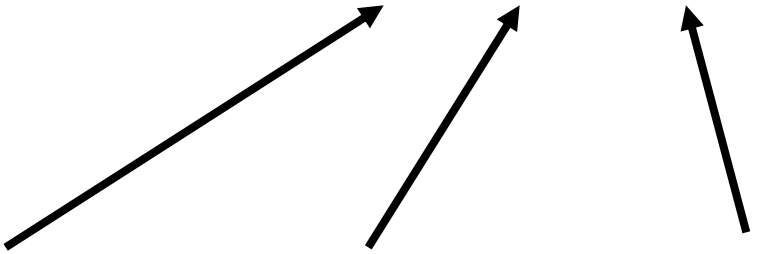
Observer View
Control Representation Look Measure Scaleman Signboard Options
ISO 15926 and
interoperability
using XMpLant technology
Adrian Laud
Noumenon Consulting Ltd – PCA Oct 2009
Kuala Lumpur
Start

Why ISO 15926 ?

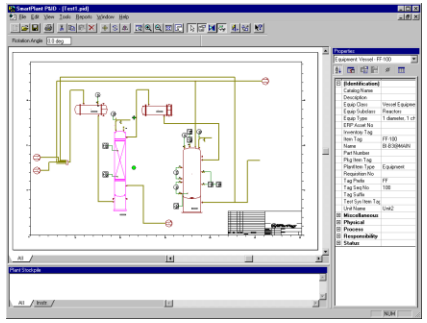


To date to create the standard

Last year and ISO 15926

- Last year several new vendors committed to ISO 15926 interfaces for their products
- Competing vendors collaborated and demonstrated exchange – Apr 2009
- XMpLant technology used in interfaces
- Camelot demonstrated iRING - Apr 2009
- New FIATECH / PCA projects planned

Proteus Project: Results



P&ID to 3D: Matrix 3

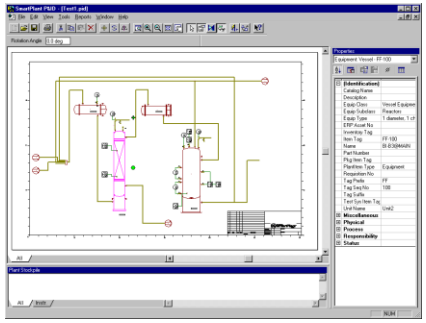
✓Achieved

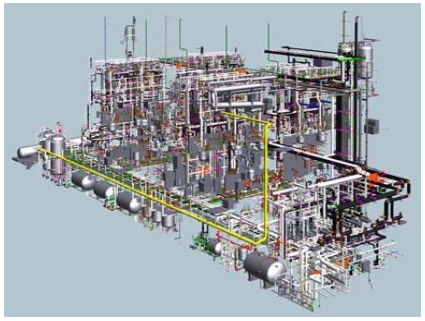
P&ID to P&ID:
Matrix 1

✓Achieved

3D to 3D:
Matrix 2

✓Achieved





- On specification
- On time
- On (the vendors' own) budget

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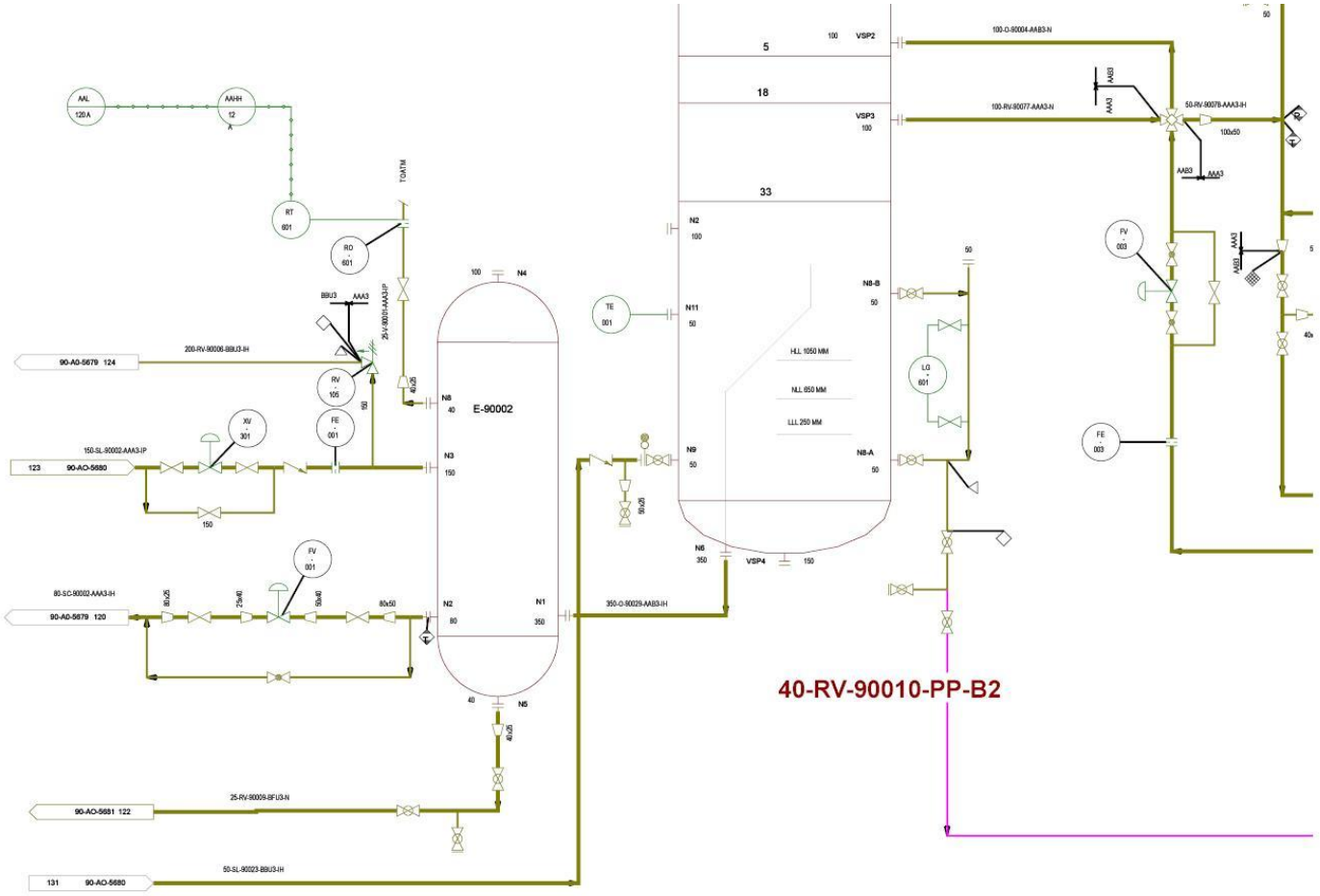
P&ID (SVG) from XML



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Vendors and ISO 15926

- AceCAD
- **Aspentech**
- Autodesk
- **AVEVA**
- Bentley
- Cadmatics
- CCC
- COADE
- Comos
- **Dassault Systemes**
- IBM
- **Intergraph**
- INOVx
- Invensys
- **Noumenon**
- **Octaga**
- VRContext

XMpLant and ISO 15926

- ISO 15926 RDL defines classes
- XMpLant Schema uses these classes
- Schema also defines the structure
- Schema defines ISO 15926 Dictionary compliant XML exchange files
- XMpLant technology is a Deployment tool for ISO 15926

XMpLant technology in use today

- 80 major commercial projects are using it successfully today
- Operations use of Engineering information
- Exchange of designs between systems
- Proving the model for commercial projects

XMpLant usage

Access to intelligent Engineering information in Operations

- Tens of thousands of P&IDs
- Tens of thousands of ISOs
- Tens of thousands of 3D models

XMpLant usage

Exchange of intelligent Engineering information between systems

- Over 20 successful conversion projects
- Many thousands of Catalogue components
- Hundreds of Specifications

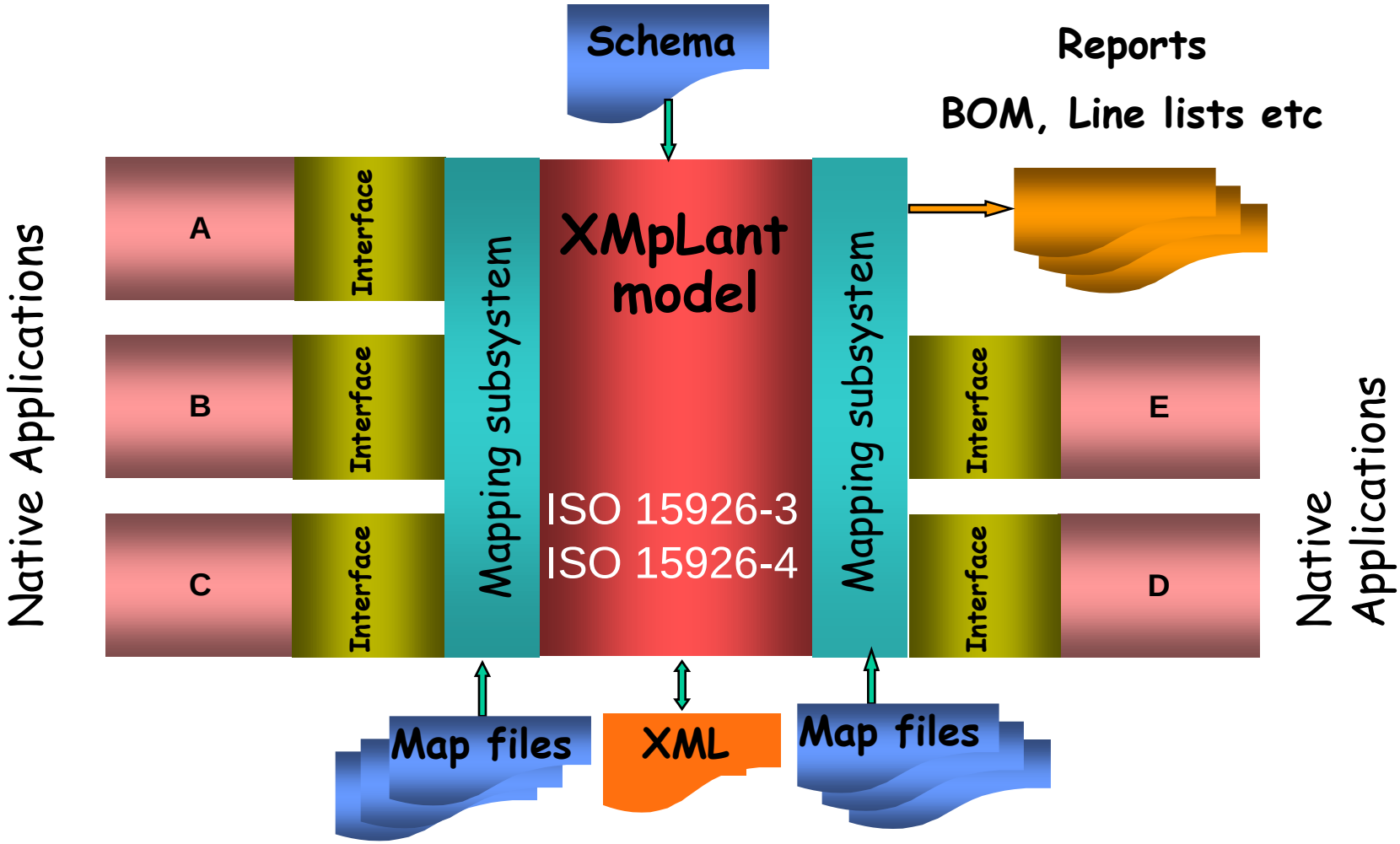
XMpLant technology

- Tool for interoperability
- Powerful Rule based mapping subsystem
- XMpDE – core development environment – data driven (Schema and mapping files)
- Enables new applications to be written working on the ISO 15926 model

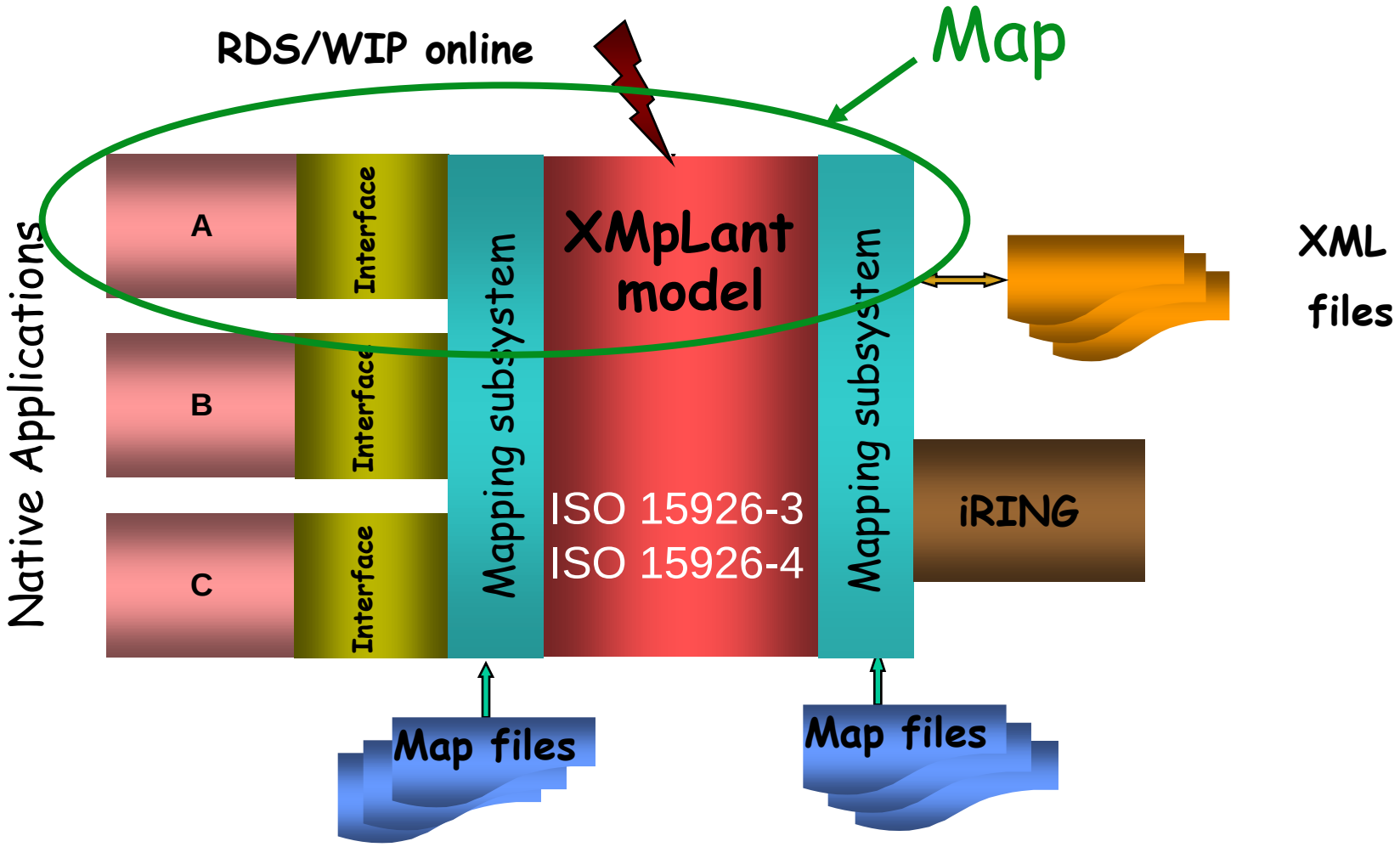
Scope

- The full engineering information model
- Intelligent 2D drawings (P&ID's etc)
- Intelligent 3D models - all disciplines
- Catalogues and Specifications
- Engineering reports - BOM, Line Lists, Datasheets
- Model merge and split
- Concurrent access to multiple models

XMpLant Overview



XMpLant and conformance



XMpLant Projects

- 1999 – First deployed for PDS to CADDS5
- 2001 – Schema in public domain
- 2003 - First AVEVA VNET deployment
- 2004 – Catalogue and Specification conversion

- Today
  - Schema aligned with ISO 15926-4
  - 10 vendors using XMpLant technology / Schema
    - Including AVEVA, Bentley and Intergraph
  - 240 + subscribing to the Schema
  - 20 successful conversion projects and several pilots
  - ~60 installations of VNET and many pilots

XMpLant interfaces

- 20 read interfaces - Import to XMpLant
- 12 write interfaces – Export from XMpLant

- New ones in development for native systems

- ISO 15926 Dictionary compliant XML files
- ISO 15926 iRING – in development

- Prototype read interface for IFC's (buildings)
- Interfaces for other standards - planned

Mapping sub-system

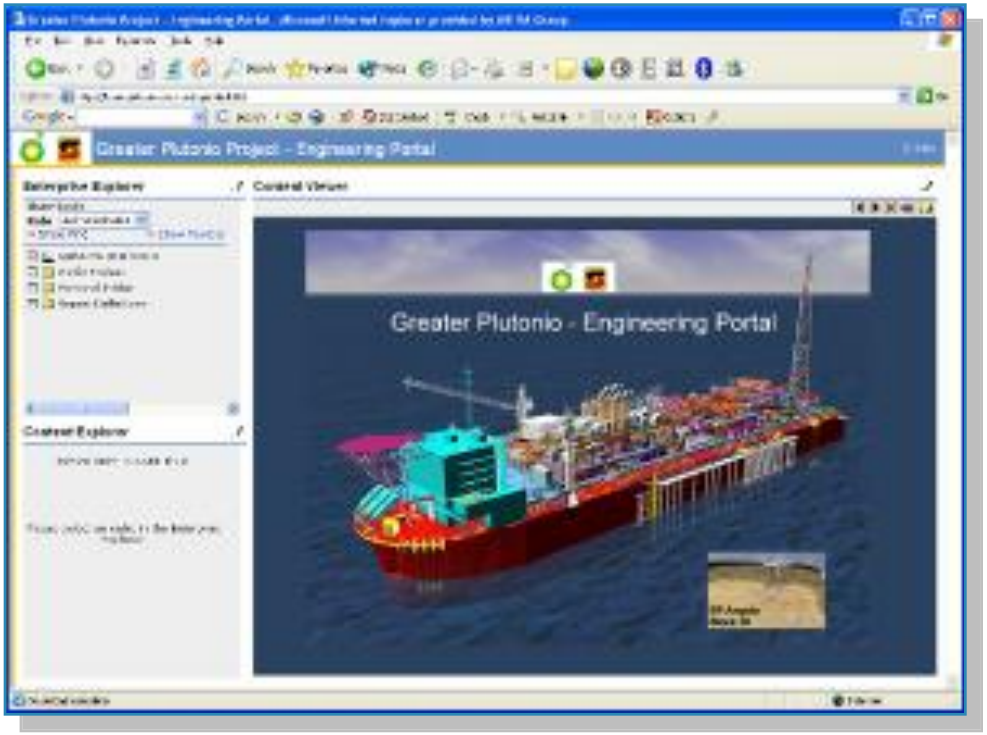
- ***Core tool*** for the data driven environment
- ***Rule based*** with powerful facilities

- ***Name*** and ***Value*** mapping
- Substring processing, evaluations
- Format ***conversion***, ***splitting***, ***concatenation***
- ***Nested*** Mapping, ***Associations***
- ***Pattern matching***, Class changing

Projects

BP Angola

$USD3.3bn FPSO constructed to serve a 5000 square km oil feed 160km offshore Angola



3D Models
590 P&IDs
2,200 GAs
700 Layouts
71,000 tags
520,000 technical attributes
1,000,000 documents

Applications
PDMS, PDS 3D, Phasset, Plumtree

BP Angola

Business Benefits

- Access to project design information during EPC phase
  - Early development of
    - Operational activities
    - Maintenance plans
- Ability to monitor progress during EPC phase
  - Check process
  - Validate information
- Early development of
  - Competency with operations systems
  - Training plans

Shell Nanhai - China

Case Study

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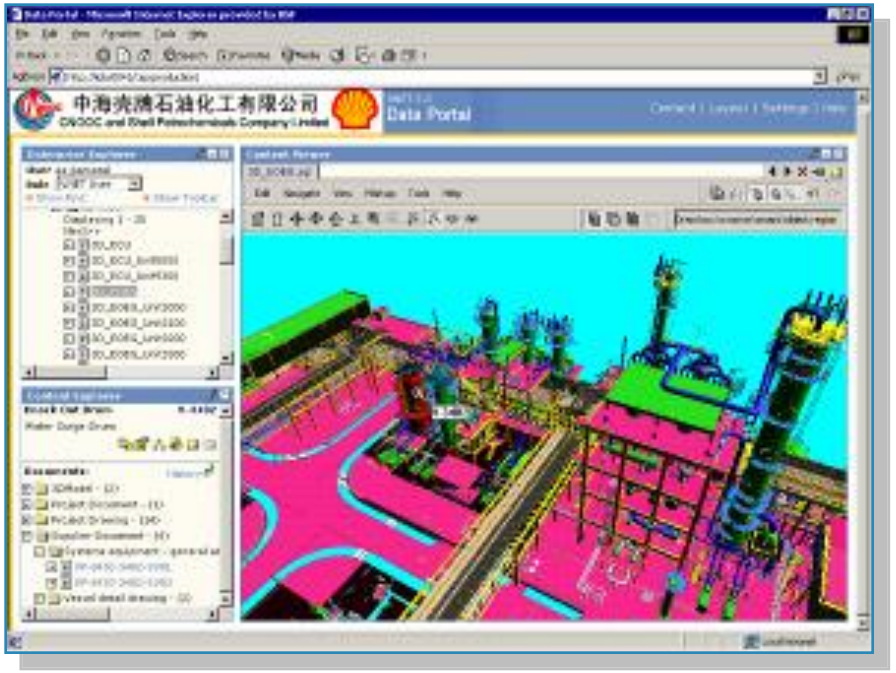
Shell Nanhai - China

USD 4.3bn petrochemical facility engineered by BSF, a PMC consortium - 8 EPC contractors

2.6 Sq Km site
1.4 million metres pipe
5.3 million metres cable

3D Models
2,600 P&IDs
Over 62,000 isometrics
Over 3 million electronic documents

Applications
PDS 3D, SP P&ID, WINPCS, Phasset, SAP, INtools & Documentum



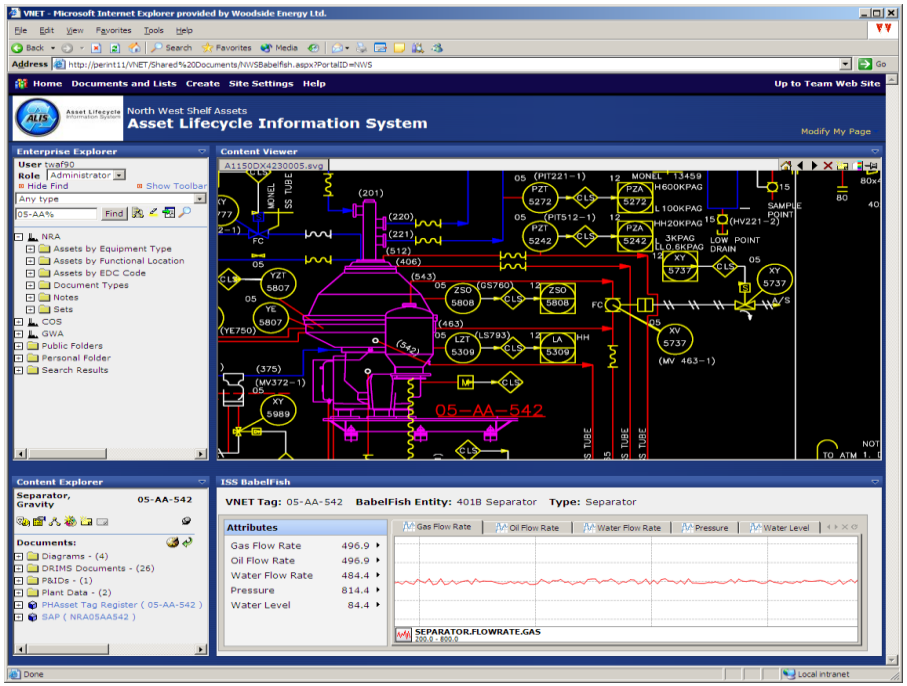
Shell Nanhai - China

Business Benefits

- Reliable, secure and seamless Data Handover
  - from 8 EPC's
  - Integration of models from all sources
  - Common neutral model
- Single point of access to all design data
  - Many different systems
  - Ability to Check overall progress
- Facilitating early SAP deployment
  - Information available before Handover
  - Identifying procurement overlap

Woodside Energy Ltd

Engineering Data Management using a standard engineering portal for all Woodside operated facilities.



3D models
1850 P&ID's
60,000 Isometrics
2,200 GA's
250,000 tags
750,000 documents

Applications
AutoCAD, Microstation, PDMS, VPE P&ID, PDS 3D, PDS 2D, VPE, SAP, Intools & DRIMS

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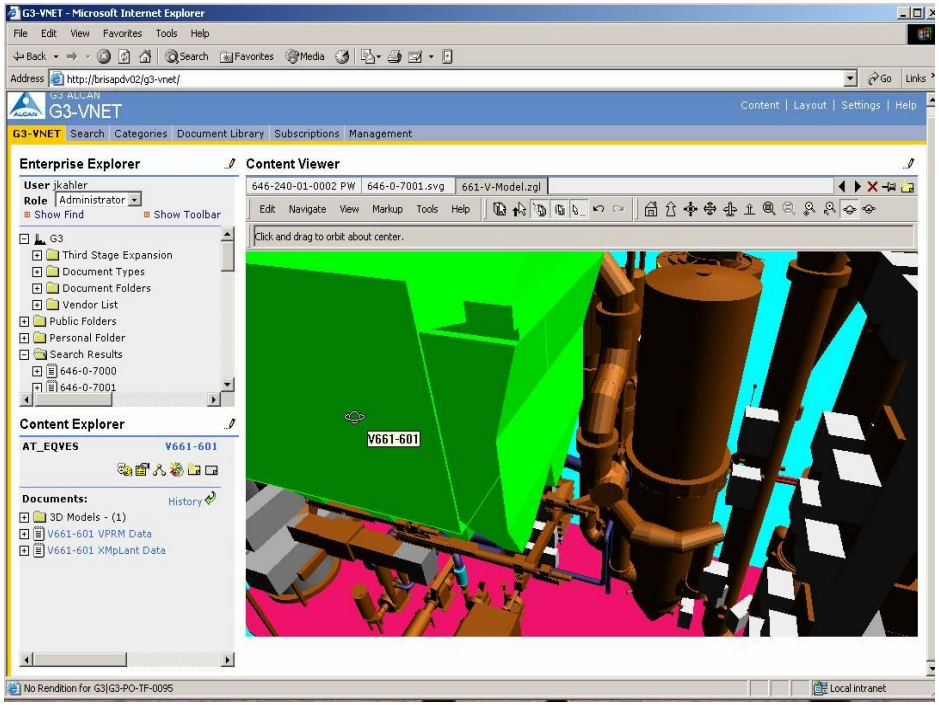
Alcan - Australia

$2.4 billion dollar aluminum refinery expansion in Australia.



250 P&ID's
3D Models
10,000 ISO's
1,200 GA's
100,000 Tags
350,000 Attributes
7,500 As-built mark-ups
Engineering data
Procurement data

Applications

AutoCad, AutoPlant, MicroStation, PDS, PDMS, SmartPlant P&ID, VPRM, ProjectWise, WinPCS, Phasset, MIMS …

Alcan - Australia

Business Benefits

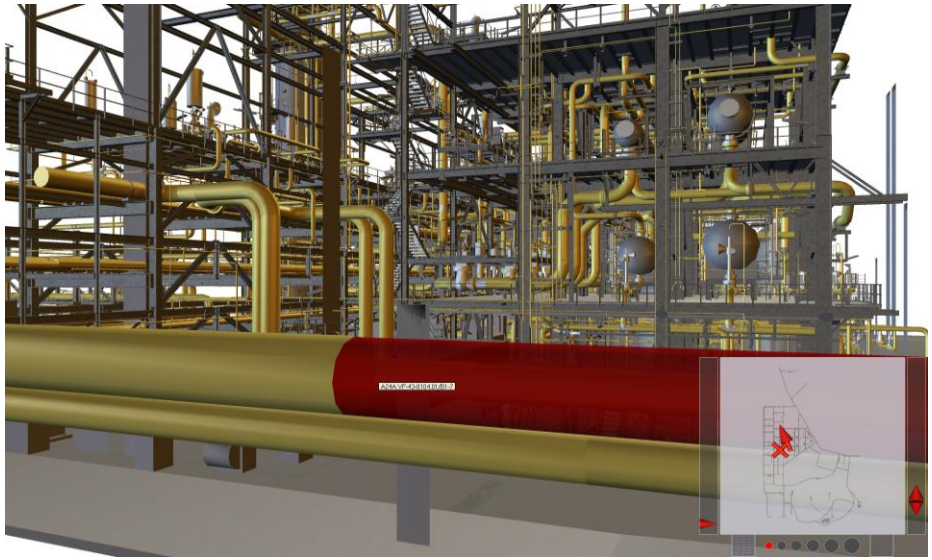
4 fabrication sites in 4 different countries with all sites linked to the Central management at Gove

- Ability to work with a mixture of different applications
  - Visual navigation of models from multiple applications

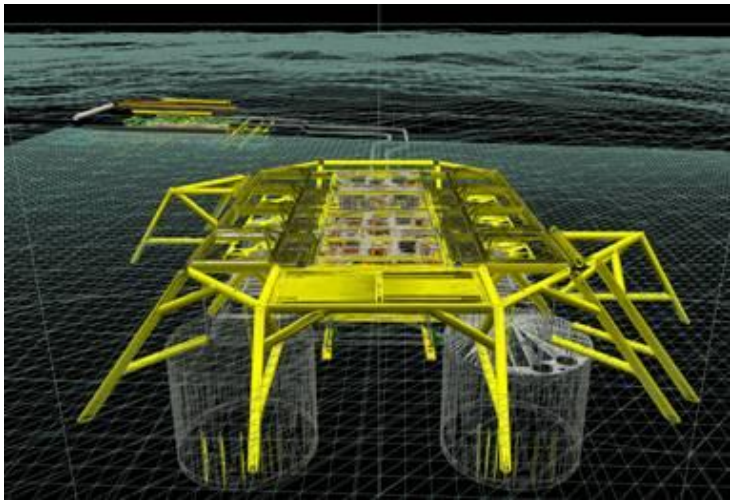
- Ability to use Bentley Engineering and Document management system to Manage the neutral information

- Stream information to remote sites

Shell Ormen Lange



Topsides
1.6 million plant items



Subsea

Octaga Enterprise © Octaga 2008

Shell Ormen Lange

Business Benefits

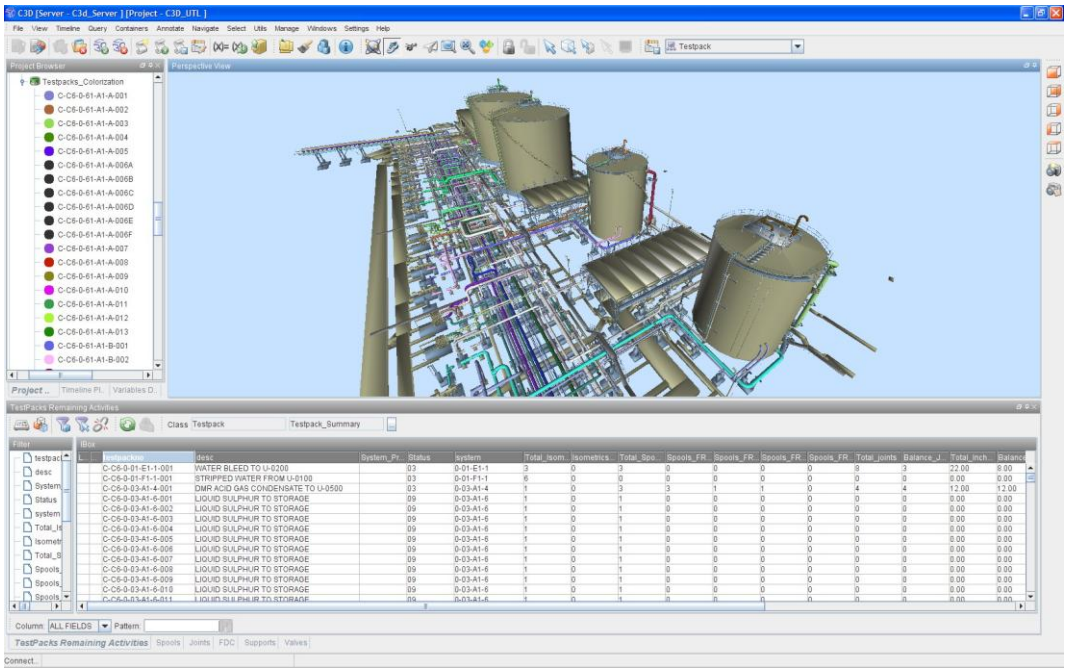
- Ability to access information from all systems
  - Process plant
  - Mechanical
  - Data Warehouse
- Ability to simulate operations in real time
  - Maintenance activities
  - Operations
  - Training

Shell – Pearl GTL

$26 billion project
11 main contractors

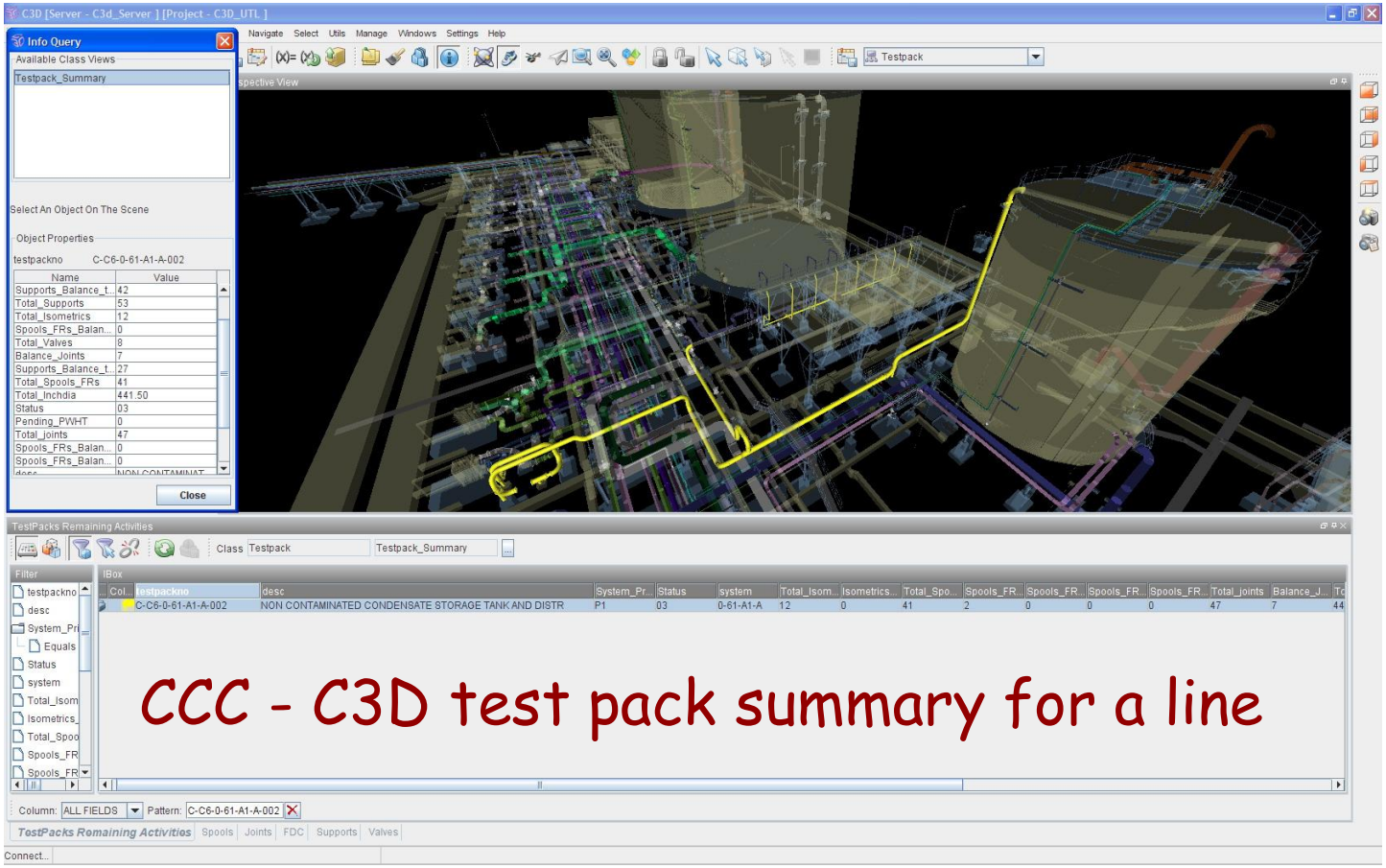
- 30 Areas
- 46,000 Isometrics
- 1,200 Equipment items
- 270,000 steel sections

Applications
PDMS, C3D



CCC - C3D – test pack identification

Shell – Pearl GTL



CCC - C3D test pack summary for a line

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Shell – Pearl GTL

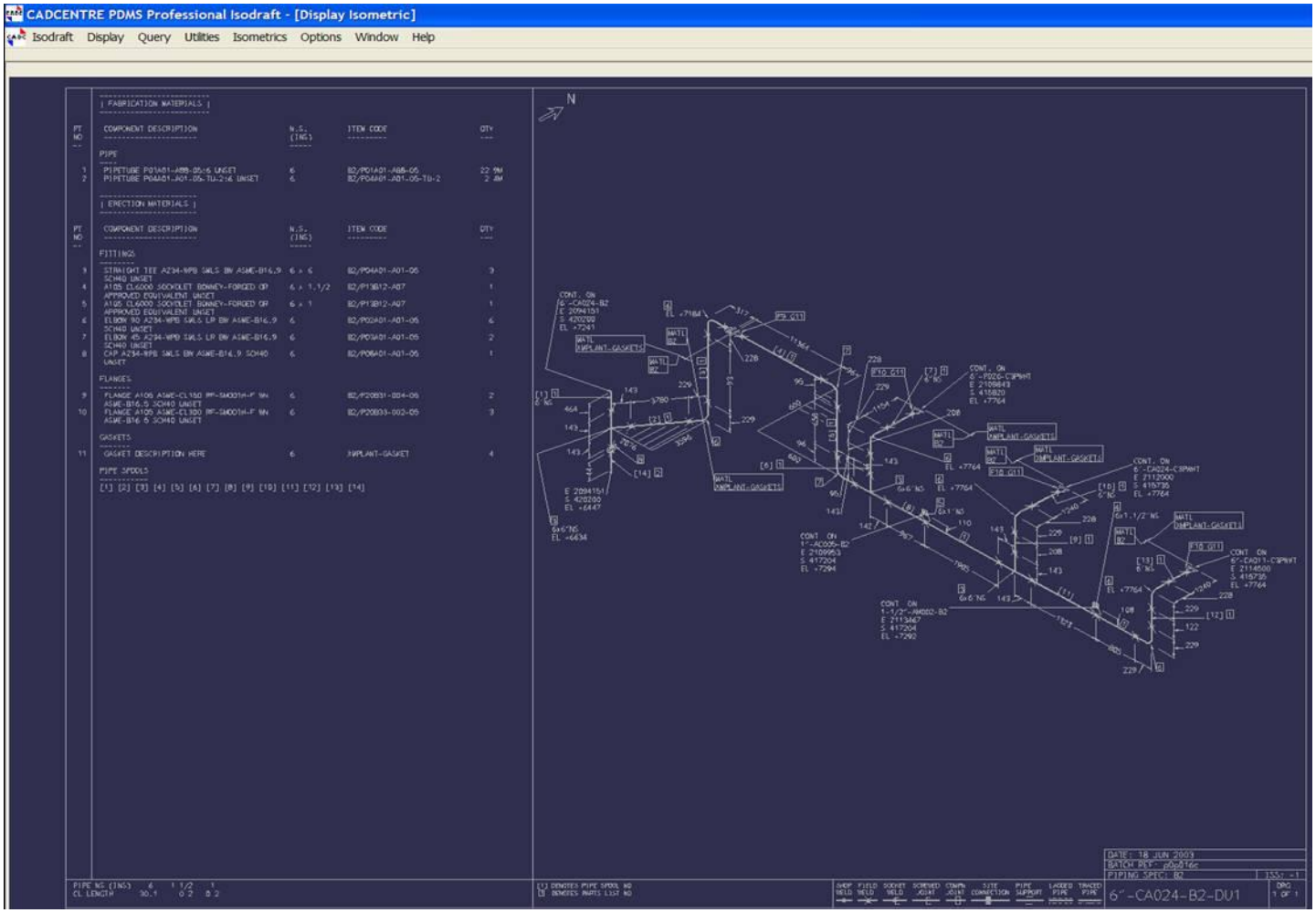
Business Benefits

- Access to all project information through 3D model
  - Welding data
  - **Test packs** + remaining activities
  - Spool status
  - ISO MTO
  - Visual presentation of **Progress** on site
- 3D model used as interface to planning
- **Seamless** integration
- **Cost effective** and very practical

PDS to PDMS

- A service delivered by AVEVA
- 20 large projects to date and others underway
- Converted model usable in production
  - ISO's
  - Pipework MTO
  - Line Lists
- Catalogues and Specifications converted
  - An industry first
  - PDS to ISO 15926 XML then XML to PDMS

ISO from a converted model



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XMpLant Applications

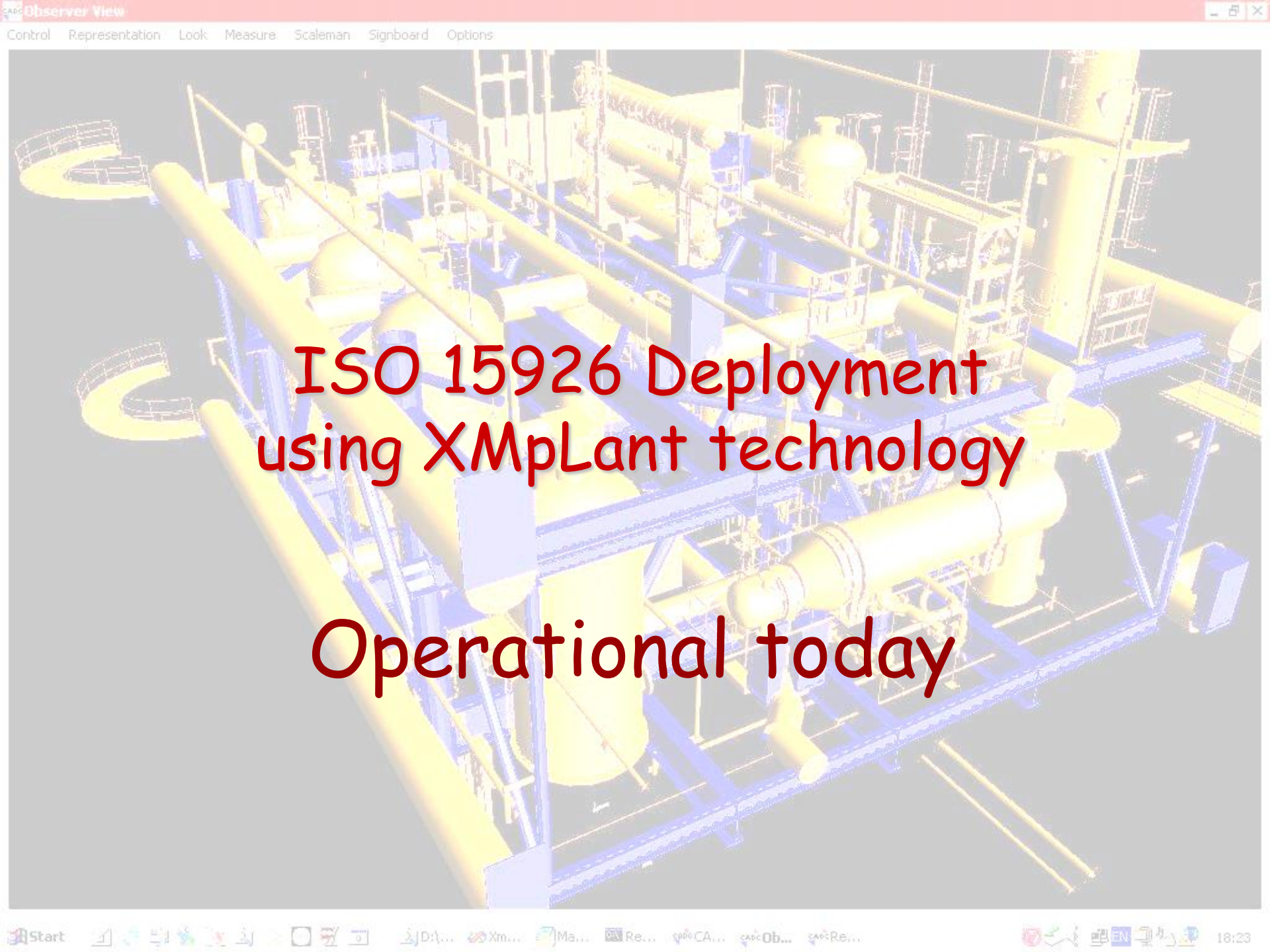
- XMpDE enables applications to be developed that are independent of the design systems
- Dumb to intelligent drawings
- Dumb to intelligent Datasheets
- Neutral Cats and Specs
- Generic Comparator

Conclusions 1

- Deployment of ISO 15926 using XMpLant
  - In use today - proven on large projects
  - Operational between major PP systems
  - Readily extensible
  - Proving the ISO 15926 model
    - 2D drawings, intelligent P&ID's
    - Intelligent 3D
  - Feedback to RDS/WIP for new classes

Conclusions 2

- XMpLant technology today
  - Interfaces for many design systems
  - Powerful mapping facilities
  - Dumb to intelligent processing
  - Exchange XML files for ISO 15926
  - Archive models as ISO 15926 files
- XMpLant technology in development
  - iRING interface – Templates / sharing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18:23