

TESC19 Update

Ron Melton noted that the TESC19 organizing committee is meeting weekly on Mondays at 1:00pm PST

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Ron will visit UMN on 4/29, Ellen Anderson will be there also and possibly Chris Villarreal.

The meeting budget is set.

The registration website is up and David Forfia was the first to register and also Leonard Tillman and Ron Bernstein registered just after David.

Sponsorships have come in for OATI at the Platinum level and Burns & McDonnell at the Gold level. More sponsorships are needed.

TESC19 Abstract and Paper sections

Farrokh is leading the review process of the abstracts and papers and that is in progress.

The meeting website is up and running with a registration link.

Transactive Energy Systems in a Participatory Grid - A Framework for the Future

- Tracks (normal GWAC plus some variation incl resilience)
 - Regulatory and Policy (1)
 - Business Models and Value Realization (1)
 - System Design and Architecture (1)
 - Physical & Cyber Technologies and Infrastructure (1)
 - Resilience (1)
 - Visions for Participation (1)

Referring to the Meeting Theme and tracks, Ron Melton noted two options for plenary or keynote talks on both July 9 and 10 if the right speakers are identified.

Ron mentioned that Mark Patterson has been recruiting international participants for a plenary session. Mark Knight commented that last year we had some international participants. Ron Melton made a note to look for those names on last year's participant list.

Action Ron Melton: Look for international attendees from last year

For the foundational sessions he suggested that there be a framework update discussion particularly on the first four sections of chapter four. This would highlight the GWAC but he is open to other suggestions. Working to get the TE framework updated, Ron has pinged people about this and gotten positive comments. Some progress has been made from calls he made yesterday.

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Maybe a presentation about the GWAC actives in progress from Chris Irwin's program. Chris might want to do the keynote talk. These would feature projects in Chris Irwin's portfolio.

Mark Knight noted that last year's foundational session focused on the Framework as well. He said there could be other ways to make it tangible like linking the framework to real world happenings.

David agreed that we want the meeting to still have the feel of a GWAC conference. The foundational session would be key to that as well.

Doug Houseman thought there should be a GWAC led and staffed session to keep the GWAC connection to the conference. Ron Melton and David Forfia agreed with Doug that it is important to keep the feel of a GWAC conference. We need to be sure to finish up the changes in time.

Ellen Anderson has agreed to moderate a panel, particularly a regulatory one.

Chris Villarreal said he has texted the NARUC president (Nick Wagoner) requesting him to be a keynote speaker. He has not heard back from him yet. Ron Melton also suggested that he be on a regulatory panel as a moderator. Chris said that Nick Wagoner is working on a two year initiative and it would mesh well with the conference theme. Chris will continue to work this issue. Ron Melton said that Nick could be part of the panel that Ellen will lead.

Trevor Gionet had some ideas for plenary speakers and Ron M encouraged him to follow up on those with his international contacts.

Ron Melton noted the PNNL staff who have presented abstracts. These could be the basis of a panel based on the DOE projects overseen by Chris Irwin provided that he is planning to attend.

Doug Houseman – suggested that we fill in the international panel with one or two groups participating by WebEx.

Ron Melton suggested that we get some Canadian participants for the international panel. Chris Villarreal has some connections and Ron Melton does also. Jeff Morris said that he would send some names. Mark Knight noted David Katz is from Ontario. Ron Melton said that this international panel seems to be a popular idea and viable. Mark Knight will look to see if he has the international contact names from last year.

Action: Ron Melton work on getting Canadian international panel participants. Also follow up with Mark Knight and Chris Villarreal

Mark Knight noted that his discussions with NARUC gave him information on possible travel support for commissioners for a TESC19 regulatory panel. Ron Melton will follow up on this with Mark and Chris. Chris will keep working on getting Nick Wagoner on board.

Mark Knight asked about the Arizona commission – he had reached out to them. He mentioned Carrie Worthington at NARUC. She was on one of the panels at MIT last year. He thought this could line up with what Nick might talk about and would fit well with the theme of this year's conference.

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Presentation by Rob Pratt, PNNL on DSO+T

Rob Pratt, PNNL joined the call to give an overview of a large effort being conducted for Chris Irwin – DSO+T, which looks at a hypothetical future TE world with an overlay of DSOs replacing the traditional distribution utility business model. He will articulate this in detail of how to design, simulate and analyze a distribution system operation (DSO) using a transactive approach. The study is underway and hopes to have the study done by December 2019. Some parts of the study will be released earlier.

The design would then be tested with simulation and estimate benefits of deployment at scale over a range of potential grid futures.

They would issue the simulation and valuation framework as an open challenge to industry and the transactive energy community to develop and improve their designs in preparation for field experiments.

Trying to accomplish a field ready design for TE coordination scheme. They would test the design in a co-simulation at scale. Futures and simulation will be part of this. They would issue the simulation and valuation framework as a challenge to the open community to validate their own designs.

PNNL will help others to explore designs and to utilize code for the simulations. There would be a grand prize of co-funding for a real world demonstration that may come out of it ideally.

We hope to show what a DSO might look like and how it might function in an operational time scale.

Saving existing capital investments as we move ahead is important. The rate of return on capital investment and where DSRs can be used, particularly to support PV are a key part. The DSO movement comes about not to put the distribution utility out of business but to change the mechanism so they can stay in.

One objective is to leverage DERs to avoid distribution infrastructure upgrades, and to increase PV hosting capacity.

Also it is important to make distribution planning and operations agnostic to rate of return on capital investment.

Rob reviewed several principal research questions.

A question they hope to help answer – is a DSO+ Transactive deployment of DERs at scale cost effective?

Various outcomes due to different possible scenarios will be demonstrated.

There is a slide that shows key characteristics of the six simulation cases.

ERCOT is a handy characteristic of this project. Its generation mix is as good a representative of the overall US as any with 15% wind power.

Rob answered questions from the group. He noted that this is a one year model.

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Ron Melton noted that Rob's slides are available in the meeting slides for this meeting located on the GridArch.org Sharepoint site.

TE Framework Status

• TE Framework Update (cont.)

- Section 4.1 status? Leonard & Chris
- Section 4.2 status? Farrokh & Lorenzo
- Section 4.3 status? Ron Ambrosio
- Section 4.4 status? Aaron Snyder & ?

Ron Melton reviewed the progress of the TE Framework update (side 39) and asked if people are using the GridArch.org website for posting their progress. Ron is hoping to publish the framework at the end of May/beginning of June so that it can be out before the conference. He asks for people to have their individual sections completed by April 26 and to load them on the Sharepoint site.

Doug Houseman asked Ron Melton to resend the link to gridarch.org Sharepoint site. Doug has contributed to section 4.4. He has also made changes to the other sections which were sent to Mark. Mark confirmed that changes he received from Doug were for section 4.4. Ron Ambrosio said that his changes to other sections were made over a year ago and he may have had Doug's changes at that time.

Ron Bernstein has made some changes to section 4.3, he will resend that to Ron Ambrosio and he will load it to the GridArch.org Sharepoint.

Liaison Reports

David Wollman – A test bed workshop was held in Knoxville last week. They will have a test bed meeting next week in Vermont. He noted that the April 30 at EPRI meeting is cancelled

Grid 3.0 – GWAC – material from the last call is in this slide deck.

Ken Wacks – gave a recap of the ISO/IEC meeting in Stockholm. The TE Roadmap will become a technical report published by the group. He sent a meeting summary press release on this to Susie.

David Forfia – The SEPA TE Primer went live on April 15 and it is posted on GridArch.org site. David recognized the major contributions by Mark Knight to this effort in Linked In.

Ron Bernstein – no ASHRAE updates

Doug Houseman – no IEEE PES updates

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Chris Villarreal – no NARUC updates

James Mater – Open ADR – they will have innovation summit coming up in San Francisco on TE and Open ADR.

David Forfia asked for a motion to adjourn the meeting. Ron Bernstein gave the motion and James Mater gave the second. The next meeting is May 22.

Standards for IoT Cybersecurity and Energy Management

Stockholm, Sweden – April 5, 2019

Consumer electronics and IT experts from Asia, Europe, and North America gathered this week at the *Svensk Office Elstandard* near Stockholm, Sweden to continue work on a series of standards under ISO and IEC for home and building networks. These standards are essential to accelerate market growth and commerce in home and building automation systems.

The focus this week was on developing standards for:

- Cybersecurity to protect customer privacy, data, and safety
- Energy allocation based on artificial intelligence (AI)
- Energy management for apartment complexes
- Voice commands and blockchains for devices and appliances

This committee has produced more than 50 standards for the *Home Electronic System* (HES) that includes communication protocols, network management, and applications for automation in homes, apartments, and small commercial buildings. These standards offer manufacturers an infrastructure for creating unique and exciting products to enhance living and working in homes and buildings. By developing products based on a standard infrastructure, manufacturers can focus their expertise on applications that deliver novel customer experiences through innovative products.

As the Internet of Things (IoT) proliferates in homes and buildings, more devices will be collecting and transmitting data on local networks with connections to external servers. Applications based on these data will deliver enhanced conveniences and support renewable energy, thereby enabling home occupants and building managers to have an impact on climate change. Protections for customer privacy and safety are essential. Therefore, this committee is developing cybersecurity standards including a “sentry” function to ensure that:

- Only authorized devices connect to the home or building network.
- All data communications to the outside are with authorized servers.
- The occupant manages privacy by authorizing all data transmission.
- Data received do not cause unsafe appliance operation.

Energy management is most effective when tailored to a specific home or building. This committee previously issued a standard framework for the Energy Management Agent (EMA), which allocates energy to appliances based on:

- The cost of power from the electric company

- Available local sources of power such as solar, wind, and storage
- Appliance power requirements
- Customer’s schedule for appliance operation
- Customer’s budget

Standards for AI algorithms in the EMA will help the user allocate power economically. Also, standards are being developed for multiple EMAs in apartment buildings and complexes to serve the occupants efficiently by managing energy from a variety of sources.

The HES standards allow consumers to mix products and services from various manufacturers in order to create a personalized environment where everything works. Lighting, entertainment equipment, heating and cooling, health and safety systems, solar power, electric vehicles, and appliances can be coordinated to adapt to the environment and deliver services automatically like an electronic butler.

About HES

An ISO/IEC¹ committee of worldwide experts is developing a family of more than 50 standards for IoT and applications in homes and small buildings. These standards are intended to stimulate international commerce by guiding designers, manufacturers, and installers of products and related services for the home and building system markets.



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¹ The *Home Electronic System* (HES) is the name of the international standards committee officially designated as ISO/IEC JTC 1/SC 25/WG 1:

- ISO = International Organization for Standardization
- IEC = International Electrotechnical Commission
- JTC 1 = Joint Technical Committee 1, entitled *Information Technology*
- SC 25 = Subcommittee 25, entitled *Interconnection of Information Technology Equipment*
- WG 1 = Working Group 1, entitled *Home Electronic System*

The missions of the ISO and IEC are to foster international trade and commerce.