

# Integrated Engineering & Design

An AVEVA solution for capital and  
brownfield projects

**ASTS**<sup>TM</sup>  
ADVANCED SOLUTIONS FOR TECHNICAL SERVICES  
(AN ISO 9001 : 2008 CERTIFIED INSTITUTION)

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# Introduction

Creating plant and marine assets involves change-intensive, iterative engineering and design processes. Multi-discipline teams – often globally distributed – must collaborate efficiently to create and refine engineering and design information, from initial concept to final design.

Delivering projects on time, on budget and to the highest standards demands the ability to control and manage changes as the design iterates through progressive refinement and detailing. This requires a collaborative digital environment that enables all the engineering and design disciplines to respond to multi-discipline changes in an ordered and organised manner

AVEVA's Integrated Engineering & Design (IE&D) solution is a scalable, expandable software toolset that provides such an environment.

It enables multi-discipline teams to use the most appropriate combination of AVEVA's products and third-party applications to collaboratively create, refine and communicate engineering and design information, in real time, from anywhere in the world. By enabling more effective communication and efficient management of change the solution reduces the number of iterative steps in the 'design spiral' to arrive more quickly at a final, optimised design.

The solution is an integral part of AVEVA's Digital Asset approach, providing key capabilities not only in engineering and design, but also in brownfield data capture and asset modification.



'By enabling more effective communication and efficient management of change the solution reduces the number of iterative steps in the "design spiral" to arrive more quickly at a final, optimised design..!'

# Overview



'The solution can be scaled without limit to support projects of any size, and provides robust yet flexible capabilities for controlling change, communicating change and ensuring data consistency...'

Only by integrating the processes of engineering and design and the information they create, can businesses effectively manage, accelerate and control the many interdependent changes in the execution of complex project design. But it is also important that the software tools supporting each individual discipline's work should be highly productive as well as interoperable with each other.

AVEVA's Integrated Engineering & Design solution comprises the core applications necessary for high-quality engineering and design project execution. The solution can be scaled without limit to support projects of any size, and provides robust yet flexible capabilities for controlling change, communicating change and ensuring data consistency.

Because change management is so critical, the solution provides unique and powerful Compare & Update and Change Highlighting functions that control and communicate change while enabling each discipline to respond to changes in a prioritised and well-controlled manner. This is in marked contrast to the common situation where each discipline is continually distracted by the constant blizzard of changes generated by others, to the detriment of its own efficiency.

Importantly, the IE&D solution can be deployed alongside existing third-party applications and business systems, enabling considerable flexibility in the operation of today's common multi-technology environments.

For more information on AVEVA's Integrated Engineering & Design solution visit [www.astsglobal.com](http://www.astsglobal.com)

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# Business Benefits

## Reduced project cost and schedule

Unlike traditional 'information silo' approaches, the optimised integration provided by AVEVA's solution means that engineering and design disciplines can work effectively in parallel, sharing and responding quickly to information changes in a controlled way. Enabling every discipline to work independently in its own most efficient manner enables them to achieve data consistency more quickly, saving time and cost.

Each discipline works with information of known status, can see others' changes as soon as they are issued, and can accommodate those changes in a planned and prioritised manner through their own workflow. By choosing when to incorporate changes generated by other disciplines, users can 'batch up' many small changes into a single design update, reducing the number of disruptive iterations required. The project team can therefore arrive earlier at a correct, fully detailed design definition, leading to further savings in cost and time throughout the fabrication and construction stages.

'Our engineers are always in control of the data they work with...'

## Key Features

### Compare & Update

This unique feature enables engineers and designers to check for differences between the data being used and the equivalent data used by other disciplines. Key changes can be selectively implemented under the control of the engineer or designer. Each discipline retains firm control over its own data.

### Change Highlighting

This enables efficient sharing and effective monitoring of information changes across disciplines. Changes made within a discipline's scope of work are automatically highlighted on its deliverables.

### Consistency

AVEVA's Integrated Engineering & Design solution enables engineers and designers to identify and eliminate inconsistencies as they work. Data created and validated by an originating discipline can be published at a known status level for use by all other disciplines. Users can manage and resolve inconsistencies ensuring that design consistency is reached with fewer iterations.

### Highest-quality deliverables

Accurate, high-quality deliverables of all types can be rapidly created, direct from the definitive project model, for compliance, procurement, fabrication, construction and project management purposes.

## Fewer design iterations

Importantly, each discipline can check and resolve changes and inconsistencies before publishing data or documents, which are generated directly from validated data of known status. Combined with extensive use of rules, catalogues and templates, this significantly reduces inconsistencies and the number of design iterations required to resolve them. In turn, this saves time and effort in design and eliminates many common causes of costly rework in construction.

## Increased project capacity

By increasing project efficiency, AVEVA's Integrated Engineering & Design solution increases project capacity, enabling contractors to execute more projects more profitably. It also enables more rapid and effective response to clients' change requests. In a demanding market, such flexibility and the ability to deliver higher-quality projects on budget and on schedule provide a powerful competitive advantage.

## Reduced project risk

By providing clear visibility of current statuses and progress against plan, and by enabling evolving engineering and design information to be robustly controlled and rapidly communicated, the solution increases project predictability and makes it easier to respond to unexpected circumstances such as changes of scope.

### Design reuse

Existing design models can be captured and reused or adapted for more efficient projects and greater exploitation of design expertise. Combined with the rapid project start-up capability of AVEVA E3D, this enables faster execution of higher-quality projects.

### Scalability

The solution enables projects of almost unlimited scale and complexity to be executed with no deterioration of system performance. Furthermore, the solution itself is scalable; an initial deployment can be readily expanded with additional product licences to support any size of project and to further extend capabilities.

### Interoperability

Self-integrating software and interoperability with a wide range of third-party solutions enable low-risk deployment into existing mixed-technology environments and efficient multi-discipline collaboration.

### Easy deployment

Class-leading ease of deployment and data integration enables rapid achievement of the solution's benefits. Deployment is non-invasive of existing business systems.



## ADVANCED SOLUTIONS FOR TECHNICAL SERVICES (ASTS)

is an Authorized Training Center for AVEVA PDMS (Plant Design Management System). ASTS will provide AVEVA PDMS training to corporates as well as to the upcoming breed of engineering students and professionals. To cater to the industry needs, professional AVEVA PDMS training programs have been devised to meet the industry needs not only locally but also at the international standards. ASTS will facilitate in producing more talented professionals with a good technical background for the industry.

### Benefits of AVEVA PDMS Training

- Faster learning curve using the most popular and demanding software.
- Contemporary way of working-giving you & your company a definite competitive engineering edge.
- Enjoy the benefits of real-time 3D modeling (2D drawings become a by-product of 3D modeling).
- Design a variety of industry like power plant, chemical plant, refinery, etc...
- Intelligent model creation of any size or complexity with ease of precision.
- Link with third party applications, automatic generation of drawings, reports or other outputs from the single 3D model.
- Revisions are much easier because the drawings and reports are fully integrated into the model.
- Leading 4D tool to manage and track project status.

### Instructor-led-training

Classroom training is our most traditional learning format. It enables students to engage in face-to-face interaction with instructors and other students in a typical classroom setting. Training centers provide environments that promote effective in-class instruction as well as technically realistic laboratory exercises. From demonstrations to hands-on labs, class room

training provides a comprehensive yet personalized learning experience.

### Eligibility

Fresh / Experienced Diploma Holders / Graduates in Chemical / Civil / Mechanical/Electrical Engineering.

Working Executives: Engineers with above qualification, working with similar industries with knowledge of piping engineering is preferred.

ITI/Diploma Draughtsman with detail engineering experience.

Corporate: corporate using Aveva PDMS for their engineering projects.

### COURSE DETAILS

Name	: AVEVA PDMS
Duration	: 5 Weeks (25 Days X 4 Hours)
Class Timings	: 9 am to 1 pm or 1.30 pm to 5.30 pm
Admissions	: Individual Admissions (Anytime can join)
Certification	: AVEVA Information Technologies Pvt Ltd.
Training Materials	: Will be Provided after this Course
Accommodation	: Paid Accommodation

### Who use AVEVA PDMS

- Engineering Consultants and Designers
- Project Owners and Contractors
- EPC Companies
- Power Plants
- Petrochemical Industry
- Refinery
- Oil & Gas Sector
- Pharmaceutical Industry
- Project and Construction
- Cement and Fertilizers
- Chemical Process Industry
- Offshore Industry



Photorealistic BubbleView™ laser scan viewing technology in AVEVA E3D enables piping design to be carried out in the context of the as-built facility

# AVEVA PDMS Syllabus

## PDMS Basics and Functions

- AVEVA PDMS Fundamentals
- User Interface Basics
- Displaying Modelled Elements
- Working with 3D Views
- Attributes, Positioning and Orientation
- General Utilities
- Introduction to Model Editor

## Basic Equipment Modelling

- Equipment Modelling Using Templates
- Equipment Utilities
- Volume Modelling
- Creating Primitives
- Nozzle and nozzle connections

## PDMS Pipework Modeling

- Pipework modeling
- Pipe routing
- Replacing Components
- Data consistency check
- Interference or clash detection
- Hole Management
- Isometric Production
- Sloping/Falling Pipelines
- Alternative Positioning forms
- Pipe Assemblies
- Pipe splitting
- Pipe Editing (component bore/specification)
- Pipe routing using bends selected via a Pipe Fabrication Machine
- Production Check

## PDMS Structural Modeling

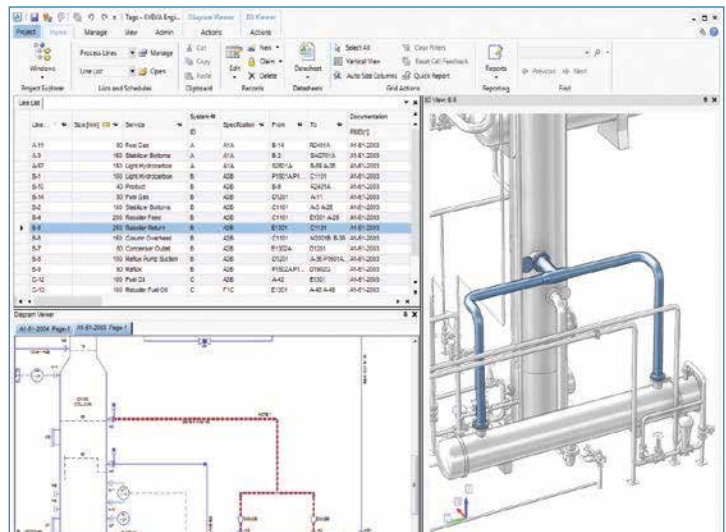
- Setting up the design database hierarchy for structural modeling
- Beams & columns
- Modifying Structural Sections
- Beam & column Utilities
- Section Fittings and Joints
- Panels & Plates
- Negative Extrusion and Panel Fittings
- Material Assignment

## PDMS Design Utilities

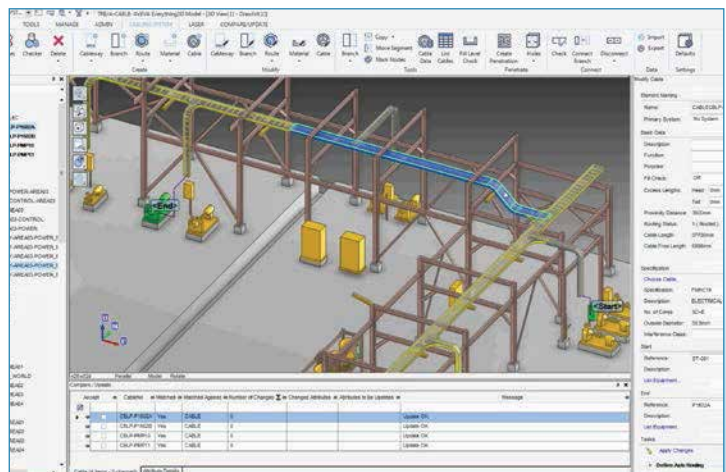
- Clash Detection
- Quick Reports
- Report Templates
- Surface Treatment
- Mass Properties
- Linking Documents to Design Elements
- Status Control
- Representation Rules in Design

## PDMS Drawing Production

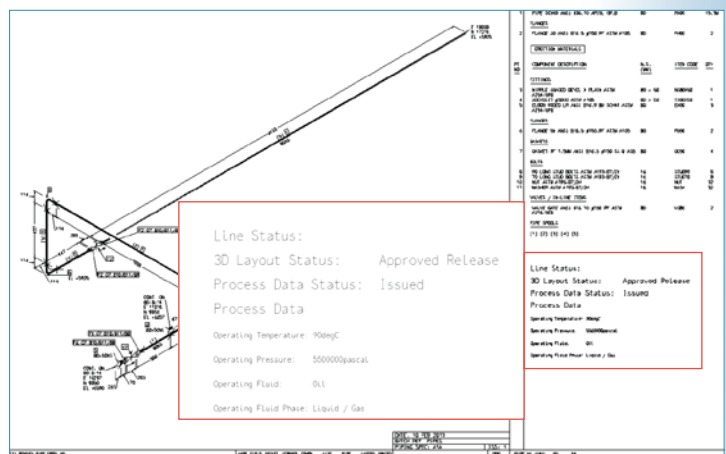
- Draft Features
- The PDMS Draft Database Hierarchy
- Creating Drawings and sheets
- Creation and Modification of views
- Dimensioning
- Labelling
- 2D Drafting
- Section Planes



Connected data enables users developing the line list in AVEVA Engineering to view the line in the P&ID and in the 3D model.



Integration between electrical design in AVEVA Electrical and 3D layout in AVEVA E3D allows fully integrated cable design.



Linked engineering data can be referenced and used on schematic and 3D deliverables.

# The Digital Asset Life Cycle

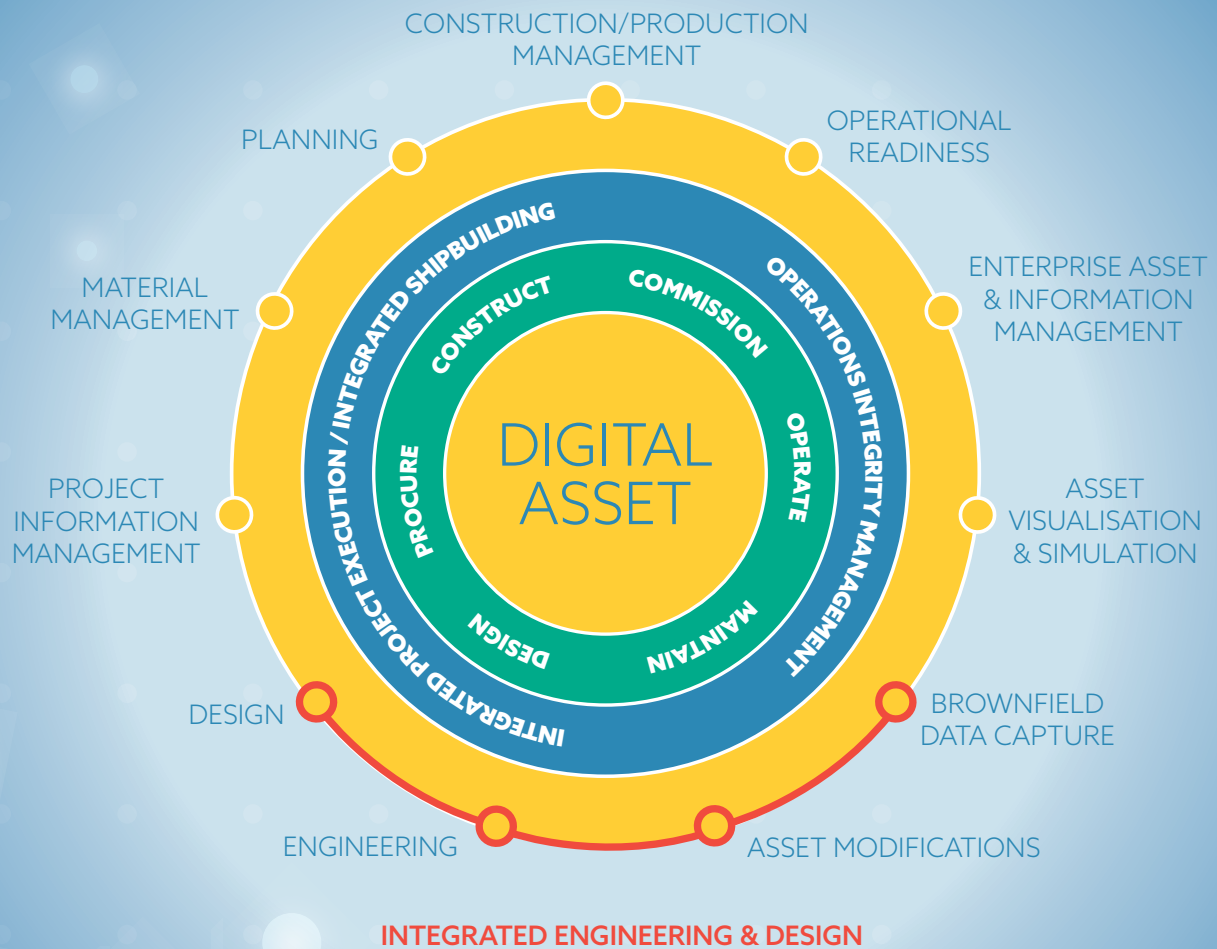
## How Integrated Engineering & Design unlocks the power of your Digital Asset

AVEVA's Digital Asset approach recognises that information has value throughout the entire life cycle of the physical asset if it can be made readily accessible to all who need to use it. All elements of AVEVA's Integrated Engineering & Design solution can therefore help to create a Digital Asset by publishing their data into it.

AVEVA's advanced Information Management technology enables the creation of a Digital Asset that aggregates all project information, regardless of type or source, and provides AVEVA's unique Design in Context™ capability.

The optional addition of Design in Context to the Integrated Engineering & Design solution unlocks value from all project information by embedding search, access and visualisation of Digital Asset content within the design and engineering applications themselves. Design in Context increases the business value of IE&D by providing a window into the entire evolving Digital Asset. It directly reduces unproductive design and engineering time and enables better, faster decision making for more efficient project execution.

'Design in Context increases the business value of IE&D by providing a window into the entire evolving Digital Asset...'



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