

# PIPELINE

EXPERIENCES FROM THE PLANT AND MARINE INDUSTRIES

2008 | Issue 1



## AVEVA PDMS 12.0

The next generation of productivity  
in plant design has arrived

**AVEVA**  
CONTINUAL PROGRESSION

Also featured in this issue:

**Aibel – Alstom – AMEC Paragon –  
Chevron – Hyundai Heavy Industries  
– Kalkavan Sedef shipyard –  
Metso Paper – WorleyParsons**

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Cover photograph: The 1200 MW Combined Cycle Gas Turbine plant at Cartagena, Spain.  
Image courtesy of Alstom

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Editor – Magnus Feldt  
Communications Manager – Industry Solutions, AVEVA

# Continual Progression

**Continual Progression is not just our corporate strapline – it also defines the very essence of AVEVA. Our products have evolved to incorporate the latest technology, while simultaneously protecting our customers' investment.**

Continual Progression means that our customers can embrace the evolution of intelligent technology without disruption. Our products and technologies are developed to ensure that the creation, sharing, control and protection of information increases their effectiveness for our customers.

One of the major demonstrations of our commitment to Continual Progression was the release, towards the end of 2007, of AVEVA PDMS 12.0, the product at the heart of our new AVEVA Plant Portfolio.

With the release of AVEVA PDMS 12.0, we really do take the AVEVA technology platform to new heights of productivity, not just for the end-users and designers but across the whole project, offering further fabrication and construction savings by extending the scope and ability to control, manage and share project information globally.

In this issue, on pages 4-7, Peter Brunning reviews why AVEVA PDMS 12.0 is the next generation of productivity in plant design.

At the recent Marine user meeting in Shanghai we showcased another highlight of our continual progression, AVEVA Marine. This application combines two 'best in class' solutions – the industry-standard Tribon range and AVEVA's unique object-based technologies and outfitting design applications – to form the ultimate set of marine design and production tools.

AVEVA Marine delivers a completely new level of efficiency for design and production in shipbuilding and floating offshore projects. It covers a complete range of design and production applications including Initial Design, Hull and Outfitting design, and production information for all types of parts manufacture and assembly operations – all based on one common database. This provides the tools for synchronisation across all disciplines and stages of design.

More information, including some exciting product videos, on both AVEVA Plant and AVEVA Marine product portfolios is available on the AVEVA website at: [www.aveva.com/plant](http://www.aveva.com/plant) and [www.aveva.com/marine](http://www.aveva.com/marine)

'Continual Progression means that our customers can embrace the evolution of intelligent technology without disruption...'

# with AVEVA

2008 will be another exciting year as we continue our progression. We will further enhance our excellent reputation amongst the world's leading engineering companies by providing innovative products, backed by first-class support. This, plus our significant investment in Research & Development, and the resulting launch of new products into strongly growing markets, positions us for further expansion.

During the many meetings we hold with customers around the world each year there is one consistent theme rising to the surface. A top priority is managing the many different data sources during an engineering project and delivering valuable data to design, purchasing, maintenance and operations staff in an easy-to-use format. AVEVA is addressing this, and future product developments will extend the use of valuable design and engineering data more widely across the enterprise through the use of the emerging range of AVEVA NET products.

AVEVA NET is a data management solution that enables the various information networks in a project (people, tasks, plans, drawings, models, documents and materials) to be linked together to provide a single, structured view of all the engineering information in context.

It then allows this information to be shared, exploited and managed, in a collaborative way, across the globe.

An important precursor to AVEVA NET has also recently been launched, in the form of AVEVA ReviewShare. ReviewShare makes use of the Web, email and AVEVA's existing Review technology to deliver an exceptionally collaborative 3D design review tool, that can be used across virtual teams and, indeed, across countries and continents. Its emphasis on web-based collaboration offers our customers a powerful introduction to the world of shared information on which AVEVA NET is also based.

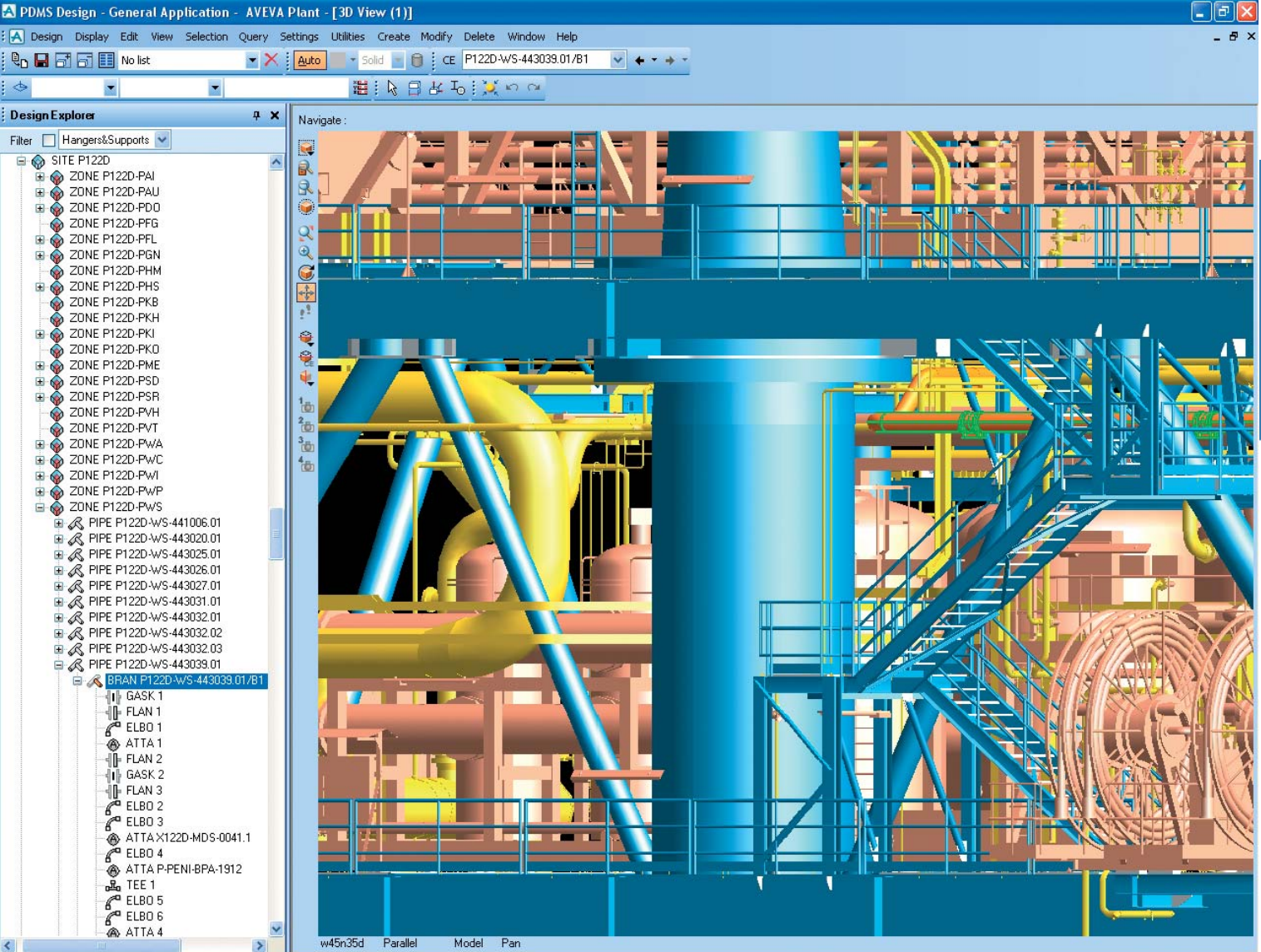
AVEVA ReviewShare enables teams to view, review, mark up, and collaborate on 3D engineering models of virtually unlimited size, across global teams, from within one application. AVEVA ReviewShare connects seamlessly to AVEVA's existing portfolio of engineering products and is available as an integral component of the AVEVA Review product. See page 11 for details.

Our continual progression will ensure that we are delivering a future for our customers by providing unique and proven technology that is unrivalled in safeguarding customers' data and protecting their investment in technology.



Richard Longdon, Chief Executive, AVEVA Group plc





The proven AVEVA PDMS user interface, with its Data Explorers and 3D model views, has been extended for AVEVA PDMS 12.0.

## AVEVA PDMS 12.0 offers exciting and highly productive new capabilities, while building on its proven strengths

**AVEVA PDMS 12.0, the heart of the new AVEVA Plant portfolio, is the largest improvement ever. It incorporates step changes in technology and in the data model and is the first of a new series of PDMS releases.**

An enlarged, multinational development team has been working hard for many months to build the latest new technology into the world-leading plant design tool, to make it still more productive. Most of the other AVEVA Plant products will also be updated to version 12 over the next few months.

Among the many technical innovations are an updated user interface, based on Microsoft's .NET platform, and an expanded, more flexible, object-based database structure. Underlying these obvious changes is a technology platform which has been updated to improve workflow support for the engineering design disciplines, including some new to PDMS. In particular, the extended platform enables the incorporation of tighter links with schematic drawings and the electrical and instrumentation disciplines.

### Design platform

PDMS 12.0 is the first version of a new generation of Plant Design products based on the new AVEVA Design Platform. This combines the best of the technology from both PDMS and the Tribon shipbuilding products, together with numerous extensions and enhancements, to provide a solid technical foundation for marine and plant design products for the next ten years.

The enhanced user interface has improved facilities for reporting and customisation, and the option of using Microsoft .NET languages alongside the PML scripting language. It also provides a common Administration and Catalogue for all relevant products. The core of PDMS is its globally enabled database, which has been extended and made even more flexible. There are, of course, many additions to provide all the new functions and applications. There are also options for alternative hierarchies – for example, to present a view more suited to fabrication or assembly. Further flexibility is provided by the ability to group objects across the usual database boundaries, either in systems or arbitrary groupings.

# AVEVA PDMS 12.0

Peter Brunning  
Product Manager – Plant Design, AVEVA

## User interface

The design applications for each discipline have been much improved to incorporate the enhanced database and user interface technology and to further increase productivity by enhancing their ease of use. Integration within and between disciplines in PDMS is improved by a new concept of 'associations' which allows rules to store relationships between objects. These rules are stored separately to provide flexibility of access, and can be checked to ensure that relationships are not compromised during design changes.

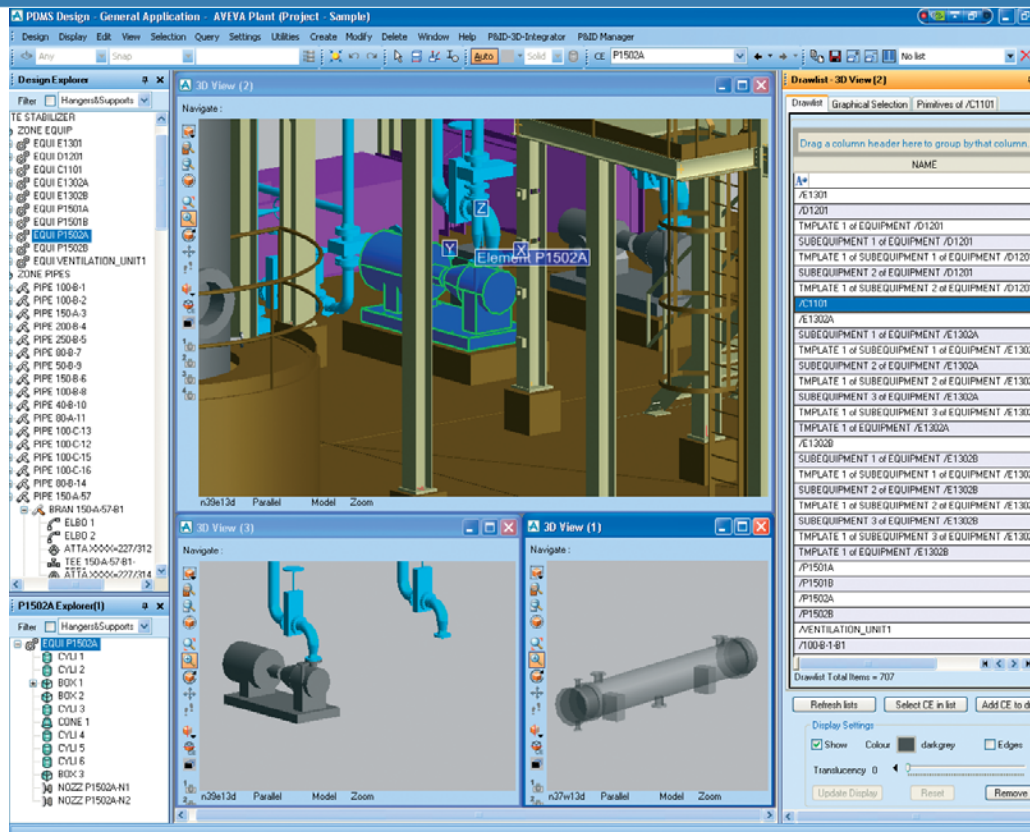
The new user interface provides excellent compatibility with other Windows software, with an environment similar to Microsoft Office. It is configurable to suit the individual user, and makes much use of standard system components for operations such as printing and file browsing. Changes are obvious from initial log in, where there is now an option to use the Windows login authentication to bypass the PDMS log in and password.

To provide the tools needed for wider use of the platform, there is now a greater variety of Explorers and Graphical displays. Multiple 3D views may contain different views of different parts of the model. A powerful new database search facility gives its results in a new tabular grid. These results can be manipulated in a manner similar to a spreadsheet, and then output to Excel if required.

The entire documentation set has been revised and updated; it is now available in both PDF and installed Help versions.

## Integration and customisation

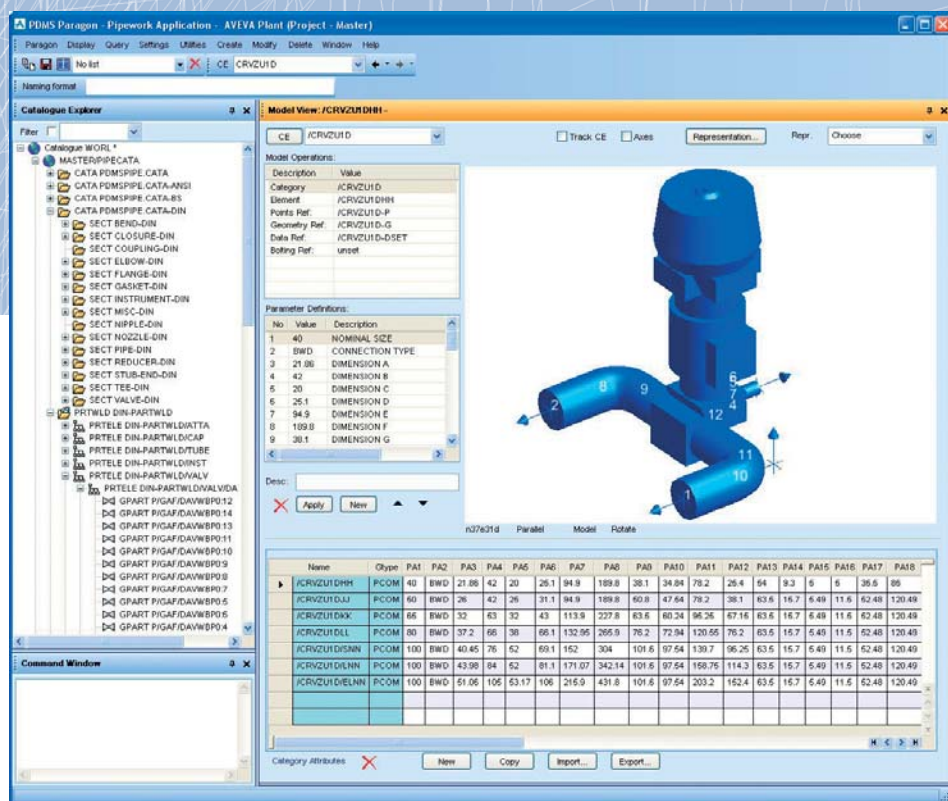
The powerful PML scripting language makes PDMS very simple to customise. The .NET framework now helps to provide even better integration capabilities. These can now be accessed from users' – and potentially third parties' – PML programs using the new PML.NET tools. The advanced PDMS developer can thus exchange data between PML and their own custom .NET objects. The PML user interface tools have also been enhanced – for example, the command-line window has been completely overhauled and provides facilities for running macros, and extensive cut-and-paste capabilities.



Among the additions to the user interface are additional Explorers and Design views for showing alternate information such as details. The draw-list uses a new data grid gadget, which provides a flexible presentation of the details and easy export to spreadsheets.

In addition to new database objects for new applications, and the extensive enhancements to existing ones, the database now has User-Defined Element Types. These can be used to provide more specific applications; for example, different types of Equipment may be more readily distinguished in users' own specialist tools. Database objects can also be grouped together in a more flexible way and even placed in different hierarchies for different applications.

The Administration function has been extensively updated to cater for new functions and simplify the administrative role. In particular, a new Access Control Assistant provides a much simpler way of defining the required access to data for different users. There is also a completely new user interface that is used to set up User-Defined Attributes and User-Defined Element Types.



The all-new catalogue user interface consolidates information about the part catalogue, material properties and selection criteria to achieve much simpler data input and checking.

## Catalogues & Specifications

A major strength of PDMS is its powerful catalogue mechanism for coordinating the design function. A completely new application provides a much simpler, workflow based approach to all aspects of Cats & Specs data preparation, including Catalogue, Specification and material properties. It also covers new facilities such as 2D symbols (for Schematics and for certain types of 3D drawings) and new disciplines.

The scope of the catalogue has been further increased to cover aspects of materials management with the introduction of Part Families. There are new branch tables and wall-thickness tables to assist in the selection of appropriate piping components, and new selection tables for other disciplines.

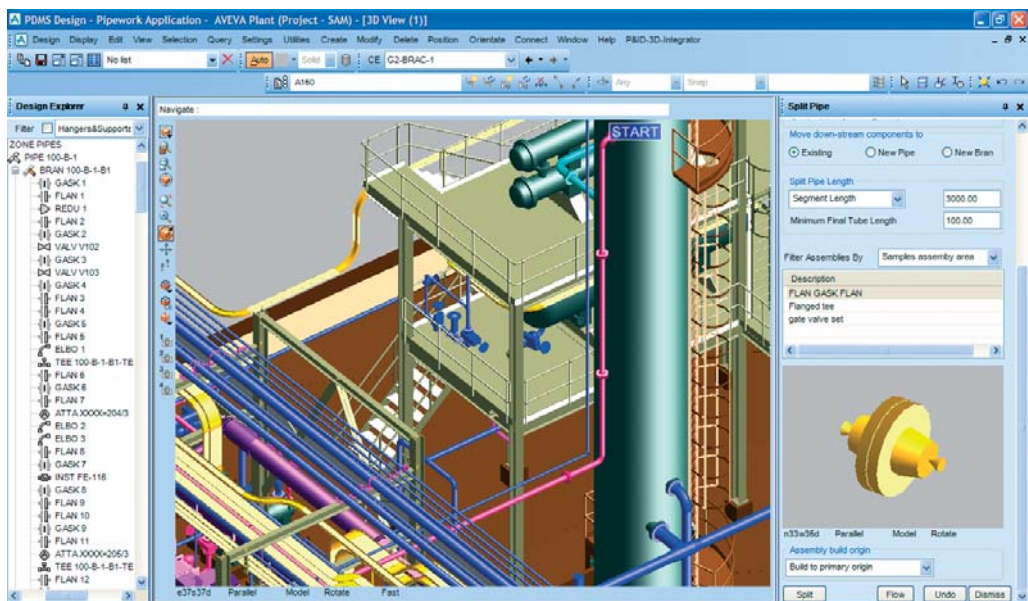
‘A completely new application provides a much simpler, workflow based approach to all aspects of Cats & Specs data preparation...’

## Engineering applications

The applications for each engineering discipline have been extensively updated and enhanced, in addition to the improved multi-discipline aspects, such as associations and penetration management.

Of particular note are the improvements to design templates for Equipment, new tools for revising and splitting Piping, a much-extended HVAC catalogue and a completely new application for the design and detailing of Access platforms, Stairs and Ladders.

Below: New utilities include procedures for splitting piping and HVAC, in this case choosing a flange pair assembly to add as appropriate.



## Rule-based design

The PDMS philosophy is to be as helpful as possible, while leaving the engineer in control of the design. PDMS 12.0 includes several improvements to help designers to ensure that the design continues to conform to the original intent.

For example, equipment templates can now be selected via a specification, with changes in the template easily propagated to all instances in the project. These specifications may address a family of components, and the definition may include parameterised obstruction and maintenance volumes, and repeat elements, such as the rungs on a ladder.

# AVEVA PDMS 12.0

Another major enhancement is the inclusion of the automatic Pipe Router as a standard part of PDMS. This, in combination with the interactive Pipe Editor, provides a truly productive piping design environment.

The new application for Access platforms, Stairs and Ladders is designed to be fast, powerful and easy to use, with high levels of 3D graphical interaction. It is highly configurable so that it can easily be adapted to structural standards (DIN, ANSI, etc.) as required, and it has extensive checking capabilities to ensure that the user can check against the required standard.

## Drawing production

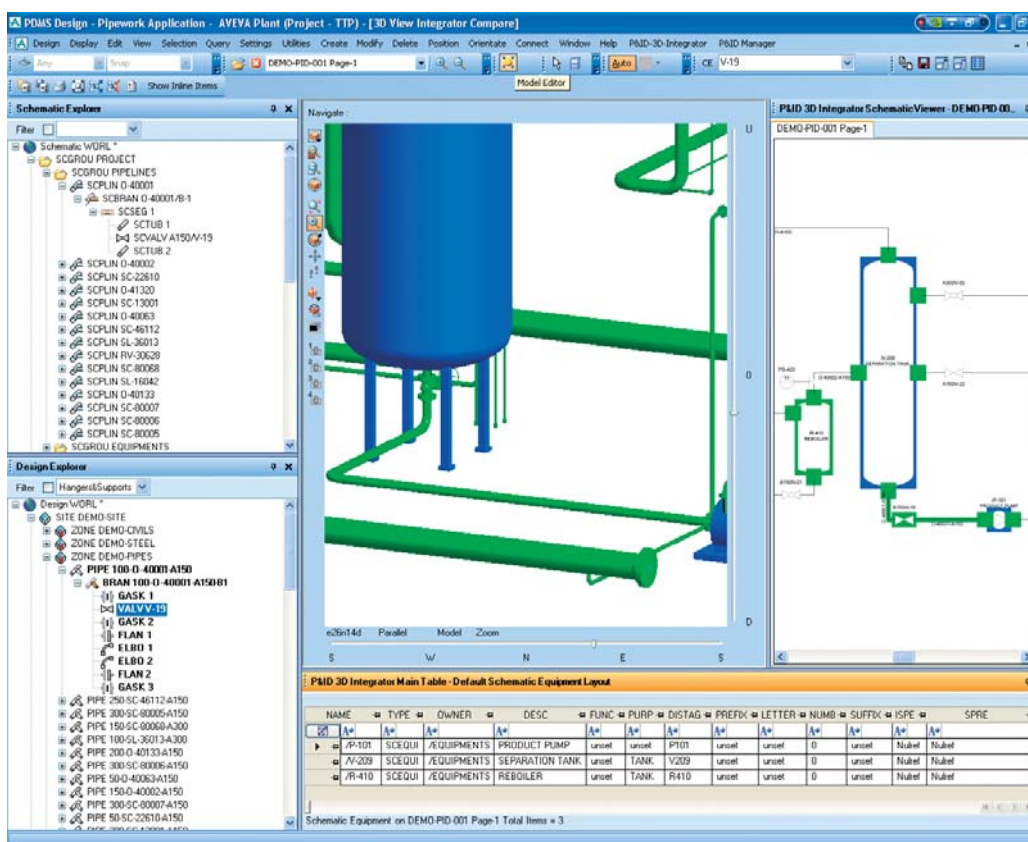
Additional representation options in Draft – for aspects such as line-styles – make it easier to comply with industry standards. The use of colour has been improved to cover a wider range, including the standard AutoCAD colours, and colour may now be selected independently of line style. TrueType text fonts may be used in place of the standard PDMS ones.

Draft's drawings of the 3D model can now include a symbolic representation of an object, scaled to suit, rather than the full 3D representation. This is expected to be of great use in new engineering applications planned for release in the near future.

New output formats such as PDF and various image formats including TIFF are now available from Draft. These include the Windows Enhanced Meta File (EMF), and closer integration with Windows printing.

## Integrated schematics

A new product option, AVEVA P&ID 3D Integrator, integrates fully with the new PDMS user interface to provide an integrated schematic/3D design environment. This allows customers to build their 3D model in a controlled manner, directly from the information on a P&ID, and enables consistency checks between the P&ID and the 3D model.



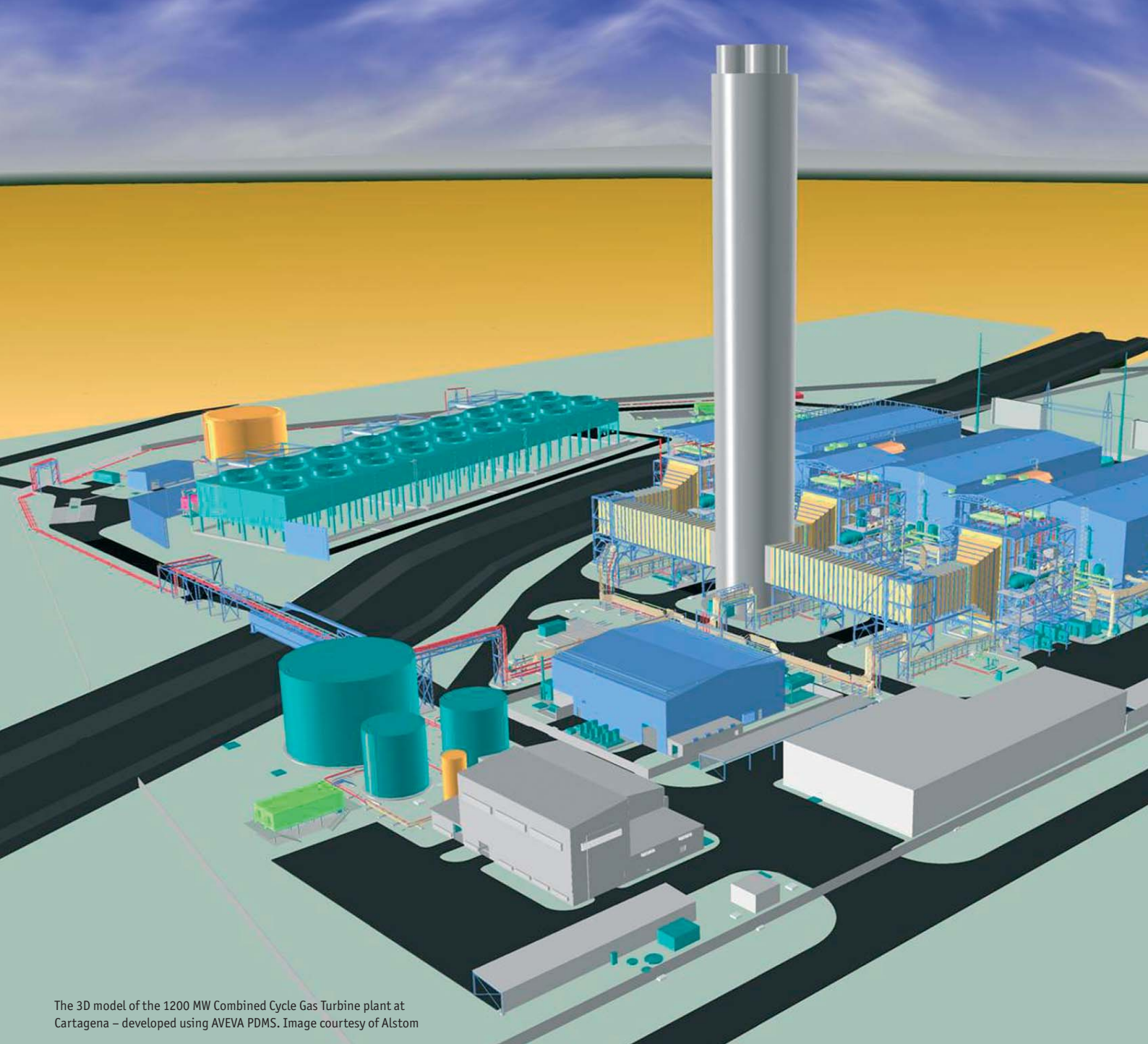
The AVEVA P&ID 3D Integrator enables P&IDs imported from a variety of engineering systems to be used to compare with – or even to help build – the 3D piping model.

'In summary, AVEVA PDMS 12.0 provides a technology platform for increased scope and capability and has a wealth of highly productive new capabilities. Nevertheless, it is designed for Continual Progression – with easy migration of customers' environment and data. The largest ever development team is now starting work on building further new applications on this highly capable new platform. If you're not using AVEVA PDMS 12.0, you'll be less productive than you could be!'

## About AVEVA PDMS

AVEVA PDMS is a datacentric, multi-disciplinary design environment for the 3D modelling of process plant. It has modules for the design of equipment, piping, HVAC, structure and cable trays. Modelling is carried out using a customer-defined catalogue and specification, in a full 3D

environment, with the support of tools that ensure a clash-free design. A full range of drawings and pipe isometrics can be produced automatically from the model.



The 3D model of the 1200 MW Combined Cycle Gas Turbine plant at Cartagena – developed using AVEVA PDMS. Image courtesy of Alstom

# Integrated design systems in **Alstom's** power business deliver high efficiency and productivity

The integrated engineering design environment at Alstom, built around AVEVA PDMS and in-house developed systems, is a significant factor in helping the company achieve the efficiency required to retain its position as the world's leading provider of turnkey power plants.

**Bob Aldridge**

Principal Consultant – Power, Industry Solutions, AVEVA



**Alstom, a global company, is active in virtually every sector of the power generation business. The use of AVEVA PDMS within Alstom's power business has grown tremendously since it began in the early 1980s. The software is now widely used across the Plant, Turbomachinery and Energy & Environment businesses. This continuous growth makes Alstom one of AVEVA's largest customers in the power business worldwide.**

The Plant and Turbomachinery businesses jointly pioneered the use of PDMS in the 1980s. The software was rapidly adopted, and quickly deployed onto numerous projects. Today, PDMS is deployed across the full scope of projects in these businesses.

The Plant division focuses on all kinds of turnkey power plant projects, covering a wide variety of fuels, including gas, coal and lignite. It works principally on a turnkey basis, integrating all Alstom Equipment (Gas Turbines, Steam Turbines, HRSG, Utility Boilers, etc.) into one single plant solution. The Turbomachinery division focuses on gas and steam turbine businesses.

The first use of PDMS in Energy & Environment was for heat recovery steam generator boilers, in 2003. Since then, usage has expanded considerably and, in the last few years, Alstom

has also switched to PDMS for utility boiler design too. Even the Hydro business has just begun its first PDMS pilot project. We visited Henri Komercero, Head of Plant Application Services in Baden, Switzerland, to learn how the use of the PDMS software has increased within Alstom's power business, and the role that it plays in Alstom's success.

#### **A high level of efficiency in plant design**

Henri Komercero explained that his team is responsible for the support of the Plant business worldwide and for significant parts of the Turbomachinery business, too. 'The power plant business is very competitive and very global. To deal with this, we have to be fast and efficient. Thanks to a high level of tool and process harmonisation between the project participants, we design power plants achieving short schedule times and high quality. We have hosted delegations from other companies and nations who can't believe the speed and efficiency of our power plant design.'

Many factors contribute to this but, in Henri Komercero's opinion, the integrated engineering design environment and the specialist customisations that Alstom has created are key factors.

#### **Turnkey plant delivered in less than two years**

A good example is the Combined Cycle Power Plant, recently completed for Gas Natural at Cartagena in Spain, which generates 1,200 MW from three gas turbines. This project represented a major challenge, as the site was restricted and congested and the schedule time was just two years. Despite all this, the power station began operation nine weeks ahead of schedule, and the owner has subsequently ordered a fourth unit to be installed, in Malaga, Spain. In addition, not only did Alstom, as turnkey provider, design and build the complete plant, but they will also operate and maintain it for 16 years.

#### **What makes Alstom's Engineering IT environment so efficient?**

'The Engineering IT environment is built around two key components,' Henri Komercero replied. 'PDMS from AVEVA, and EDB, an engineering database system developed in house.'

'Around these foundations, we have optimised our work practices and information management to enable us to be very fast and efficient at all stages of the project. We can deploy onto new projects very quickly, manage multi-partner, multi-location work-share, and effectively reuse information from previous projects.'



The completed 1200 MW Cartagena plant

#### **What role does AVEVA PDMS play?**

'PDMS plays a very important, rapidly growing role. We put almost everything that takes up 3D space into PDMS, including all details of the concrete, and all underground services, to ensure a completely clash-free design, where everything will fit when we build the plant.'

#### **Why does Alstom use AVEVA PDMS?**

'We use PDMS for many reasons,' explained Henri Komercero. 'PDMS is very logical, and it integrates very well with the Alstom engineering concept. Perhaps most important is the ability to generate completely clash-free designs. That has always been a key strength of PDMS which continues to save us enormous amounts of money and time.'



**Henri Komercero**  
Head of Plant Application Services  
for Alstom's Plant business

‘The ability to integrate PDMS into our entire work process and efficiently link it to all the other IT systems on a project is also very important. 3D design is crucial, but it is only a part of any project. It is in linking and controlling all the data flows that much of the value lies.’

‘Also vital, is the facility to customise PDMS to fit the exact requirements of our work processes and to automate many of our processes. We have developed many PDMS-based customisations, ranging from simple tools that make our piping designers more efficient, through to complete PDMS-based Alstom applications.’

‘Perhaps the final thing is confidence. We have a lot of history with PDMS; we know it works, and we know how to get the very best out of it.’

#### AVEVA PDMS used on all kinds of projects

‘Most of our major projects are now PDMS, whatever the fuel type (coal, gas, oil, and so on). Among the better known examples are the 850 MW clean coal project at Belchatow in Poland, the big Neurath lignite plants in Northern Germany, and Shoiba, the largest oil-fired plant in the Middle East.’

The scale of usage is illustrated by Alstom’s “Combined Cycle Power Plant Reference List” published on the Alstom web site. ‘In the early days, we designed only the power island for these plants on PDMS. However, since the early 2000s all of the plants have been completely designed using PDMS and integrated engineering,’ says Henri Komerccero.

#### Worldwide deployment

Alstom’s worldwide business has grown rapidly in recent years and PDMS usage has expanded into numerous Alstom partner and project locations. PDMS is now installed at Alstom offices in China, Croatia, Finland, France, Germany, India, Italy, Indonesia, Malaysia, Poland, Spain, Switzerland, the UK, the USA, and at numerous project and partner sites.

Installing the Alstom environment at new project locations is key to getting projects operational quickly, and Henri’s team has focused on streamlining this, too. It takes just one person one week to install PDMS onto a new location, install the Alstom add-on tools and complete training in the Alstom ways of working and using the additional tools.

#### Over 70 simultaneous AVEVA PDMS projects, and still expanding!

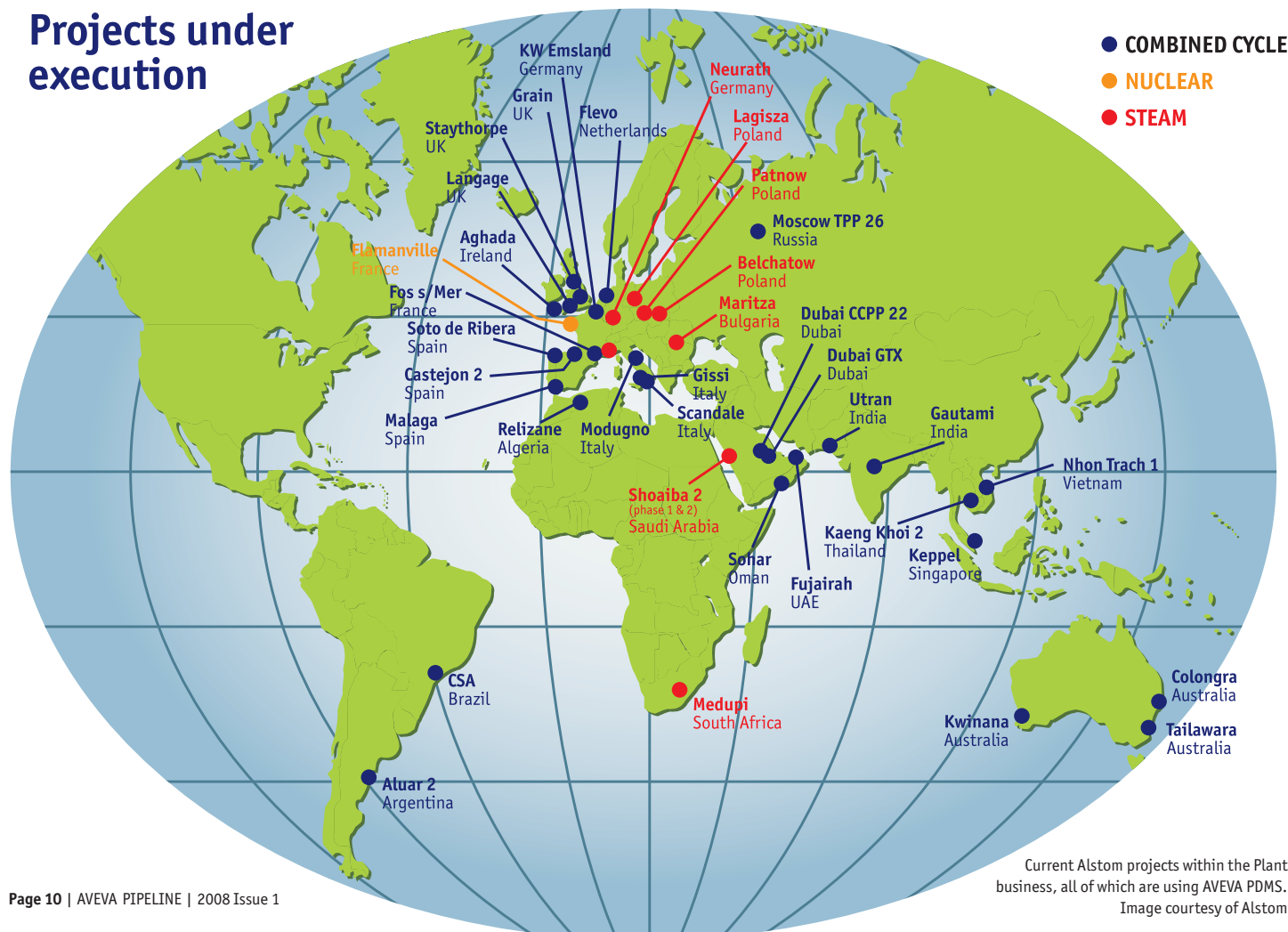
The use of PDMS is continuing to grow within Alstom. On the day of our visit, there were over 70 live PDMS engineering projects running across all business units. Even with 70 simultaneous projects running, Alstom plans to further increase product usage. Shortly after our visit in September 2007, the company purchased a significant extension to its AVEVA software licence, allowing it to operate, not only more PDMS licences, but also a wider variety of AVEVA products.

#### About Alstom

Alstom is the world leader in integrated power plant, power production services and air quality control systems. The company works with all energy forms (coal, gas, conventional island, fuel oil, hydropower and wind) and is a leader in environmental protection (reduction of CO<sub>2</sub> emissions and reduction of NO<sub>x</sub>, SO<sub>x</sub> and particulates).

The Alstom Company has 65,000 employees and a presence in 70 countries worldwide. Visit [www.alstom.com](http://www.alstom.com) for more information.

## Projects under execution



# AVEVA ReviewShare simplifies and promotes collaboration

The new, unique AVEVA ReviewShare combines 3D design review, mark-up and collaboration into one easy-to-use application

Simon Fletcher  
Marketing Strategy, AVEVA

**3D engineering review and mark-up are important, but they are hardly new concepts. The key to AVEVA ReviewShare's uniqueness is the way in which it simplifies and promotes collaboration.**

Within one desktop application, ReviewShare enables a reviewer to take a 3D model of any size, put in physical mark-up, such as clouds or arrows, then add commentary and questions, each in a dedicated comment frame, all through the simplest of interfaces.

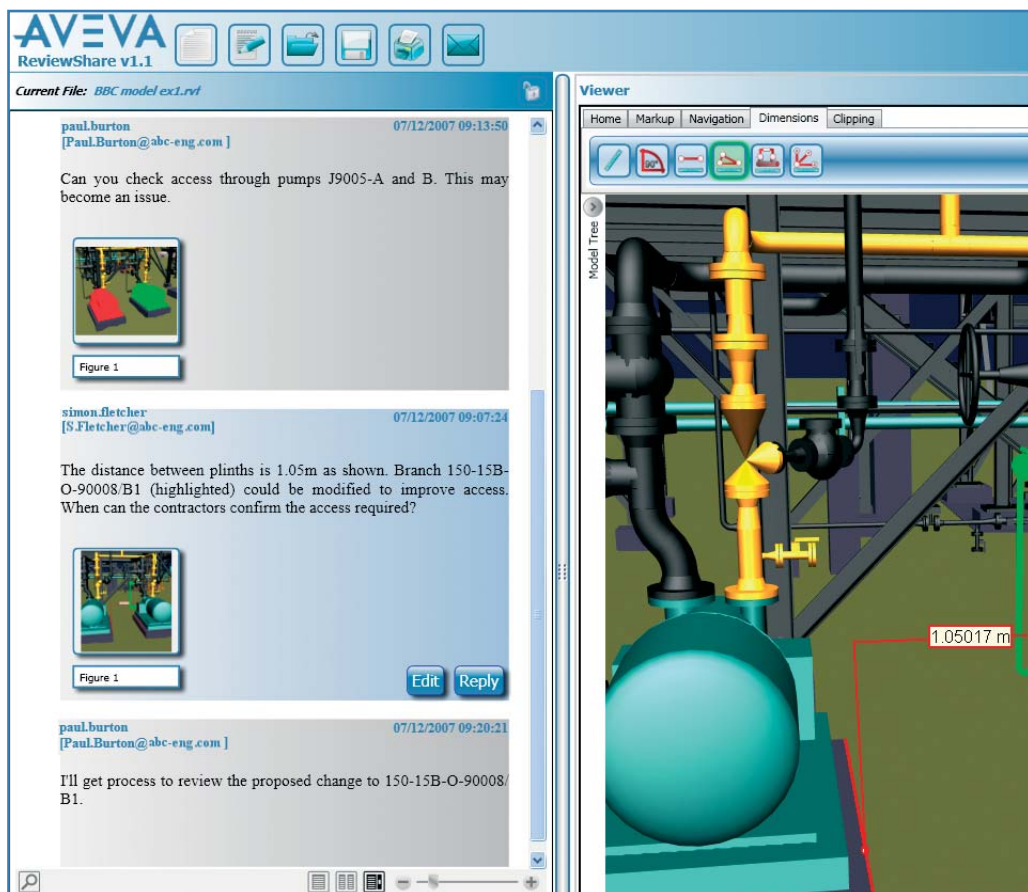
The application then enables the user to wrap all this information up in a ReviewShare document, and email it to the next recipient. The recipient, opening the document, can see all previous mark-up and comments, make their own additions, and then email all this, quickly and easily, anywhere around the world for the addition of further comments and mark-up – and so on, until all those involved have made their contribution. And all this in a small document that even low-bandwidth users can cope with.

ReviewShare makes it easy for all reviewers to work together – no matter where they are located – and gives them realistic tools to achieve this goal.

## **Partner accessibility is a key objective**

ReviewShare's full 3D functionality works through a server connection. Uniquely, ReviewShare enables you to extend this connection to selected partners outside your organisation, such as suppliers and contractors, so that they, too, can view, review, mark up, and comment on the same models as you.

Indeed, this partner accessibility is a key objective of ReviewShare. It is made possible by a combination of intelligence contained within the ReviewShare document and the way the client/server relationship is configured.



AVEVA ReviewShare in action, showing mark-up, annotation and a trail of comments from different reviewers. View and mark-up information is captured within the ReviewShare document, which can be circulated by email.

It can, of course, be secured in various ways, including password protection.

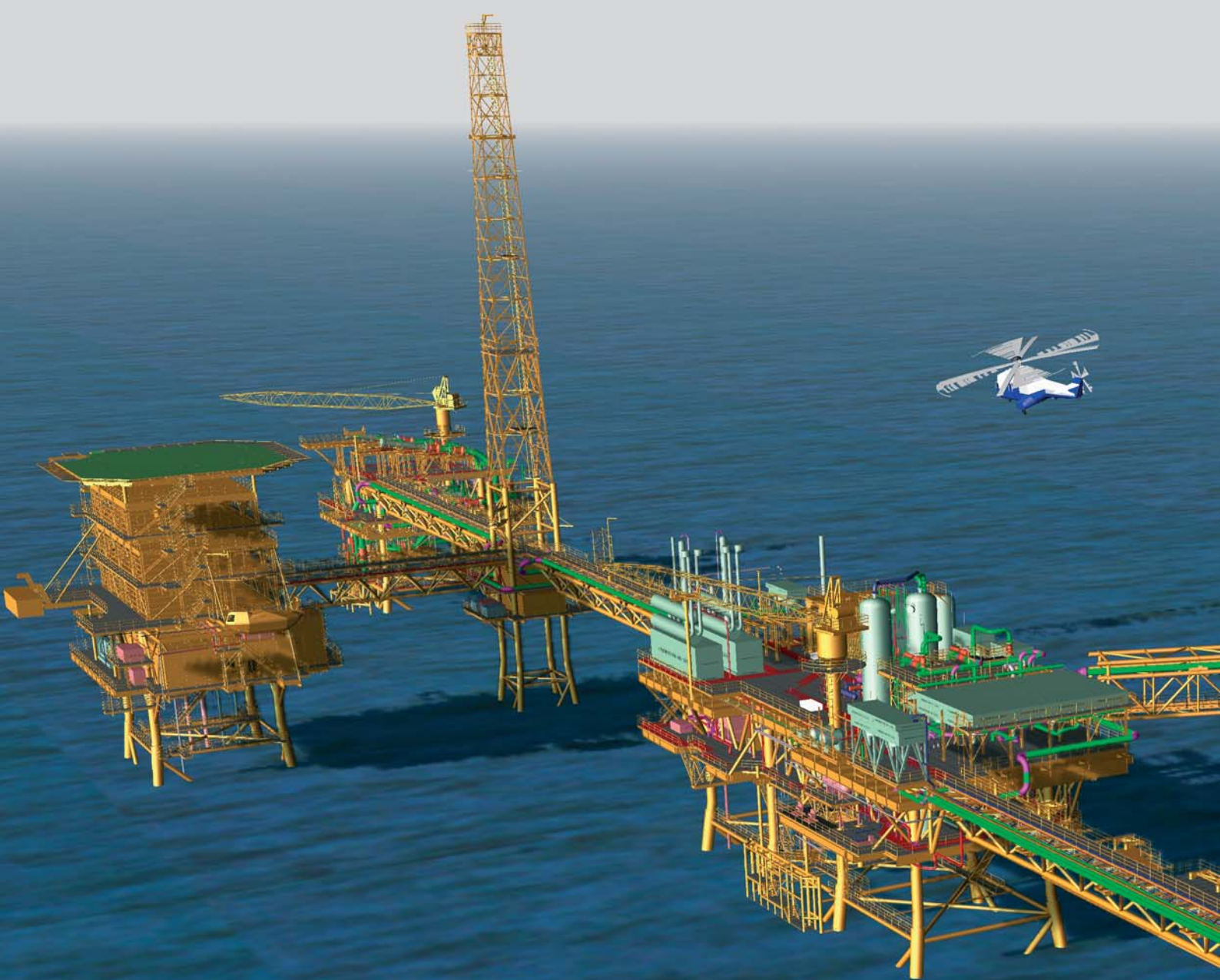
At no extra cost, existing users of AVEVA Review will receive AVEVA ReviewShare (both the client Reader and the server connection) as part of the forthcoming AVEVA Review 6.4.

Anyone who receives a ReviewShare document but does not have the application on their machine, will simply be prompted to download ReviewShare from the AVEVA website. Without the server connection, ReviewShare still provides a useful mark-up and collaboration tool, though only in 2D.

## **AVEVA ReviewShare knows no organisational, national or virtual boundaries**

AVEVA ReviewShare is a collaborative tool that knows no organisational, national or virtual boundaries. It is a natural stepping stone to an even more advanced world of managed collaboration, where information about systems and components is as important as the design process behind those systems and components, and where the consequences of change and decision-making can be automatically modelled.

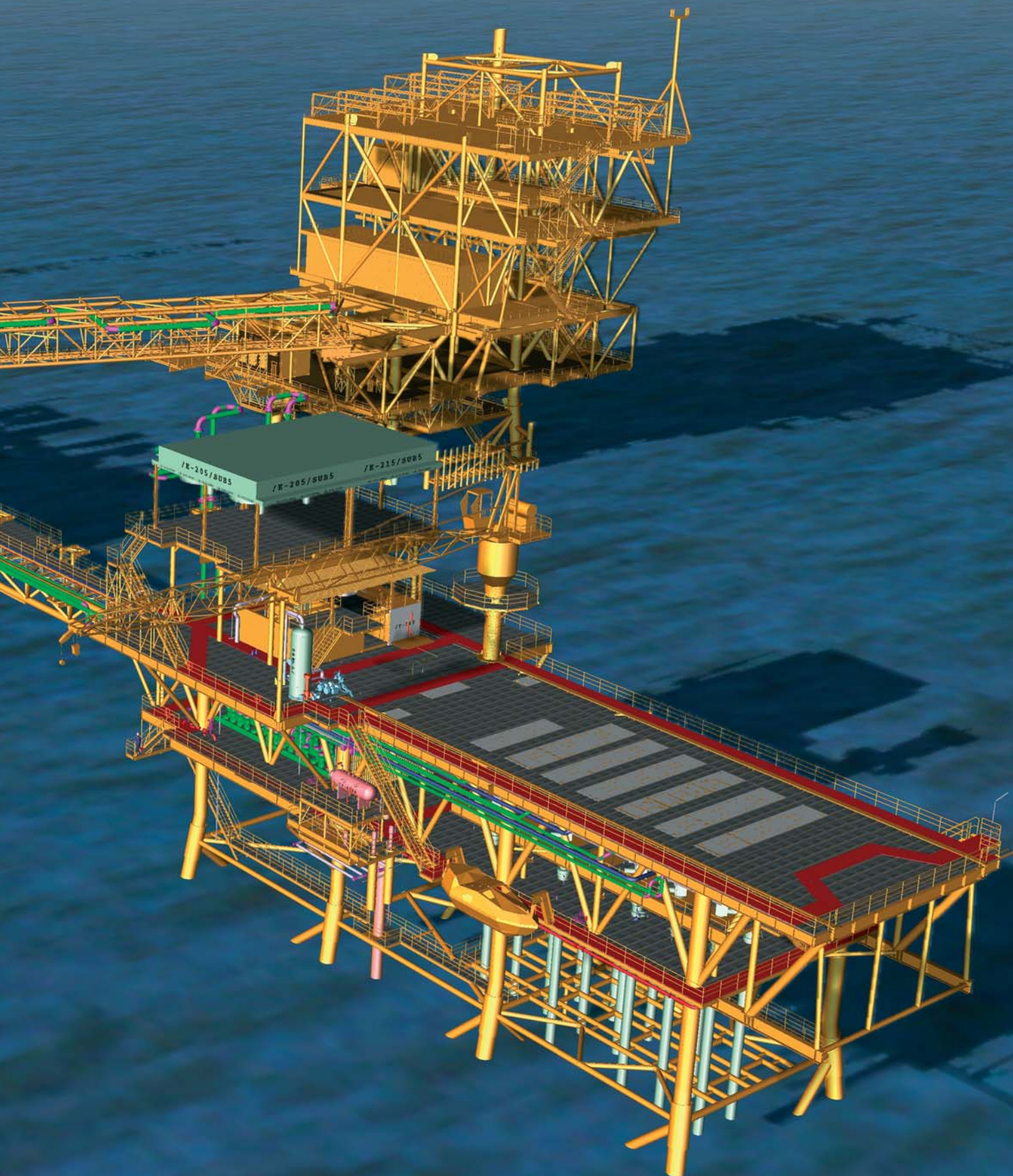
For more information, see:  
[www.aveva.com/reviewshare](http://www.aveva.com/reviewshare)



# Standard AVEVA PDMS Project concept cuts project schedules for **WorleyParsons**

**WorleyParsons is a leading global provider of professional services to the energy, resource and complex process industries, with offices throughout Australia and New Zealand, Asia, the Middle East, the Americas, Canada, Europe and Africa.**

**Magnus Feldt**  
Communications Manager – Industry Solutions, AVEVA



**AVEVA met Grant McPherson, Piping Design Department Head at WorleyParsons, in their office in Kuala Lumpur, Malaysia. Grant McPherson also manages the WorleyParsons - AVEVA global contract.**

Grant McPherson told us, 'WorleyParsons projects are increasingly executed globally, we understand that our customers need immediate access to strong technical expertise throughout the world, thus our global presence helps us to meet our customers' needs. It is now common practice for us to perform engineering and design in multiple execution centres, with the fabrication and construction activities completed somewhere entirely different. A plant can be engineered in Malaysia, London and Beijing, but fabricated in the Middle or Far East.'

**High-value engineering centre**

'The Kuala Lumpur office,' Grant continued, 'is one of several high-value engineering centres utilised by WorleyParsons. Kuala Lumpur also provides AVEVA PDMS technical, operational and training support to 19 other WorleyParsons global offices including; Singapore, Brunei, Jakarta, Bangkok, Abu Dhabi, Lagos, Perth, Melbourne, Chile, Trinidad, Houston, Beijing and London, where AVEVA systems are widely used within these offices. By utilising a standard and uniform project set up, we maximise the synergies of sharing engineering resources between our offices whilst at the same time maintaining quality. For some projects we have also successfully used AVEVA Global for the communication between our offices.'

'The Kuala Lumpur office core business is both greenfield and brownfield multi-disciplinary project execution, primarily within the hydrocarbon industry. A few of the projects that the Kuala Lumpur office is currently engaged in include:

- Four new offshore platforms for Petronas, (PCSB) including wellhead and gas production facilities.
- The Umm Shaif Gas Injection (USGIF) project for ADMA, which includes detail design of three new offshore platforms, a bridge link to the accommodation facilities, 16 subsea pipelines and tie-ins to three existing wellhead towers, and the existing Umm Shaif super complex for gas reinjection.
- Detail design of gas compression facilities for Shell Sarawak (SSB).
- Detail Design for production facilities for Murphy Oil.

We have also gained experience from working with brownfield projects in Malaysia using laser-scanning technique for referencing and/or converting data to PDMS 3D models.'

**Standard AVEVA PDMS Project Creation**

Grant McPherson continues, 'In today's project environment, customers expect project delivery schedules to get increasingly shorter. To meet these demands, WorleyParsons has created a standard project build in terms of AVEVA PDMS project set up and execution.'

Grant McPherson explained, 'The creation of a standard PDMS project has brought many benefits, including the rapid start-up of new projects, more efficient reuse and management of standard data, greater standardisation across projects, and the ability to create customisation, automation, and integration tools that can be used across multiple projects and multiple execution centres. This standardisation also enables greater work share capability and capacity.'

All the company's standard and reusable data, such as piping catalogues, support standards, design templates, drawing rules, and line-style definitions, is included in a standard PDMS project. This standard project can either be replicated to create a new stand-alone project, or referenced from each of the engineering projects. A standard has also been adopted for many aspects of the PDMS project configuration. For example, a common approach is always used for the database configuration and the data structures.

'As a result of this approach,' said Grant McPherson, 'we can deploy extremely quickly and we can now have our engineering design teams up and running on a new project much faster than ever before. We can move people between projects far more effectively, because our designers know what to expect in any WorleyParsons PDMS project. We operate with reduced levels of system administration. The standardisation also means that we can create customisations, such as automation and quality-checking tools that will work across all projects and locations.'

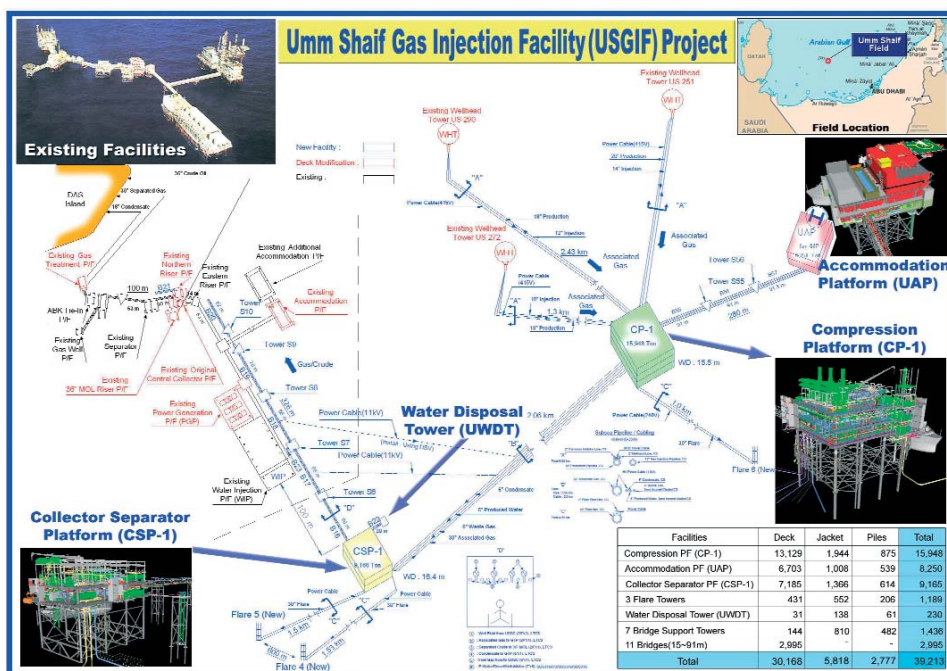
He concluded, 'After implementing this standard, we have shortened the design and engineering time on all our projects. A new project set-up can be performed in less than two days at any of our offices. These benefits have also resulted in considerable financial savings.'



**Grant McPherson, Piping Design Department Head, WorleyParsons**

**About WorleyParsons**

WorleyParsons is a leading provider of professional services to the hydrocarbon, power, mineral and metals, and infrastructure industries. Originally formed as an Australian structural engineering consultancy in Sydney, in 1971, the company has today expanded to over 84 operating centres in more than 30 countries, with over 23,800 employees. Visit [www.worleyparsons.com](http://www.worleyparsons.com) for more information.



The Umm Shaif Gas Injection (USGIF) project for ADMA, which includes detail design of three new offshore platforms, a bridge link to the accommodation facilities, 16 subsea pipelines and tie-ins to three existing wellhead towers, and the existing Umm Shaif super complex for gas reinjection. Image courtesy of WorleyParsons

# AVEVA training Nigeria's oil industry

The Federal Government of Nigeria has stipulated that the Nigerian 'local content' in the Oil & Gas industry in Nigeria should rise to 45% by 2007, and to 70% by 2010. The term, 'local content', applies to Nigerian human and material resources and services in the petroleum industry. This increase can only be achieved through the enactment and implementation of appropriate policies in domestic projects in Nigeria, and by the Nigerian Government making a commitment to investment in technology transfer and manpower development.

The growth of the capabilities of the Nigerian workforce in the Oil & Gas industry must further provide economic expansion while adhering to quality, health, safety and environmental standards.

## The challenge

The average experience level of the Nigerian Oil & Gas industry workforce who have been trained in traditional engineering practice has shown the need for a new generation of workers to undergo relevant, structured training programmes which incorporate Information Technology and project automation.

The Federal Government of Nigeria is committed to investment in a national Oil & Gas capacity development programme. The Nigerian Content Department of the Nigerian National Petroleum Corporation (NNPC) will oversee the training of more than 300 Nigerians on a software design tool in readiness for the 2.5+ million man-hours of engineering design work expected in Nigeria over the next few years.

## The decision

AVEVA PDMS was chosen as the preferred 3D modelling Engineering IT solution for offshore and onshore facilities, and was listed as one of the standard tools to be used to increase local participation through training in Nigeria.

Lonadek Consulting, AVEVA's representative in Nigeria, collaborated, as main contractor, with all the relevant organisations to ensure funding for the training initiative. Lonadek gained sponsorship to invest in capacity development programmes from the Petroleum Technology Development Fund (PTDF), a department responsible for capacity, capability and

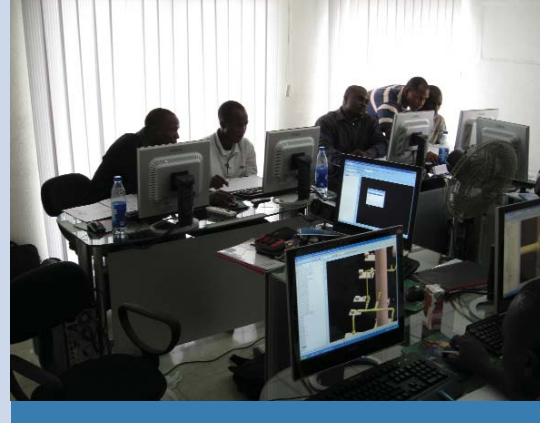
competence development within the Nigerian Oil & Gas industry, and from the NNPC. In order to fulfil the goal of training more than 300 Nigerians in the use of PDMS, Lonadek Consulting and AVEVA will be working together to meet the objectives of both companies. Lonadek Consulting will provide state-of-the-art computerised technology and CAD support services, while AVEVA will supply certified trainers to provide world-class training in PDMS.

## The bottom line

The extensive capabilities of PDMS, used by a local workforce to develop high-value Engineering Design Centres, will enable Nigerian companies to bid competitively internationally and to meet the global strategic demands of the 21st century.

## About Lonadek

Lonadek Consulting evolved from Lonadek Oil and Gas Systems Consultants, the systems implementation arm of LONADEK, which provides state-of-the-art computerised technology and CADD support services to the Oil & Gas industry. Lonadek understands the needs of the industry and has developed a full range of business-focused services that constantly exceed industry requirements. Lonadek is the Nigerian representative of AVEVA Solutions Ltd.



**'Technology transfer, manpower development and capacity building are essential steps in ensuring the sustainability of any development. A highly skilled, capable and competent workforce is vital to the success of exploration, production, refining, and the distribution of crude Oil & Gas products. For the successful completion of Front-End Engineering Design and Detailed Engineering of the huge Oil & Gas projects in Nigeria, it is essential that long-term capacity, capability and competence development programmes focus on the development of highly skilled process, piping, civil/structural, mechanical, vessels, electrical and instrumentation engineers; also designers and technicians who can successfully execute projects using AVEVA PDMS.'**

**Dr Lola Amao –  
Lonadek's Principal Consultant**

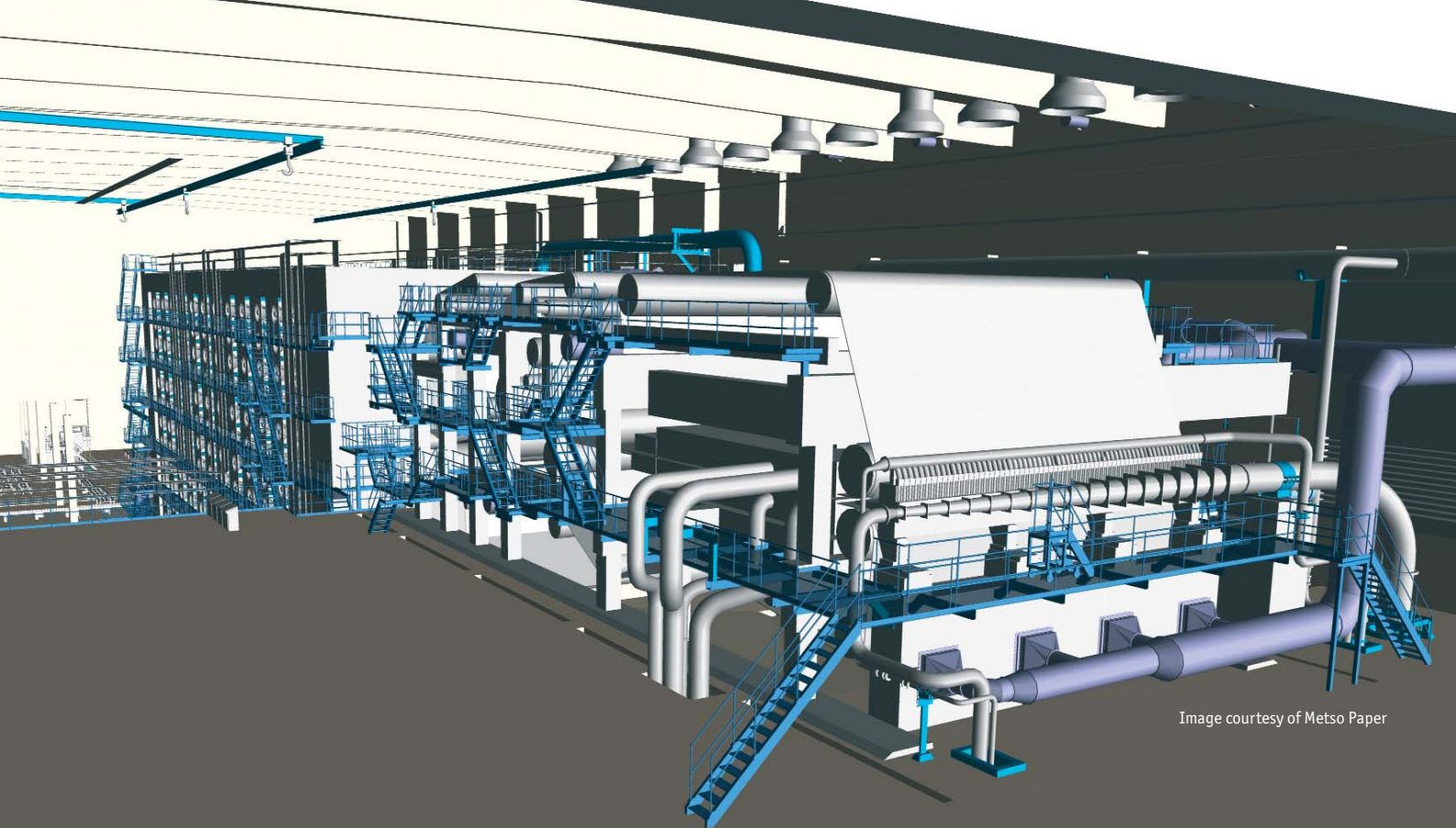


Image courtesy of Metso Paper

# With customers in more than 50 countries, global cooperation is a key issue for **Metso Paper**

**Metso Paper is a global leader in pulping, papermaking and power generation, with business operations in more than 50 countries. The company has more than ten years' experience of using AVEVA PDMS and AVEVA Global, and has recently signed a three-year agreement to continue using AVEVA Plant portfolio products.**

**Magnus Feldt**

Communications Manager – Industry Solutions, AVEVA

Right: The Stora Enso's Skoghall board mill in Sweden where Metso Paper supplied a new soda recovery boiler, a new evaporation plant, modernisation of the power boiler and a treatment system for odorous gases. Image courtesy of Metso Paper



### Full-scope supplier to the pulp and paper industries

To find out more about Metso Paper's use of AVEVA's engineering tools, we visited their head office in Jyväskylä in Finland, and two offices of the power division, in Tampere, Finland and in Gothenburg, Sweden. We met Ismo Vaiste, General Manager, Engineering Systems, Metso Paper, Jyväskylä.

Ismo Vaiste told us, 'Metso Paper is the leading full-scope supplier of pulping, papermaking and power generation technologies for the pulp and paper industry. Metso Paper develops and delivers complete production lines, rebuilds and modernisations, as well as process know-how, and expert and maintenance services. The wide product range covers the whole process line from wood-handling and pulping all the way to paper roll handling.'

He went on, 'Metso Paper has delivered about half of the world's paper machine capacity, and about 40 per cent of the pulping line and tissue machine capacity. Our power division, Metso Power has delivered about 40 per cent of the pulp industry's recovery boilers, and about a quarter of the world's industrial-sized bio- and multi-fuel fluidised bed boilers.'

'Demand for new machines and equipment used in the production of pulp, paper and board is increasing faster than average in Asia and South America. Most of the new pulp, paper and board mills are built for these growing markets.'

'In December 2006, we acquired the Pulping and Power businesses of Aker Kvaerner. This acquisition enables us to deliver complete pulp mills, modernisations and maintenance services, and to serve new customers in the power industry.'

'Applications from the AVEVA Plant portfolio, including AVEVA PDMS and AVEVA Global have been in use for more than ten years in our organisation as the design and engineering tool for our five business lines – Fibre, Paper and Board, Tissue, Power and Panel-board. PDMS is used as the engineering tool for the chemical pulping, power generation, mechanical pulping, and chemical recovery processes. The next step for us is to increase our own capacity

by also using PDMS for the design and engineering of the paper and board making process, as our customers prefer only one vendor to be responsible for the complete delivery. Paper and board making is a growing industry today, as a result of expanding sales through the Internet.'

### Growing demand for sharing information with customers and subcontractors

Ismo Vaiste continued, 'Our projects are often very complex, and are executed globally with many consultants and subcontractors involved. At Metso Paper, we cooperate extensively with our customers and subcontractors. During a project, there are several 'freezing points' where design information such as drawings, documents and 3D PDMS models are delivered to customers for their comments, before we can go ahead with the project. AVEVA Global plays an important role here, enabling our 13 engineering offices and partners to work concurrently towards the same model, independent of geographical distances and time zones. We are using the application more and more, with highly satisfying results.'

'It is vital for us to share design and engineering information with our subcontractors. By having access to all information, our subcontractors will be able to take greater responsibility for projects.'

'Metso Paper will always perform high-end engineering tasks. But our customers worldwide have differing requirements, so customisation varies from country to country. This creates a great need for efficient cooperation between our offices and our local people. In this, Global plays an important role.'

### AVEVA PDMS used from the very start of a project

Pasi Ilomäki, CAE Systems Development Engineer, Metso Power in Tampere, and Lars Bylund, General Manager IT, Metso Power in Gothenburg, further emphasised the importance of the Global application. They told us, 'All our power projects are global. Our five engineering offices in the Power division are located in Brazil, the United States, Sweden and Finland. They all work closely together. AVEVA Plant portfolio products have been used for the design of boilers and evaporation plants for more than forty complete large power projects in the last ten years. Ten power projects are running at this moment, and the two biggest projects are in Brazil and Chile. Today, we use PDMS right from the start of a project when we create the first layout of a new boiler or evaporation plant.'



**Lars Bylund**  
General Manager IT, Metso Power



**Ismo Vaiste**  
General Manager - Engineering Systems, Metso Paper



**Pasi Ilomäki**  
CAE Systems Development Engineer, Metso Paper



'The creation of a master PDMS project has led to the rapid start-up of new projects, and more efficient reuse and management of standard data such as piping catalogues and specifications. A common approach is used for the database and the data structures. All new projects are set up to suit a Global approach. The trend through the years has been to increase the use of PDMS into more of our engineering disciplines. Today, almost all disciplines are modelled in PDMS, creating a complete 3D model. Our target is to have a complete 3D model for each new project.'

### Clash-free design

For Metso Power, one of the most important features of PDMS is the clash-free design. 'Today, we never hear of any serious clashes during the construction of a plant,' says Pasi Ilomäki. The automatic clash-detection functions of PDMS are only used at Metso when geometry such as steel and equipment is imported from other systems. Pasi Ilomäki describes Metso's way of working: 'The detailed design engineer works with the entire model of the plant, and it is always updated to the latest available revision. Seeing the shaded 3D model is, in most cases, enough to avoid clashes. Many designers have both PDMS and Review running at the same time, with the details in the PDMS model and the overview in the Review model. We also try to bridge over the disciplines – for example, the piping designer will always route and design the cable trays in 3D based on specifications and sketches from the Electrical and Instrumentation department. During design review meetings, Metso organises linked Review sessions. The Review model is displayed on a screen at each participating Metso office. A chairperson will run the review session, and everyone can share the same information. For a global organisation like Metso, this also contributes to the achievement of a clash-free design.'

Finally, Pasi Ilomäki mentions that it is not only hard clashes that it is important to avoid. 'We always take insulation, safety distance, maintenance requirements, and so on into account as well,' he says.

### Reuse of design

Ismo Vaiste concluded, 'Every machine or boiler project is unique, but several of the components are identical and can be used each time we build a new machine. Many of these components can be reused as 3D models with small modifications, saving us considerable time and money.'

### About Metso Corporation

Metso Corporation is an international engineering and technology corporation serving customers in the pulp and paper industry, rock and minerals processing, power generation and other selected industrial sectors.

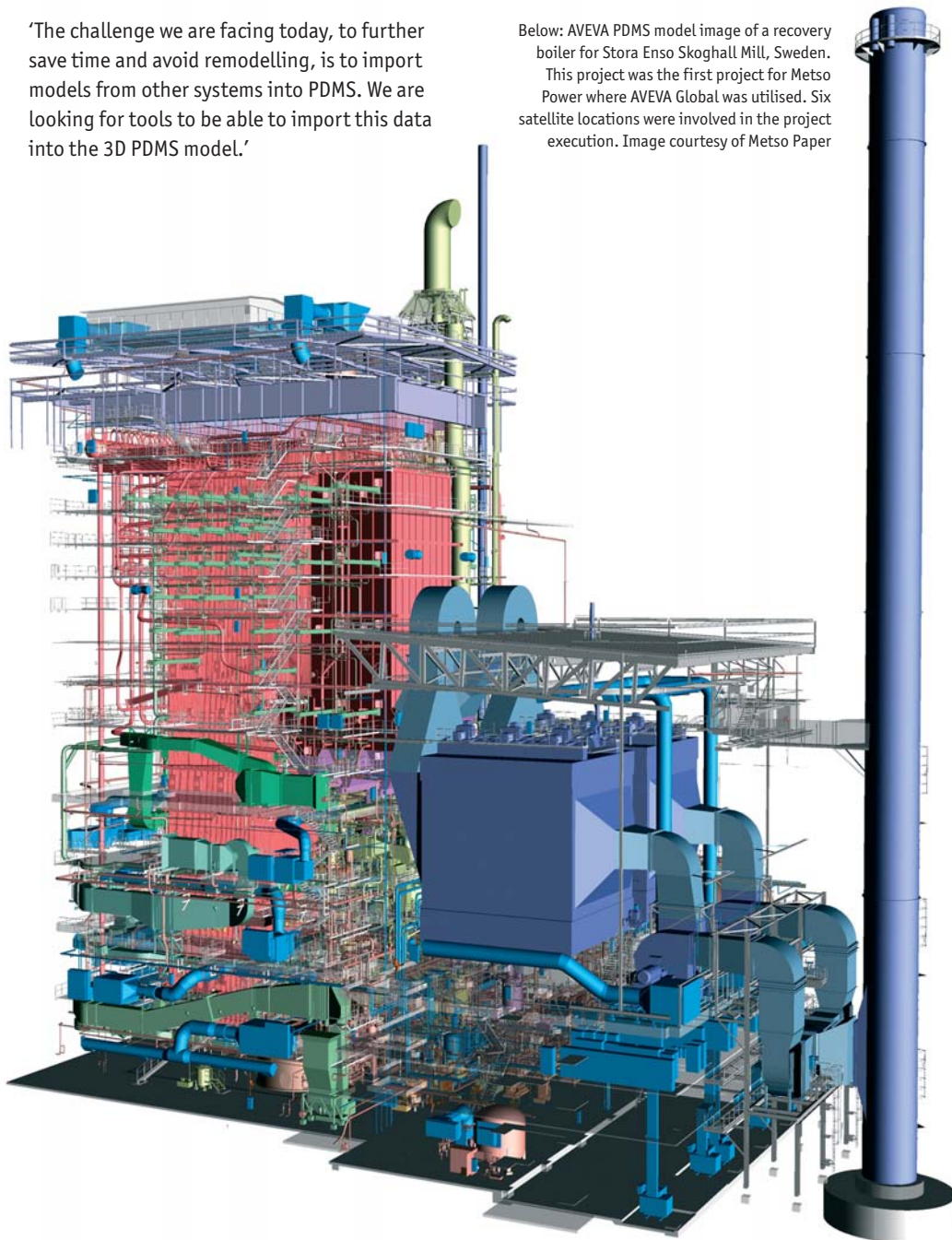
Metso Corporation comprises three business areas: Metso Paper, Metso Minerals and Metso Automation. In 2006, Metso Corporation's net sales totalled some EUR 5 billion. Metso Corporation has business operations on all continents, in over 50 countries, and has more than 26,000 employees.

The corporation's shares are listed on the Helsinki and New York stock exchanges.

The history of the Metso Corporation goes all the way back to the 1750s, when a small shipyard was established in the Viapori fortress, on the islands outside Helsinki, in Finland. Today's Metso Corporation was created through the merger of Valmet and Rauma in 1999. Valmet was a paper and board machine supplier, while Rauma's operations were focused on fibre technology, rock crushing and flow control solutions. Visit [www.metso.com](http://www.metso.com) for more information.

'The challenge we are facing today, to further save time and avoid remodelling, is to import models from other systems into PDMS. We are looking for tools to be able to import this data into the 3D PDMS model.'

Below: AVEVA PDMS model image of a recovery boiler for Stora Enso Skoghäll Mill, Sweden. This project was the first project for Metso Power where AVEVA Global was utilised. Six satellite locations were involved in the project execution. Image courtesy of Metso Paper



'Today, we never hear of any serious clashes during the construction of a plant...'

# Chevron uses AVEVA NET Portal (VNET) on world's largest FPSO to manage critical information

**Chevron has selected AVEVA to provide and implement its AVEVA NET Portal (VNET) solution to manage critical information for the operation of Agbami, which when completed will be the largest FPSO in the world.**

Located offshore Nigeria, the Agbami FPSO will produce 250,000 barrels of oil per day. The FPSO will inject water and associated gas for reservoir pressure management. It will also be equipped with the latest environmental protection technology.

When operational, the FPSO will be managed from the Chevron offices in Lekki, Nigeria. The design and engineering work will be coordinated over a number of sites internally in Nigeria, with specialist contractors internationally and with the Agbami FPSO itself. Utilising AVEVA NET Portal (VNET), information is continually updated on the master hub and then synchronised with the replicated data onboard the FPSO which will include P&IDs, the 3D ship/facility model, documents, and other information ensuring that reliable and accurate data is available online at any time during operation.

AVEVA NET Portal (VNET) is a web-enabled solution for the integration and collaborative use of all engineering information. 3D models, schematics, documents and data from any application can be accessed and navigated in context, with full intelligence, without needing the source application that originally created the data. Based on ISO 15926 and XML technology it provides a fully flexible and easy-to-implement solution for the management of engineering data across the lifecycle of a project. AVEVA NET Portal (VNET) reduces the time it takes to find information, increases

quality and consistency of data, and makes the information accessible across all stakeholders on a global basis, reducing risks and costs in the design, build and operation of large capital engineering projects.

## **About Chevron in Nigeria**

Chevron is guided by the vision of being the energy company most admired for its people, partnership and performance. In the pursuit of this vision, Chevron has developed programs that foster sustainable development in all facets of the Nigerian society. This includes the development of 'Nigerian Content' to encourage the participation of Nigerian service providers and suppliers in the Oil & Gas industry. Participating in the Agbami Engineering Portal project is Nigerian engineering services company, Lonadek Consulting. Lonadek Consulting is the agent for AVEVA in Nigeria and provides training and support for AVEVA applications sold throughout Nigeria. Lonadek Consulting will be responsible for aspects of the delivery of the Agbami Engineering Portal system as well as ongoing support after it goes into operation in 2008.

## **The Agbami FPSO**

The Agbami FPSO is one of the largest offshore floating structures built to date. The new build FPSO is 300 metres long and, with topsides weighing 38,000 tonnes, will be capable of processing 250,000 barrels per day of oil and 450 million standard cubic feet per day of gas, with a storage capacity of some 2.3 million barrels of oil. The Agbami FPSO will be spread moored in a water depth of approximately 4,500 feet. The Agbami field lies some 45 miles offshore Nigeria, approximately 220 miles south-east of Lagos. First oil from the FPSO is expected third quarter 2008, reaching full capacity within a year.



# AMEC Paragon uses AVEVA's portfolio of applications to deliver measurable project savings

AMEC Paragon, the Americas Oil & Gas hub for AMEC, the international project management and services company, received a 2007 AVEVA Engineering Excellence to the Extreme award (Americas) for its Integrated Project Execution (IPE). The award was presented to AMEC Paragon at the ISEIT Americas conference in October 2007.

Becky Stevens

Marketing Consultant for AVEVA (Americas)

**IPE is a work process that has allowed AMEC Paragon to measure and deliver outstanding time and cost savings across multiple projects, utilising the full suite of AVEVA's design and engineering applications. AMEC Paragon's IPE strategy enables the safe, efficient and effective collaboration of all parties involved in an Engineering, Procurement and Construction (EPC) project, across all applications and executed from multiple locations.**

## How IPE solves design challenges

'Each project has some common design challenges,' explained Marc-Henri Cerar, Project IT & Information Systems Manager for AMEC Paragon. 'We use the full suite of AVEVA's solutions – AVEVA VPE P&ID, AVEVA VPE, AVEVA PDMS, AVEVA VPRM, and AVEVA Review with AVEVA Laser Model Interface – to address these challenges, and we have found that, when employed together, the benefits achieved are much greater than any single application could deliver.'

Common design challenges, and AMEC Paragon's approach to solving these problems:

- The design model must reflect reality, i.e. what is to be built. AMEC Paragon answers this challenge by dynamically linking the design model to P&IDs and procurement.
- Document changes must, and can be, controlled by requiring electronic approvals for revisions.
- Changes in one document must be reflected in all documents. At AMEC Paragon, documents, models and other engineering deliverables are linked and 'red-flagged' when a change is made.
- Information must be readily available to all. Internet access is used, and documents are linked for quick reference.
- The pieces must fit together when fabricated. The design model includes everything (actual structure, pipe supports, cable trays, realistic valves and controls).

Marc-Henri Cerar continued: 'The AVEVA suite provides the framework for AMEC Paragon's IPE strategy by enabling reliable and repeatable work processes. It establishes a common technical database across multiple project areas, eliminating duplicated effort and producing consistent results. It provides us with a common configuration across multiple projects, resulting in consistent design and execution and a consistent basis for progress tracking and reporting. From using the suite, we gain improved quality management, improvements in communication and collaborative work effort between multiple work sites. Further advantages include consistent material requisitions, awards and tracking of procured equipment and material, and the quicker, more consistent conveyance and storage of deliverables and other project documents.'

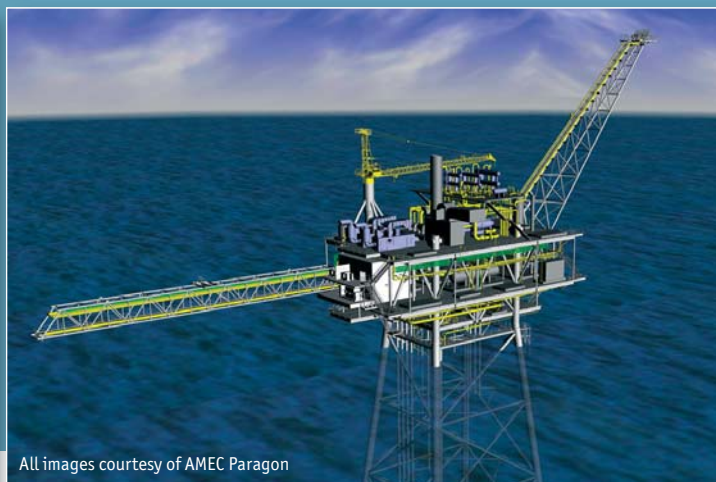
Support and collaboration between AMEC Paragon and AVEVA's Americas operations have been instrumental in the success of AMEC Paragon's IPE strategy. As Marc-Henri commented: 'I have personally worked with AVEVA on two different projects from start to finish. AVEVA has a team of fine professionals who have advised us on what we need to do technically. Having the AVEVA Houston office close by is a great help. If we have a serious issue, AVEVA sends a person immediately to fix the problem. We can also take advantage of the many advanced technical courses AVEVA offers, both at their training facility and at ours.'

He concluded: 'AVEVA also solicits our feedback on product enhancements, and when there is a major new product in release AVEVA will visit our office and conduct several days of product orientation, helping us understand what the product does, what it is capable of, and how it can impact our future strategy. We derive tremendous value from our relationship with AVEVA.'

## About AMEC Paragon

AMEC Paragon is AMEC's hub for Oil & Gas production, midstream/gas processing, and pipeline operations. Based in Houston, Texas, it provides engineering, design/drafting, mapping, materials management, and construction management services. Specialities include onshore and offshore production facilities, onshore and offshore pipelines, floating production and subsea systems, LPG and LNG facilities, alternative fuels facilities, stranded gas applications and heavy oil treatment facilities. AMEC Paragon has completed more than 4,000 projects, in 30 countries, for over 260 clients. Visit [www.amecparagon.com](http://www.amecparagon.com) for more information.

Below are quantified results from two AMEC Paragon projects that utilised an Integrated Project Execution strategy:



All images courtesy of AMEC Paragon

### Project 1: Retrofit offshore project using laser scanning integrated with AVEVA PDMS

- **20% reduction in spool piping field welds** normally left for field verification, fit-up and weld out due to incorporating, into the PDMS model, accurate dimensions of the existing facilities derived from the laser scan. This percentage varies from project to project according to type of installation and its location. Since the project consisted of a high-pressure piping and equipment installation for gas injection on an existing offshore platform, the amount of field weld reduction was limited due to the size and weight of each spool piece in order to be able to safely rig, lift, transfer and handle each piece during hook-up.
- In addition to the spool piping fabrication savings, AMEC Paragon achieved approximately a **50% reduction of the man-hours** it would normally take to field verify, fit-up, weld out, perform a Non-Destructive Evaluation (NDE), and post weld heat-treat the 20% reduction of field welds compared with onshore in the fabrication shop. NDE is vital for constructing and maintaining all types of components and structures. To detect different defects such as cracking and corrosion, there are different methods of testing available, such as X-ray (where cracks show up on the film) and ultrasound (where cracks show up as an echo blip on the screen).
- **0% rework of piping and structural clashes within the new installation** has been accounted for during the offshore hook-up, thanks to the accuracy of information obtained from the laser scan of the existing facilities being incorporated into the PDMS model to prevent clashes of the new installation with the existing asset. The PDMS model in itself has also been a benefit with 0% rework accounted for, since its main directive is to prevent the possibility of clashes within the new installation.
- **Project saved approximately one month of offshore hook-up time at completion.** There was no rework due to interferences or clashes.
- **5% reduction of material waste** due to lack of interferences, clashes, rerouting, and so on.
- **Reduced engineering time by up to 10%.**
- **Reduced offshore visits by up to 70%.**

### Project 2: Offshore project using AVEVA VPE, AVEVA VPRM and AVEVA PDMS integration

- **50% reduction in procurement group man-hours for major equipment packages.** The turn-around time from the release of a Material Requisition by engineering to the issue for inquiry has traditionally been measured in weeks. In most cases, this was accomplished in days, due to the structured work process and integration between AVEVA VPE and VPRM.
- **90% reduction in procurement group man-hours for bulk material packages.** The integration between AVEVA PDMS and VPRM made this an extremely efficient work process.
- **50% reduction in document control man-hours for client handover.** VPRM's structured work process provided streamlined engineering and vendor documentation processing, and complemented AMEC Paragon's electronic document management system.
- **95% reduction in reprographic costs related to client handover.** The client handover process would traditionally take days, and many man-hours, and have large reprographic costs. In most cases, AMEC Paragon's projects transfer documents in hours, with reduced man-hours and almost no reprographic costs.
- **Creation of weight management reports in less than five minutes instead of four hours.** This weight management reporting application uses data directly obtained from PDMS, which is then formatted and summarised. The system eliminated the creation and management of manual spreadsheets. In addition, the reports are far more detailed, providing weight by location, category, shape or material.

## Using the **AVEVA Schematic Model** database to create and view a single logical plant model

## Henrik Hultin

## Team Leader – Marine Diagrams & Migration, AVEVA

With the latest releases of the new 12 series AVEVA Plant and AVEVA Marine, a new schematic model database has been introduced. This has been developed as a natural extension to the 3D product model, and provides a common database usable by all schematic designers and disciplines in a project. Using this database, a consolidated and complete schematic model can be created. The database is open for import and export, meaning that it is possible to use various authoring tools in a project.

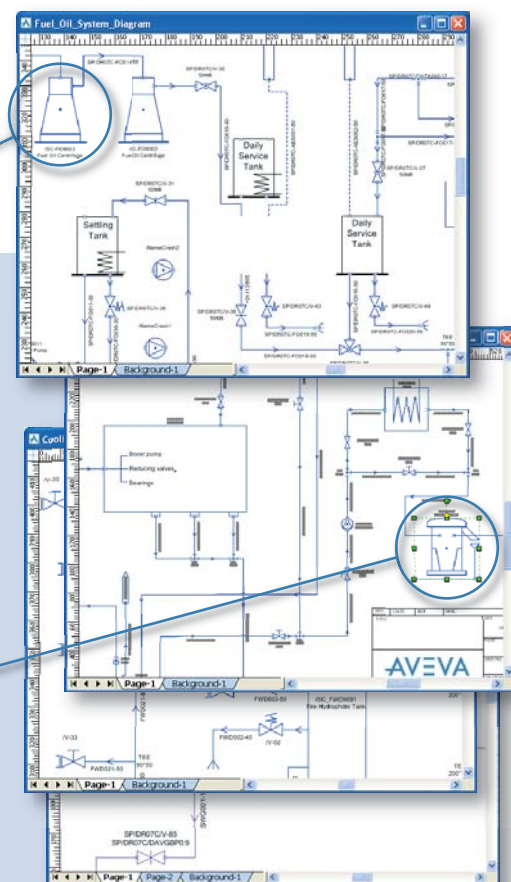
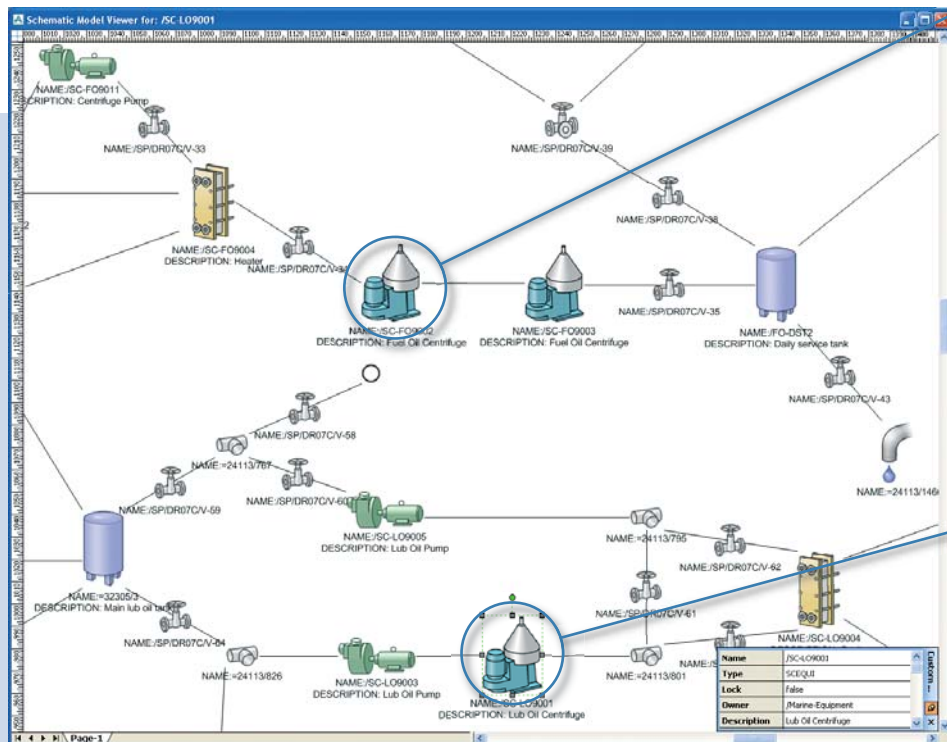
As the schematic model database is tightly integrated with the 3D product model, schematic data can be reused when creating 3D data. Schematic data and 3D data can also be compared, to find and highlight any inconsistencies between these sources. Based on the comparison result, it is also possible to make managed updates.

The schematic model database can handle P&ID data, including the drawing sheets (graphics) as well as the underlying topological model. It also supports HVAC and cabling diagrams and data. In most projects, there is interconnectivity between different drawing sheets, meaning that a single system might be depicted on several sheets. There are normally also connections between different systems.

So far, it has been a difficult task to get an overview and understand this whole schematic network. However, in this release, a unique schematic model viewer is included which gives the user the ability to visualise and navigate through the schematic model, independently of the drawing sheet structure.

Using the schematic model viewer, the user can start on a certain equipment item and generate a view of all connections from that item. It is then possible to navigate by expanding the view along the schematic network to see and understand how things are connected. The viewer also provides two modes of operation: the Overview mode shows equipment items, their connections and generic branching points, while in the Detailed mode, all valves, fittings and instruments can be seen.

Read more about the schematic model and related functions in the white paper on: [www.aveva.com/publications](http://www.aveva.com/publications)



By using the Schematic Model Viewer it is possible to navigate and view the complete schematic model. This data can originate from different P&IDs. The viewer provides a continuous view of interconnected systems independently of the drawing sheet limits.

# AVEVA welcomes our new customers in 2007

The AVEVA Plant and AVEVA Marine solutions are associated with complex process plant and marine assets around the world. AVEVA has unparalleled experience and understanding of these markets, which is just one of the reasons why we are proud to welcome these companies as new customers.

3I Ingenierie, France  
9Sq Corporation, Korea

AAF Ltd, UK  
Abel, Italy  
ACCENT Engineering Consultants Inc., Canada  
AD MARIN Shipyard, Turkey  
ADIK, Turkey  
Aker Kvaerner Germany GmbH, Germany  
Albert Garaudy Consulting Engineers, USA  
AML Consultants, Australia  
Anhul Conch Kawasaki Engineering Co., China  
Arting, France  
AS Intec, Italy  
Astilleros Armón Vigo, Spain  
Atlantec Enterprise Solutions GmbH, Germany  
Audubon Engineering, USA  
Auxitex, France

Babcock Borsig Service GmbH, Germany  
Babcock Industrierohrleitungsbau GmbH, Germany  
Babcock Support Services, UK  
Basstech, Sweden  
BBG, Spain  
BE Bioenergie GmbH & Co.KG, Germany  
Beijing Bootes Electric Power Sci-tech Co., Ltd., China  
BHP Billiton Olympic Dam, Australia  
Bumi Armada Berhad, Malaysia  
BUMIGEME INC., Canada

Cactus Engineering Co. Ltd., Vietnam  
Calamai & Agresti, Italy  
CAMELOT, Turkey  
Cantieri Navali Seaborne, Italy  
Cantieri San Marco, Italy  
Capnor Poland Sp. z o.o., Poland  
Casablanca Tankers, Sweden  
Casale, Italy  
CB&I Eastern Anstat, UAE  
Changwon College, Korea  
Chemserv Industrie Service GmbH, Germany  
China BCEL International Engineering Co., Ltd., China  
CME, Italy  
Co-Ver Impiantisca, Italy  
Cofatech, Italy  
Constructora Subacuatica Diavaz S.A. DE C.V., Mexico

Daehan Shipbuilding Co., Ltd., Korea  
DaeSun Shipbuilding & Engineering Co., Ltd., Korea  
date-up GmbH, Germany  
Davie Quebec Inc., Canada  
DCK Engineering, Inc., USA  
DEARSAN, Turkey  
DG Impianti, Italy  
Dietrich Günther Sbresny Ingenieurbüro, Germany  
Dimensional Solutions Inc, USA  
Direktorat Industri Maritim dan, Indonesia  
Dodsall Engineering and Construction, UAE  
Dolphin Energy Ltd, UAE  
Dongnam Precision Ind. Co Ltd, Korea

Dow Chemical Corporation, USA  
DPS Bristol (M) Sdn Bhd, Malaysia

ECM Ingenieur-Unternehmen für Energie- und Umwelttechnik GmbH, Germany  
EICKHOFF Industrie-Anlagenbau und Montagen GmbH, Germany  
Energoprojekt Warszawa S.A., Poland  
EnergySolutions, USA  
enertech Energie und Technik GmbH, Germany  
Engineering Projekt Group, The Netherlands  
Eplant Solutions, Inc., Canada  
EPPM, France

Fincantieri, Italy  
FKT Faßbender GmbH, Germany  
ForceTEC Corporation, Korea  
Formosa Plastics Group, Taiwan  
Friede & Goldman, USA

Gas Services International (S) Pte Ltd, Singapore  
GEA Wiegand GmbH, Germany  
Geochang Provincial College, Korea  
GiprogaZoostchka, Russia  
GKN Aerospace Engineering Services, UK  
GL&V Sweden, Sweden  
Global Process Systems, UAE  
Global Process Systems Sdn Bhd, Malaysia

Harvard Co., Ltd., Korea  
HERA Maintenance GmbH, Germany  
Hoyeon Tech Co., Ltd., Korea  
Husky Energy Inc., Canada  
HYL Technologies, Mexico

Iberese, Spain  
IDO HUTNY PROJEKT a.s., Slovakia  
IDOM Ingenieria, Mexico  
IKN Ingenieur-Planungs- Gesellschaft mbH, Germany  
Inco Australia Management Pty Ltd, Australia  
Industry & Project Engineering s r.o., Slovakia  
Infosys Technologies Ltd., India  
Ing. Büro Hendlmayr GmbH, Germany  
Ingenieurbüro Kiefer & Voss GmbH, Germany  
Institute KazNIPiEnergoprom, Republic of Kazakhstan  
INWAT Sp. z o.o., Poland  
Iosis, France  
Ironopolis Engineering, Nigeria  
IVC Ost, Sweden  
IVITAS a.s., Czech Republic  
iXIT Eningeering Technology GmbH, Germany

Jinan Industrial High School, Korea  
Jinju National University, Korea  
Jinse Shipbuilding Co., Ltd., Korea  
Josef Bertsch Gesellschaft m.b.H & Co., Austria  
JP Kenny, UK

Kavya Projects Pvt Ltd, India  
Kencana Bestwide Sdn Bhd, Malaysia

King Polytechnic Engineering Co. Ltd., Taiwan  
Koch, Spain  
Korea Shipyard Co. Ltd., Korea  
Kraftanlagen München GmbH, Germany  
Kwang San Co., Ltd., Korea

Laboratoires Serono SA affiliate of Merck Serono S.A., Switzerland  
Larsen Oil & Gas Pte Ltd, Singapore  
Lenzing Technik GmbH, Austria  
Litwin, Italy  
LITWIN-RO S.A., Romania

Malaysia LNG Dua Sdn Bhd, Malaysia  
MAN Ferrostaal GMBH, Germany  
Metso Fiber Karlstad AB, Sweden  
Metso Power AB, Sweden  
Military Sealift Command, USA  
Modelsa S.A. de C.V., Mexico  
Mokpo Industrial High School, Korea  
Mokpo Science College, Korea  
Movesa, Spain  
MVM Information Technologies Service Centre Ltd., Hungary

Nantong Mingde Heavy Industry Co., Ltd., China  
Natco Canada, Canada  
Navtec Engineering India, India  
Nishinippon Plant Engineering & Construction, Japan  
Noorter Eriksen, Italy

ODL Services, Inc., USA  
Oil & Gas Solutions, USA  
OilFab Sdn Bhd, Malaysia  
Omega, Italy  
Optimus Sistemias Holisticos, Mexico  
Ourhoud, France  
Outotec GmbH, Germany  
Outotex, Sweden  
OXEA Deutschland GmbH, Germany

PARKER Engineering Co., Ltd., Korea  
Petroleum Development Oman, UAE  
PKB Ingenieurgesellschaft mbH, Germany  
Plant Design Survey Sdn Bhd, Malaysia  
PolymerLatex GmbH, Germany  
Poyry Energy Pty Ltd, Australia  
Praj Industries Ltd., India  
Proceanic, Ltd., USA  
Proceanic Engineering, Singapore  
Process Plus, USA  
Promt AB, Sweden  
Prosafte Production Services Pte Ltd, Singapore  
PT Gastech Engineering, Indonesia  
PT. Surveyor Indonesia, Indonesia  
Pörner Ingenieurgesellschaft m.b.H, Austria

RAM Engineering + Anlagenbau GmbH, Germany  
Raschig GmbH, Germany  
RED Engineering GmbH, Austria  
Reliance Industries Limited, India  
Rosetti Marino, Italy  
RusGazEngineering, Russia

Salavatnefteorgsintez, Russia  
SamKun Century Co., Ltd., Korea  
Samsung Heavy Industries India Private Limited, India  
Schatz KEG, Austria  
Seadrill Engineering UK, UK  
Seasafe Inc., USA  
Semcon Sweden AB, Sweden  
Sempra Global, USA  
Seoul National University, Korea  
SGN, France  
Shanghai Bestway Marine Engineering Design Co., Ltd., China  
Shanghai Dingheng Shipping Co. Ltd., China

Shaw Global Energy Service, USA  
Shell Deutschland Oil GmbH, Germany  
SIAD, Italy  
SibCOTES, Russia  
Sichuan Air Separation Plant (Group) Co., Ltd., China  
Silicon Designs (M) India Pvt. Ltd., India  
Simon Carves India Limited, India  
Simon Carves Singapore (Pte) Ltd., Singapore  
SMS Demag AG, Germany  
SNC Lavalin – Montreal, Canada  
Sorit, Italy  
Soyuz Corporation, Russia  
Stantec Inc., Canada  
Stena Drilling, UK  
StoGda Ship Design & Engineering sp. z.o.o., Poland  
STOP Management BV, The Netherlands  
SUBMARIN, Turkey  
Syngenta Crop protection, USA

TaeKeon Co., Ltd., Korea  
Taesung Engineering Co., Ltd., Korea  
Taiwan Synthetic Rubber (Nantong) Corp., China  
Technisches Büro Ulrich Geiger, Germany  
Tecnas, Italy  
TEKFEN, Turkey  
Teploelectroproject, Republic of Uzbekistan  
Texas Southern University, USA  
TMT Italia, Italy  
Toyo Kanetsu K.K., Japan  
TRIPLAN AG, Germany  
Truboprovod, Russia

Ulsan Science College, Korea  
UNIS Nefteproject, Republic of Belarus  
UNIS spol. s r.o., Czech Republic  
University of Calgary, Canada  
University of Pittsburgh, USA

VÍTKOVICE ITS a.s., Czech Republic  
Vogelbusch GmbH, Austria

Waller Marine, Inc., USA  
WEBER Rohrleitungsbau GmbH & Co. KG, Germany  
Werner Konrad Ingenieurbüro, Germany  
Woochang Ind., Korea

Zakłady Remontowe Energetyki Katowice S.A., Poland



# Kalkavan Sedef shipyard implements AVEVA Marine to further increase productivity

**Magnus Feldt**

Communications Manager – Industry Solutions, AVEVA

**When we visited Kalkavan Sedef shipyard in Tuzla, Turkey, we found the site extremely busy. A new dry dock was under construction, a newly-built container ship was at the outfitting quay ready to be delivered in two weeks, and three container ships were being built simultaneously. The pace of progress is also high in the design office, where the design work had begun on a 180,000 dwt bulk carrier. This will be by far the largest bulk carrier ever built in Turkey.**

We met Cumhuri Kuter, General Manager, who explained the changes the shipyard is carrying out to further increase productivity to meet the new challenges they are facing due to a very successful order intake. In the early 2000s, the shipyard's fabrication process was transformed into a workstation-oriented workshop production line with modern panel-line and assembly-line equipment. To support their fabrication process, Sedef implemented AVEVA's Tribon shipbuilding system for both their structural steel and their outfitting disciplines. A numerically controlled pipe-bending machine was also installed for the fabrication of pipe spools.

The increased accuracy of production information has substantially reduced rework and saved man-hours as well as material costs. The shipyard has been able to reduce production time from first steel cutting to delivery from eleven months to eight months. Their first ship in a series of five container ships took 700,000 man-hours to build, while the fifth in the series required only 500,000 man-hours. Today, Sedef can build seven ships per year, compared to five similar ships before.

In order to further increase the shipyard's production capacity and boost productivity, a huge investment programme is currently being undertaken. The shipyard is being extensively upgraded to allow the building of larger container ships of up to around 4,500 TEU, and bulk carriers of up to 180,000 dwt. The existing production facilities have recently been further extended by a new panel line supported by the AVEVA Marine solution. When the new, enlarged prefabrication area is completed, it will be possible to carry out all operations under cover.

A 10,500 square metre dry dock is under construction, with an overhead gantry crane with a 500 tonne lifting capacity. A new pipe shop is also nearing completion. Near to this berth, and already in use, is a highly automated painting facility, providing environment-controlled, enclosed conditions where all blocks can be painted and finished. This facility has four halls, up to 18 metres high, and covers around 3,300 square metres.

Using the AVEVA Marine system, the shipyard has now started the detailed design work on the first of the three 180,000 dwt bulk carriers. The basic design was undertaken by the Turkish engineering company, Delta Marine.

#### About Kalkavan Sedef shipyard

Kalkavan Sedef Shipbuilding and the vessel operator, Turkon Maritime, belong to the Kalkavan group. Sedef shipyard was first established by the STFA group as a company in the shipbuilding industry sector in Gezbe in 1972. In 1990, after winning the contracts for a series of new projects, the current modern shipyard was opened in Tuzla. The new site has been controlled by the Kalkavan group since 2000. The Kalkavan Sedef shipyard is booked fully until 2010, building a series of container ships and bulk carriers for its parent group, Turkon Holdings.

Visit [www.kalkavanshipyard.com](http://www.kalkavanshipyard.com) for more information.



**Cumhur Kuter**  
General Manager,  
Kalkavan Sedef shipyard



The container feeder vessel 'Erkan K', built at Kalkavan Sedef shipyard.  
Image courtesy of Kalkavan Sedef shipyard

'The increased accuracy of production information has substantially reduced rework and saved man-hours as well as material costs...'

## Turkish shipbuilding industry extends its shipbuilding facilities

The Turkish shipbuilding industry is very keen to extend its shipbuilding facilities. For over 20 years, the industry has been concentrated in Tuzla Bay (shown below), where there are 44 shipyards. Tuzla lies 50 kilometres east of Istanbul, on the Sea of Marmara. Turkish shipbuilding is experiencing a genuine boom period, with all the shipyards in Tuzla fully booked for the coming years. These shipyards are building more and more ships, of increasing size and complexity. During the last two years,

the Tuzla Bay shipyards have invested heavily to allow them to handle these larger ships. There is, however, still a lack of space for significant expansion.

To address this, several new shipyards are being built in Turkey, most of which have the capacity to build larger ships than those in Tuzla. The Turkish government has initiated the Yalova project to create a new shipbuilding centre, and new shipyard sites are planned also at Eregli on

the Black Sea coast, at Karabiga in the Dardanelles, and in Mersin and Adana. Turkey is an emerging global shipbuilding power. The Turkish shipbuilding industry employs 25,000 people. The size and number of ships being built is increasing steadily and their designs are growing in complexity and sophistication. There have also been major improvements in quality and efficiency within the industry.



# Hyundai Heavy Industries (HHI) launches the Republic of Korea's first AEGIS destroyer

The 7,650-tonne AEGIS destroyer, launched on May 25th 2007 at HHI's Special and Naval Shipbuilding Yard in Ulsan, South Korea, was designed and built using AVEVA Marine solutions.

**Magnus Feldt**

Communications Manager – Industry Solutions, AVEVA



## Sejong the Great

The destroyer was named Sejongdaewang-Ham (Sejong the Great) after the legendary king of the Chosun dynasty who strove to protect his people and kingdom by fortifying the nation's defences. The Republic of Korea Navy (ROKN), which commissioned the ship, is now testing and operating all the ship's systems. The vessel will be deployed for naval operations in 2009, after 18 months of tests.

The Sejongdaewang-Ham is the ROKN's first KDX-III destroyer. These destroyers are equipped with the advanced US AEGIS integrated radar and missile defence system. Along with the existing 4,300-ton KDX-II destroyers, the Sejongdaewang-Ham will help strengthen Korean naval operational power.

The KDX-III Class destroyers are among the first to implement the highly advanced AEGIS combat system with the RIM-116 Rolling Airframe Missile weapons system. The Sejongdaewang-Ham is also equipped with torpedoes, anti-submarine rockets, 16 long-range anti-ship missiles and 32 land-attack cruise missiles. AEGIS tracks and targets multiple threats from other ships, aircrafts and missiles.

The standard displacement of the KDX-III Class is 7,650 tonnes, and its fully loaded displacement is over 10,000 tonnes.

## AVEVA Marine solutions

HHI has, in the past, used AVEVA Marine solutions to design and build submarines and auxiliary service vessels. Work on the destroyer started in November 2004 and was completed in 30 months. AVEVA Marine solutions played a key role in maximising efficiency by providing a single design database system and a datacentric environment. Furthermore, collaboration between HHI and their subcontractors was facilitated with tools that integrated information for sharing in a secured and effective manner.

US manufacturing giant Lockheed Martin, which won the contract to provide the AEGIS combat system for the destroyer, used AVEVA Marine solutions for data translation and clash checking.

All the South Korean shipbuilders commissioned by the ROKN, namely Hyundai Heavy Industries, Daewoo Shipbuilding & Marine Engineering, Hanjin Heavy Industries and STX Shipbuilding, subscribe to AVEVA Marine solutions. In the next few years, AVEVA Marine will play an important part in helping the ROKN to become a blue-water naval power.

*'AVEVA Marine solutions played a key role in maximising efficiency by providing a single design database system and a datacentric environment...'*



Image courtesy of Hyundai Heavy Industries

#### About Hyundai Heavy Industries

HHI is the world's most productive shipbuilder, with roughly a 15% share of the market, and more than 25,000 employees. Between 1972, when construction of their first ships began, and the end of June 30, 2007, HHI had delivered 1,273 vessels to 232 different shipowners, in 45 countries.

Since building and delivering the first ROK-built frigate in 1980, HHI has grown as a developer and builder of naval ships; and a leader in the design, development and building of frigates, submarines, destroyers, including the 7,650 tonnes KDX-III AEGIS destroyer.

HHI has also exported various naval ships to overseas markets such as New Zealand, Bangladesh and Venezuela.

In total, the order book in October 2007 contained 340 vessels.

HHI can build all types of ships, including:

- VLCCs, tankers, product carriers, chemical carriers
- Container ships, bulk carriers, OBO carriers
- Ro-Pax ships, Ro-Ro ships, pure car carriers
- LNG carriers, LPG carriers
- FPSOs
- Submarines, destroyers and frigates.

In December 2004, HHI selected the AVEVA Marine portfolio of products for the design and production of commercial ships, naval ships and offshore products at their shipyard in Ulsan, Republic of Korea.



In attendance for the launch were President Roh Mu-hyun, First Lady Kwon Yang-sook, Minister of Defense Kim Jang-soo, Chief of Naval Operations Song Young-moo, Chairman of the Korean Joint Chiefs of Staff Kim Kwan-jin, Commissioner of the Defense Acquisition Program Administration Lee Sun-hee, Mayor of Ulsan Park Maeng-woo, CEO of HHI Choi Kil-seon, and 350 other guests.

Image courtesy of Hyundai Heavy Industries

# The Alvheim FPSO

## Designed for the North Sea by Aibel using AVEVA PDMS

**Steve Gibbons**

Principal Consultant – Oil & Gas, Industry Solutions, AVEVA

**The conversion of the shuttle tanker Odin to the FPSO Alvheim has been an important project for Aibel; AVEVA visited Aibel's Knut Storsveen in their Oslo office to find out more...**

### **The Alvheim development**

The fields that comprise the Alvheim development are on the Norwegian Continental Shelf close to the UK border, in water which is 125 metres deep. It consists of three principal oil and gas discoveries, and is operated by Marathon Petroleum Company (Norway) (65%) on behalf of ConocoPhillips (20%) and Lundin Petroleum (15%).

The development comprises an FPSO for production, with oil exported by shuttle tanker, and gas via pipeline to the UK. Production from the Alvheim and Vilje (third party production) developments is expected to eventually reach 75,000 net barrels per day of oil equivalent (oil plus gas), with the Alvheim FPSO storing approximately 560,000 barrels of oil. The combined Alvheim development is estimated to contain resources of 200–250 million gross barrels of oil equivalent.

### **Aibel experienced users of AVEVA PDMS**

Aibel is the result of the consolidation of several companies over many years. One of these original companies, Umoe Oil & Gas, had been an AVEVA PDMS user since 1998. Aibel's previous experience in the conversion of FPSOs includes Berge Charlotte, Berge Hus, Berge Helene, Chinguetti and Golfinho.

The Alvheim conversion, however, has been a very important project for Aibel – it was the first FPSO conversion where the topsides were constructed and integrated in Norway (at Aibel's yard in Haugesund, on the west coast, between Bergen and Stavanger). It is also the first FPSO Aibel have constructed for use in the North Sea, where harsh conditions demand different construction standards and regulations from, for example, West Africa.

### **Accurate as-built information essential**

For the process of integration (or merging) of the different components associated with the FPSO – specifically the topsides and the hull – accurate as-designed and as-built information was essential.

Although it was built as recently as 2001, a 3D modelling system had not been used for the design of the Odin, nor were accurate as-built 2D drawings available. The as-built information therefore had to be obtained by surveying the vessel. The solution chosen was to laser-scan the existing deck structure of the Odin. The original laser-scanning being carried out in Stavanger. One interesting but unforeseen problem was that when the Odin was transported from Stavanger to dry dock in Singapore, the hull structure deflexed differently than when afloat and also expanded with the rise in temperature. These factors meant that later scanning carried out in Singapore, and the subsequent modelling from that data, did not match the modelling carried out from the Stavanger scanning. Consequently Aibel found the integration of the different models (including a PDMS model of the deck modifications created by Keppel) more difficult because of these inaccuracies.

The scanning was carried out by Capnor AS, a two-man team taking 110 scans. After checking and registering, the scanned data was imported into Leica Geosystems HDS Cyclone software modules, before exporting to MicroStation, then into AVEVA PDMS using the ImPlant interface.

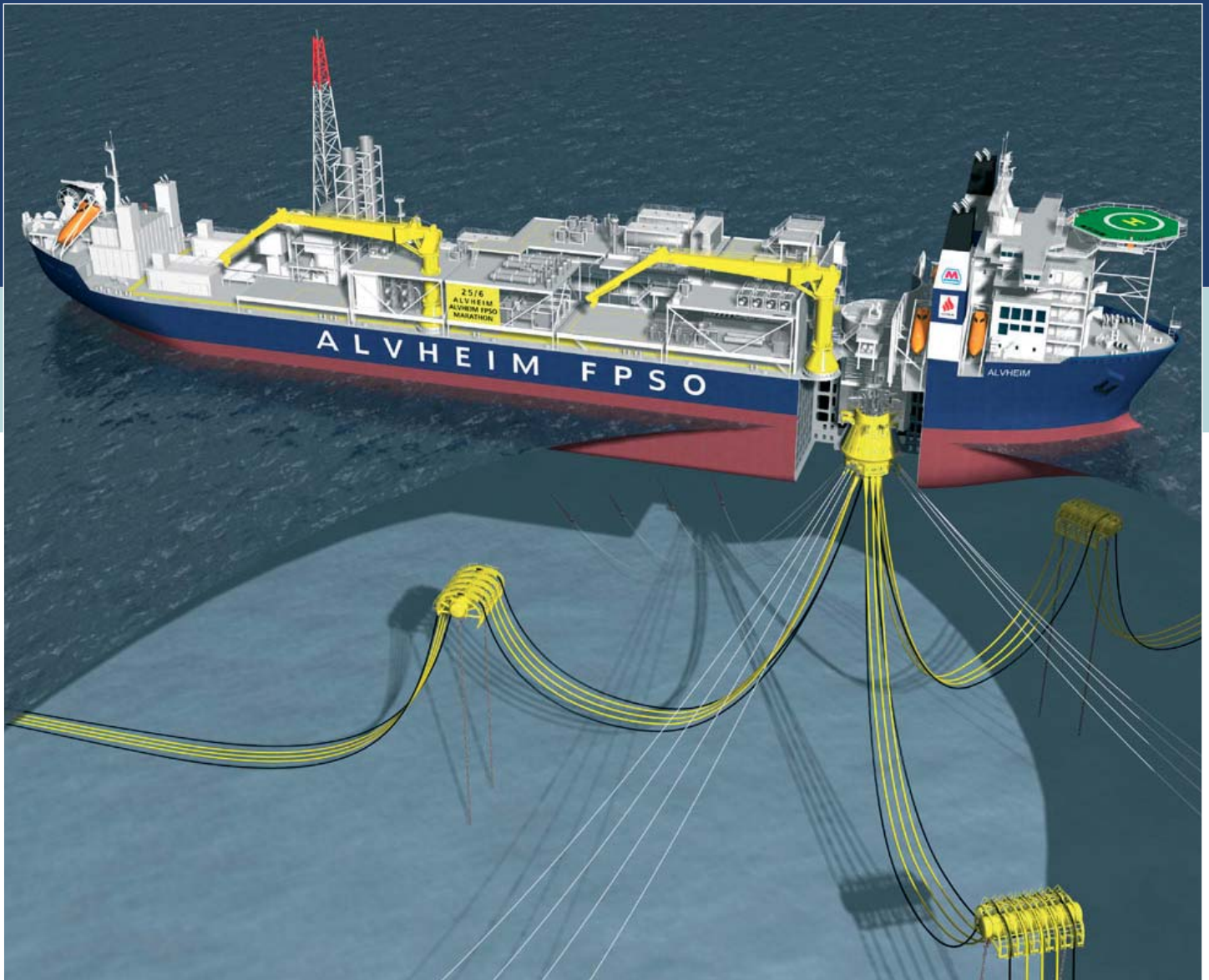
**Knut Storsveen**  
System Integration  
Specialist, Aibel



### **The Alvheim FPSO**

The Alvheim FPSO is a conversion of the multipurpose shuttle tanker, Odin, purchased from Statoil in 2004. The conversion consists of three main components: the hull upgrade, the topsides construction and integration, and the construction of the Turret Mooring and Swivel (TMS) system.

The hull upgrade work was carried out by Keppel Offshore & Marine at their Keppel Shipyard in Singapore. The TMS system was provided by Advanced Production and Loading (APL) AS, Arendal, Norway. Aibel provided the engineering, procurement, construction, integration and completion contract for topside work on the FPSO. The work, including the design and construction of 12 modules, approximately 9,000 tonnes in total comprising production separators, gas compression and dehydration, water treatment and power generation systems, was mainly carried out in Oslo and Haugesund, Norway.



The Alvheim FPSO – turret mooring and subsea systems. Image courtesy of APL/AXIS

## Floating Production Storage and Offloading vessels

Shell deployed the first FPSO, a converted 60,000-dwt tanker, in 1977, on the Castellon field, off the coast of Spain. The vessel had a processing capacity of 20,000 barrels per day (bpd) and operated in 115 metres of water.

Since that time, the use of floating production systems has become increasingly established, with FPSOs becoming the most popular option. The 90 or so FPSOs currently in operation make up approximately 60% of the worldwide fleet of floating production systems; FPSOs make up more than 70% of the floating production systems currently on order, and are in use in nearly all the major offshore oil producing regions. The only exception is the Gulf of Mexico but, even here, regulatory approval has now been granted and the first FPSO is expected to be in production by 2009, operated by Petrobras.

AVEVA software has been used on many FPSOs including the Kizomba A, the Dalia, the Bongo and the Greater Plutonio – each of which was the largest in the world at the time of building.

FPSOs are popular and successful for economic reasons. They are used in remote or deepwater locations where pipelines on the seabed would be neither practicable nor cost effective. They are normally faster to construct than fixed platforms, and are usually the cheapest overall solution – virtually all construction and modification work takes place at the shipyard rather than offshore. In addition, FPSOs can be redeployed to other fields with lower field abandonment costs.

Depending upon the environment, FPSOs are designed either as spread moored in a fixed position (in places like West Africa, for example, where sea conditions are relatively benign and constant throughout the year) or turret moored, which allows the vessel to weathervane with the prevailing wind.

Turret moored FPSOs can also have the advantage of being able to rapidly disconnect and sail away in response to adverse weather conditions or other hazards. FPSO turrets contain the oil risers as well as the mooring lines and are very specialised pieces of equipment.



The Alvheim FPSO – the original deck structure was laser scanned to aid the integration with the topsides modelled with AVEVA PDMS. Image courtesy of Aibel

### Topsides modules modelled using AVEVA PDMS

Aibel used AVEVA PDMS to model the topsides module. The 3D PDMS model of the topsides was integrated with the model of the hull provided by Capnor, then used to determine where the topsides equipment clashed with the existing and new upper deck equipment of the vessel.

A level had been defined for the vessel which reflected the scope of the responsibilities of Aibel and Keppel – above the level was Aibel's responsibility and below the level was Keppel's. Regular design reviews were held to resolve possible clashes. The topsides design, layout and sometimes the deck itself were then modified to resolve the clashes.

The project was managed from Billingstad, Norway, with fabrication/assembly and commissioning undertaken at the Aibel yard in Haugesund. Aibel used AVEVA Global to link Billingstad with a subcontractor, Prochem S.A., based in Warsaw, Poland, and with a satellite office in Haugesund.

The Prochem office performed piping, structural and electrical detailed design for part of the topside, producing fabrication drawings, and the Haugesund office mainly produced detailed design and fabrication drawings for EIT. Haugesund also used the PDMS model and AVEVA Review to examine the model and as a tool for job setting. AVEVA Review has also been used by Marathon for follow up.

At its peak, 300 engineers and 1,000 operators were engaged on the Alvheim project, including 120 PDMS designers. Work on the Alvheim is now almost completed with first oil expected in early 2008.

### About Aibel

Aibel is a leading provider of products and services to the upstream oil and gas industry. They provide production facilities, process systems, technology and products and, on behalf of their oil company, shipowner and field operator customers, they maintain, operate and modify on- and offshore facilities around the world. Their involvement in a project from day one ensures maximum optimisation right along the value chain.

A multicultural company, with over 100 years of industry experience and more than 7,000 professionals, their dedication to meeting their customers' needs is matched only by their equal commitment to innovation, integrity, safety and environmental sustainability. Visit [www.aibel.com](http://www.aibel.com) for more information.



Close-up details of two of the topsides modules modelled with AVEVA PDMS. Image courtesy of Aibel



'At its peak, 300 engineers and 1,000 operators were engaged on the Alvheim project, including 120 PDMS designers...'



# ISEIT 2007

**Alison Patey**

Marketing Communications Manager, AVEVA

**Nearly 300 delegates, from 29 countries, attended the International Symposium for Engineering Information Technology (ISEIT) events held in London, England and San Antonio, USA during October.**

ISEIT, hosted by AVEVA, provides an opportunity to network, review and discuss the business and technical challenges of building and maintaining the world's most complicated engineering plant. The event brings together AVEVA executives and technical experts with senior stakeholders from both EPC and Owner Operator companies.

The ISEIT theme this year was 'Continual Progression', exploring how advances in Information Technology drive engineering innovation and, conversely, how advances in engineering place greater demands on Information Technology.

Delegates at both the Europe and Americas events were able to see a number of strategic presentations including those outlined on the following pages.





## Invest in Design, Operate and Maintain Interoperability – The Returns Are Worth It!

*Dr Sid Snitkin, Vice President & GM, Enterprise Services, ARC Advisory Group*

ARC Advisory Group has been involved with asset management for many years, covering topics such as plant design, plant utilisation and plant maintenance from the perspectives of both Software and Condition Monitoring technology. Design, Operate, Maintain (or DOM) is ARC's integrated view of the knowledge gained – and their platform for research – in this area.

ARC's DOM model is a more modern systems view of the Asset Lifecycle Management that explicitly captures the critical interdependencies and cyclical nature of the many activities that occur and recur throughout the plant's lifecycle from initial concept to final retirement. In DOM, the asset lifecycle is modelled as three recurrent, intersecting processes referred to as Design, Operate and Maintain:

- Design includes all the activities needed to provide the production capabilities the company requires to meet its market opportunities (i.e. design, source, build and commission).
- Operate includes all the activities needed to optimally utilise these capabilities in order to generate maximum returns for the shareholders (i.e. planning and operating).
- Finally, Maintain includes all the activities involved in maximising the time the capabilities are available for these purposes (i.e. maintain, improve and Maintain, Repair, Overhaul [MRO]).

A key benefit of the DOM view of Asset Lifecycle Management is that it explicitly shows the relationship between asset lifecycle and plant performance. The performance of any plant is determined by how well the organisation performs in each of the key DOM domains. This is analogous to the popular manufacturing concept of Overall Equipment Effectiveness (OEE) and highlights the fact that overall performance is the product of performance in Design, Operate and Maintain. Optimum performance can only occur in such systems when all factors are optimised jointly. Each factor must be individually efficient and effective, but actions need to be coordinated across all factors to manage the impact of interdependencies.

DOM requires information Interoperability across the Asset Lifecycle. Jointly optimising performance across the many groups involved in Design, Operate and Maintain requires teamwork; and teamwork is only enabled when all groups have shared views of information, compatible software tools, consistent business processes and common goals. ARC refers to this as **DOM Interoperability**, and the lack of this is costly for most organisations today. Studies consistently show that poor interoperability across Design and Operate/Maintain stages complicates plant handover, and leads to poor plant availability and excessive operating and maintenance costs. Poor interoperability across Operate/Maintain and Design stages significantly increases the time and costs for eventual plant upgrades.

## AVEVA Business Strategy and Direction – A response to ARC Advisory

*Derek Middlemas, Executive Vice-President – Business Strategy, AVEVA*

AVEVA's mission is to offer global working solutions with less risk, shorter lead times and improved business efficiency in the creation and management of complex engineering projects.

To achieve this, AVEVA has put in place a detailed product strategy that merges the core object technologies upon which AVEVA design and lifecycle products are built, to create a unified AVEVA Technology Platform.

This platform provides an application-neutral store for all engineering data, combined with a network of object associations and core collaborative work processes, resulting in a Plant Information Model to support both integrated project execution and integrated asset management.

Furthermore, customer value is enhanced through a network of technology and solution partners, working either directly or in conjunction with the AVEVA Technology Platform.

AVEVA's evolutionary approach to product development allows customers to absorb technology within their existing business models, with no major disruptions to the underlying business processes. Open data exchange, integration and flexible customisation provide the ability to use AVEVA products to capture and manage plant data from any source, and to integrate third-party applications where appropriate, resulting in greater choice and flexibility.

## Enabling Collaboration, and Innovating for the Future

*Dave Coplin, Enterprise Strategy Consultant, Microsoft (at Europe event) and Scott Garvey, Director of Enterprise Solutions, Microsoft (at Americas event)*

Collaboration is at the core of how both individuals and organisations are able to interact with the world around them and make full use of skills and resources that may be spread throughout an organisation, regardless of their geographic location. As the world becomes increasingly 'connected', we are presented with greater opportunities (and challenges!) in what can be achieved and how far we are able to 'reach'.

With the recent launch of flagship products like Vista and the 2007 Microsoft Office System, Microsoft has set the stage for a new generation of innovation and collaboration and, working closely with partners like AVEVA, is making great strides to ensure that they are able to help their customers to respond to their business challenges.

Dave Coplin provided insight and background into the potential for collaboration offered by current and future Microsoft technologies, and a glimpse of the longer-term opportunities and innovations that are providing a key focus for Microsoft.

## AVEVA Technology Direction – A response to Microsoft

*Dave Wheeldon, Group Product Development Director, AVEVA*

AVEVA's technology vision is evolving towards a single platform for project and lifecycle information management. This platform evolution means that AVEVA technology originally developed for PDMS is being deployed more widely in authoring applications. Combined with Microsoft technology it will provide the best possible user interaction, configurability and information exchange.

There are a number of critical success factors for any collaboration tool. In particular, a product needs to be readily deployable; easy to administer; natural to use; integrated with other Office collaboration tools; configurable in order to comply with company structures and practices; automated where applicable; and secure.

AVEVA is committed to the development of applications that enable the continual progression of intelligent technology for the creation and management of complex engineering projects. The company has a responsibility to exploit new technologies in its products, whilst at the same time protecting customers' investments in AVEVA applications.

## AVEVA NET – The Next step for VNET

*Martin Gwyther, Vice-President of Lifecycle Solutions, AVEVA*

Organising and controlling the creation, update, storage, security and availability of information throughout the plant lifecycle and across multiple geographical and organisational boundaries are major challenges for plant information management. AVEVA NET is the evolution of AVEVA's existing Integrated Asset Management strategy and is the logical progression of the approach pioneered by VNET.

AVEVA NET makes information available to those who need it, where and when it is required. It controls the processes and activities that create, modify or use information; and allows users to identify, analyse, assess and report issues affecting information quality.

Through its approach to Information Access, Information Workflow and Information Integrity, AVEVA NET connects people, processes and systems through information.





## The following brief overviews provide some insight into a number of presentations by customers at ISEIT Europe:

### Openness of AVEVA Software – A key factor of AVEVA success in Russia

*Olga Elagina, Head of CAD Department, Gazprojectengineering BOJSC (Gazprom OAO)*  
Olga Elagina's presentation showed how Gazprojectengineering BOJSC is using AVEVA PDMS on a number of projects including methanol storage facilities, oil storage facilities, administrative buildings and a nitrogen oxygen station. In the future, they will continue to collaborate with their customers and contractors on the implementation of new working methods, the remote coordination of design solutions, and 3D models for complex design projects using AVEVA VNET.

### Business benefits of AVEVA PDMS Global during project execution

*Nick Simmons, Applications Group Manager, Foster Wheeler Energy Limited*  
In his presentation, Nick Simmons showed that Foster Wheeler Energy Limited (FWEL) selected AVEVA PDMS Global because it is tried and tested technology which makes efficient use of network bandwidth, and enables rapid project setup and configuration. The application provides confident control of data, with flexibility, but requires minimal administration.

### The Use of Point Cloud Data on Brownfield Projects

*Colin Fairweather, Engineering Systems Manager, AMEC Natural Resources*  
Colin Fairweather showed in his presentation how, by using point cloud data (PCD) and the AVEVA Laser Model Interface, AMEC has gained numerous benefits including a more efficient process for capturing plant status and ensuring there is accurate plant data inside the design environment. The process has improved workflow for referencing the existing plant, and enables a full clash check of the new design against existing plant, as well as the AVEVA PDMS model. Reducing personnel exposure to hazardous environments has improved safety. The combination of PCD with Laser Model Interface provides a truly global solution for the AMEC brownfield business.

### Engineering Data Management

*Richard Harris, EDM Project Team Leader, Woodside Energy Ltd*  
Richard Harris gave a presentation on the engineering data management (EDM) solution for Woodside's North West Shelf Venture assets. The overall strategy for the EDM project was to provide fast access to engineering information, with consistent engineering data, and to enable the efficient handover of project information to Operations. Richard explained the issues that had to be addressed and the methods involved in resolving those issues.

### Fluor Ltd VNET Implementation for Handover

*Alex Giles, Project Information Manager, Fluor Ltd*  
During this session Alex presented a brief overview of the project and the information management requirements, and how AVEVA NET Portal (VNET) has been successfully incorporated into Fluor's engineering work processes in order to collect, clean and deliver engineering, procurement and maintenance data. Fluor is one of the world's largest publicly-owned engineering, procurement, construction and maintenance services companies. The UK office is executing the engineering and procurement for Daewoo on Shell's Gbaran Ubie Integrated Oil and Gas development project in Nigeria. Fluor has implemented AVEVA NET Portal (VNET) to assist in data collection, storage and delivery.

### Daelim's Project Portal for Concurrent, Multi-Site EPC Projects

*DongWook Seo, BPI Manager, Daelim Industrial Co. Ltd*  
As a global Engineering and Contracting company, Daelim faced a number of challenges to improve their efficiency in managing and delivering projects. Among the key issues were such questions as how to achieve global execution and resourcing, how to manage the numerous stakeholders in a project, and how to improve upon the current 40% of project time spent searching for information. They then needed to address the challenge of effecting information handover in electronic format. The answer was to create a Project Portal based on standard Microsoft applications and AVEVA VNET Portal. The aim of the Portal is to significantly reduce time spent searching for

data, to provide instant sharing of information, and to improve information access for subcontractors. The Project Portal also allows for instant decision-making support, improved customer satisfaction through design quality management, and reduced software dependency. DongWook Seo showed the steps Daelim took to implement the Project Portal and the lessons they had learnt from the implementation. He also provided a demonstration of correspondence control using VNET within the Project Portal

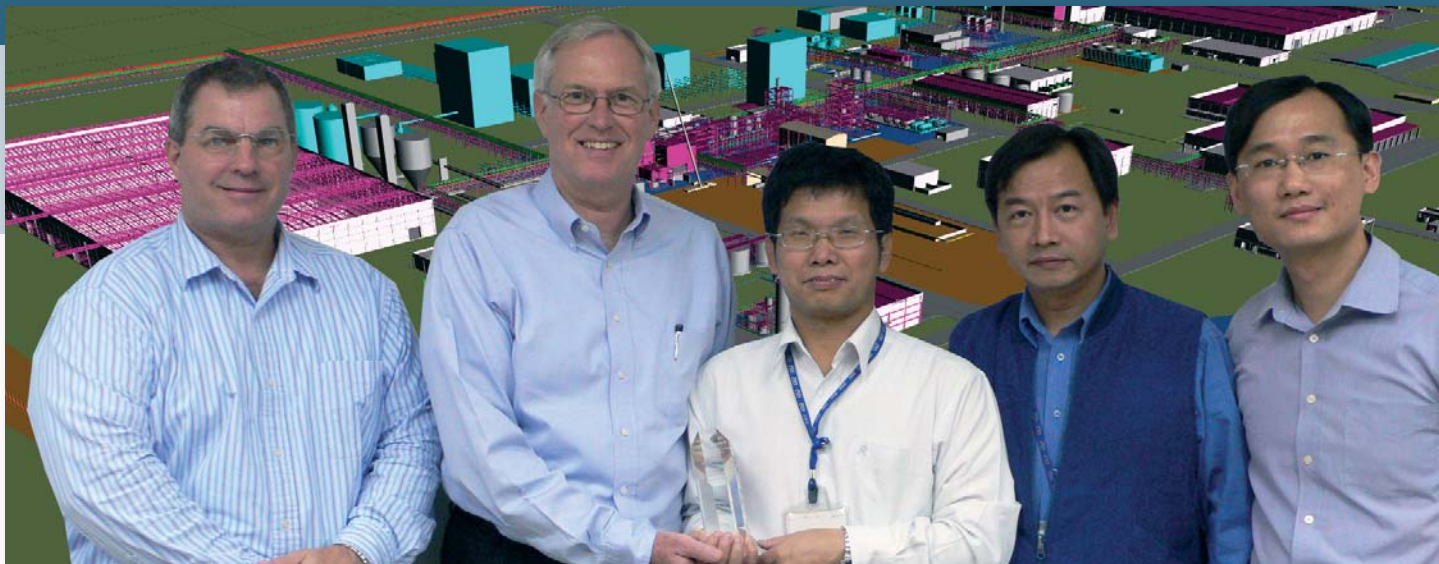
### Complete planning for the component-led processing of large-scale power plants – Project processing, requisite expertise and tools

*Dirk Rudolph, IT Management, Envi Con & Plant Engineering GmbH*  
Power suppliers are facing enormous challenges due to the pent-up demand for power plants in Germany. First-rate overall planning is essential to ensure that such issues as component supply, approvals and implementation are all handled in time and as efficiently as possible. Dirk Rudolph explained how Envi Con has implemented a component-led planning system that takes account of the needs of the operator/investor as well as the supplier companies. He showed how Envi Con use the 3D PDMS model as the hub of the 3D planning system during the engineering design, procurement and construction processes, and how the system is used to monitor progress on real projects.

### At ISEIT Americas:

An interesting keynote address was given by Dr Lewis 'Ed' Link, Head of the Hurricane Katrina Task Force. His presentation reviewed information and technology issues, together with lessons learned from the extensive forensic analysis of the impact of Hurricane Katrina; and how that knowledge can be applied to develop a system for assessing and mitigating risk on new and existing assets.

An exciting highlight of ISEIT was the official Americas launch of AVEVA PDMS 12.0, including a hands-on PDMS 12.0 workshop that quickly sold out. AVEVA will be hosting PDMS 12.0 seminars in major cities throughout North America in the coming months.



Above: (left to right) David Swindell, DuPont Lead Designer; Jehu Burton, DuPont Project Manager; Forest Lin, CTCI Project Manager; Chiang Hsu, CTCI Lead Piping Engineer; and Chuang-Tzer Shiang, CTCI PDMS Administrator.

## AVEVA announces winners of 2007 'Engineering Excellence to the Extreme' Awards at the ISEIT Americas event

The winners of the 2007 'Engineering Excellence to the Extreme' award were AMEC Paragon, for delivering significant project savings as a result of using AVEVA's integrated suite of applications; and DuPont, for its rapid design of a new, world-class DuPont Titanium Technologies (DTT) plant in Dongying, Shandong Province, China.

AVEVA's annual 'Engineering Excellence to the Extreme' awards recognise AVEVA customers and the engineering excellence and problem-solving that goes into executing process plant and marine projects, in terms of scope, environmental, safety, risk, completion time, or other factors.

**AMEC Paragon** ([www.amecparagon.com](http://www.amecparagon.com)), the Americas Oil & Gas hub for AMEC, the international project management and services company, was honoured for its Integrated Project Execution (IPE). IPE is a work process that has allowed AMEC Paragon to measure and deliver outstanding time and cost savings across multiple projects. AMEC Paragon's IPE strategy enables the collaboration of all parties involved in an Engineering, Procurement and Construction (EPC) project – across all applications and executed from multiple locations – safely, efficiently and effectively. See the related article on pages 26-27 for more details on how AMEC Paragon's IPE strategy is delivering measurable cost and schedule savings

**DuPont** ([www.dupont.com](http://www.dupont.com)), a science-based products and services company, was recognised for its rapid design of a world-class titanium dioxide (TiO<sub>2</sub>) plant in the City of Dongying, Shandong Province, China. The plant will be wholly owned by DuPont and will be the company's largest single investment project outside the United States. As a result of DuPont's history of using AVEVA's solutions, DuPont Titanium Technologies (DTT) was able to extract existing PDMS models and arrange them together in a new model to represent the planned Dongying facility. This process greatly accelerated development of the first study model, which evolved over time into the current 3D facility model. Front-End Loading of the project was further accelerated because DuPont was able to hand over a fairly complete 3D data model of the plant to the project EPC contractor within 12 months.

The DTT China Project was recognised for its sheer size, innovative use of existing DuPont PDMS models from other DTT Plants, and coordination with international contractors.

DuPont was an innovator in the development of 3D plant design, creating their own solids-modelling, real-time interactive graphics, wire-frame, 3D equipment arrangement program in the early 1980s. DuPont has been an AVEVA customer since 1986 and executed its first PDMS project in 1987.

In November 2005, DuPont announced plans, outlined above, for the titanium dioxide plant in Dongying. DTT and engineering personnel began Front-End Loading of this project. PDMS models, drawn from existing global DTT facilities, provided a starting point for the Dongying facility. Portions of these existing facility models were extracted and arranged together in a new model.

This process greatly accelerated development of the first study model which evolved into the current 3D facility model. This PDMS model, which was developed by the original DuPont team, was later transferred to CTCI in Taipei, Taiwan which was contracted as the project EPCM contractor. CTCI received the PDMS model in May 2006 and has continued Front-End Loading. The production design is now nearly 30% complete.

'AVEVA's customers design and build some of the most complex and important projects in the world,' commented Rob Glasier, head of AVEVA Americas. 'These awards are our way of recognising the hard work and achievement that goes into these projects. We congratulate AMEC Paragon and DuPont Titanium Technologies, and look forward to honouring more of our great customers for next year's 'Engineering Excellence to the Extreme' awards.'

For more information on the 'Engineering Excellence to the Extreme' awards and to download a 2008 nomination form, please visit [events.aveva.com/iseit08/extreme\\_2008.doc](http://events.aveva.com/iseit08/extreme_2008.doc). The deadline for submissions is August 30, 2008.

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