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P2688: Recommended Practice For Energy Storage Management Systems In Energy Storage Applications

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Acknowledgements

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The speaker is especially grateful for the collaboration of the members of the P2688 Working Group for the development of this standard.

Motivation

With the increasing deployment of energy storage systems (ESSs) in providing grid services, a well-designed Energy Storage Management System (ESMS) is critical to effectively operate one or more ESSs in grid applications. A need exists for recommended practices and standards to inform designers and integrators about the challenges in ESMS development & deployment.

Scope

This recommended practice covers the development and deployment of ESMS in energy storage applications.

ESMS is an umbrella term that includes a range of systems that generally fall into one of several categories:

— Power management systems (PMS)
— Power plant controllers (PPC)
— Energy management systems (EMS)

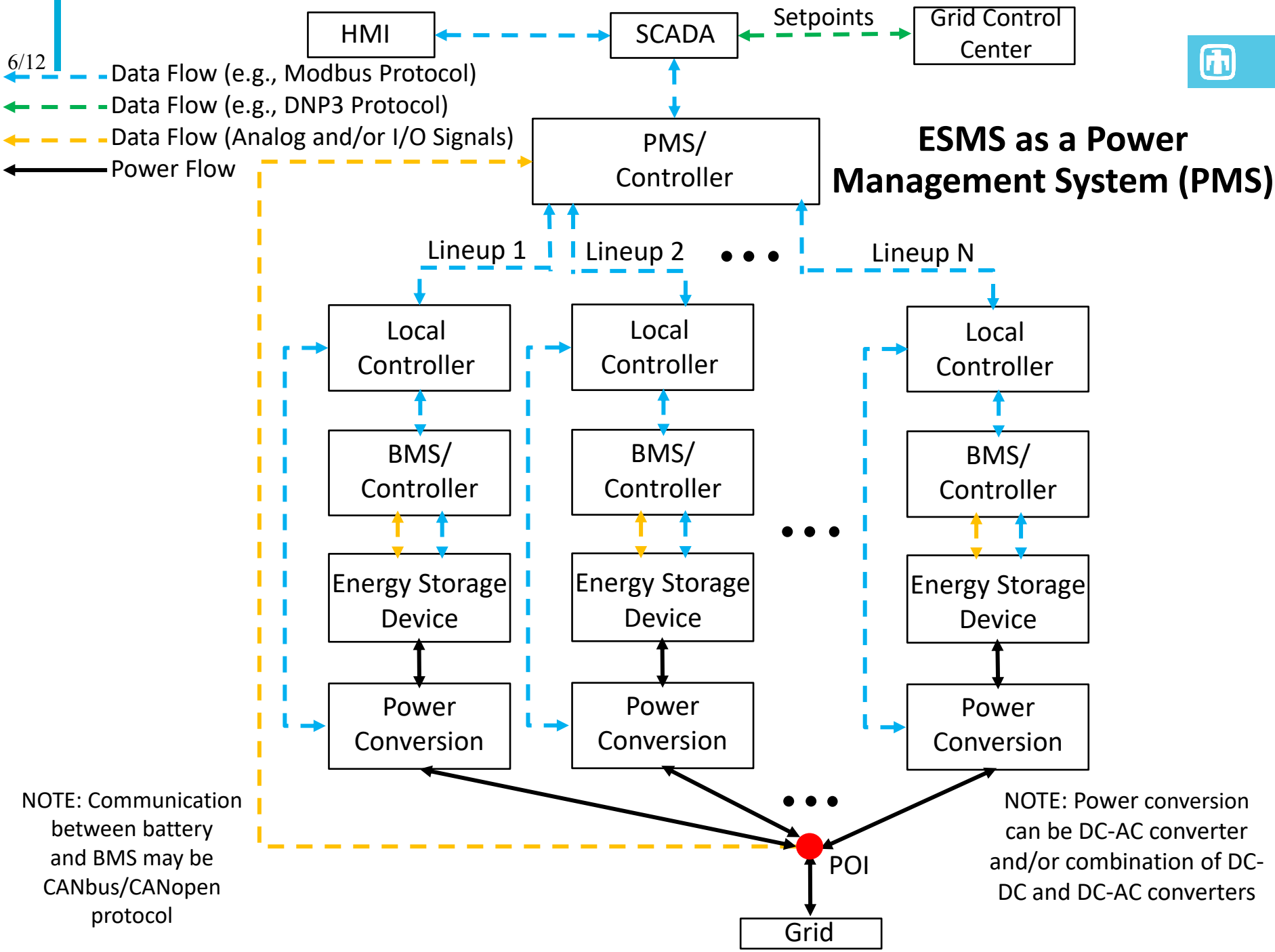
For each category, ESMS includes software functions and hardware capabilities addressing the requirements to operate ESSs in supply-side and demand-side applications.

Purpose and Functions

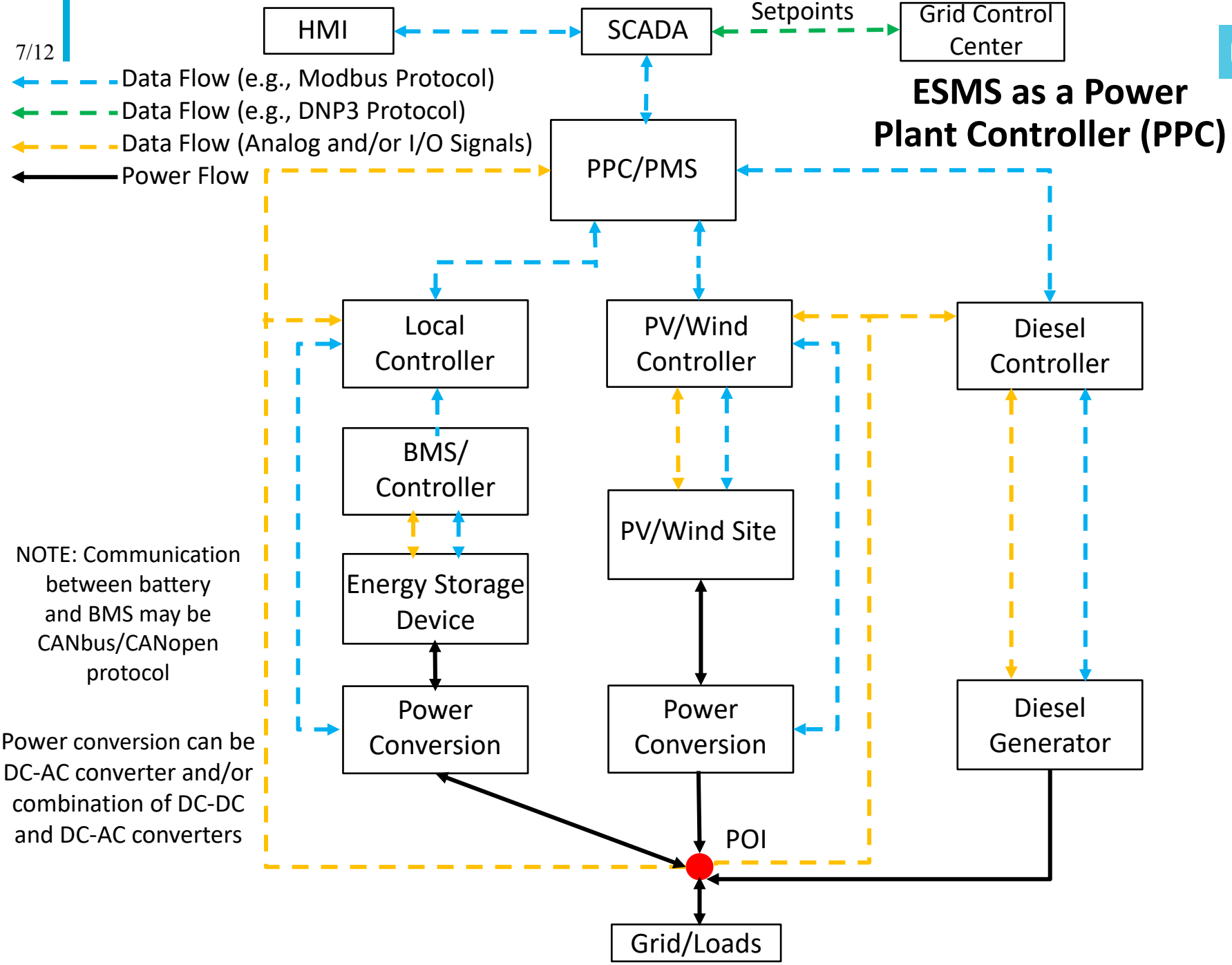
- The **purpose** of the ESMS is to dispatch single and aggregated ESSs, and coordinate their operation together with other distributed energy resources (DERs) in grid applications.

- Core **functions** of an ESMS include: dispatch of real and reactive power of single or multiple ESSs to provide grid services; monitoring, estimation, and visualization of system states, including safety sub-system alarms. Hardware capabilities include: sensing, control, and communication.

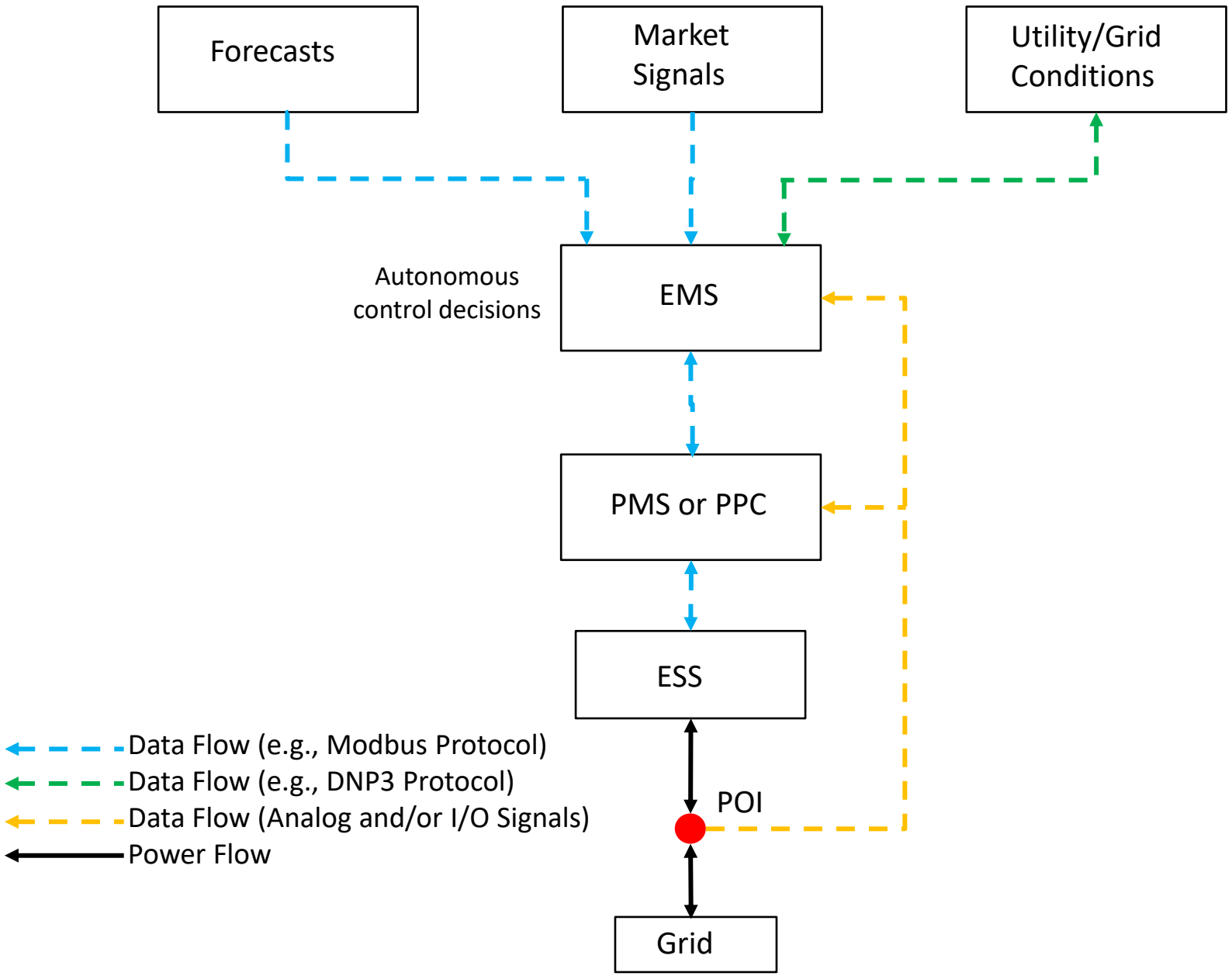
ESMS as a Power Management System (PMS)



ESMS as a Power Plant Controller (PPC)



ESMS as an Energy Management System (ESMS)



Tentative P2688 Project Schedule

1. Propose ESMS Project to ESSB – June 2020 ✓
2. Draft PAR, then submit to ESSB – July 2020 ✓
3. PAR Approval from ESSB – August 2020 ✓
4. PAR Approval from SA – Q1 2021 ✓
5. Form Working Group – Q2 2021 ✓
6. Kickoff Monthly ESMS WG meetings – Q3 2021 ✓
7. Write the Draft Recmd Practice – Q3 2021 – Q4 2022 (in progress)
8. Ballot the Draft Recmd Practice – Q1 2023
9. Approval and Publication – Q2 2023

P2688 Working Group Team

- WG Chair – Dave Schoenwald, SNL
- WG Vice Chair – Tu Nguyen, SNL
- WG Secretary – Slobodan Matic, GE
- PES/ESSB Standards Rep – Jim McDowall, Saft
- SCC21 Liaison – Charlie Vartanian, PNNL
- Topic Leads (more to be added):
  - ESMS Scope/Functional Descriptions – Jim McDowall, Saft
  - ESMS Safety – Chris Searles, Chris Searles and Associates
  - ESMS Grid Applications – Slobodan Matic, GE

Challenges/Issues

- Avoid duplication/clarify differences to related standards
  - Provide citations to relevant standards, documents, guides, etc.
- Explain terminology concisely and clearly without being too wordy
- Include schematics/figures that give context to subsystems and functions without being overly complex
  - Write text to provide more detail to clarify schematics/figures
- Incorporate feedback from SCC-21 regarding communications and cyber security content needed in the document

Next Steps

- Continue to refine schematics based on WG members feedback
- Complete the outline of needed clauses/sub-clauses
- Identify writing assignments for each clause/sub-clause
- Incorporate SCC-21 feedback, particularly on communications and cyber security content for the document

Thank You to PNNL for hosting the workshop and Ryan Franks for his organization of this panel and invitation to the speaker.

QUESTIONS?

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