

## Ontario Participation in NIST Smart Grid Interoperability Framework Development

### Action Item from the February 9<sup>th</sup> SGF Meeting:

This document stems from an action item issued at the February 9<sup>th</sup> meeting of the Smart Grid Forum. Specifically, to apprise the Forum on the participation of Ontario organizations in regards to the development of the U.S. National Institute of Standards and Technology (NIST) Smart Grid Interoperability Framework.

### Sources of Information:

The information in this presented in this paper has been gathered from the NIST Smart Grid Collaboration Site and the publicly-available membership lists of various umbrella organizations contributing to the development of the NIST Smart Grid Interoperability Framework

It is important to note that there is no single, consolidated list of participant organizations contributing to the NIST interoperability effort. Certain organizations however, have responsibility for sub-tasks to each of the NIST Priority Action Plans (PAP) which are discussed later in this paper. Specific responsibilities for these tasks are available on the NIST Smart Grid Collaboration Site:

<http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/WebHome>

It should also be noted that many Ontario and Canadian organizations play a role in contributing to the activities of various Standards Development Organizations (SDO's). SDO's are making a major (if not the majority) contribution to the NIST Interoperability Framework. (e.g. International Electrotechnical Commission - IEC, Institute of Electrical and Electronics Engineers - IEEE, etc.). Various Ontario organizations such as the Ministry of Energy and Infrastructure, the IESO, the OPA, Hydro Ottawa, and Hydro One are also contributing to the work of the Standards Council of Canada Task Force on Smart Grid Technology and Standards and their efforts to rationalize the activities of various SDO's. The membership of this Task Force is provided in **Appendix 'C'** of this document.

### Means of Participation:

Ontario-based organizations can participate in the development of the NIST framework through direct participation, or through indirect participation via the numerous umbrella organizations that are contributing to this effort. There are two main contexts in which this is taking place as follows:

1. Direct or indirect participation in one of the **NIST Priority Action Plans (PAPs)**, which are devoted to a specific interoperability topic area.
2. Direct or indirect participation in the standing **Smart Grid Interoperability Panel (SGIP)**, which will have ongoing authority to "...identify, prioritize and address new and emerging requirements for Smart Grid standards."

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This paper will briefly outline direct and indirect Ontario touch points to these two areas (insofar as such information is publicly available as of the date of this paper).

### Contributing to the NIST Priority Action Plans:

At present, NIST is developing its smart grid interoperability framework with a particular focus on 17 topic areas, each assigned to a 'Priority Action Plan' (PAP) for their development into recognized interoperability standards. These 17 PAPs are follows:

- 0 Meter Upgradeability Standard
- 1 Role of IP in the Smart Grid
- 2 Wireless Communications for the Smart Grid
- 3 Common Price Communication Model
- 4 Common Scheduling Mechanism
- 5 Standard Meter Data Profiles
- 6 Common Semantic Model for Meter Data Tables
- 7 Electric Storage Interconnection Guidelines
- 8 CIM for Distribution Grid Management
- 9 Standard DR Signals
- 10 Standard Energy Usage Information
- 11 Common Object Models for Electric Transportation
- 12 IEC 61850 Objects/DNP3 Mapping
- 13 Time Synchronization, IEC 61850 Objects/IEEE C37.118 Harmonization
- 14 Transmission and Distribution Power Systems Model Mapping
- 15 Harmonize Power Line Carrier Standards for Appliance Communications in the Home
- 16 Wind Plant Communications

Ontario organizations have little, if any, formal responsibility to manage any of the NIST PAP sub-tasks although there is opportunity to contribute to them. Some Ontario organizations are contributing to this effort by virtue of their association with certain umbrella organizations which they are affiliated with, including:

- **Building Owners and Managers Association (BOMA):** BOMA includes a council of local BOMA GTA members: "725 members representing 350 companies" <sup>1</sup>
- **North American Electric Reliability Corporation (NERC):** Ontario members of the Northeast Power Coordinating Council (NPCC) include: Hydro One Inc, IESO, Ontario Power Generation Inc, TransCanada, Prowind Canada Inc<sup>2</sup>
- **North American Energy Standards Board (NAESB):** Ontario members include Alliance Pipeline LP, Clarity Systems, Ltd and the IESO.<sup>3</sup>
- **Utility Communications Architecture International Users Group (UCAIG):** Ontario Members include: Hydro One Telecom Inc.<sup>4</sup>

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<sup>1</sup> Source: <http://www.bomatoronto.org/Resources.cfm>

<sup>2</sup> Source: [www.npcc.org](http://www.npcc.org) membership list

<sup>3</sup> Source: [www.naesb.org](http://www.naesb.org) membership list

<sup>4</sup> Source: [www.ucaiug.org](http://www.ucaiug.org)

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- **Distributed Network Protocol (DNP) Users Group:** Ontario Members include: Enersource Hydro Mississauga, Hydro One Networks, Oakville Hydro Electric Commission, Ontario Power Generation, Survalent Technology Corporation.<sup>5</sup>

In addition, some Advanced Metering Infrastructure (AMI) providers which are heavily involved in the Ontario Smart Metering Initiative are also participating in some of the metering-related PAPs .

**Appendix ‘A’** summarizes some of the principal organizations that are leading various work tasks in each of the PAPs.

### **“Participating” members in the NIST Smart Grid Interoperability Panel (SGIP):**

At present, there are 481 Participating Member Organizations in the NIST SGIP. This list also includes:

- Participating Ontario Organizations: IESO
- Other Participating, Canadian Organizations: BC Hydro, Canadian Electricity Association
- North American Energy Standards Board – NAESB whereby Ontario members include Alliance Pipeline LP, Clarity Systems, Ltd and the IESO.<sup>6</sup>

The complete list of “participating” SGIP members is available at the following address:

<http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/SGIPParticipatingMemberOrganizations>

The SGIP will also include various stakeholder consultation groups drawing from 22 categories which are listed in **Appendix ‘B’**.

### **“Observing” SGIP Members:**

At present there are 50 registered “observing” organizations listed on the SGIP website. While no Ontario-specific organizations are listed, the Canadian Manufacturers & Exporters Association is included in this list.

The complete list of “observing” SGIP members is available at the following address:

<http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/SGIPObservingMemberOrganizations>

Prepared by:

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<sup>5</sup> Source: [www.dnp.org](http://www.dnp.org) membership list

<sup>6</sup> Source: [www.naesb.org](http://www.naesb.org) membership list

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## APPENDIX 'A' – Lead Organizations in NIST Priority Action Plans

Source:

NIST Smart Grid Collaboration Site <http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/WebHome>

<b>Legend:</b>
International Standards Development Organization (SDO) or Standards Setting Organization (SSO)
Umbrella Organization which include one or more Ontario organizations in its membership
Commercial organization involved in Ontario Smart Metering Initiative or Ontario Smart Grid activities.

NIST Priority Action Plan (PAP)	Stakeholder Organizations
<b>PAP 0</b> Meter Upgradeability Standard	<p><b>Action Plan SDO/User Groups Leads:</b></p> <ul style="list-style-type: none"> <li>• John Caskey, Paul Orr <span style="background-color: #ADD8E6;">NEMA</span></li> </ul> <p><b>Stakeholder Leads :</b></p> <ul style="list-style-type: none"> <li>• Alabama Power—Derl Rhoades</li> <li>• Consumers Energy—Wayne Longcore, Matt Gillmore</li> <li>• <span style="background-color: #FFFF00;">Elster Electricity</span>—Ed Beronet, Ed Gray, Mike Longrie</li> <li>• General Electric—Robby Simpson, Steve Richards, Kerry Evans, Mak Tarnoff</li> <li>• Georgia Power—Terry Penn</li> <li>• <span style="background-color: #FFFF00;">Itron, Inc.</span>—Michael Garrison Stuber, Ed May, Brent Cain</li> <li>• Landis+Gyr—Michelle Mindala-Freeman, Hassan Ali, Ruben Salazar</li> <li>• Oncor Electric Delivery—Mark Carpenter</li> <li>• <span style="background-color: #FFFF00;">Sensus</span>—Britton Sanderford, Arlin Rummel, George Uram</li> <li>• Southern California Edison—Greg Sheran</li> <li>• U.S. Department of Energy, Pacific Northwest National Laboratory—Steve Widergren</li> </ul>
<b>PAP 1</b> Role of IP in the Smart Grid	<p><b>Participating SDO's:</b></p> <ul style="list-style-type: none"> <li>• <span style="background-color: #90EE90;">IETF</span>, <span style="background-color: #90EE90;">ATIS</span>, <span style="background-color: #90EE90;">IEEE</span>, <span style="background-color: #90EE90;">TIA</span>, <span style="background-color: #ADD8E6;">UCAuig Open Grid</span>, <span style="background-color: #90EE90;">NEMA</span></li> </ul>
<b>PAP 2</b> Wireless Communications for the Smart Grid	<p><b>Participating SDO's:</b></p> <ul style="list-style-type: none"> <li>• <span style="background-color: #90EE90;">ISA SP100</span>, <span style="background-color: #90EE90;">IEEE 802</span>, <span style="background-color: #90EE90;">IETF</span>, <span style="background-color: #90EE90;">TIA</span>, <span style="background-color: #90EE90;">ATIS</span>, UTC</li> </ul>

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NIST Priority Action Plan (PAP)	Stakeholder Organizations
<p><b>PAP 3</b> Common Price Communication Model</p>	<p><b>SDO Lead:</b></p> <ul style="list-style-type: none"> <li>• OASIS James Bryce Clark jamie.clark@oasis-open.org</li> </ul> <p><b>Other SDOs:</b></p> <ul style="list-style-type: none"> <li>• FIX Protocol, Ryan Pierce, FIX Protocol, ryan.pierce@fixprotocol.org</li> <li>• FIX Protocol, Jim Northey, FIX Protocol, jimn@lasalletech.com</li> <li>• NAESB, Jonathan Booe, NAESB, jbooe@naesb.org</li> <li>• NAESB, Joelle Ogg, Ogg@bc-law.net</li> <li>• IEC, Jim Waight, Siemens, jim.waight@siemens.com</li> <li>• ISO, Tim Schoeckle, ISO, schoechl@colorado.edu</li> <li>• ISO/IEC, Ron Ambrosio, (GWAC) IBM, rfa@us.ibm.com</li> <li>• ISO/IEC, Kenneth Wacks, (GWAC) GridPlex . Inc, kenn@alum.mit.edu</li> <li>• PNL, Ron Melton, Pacific Northwest National Laboratories, ron.melton@pnl.gov</li> <li>• Toby Considine Toby.Considine@gmail.com</li> <li>• William Cox wtcox@coxsoftwarearchitects.com</li> </ul> <p><b>Users Group Lead:</b></p> <ul style="list-style-type: none"> <li>• OSCRE Andy Fuhrman, Andy.Fuhrman@oscre.org</li> <li>• AHAM, Charles R Smith, General Electric, CHARLESR.SMITH@ge.com</li> <li>• AHAM, Matthew Williams, AHAM, mwilliams@aham.org</li> <li>• ASHRAE, Jim Butler, Cimetrics, JimButler@cimetrics.com</li> <li>• ASHRAE, Jim Lee, Cimetrics, JimLee@cimetrics.com</li> <li>• CABA, Ron Zimmer, CABA, zimmer@caba.org</li> <li>• FIATECH, Rick Jackson, FIATECH, jackson@fiatech.org</li> <li>• GWAC, Lynne Kiesling, Northwestern University, lynne@knowledgeproblem.com</li> <li>• GWAC, Terry Mohn, BAE, terry.mohn@baesystems.com</li> <li>• GWAC, David Hardin, Invensys, david.hardin@ips.invensys.com</li> <li>• GWAC, Nora Mead Brownell, norabrownell@verizon.net</li> <li>• User, Ed Cazalet, Cazalet Group, ed@cazalet.com</li> <li>• Multispeak, Bob Saint, (GWAC) NRECA, robert.saint@nreca.coop</li> <li>• OSCRE, Andy Fuhrman, OSCRE, Andy.fuhrman@oscre.org</li> <li>• UCAlug, Wayne Longcore, Consumers Energy, wrlongcore@cmsenergy.com</li> <li>• BOMA, Henry Chamberlain, BOMA, Hchamberlain@boma.org</li> <li>• User, Dr. Ralph Martinez, BAE Systems, ralph.martinez@baesystems.com</li> <li>• LONMark, User, Jeremy Roberts, LONMark International, jeremy@lonmark.org</li> <li>• [RTO/ISO trade association ]</li> </ul> <p>The event organizers below run purpose-driven organizations in the areas of standards-based building systems and grid communications (building system suppliers &amp; integrators) and IT-based facility operations (owner-operators). Each can be very helpful in building participation and consensus)</p> <ul style="list-style-type: none"> <li>• Jim Young, RealComm jyoung@realcomm.com</li> <li>• Anto Budiardjo, Clasma, antob@clasma.com</li> </ul> <p><b>Technical Team:</b></p> <ul style="list-style-type: none"> <li>• Richard Brooks, New England ISO rbrooks@iso-ne.com .</li> <li>• FIX, ISO20022, Derek LaSalle , derek.n.lasalle@jpmorgan.com</li> <li>• OASIS, Ed Koch, (OpenADR ) Akuacom, ed@akuacom.com</li> <li>• OASIS, Toby Nixon, Microsoft, Toby.Nixon@microsoft.com</li> </ul>

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NIST Priority Action Plan (PAP)	Stakeholder Organizations
<p><b>PAP 4</b> Common Scheduling Mechanism</p>	<p><b>EnerNex Technical Champion Leads:</b></p> <ul style="list-style-type: none"> <li>• Toby Considine Toby.Considine@gmail.com</li> <li>• William Cox wtcox@coxsoftwarearchitects.com</li> <li>• SDO Lead: OASIS Laurent Liscia laurent.liscia@oasis-open.org</li> </ul> <p><b>Other SDOs:</b></p> <ul style="list-style-type: none"> <li>• CALCONNECT, Dave Thewlis, CalConnect , dave.thewlis@calconnect.org</li> <li>• ISO, SIIA, Derek Lasalle, JPMorgan, ISO20022, derek.n.lasalle@jpmorgan.com</li> <li>• FIX Protocol, Jim Northey, FIX Protocol, jimn@lasalletech.com</li> <li>• Semantic Reviewers:</li> <li>• OASIS, Toby Nixon, Toby.Nixon@microsoft.com</li> <li>• OASIS, Brian Frank, Tridium &amp; oBIX Editor, bfrank@tridium.com</li> <li>• CALCONNECT, Steven Lees, Microsoft, mailto:steven.lees@microsoft.com</li> <li>• CALCONNECT, Mike Douglass, RPI, douglm@rpi.edu</li> <li>• ISO, SIIA, Derek Lasalle, JPMorgan, ISO20022, derek.n.lasalle@jpmorgan.com</li> <li>• FIX Protocol, Ryan Pierce, FIX Protocol, ryan.pierce@fixprotocol.org</li> <li>• PNL, Ron Melton, ron.melton@pnl.gov,</li> <li>• OSCORE Alan Edgar, aredgar@comcast.net</li> </ul> <p><b>Technical Team:</b></p> <ul style="list-style-type: none"> <li>• CALCONNECT, Steven Lees, Microsoft, steven.lees@microsoft.com, TC XML Chair</li> <li>• CALCONNECT XML Technical Committee</li> </ul>
<p><b>PAP 5</b> Standard Meter Data Profiles</p>	<p>EnerNex Technical Champion: Aaron Snyder, aaron@enernex.com</p> <p><b>Action Plan SDO Leads:</b></p> <ul style="list-style-type: none"> <li>• AEIC: Larry Barto labarto@southernco.com</li> <li>• AEIC: Terry Penn tlpen@southernco.com</li> <li>• AEIC: Jim West jbwest@ameren.com</li> <li>• AEIC: David Bernaudo david.bernaudo@sce.com</li> <li>• ANSI C12 SC12.1: Scott Weikel scott.j.weikel@us.elster.com</li> <li>• ANSI C12 SC17: Larry Kotewa larryk@cntenergy.org</li> <li>• ANSI C12 SC17 WG1: Ed Beronet edward.j.beronet@us.elster.com</li> <li>• ANSI C12 SC17 WG2: Avy Moise avy@fdos.ca</li> <li>• ANSI C12 SC17 WG3: Ginger Zinkowski ginger.zinkowski@ge.com</li> <li>• ANSI C12 SC17 WG4: Aaron Snyder</li> <li>• IEC TC13: Thomas Schaub thomas.schaub@landisgyr.com</li> <li>• IEC TC57 Smart Grid TF: Scott Neumann sneumann@uisol.com</li> <li>• IEEE SCC31: Larry Kotewa</li> <li>• IEEE SCC31 End Devices SC: Richard Tucker richardaet@aol.com</li> <li>• MultiSpeak: Gary McNaughton gmnaughton@corniceengineering.com</li> <li>• NEMA: John Caskey joh_caskey@nema.org</li> <li>• NEMA: Paul Orr pau_orr@nema.org</li> <li>• UCAIug AMI-NET TF: Matt Gillmore mkgillmore@cmsenergy.com</li> </ul> <p><b>Other SDOs:</b></p> <ul style="list-style-type: none"> <li>• Measurement Canada: Vuong Nguyen nguyen.vuongt@ic.gc.ca</li> </ul>

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NIST Priority Action Plan (PAP)	Stakeholder Organizations
<p><b>PAP 6</b> Common Semantic Model for Meter Data Tables</p>	<p><b>EnerNex Technical Champion:</b> Aaron Snyder, aaron@enernex.com</p> <p><b>Action Plan SDO Leads:</b></p> <ul style="list-style-type: none"> <li>• AEIC: Larry Barto labarto@southernco.com</li> <li>• AEIC: Terry Penn tlpen@southernco.com</li> <li>• ANSI C12 SC17: Larry Kotewa larryk@cntenergy.org</li> <li>• ANSI C12 SC17 WG1: Ed Beronet edward.j.beronet@us.elster.com</li> <li>• ANSI C12 SC17 WG2: Avy Moise avy@fdos.ca</li> <li>• ANSI C12 SC17 WG3: Ginger Zinkowski ginger.zinkowski@ge.com</li> <li>• ANSI C12 SC17 WG4: Aaron Snyder</li> <li>• IEC TC13: Thomas Schaub thomas.schaub@landisgyr.com</li> <li>• IEC TC57 Smart Grid TF: Scott Neumann sneumann@uisol.com</li> <li>• IEEE SCC31: Larry Kotewa</li> <li>• IEEE SCC31 End Devices SC: Richard Tucker richardaet@aol.com</li> <li>• MultiSpeak: Gary McNaughton gmcnaughton@corniceengineering.com</li> <li>• NEMA: John Caskey joh_caskey@nema.org</li> <li>• NEMA: Paul Orr pau_orr@nema.org</li> <li>• UCAIug AMI-NET TF: Matt Gillmore mkgillmore@cmsenergy.com</li> </ul> <p><b>Stakeholder Leads:</b></p> <ul style="list-style-type: none"> <li>• AEIC: Jim West jbwest@ameren.com</li> <li>• AEIC: David Bernaudo david.bernaudo@sce.com</li> <li>• ANSI C12 SC12.1: Scott Weikel scott.j.weikel@us.elster.com</li> <li>• Marty Burns - Co-lead from EPRI meter objects harmonization effort</li> <li>• Grant Gilchrist - Co-lead from EPRI meter objects harmonization effort</li> <li>• David Haynes – Technical Expert, ANSI/IEC/MultiSpeak</li> <li>• Someone from ASHRAE BACnet (Marty Burns??)</li> </ul>

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<p><b>PAP 7</b> Electric Storage Interconnection Guidelines</p>	<p><b>EnerNex Technical Champion:</b> Frances Cleveland Xanthus Consulting</p> <p><b>PAP SDO Leads:</b></p> <ul style="list-style-type: none"> <li>• Dick DeBlasio NREL <a href="#">IEEE SCC21</a> <a href="mailto:Dick.DeBlasio@nrel.gov">Dick.DeBlasio@nrel.gov</a></li> <li>• Jean Goulet IREQ <a href="#">IEC TC57 WG17</a> <a href="mailto:goulet.jean@ireq.ca">goulet.jean@ireq.ca</a></li> </ul> <p><b>Other organizations:</b></p> <ul style="list-style-type: none"> <li>• EPRI</li> <li>• Xanthus</li> <li>• NREL</li> <li>• Satcon</li> <li>• FSEC</li> <li>• ABB</li> <li>• Novus Energy</li> <li>• OSCRE</li> <li>• GMATC</li> <li>• Altairnano</li> <li>• ORNL</li> <li>• A123Systems</li> <li>• Sandia</li> <li>• BuildingSmart</li> <li>• UL</li> <li>• DTE Energy</li> <li>• NEC-NFPA</li> <li>• MAGIC Consortium/Univ. of Delaware</li> <li>• S&amp;C</li> <li>• CSA-Standards</li> <li>• AEP</li> <li>• IEEE</li> <li>• DOE</li> <li>• NERC</li> <li>• FERC</li> <li>• EEI</li> <li>• IBEW</li> </ul> <p><b>Energy storage vendor community</b></p> <ul style="list-style-type: none"> <li>• Charlie Vartanian <a href="mailto:cvartanian@a123systems.com">cvartanian@a123systems.com</a></li> <li>• David Nichols <a href="mailto:dnichols@altairnano.com">dnichols@altairnano.com</a></li> <li>• Kevin Dennis <a href="mailto:KDennis@zbbenergy.com">KDennis@zbbenergy.com</a></li> <li>• Matt Lazarewicz <a href="mailto:lazarewicz@beaconpower.com">lazarewicz@beaconpower.com</a></li> <li>• Glenn Skutt <a href="mailto:gskutt@vpt-es.com">gskutt@vpt-es.com</a></li> <li>• Jim McDowell <a href="mailto:jim.mcdowall@saftbatteries.com">jim.mcdowall@saftbatteries.com</a></li> <li>• Mike Buckner <a href="mailto:bucknerm@research.panasonic.com">bucknerm@research.panasonic.com</a></li> <li>• Allen Gillette <a href="mailto:Allen.Gillette@generac.com">Allen.Gillette@generac.com</a></li> <li>• Terry Mohn US SSA <a href="mailto:terry.mohn@baesystems.com">terry.mohn@baesystems.com</a></li> <li>• Tod Tesch <a href="mailto:Tod.Tesch@generac.com">Tod.Tesch@generac.com</a></li> </ul> <p><b>“Smart Grid Leaders”</b></p> <ul style="list-style-type: none"> <li>• Doug Houseman <a href="mailto:doug.houseman@capgemini.com">doug.houseman@capgemini.com</a></li> <li>• Richard Schomberg <a href="mailto:Richard.Schomberg@edf.fr">Richard.Schomberg@edf.fr</a></li> <li>• Steve Pullins <a href="mailto:spullins@horizonenergygroup.com">spullins@horizonenergygroup.com</a></li> <li>• Erich Gunther <a href="mailto:erich@enernex.com">erich@enernex.com</a></li> <li>• Madhav D. Manjrekar <a href="mailto:madhav.manjrekar@siemens.com">madhav.manjrekar@siemens.com</a></li> </ul> <p><b>OTHERS:</b> See website: <a href="http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/PAP07Storage#Who">http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/PAP07Storage#Who</a></p>

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<p><b>PAP 8</b> CIM for Distribution Grid Management</p>	<p><b>EnerNex Technical Champion:</b> Frances Cleveland, fcleve@xanthus-consulting.com  <b>SDO Leads:</b> Greg Robinson, Gary McNaughton , Frank Goodman/Jean Goulet  <b>SDOs:</b></p> <ul style="list-style-type: none"> <li>• IEC TC57 WG10: Christoph Brunner, UTInnovation</li> <li>• IEC TC57 WG13: Terry Saxton</li> <li>• IEC TC57 WG14: Greg Robinson, Xtensible Solutions</li> <li>• IEC TC57 WG17: Frank Goodman, SDG&amp;E</li> <li>• IEC TC57 WG19: Paul Skare, Siemens Paul.Skare@siemens.com</li> <li>• IEC TC57 WG15: Frances Cleveland, Xanthus fcleve@xanthus-consulting.com</li> <li>• IEEE Power Systems Relay Communications Committee: Miriam Sanders</li> <li>• T&amp;D DEWG: Joe Bucciero</li> <li>• IEEE PES DAWG: Larry Clark, Georges Simard</li> <li>• OGC: Louis Hecht</li> <li>• MultiSpeak: Gary McNaughton</li> </ul> <p><b>Users Groups:</b></p> <ul style="list-style-type: none"> <li>• UCAlug: Mark Adamiak</li> <li>• USB: Forrest Small</li> </ul>
<p><b>PAP 9</b> Standard DR Signals</p>	<p><b>SDOs:</b></p> <ul style="list-style-type: none"> <li>• ASHRAE</li> <li>• IEC TC57</li> <li>• IEC TC57 WG14 Distr Mgt</li> <li>• IEC TC57 WG16 Dereg Mkt C</li> <li>• ISO/IEC JTC 1 WG15</li> <li>• LonMark</li> <li>• NAESB</li> <li>• OASIS</li> <li>• OASIS WS-Device Profile</li> <li>• OASIS WS-Device Discovery</li> <li>• SAE</li> </ul> <p><b>Task Leads:</b></p> <ul style="list-style-type: none"> <li>• BACnet/ASHRAE Sharon Dinges sdinges@trane.com</li> <li>• LonMark Ron Bernstein ron@lonmark.org</li> <li>• MultiSpeak Bob Saint robert.saint@nreca.coop</li> <li>• NAESB Jonathan Booe jbooe@naesb.org</li> <li>• OASIS James Bryce Clark jamie.clark@oasis-open.org</li> <li>• UCAlug Wayne Longcore wrlongcore@cmsenergy.com</li> <li>• ZigBee SEP2 Robby Simpson robbysimpson@ge.com</li> </ul> <p><b>Other organizations identified, members of which suggested or committed to participation in the Action Plan:</b> AHAM HES NEMA OpenHAN B2G DEWG I2G DEWG No Magic, Inc PAPs 3, 4, 7, 11 BAE Systems IEC TC57 oBIX Underwriters Laboratory H2G DEWG IEEE 1547.3, 1377 OpenADR /LBL UPnP /WS-DD/DP UCAlug Smart Grid SC UCAlug AMI-ENT TF UCAlug OpenADR AHAM EPRI (appliances)</p> <p><b>OTHERS:</b> See website: <a href="http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/PAP09DRDER#Who">http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/PAP09DRDER#Who</a></p>

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NIST Priority Action Plan (PAP)	Stakeholder Organizations
<p><b>PAP 10</b> Standard Energy Usage Information</p>	<p><b>EnerNex Technical Champions:</b></p> <ul style="list-style-type: none"> <li>Toby Considine, toby.considine@gmail.com</li> <li>William Cox, wtcoc@coxsoftwarearchitects.com</li> </ul> <p><b>Action Plan SDO/User Groups Leads:</b></p> <ul style="list-style-type: none"> <li>OASIS: James Bryce Clark jamie.clark@oasis-open.org</li> <li>IEC TC57 WG14: Greg Robinson Xtensible Solutions grobinson@xtensible.net</li> <li>IEC TC57 WG15: Frances Cleveland, Xanthus fcleve@xanthus-consulting.com</li> <li>ANSI C12.19: Paul Orr, NEMA pau_orr@nema.org</li> <li>ZigBee/HomePlug Alliance – SEP Michael Stuber, ITRON michael.stuber@itron.com</li> <li>ASHRAE BACnet. Dave Robin, Automated Logic drobin@automatedlogic.com</li> <li>LonMark.Jeremy Roberts,LonMark International jeremy@lonmark.org</li> <li>UCAlug, Dave Mollerstuen, Tendril dmollerstuen@tendrilinc.com</li> </ul> <p><b>Other SDO Representatives:</b></p> <ul style="list-style-type: none"> <li>Craig Gemill, Honeywell/Tridium craig.gemmill@tridium.com</li> <li>ODVA: Katherine Voss, KVoss@odva.org</li> <li>IEEE SCC21 P2030: Dick DeBlasio dick_deblasio@nrel.gov</li> <li>OSCRE Andy Fuhman , Andy.Fuhrman@oscre.org (Commercial Real Estate)</li> <li>Kantara Initiative Brett McDowell brett@kantarainitiative.org</li> </ul> <p><b>Users Groups:</b></p> <ul style="list-style-type: none"> <li>BOMA: Henry Chamberlain hchamberlain@boma.org</li> <li>UCAlug Paul De Martini, SCE paul.demartini@sce.com</li> </ul> <p><b>Service Providers:</b></p> <ul style="list-style-type: none"> <li>Larry Cochrane, Microsoft L.Cochrane@microsoft.com</li> <li>Michael Jon Miller, Microsoft Michaeljon.Miller@microsoft.com</li> <li>Todd Graves, Microsoft tgraves@microsoft.com</li> <li>Charles Spirakis, Google css@google.com</li> <li>Harry Wingo, Google hwingo@google.com</li> <li>Paul Nagel (CEO), Control4 pnagel@control4.com</li> <li>Jim Butler, Cimetrix jimbutler@cimetrix.com</li> </ul> <p><b>Utilities &amp; Energy Services:</b></p> <ul style="list-style-type: none"> <li>George Bjelovuk, AEP gbjelovuk@aep.com</li> <li>Chris Knudsen, PG&amp;E CxKq@pge.com</li> <li>Brent Hodges, Reliant bhodges@reliant.com</li> <li>Customer Information Systems (CIS):</li> <li>Bradley Williams, Oracle Bradley.Williams@oracle.com</li> <li>Klaus Heimann, SAP heimann.k@t-online.de</li> <li>Alan Johnston, MIMOSA (Industrial) atjohn@comcast.net</li> </ul>

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<p><b>PAP 11</b> Common Object Models for Electric Transportation</p>	<p><b>Project Team Leads</b></p> <ul style="list-style-type: none"> <li>NIST Leads: Eric Simmon, eric.simmon@nist.gov</li> <li>EnerNex Technical Champion: Jerry Melcher, jerry@enernex.com</li> </ul> <p><b>Action Plan SDO Leads:</b></p> <ul style="list-style-type: none"> <li>SAE George Bellino General Motors george.bellino@gm.com</li> <li>ANSI C12.19 Ed Beronet ABB edward.j.beronet@us.abb.com</li> <li>NEMA Ben Biroshak NEMA</li> <li>IEEE John Boot Current Group jboot@currentgroup.com</li> <li>SAE, ZigBee SEP Mike Bourton Grid2Home mikebourton@grid2home.com</li> <li>IEC TC57 WG19 Jay Britton Areva jay.britton@areva-td.com</li> <li>IEC TC57 WG17 Jean Goulet Hydro Quebec / IREQ goulet.jean@ireq.ca</li> <li>SAE Liang Huang Pacific Gas &amp; Electric L1Hg@pge.com</li> <li>SAE Michael Kitner-Meyer Pacific Northwest Lab michael.kitner-meyer@pnl.gov</li> <li>SAE Arindam Maitra EPRI AMaitra@epri.com</li> <li>SAE Dan Mephram GM dan.mephram@gm.com</li> <li>IEC TC57 WG14 Greg Robinson Xtensible grobinson@xtensible.net</li> <li>SAE Jose Salazar SCE Jose.Salazar@sce.com</li> <li>SAE 2293 Rich Scholer Ford rscholer@ford.com</li> <li>SAE Efrain Ornelas Pacific Gas &amp; Electric ExO1@pge.com</li> <li>Zigbee SEP Robby Simpson General Electric Energy robbysimpson@ge.com</li> <li>IEC Paul Skare Siemens Paul.Skare@siemens.com</li> <li>SAE Nathan Tenney Pacific Northwest Lab Nathan.Tenney@pnl.gov</li> </ul> <p><b>Users Groups:</b></p> <ul style="list-style-type: none"> <li>UCAlug Wayne Longcore, Consumers Energy wrlongcore@cmsenergy.com</li> </ul>
<p><b>PAP 12</b> IEC 61850 Objects/DNP3 Mapping</p>	<p><b>EnerNex Technical Champion:</b>* Ron Farquharson, ron@enernex.com EnerNex Support: Grant Gilchrist grant@enernex.com</p> <p><b>Action Plan SDO Leads:</b></p> <ul style="list-style-type: none"> <li>DNP Technical Committee: Andrew West andrew.west@ieee.org</li> <li>IEC TC57 WG10: Christoph Brunner christoph.brunner@utinnovation.com</li> <li>UCAlug Technical Committee: Kay Clinard Clinardkay@aol.com</li> </ul> <p><b>Other SDO Representatives:</b></p> <ul style="list-style-type: none"> <li>DNP Technical Committee: Barry Shephard barry.shephard@grontmij.co.uk</li> <li>UCAlug Testing Committee: Bruce Muschlitz bruce@EnerNex.com</li> <li>IEC TC57 WG10 Barry Shephard barry.shephard@grontmij.co.uk</li> <li>IEC TC57 WG03: Wolfgang Brodt wolfgang.brodt@siemens.com</li> <li>UCAlug 61850 Technical Group: George Schimmel gs@trianglemicroworks.com</li> </ul> <p><b>Users Group Leaders:</b></p> <ul style="list-style-type: none"> <li>DNP User Group: Jim Coats jcoats@trianglemicroworks.com</li> <li>UCA International Users Group: Kay Clinard Clinardkay@aol.com</li> <li>Utility Representatives: Rick Murphy murphy@FirstEnergyCorp.com</li> </ul>

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<p><b>PAP 13</b> Time Synchronization, IEC 61850 Objects/IEEE C37.118 Harmonization</p>	<p><b>NIST Lead:</b> Jerry Fitzpatrick, gerald.fitzpatrick@nist.gov  <b>EnerNex Technical Champion:</b> Ron Farquharson, ron@enernex.com  <b>SDO Lead:</b> Christoph Brunner, Convenor IEC TC 57 WG 10 (IEC 61850)  <b>Other SDOs:</b></p> <ul style="list-style-type: none"> <li>• IEEE PSRC H11 Committee Chair Ken Martin kemartin8421@comcast.net.</li> <li>• IEEE PSRC H7 Committee Chair Galina Antinova</li> <li>• IEEE PSRC H3 Committee Chair Bill Dickerson</li> <li>• IEEE Power Systems Relay Committee, Communications Subcommittee: Veselin Skendzic</li> <li>• IEC TC57 WG19: Paul Skare Paul.Skare@siemens.com</li> <li>• IEC TC57 WG15: Frances Cleveland, Xanthus fcleve@xanthus-consulting.com</li> <li>• IEC TC38 WG37: Pascal Tantin</li> <li>• IEEE PSRC H4 C37.111 COMTRADE: Ratan Das</li> <li>• NERC CSSWG: Mark Engels</li> </ul> <p><b>Users Groups:</b></p> <ul style="list-style-type: none"> <li>• UCAIug/IEC61850ug: Mark Adamiak</li> <li>• Technical Team:</li> <li>• NASPI, Performance and Standards Committee, Vahid Madani, VxM6@pge.com</li> <li>• NASPI, Alison Silverstein</li> <li>• Alex Apostolov (Member IEC TC57, WG10, 19, IEEE PSRC H7)</li> </ul>
<p><b>PAP 14</b> Transmission and Distribution Power Systems Model Mapping</p>	<p><b>NIST Lead:</b> Jerry Fitzpatrick, gerald.fitzpatrick@nist.gov  <b>EnerNex Technical Champion:</b> Joe Hughes, jhughes@epri.com  <b>SDO Lead:</b> Christoph Brunner, Convenor IEC TC57, WG10  <b>Other SDOs:</b></p> <ul style="list-style-type: none"> <li>• IEEE PSRC H3 Committee Chair Bill Dickerson</li> <li>• IEEE PSRC H5 Committee Chair Jürgen Holbach</li> <li>• IEEE PSRC H16 Committee Chair Mark Adamiak</li> <li>• IEEE Power Systems Relay Committee, Communications Subcommittee: Veselin Skendzic</li> <li>• IEC WG13 Convenor Terry Saxton</li> <li>• IEC WG14 Convenor Greg Robinson</li> </ul> <p><b>Users Groups:</b></p> <ul style="list-style-type: none"> <li>• UCAIug, Mark Adamiak</li> </ul> <p><b>Technical Team:</b></p> <ul style="list-style-type: none"> <li>• Alex Apostolov (Member IEC TC57, WG10, 19, IEEE PSRC H3, H5 and H16)</li> </ul>
<p><b>PAP 15</b> Harmonize Power Line Carrier Standards for Appliance Communications in the Home</p>	<p><b>NIST Lead:</b> David Su, david.su@nist.gov</p> <p><b>Subgroup on Coexistence Lead:</b> Stefano Galli - IEEE P2030 (co-Chair TF3), IEEE Technical Committee on Power Line Communications (Chair) SGalli@research.panasonic.com</p> <p><b>Standard Setting Organizations:</b></p> <ul style="list-style-type: none"> <li>• Institute of Electrical and Electronic Engineers (IEEE) P1901 and P2030,</li> <li>• International Telecommunication Union ITU-T Study Group 15, ISO, IEC</li> </ul> <p><b>Collaborators:</b></p> <ul style="list-style-type: none"> <li>• Association of Home Appliance Manufacturers (AHAM),</li> <li>• Consumer Electronics Powerline Communication Alliance (CEPCA),</li> <li>• HD-PLC Alliance, HomeGrid Forum,</li> <li>• HomePlug Powerline Alliance,</li> <li>• Universal Powerline Association (UPA),</li> <li>• U-SNAP Alliance</li> </ul>

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NIST Priority Action Plan (PAP)	Stakeholder Organizations
<p><b>PAP 16</b> Wind Plant Communications</p>	<ul style="list-style-type: none"> <li>• UWIG – lead</li> <li>• IEC TC 88 61400-25 working group – recipient of the final recommendations</li> <li>• American Wind Energy Association (AWEA)</li> </ul> <p><b>Project Team Leads</b> Al Hefner [ hefner@nist.gov]</p> <p><b>Users Groups:</b></p> <ul style="list-style-type: none"> <li>• Charlie Smith, UWIG Director – jcsmith@uwig.org</li> <li>• Jack King – proposed PAP lead – jking@uwig.org</li> <li>• Sandy Smith – UWIG Marketing Manager – sandy@uwig.org</li> <li>• Erich Gunther – Interim Tech Champion – erich@enernex.com</li> </ul>

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## APPENDIX 'B' – SGIP Stakeholder Categories

Source: <http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/SGIPAbout>

#	Stakeholder Category	Description
1	Appliance and Consumer Electronics Providers	Manufacturers of consumer appliances and devices such as thermostats, televisions, dishwashers, refrigerators, residential scale HVAC.
2	Commercial and Industrial Equipment Manufacturers and Automation Vendors	Manufacturers of controls and the actual energy consuming equipment for air conditioning, industrial processes, lighting, etc... Additionally, OEM manufacturers of semiconductors and other components of equipment.
3	Consumers – Residential, Commercial, and Industrial	Consumers using energy for heating, air conditioning, cooking, water heating, and other residential uses in single and multi-family dwellings and apartments and mobile homes, commercial buildings and industrial facilities. Additionally, industrial consumers of energy for production and manufacturing purposes.
4	Electric Transportation Industry Stakeholders	Organizations interested in plug-in electric vehicle (PEV) interaction with the electric grid, including discharging as well as charging and customer-utility interactions.
5	Electric Utility Companies – Investor Owned Utilities (IOU) and Publicly Owned Utilities	Privately held utility companies and publicly owned utilities operating under State and Federal regulation to deliver electric and energy services (Includes combined electric and gas companies).
6	Electric Utility Companies - Municipal (MUNI)	Publicly owned electric utilities operating under Municipal Government or other forms of local regulation.
7	Electric Utility Companies - Rural Electric Association (REA)	Private Independent Electric utilities operating under cooperative or Rochdale Principles.
8	Electricity and Financial Market Traders (includes Aggregators)	Organizations participating in electricity or financial markets as a trader or broker. Note the separate category for ISOs and RTOs who may participate as both operators and traders, and the categories for various types of utilities, who may also participate as traders. These entities must choose one category.
9	Independent Power Producers	Power Producers operating under the FERC rules as an Independent Power Producer (IPP) These are non public utility entities that sell power to electric markets and can include privately-held facilities, cooperatives such as rural energy producers, and non-energy industrial companies.
10	Information and Communication Technologies (ICT) Infrastructure and Service Providers	Satellite, wireless, and wire line providers that depend on each other to carry and terminate their communication traffic and companies who routinely share facilities and technology to ensure interoperability. This includes network service providers such as Cable, ISPs, Telcos, etc...
11	Information Technology (IT) Application Developers and Integrators	Companies offering virtual and distributed functions that produce and provide hardware, software and IT systems and services.
12	Power Equipment Manufacturers and Vendors	Equipment Manufacturers for Electric Power Generation, Transmission, and Distribution Systems and Equipment, Metering Equipment, and Energy

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#	Stakeholder Category	Description
		Storage.
13	Professional Societies, Users Groups, Trade Associations and Industry Consortia	Organizations that formally represent manufacturers, individuals, service providers, and other participating entities in other stakeholder groups.
14	R&D Organizations and Academia	Organizations whose interest in the Smart Grid is primarily for research, teaching, or other types of technology transfer.
15	Relevant Federal Government Agencies	Agencies of the United States federal government that may place requirements on the Smart Grid or be affected by Smart Grid applications.
16	Renewable Power Producers	Independent Power Producers that Generate Power from Renewable Energy Resources including but not limited to Hydro, Wind, Solar, Biomass and other resources recognized as meeting Renewable Portfolio Standards (RPS).
17	Retail Service Providers	An entity which offers electric energy and related services at unregulated prices directly to retail customers. In some jurisdictions, this entity will be certified, such as by the PUCT in Texas.
18	Standard and Specification Development Organizations (SDOs)	Organizations that create national or international standards specifications through an open, public process. To qualify for this category, an organization must either be recognized by: * The International Standards Organization (e.g. CEN is recognized by ISO) * A national government, as the national SDO for that country (e.g. ANSI is recognized as the American national SDO), or A national SDO (e.g. ASHRAE is recognized by ANSI).
19	State and Local Regulators	Organizations that regulate the operation of the power system in the United States but are not federal in scope.
20	Testing and Certification Vendors	Organization which issue test certificates or manufacture equipment used either for pre-testing or during the conformance testing process.
21	Transmission Operators and Independent System Operators	Transmission Operators are Service Provider organizations chartered to deliver energy from large generation through Transmission Facilities to Distribution companies Transmission Operators function under Independent System Operator (ISO/RTO) dispatch rules. Transmission Systems generally operate above 69kVA and may be independent companies or operate under a utility.
22	Venture Capital	Organizations with an interest in raising funds for the development or operation of the Smart Grid.

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### APPENDIX 'C' – Standards Council of Canada Task Force on Smart Grid Technology and Standards

#### Source: Standards Council of Canada

List of Canadian National Committee of the International Electrotechnical Commission Task Force on Smart Grid Technology and Standards (CNC/IEC/TF-SGTS) members

<b>Name</b>	<b>Affiliation</b>	<b>TC if Any</b>
• Chair, Lisa Dignard-Bailey	Director, Integration of Renewable and Distributed Energy Resources Program, Natural Resources Canada; CSC/IEC-TC8, SCS/TC57, CSC/TC82	
• Co-Chair, Bill Bryans	CNC/IEC Secretary, Standards Council of Canada	
• Jason Crossman	Hubbell Canada	
• Ludo Bertsch	Horizontal Technologies - Representing Continental Automated Building Association (CABA)	
• Andre Brandao	Wireless Research Engineer, Project Leader - CRC - Communications Research Centre - Industry Canada	
• Daniel Desrosiers	CYME International T&D, Director Service, CSC/TC8, SC77A, TC99, SB1	
• Sol Lancashire	Chairman, Canadian UTelco Committee, Utilities Telecommunication Council of Canada (UTCC) - Telecom Architect- BC Hydro	
• Edward Arlitt,	Independent Electricity System Operator (IESO)	
• Kip Morison	BC Transmission Corporation, IEC SMB SG3	
• Jean Goulet	Institut de Recherche d'Hydro-Québec, Hydro Quebec, CSC/IEC TC57	
• Scott Fawcett	Director, Energy Industry, & Smart Grid - CISCO, Calgary	
• David Curtis	Director on Ontario Smart grid Forum	
• Joseph Neu EFC,	VP Engineering, Codes & Standards, CPIC, TC38, TC61, SMB/SG1	
• Tab Gangopadhyay,	National Energy Board	
• John Lawton	New Brunswick Energy and Utilities Board (CAMPUT)	
• Annamaria Cross,	Ontario Ministry of Energy & Infrastructure	
• Grant Gilchrist,	EnerNex Corp, Consulting engineer, Data Communications, IEC TC57	
• Eric McWhinney,	BC Hydro, member of Gridwise alliance	
• Devin McCarthy	Senior Advisor (Distribution), Canadian Electricity Association	
• John O'Neil	Canadian Standard Association (CSA), CSC/TC77, CISPR	
• Mahendra (Mike) Prasad,	C.E.T. Manager, International Standards, Standards Depart. Underwriters Laboratory Canada (ULC), ISO/IEC/ITU-T (SAG-S), IEC/TC79, ISO/TC223	

List of CNC/IEC/TF Resource Group members:

<b>Name</b>	<b>Affiliation</b>	<b>TC if Any</b>
○ Dragan Nerandzic	Chief Technology Officer, ERICSSON	
○ Jim MacFie	National Standards Office, Microsoft Canada	TCIT, JTC1/SC??
○ Bill Munson	Vice-President Policy ITAC	
○ Ed Tymofichuk	Manitoba Hydro	TC8, TC99, SB1, SMB/SG1, CSC/UHV
○ James Robbins	President EWA - Canada	
○ Yves Pope	Director, development des affaires Services IP - TATA Communications	
○ Sylvain Martel	NRCan	CSC/TC8

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<b>Name</b>	<b>Affiliation</b>	<b>TC if Any</b>
○ Tony Capel	Comgate Engineering Ltd.	TC65, SC65C Int'l Chair, JTC1
○ Michael Richardson	[he has suggested the 3 below)	1) President, Sandelman Software
Works Corporation.	2) Founder and Maker - Centre de Recherche et Developpement en Informatique Libre	
○ Avygdor Moise	President DOS R&D Inc. Calgary	ANSI/IEEE Smart Meters - interoperability
○ Michael Christensen	manager of the Fixed Wireless Communications at Spectrum Engineering of Industry Canada	
○ Robert Thomas	Director, Regulatory Policy, Alberta Utilities Commission	
○ Neil Hutchings	Project Manager, Codes & Standards	
○ Bill Bennitt	Director, Distribution Asset Management - Hydro Ottawa	
○ Colman Ho	Director Advanced Communications Engineering - Industry Canada [cybersecurity, telecom and Internet technologies, architectures & protocols]	JTC1/SC27, IETF, ITU-T
○ Rose Coelho	Director, Cyber Policy, National Cyber Security, Public Safety Canada, Ottawa	
○ Gilles Vinet	Vice-President, Program Development Directorate, Measurement Canada, Industry Canada	
○ Bruce Orloff	IBM Canada - IUN/Smart Grid lead	
○ Steven H. Corbin	CAE Vice-President Business Development and Innovation - Flight Simulators	
○ Garry Spicer,	Chair, Alberta Electricity System Operator for NERC CIP reliability NA	
○ Johnathan Boon	US - North American Energy Standards Board (NAESB) Smart Grid WG.	