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REGULATORY DATA STANDARDS

COMMITTEE CHARTER

PRESENTED BY: PPDM

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REGULATORY DATA STANDARD

BACKGROUND & OPPORTUNITY

Today's legacy of legislative and technical regulatory architecture was developed specifically to fit the needs and purposes of each region; in many cases, rules of primacy determine where regulatory authority resides. This practice allows each regulator to develop legislation tuned to the specific social, economic and environmental needs of their constituency.

Typically, a governmental authority distributes the necessary functions of approving and overseeing the complex E&P life cycle processes among one or more agencies who develop a series of technical systems for receiving, processing and managing the information that moves between themselves and industry. Over time, the cost and effort required for each agency to develop the necessary regulations, guides, forms, procedures and administrative infrastructure necessary to manage these processes becomes difficult and expensive.

At the same time, operators must address the complexities of managing applications and compliance processes for every agency in each government under whose authority they do business. Developing policies and procedures to conduct operations in each region, training staff and developing the systems to respond appropriately to each regulator is costly and time consuming.

Industry and Regulators around the world are facing the same issues. They must answer to their stakeholders in the areas of: water quality, waste management, air quality, public safety and transparency. They must increase efficiency and effectiveness and develop mechanisms to enable transparent access to information.

PROPOSAL

PPDM proposes a standing Regulatory Data Standards Committee comprised of representatives from international Regulators, Operators and Data Vendors that would come to consensus and prioritize issues in the areas of:

- Semantics – to disambiguate key terms and phrases such as Well, Log and Completion
- Quality – define what it means for data to be measurably complete, consistent and cohesive
- Data model – develop a model for storing or mapping existing information stores for the purpose of sharing information

Representatives will commit to a two year term of participation, renewable by mutual agreement. The Regulatory Data Standards Committee will use expert industry resources in these areas to determine opportunities and set relative priorities. These outcomes will be chartered workgroups in each of the outlined areas above.

CURRENT SITUATION

Technology is advancing: Drilling and production technology continue to evolve. Indeed, the evolution of drilling and completion technology has "unlocked" the potential of many "Unconventional Resources". Only recently has technology made recovery economically feasible in Oil Sands, Heavy Oil, Tight Gas, Coal Bed Methane and Shale Oil & Gas. Mechanisms that help regulators support unconventional resource plays can help all stakeholders be more efficient.

Regulators must be holistic: Furthermore, increased social pressure has highlighted the need to manage Exploration and Production activity more holistically. Globally, most regulatory agencies must now consider the impact of oil and gas in conjunction with their mandate to operate transparently, and manage the cumulative impact of industry on air and water quality, waste management, public safety and land use. Cumulative effects must be tracked regardless of source or land use, be it energy, agriculture, forestry or urban development; a holistic view of activity is critical, whether it involves one government agency or twelve.

Data helps everyone: Data is the life blood of industry; it supports operators in planning and execution of exploration and development programs, and allows regulators to ensure that operations are in compliance with regulations. It supports the development and exploitation of new regions, and sustains operational excellence in productive fields. During stakeholder interviews, many stakeholders reported that the quality, consistency and completeness of data available from regulators is a barrier to efficiency, transparency and compliance. Regulators report that data problems make their process management very difficult, particularly when data needed by one agency is received by another agency (making enforcement of expectations very difficult). Similarly, operators report that inconsistency between regulators poses challenges at all stages of the life cycle, from planning, submission, construction and operations to reclamation. Stakeholders in every sector have indicated that industry developed and accepted standards for completeness and quality of data submissions would benefit them.

Regulatory Ecosystem: Industry developed, standards based toolkit will provide software developers with the necessary foundation upon which commercial off the shelf software can be built. With multiple solutions available to choose from, the Regulator can chose the solution that requires the least amount of customization for their regulatory environment and/or their chosen technology standards.

KEY STAKEHOLDER OPPORTUNITIES

Regulators: Many regulators face challenges with aging technology, and systems that require specialized support systems. Further, many are interested in a standards based foundation that could make use of commercial off the shelf software products feasible. Industry standards developed by the PPDM Association (such as "*What is a Well?*" and the PPDM Data Model) have been designed to help industry communicate and manage data more effectively.

Operators: Many operators have developed master data stores based on the PPDM Data model. Systems that share the same data model make transferring data simpler and less prone to confusion. Pipeline standards developed by Pipeline Open Data Standards (PODS) may help support clear transfer of pipeline information between industry and regulators. Use of Open Geospatial Consortium (OGC) compliant mechanisms for managing and using spatial data are already in common use. Finally, data transfer standards such as WITSML and PRODML, developed by Energistics, may provide standard data exchange mechanisms for well site and production information.

Software Vendors: Today, many standards based software products exist and are in use by industry. Some of these can be readily adapted to regulator needs, and a standards based regulatory environment will encourage the development of more products.

Note that engagement of software vendors is out of scope for the Project, as are any related technology decisions and technology implementations.

Data Vendors: Nearly every data vendor in North America uses the PPDM Data Model as the foundation of their data delivery systems. Access to regulatory data that is in standards based format will enable data vendors to focus on value added propositions for their industry clients.

Consulting Companies: One of the many challenges regulators face from custom built environments is the lack of experts to support their systems, and the time and cost associated with any upgrades or new development. Access to a pool of consultants who have a standards based skill set will allow regulators and industry to be more efficient.

Public, Interest Groups, Non-government Organizations (NGO): Standards support the sharing of open data, reports and web interfaces for data query and business analytics across jurisdictional boundaries.

THE REGULATORY DATA STANDARDS COMMITTEE & WORK GROUPS

Regionally, a number of local efforts have been started to address issues individually. Our hope is that through international collaboration of this committee, we can support and strengthen each initiative as they move toward a collective and global approach to data standards. As issues are identified, defined and weighted by this committee, the highest priority projects will be chartered by PPDM. With Subject Matter Experts and industry funding, PPDM will launch appropriate tactical work groups. Workgroups may run simultaneously in the areas of semantics, quality and data model.
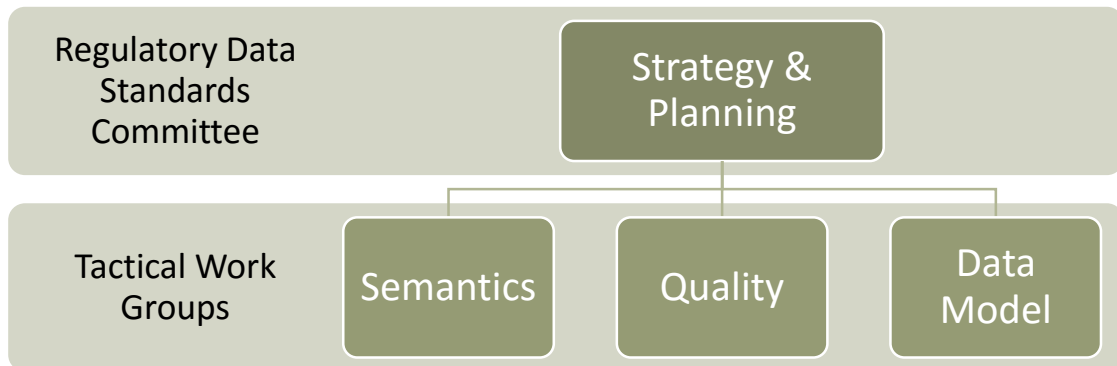
Optimal characteristics of the Regulatory Data Standards Committee have been defined as:

- Each of 12 seats will represent a PPDM Member Company.
  - Regulatory, with participants coming from different countries - 6
  - Operating Company, preferably multinational - 4
  - Data Vendor, preferably standards focused - 2
- As appropriate, participants will provide some foundational financial support.
- Average monthly individual effort requirement would be a 2 hour committee meeting and possible 1 – 5 additional hours of research/preparation.
- Each volunteer holding a seat will be available to serve a two (2) year term.

Goals and objectives of the Tactical Work Groups in the areas of semantics, quality and the data model will be dependent on the work to be completed and will be identified in the relevant Work Group Project Charter.

GUIDING PRINCIPLES

PPDM workgroups and committees must comply with the policies and procedures of the PPDM Association, as expressed in "the PPDM Way" and in procedures. Activities require PPDM Board of Directors approval prior to starting.

PPDM will not undertake tasks that are in the purview of the regulatory authority, as PPDM staff and workgroups do not have the authority or mandate to interpret legislation or regulations.

PPDM will create a series of very small, achievable deliverables that stand alone with a low dependency ratio to reduce risk.

ASSUMPTIONS

PPDM and all participants must remain in compliance with Alberta antitrust law and PPDM's anti-trust policy, and any relevant legislation such as the US Foreign Corrupt Practices Act at all times.

PPDM must not engage in activities or interpretations that are properly in the purview of the regulator.

PPDM must not assume any liability for the accuracy, implementation or use of the rules or standards that are developed. Ultimately, the final authority for determining what is and is not allowed is established by legislation and regulation.

All PPDM activities must be fully funded by industry or the regulator; this requirement conforms to the requirements of "the PPDM Way", and ensures that industry sees positive ROI for the project.

At least three legal entities must be involved with the project at all times; this is a requirement of the PPDM work group processes to ensure that its work processes are aligned with industry needs.

SCOPE

This committee will focus on how PPDM data standards can be expanded and deployed to fully support the needs of regulators. It is not intended to take on any of the regulatory or administrative functions of any regulatory agency. The scope may consist of:

Vocabulary: Semantics can cause miscommunication both within and beyond individual organizations. Many companies and agencies have developed their own internal definitions and rules. While these definitions may prove adequate within each organization, they do not resolve (and may compound) problems when a company needs to communicate effectively with other organizations (regulators, operators, partners, software/data vendors, etc.) As a baseline of common language for this project, we intend to use the 'What is a Well?'

Data Model Development: PPDM is robust for industry purposes, and supports many regulatory processes at a high level. There are gaps to be filled before this standard fully addresses regulatory requirements, including spatial, temporal, environmental and field inspection details.

Rule Base: Expand the PPDM open rules repository to support automated testing that can ensure that operations are planned and conducted in conformance with regulators before data is submitted (or operations accidentally violate regulations).

OUT OF SCOPE

Software application development is beyond the scope of this project. *We expect representatives from the vendor community to participate, because the development of a standards based framework will encourage additional software vendors to develop applications in the space.*

Data exchange specifications (such as XML) are out of scope.

COMMITTEE DELIVERABLES

The final form of this list is contingent on committee discussions.

- Recommendations and relative priorities for specific tactical initiatives, such as "What is a Completion?"
- Conceptual and strategic supporting materials, such as flowcharts
- Recommendations for support material
  - Documentation
  - Articles
- Other publications, comparable to the current PPDM portfolio of technical booklets. Communication plan and materials
  - Presentations
  - News Releases
- Communication & dialogue with other committees and the PPDM Association Board of Directors.
- The committee is responsible for creating its own mechanism for sustainment.

COST / BENEFIT ANALYSIS

Enabling the adoption of collectively developed standards and best practices such as vocabularies, rules, and life cycle centric systems that function across many jurisdictions will improve efficiencies for both industry and the regulatory agencies. Reduced training time, staff portability, and process transparency will make operations faster, more consistent and better fit for purpose by all stakeholders. . The value of the industry wide approach ensures that all stakeholders are able to achieve these benefits. The qualitative benefits include:

- improved information sharing

- improved accountability and transparency

- improved service design and delivery

- increased evidentiary reliability

- risk avoidance

- enhanced information security

- compliance with legislative and policy requirements

RISKS AND ISSUES MANAGEMENT

Risk of doing nothing / Status Quo: For some regulatory agencies, "doing nothing" is no longer an option. As more of the activity becomes "non-standard" an ever larger percentage of the applications will become "non-routine" with the associated timeframes increasing. For some Operators the long-lead time to approvals will drive them out of business. For others, capital will move to other jurisdictions.
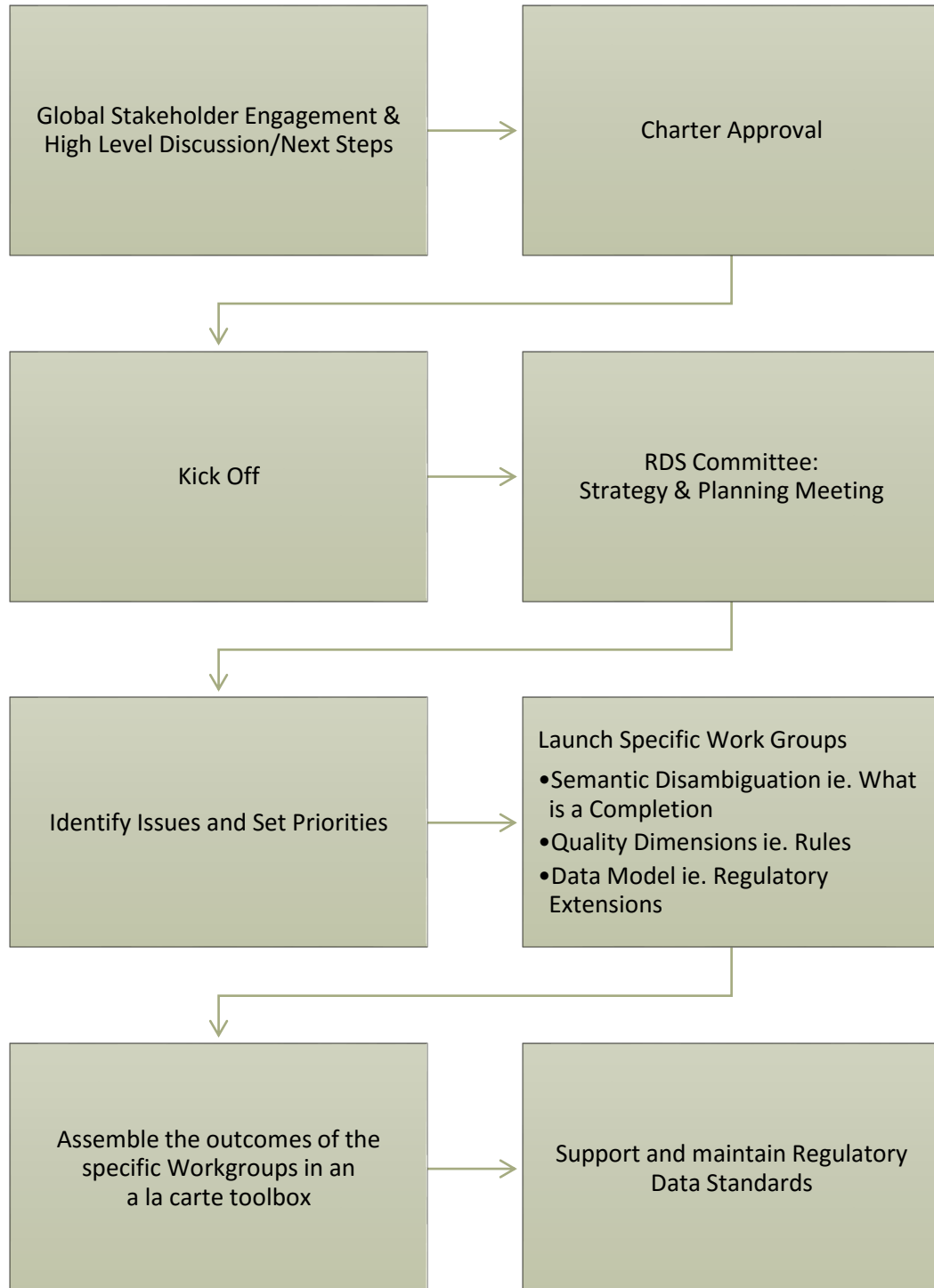
Engagement risk: It is possible that we will not be able to get all of the appropriate stakeholders to the table to move this initiative forward. It has been suggested that a minimum of 3 global participants from Industry and Regulatory Agencies be involved. Representation from the data vendor and software development community is desirable.

Adoption risk: We recognize that there are challenges in adopting standards. Appropriate supporting materials will help address many of these challenges.

Challenge	Recommendation
Standards are complex	• Create documentation and roadmaps • Provide training
Standards require commitment to realize value in long and short term.	• Standards broaden the available support base • Provide Use Cases that map standards to work flows
Value proposition needs to be clear and supported at executive levels	• Describe the benefits of solutions that are robust, scalable and durable • Highlight the value of transferable portable skills to organizations and individual • Exhibit industry leadership and vision • Include standards use in job descriptions • Establish policies that require and reward use of standards

HIGH LEVEL ACTIVITIES

Beyond the kick off, when the committee is engaged, this will be an iterative process and ongoing process.

Global Stakeholder Engagement & High Level Discussion/Next Steps	Charter Approval
Kick Off	RDS Committee: Strategy & Planning Meeting
Identify Issues and Set Priorities	Launch Specific Work Groups • Semantic Disambiguation ie. What is a Completion • Quality Dimensions ie. Rules • Data Model ie. Regulatory Extensions
Assemble the outcomes of the specific Workgroups in an a la carte toolbox	Support and maintain Regulatory Data Standards

The committee is expected to meet on a regular basis at a time that is agreeable to the global representatives. As the committee recommends workgroup, they will be chartered and launched. Once operational, each Workgroup will report to the committee on a pre-agreed basis.

APPENDIX A: STAKEHOLDER INTERESTS

The interests of the five (5) major stakeholders that would be further evaluated through this committee and associated work groups:

Regulators:

Accountability	Challenge	Opportunity / Benefit
Manage resource development holistically and transparently. Consider the cumulative impact from all industries.	Many aging systems that are managed by agencies who may not have strong lines of internal communication or integration with each other. Integration and custom development is very expensive and difficult to maintain.	Develop an integrated "master information model" that can support information that can be shared between agencies.
Ensure that data provided by operators (which later cycles back to new operators to encourage economic development) is trusted and fit for purpose.	The definition of "fit for purpose" is highly variable between regulators (and even agencies) and operators, making it difficult to develop systems that can accommodate everyone's expectations.	Develop an industry accepted definition of what "good" data looks like and what can make submissions "fit for the life cycle" to meet the needs of many stakeholders.
Regulators must operate with transparency, and must allow key information to be moved between agencies in ways that support every key process in every agency, regardless of which agency collects or manages the information.	Multiple data sources with different definitions makes use and sharing of data very difficult. Data expectations in one agency may not be considered by a receiving agency, resulting in process risks.	Regulatory data standards will improve the quality and use of data and enable scientific validity in representing information.
Support the needs of industry technological advancements while managing the needs of their constituency.	Technology is advancing swiftly, resulting in short term "patches" to existing systems, point solutions and increased dependency on customization.	Develop an environment in which a standards based foundation results in a large pool of software products and consulting experts to support regulatory needs.
Ensure that regulatory communications and expectations are clear and unambiguous to all stakeholders.	The consequence of isolated development has resulted in key vocabulary terms being used inconsistently and inappropriately. "Self-defining" terms such as "well", "completion", and even "oil" are inconsistently used. Terms essential to business analytics are undefined, resulting in	Develop a standard vocabulary of key terms that will help all stakeholders share information with each other. Even if these terms are not used by all, they can serve as a "Rosetta Stone" for translation.

| | challenges developing multi-regional competitor analysis. | |

Operators:

Accountability	Challenge	Opportunity / Benefit
Operators have an accountability to operate efficiently and provide a return on investment to stakeholders. Incremental improvements in efficiencies can make the difference between making a prospect or company viable or not.	Every operator deals with multiple agencies within jurisdictions there are multiple partners, multiple service providers. Identifying the requirements and making them measurable and objective is difficult. A mechanism for identifying the baseline that is common.	The opportunity to reduce the risk and time of going from planning to approval by making as much of the process objective, accessible and transparent through the creation of measurable and atomic data rules that are publicly available.
Ensure that data provided to regulators through regulatory compliance processes is complete, consistent and fit for purpose when the data cycles back to industry to facilitate development.	The definition of "fit for purpose" is highly variable between regulators (and even agencies) and operators, making it difficult to develop systems that can accommodate everyone's expectations.	Develop an industry accepted definition of what "good" data looks like and what can make submissions "fit for the life cycle" to meet the needs of many stakeholders.
Operators must manage their liability and risk exposure by ensuring unambiguous communications between stakeholders internally and externally.	Vocabularies used by stakeholders are inconsistent and in need of disambiguation. Even commonly used words such as well, completion, oil and spud date have highly variable, but often undocumented definitions.	Build on existing PPDM semantic vocabularies (What Is A Well?) to support unambiguous communication.
Operators must ensure that their data assets are portable and accessible by all internal and external stakeholders (and their supporting systems) while maintaining their integrity and trustworthiness.	As data moves from one system to another there is loss of content and fidelity, making data unfit for purpose or untrusted. Corporate data systems that are tuned to the business are less susceptible to these problems than individual application centric systems.	Build on the existing PPDM master data management model to fully accommodate the information most important to the stakeholders.
Operators must abide by their own corporate standards and governance policies and those of the jurisdiction(s) in which they operate.	Sometimes there is disconnect between these expectations, forcing the operator to make difficult choices. In some cases an operator may choose not to operate in a region rather than	Provide all industry stakeholders the opportunity to participate in and leverage industry set expectations about 'good data and information'.

accept the risk of following lower standards.	

Data Vendors:

Accountability	Challenge	Opportunity / Benefit
Provide high quality, integrated and harmonized information sourced from many regulatory agencies.	Every regulatory agency has highly customized solutions using variable vocabularies, data stores and access methods. Collecting the data is time consuming and labor intensive.	Harmonized or mapped vocabularies, documented business rules and a common data model will support and facilitate these processes.
Data quality: Context, conformity, consistency, cohesion and completeness are expected by customers, regardless of the nature of the source.	The vendor is spending time creating the foundation to which they can add value.	Having a baseline standard frees time for the vendor to focus on higher value add activities.

Software Vendors:

Accountability	Challenge	Opportunity / Benefit
Provide software solutions to customers that provide value and generate revenue through scale-able distribution and support.	Most regulators use custom built or highly customized software to meet their needs. Perception is that it is not possible to build plug and play software for regulators economically.	An integrated, standardized view of regulatory business rules and data will create an opportunity for vendors to provide solutions consistent across multiple jurisdictions.
Provide solutions are adaptable and can evolve as technology and regulation change.	Multiple versions of multiple products are costly and difficult to maintain.	Standards based products are robust and flexible supporting the needs of the global community.

Public, Interest Groups, Non-government Organizations (NGO):

Accountability	Challenge	Opportunity / Benefit
Keep informed of industry activities that affect them.	Multiple sources of data and inconsistency of vocabulary and granularity limits transparency.	An integrated, standardized view of regulatory business rules and data will provide a consistent transparent environment.

Represent their interests to other stakeholders.	Multiple versions and multiple data sources provide conflicting and challenging data which is difficult to interpret.	Standardized information will provide improved holistic data quality and consistency.
The interests and operations are not limited by geopolitical boundaries.	Multiple sources of data and inconsistency of vocabulary and granularity limits or makes data integration and holistic representation difficult.	An integrated, standardized view of regulatory business rules and data will provide a consistent transparent environment.

APPENDIX B: RESPONSIBILITIES

PPDM BOARD OF DIRECTORS	Approve charter and budget for project activities Final approval for release of products to membership or industry as required by the board. Option to provide representatives into any work group if deemed necessary by Board of Directors. This representative has no special authority, but may represent the objectives of the Board to the work group.
PPDM CEO	Develop business plan, and integrate project plans into overall objectives of the PPDM Association Overall PPDM Association budget, including project budget administration. Recruit funds for project funding Approve final product submissions.
PROJECT SPONSORS	Recruit and Provide funds to conduct project Approve project charter for submission to the board Assist with business priorities and technical direction Provide technical resources as required
PPDM SENIOR PROJECT MANAGER	Coordinate all technical work groups and projects. Coordinate PPDM staffing, logistics and facilitation as needed. Project planning and project management. Ensure integration of work among PPDM activities. Coordinate testing and product release Guide works groups, ensures deliverables are generated.
CHAIRS AND CO-CHAIRS	Work with PPDM resources to plan work activities, develop agendas and schedules, and ensure that high quality deliverables are created Work with PPDM resources to identify and mitigate risks Ensure that appropriate industry resources participate in the work
PPDM TECHNICAL SPECIALIST(S)	Ensure adherence to appropriate standards Technical recommendations and advice Technical product development
COMMITTEE	Provide knowledge of business and technical requirements Complete action items and attend meetings as necessary

APPENDIX C: AUTHORITY LEVELS

BOARD OF DIRECTORS	Approve charter and budget
	Final approval of products for production release
	At risk projects may be halted by the board
CEO	Overall PPDM Budget, including project budget administration.
	Projects that are "at risk" may be halted by the CEO pending risk analysis and mitigation
	Contingent on funding, obtain and manage appropriate resources to complete project work.
	Final approval of deliverables
	Harmonization of work with other initiatives within or outside PPDM
PROJECT SPONSORS	Provide project funding
	Provide business priorities and technical direction
	Projects that are "at risk" may be halted and escalated to the CEO for review
WORK GROUP CHAIRS AND CO-CHAIRS	Recommend schedule and deliverables support
PPDM SENIOR PROJECT MANAGER	Budget reporting to project sponsors
	Final scheduling and deliverables decisions
	Recommend expenditures for project funds
	Ensure compliance with PPDM requirements