INFORMATION, COMMUNICATION & CYBER SECURITY NEWSLETTER

Dear EPRI ICCS Members and Stakeholders,

Only 10 days until the next President of the United States is selected, 26 days until Thanksgiving, 57 days until Christmas, and 64 days until 2017. At EPRI, that means it's full on deliverables season. There will be a lot of reports, updates, and meetings through the end of the year. *Remember, you can keep up with all the new information by subscribing to TIPs through the member center (www.membercenter.epri.com).*

And speaking of new, the latest edition of the EPRI Journal has been posted. Follow this link EPRI Journal for current articles, perspectives, R&D quick hits, and other news from across EPRI.

Keep reading to see what's been happening in the ICCS area, and what's still to come --- and thank you for your continued collaboration.

Sincerely,

Matt Wakefield
Director, Information, Communication and Cyber Security Research

October 2016

In this Newsletter

Information and Communication Technology (ICT) (161)

ICT Team Industry Contributions and Collaborations

Ed Beroset, EPRI Principal Technical Leader, contributed to the E&E article, "Technology: NY's quest to turn Daunting Data into an 'Energy Internet'," about the continuous flow of data from digital meters and how that information can be used to enhance grid reliability. The article looks at an effort in New York State to turn the energy data into an "energy internet." To read the full story, click here.

Tim Godfrey, EPRI Technical Executive, contributed to the Greentech Media article by Jeff St. John, "Utilities in Search of Smart Grid Spectrum Look to Narrowband as Next Frontier" --- about the long saga of the Upper-A Block spectrum, and how new standards and new radios could link the grid edge in the U.S.

Program on Technology Innovation: Common Needed Attributes of Architecture for an Integrated Grid

This document presents the needed attributes of an integrated grid architecture and provides information on EPRI's efforts to help utilities fill those architectural needs in its multi-year Breakthrough Technology Innovation Project, Architecture for an Integrated Grid.

ICT / IntelliGrid (161) & Related Demonstration Deliverables

Service Oriented Architecture – Versioning and Maintenance

Web services are often employed as a means to integrate software applications to facilitate flexible architecture and to promote the re-use of these services. A significant challenge that is faced when maintaining existing applications is what to do when a service has been updated to take advantage of new capabilities, and how to manage all the other services that may depend on the new capability, or the capability present in a prior version. This challenge is addressed in this technical report by exploring and providing examples related to this issue; following a change as it occurs in a data model used to define the message that is used as part of a web service, and then providing examples of how versioning can be used to indicate when dependent web services need to be changed, or when a change can be avoided. Technical examples are provided for both Simple Object Access Protocol (SOAP) over Hypertext Transfer Protocol (HTTP) as well as RESTful implementations. Additionally, test code is provided that correspond to these examples that can be loaded into the testing application, soapUI, so that the reader can explore these examples first hand.

Utility Precision Time Methods: Current State

Utilities are using precision time for a growing number of purposes including protection relays, substation metering, other intelligent electronic devices (IEDs), digital fault recording, synchrophasor measurement, and the IEC 61850 process bus. As new uses for precision time are identified, new requirements such as improved reliability, device clock stability, back-up methods, time-system monitoring, and cyber security are being identified and must be addressed. Security and reliability concerns with GPS based clocks and potential spoofing of the GPS signal have been growing and must be considered.

This report explains how electric utilities are using precision time today and provides a summary of each of the primary technologies and standards being deployed or recommended in a number of categories.

Smart Grid Communications Intelligencer: Issue 16, Fall 2016

The Smart Grid Communications ("Comms") Intelligencer is a triannual newsletter published by EPRI's Information and Communications Technology (ICT) Program. This newsletter highlights

issues of relevance and interest to utility communications engineers and managers. The focus is on developments in communication technologies and standards, and business issues that can affect the design, deployment, or operation of utility communications infrastructure.

Program on Technology Innovation: Test Script for International Electrotechnical Commission, 61968-5:CD Messages

EPRI has been advancing the understanding of enterprise integration challenges related to the need to manage distributed energy resources (DER). This effort creates the necessary artifacts required to implement those business functions. To that end, a test script was created to set the expectation level for standards-based compliance with the International Electrotechnical Commission (IEC) standards. These standards include what will become the committee draft of IEC 61968-5 Planning and Optimization Committee Draft (CD) --- but also incorporate IEC 61968-100:2013, which sets the expectations for application integration for utilities using common information model (CIM)-based messaging, specifically leveraging simple object access protocol (SOAP) over hypertext transfer protocol (HTTP). This test script uses messages that have been defined using eXtinsible schema definition (XSD) files which also reflect changes to the CIM that have been made to support the subset of the use cases covered in the EPRI DER functional requirements technical report.

Utility Enterprise Architecture Guidebook, 2nd Edition

This guidebook seeks to address a gap between reading a leading enterprise architecture reference, such as The Open Group Architecture Framework (TOGAF), and being able to apply the information. An ERI Chief Information Officer (CIO) workshop held in 2012 revealed that roughly half of the CIOs questioned either had no enterprise architecture program, or were just getting started. This suggested a need to arm practitioners of enterprise architecture with the information they need to succeed.

Program on Technology Innovation: State of the Art of Wearable Enterprise Augmented Reality Displays

In order for workers to perform tasks using both of their hands while receiving the content of augmented reality (AR) experiences, they will need hardware that has heretofore not been generally available outside of testing and research labs. New, wearable products such as "smart" glasses, helmets, and headgear—specifically designed to provide enterprise AR experiences—can now be purchased for evaluation in the workplace. Unfortunately, suppliers and customers are delayed in their ability to agree on final product features due to lack of understanding of requirements and unclear benefits and tradeoffs associated with the various options. Through this report, customers will gain understanding about wearable AR display challenges that need to be resolved, learn how the devices are already being used in enterprise settings, and discover trends that will impact the product segment.

2016 Second Quarter CEA-2045 Field Demonstration Project Update

This report provides an update on project activities through the second quarter of 2016. EPRI's Field Demonstration Project, which is described in EPRI Report 3002004009, is a three-year collaborative research activity designed to assess this new standard. Participating utilities are fielding various

end-use devices and connecting them into existing and new DR programs to evaluate the standard in terms of achieving interoperability, while at the same time, supporting the needs of a wide range of programs. Consensus functional requirements for end-use devices are being developed and shared with manufacturers who are producing the CEA-2045 based products for field installation and testing. Communication system providers are producing plug-in communication modules needed to connect and test.

Electric Utility Guidebook for Geographic Information Systems Data Quality: Metadata
This document outlines the technology and standards associated with GIS metadata use, primarily focusing on how utilities can take the best practices from other users and create their own metadata solution from a 'people and process' perspective. It outlines the quantitative benefits associated with a metadata solution and some key metrics which can be used to gauge ROI. Section five outlines the best practices for metadata implementation in three major steps. By reading how to put an implementation team together, then using the metadata maturity model and questionnaire to gauge the current state of utility process and technologies, and finally reading the best practices associated with value tracking and key metadata analytics, a utility can jump start its road to a GIS metadata solution.

Meeting Materials Available

- Index Augmented Reality is Ready Now to Improve Utility Performance, September 6, 2016
- ICT Technology Transfer Webcast - Connected Workplace Survey, September 13, 2016

NEW Supplemental Projects

- Assessing Augmented Reality for the Electricity Industry
- Collaborative Research on CTA-2045 Standard Deployment and Adoption

Cyber Security Team Industry Contributions and Collaborations

U.S. News & World Report ran an extensive article that offers a timely look at the alliance between government and private industry to secure the integrity of the nation's grid. The story focused on cyber and physical security and included quotes from Annabelle Lee, EPRI Principal Technical Executive-Cyber Security. The article also mentioned EPRI's work with the Department of Homeland Security on the recovery transformer project.

Meeting Materials Available

EPRI Generation Cyber Security R&D - Post-Advisory Update, September 28, 2016

Upcoming Meetings/Webcasts

Cyber Security Technology (183B) & Information Assurance (183D) Technology Transfer Workshop, November 1- 2, 2016; Irving, TX

Upcoming Events	Dates
CIGRE **joint work group JWG No D2/C2.41 "Advanced Utility Data Management and Analytics for Improved Situational Awareness of Electric Power Utility Operations" - Philadelphia, PA** ***This working group (WG) will survey and examine current practices, industry trends, and new research on the use of various data sources and applications to enhance situational awareness, and that facilitate effective implementation in the control room. This WG has 18 members, representing 10 different countries, who are experts in various relevant areas such as power system operation, data analytics, smart grid, communication, and data integration and modeling.*** *Dr. Alberto Del Rosso, EPRI Sr. Project Manager - Transmission Modernization Demonstration (TMD) initiative, who is the Chair of the WG No D2/C2.41****, explains that the objective and scope of this WG are well aligned with TMD, and that the outcome of this work will help enrich and expand TMD value from wider international perspective.*** ***This meeting is being held in parallel with the 2016 CIGRE U.S. National Committee Grid of the Future Symposium (GOTF).***	Nov 1, 2016
Korea Electric Power Co/EPRI Cyber Security Workshop, (BIXPO 2016) Gwangju, S. Korea	Nov. 2-3, 2016

2017: SAVE THE DATE	Dates
DistribuTECH 2017 – EPRI booth 1736, San Diego, CA	Jan. 31-Feb 2
2017 Winter PDU Advisory / ICCS Sector Council Meeting Huntington Beach, CA	Feb. 13-16
2017 European EPRI PDU Advisory Meeting, London	May 17-18
EPRI Grid Analytics and Power Quality 2017 Conference and Exhibition, Sacramento, CA	June 20-22

2017 Fall PDU Advisory / ICCS Sector Council Meeting, Denver, CO	Sep. 11-14

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