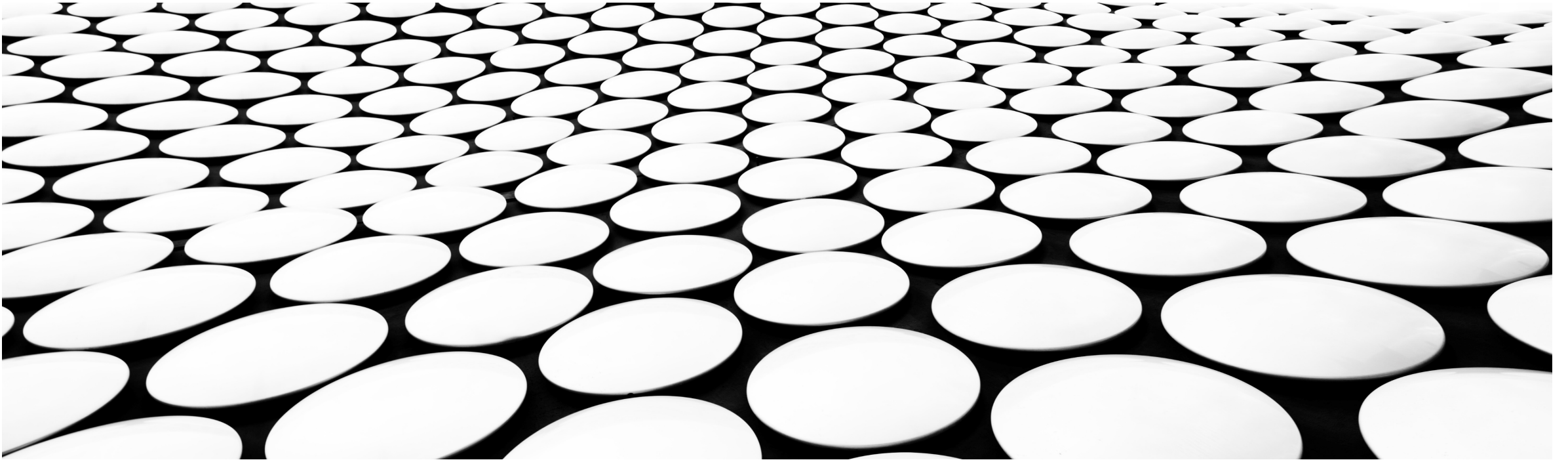

WELCOME

SPACE POWER CONSORTIUM



KICKOFF AGENDA

3:00 pm Pacific

- Welcome
- Introduction of Kickoff Organizers
- Mission Statement

3:15 pm Pacific

- Introductions – around the room
- Organizing Committee first cut concepts

3:30 pm Pacific

Presentations from Space-going Agencies and Prime Contractors

- Fernando/Arturo – ESA
- Brad Reed – AF SMC
- Raphael Some – JPL
- Wes Powell – NASA GSFC
- Brenda Boritski – L3Harris
- Michael Lackey – Raytheon

OASIS KICKOFF AGENDA

4:30 pm - Break

4:45 pm Pacific

Presentations from spacecraft power system and avionics developers

- Steve Parkes – Star Dundee
- Oscar Mansilla – Renesas
- Anton Quiroz – Apogee
- Gates West – Moog
- Bill King – Micropac

6:15pm pm Pacific

- Existing/evolving standards and organizations – NASA, USAF, AIAA, and others

6:30 pm Pacific

- Vote: Do we want to start this org?
 - Steering Committee Chair/Membership,
 - Reference Architecture StC Chair/Membership,
 - Existing Standards/Specs Adoption SC Membership.



PART ONE



INTRODUCTION OF ORGANIZING COMMITTEE

- Raphael Some – NASA JPL
- Patrick Collier – Army C5ISR
- Bill King - Micropac
- Harry Kellzi - Micropac
- Gates West - Moog
- Steve Parkes – Star Dundee
- Michael Lackey - Raytheon
- Anton Quiroz - Apogee
- Peter Morico – Raytheon
- Wes Powell – NASA GSFC
- Oscar Mansilla - Renesas
- Brad Reed – Air Force SMC



PART TWO





MISSION STATEMENT

- Our focus is the development of a reference architecture and an associated standard for space power interfaces and functions.
- The reference architecture will feed into and support several system architectures that provide the basis of our definitions of power functions, power modules, and power interfaces.
- This approach will treat the different “components” or aspects of this architecture as independent modular entities. These, each, will have well-defined and key open interfaces. This fundamentally drives the modularity and the ability of a user to configure an instantiation based on need.
- We will leverage (and align) existing power standards (and efforts) through full adoption of those standards or through augmentation of those standards.



WORKING GROUPS (WG) AND COMMITTEE CADENCE

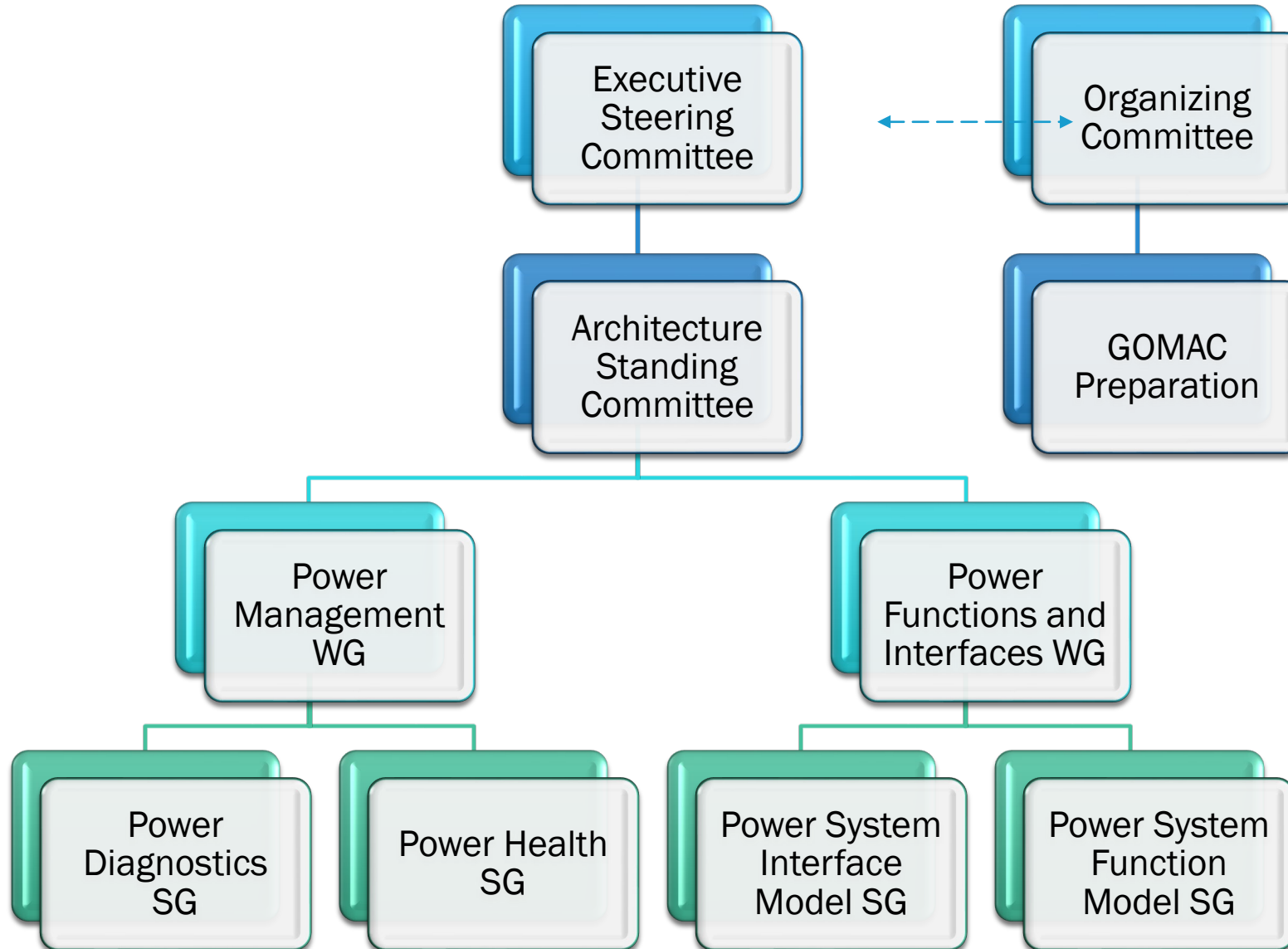
- All WGs will meet on a weekly basis for the near term until they have their own rhythm.
- At that point it is up to the WG Officers to decide the most appropriate rhythm for their work.
- The Executive Steering Committee will meet weekly for the first month and then move to a bi-weekly rhythm
- Our expectations are that we will meet F2F 2 – 3 times a year. Ultimately, this is up to the Executive Steering Committee to decide based on schedules and which standards body we call home.



CHARTER

- We will develop and document a reference architecture and an associated standards for power interfaces and functions
- We will consist of an Executive Steering Committee, Working Groups (WGs) and Sub-Groups (SGs) that are tasked with broad, and in some cases specific, goals.
- We will leverage (and align) existing power standards (and efforts) through full adoption of those standards or through augmentation of those standards.

PROPOSED STRUCTURE





EXECUTIVE STEERING COMMITTEE CHARTER

- The Executive Steering Committee (ESC) is responsible for the overall (broad) direction of the effort
- The ESC will provide overall effort guidance and direction
- The ESC is responsible for the ratification of Standards
- The ESC will ensure engagement, support, and adoption by gov't agencies and Industry
- The ESC will charter the number and type of WGs.
- The ESC will provide user input and guidance to the WGs.



ARCHITECTURE STANDING COMMITTEE (ASC) CHARTER

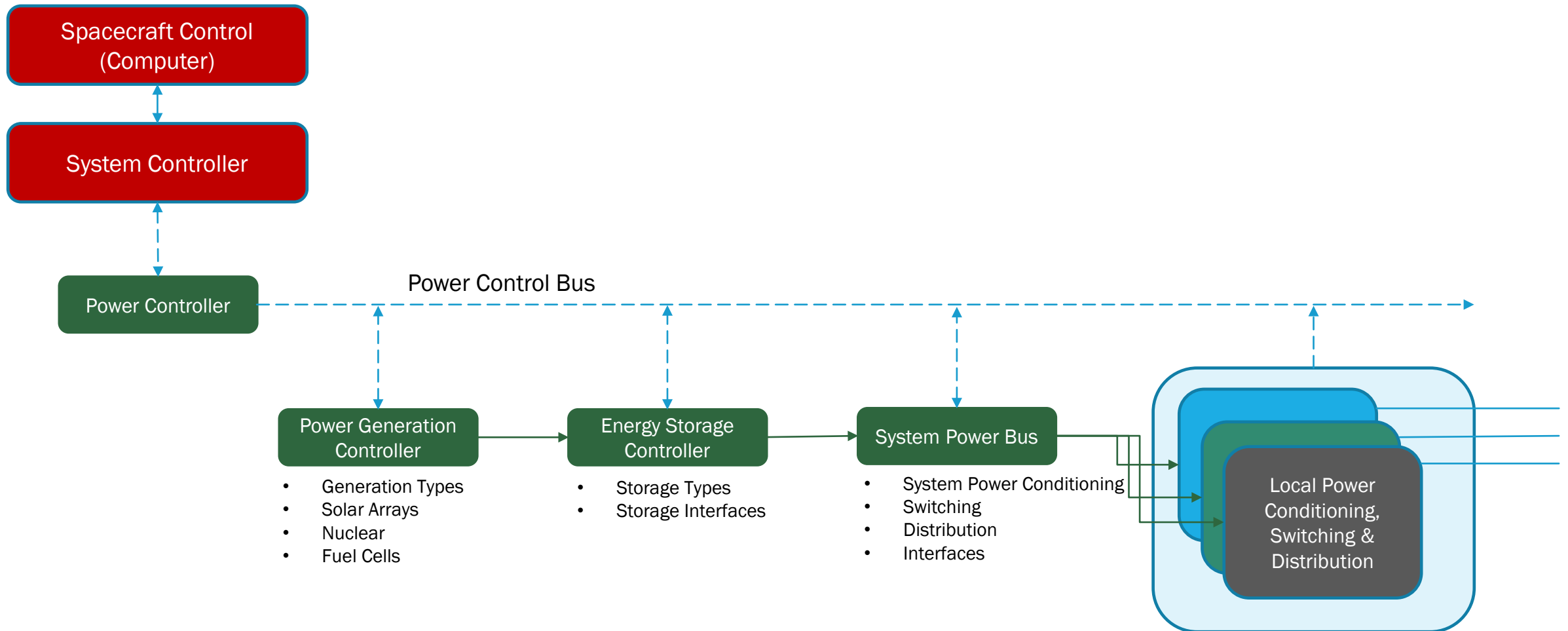
- The ASC will develop and maintain a high-level reference architecture for the spacecraft power subsystem at a sufficient level of detail to show interfaces and the basic elements of a spacecraft power system.
- The ASC will develop and maintain a set of detailed spacecraft subsystem reference architectures that include specific interfaces and provide a working context for each class of spacecraft, e.g., crewed spacecraft; deep space robotic spacecraft; geo-stationary spacecrafts; low earth orbiting short mission duration orbiters;
- The ASC will determine the set of extant standards and specifications that are relevant and should be considered in whole or in part for adoption.



POWER MANAGEMENT WORKING GROUP CHARTER

- The Power Management Working Group (PMWG) shall develop electrical, functional and software interface standards for electrical power management equipment intended for spacecraft applications.
- The PMWG shall include members from Government, industry, and academia, as appropriate, to provide technical guidance while developing technical standards and associated documents to further the interoperability and standardization of electrical power management components, modules, assemblies, and systems with specific emphasis on power telemetry. The PMWG shall establish requirements that communicate the operational state and health of the power component / module / assembly and data that provides diagnostic information.
- The PMWG shall be responsible for developing, reviewing, obtaining consensus and promoting standards and associated documents to the OASIS Steering Committee for review, ratification, and adoption.
- The PMWG may establish task oriented sub-groups to address specific topics in support of the overall PMWG charter.

SPACECRAFT SUBSYSTEM – GENERIC BLOCK DIAGRAM





BREAK – 15 MINUTES





PART THREE



PRESENTATIONS FROM SPACE AGENCIES AND PRIMES

Current Presenters

- Ferdinando/Arturo – ESA
- Brad Reed – AF SMC – Space Force
- Raphael Some – JPL
- Wes Powell – NASA GSFC
- Brenda Boritski – L3Harris
- Michael Lackey – Raytheon



PART FOUR



PRESENTATIONS FROM SPACECRAFT POWER SYSTEM AND AVIONICS DEVELOPERS

Current Presenters

- Steve Parkes – Star Dundee
- Oscar Mansilla – Renesas
- Anton Quiroz – Apogee
- Gates West – Moog
- Bill King – Micropac



PART FIVE





POSSIBLE PLACES TO CALL HOME

- AIAA
- IEEE
- VITA
- The Open Group
- CCSDS?
- SAE

EXISTING EFFORTS TO POTENTIALLY LEVERAGE

- These are examples that we can leverage. But we need to understand the specifics and how they align with our effort.
- **Important:** We will leverage, to the full extent possible, applicable existing standards that aligns with our intended goals. We will leverage existing standard with augmentation. We will create new standard where there are none that exist to achieve the goal of the effort.
- VITA 62
- NASA AMPS
- AIAA Power Standards
- International Space Power System Interoperability Standards (ISPSIS)
- SAE Space Power Standard (AS5698)
- AIAA Electrical Power Systems for Unmanned Spacecraft S-122-2007
- ESA SAVOIR



PART SIX



LET'S MAKE IT HAPPEN

Question: Do we want to start this org?

- **Vote!**

- Vote for the existence of the effort
- Vote for Committee and STC Leads

- **One vote per Organization**

- Executive Steering Committee Chair/Membership
- Architecture Standing Committee chair/Membership



EXECUTIVE STEERING COMMITTEE POST GOMAC TASKS

- Work with OC and their first cut organizational structure
- Finalize and begin to fill ASC and WGs – once structure is agreed upon
- Execute on set of goals and tasks developed from OC and GOMAC meeting
- Work with ASC to develop framework for Reference Architecture
- Determine how to handle adoption/modification of extant standards and specifications
- Develop overall roadmap



BACKUP SLIDES



PRESENTER OUTLINE

- Kickoff meeting participants will need to prepare a short presentation discussing their perspective
 - How do you see the current market and ecosystem with respect to Power?
 - What are areas of concern for you in this current market and ecosystem?
 - What is your area of interest?
 - Where do you see yourself participating?
 - Is there anything that the OC hasn't considered?
- Other options – what are you working on now?



WORKING GROUP (WG) CHARTERS

- Each approved WG is responsible for their own Charter.
- WG Charters will require approval through the Executive Steering Committee
- List of potential WGs is in development



EXECUTIVE STEERING COMMITTEE BROAD RESPONSIBILITIES

- Overall effort guidance and direction
- Charter WGs
- Ratify Specifications
- Ensure engagement
- Support and adoption by Gov't agencies and Industry



ADDITIONAL CONSIDERATIONS

Items to consider

- Business Drivers
- Quality Attributes
- Architectural Mechanisms



QUALITY ATTRIBUTES

- **Modularity** - The degree to which a system or element is composed of individually distinct physical and functional units that are loosely-coupled with well-defined interface boundaries.
- **Interoperability** - The ability of the system to provide data/information to – and accept the same from – other systems, and to use the data/information so exchanged to enable them to operate effectively together.
- **Resiliency** - The ability of a system to continue or return to normal operations in the event of some disruption or over-capacity (system saturation), natural or man-made, inadvertent or deliberate, and to be effective with graceful and detectable degradation of function.

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