INFORMATION, COMMUNICATION & CYBER SECURITY NEWSLETTER

Dear ICCS Advisors and Stakeholders,

July 2015

In this Newsletter

Augmented Reality (**AR**), or overlaying multimedia and graphics on a computer screen to create an interactive environment for users, is an emerging technology that cuts across both the Operational Technology (OT) and Information Technology (IT) aspects of the energy industry. Dr. John Simmins has been leading EPRI's AR research with several research questions in mind. From an OT perspective one key question is, *"Can advanced AR technologies be developed to allow interactive and digital manipulations to improve worker efficiency and data input accuracy?"* From an IT perspective, *"How do we ensure vendors are using standards like the Common Information Model (CIM) to gain all the benefits of standards-based AR Platforms and devices?"*

John has just completed his most recent report as part of the Field Force Data Visualization project, **Field Force Data Visualization: Applying Augmented Reality** (referenced below), where members of that project and numerous other stakeholders have identified opportunities for improving workforce efficiency as well as emerging research gaps on how to advance the use of AR across the energy industry. This multi-year effort has resulted in a new project to accelerate the value of adopting AR in the electric industry: Assessing Augmented Reality for the Electric Industry.

To facilitate and accelerate knowledge transfer of AR, just this week EPRI hosted an "*Augmented Reality in Leading-Edge Utilities*" event in Charlotte, NC. The event, co-sponsored by IEEE and AREA (the Augmented Reality for Enterprise Alliance), pulled together more than 40 utility and government stakeholders and vendors to discuss the state of the AR industry in regards to wearable technology and augmented reality in utilities; review utility case studies in France, Spain and the US, as well as emerging utility use cases; and observe vendor technology demonstrations. Deliverables from this workshop will be videos of the presentations and a white paper with results. Feedback from this event will help accelerate the adoption of this technology in our industry. Good job John and Team!

For more information about this project, please contact:

- Scott Sternfeld, Technical Advisor, East Coast Utilities, ssternfeld@epri.com, 843-619-0050;
- Christine Hertzog, Technical Advisor, West Coast Utilities, chertzog@epri.com, 650-387-8831;
- Dr. John Simmins, Technical Executive (and AR Project Manager), jsimmins@epri.com, 865-218-8110

One more note about maximizing your value from your EPRI membership - EPRI recently added a mobile application capability that allows you to gain access to EPRI's member center on your smart phone or tablet. Go to http://mmc.epri.com and login to access products, event information, and more. Have Fun!

Sincerely,

Matt Wakefield
Director, Information, Communication and Cyber Security Research

Articles

- **The Integrated Grid: How Do We Get There?**
Public Utilities Fortnightly, by Dr. Michael W. Howard, Tuesday, June 9, 2015
In this article, EPRI President and CEO Mike Howard explains the concept of The Integrated Grid, and the importance of optimally integrating distributed and centralized energy resources. Full article

"Capacity and Energy in The Integrated Grid," an EPRI white paper available for download here. *This paper addresses the role of capacity and energy in the Integrated Grid by providing insights from EPRI's research in the following areas:*

- *How individual resources may contribute differently to the system's capacity to deliver energy;*
- *How changing supply and load characteristics make it necessary to distinctly address both energy and capacity on wholesale and retail levels;*
- *The cost of capacity, based on an assessment of cost structures of several U.S. utilities;*
- *Emerging trends in wholesale markets and retail rate structures to value capacity and energy as distinct elements of those markets/structures; and*
- *Key research to enable DER to provide both capacity and energy.*

Recent ICT / IntelliGrid (161) and Related Demonstration Deliverables

Title	Date
Field Force Data Visualization Project Deliverable: Field Force Data Visualization: Applying Augmented Reality *This report discusses possible technologies that may lead to increased*	16-Jul-2015

efficiencies while lowering implementation and operational costs for deploying field crews. By utilizing commercially available tablet technology, open standards, and open source software, utilities may be able to improve data capabilities of deployed field crews with modest investment in technology.	
Security Implications and Considerations for Serial to IP-Based SCADA Migration Revisited *This technical update describes the requirements, risks, benefits, vulnerabilities, and potential North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection (CIP) standards compliance issues that utilities might face when migrating their supervisory control and data acquisition (SCADA) systems from serial-based communications to communications based on the Internet Protocol (IP) suite. The report is based on two surveys—performed with a two-year interval between them—of several utilities that have taken different approaches to this issue.*	14-Jul-2015
Common Information Model Primer: Third Edition *The* Common Information Model Primer *explains the basics of the Common Information Model (CIM) standards to help operations professionals better understand how electric systems are modeled in the applications they use. CIM standards currently have three primary uses: 1) to facilitate the exchange of power system network data between organizations, 2) to allow the exchange of data between applications within an organization, and 3) to exchange market data between organizations. The Second Edition of this primer was updated with a case study that follows a utility through its journey of discovery, learning, and application of the CIM for grid modeling and integration. Questions were added to the end of each section for the reader to reinforce learning. This Third Edition includes a section on inexpensive tools for applying the model described in the narrative.*	01-Jul-2015
Program on Technology Innovation: Utilities and Open Source Software *This white paper describes current use and perceptions of open source software (OSS) in the electric power industry. It features results of a survey of 15 mostly large-sized utilities in the United States, conducted by the Grid Open Source Software Alliance (GOOSA) on behalf of EPRI in late 2014.* *The survey was commissioned to better understand the present state of OSS use by utilities and to gain insights regarding utility understanding of the value and risks associated with the use of OSS.* *Examples of EPRI OSS projects—software with which EPRI has been involved as a developer or contributor—are provided to illustrate how and why open source software is used in the utility sector. These include OpenADR (Open Automated Demand Response), OpenDSS (Open Distribution System Simulator), and Open PQ Dashboard (Open Power Quality Dashboard).*	30-Jun-2015
Information and Communication Technology (ICT) Interoperability Newsletter, June 2015 *The Interoperability Newsletter provides members with information and insight on developments in interoperability standards. The June 2015 issues*	30-Jun-2015

contains articles on the Grid 3.0 workshop and roadmapping effort; status of developments to the Common Information Model (CIM) and IEC 61850 standards; reports on the activities of the GridWise Architecture Council, North American Synchrophasor Initiative and OpenADR Alliance; and an update on the Smart Grid Interoperability Panel.	

Meeting Materials Available

Information and Communications Technology for Distributed Energy Resources and Demand Response Webcast – Project Set P161D
EPRI: Information and Communications Technology for Enterprise Architecture and Systems Integration Webcast – Project Set P161E
ICT Interoperability Webcast - IEEE 802.15.4 / Wi-Sun

Upcoming Webcasts

(Details are available in the Member Center under the ICT Cockpits)

Title	Date
EPRI: Smart Grid Enterprise Architect Interest Group Webcast	27-Aug-2015 24-Sep-2015 22-Oct-2015 19-Nov-2015

Recent Cyber Security (183) and Related Demonstration Deliverables

Title	Date
Security Implications and Considerations for Serial to IP-Based SCADA Migration Revisited *This technical update describes the requirements, risks, benefits, vulnerabilities, and potential North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection (CIP) standards compliance issues that utilities might face when migrating their supervisory control and data acquisition (SCADA) systems from serial-based communications to communications based on the Internet Protocol (IP) suite. The report is based on two surveys—performed with a two-year interval between them—of several utilities that have taken different approaches to this issue.*	14-Jul-2015
Cyber Security and Privacy Newsletter, July 2015 *EPRI's tracking and outreach efforts reflect its continued commitment to support the power industry in the identification of cyber security and privacy issues and efforts for the electric sector. In support of these efforts EPRI works diligently to stay abreast of the present state of standards and guideline developments as well as regulatory governance. This newsletter provides highlights and status of ongoing efforts by numerous working groups, as well as insights into future activities.*	13-Jul-2015

Meeting Materials Available

Cyber Security & Privacy 183D Mid-Year Update

Recent DMD and TMD Data Analytics Deliverables

Title	Date
Overcoming Barriers to Data Interoperability: Silos, Semantics, and Schemas *Effective data interoperability is a key foundation of a utility's data analytics capability. Effective use of analytics tools requires up-to-date, consistent data of known validity that may be drawn from disparate databases and other storage systems. For decades the standard solution to overcoming data interoperability barriers for reporting and analysis has been the use of a* data warehouse*. This report describes an alternative to creating a physical data warehouse: a* Logical Data Warehouse *(LDW). Describing a utility's data using a shared, universal model, such as that provided by the Common Information Model (CIM), may allow data from disparate, non-interoperable storage locations to be combined and analyzed at a lower cost and with greater flexibility. A hybrid solution that combines both physical and logical warehouses represents a balanced approach for most utilities.*	27-Jul-2015

Upcoming Webcasts

(Details are available in the Member Center under the ICT Cockpits)

Title	Date
EPRI: Distribution Modernization Demo (DMD) Webcast – Data Repository and Data Mining Initiative – Add to Calendar	13-Aug-2015

Meeting Materials Available

EPRI Data Analytics for Distribution and Transmission DMD/TMD Spring 2015 Advisory Meeting

What They're Saying

Walt Johnson, Technical Executive: "OpenADR is becoming known as *the* open, standards-based pathways by which operators of an integrated electric grid can communicate with devices and appliances that are part of the distribution system." Download webcast recording

Recent Field Area Network Demonstration Deliverables

Title	Date
Field Area Network Demo: Second Year Update *The Field Area Network (FAN) is an essential layer of many utilities' smart grid communications infrastructure. The FAN concept enables a ubiquitous, high-performance, secure, and reliable network providing "last mile" backhaul service for distribution supervisory control and data acquisition (SCADA) and advanced metering infrastructure (AMI) systems. The FAN also enables network access services for advanced distribution management and automation, distributed energy resources, and any future smart grid applications requiring connectivity from within and beyond the distribution substation.*	30-Jun-2015

Upcoming Events	Dates
EPRI Seminar: Integrated Grid Concept and Technology Development Tokyo Japan	Aug 20-21, 2015
EPRI Power Delivery and Utilization Advisory Meetings, Baltimore, MD	Oct 5-8, 2015
DMD/TMD Data Analytics for Transmission & Distribution Fall Advisory Meeting, EPRI offices in Charlotte, NC	Oct, 26-27, 2015
Save the Date: EPRI Power Delivery and Utilization Advisory Meetings, Austin, TX	Feb. 22-25, 2016
Save the Date: EPRI European ICCS Engagement Summit, Dublin, Ireland	April 19-20, 2016
Save the Date: EPRI Power Delivery and Utilization Advisory Meetings, Hollywood, FL	Sept. 19-22, 2016

Together...Shaping the Future of Electricity

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