



# Engineering Standards & Data Management

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# Disclaimer and important notice

This presentation contains forward looking statements that are subject to risk factors associated with oil and gas businesses. It is believed that the expectations reflected in these statements are reasonable but they may be affected by a variety of variables and changes in underlying assumptions which could cause actual results or trends to differ materially, including but not limited to: price fluctuations, actual demand, currency fluctuations, drilling and production results, reserve estimates, loss of market, industry competition, environmental risks, physical risks, legislative, fiscal and regulatory developments, economic and financial market conditions in various countries and regions, political risks, project delay or advancement, approvals and cost estimates.

All references to dollars, cents or \$ in this presentation are to Australian currency, unless otherwise stated.

References to “Woodside” may be references to Woodside Petroleum Ltd. or its applicable subsidiaries.

# WOODSIDE - Engineering Data Management

## Key Points

- Who is - Woodside
- Our key engineering interfaces
- Asset Lifecycle view
- Engineering Data Management – Our “5” Year Journey
- One Portal - One Entry Point
- Developing Industry Standard Software - Partnerships
- Why Standardise the Standards?
- Development of ISO 15926

# WOODSIDE ENERGY - AUSTRALIA

Woodside is currently one of Australia's top ten companies by market capitalisation\*, and the nation's largest publicly-traded oil and gas exploration and production company.

Based in Perth, Western Australia, Woodside has major operational assets and exploration and development interests in five continents including Australia and the United States.

In 50 years we have grown from a pioneer oil and gas explorer to Australia's largest independent producer of oil and gas and one of the world's largest producers of LNG.

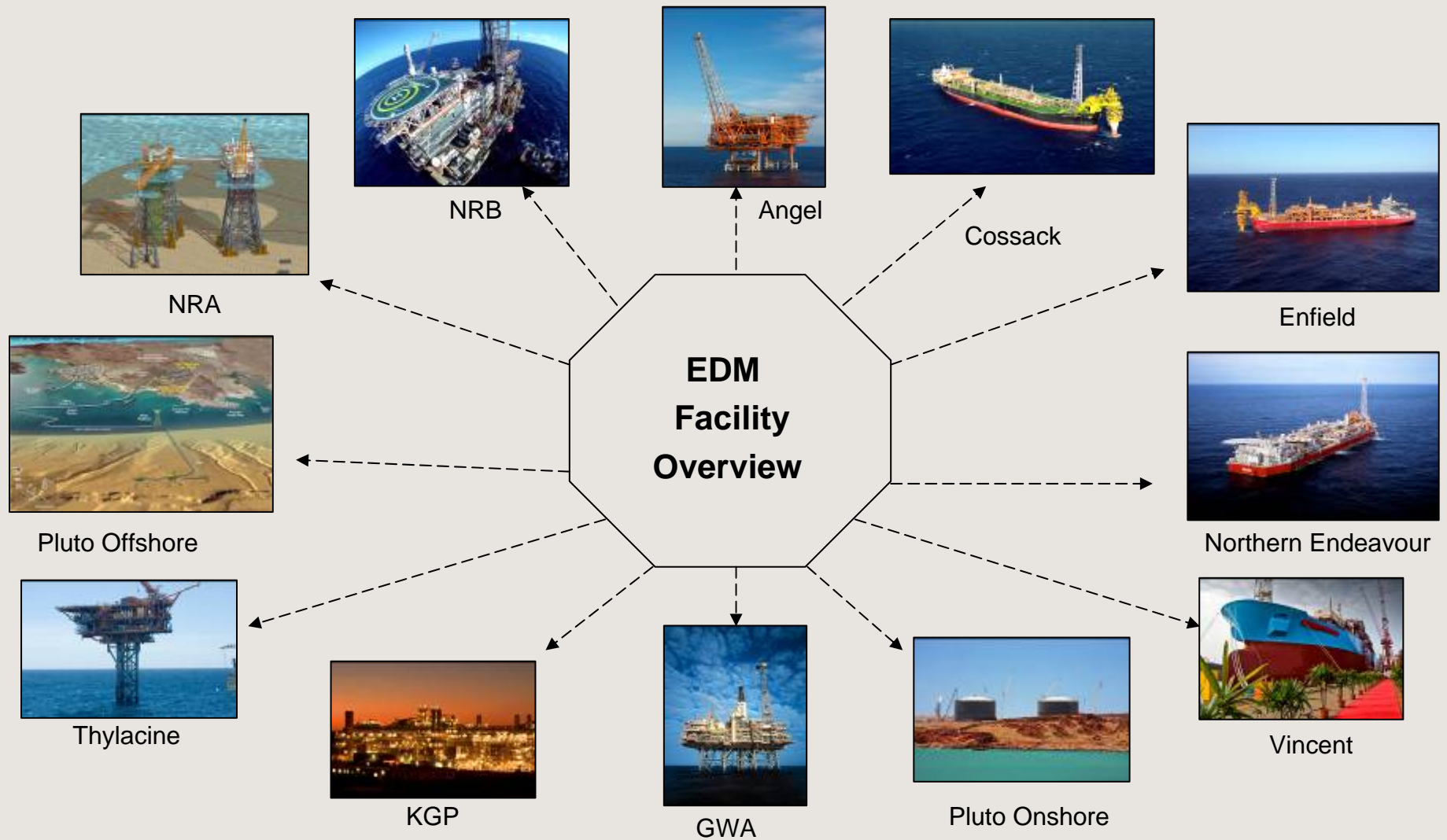
Woodside operates Australia's largest resources project, the North West Shelf Venture in Western Australia, which produces about 40 per cent of Australia's oil and gas.

Woodside also operates the Pluto LNG Project which is set to become the fastest developed LNG project discovery of the gas field in 2005 to first gas from the field in late 2010 and the first LNG in early 2011. Woodside is also seeking to progress its Sunrise LNG development in the Timor Sea and the Browse LNG development in northern Western Australia.

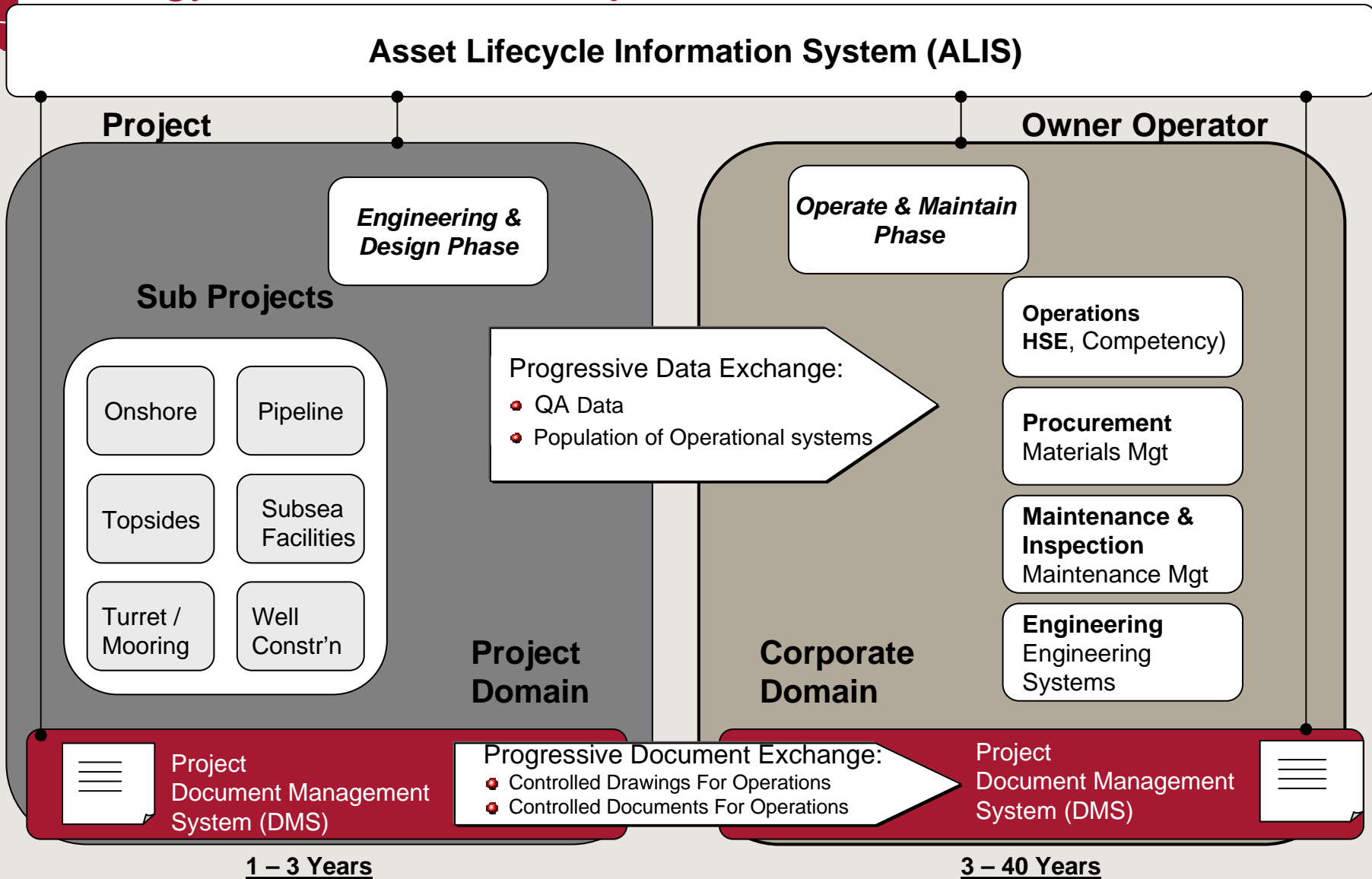
With a proved plus probable reserves to production ratio of 21 years \* Woodside is poised to help meet growing global demand for clean energy.

\*As at the 24<sup>th</sup> February 2010.

# EDM – Engineering support



# Strategy for Greenfield Projects



# Woodside EDM Journey

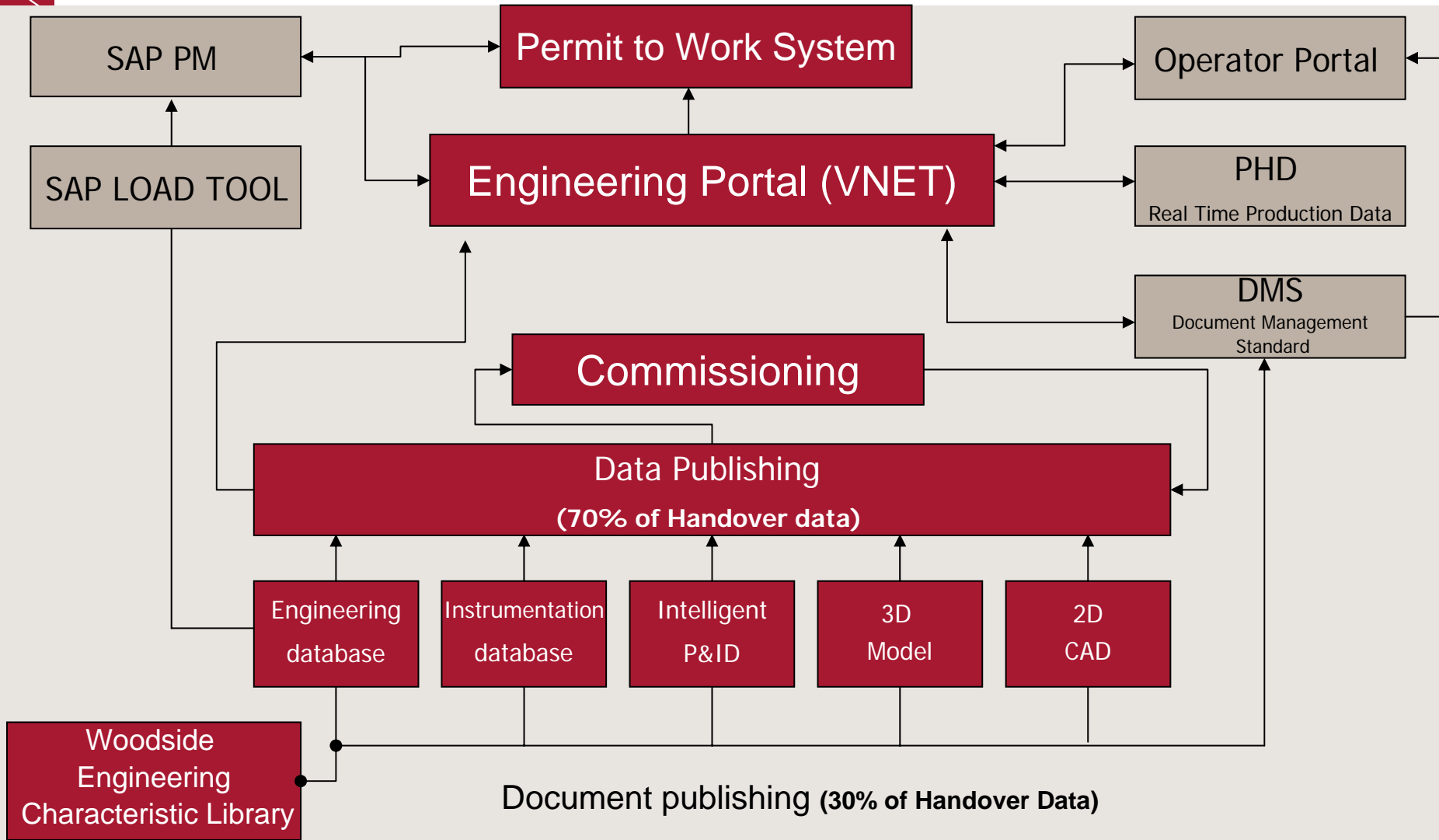
Our EDM journey commenced Jan 2005 with clearly defined objectives, originating in the Brownfield projects division and migrating to the Production division in 2007. Practical project completion December 2009.

EDM group established as a core corporate team delivering significant value in cost savings and improved data quality.

## Key deliverables

- Select Software Systems, Configure & deploy
- Migrate company legacy data & systems into a digital plant environment
- Develop standards to support a digital plant
- Improve data quality, access & linkage
- Enable efficient handover from Greenfield & Brownfield Projects
- Identification and rectification of data inconsistencies
- Identify value adding opportunities Enterprise & Next Generation Software
- Early developer & adopter of International standards
- Measure, evaluate effectiveness & achieved cost savings against R.O.I.

# Engineering Portal relationship to EDM applications





# Strategic Management – Production's Single Entry Point

**Production Division**  
Content Custodian: Santostefano, Vince V.  
Content Manager: Oiler, Helen H.  
Site Feedback: Please complete form

**Daily Provisional Production Report**  
For Wednesday 1st July

Facility	Product	Target	Actual	ΔL
NWS	LNG (tonnes)	42,050	44,109	2,051
	LPG (tonnes)	2,535	2,334	-201
	Domgas (Tpa)	640	670	30
Coveaack	Oil (boe)	131,200	137,050	5,870
	Oil (boe)	42,818	44,252	1,435
Northern Endeavour	Oil (boe)	13,222	13,492	182
Bagnurra	Oil (boe)	31,033	33,584	2,551
Vincent	Oil (boe)	29,071	27,306	-1,765
	LPG (tonnes)	159	143	-16
Owley	LPG (tonnes)	204	207	3
	Condensate (bo)	1,540	2,121	577
<b>Operated Total (boe)</b>		<b>773,247</b>	<b>866,614</b>	<b>93,426</b>
Mutneer Exeter	Oil (boe)	10,940	11,470	528
Stybarrow	Oil (boe)	32,009	32,611	622
GoM Shelf	Net (boe)	12,492	12,385	-107
GoM Neptune	Net (boe)	16,309	16,361	2,662
GoM Power Play	Net (boe)	8,541	8,660	120
<b>All Facility Total (boe)</b>		<b>860,726</b>	<b>888,118</b>	<b>27,432</b>

Note: GoM is latest full day data available; Owley is the VC calendar day.

**Production Commentary**  
 • Owley Gas Day Production 140 TPa (Sam-Sam SA limit) - Met nominations.  
 • KGP - LNG 1.2 and 4 at max rates. LNG 5 rates increased to max rates following NRV re-torquing. LNG 2 shutdown progressing with expected start-up planned for 01/04/07. Step 2 at reduced rates due to fouling. Domgas at required rate for DNRV; 30% bypass in operation to Train 2 Domgas planned shutdown.  
 • ANP - Not normally Manned status at 14:45hrs.  
 • VIN - Production shortfall due to cycling Well VIN-A2.

**Production Status - May 2009**  
 Actual Production: 5.24 MBoe  
 Forecast Production: 7.27 MBoe

# Develop & Enhance Industry Standard Applications

Karratha Gas Plant > ALIS Portal > Portal

## Enterprise Explorer

User woprh5  
Role VNET User  
Hide Find Show Toolbar  
Any type  
2KT1420 Find Mode: By ID

KGP  
KBS  
Public Folders  
Personal Folder  
Search Results  
2KT1420  
Battery - (1)  
Bottle - (1)  
Burner - (1)  
Exchanger - (3)  
Fan - (2)  
Filter - (6)

## Content Explorer



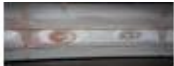






















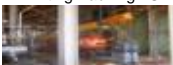




Turbine, Gas 2KT1420  
TURBINE, DRIVER FOR 2KT1420


Documents:  
DRIMS Documents - (533)  
Datashets - (3)  
Drawings - (422)  
Lists & Registers - (9)  
Manuals & Guidelines - (40)  
Reports, Reviews, Studies, File No  
Vendor Documents, Manuals - (1)  
Vendor Drawings - (57)  
Intelligent P&IDs - (4)  
Train 2 - (4)  
2KT1420 VPE Eng Data  
Turbine - (1)  
Turbine, Gas - (1)  
AU01.2KT1420 SAP Link

## Media Gallery

Home Page

2009 Major Shutdown Tag: 2KT1420

 HP Rotor Overview	 Stage 1-4 HP Blades	 Guide Van Pins	 HP Rotor - N D E	 Stage 5-11 HP Blades
 LP Blade Section	 LP Stator Blades	 LP Rotor Section	 LP Rotor in Situ	 LP Rotor Shaft & Brg
2009 Major Shutdown				
 Active Thrust Pad Brg	 Thrust Pad T/C's 4Brg	 Thrust Ring Assy	 Thrust Pad Hot Spot1	 Thrust Pad Hot Spot2
 Thrust Pad Normal v1	 Thrust Pad Normal v2	 Half Moon Thrust Pad	 Thrust Pad Carrier	 Thrust Pad Shoes
2009 Major Shutdown				
 HP Tilting Pad Brg 4U	 HP Tilting Pad Brg 4L	 HP Tilting Pad Brg 4L	 Tilting Pad Assy Brg 4	 Scaffolding Arrangement
 Lifting Beam Install	 Scaffolding Arrangement	 Enclosure Scaffolding	 Enclosure Scaffolding	 HP Stators Topside



- Got a problem or issue with ALIS? Contact the [ITHelpDesk](#) for assistance: x84444.
- Need help using ALIS, or want to find out what ALIS can do? See the [ALIS Help Page](#) for videos, how-to's and quick reference guides.
- Something wrong with the info in ALIS, or can't find info that should be in ALIS? Contact the [ALIS Information Custodian](#) to report it.
- See the [Production Division Homepage](#) for more information about Woodside's facilities & other information systems.

# ISO 15926 - Why focus on common standard ?

- Integration pre-requisite – Mega Project Environment
- Common information language & format
- Reduce time for handover between life-cycle phases
- Set direction for Owner Operators & EPC's
- Ensure Uniformity – Apples are Apples not Pears
- Reduced errors on input
- Reduced costs to maintain (\$m's)

# Why Standardise?

- Engineering Characteristics library provided to POSC/Caeser contribution to ISO 15926 reference data library.
- One global standard for common information types, reduces the workload on creators of information.
- Data can be verified throughout project cycle for validity and gap analysis.
- Non application specific, so creators able to maintain own systems and still meet Owner Operator requirements.
- Software vendors able to embed standard in products to provide off the shelf compatibility with other applications
- Proposed membership to standards committee focusing on part of ISO 15926 Part 4 initially.
- Long term involvement with industry bodies & standards organisation to assist in direction setting
- Operators multi facility - common view / user base

# Understanding Owner Operator Data

Evolution from EPISTLE & Step compliant projects over the years has failed to gain sufficient traction for a variety of reasons.

It has not aligned our requirements with EPC deliverables or engineering software development required to support Mega projects.

Woodside have identified our critical documents & data sets to support Production on a full Asset Information Life Cycle.

Attributes consist of generic engineering deliverables (No Gold plating)

The owner operator world is now maturing with a growing trend to define and expect quality information deliverables.

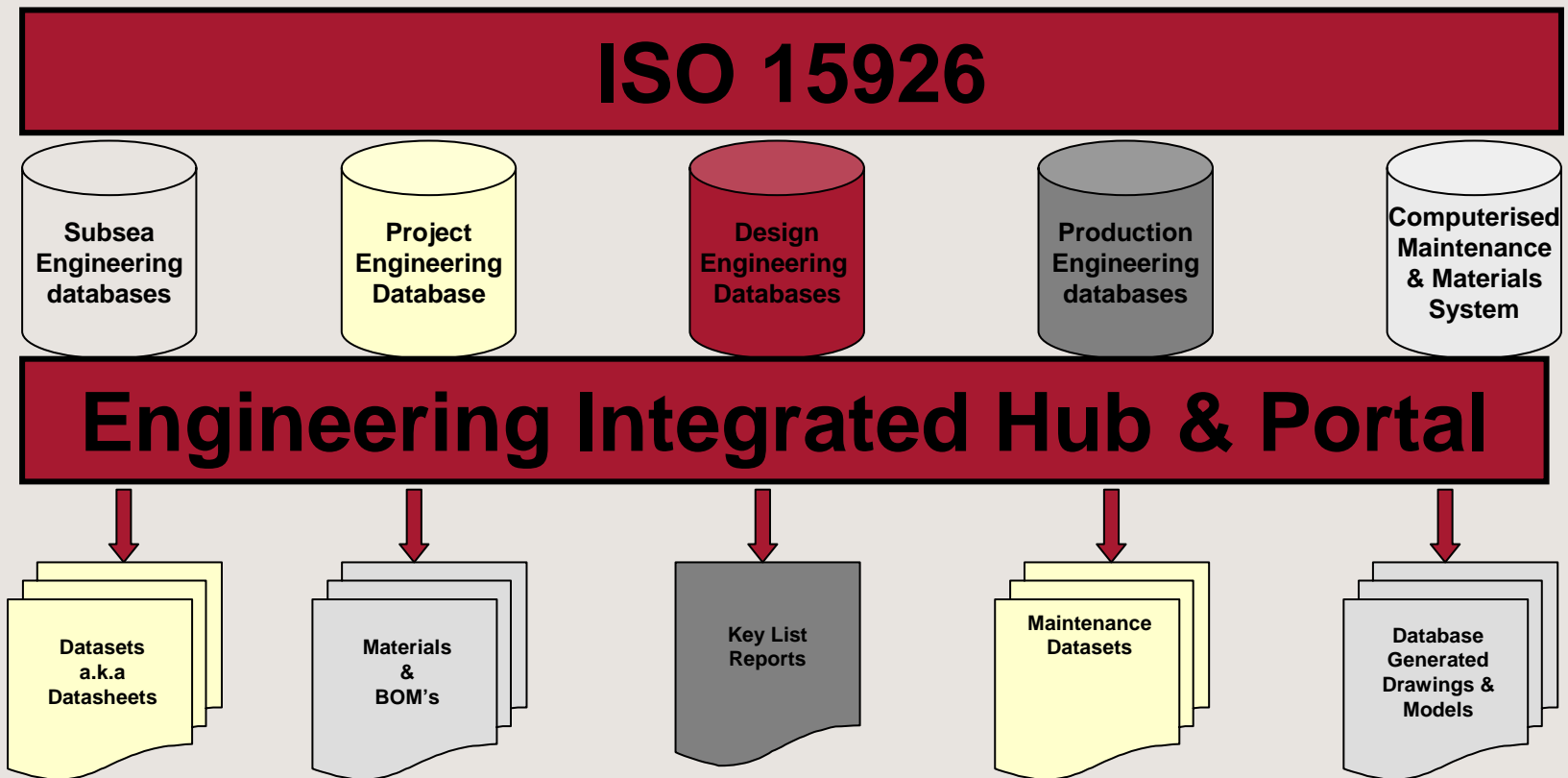
Many project design tools have become primary production systems for operating and modifying facilities.

*Summary Keep It Short & Straightforward*

KISS : The most reliable, quickest to implement, easiest to use & lowest cost solution !

# ISO 15926 Parts 4,5,6 – Engineering Reference Data

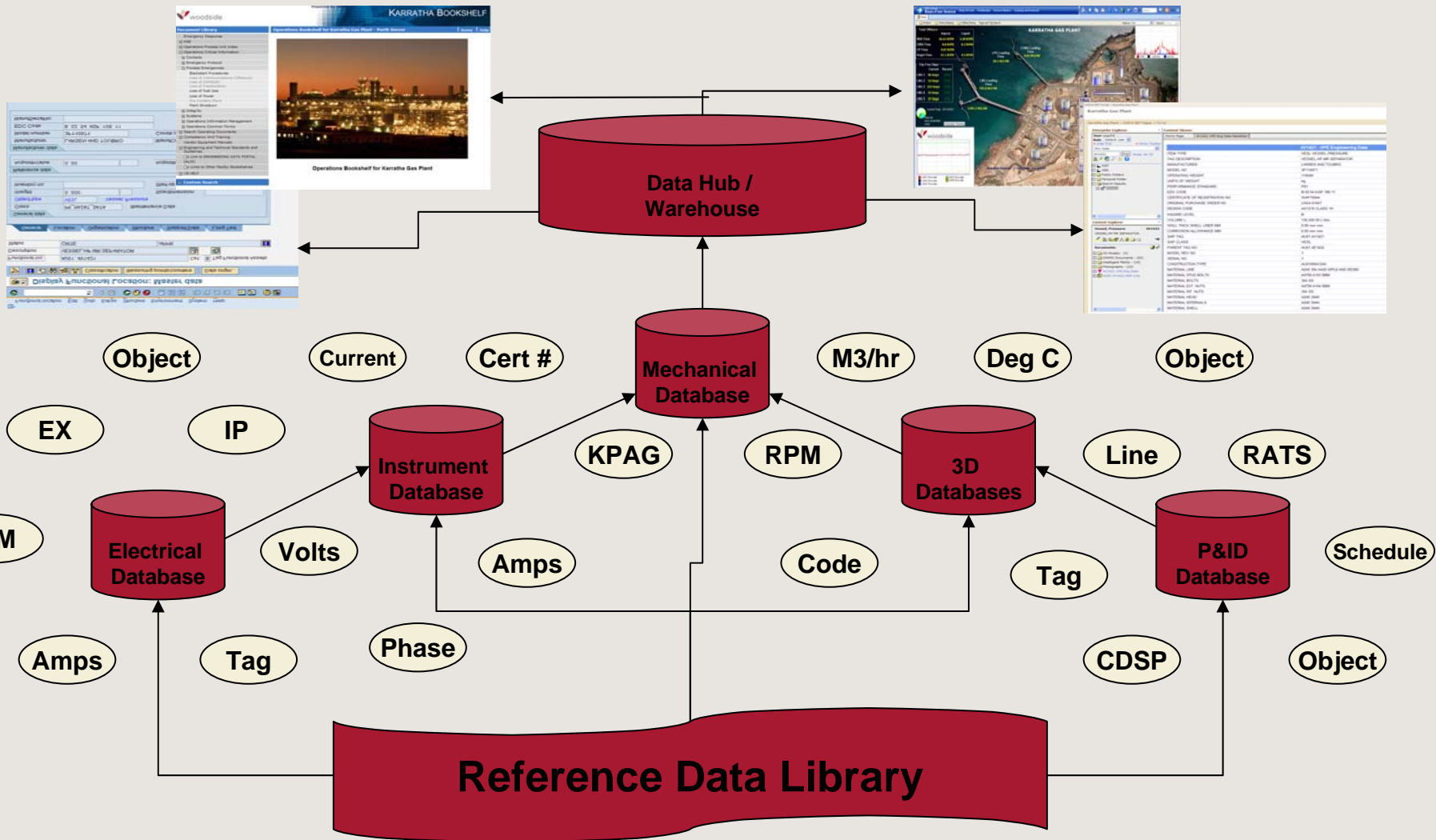
- 70% + of the data we use every day to operate a facility is based on Engineering Reference Data
- Our primary focus is to create a universal standard set of data used to Operate & Maintain facilities



# Production Engineering Data - Top “5” Project Deliverables

1. Engineering Systems to support on going operations
2. Engineering Drawings & Documents
3. Maintenance Management System
4. Material System
5. Live Production Data (Plant Historians)

# Basic Engineering Reference Data





# Current - Woodside engineering Characteristic Library

Name	Cell Name	BCC	Datasheet Name	Controlled Ref No	Page	Cell Ref	Units U.O.M	Alpha /Numeric	Decimal	Negative	Field Length	SAP CharVal	API Button/	Source	Discipline
Vessel No.	Vessel No.	3	Relief Valve	<a href="#">W1000KP001.0030</a>	1	G12		Alpha	No	No	30		No	SPI	PROCESS
Line No.	Line No.	2	Relief Valve	<a href="#">W1000KP001.0030</a>	1	M12		Alpha	No	No	30		No	SPI	PROCESS
Operating Case Number:	Operating Case Number: - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K15		Alpha	No	No	30		No	SPI	PROCESS
Operating Case Description:	Operating Case Description: - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K16		Alpha	No	No	30		No	SPI	PROCESS
Relieve Case	Relieve Case - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K17		Alpha	No	No	30		No	SPI	PROCESS
Toxicity/Hazardous Handling	Toxicity/Hazardous Handling - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K18		Alpha	No	No	30		No	SPI	PROCESS
Design Temperature: (Min)	Design Temperature: (Min) - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K20	°C	Numeric	Yes	Yes	15		No	SPI	PROCESS
Design Temperature: (Max)	Design Temperature: (Max) - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	M20	°C	Numeric	Yes	Yes	15		No	SPI	PROCESS
Design Pressure: (Min)	Design Pressure: (Min) - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K21	kPag	Numeric	Yes	No	15		No	SPI	PROCESS
Design Pressure - Max	Design Pressure - Max - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	M21	kPag	Numeric	Yes	No	15		No	SPI	PROCESS
Operating Temperature:	Operating Temperature: - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K23	°C	Numeric	Yes	Yes	15		No	SPI	PROCESS
Operating Pressure	Operating Pressure - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K24	kPag	Numeric	Yes	No	15		No	SPI	PROCESS
Design Code	Design Code - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K26		Alpha	No	No	30		No	SPI	PROCESS
Fluid state	Fluid state - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K27		Alpha	No	No	30		No	SPI	PROCESS
Relieving Pressure	Relieving Pressure - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K28	kPag	Numeric	Yes	No	15		No	SPI	PROCESS
Relieving Temperature	Relieving Temperature - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K29	°C	Numeric	Yes	Yes	15		No	SPI	PROCESS
Downstream Pressure:	Downstream Pressure: - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K30	kPag	Numeric	Yes	No	15		No	SPI	PROCESS
Downstream Temperature:	Downstream Temperature: - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K31	°C	Numeric	Yes	Yes	15		No	SPI	PROCESS
Wt % Vapour: (In)	Wt % Vapour: (In) - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K32	%	Numeric	Yes	No	15		No	SPI	PROCESS
Wt % Vapour: (Out)	Wt % Vapour: (Out) - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	M32	%	Numeric	Yes	No	15		No	SPI	PROCESS
Mass Flow:	Mass Flow: - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K33	kg/h	Numeric	Yes	No	15		No	SPI	PROCESS
Molecular Weight	Molecular Weight - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K34	kg/kmol	Numeric	Yes	No	15		No	SPI	PROCESS
Compressibility factor	Compressibility factor - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K35		Numeric	Yes	No	15		No	SPI	PROCESS
Specific Heat Ratio: (Vapour)	Specific Heat Ratio: (Vapour) - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K36	Cp/Cv	Numeric	Yes	No	15		No	SPI	PROCESS
Specific Heat Ratio	Specific Heat Ratio - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	M36	Cp/Cv	Numeric	Yes	No	15		No	SPI	PROCESS
Density at T & P: (Vapour)	Density at T & P: (Vapour) - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K37	kg/m³	Numeric	Yes	No	15		No	SPI	PROCESS
Density at T & P:	Density at T & P: - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	M37	kg/m³	Numeric	Yes	No	15		No	SPI	PROCESS
Viscosity at T & P: (Vapour)	Viscosity at T & P: (Vapour) - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K38	cP	Numeric	Yes	No	15		No	SPI	PROCESS
Viscosity at T & P: (Liquid)	Viscosity at T & P: (Liquid) - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	M38	cP	Numeric	Yes	No	15		No	SPI	PROCESS
Latent Heat of Vapourisation:	Latent Heat of Vapourisation: - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K39	kJ/kg	Numeric	Yes	No	15		No	SPI	PROCESS
Valve Type	Valve Type - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K41		Alpha	No	No	30		No	SPI	PROCESS
Set pressure	Set pressure - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K42	kPag	Numeric	Yes	No	15		No	SPI	PROCESS
% Over Pressure (Gauge):	% Over Pressure (Gauge): - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K43	%	Numeric	Yes	No	15		No	SPI	PROCESS
Back pressure - constant	Back pressure - constant - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K44	kPag	Numeric	Yes	No	15		No	SPI	PROCESS
Back pressure - variable	Back pressure - variable - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K45	kPag	Numeric	Yes	No	15		No	SPI	PROCESS
Built Up Pressure	Built Up Pressure - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K46	kPag	Numeric	Yes	No	15		No	SPI	PROCESS
Material of Construction:	Material of Construction: - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K47		Alpha	No	No	30		No	SPI	PROCESS
Area - calculated	Area - calculated - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K49	mm²	Numeric	Yes	No	15		No	SPI	PROCESS
Area - selected	Area - selected - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K50	mm²	Numeric	Yes	No	15		No	SPI	PROCESS
Orifice Designation	Orifice Designation - Case 1	4	Relief Valve	<a href="#">W1000KP001.0030</a>	1	K51		Alpha	No	No	30		No	SPI	PROCESS

# Questions & Answers!