

## PSCC Subcommittee Study Group Meeting Minutes

Designation: P21		Name: System Architectures Supporting the Virtualization of Substation Protection and Control Applications			
Meeting Location: Garden Grove, CA and Teams		Meeting Time: 5:00 PM	Meeting Date: 2022/01/10	Minutes Revised:	Minutes Approved: 2022/1/31
PAR Output: N/A	PAR Output: N/A	PAR Approval Date: N/A	PAR Expiration Date: N/A	Target Sponsor Ballot Date: N/A	Target Completion Date: N/A
Presiding Officer: Craig Preuss, Chair			Recorded by: Craig Preuss	Draft Number: N/A	
Attendance:					
Name		Affiliation		Attending via Phone (P) / Web (W) or Local (L) M/CM/G	
Craig Preuss		Black & Veatch		L	M
James Formea		Eaton		L	M
Jeff Pack		POWER Engineers		L	M
James Bougie		GPT		L	M
Michelle Afenya		S&C Electric		W	M
Alex Apostolov		OMICRON		W	M
Jay Anderson		ComEd		W	M
Anthony Johnson		SCE		W	M
Austin Wade		SEL		W	M
Benton Vandiver		Hitachi Powergrids		W	M
Byungtae Jang, KR				W	M
Chris Huntley		SEL		W	M
Dean Ouellette		RTDS Industries		W	M
Dennis Holstein		OPUS Consulting Group		W	M
Dustin Tessier		Tesco Automation		W	M
Gayle Nelms		SEL		W	M
Jay Herman		EPRI		W	M
Jim Michaelis		Commonwealth Associates. Inc.		W	M
Steve Klecker		MidAmerican		W	M
Mike Dood		SEL		W	M
Scott Mix		PNNL		W	M
Nirmal Nair		University of Auckland, New Zealand		W	M
Madhab Paudel		Eaton		W	M
Jose Ruiz		Doble		W	M
Shane Haveron		AMETEK		W	M
Jun Verzosa		Doble		W	M
Farzad Khalilpour		SCE			M
Andre Melo		Schneider Electric			M
Greg Zweigle		SEL			M
Ibrahim Abdulhadi		University of Strathclyde, Glasgow			M
Prasad Shrawane		Greater Sudbury Hydro Inc.			M
Priyanka Nadkar		SEL			M

Jean Raymond	Hydro Québec		M
Dean Samara-Rubio	Intel		M
Song Zhang	ISO New England		M
Thomas Rudolph	Schneider Electric GmbH		M
Veselin Skendzic	SEL		M
Prithpal Khajuria	Intel		M
Cole Weber	Advantech		M
Anthony Sivesind	SRP		M
Miguel Rios	Southern Company		M
Adam Caballero	Eaton		M
Michael Thompson	SEL		M
Fred Agyekum	SEL		M
Paul Myrda	EPRI		M
Sai Chandra Reddy Thota	Megger Ltd		M
Noor Mohd Fadzli B Hj. Othman	PETROLIAM NASIONAL BERHAD (PETRONAS)		M
Ted (Charles) Witham	Eaton		M
Eugenio Carvalheira	OMICRON		M
Hao CHEN (来宾)	State Grid Corporation of China		M
Chris Heron	Integrated Power Services		M
Joseph Yang	Advantech		M
Jeff Brown	Advantech		M
Antonello Monti	RWTH Aachen University		M
Arun Shrestha	IEEE		M
Chand Tailor	Eaton		M
Charles Adewole	ERL Phase Technologies		M
Daniel Ridenour	Dominion Energy		M
Daqing Hou	SEL		M
David Dolezilek	SEL		M
Deepak Maragal	NYPA		M
Deryk Yuill	is5		M
Eric Thibodeau	Hydro Québec		M
Florian Ainhirn	Versuchsanstalt für Hochspannungstechnik Graz GmbH   High Voltage Test Laboratory Graz Ltd.		M
Gurudatha (Guru) Pai	GE Digital		M
Jeremy Slimmer	Cybirical		M
Jesse Silva	SCE		M
Joshua Hughes	Patterson Power Engineers		M
Juan Placid	J J Power & Energy Inc.		M
Laurel Brandt	TVA		M
Luke Hebert	Cybirical		M
Mickey Schultz	Black & Veatch		M
Mital Kanabar	GE Renewable Energy		M
Murty Yalla	Hubbell		M
Nathan Wallace	Cybirical		M
Ramakrishna Gokaraju	University of Saskatchewan		M
Richard Kephart	Emerson		M
Steven Blair	Synaptec		M
Thai Li	Hubbell		M
Wayne Stec	Distregen		M

Xavier Manel-la	Siemens		M
Zeus Xioco	SCE		M
M: Member CM: Corresponding Member G: Guest			

Item no.	Notes	Action by
<b>CALL TO ORDER</b>	Meeting was called to order by the chair at approximately 5:00 PM Pacific.	
<b>INTRODUCTIONS AND QUORUM</b>	Introductions were not undertaken, the participants list was used. Quorum does not apply to study group per IEEE-SA rules all attendees are considered voting members.	
<b>CALL FOR PATENTS</b>	Pre-PAR patent slides were shown.	
<b>IEEE-SA COPYRIGHT</b>	IEEE-SA copyright slides shown.	
<b>CHAIR'S REMARKS</b>	General welcome given.	
<b>AGENDA APPROVAL</b>	Scott Mix motion to approve agenda, Jay Anderson second. No objections or abstentions.	
<b>APPROVAL OF PREVIOUS MINUTES</b>	Dec 13 – Scott Mix motion to approve, Mike Dood second. No objections or abstentions.	
<b>Action Items</b>	<ul style="list-style-type: none"> <li>Follow up with chair of PSCCC P11 TF Cloud Computing, uses and Requirements of Electric Power Utilities (TW Cease) – not meeting at JTCM</li> <li>Copy of CIGRE B5.60 report for P21 will likely be unavailable, but CIGRE and IEEE just signed new MOU</li> <li>Prithpal to coordinate utility presentations (Entergy, National Grid, AEP)</li> <li>Chair emailed out meeting invitation to next series of meetings starting on Jan 31</li> <li>IEEE-SA presentation on trial-use standards – in progress</li> </ul>	
<b>New Business</b>	Meetings started up May 5, 2021 Meetings held on <ul style="list-style-type: none"> <li>August 9 and 23</li> <li>September 22</li> <li>October 4 and 18</li> <li>November 1, 15, and 29</li> <li>December 13</li> </ul>	
<b>New Business</b>	Worked on definition of substation virtualization:  A consistent, secure, and managed approach to the decoupling of software from its dedicated hardware using a variety of hardware architectures to support multiple real-time or near real-time substation applications such as protection, automation, monitoring (e.g., condition-based monitoring, validation, transformation), metering, control (closed- or open-loop), or simulation (e.g., digital twin).	

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<b>New Business</b>	Presentations so far: EPRI SCE SRP Intel Advantech LF Energy SEAPATH project and CIGRE B5.60 PSRC H45 PC37.300	
<b>New Business</b>	Upcoming Presentations: January 31 <ul style="list-style-type: none"> <li>• VMWare</li> <li>• SEL</li> </ul> February 14 <ul style="list-style-type: none"> <li>• TTTech Industrial North America</li> <li>• ABB</li> </ul> February 28 <ul style="list-style-type: none"> <li>• Hydro-Quebec</li> </ul>	
<b>New Business</b>	Schedule - Extension request to finish at the May 2022 face-to-face meeting in Reno, NV was approved by the PO officers	
<b>Regular Web Meetings</b>	How much background / reference / presentation is needed EPRI (X) SCE (X) SRP (X) Intel (X) Advantech (X) LF Energy SEAPATH project and CIGRE B5.60 (X) PSRC H45 PC37.300 (X) VMWare (Jan 31) SEL (Jan 31) TTTech Industrial North America (Feb ??) ABB (Feb ???) CIGRE D2.43 Report (Feb 28) PSCCC S1 P1686??? PSRC H46 PC37.1.3??? PSRC H27 COMSET PC37.251??? PSCCC S7 WG, IEEE Std 2808 Standard for Function Designations used in Electrical Power Systems for Cyber Services and Cybersecurity PSCCC P11 TF, Cloud Computing, uses and Requirements of Electric Power Utilities ISO TS 23167, general cloud that is applicable Analytic Methods for Power Systems (AMPS) Technical Committee, Big Data & Analytics (BDA) Subcommittee, Cloud for Power Grid IEEE Computer Society Technical Committee on Cloud Computing <a href="https://tc.computer.org/tccloud/">https://tc.computer.org/tccloud/</a> Others???	Prithpal still working on coordinating presentations from other utilities.
<b>New Business</b>	Dennis Holstein volunteered to present on CIGRE D2.43 report. This is in final draft to review, discusses enabling Software Defined Networks (SDN) for Electric Power Utilities (EPU), plus network virtualization.	Dennis Holstein
<b>New Business</b>	CIGRE D2.42 report on time synchronization and distribution, that is a challenge for virtualization. Dennis Holstein will investigate whether that work is addressing virtualization or not, it may have been a survey.	Dennis Holstein

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<b>Next Steps</b>	What does P21 want to recommend to P0 subcommittee <ol style="list-style-type: none"> <li>1. PAR related work, working group (could address trial use)</li> <li>2. Report related work, task force</li> <li>3. No future work is needed</li> </ol>	Chair to follow up with IEEE-SA to give presentation on how trial-use standards
<b>ITEMS REPORTED OUT OF EXECUTIVE SESSION</b>	There was no executive session.	
<b>TIME OF FINAL ADJOURNMENT</b>	The meeting was adjourned at approximately 5:43 PM Pacific.	
<b>NEXT FACE TO FACE MEETINGS</b>	Next bi-weekly meetings start Jan 31. Final face-to-face meeting will be held May 9-12, 2022, presently scheduled for Reno, NV.	
<b>FUTURE MEETING ROOM REQUIREMENTS</b>	N/A for room size, projector, conflicts.	