

MIMOSA – OpenO&M™ and ISO 15926

An Operations and Maintenance Perspective on Interoperability

POSC Caesar Association Meeting

October 21, 2010

Kuala Lumpur, Malaysia

Alan Johnston
OpenO&M Initiative Chair
MIMOSA President



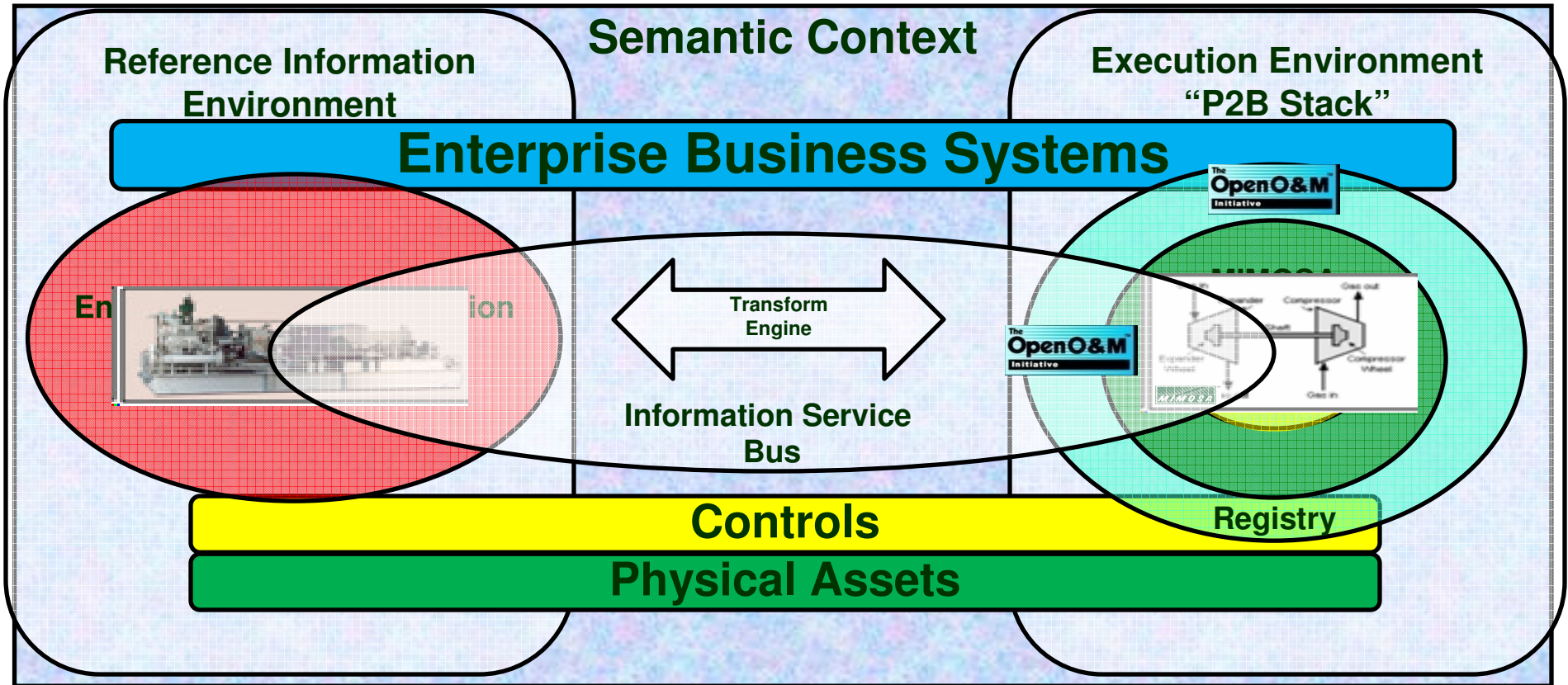
Presentation Outline

- Context
- What are the problems?
- Differing perspectives on interoperability (Capital Projects vs O&M)
- A solution path based on collaboration



Context for Collaboration

The Safe Technology Roadmap™ for Interoperability



Interoperability and Standardization are Foundational to Advances in Productivity

- Standardization has provided many of the major productivity breakthroughs throughout human history
- This process began with language formation followed by weights and measures
- In the industrial age, standardization and interoperability for parts of mechanized devices (firearms, automobiles...) led to huge productivity gains
- The process has worked its way through most areas of manufacturing
- The implications of standardization and interoperability for Operations and Maintenance (O&M) have been just as profound as for manufacturing
- Information architecture and information itself have become increasingly large and critical portions of the deliverables associated with plants, platforms and facilities
- Major productivity gains depend on transitioning to an interoperable, componentized architecture with shared supplier neutral, industry information models, information and utility services

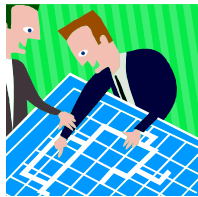


Core Problem to Overcome

Lack of Interoperability Between Key People, Processes and Systems



Engineering Systems



Proprietary Enterprise Business Systems

Proprietary Middleware

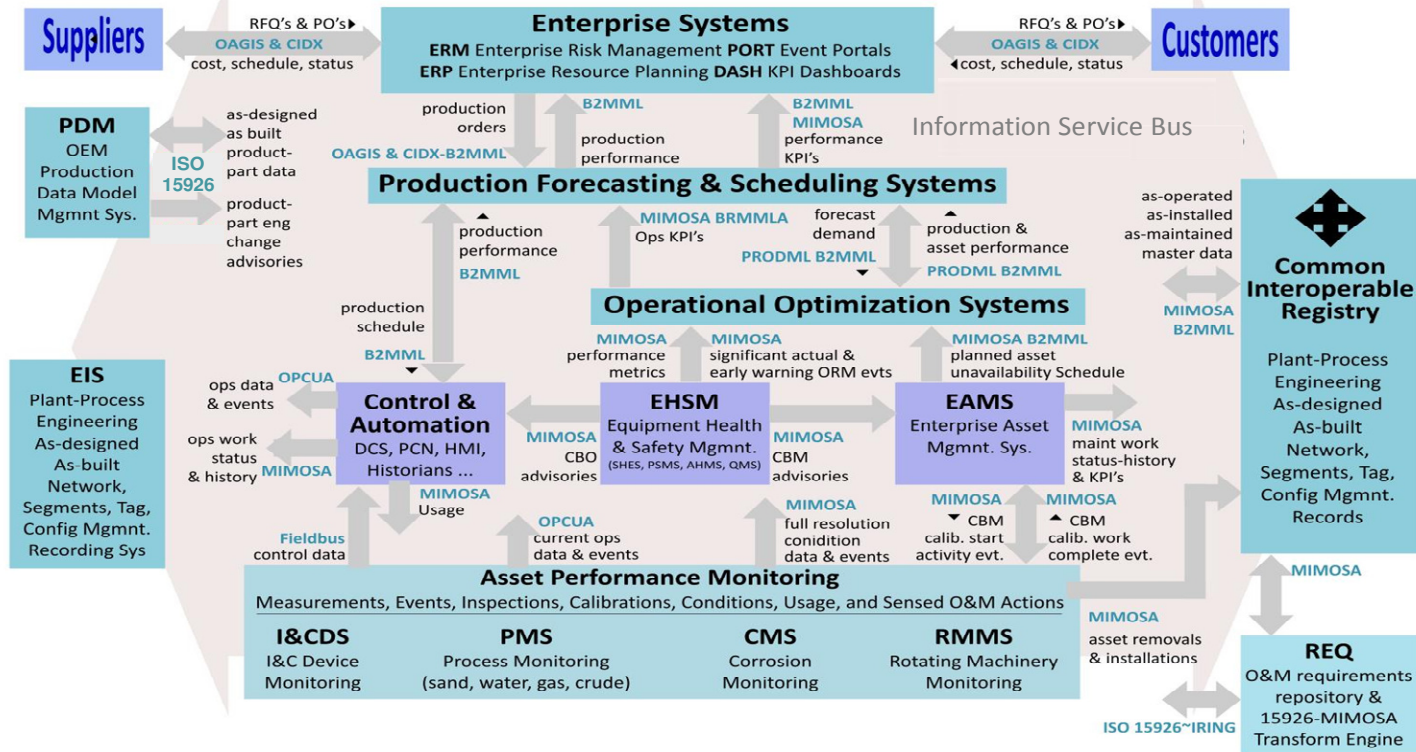
Proprietary Automation Systems

A Critical Paradigm Shift

- A new industry solutions business model where systems of systems interoperate based on open, supplier neutral standards
 - ✓ Shared, supplier neutral industry information models
 - ✓ Shared industry information plus confidential owner/operator specific information
 - ✓ Shared, supplier neutral industry utility services (SOA-2) driven by industry use cases, with the ability to be validated by 3rd parties
- Shared industry information models, all required industry and enterprise information (including all required O&M information) and shared industry utility services **delivered as part of the EPC process and sustained through Life-cycle Management of Change.**



Oil & Gas Use Cases

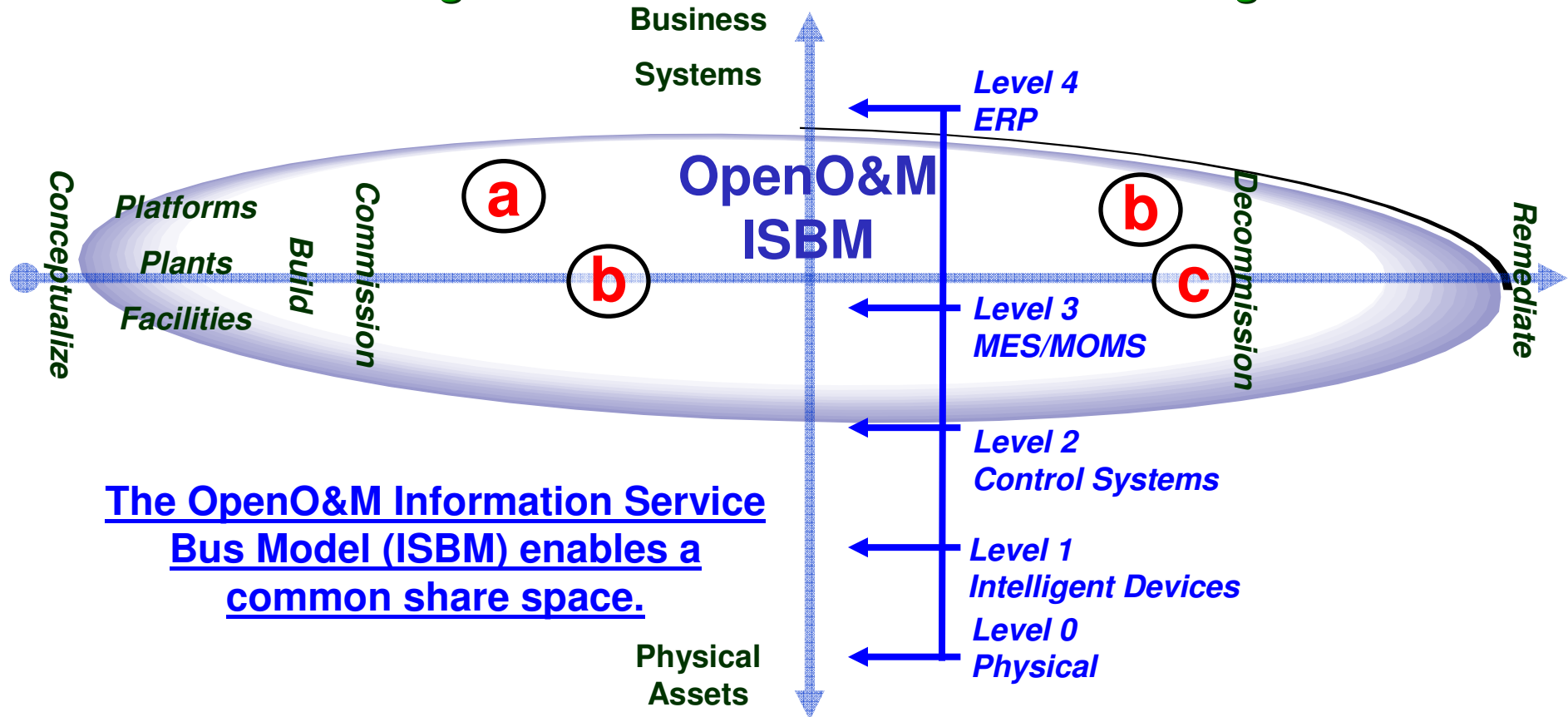


Prime Objective:
Sustainable Interoperability for People, Processes and Systems in the P2B stack

Methodology
OpenO&M Use Cases are developed with the owner/operator community with a focus on practical, experience-based functional requirements.

The OpenO&M Use Cases are mapped to the Systems and Scenarios and then to the standards supporting the required data flows.

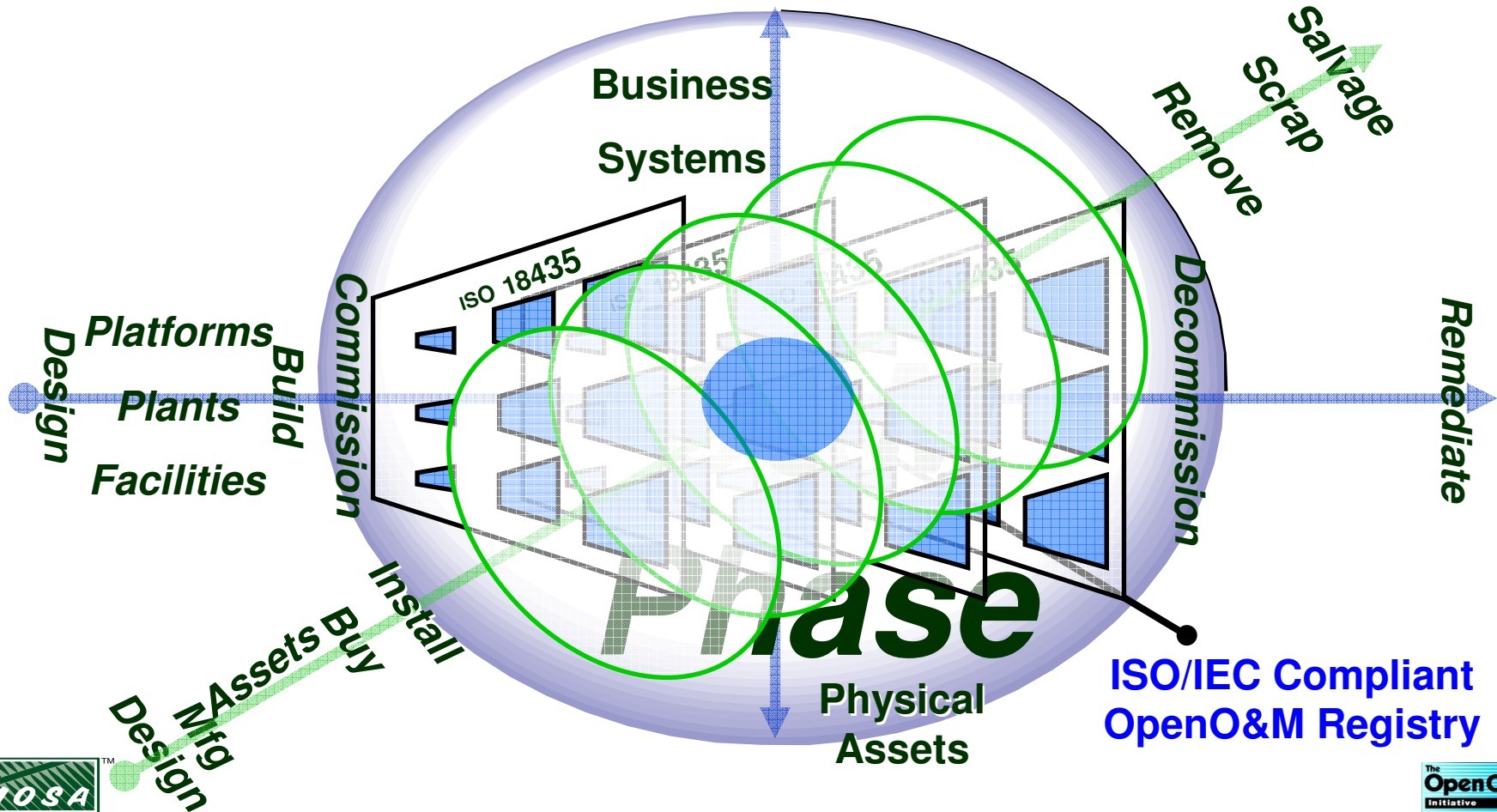
The need for an open Information Service Bus (ESB Neutral) enabling safe and secure information exchanges



The OpenO&M Information Service Bus Model (ISBM) enables a common share space.

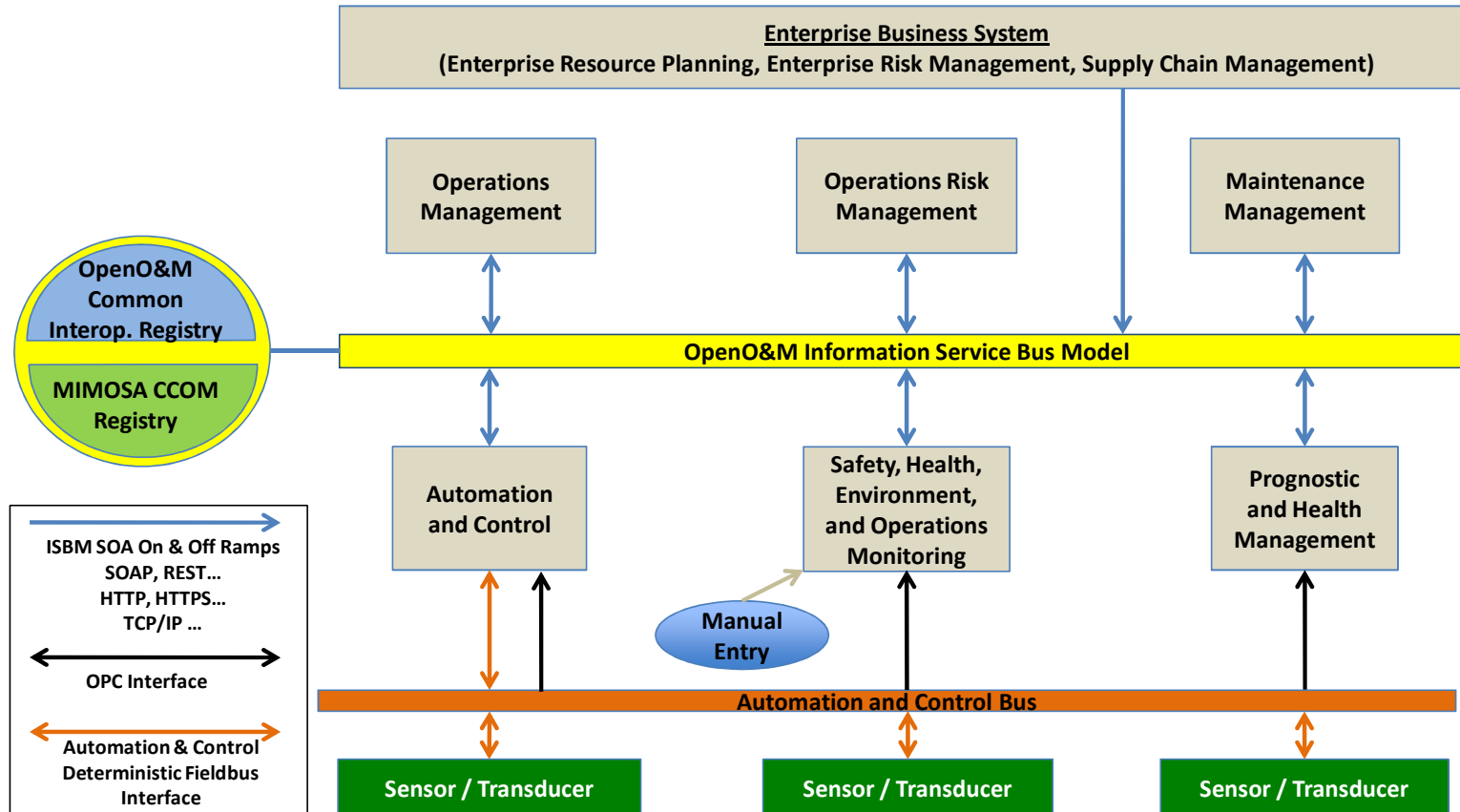


Life-cycle Management of Change (Simplified By Removing In-process Supply Chain Axis)



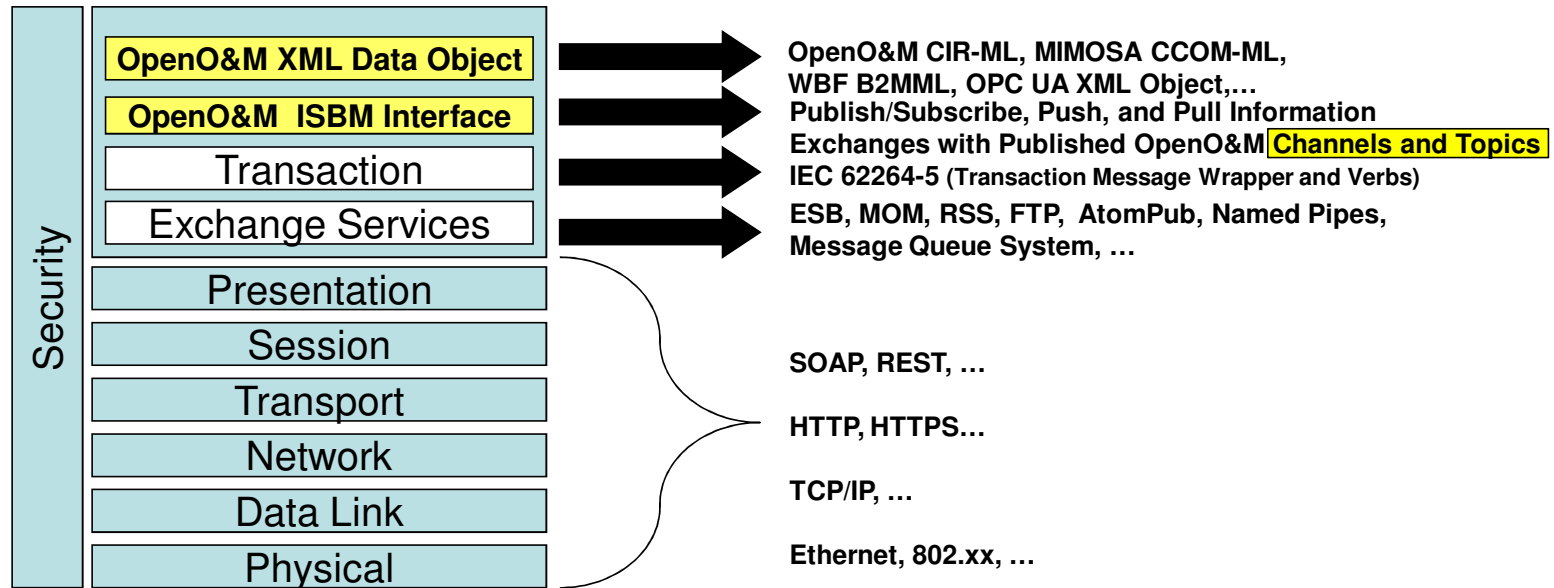
Second Generation SOA – Information Bus

The Execution Environment



The IT Stack for Second Generation SOA

Building On the Past, Enabling the Future information Bus Architecture



Channels – ISO 18435 Domains

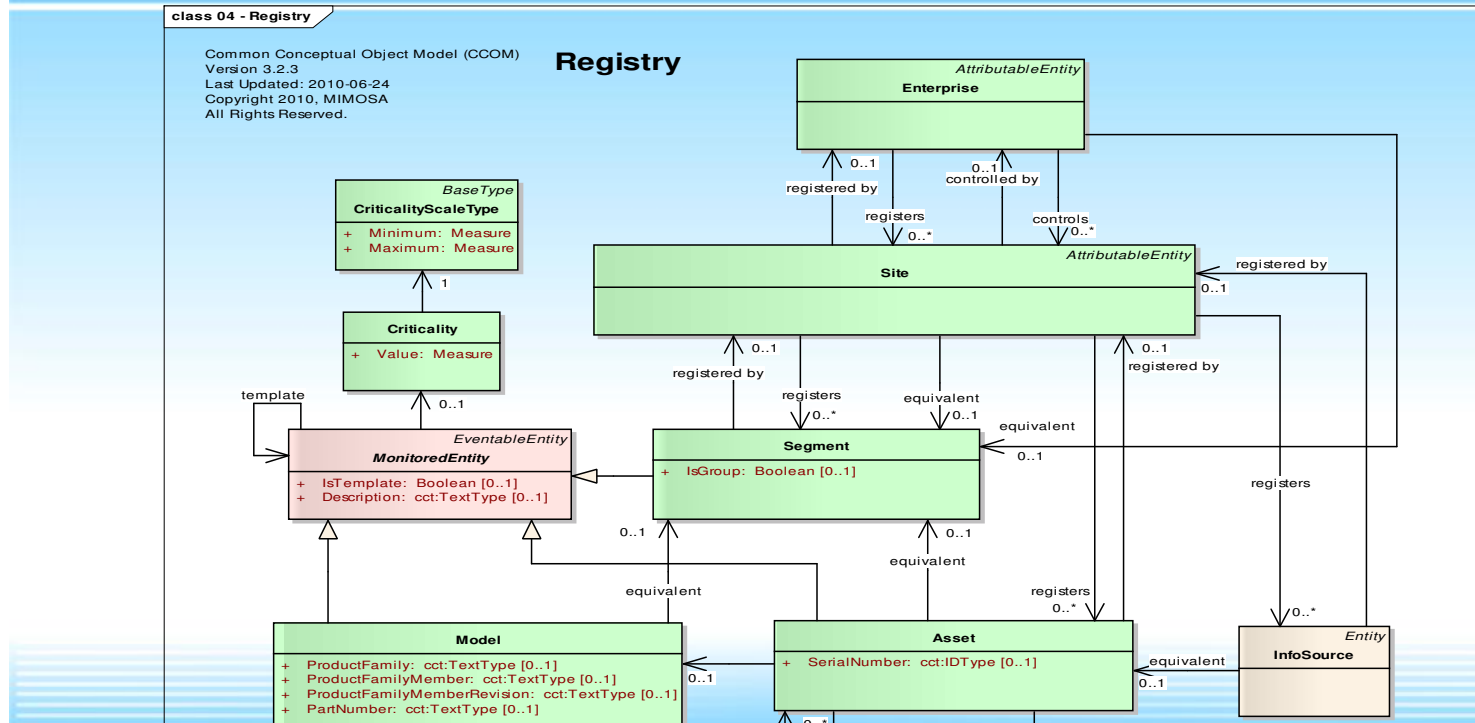
Topics – MIMOSA CCOM Objects (UML)



MIMOSA CCOM UML Version 3.2.3 Sample



MIMOSA Open Systems Architecture for Enterprise Application Integration (OSA-EAI) Common Conceptual Object Model





ISO TC184

Oil and Gas asset management operations and maintenance Interoperability (OGI) Technical Specification Proposal

Nils Sandsmark and Alan T. Johnston
Co-Chairs

ISO TC 184 Plenary
May 4, 2010
Rosslyn, VA
ISO TC184



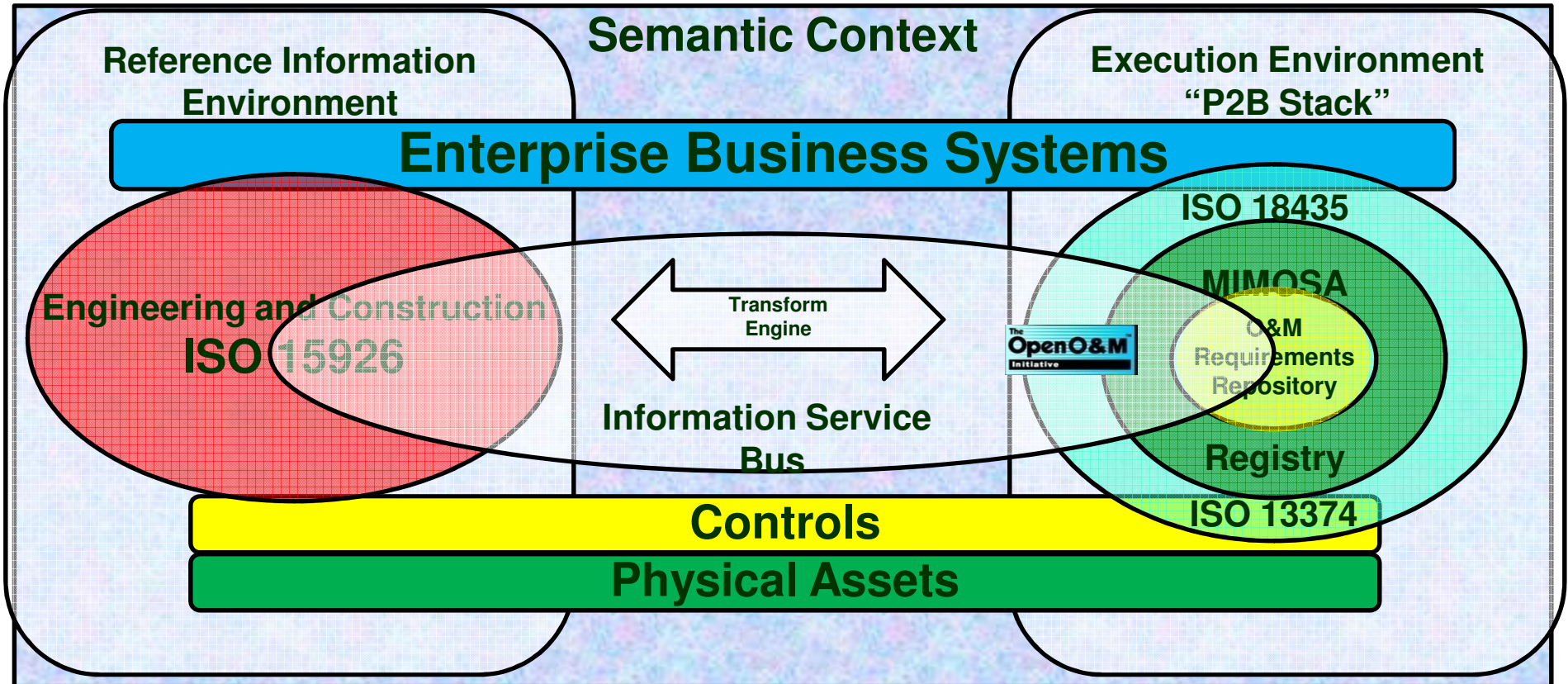
Problem and Opportunity

- Currently, most major Oil and Gas companies operate in a relatively siloed fashion.
 - ✓ Lines of Business
 - Upstream - Exploration/Drilling/Production/Well Management/Mining /Separation (Oil Sands)
 - Downstream - Upgrading/Refining
 - Trading
 - Pipelines/Distribution
 - ✓ Functional/Departmental
 - Capital Projects
 - Enterprise Business Systems
 - Enterprise IT
 - Automation and Controls
- They desire to shift to an environment where people processes and systems interoperate in a comprehensive and sustainable way.
 - ✓ Suppliers tend to be organized to support the existing silos
 - ✓ Standards have been developed reflecting these same points-of-view and they are distributed over many ISO Committees and industry standards organizations
 - ✓ Frequently, all of the points-of-view are legitimate
 - ✓ The multiple points-of-view need to be brought together in a mutually respectful manner

ISO TC 184



Context for Collaboration





Some Relevant ISO Related Activities

ISO TC 67
Materials, equipment
and offshore structures
for petroleum,
petrochemical and
natural gas industries

ISO TC 108
Mechanical vibration
and shock

ISO TC 184
Industrial automation systems and integration

SC5
Condition monitoring and
diagnostics of machines

SC4
Industrial Data

SC5
Architecture, communications
and integration frameworks

ISO 14224
Petroleum, petrochemical and
natural gas industries --
Collection and exchange of
reliability and maintenance
data for equipment

ISO 13374
MIMOSA OSA-CBM
WG6
Formats and methods for
communicating, presenting and
displaying relevant information
and data

**15926- Data for Process
Industries**
**10303-Product data
representation and exchange**
STEP/PLCS
OASIS
*Collaborating on the deployment of an
international standard for product
data exchange (ISO 10303)*

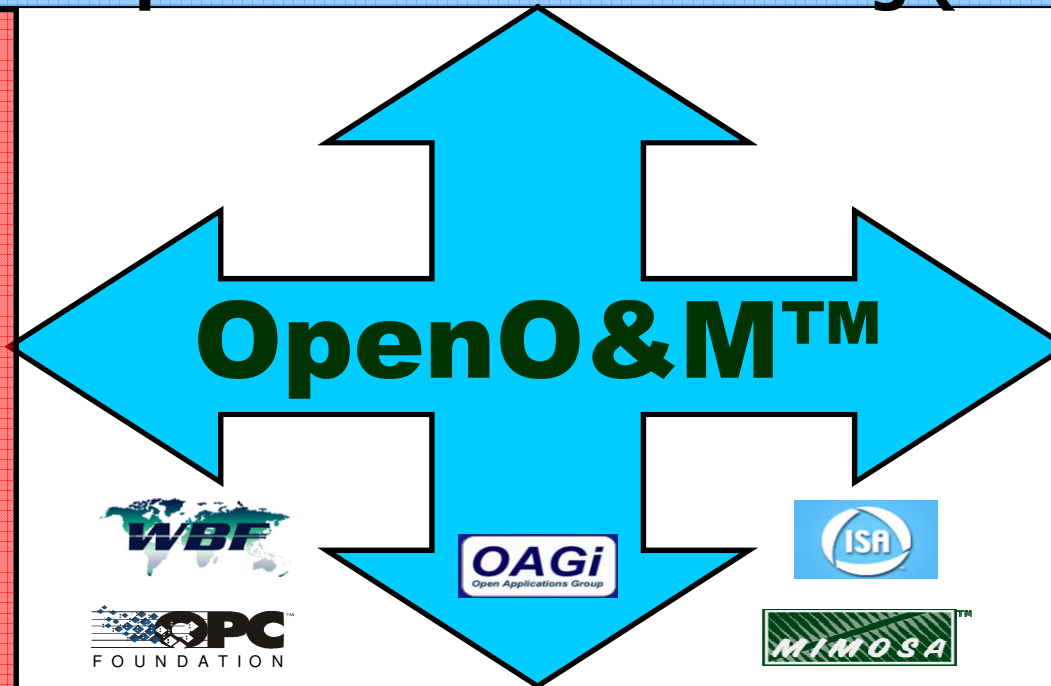
ISO 18435
MIMOSA OSA-EAI
WG7
Diagnostic and maintenance
applications integration



The OpenO&M™ Initiative Enabling Open Standards-based O&M Interoperability

Enterprise Business Systems
Enterprise Resource Planning (ERP)

Operations



Maintenance

Physical Asset Control
Real-time Systems



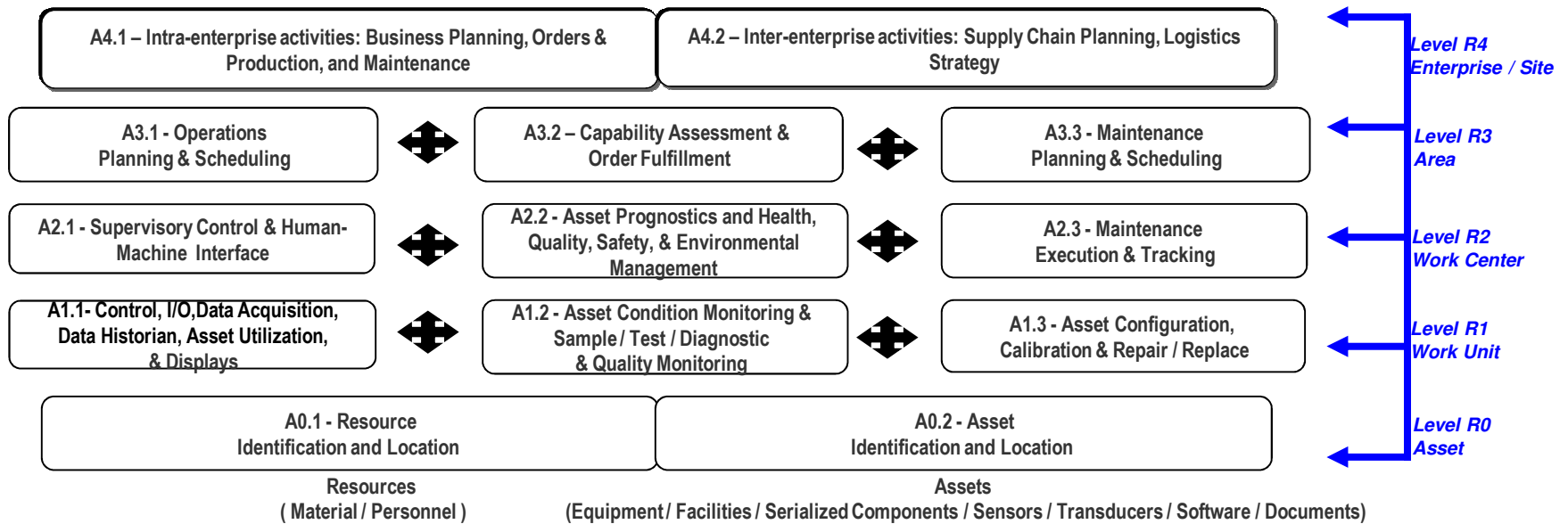


ISO 18435 - 1

Application Domain Integration Diagram



Application Domain Integration Diagram



ISO TC184



Conclusions and Recommendations

- MIMOSA/OpenO&M, FIATECH, POSC Caesar and CIEAM have begun an interdisciplinary based collaboration in support of asset management
 - CIEAM (which is chaired by the TC108 SC5 Chair) has approved using the combination of ISO 15926 and OpenO&M as its preferred standards.
 - CEAM (which is the global alliance for EAM) has approved the same approach.
- Nils Sandsmark (POSC Caesar, TC184 SC4) and Alan Johnston (MIMOSA, TC184 SC5) Propose an ISO TC184 Project
 - Focused on Oil and Gas, Chemical, Petrochemical Industry
 - Based on expressed interest of this community
 - Consequences of failure versus for discreet manufacturers – Baker Report (Risk Management)
 - To further develop and pilot the collaborative approach for enabling improved asset management integration and more sustainable O&M interoperability
- SC5 Approved a Resolution for this at the SC5 Plenary in Paris April 24, 2009
- Major owner/operators, key suppliers and multiple industry standards organizations are already engaged in this solutions-focused effort to specify how to achieve sustainable interoperability
- We believe it is appropriate to organize a TS effort at the TC level in order to help bring everyone together.

ISO TC 184



Task Force Result Global Collaboration

- MIMOSA/OpenO&M
- FIATECH
- POSC Caesar
- Center for Integrated Engineering Asset Management (CIEAM)



MIMOSA/OpenO&M, FIATECH, POSC Caesar and the CIEAM have begun collaboration on a global basis to foster improved approaches to open standards-based interoperability for asset management through an industry-use case driven solutions process.
ISO TC 184



IBM

Invitation

Offshore Oil Executive Briefing
 September 15, 2010
 5:30 pm - 8:50 pm

Houston Museum of Natural Science
 Cockrell Butterfly Center Lobby
 5555 Hermann Circle Drive
 Houston, TX 77030

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Smarter Oil & Gas 

IBM cordially invites you to join offshore oil industry executives at an exclusive dinner briefing, *Charting a Solution Path through Emerging Offshore Oil Industry and Regulatory Imperatives*.

Featuring keynotes by:

- **Dr. Lee Hunt**, Chief Executive, International Association of Drilling Contractors (IADC)
- **Rear Admiral Mary Landry**, United States Coast Guard Commander, Eighth Coast Guard District
- **Dr. Thore Langeland**, Manager Integrated Operations, Norwegian Oil Industry Association (OLF)

There will also be a panel discussion featuring owner-operators.

The briefing will explore:

- Key implications for the offshore oil industry
- Regulatory corporate compliance and risk management to reduce human factors on critical safety environmental processes
- An Integrated Operations and Maintenance approach to business and operational process management

For more information, please contact Debra Miller Fleischer at 720-395-6685 or debra@us.ibm.com.

Free parking. Enter from the parking garage on the 1st floor, go through the gift shop (closed to the public), take a right to Grand Hall.

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Recent Oil and Gas Industry Upstream Event Held In Houston

Keynote Speakers

Dr. Lee Hunt – President IADC
USCG Rear Admiral Landry
Dr. Thore Langeland – Manager IO, OLF

Theme

It is a small, interconnected world and we need to collaborate to develop and deploy the needed solutions.

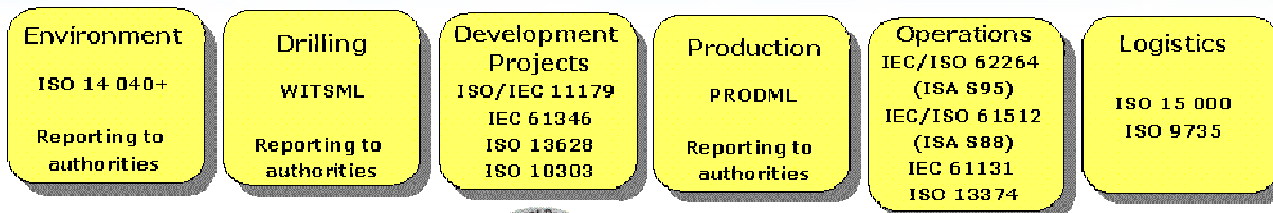
Integrated Operations reduce risks and improve productivity

Dr. Thore Langeland
Manager IO, OLF
September 15, 2010

**Dr. Thore Langeland
Presentation
Selected Slides**



PCA collaborates globally on the oil and gas ontology



Data integration based on ISO 15926 for creating an Oil and Gas Ontology (OGO)



<http://www.posccaesar.com/>



Collaboration between standards organizations is key if we are to enable pragmatic industry solutions where interoperability is fully based on standards.

A Proposed Solution Path Working Together Globally for Common Benefit

Regulation

When possible, industry and government should work together to refine and enhance existing international regulations (such as those developed by the International Maritime Organization) to meet the challenges posed by energy exploration, drilling and production, rather than creating new and potentially conflicting regulations.

**Programs
and
Research Projects**

IO
2005

IOM-OG
2010
CBM, EAM

IOHN
2011
Common Architecture for Drilling
and Production

Technology

New Technology will help us implement these regulations in practical ways to achieve the needed gains in productivity and risk management. Transparency and timeliness of information availability on-shore should be substantial foci as this will naturally tend to result in better management.

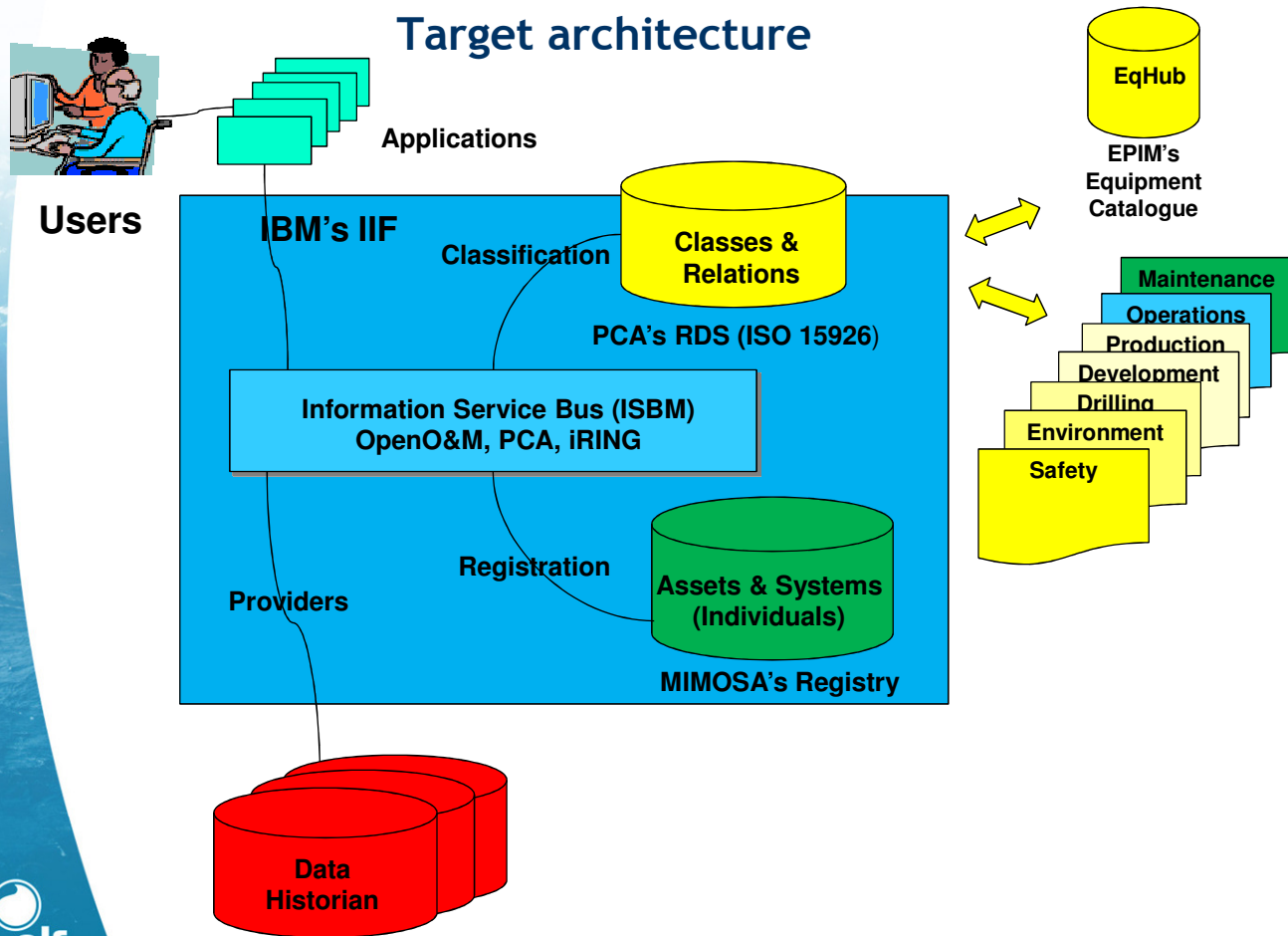
IO Continues To Move Forward

**Maintenance is now
being explicitly added to
enable IOM-OG**

**The IOHN project is now
developing O&M use
cases with a common
information architecture
including both Drilling
and Production**



Target architecture



A Comprehensive Architecture for Sustainable, Risk Managed, Standards-based Interoperability

Includes:
Capital Projects
Operations
Maintenance
Life-cycle Engineering

Conclusion

- We are making significant progress in solving real industry problems through broad, interdisciplinary collaboration
- The OpenO&M Initiative has established strong credentials as an enabler of industry solutions with owner/operator leadership and supplier support
- We hope you will join this important activity and support our collaborative efforts

Further information about OpenO&M and MIMOSA
is available on the MIMOSA website at

www.mimosa.org

