# CADIS●N® WORLD

## BIM For Plant Engineering

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https://www.linkedin.com/showcase/cadison

https://twitter.com/ITandFactory

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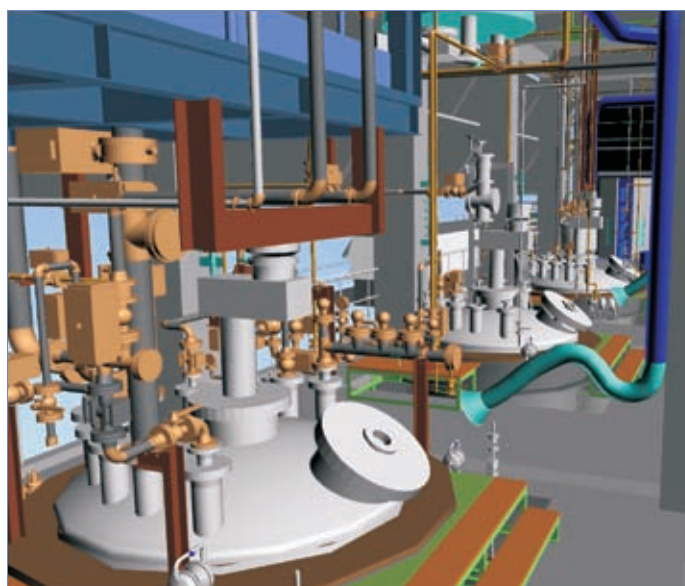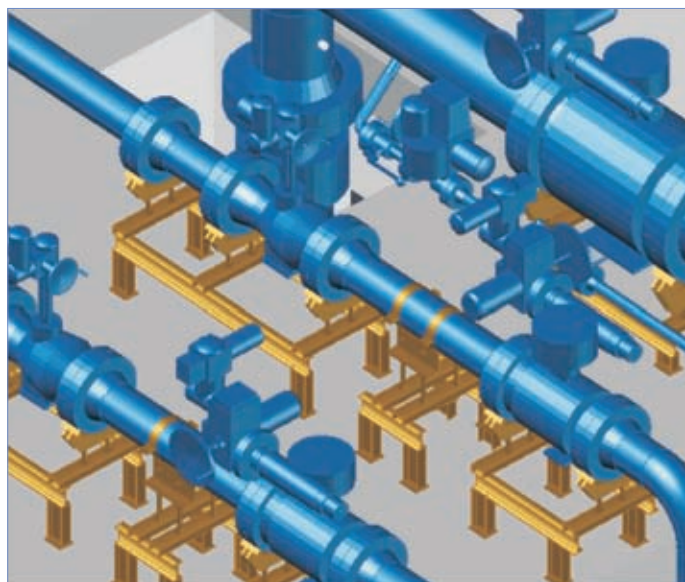
Ralf Lehmann


Ajit Joshi


Michael Brückner

**"Our new Global Support program will now help customers to get better Implementation & Project Support in DACH region and Internationally in English"**


Stefan Kraus


Falko Meier


Prashanth Chunduri

Dear Customers,

Welcome to CIC 2018 !
We are pleased to announce the release of CADISON R18 in December 2018. The major focus of Release 18 was on improving Usability, better User Interface (UI) for easier Project Cost Estimation, 3D Designer enhancements, enhanced or improved Catalog(s) creation & management and some new important features in Electrical Designer. We have also further enhanced the configuration and customization capability in R18. A 'standalone' E&I (Electrical & Instrumentation) module is also being introduced which makes it the best Value and Powerful Electrical & Instrumentation application in the world.

In the recent past, BIM methodology has become very popular for 'Building' projects. CADISON has all the necessary foundation & capabilities for BIM in Plant Engineering since its introduction 18 years ago. It has also evolved over the years making it the best BIM platform for Plant Engineering. CADISON is a very good example of German ingenuity at work.

Please enjoy the CIC conference, learn all about the nice enhancements in CADISON R18, try the Samosas with your Beer on day 1 in the evening and tell your friends about how CADISON gets better and better.

Ralf Lehmann
Management Team member

## Partwise Pipe Routing made Intuitive with Additional Slope Options

Partwise Pipe Routing command helps users to quickly and efficiently route pipelines automatically which results in saving time and optimize designs. In R18 this feature has been improved with new slope options (percentage & degree) which makes it more intuitive to route pipes. This strengthens the existing pipe routing capabilities and further improves efficiency.

## New Feature Reducing the Manual Effort of Pipeline Routing across Projects: Exchange Pipe Specification

To reuse the pipeline layout across multiple projects with specification changes, users currently have to manually route the pipeline. Exchange Pipe Specification functionality eliminates the manual efforts required and improves routing efficiency. It re-routes the pipeline automatically as per the desired specification, at the same time identifies the non-standard components and add to task container, which can be used in design decision making. This also revises the pipeline across the X-ref drawings.

## Enhancement to Update General Arrangement Drawings with a Single Command

**Update Layout Graphics**: It is always a repetitive task for users to update GA drawings as per the changes done in the 3D model. However, in the new release of R18 it is possible to quickly update the multiple changes, i.e. update 'hidden line', 'centerline' and 'shade representation' in a single command. Users can now do multiple updates with minimal time & effort, and can revise the GA drawing as per the model.

**Show Layout Graphics**: Locating the pipeline's representation in GA drawings to update layouts is another tedious task. CADISON introduces a new functionality to find the representation of a selected pipeline in GA drawings. This helps users to quickly identify the number of GA drawings which need to be updated based upon the revised model. Modified pipelines can be easily highlighted for quick revision of GA layouts. Thus, it improve the change management and revision efficiency in GA drawings.
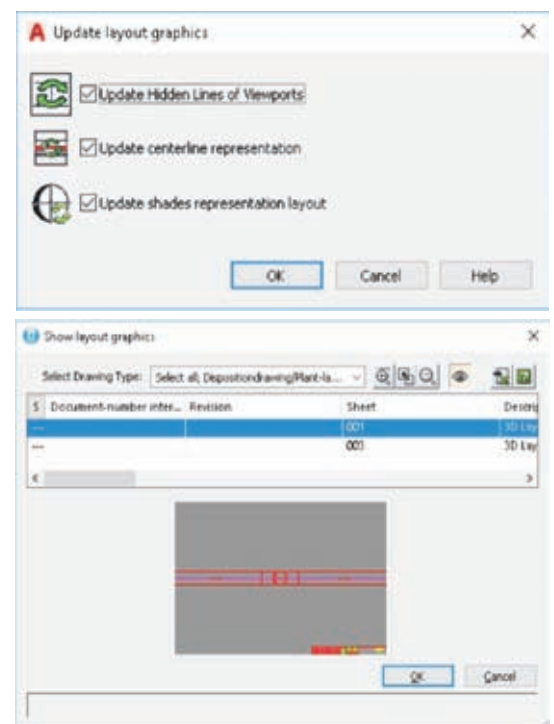


## Logic Analyzer (Rule-based Quality Checks) with Simplified User Interface based on Keyword Configuration

In R18 release, it becomes easier to categorize Logic Checks, which helps to improve the quality checking process making it more intelligent and prompt. This new interface enables the users to configure multiple checks based upon different keywords and relevant descriptions. With this new UI, users can achieve accurate data consistency throughout the project.

## Enhanced Functionalities of Object Selection for Better Usability

**Dockable Object Manager**: It has been further improved to show the graphical representation of objects for ease of selection. With this enhancement users will not need to spend additional time to 'search and drag & drop' objects into the CADISON Tree or drawing.

**CADISON Symbol Palette**: With this new release users can create a customizable Symbol Palette for use across multiple projects.The CADISON Symbol Palette with its multiple tabs can be shared as a configuration with multiple users. To create a CADISON Symbol Palette, symbols can be simply added from the Dockable Object Manager. This functionality reduces the number of clicks to insert required symbols and thus saves time.



Dockable Object Manager



Symbol Palette
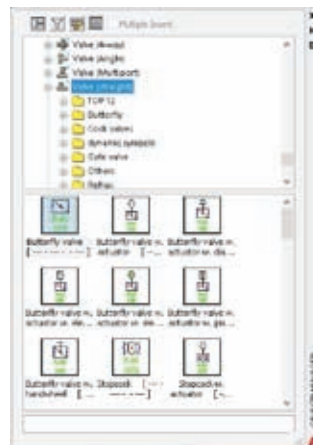
## Innovative & Simple-to-use 'User Interface' for Project Engineer

With this contemporary interface, Project Engineer has been enhanced with 'Ribbon Menus', Dockable Object Manager, Object Inspector, Windows Layout Management for multiple CADISON Tree views, etc. To make Proposal Engineering easier, Project Engineer now has 'Context Sensitive' and 'Workflow Based' Menus for better control over the Project information.
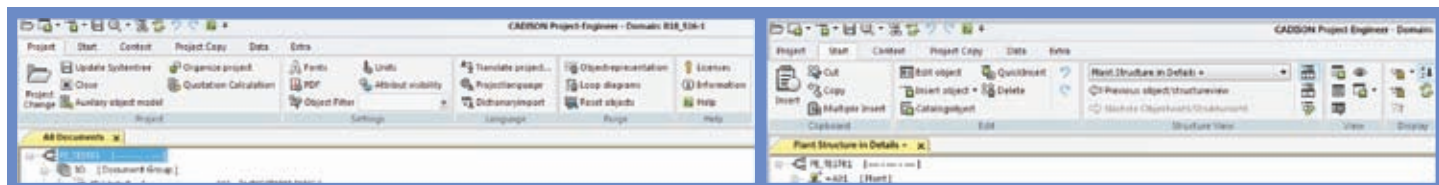


## Multi Language Support for Global Stakeholders

CADISON already supports dual language in a project and each project has a main language and a secondary language. Its already possible to generate reports in main, secondary language as well as dual language in a single report. With changed global economics, many times multi-lingual stakeholders are involved in a project. This leads to the requirement of reports in various languages; CADISON addresses such requirements efficiently with Multi Language Support capabilities and dictionary at backend.
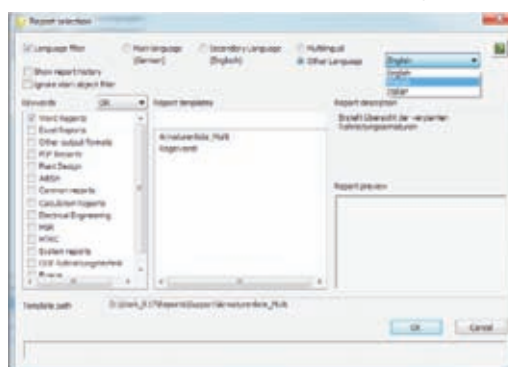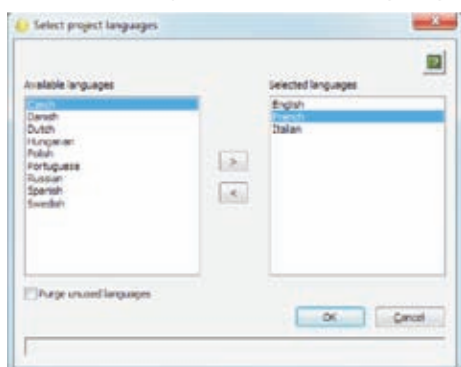
# Key Features of R18 which Improves Usability and Configurability

## Context Based Dynamic Input Forms for Better Usability of Project Workflow Management

We have further enhanced the user 'Input Forms' to have a context sensitive user interface for different workflows. A new feature called 'Sub Forms' has been added which enables users to customize the UI for the defined workflows. Users can add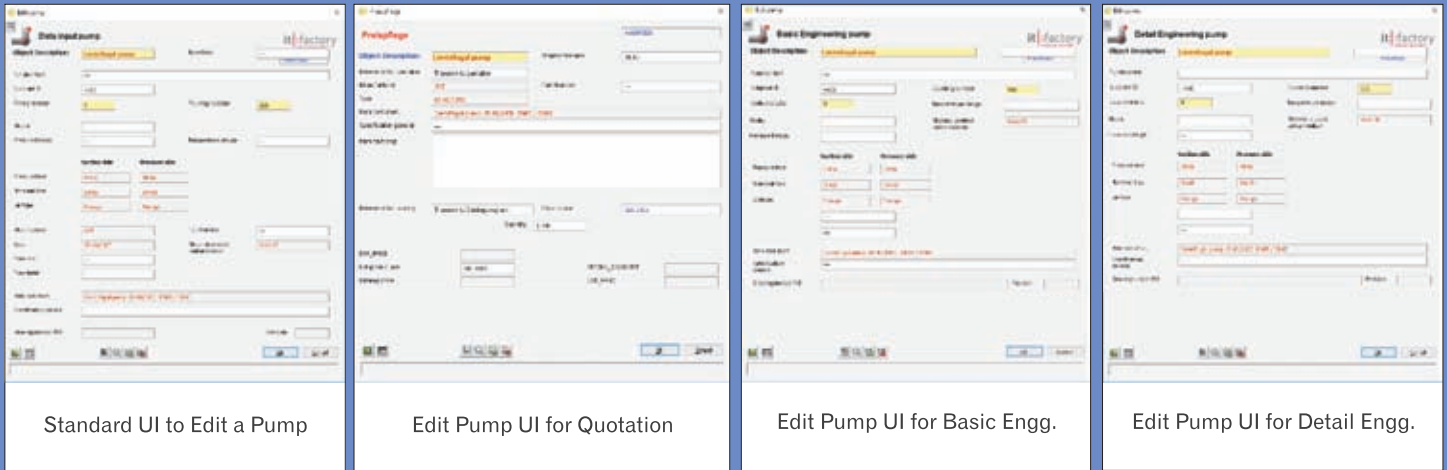 any number of Sub Forms to meet the requirements. Users can validate the necessary information to be filled with the help of mandatory fields and sub forms, which is based on the context and workflow. The users will able to see the relevant information only.

The images below are the examples of pumps which can have different UI based on context (Standard or Quotation) or workflow (Basic Engineering or Detail Engineering).



Standard UI to Edit a Pump    Edit Pump UI for Quotation    Edit Pump UI for Basic Engg.    Edit Pump UI for Detail Engg.

## Enhanced User Interface (UI) for 'Cost Estimation' in Project Engineer

A new and enhanced user interface has been introduced in 'Quotation & Purchase Calculation' as an improved functionality which is more time saving and user friendly. Now default schema structures are available for budgetary cost estimation which users can also configure as per the project requirements. Now 'Calculation Overview' and 'Purchase' reports can be generated with one click (in the same interface). This enhancement eliminates the manual assignment of objects for cost estimation and also provides functionality to identify the status of plant objects with the colour codes.
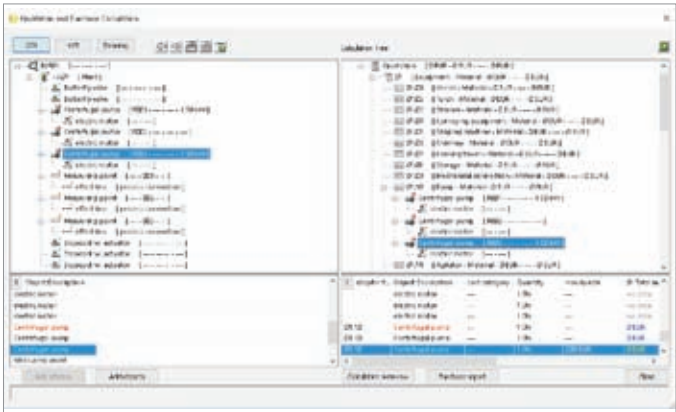


**Colour Codes to Assist the User to Validate Quotation Accuracy**

**Red**: Object to be considered for Quotation but not yet added to Quotation/Budget calculation

**Green**: Object to be considered for Quotation and added to Quotation/Budget calculation

**Black**: Object needed for plant structure or logical objects, but not to be considered for cost calculations

The 'Add Objects' command automatically moves the objects under the respective cost group of schema which can be configured as per organization's own standard.

## CADISON Electrical Designer Enhanced to Cater to Underground Cabling Needs Using Conduits and Cable Trench Systems

With CADISON R18, it is now possible to create Conduits and Cable Trenches analogous to the existing Cable Tray or Pipeline Routing. Users can route 3D centreline and overlay features to model flexible conduits. It is easy to create/edit/modify the conduits with the addition of new conduit components such as Straight segments, Tee & Cross, etc. with Continue command. Similar to conduit modeling, Cable Trenches Systems can also be created with necessary supports/spacers.



Cable Trenches



Conduits
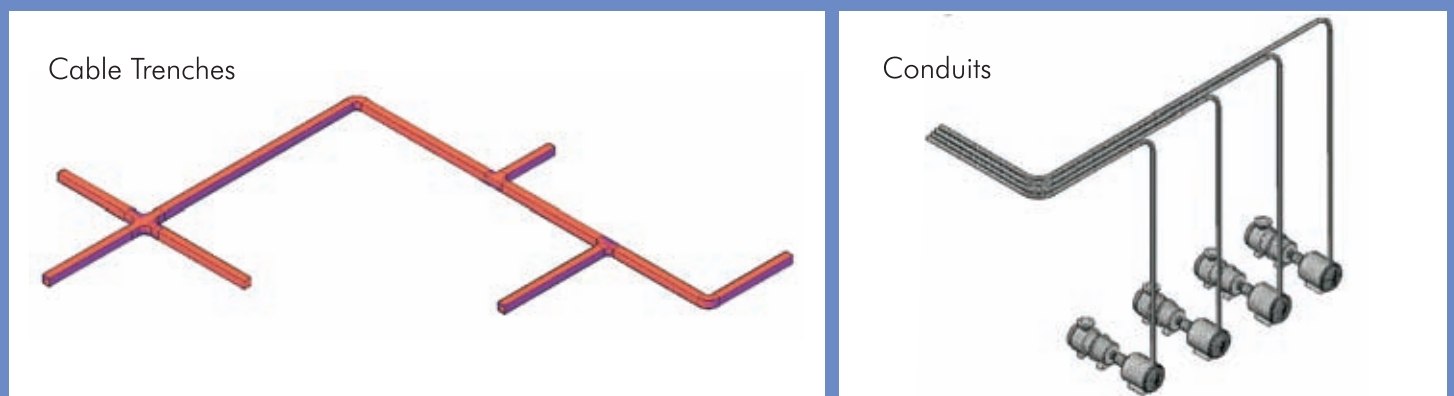
### Cable Trench System Calculations:

- Total Trench length
- Number of sections required
- Number of Supports/Spacers required
- Minimal external and minimal internal bend radius

## Improved Multiphase Wiring Command

This new enhancement helps the users to route the wires from multiple objects with one command (e.g. multiple motors) which helps reduce the drafting time and efforts. Furthermore, it is possible to flip the wire while routing and the users can continue with the selected wires from the existing multi wire system in a drawing.
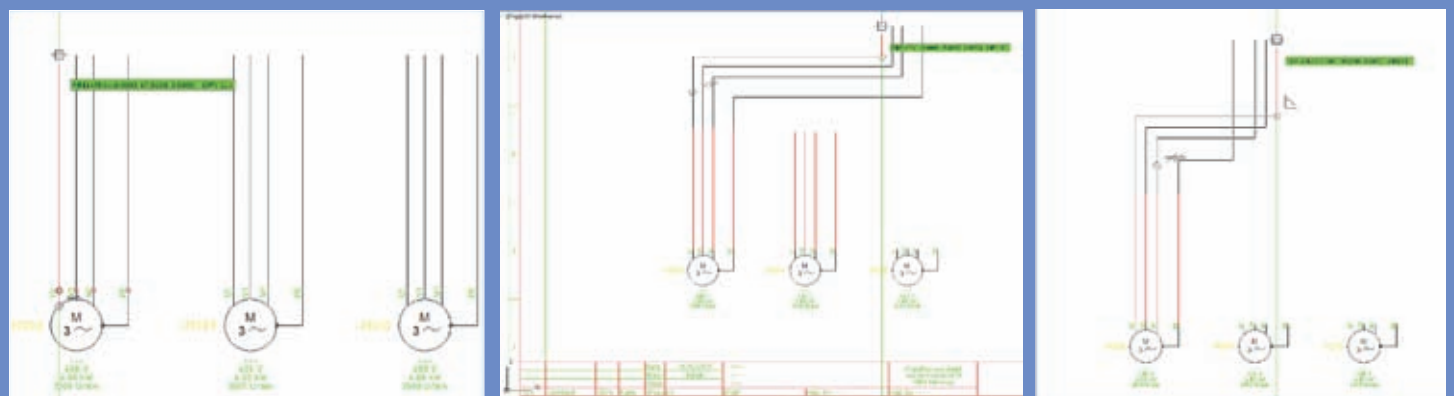
# MATPIPE Catalogs with AutoCAD Blocks - Workflow

## Creating MATPIPE Objects in CADISON:

There are different ways to create MATPIPE objects in CADISON i.e.

- Without any Graphic representation (Text)
- With a P&ID Graphic representation (Symbol)
- With a 3D Graphic representation (Parametric)
- With a 3D Graphic representation (AutoCAD Block)

MATPIPE Parametric Modeler is however the recommended and best way for the user to create MATPIPE objects, because of its distinctive functionality  i.e. 'Reusability' which can be used repeatedly for multiple projects. Creation of parent variant is one of major benefits of parametric object. This parent variant can be used to add data for other variants along with the creation of its associated elements. There are numerous vendors also in the market who deliver ready to use objects in the form of drawings, PDFs, etc. which are designed for a specific purpose or function. Thus, users can also save time by creating parametric models of required objects. CADISON provides you with this unique functionality where user can create vendor objects in MATPIPE which can save effort and time, thus increases the overall efficiency.

## Create object in MATPIPE using AutoCAD Block:



**Workflow**

1.
- Search a 3D Block on net
- Download a .dwg file
- Open dwg file in AutoCAD
- Review and save on your system

2.
- Open the 3D Designer
- Use the CAD import function to open the saved dwg file
- Follow the instructions of CAD Import process

3.
- Open the MATPIPE and create new object table
- Add/Modify the properties

4.
- Create a new graphic entry
- Set Graphic Type as 'Block'
- Attach the dwg file

5.
- Modify the object table with the required properties for connections, type, vendor, etc.
- Vendor datasheet can also be used

6. **Testing**
- Insert the object in the 3D-Designer and connect to pipeline.
- By attaching symbol user can also display the object in P&ID.

7. **Export**
The Export function from the MATPIPE can be used to distribute catalog to different users

**Step 1:**
Import the AutoCAD Block to CADISON Designer and use 'CAD Import' command to make it an 'Intelligent CADISON Object' by defining connection & insertion points and save the dwg file.
Now to create new CADISON Object in MATPIPE, the user needs a graphic entry (graphical representation) to be created in MATPIPE that can be imported from AutoCAD in the form of 'Block'.
Note: The dwg file size should not exceed 200 KB.

**Step 2:**
Using graphic entry from first step, user can define object table and can also define object e.g. pump-attributes (vendor information, type, process parameters, etc.). User needs to add only those properties which are needed in reports or datasheets. To provide connection information of the object in the object table, user can select specific connection points from the dropdown list of ListFromFile(LFF) function in MATPIPE. (If user wants to add a P&ID Symbol or further document, that is also possible.)

**Step3:**
The user can assign 'Graphic Type as Block' and select the associated drawing file name for the Block in the graphic entry dialog box (please refer the above workflow figure - step no. 4). This process creates a new folder with the catalog name in the MATPIPE library and .dwg & .sld files are stored in the same folder.
Note: User can share the catalog using export function in MATPIPE.

After completing all the steps of MATPIPE object creation with AutoCAD Block, the user can test the created object in CADISON 3D Designer. For example, in case of a pump as an object, flanges, gaskets, screws will be automatically generated from the Piping Class. For the final check user needs to create report and an isometric drawing to confirm whether all the connections are correct or not.

The user can modify and add object properties in MATPIPE and can use 'CCC function' for tracking real-time changes from the MATPIPE catalog to CADISON 3D-Designer/Project Engineer. CADISON can compare the changes and then user can update the changes automatically, as per required.

**This is a smart and efficient way to create & use complex Object in MATPIPE Catalogs**

Additional Information: Another example is the Pipe Support, user can download parts from the Sikla website, where different types of supports with unique part numbers available. These Objects are very detailed and it's a combination of different parts. User can buy these as one piece with a pre-defined article number.



Importing AutoCAD Objects
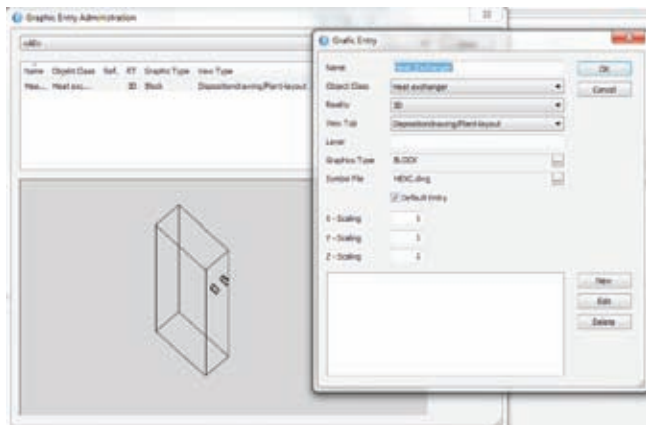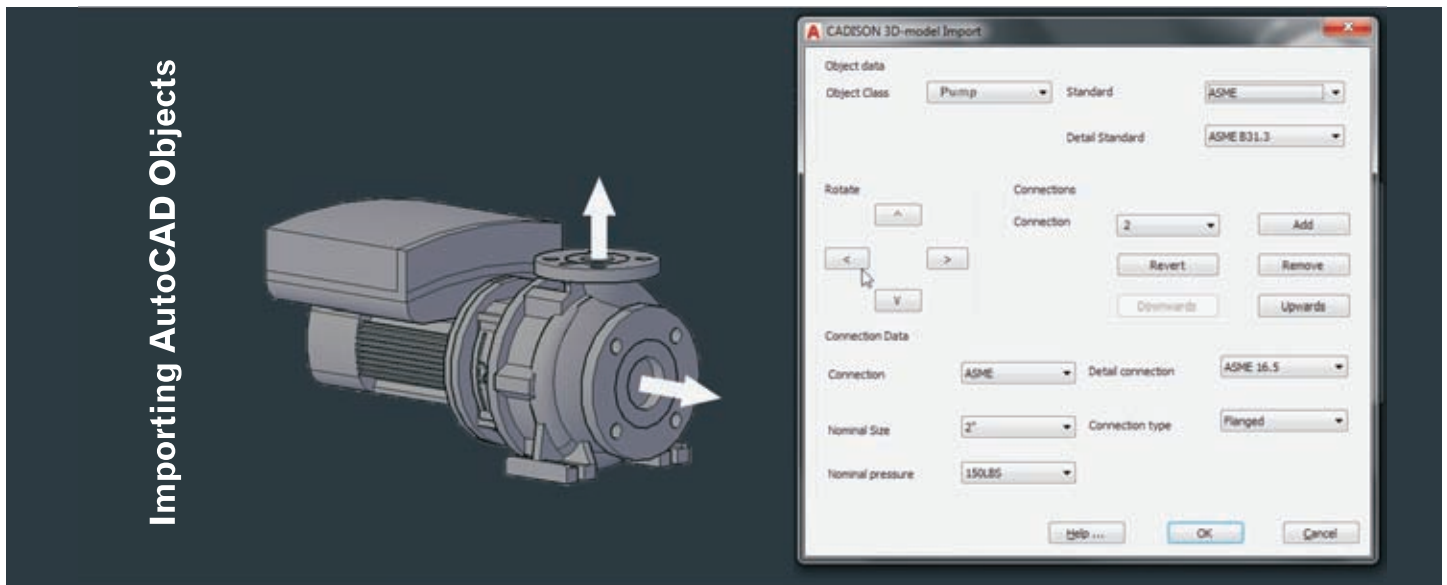


MATPIPE Object with AutoCAD Block
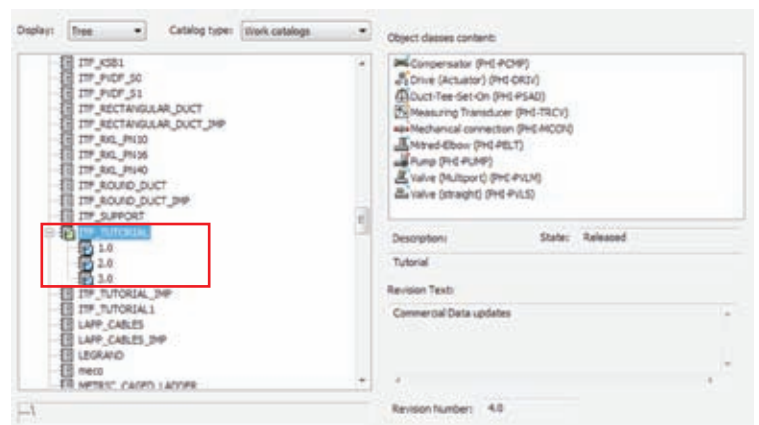


Catalog Revision Control (CRC)

# Case Study - Vitek Uses CADISON from Conceptulization to Tender Planning and Detailed Engineering



CADISON® Modules:
P&ID-Designer,
3D-Designer & MATPIPE

Vitek Engineering is a German engineering company with more than 30 years of experience and dedication towards Energy Industry for plant engineering, pipeline construction, civil engineering and EMSR technology. It has been founded in 1986 by Reinhard Vitek, and since its inception Vitek Engineering adapted modern technologies and is constantly growing. Since 2014, Christian Vitek has given a new shape and ideology to expand Vitek's Competency, Project Management and capabilities for the Power and Gas sectors. Now consulting on energy supply concepts and planning of Infrastructural measures have become an effective part of the range of services. The goal is to always be a step ahead, keeping the market differentiation and competitive edge and be in the league of Industry 4.0 technological evolution.

> " CADISON helps us to manage the whole project efficiently and create fast schematics, material lists & reports. Thanks to MATPIPE, we can easily sort catalog entries and 3D components. "      - René Franco

To keep up with the changing market trends and the need to better serve their customers, Vitek Engineering was in search of a Solution which could help them with quality consultation and service to their customers. Vitek Engineering after evaluations chose CADISON for Conceptual Design, Tender Planning and Detailed Engineering. Vitek also uses CADISON for automated Report Generation & Documentation, Cost Estimation & Analysis at every project phase, and thus achieved to reduce the total man-hours required for the Project(s) with improved efficiency.
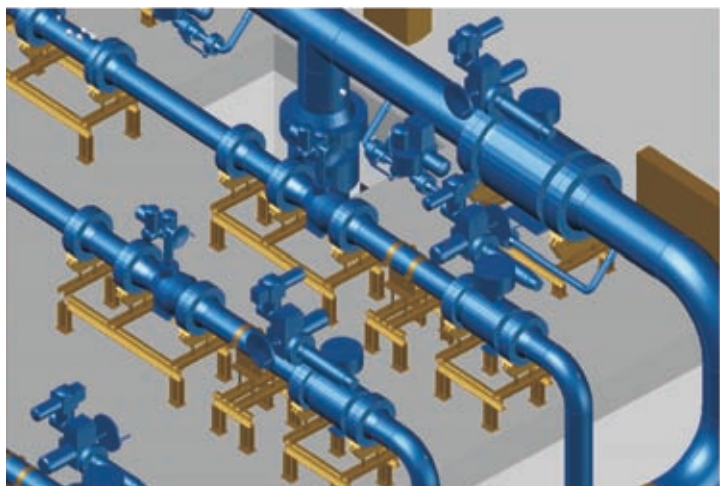
# Case Study - CADISON Improves Engineering Efficiency for Bioethanol Plant



**As Bioethanol investments take place more and more, the need is felt for an effective functional and efficient planning & engineering tool that works according to BIM methodology.**

**CADISON with its object oriented technology and centralized database along with it's multi-disciplinary integration is the ideal tool for implementing BIM methodology for Ethanol Plant design, engineering and construction. It services the entire project life cycle from project estimation to planning to design and construction. It also assists in clash detection and coordination tasks during the design phase.**

### CADISON is Used for Engineering of Bioethanol Plant



While building our Biodiesel plant, we inevitably started with smaller capacity plant, i.e. semi-batch plant which was specifically well suited for us. An advantage of the semi-batch mode of operation is that the operator can actively intervene in the central process stages of the biodiesel production at any time, "which makes the operation very flexible and ensured the desired quality". Flexibility and Modularity of this object oriented system enable us to revise the process quickly and also being a central database system, it helped integrating with the multi disciplines of our interest.



Conventional continuous processes, offered by other engineering solutions, do not allow such short-term intervention. Biodiesel / Bioethanol plant is well suited for modular planning of all disciplines. Thus, our capacity expansion at later stage became easy through advanced assemblies of CADISON modules-P&IDs, Instrumentation, 3D-Modeling, Isometrics, Pipe Stress Calculations and Electrical Design with Cable Trays capabilities.

With CADISON, users and owners were able to access plant information using Project Engineer module without depending on the CAD Designer.

# Plant Design & Equipment Engineering Solution

**CADISON® Project Engineer** is the module for project planning & management, costing, administration, work-flow management, status review and document management. It allows project managers to create and control the project data without any CAD/Graphical interface. It also provides bidirectional interface with MS Projects to plan and track the project status in CADISON®.

**CADISON® P&ID Designer** is a spec-driven module for creation of intelligent PFD/P&ID, instrumentation (measurements, hookups, etc.), specifications and reports (BOM, datasheets, report, etc). It supports various standards (DIN, EN, ISO 10628, ISA 5.1, ANSI, etc.) and also allows users to conform to company standards. CADISON enables Pipeline Sizing and Utility Pump Sizing Calculations for optimum selection of equipments at P&ID stage.

**CADISON® 3D Designer** is the module which allows the users to build plant layouts, pipeline routing and equipment modeling. It also provides various design assistants/wizards such as 'Tank Assistant', 'Nozzle Assistant' for creating 3D vessels and tanks. It uses ISOGEN for extracting isometrics and enables users to automatically generate orthographic (GA) drawings for construction documentation. Its integrated report generator enables users to generate various types of reports (BOM, MTO, datasheets, etc.).

**CADISON® Electrical Designer** is a comprehensive solution for schematic & controls design, sizing calculations (Cable, Transformer & Battery sizing and Earthing calculations), 3D cable tray & panel layouts, automatic report generation, bill of materials (BOM) and material take-offs (MTO) & lists.

**CADISON® MATPIPE** is an independent module for development and management of pipe classes, creation of parameterized 3D components, preparation and integration of manufacturer's catalogs and maintenance of up-to-date catalogs data in the system with import & export functionality of MATPIPE.

**CADISON® Steel Layout** is a tool for planning and creating 3D steel structures and custom assemblies (ladders, staircases, platforms, hand rails, pipe supports, frames, etc.). The users can also extract GA drawings and generate Bill of Material (BOM) and quantities (BOQ) required. Its SDNF export features allow the users to the export steel structures to Tekla for further detailing.

**CADISON® Pipe Support Modeler** is a wizard which assists the users to create and edit different types of predefined secondary supports in an easy and intelligent manner. Hookups can be generated automatically and inserted/displayed in the documents (drawings/Isometrics). Users can also quickly create non-standard pipe supports manually using steel profiles (beam/columns).

**CADISON®**
For Improving your
Engineering Efficiency by 30%

**CADISON® P&ID Designer for Visio** This process engineering solution is very useful for conceptual design and proposal generation. Its a tool for process engineers and business development professionals who are interested in lightweight CAD systems.

**CADISON® Archiver & Archiver Browser** The CADISON® Archiver allows you to swap and archive completed projects from the CADISON® productive environment. Archived project data/information can be quickly and easily viewed with the CADISON® Archive-Browser without a need to retrieve it from the productive environment.

**CADISON® Engineer2Web** CADISON® Engineer2Web enables the users (at remote location/site) to gain direct web access to CADISON® object data. The data and structures generated by using Project Engineer, P&ID Designer, 3D Designer and other modules can be viewed, edited or re-integrated over a standard web browser.

**CADISON® ERP-Interface** CADISON® provides an access to the known ERP systems (Enterprise-Resource-Planning) for dynamic data exchange via an open ERP Interface. This bidirectional interface combines the ERP and engineering workflow for creation of a highly integrated system. For instance, orders can be directly released and controlled from the engineering workflow.

**CADISON® Inventor Interface** The CADISON® Inventor interface enables users to import an Autodesk Inventor part or assembly into CADISON® environment as a CADISON® object. Add-on menu in Inventor will assist users in exporting Inventor part or assembly file into SAT and XML format. The interfaces have a provision to define connection points on planar face of any shape (in Inventor as well as in CADISON® import wizard) enabling users to import objects with or without connection points.

**CADISON® CAESAR II Interface** CADISON® provides an interface with industry standard CAE software CAESER II for quick and accurate analysis of piping system subjected to wide variety of loads taking in to account weight, pressure, thermal, seismic and other static and dynamic conditions based on user defined variables and accepted industry guidelines. CAESAR II interface adds the ability to export pipeline or selected pipe data form CADISON® 3D Designer to neutral ASCII –format.cii file.

**CADISON® ROHR2-Interface** makes it possible to transmit all pipeline systems created with CADISON® 3D Designer to ROHR2 for quick and accurate analysis of piping system. All the required information will be completely transmitted in the form of NTR files for analysis.
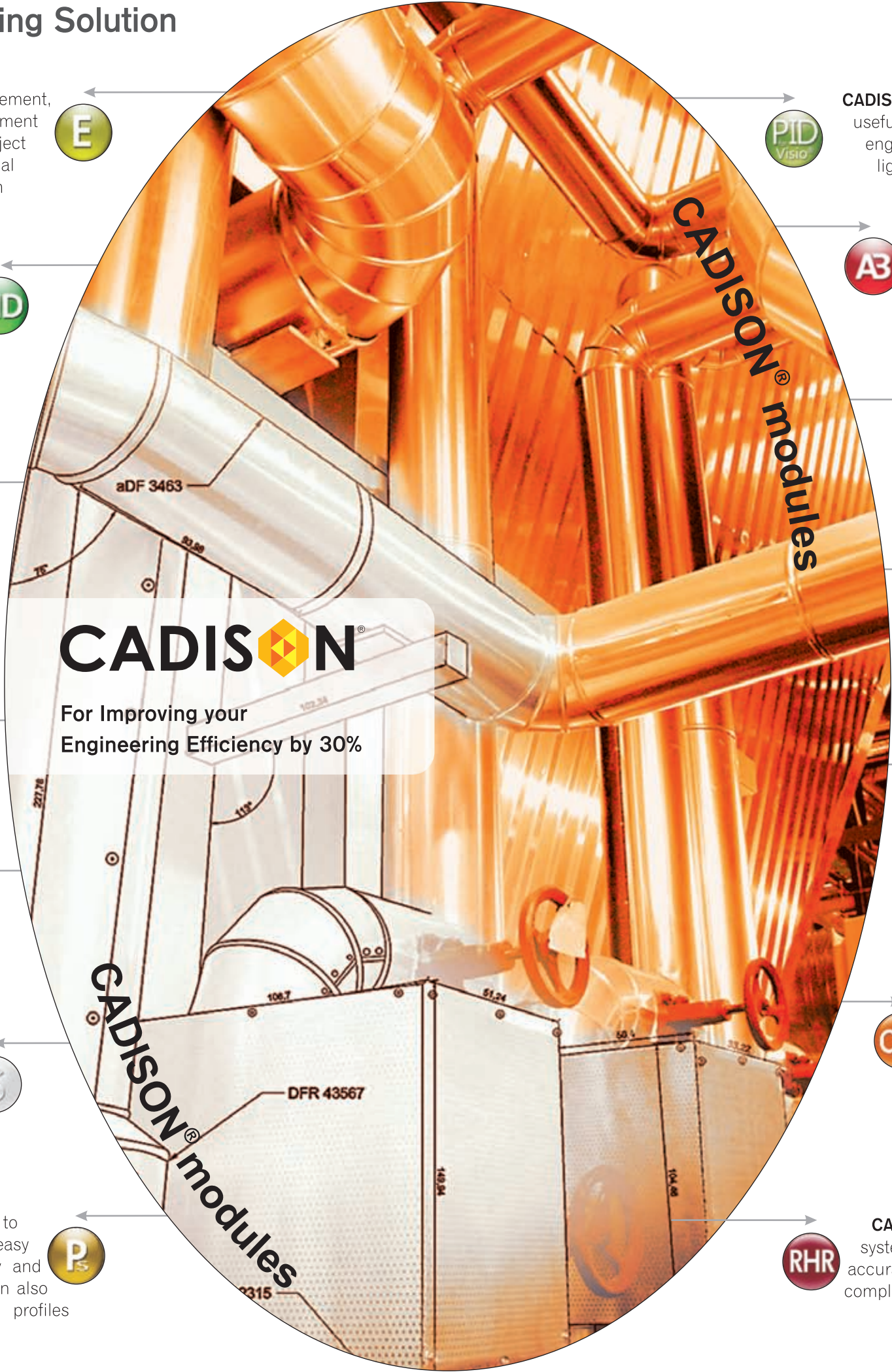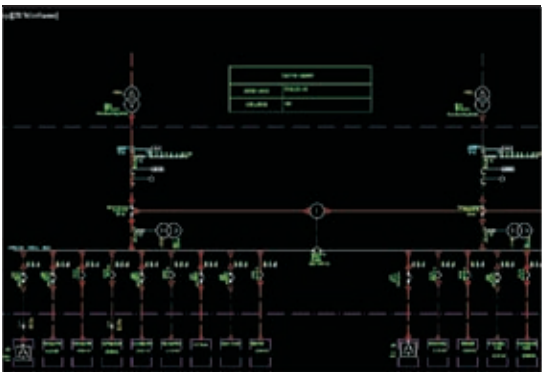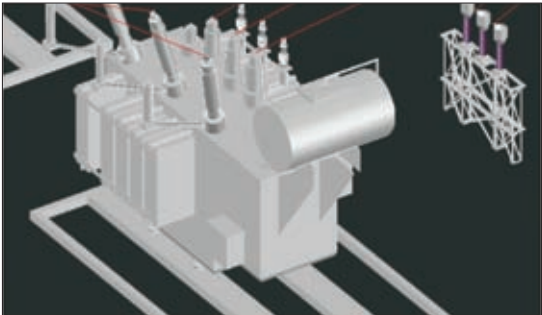
## Experience of Substation Design using CADISON Electrical Designer

Utility systems such as electrical power and water supply are integral parts of every process plant design. Substations extensively check and transform accurate distribution of voltage levels impending from a utility system to supply exact levels of voltage and power to a plant. Design of substation involves creation of concept layout, design of distribution connections and components, calculations, detailed specifications of individual components, project schedule and estimates.

A complete substation design with physical and electrical design along with calculations was important for us. Thus, we were searching for a solution which can provide us a comprehensive suite for estimation and design of a complete substation. We did an evaluation of three different softwares available in the market to match our requirements. Based on comparison, we found CADISON Electrical Designer as most suitable for all our needs. It offers an exhaustive library of objects for transformers, cables, cable trays, control switches, relays, motors, generators, fuses & panels.







**Project Requirements**

We selected CADISON Electrical Designer also because of its flexibility and ease of creating custom elements for transmission poles, power transformers, insulators, line traps, etc. As a part of this pilot project, we were able to create more than 10 types of new elements, almost 25 new symbols and catalogs within 2-3 days.

**Deliverables prepared within a week's time**
- Single Line Diagrams
- Panel Layouts
- 3D Layout of Distribution
- PLC Drawing, Terminal Drawings
- Sizing Calculation Reports
- BOM, MTO & Reports

CADISON Electrical Designer was used to design the complete substation for a battery manufacturing unit. The design of 5700 KW capacity included various panels providing power for different electrical loads. We anticipated some issues for load calculations, but CADISON helped us to solve the complex issues of sizing and reduced the drafting time by 30%.

The CADISON helped in transforming our design process and with this single solution we were able to meet all our needs for creating Single Line Diagrams, Panel Layouts, 3D Layouts of Transmission and Distribution, PLC Drawing, Automatic Terminal Drawing, Reports & BOM.

# BIM is Beyond 3D

BIM is often misunderstood as an output of working on a 3D platform. While it is true that you do need a 3D platform (like CADISON, Revit) and the ability to attach attribute data to the object models. For the BIM methodology to succeed it is essential that the Owners or EPC contractors upfront in the process defines their own BIM standards & guidelines which have to be adhered to by all stakeholders. This methodology enables consistent, meaningful and intelligent collaboration in a defined manner between the various stakeholders at every stage of the design and build process.

In the late 80's & early 1990's, Autodesk, Bentley and few other vendors began working on the initial concepts of how to create intelligent buildings and that led to the introduction of object-oriented tools like Revit, CADISON subsequently. This was the first and very essential step that enabled Process Engineers and Designers to attach relevant attribute data to the object models that were created. This was the beginning of adding intelligence to the models that were being designed. However, it was soon discovered that each stakeholder was adding attribute data to meet their own needs and hence there was a need for the Owners or EPC contractors to define the standards & guidelines for what information needed to be attached by the various stakeholders and to ensure consistency of information throughout the design and build cycle.
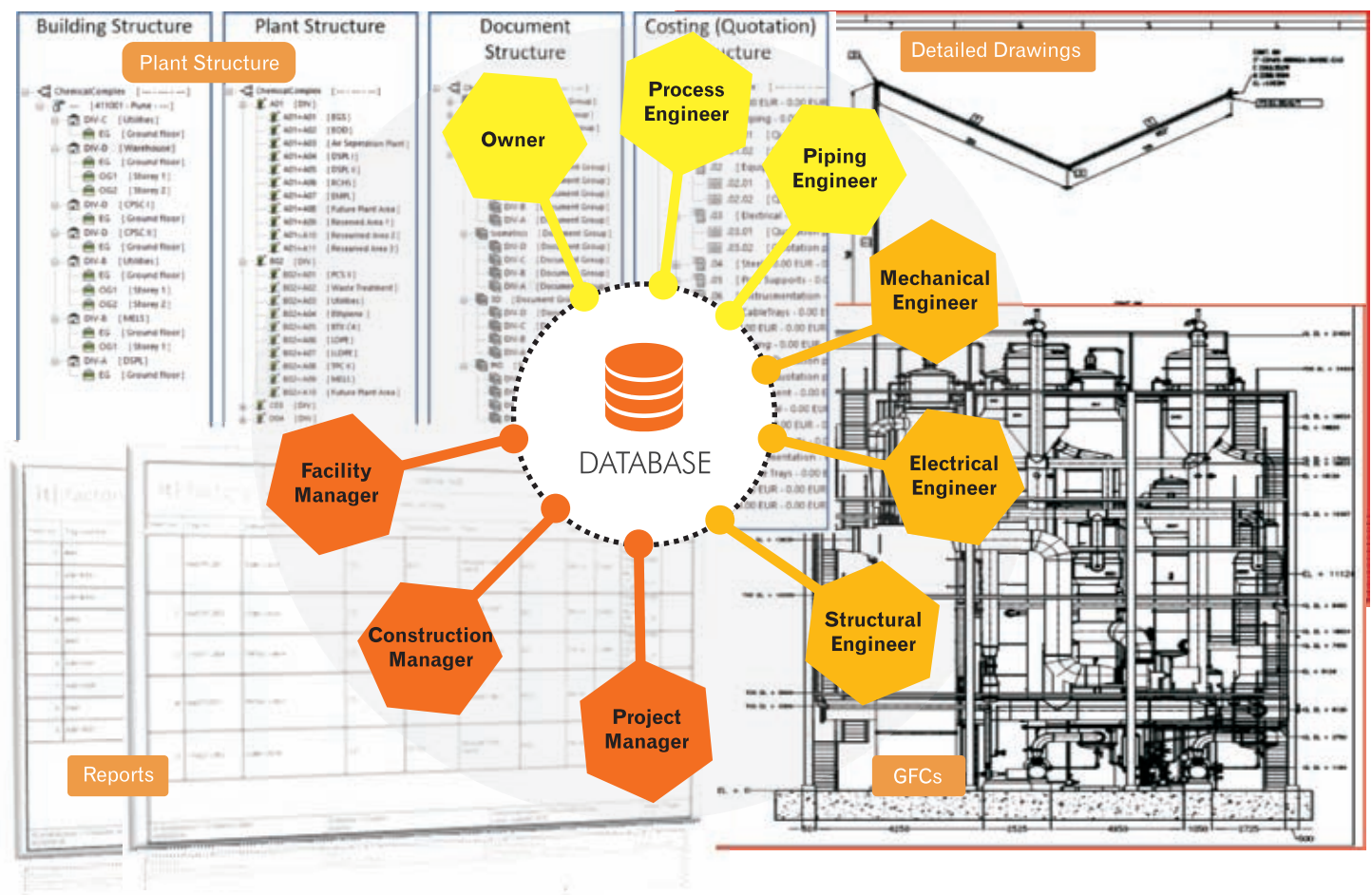


This effort and methodology over a period of time came to be defined as BIM standards & guidelines. The Owners & EPC contractors request for reducing design & construction time, reducing errors & changes and to ensure better collaboration between various stakeholders has led to the continuous fine-tuning of the BIM methodology and each organization is defining what building information models and workflows are required (standards & guidelines) for their own projects.

## Converting your Legacy (Old) and AutoCAD Based P&IDs into a Database-driven Smart P&IDs with CADISON

Most companies in the past had their P&IDs on paper or in AutoCAD. Relevant data was stored as attributes in the drawings. The challenge or problem with this way of working is that when a Plant has to be modified, it requires a lot of rework.

**Required Modification Efforts**

a) Modifications to P&ID
b) Update Lists & Reports like Valve List, Equipment List, Pipeline List, Measurement List, Datasheets, ERP Export List, etc.
c) New Tagging (manual process)
d) Further information required by other Disciplines

With a system like CADISON which provides an object-oriented centralized database and linkage to all disciplines, most of the rework stated above can be avoided. It's important that modifications made in the P&ID also gets updated for all other disciplines. That is what you get when you have Smart P&IDs.

**Migration to Smart P&IDs**

Companies that want to migrate their old P&IDs to Smart P&IDs in CADISON need to think about what is the best way to achieve this.

- Criteria for a migration from the perspective of the user or
- Criteria from the perspective of the solution provider

In the past there were different CAD Systems used to export P&IDs to dxf and dwg formats, with database or without database. The primary requirement is to have output in dxf and dwg format with data (attributes) stored within the drawings.
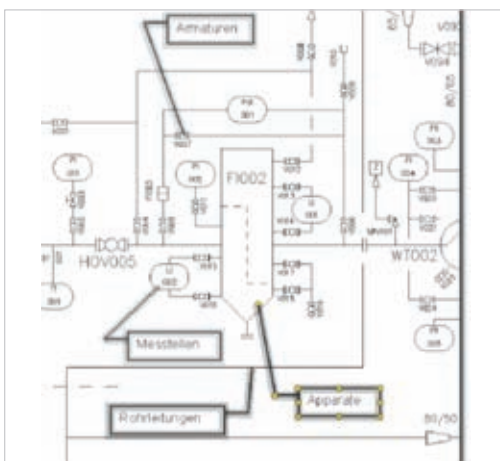
**Inspecting the drawings will let us see the obvious visible information in the P&ID**

**This example is of a dxf drawing and you can see visible information**
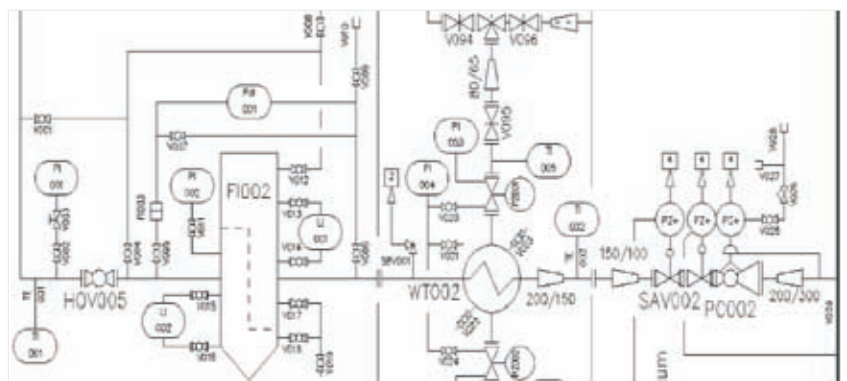


### Information that is assignable

- Tagging (Kennzeichnung)
- Valve (Armaturen)
- Equipment (Ausrüstung)
- Measurement point (Messstellen)
- On the Lines (Rohrleitungen) you see no information

**Steps for Migration of Your AutoCAD Based P&IDs to CADISON:**

1. Analyze the existing P&IDs to study Attributes and Blocks
2. Create a mapping file that converts the AutoCAD Blocks to CADISON Objects
3. Create a mapping file to map the Attributes to CADISON Properties
4. Execute the import Function to start the process
5. Make a quality check of the reports generated from CADISON
6. What were the limitations, or what 'Errors' in the past need more attention?

   - No structures (Plants, Buildings)
   - Non uniform standards
   - Non uniform symbols (different user different symbols)
   - User can change without consequences
   - Data can be filled in, but there is no need to manually create reports
   - No data check, logic checks, consistency checks and binding filing structures

A modern system like CADISON helps you to solve these issues after migration.
It's also important to understand customer's expectations and what is possible or needs to be changed. This requires a discussion with the customer to get the best results.
The general expectation of customer:
- Holistic data migration
- Minimal effort
- As fast as possible
- Migrated result should be better than the original
- Merge graphics data and datasets
- Adopt existing definitions (standards, pipe specs, etc.)

**From a solution provider point of view we must think about the following**

- What should be migrated (everything or only P&ID?)
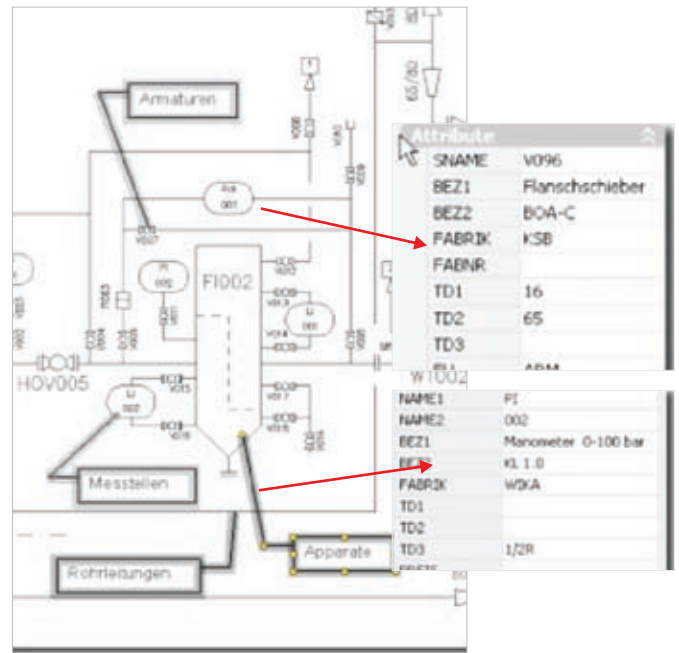
- In what form is the data available? (Drawing with or without Attributes)
- How is the quality of the data?
- Evaluation of the results
- Presentation of the added value for the customer

One point is clear, everyone must be realistic, we must have a good definition and we must agree on what limitations should be expected. This approach helps to get a good result and a happy customer.

**Case study from an earlier project (summary)**

This Drawing was used as an example to make an analysis to define and prepare the mapping files, find out the limitations, lines (pipelines) are only lines. This Pipeline needs to be redrawn (with Rules: Media, Piping Classes) and Structures (Plant Structures) is also required to be redrawn. Report was created, Rules were defined. An initial migration of 100 P&IDs, Documentation as a Pilot was done. Handholding of customers during migration was done.
This Pilot example was shown to the customer so that they can convert the rest of the files themselves.

Neilsoft's Plant Design & Engineering services practice used PDMS and Autodesk products for their Customer Projects before 2008. In 2008, Neilsoft acquired CADISON to improve their efficiency and reduce the design and engineering costs. The company has a group of 46 users who work with CADISON for Plantand have managed to reduce costs by approx. 35%.

**Below are Three Projects that Neilsoft Successfully Executed in the Past.**

**VISCOSE FIBER PLANT**

Neilsoft worked on one of the large projects in Viscose Fiber domain in Purwakartha near Jakarta, Indonesia. The capacity of the plant 200 TPD. This project was divided into three main areas named as Viscose, Spinbath and Spinning. Three different projects databases in CADISON were created to enable different teams to work effectively on different areas. The scope involved creating Intelligent P&IDs, optimization of Equipment Layout and Piping using as-built drawings, Equipment Modeling and Layout, Piping Modeling with supports, Cable Tray Modeling, Secondary Support Modeling and all final deliverables extracted from 3D model. Neilsoft was also involved in design and detail engineering of Civil & Electrical disciplines. For subsequent similar projects which involved 30 - 40% changes as per the new equipment layout, the Neilsoft team made necessary changes in the existing CADISON database there by improving efficiency for new projects. Reuse of existing models for new projects is a good capability in CADISON.

Number of Pipelines – Approx. 2800, Number of Equipments – Approx. 850
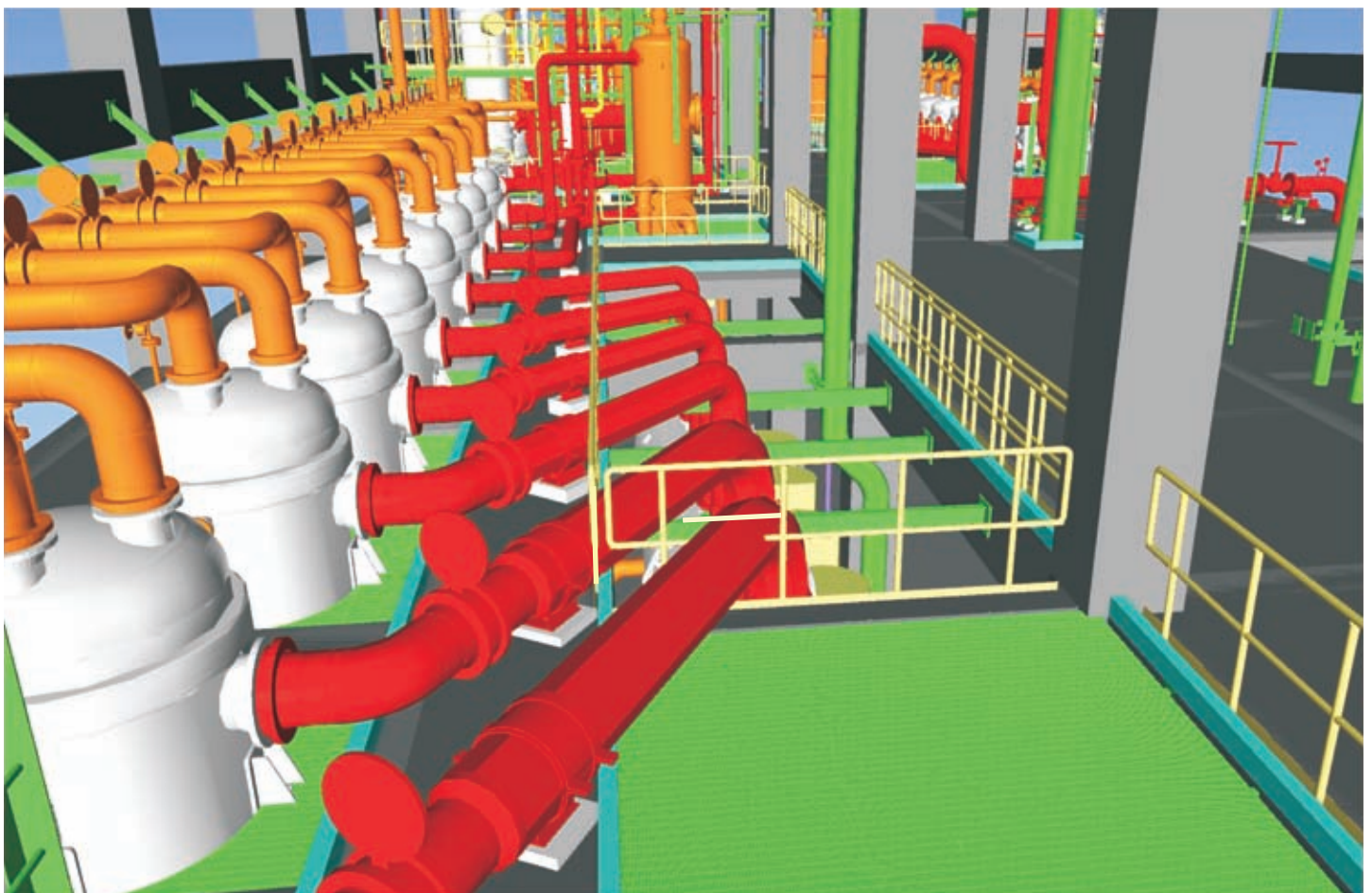
## Lube Oil Additives (LOA) Project

In many production systems such as 'Lube Oil Additives', the process of mixing and filtration liquids plays a major role in agitated vessels. The main process steps are Acid formation, Neutralization and Drying/Filtration packages. The areas in this plant are Tank Farm System, External Pipe rack and Process Building. The scope involves Pipe rack design, 3D Equipment modeling, Dust extraction system network & Equipment modeling, 3D Pipe routing with primary and Secondary supports, Cable Tray modeling, 3D Modeling of Civil & Structural component and extraction of final deliverables from 3D Model. All models were clash checked for collision detection in Navisworks through CADISON interface at 30,60,90% model review stages. Also generated clash/collision reports in Navisworks through CADISON interface.
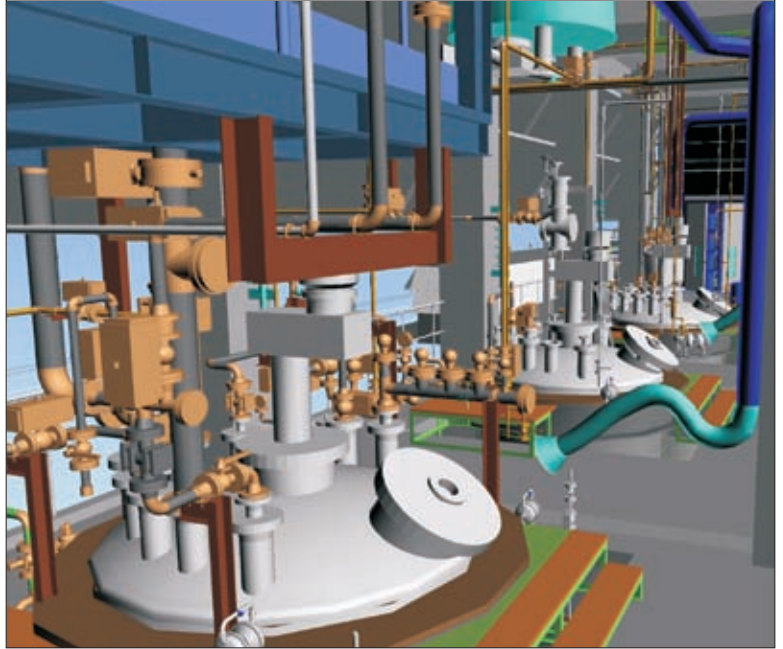


Number of Pipelines – Approx. 480, Number of Equipments – Approx. 150

## Pre-FEED and FEED Engineering Services for LNG Terminal Project

LNG is unloaded from ship and stored in storage tanks in liquid form. This undergoes through process equipments and converted into gas. This gas is supplied to customer through metering station by



underground piping (Approx.1000 km). The capacity of the plant is 4 x 270000 $m^3$. Project was executed in two phases i.e. Pre-FEED stage and FEED stage. At Pre-FEED stage conceptual 3D model was prepared without any input documents and 3D Model delivered. For the FEED stage pipelines of size greater than 6" were routed and basic pipe racks were designed. In addition modeling of the plant equipments, building and infrastructure was carried out. Majority of pipelines were checked for stress analysis. Cryogenic lines run at -170°C, hence it is of utmost importance to carry out stress analysis. All P&IDs were created as per client's markups. All final deliverables were extracted from 3D Model for FEED stage.
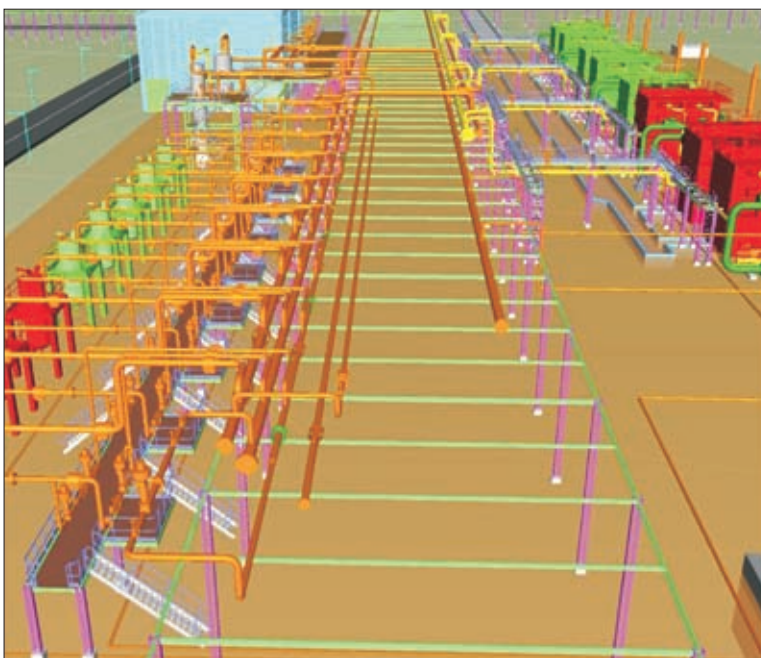
Number of Pipelines – Approx. 600, Number of Equipments – Approx. 75

**Intelligent and Integrated Way to Plan, Design, Collaborate, Construct and Operate**

The Plant Industry is rapidly moving to BIM, embracing the promise of lower risks, improved margins and faster & better project delivery. BIM is a methodology that ensures common processes and information management guidelines & standards across all stakeholders; be it plant owners & operators, process developers, engineers and EPC contractors.

BIM is changing the way projects are planned, designed and delivered, especially when multiple stakeholders or organizations need to collaborate for better design coordination and share information to improve efficiency & quality of plant construction projects. The benefits of BIM to the owners or EPC Contractors far outweigh the efforts & costs involved in the initial phases of the projects.

Construction of plants is strongly evolving to adopt the promises of advanced BIM planning, faster collaboration, better project delivery in quicker timeline and lower costs. This has become essential with involvement of multiple stakeholders or organization teams like Plant Owners, EPC Contractors, Consultants and Engineers.

BIM process ensures Planning, Information Management, Integrated Design Development, Construction Planning, Resource Planning, Monitoring, Operation and Maintenance for a Plant.



**BIM methodology for plant industry helps in risk management and optimize designs, to deliver more predictable project outcomes and win new business.**

BIM is more known to the Industry as a 3D way of working on Plant Project, but it is much more than that. End to end implementation of the BIM process on a Project is necessary to yield full benefits. It is essential for the BIM team to define a clear and concise BIM Execution Plan to be followed by every stakeholder of the Project. The 3D Model should be augmented for every discipline and stage of plant design to add the required attribute data to the model elements as appropriate for various disciplines. BIM authoring tools or modules for different design teams could be different based upon preferences, but it is essential to have common coordination platform for design reviews and monitoring.

Coordinating design reviews, construction and commissioning services across multiple disciplines, leveraging BIM and  Multi-disciplinary Integration with centralized database can ease a project monitoring. The technology available in today's world has made it easier to work in collaborative working environment to achieve the real time exchange of information and quicker decision from different corners of the world. Most desirable benefits of BIM methodology can be achieved with integrated 4D, 5D solutions wherein Schedule, Cost information can be fed along with the 3D Model development. The 4D development enables simultaneous monitoring and comparison of time with construction stage. This enables immediate corrective actions to mitigate any delays in construction. The 5D simulation keeps a track of cash flow till the completion of a project, at every stage of construction.

The BIM models can further be enriched by additional data related to Operation and Maintenance of each equipment in line with requirements of operations and maintenance.

**Benefits of BIM for Plants:**

Improved Plant Quality with reduced construction time and cost

Better visualization for more predictable project outcomes and control from start to end of the project

Reduced risks and optimized design

Streamlining unified workflow to manage detailed modeling, change and revision management

Optimization of operational efficiency because of reduced documentation errors and reduced rework

Reduce manual work and bring intelligence for plant's own tagging or labelling systems

Auto generated of accurate quantity and clash report

Significantly decreased Project Lifecycle Cost and Asset Management Cost

# CADISON Training and Webinar

Below is the training schedule of CADISON modules at our Bad Soden office. Please check our website (www.cadison.com) for the detailed training calendar. If you are interested in participating or arranging trainings for your team, please contact us at: training@itandfactory.com

## Training Schedule

| Topics | Date |
|---|---|
| P&ID Designer (Basic)  -  **2 Days** | 05.02 - 06.02.2019<br>02.04 - 03.04.2019<br>02.07 - 03.07.2019<br>03.09 - 04.09.2019 |
| 3D Designer (Basic)  -  **3 Days** | 29.01 - 31.01.2019<br>26.02 - 28.02.2019<br>26.03 - 28.03.2019<br>25.06 - 27.06.2019<br>27.08 - 29.08.2019 |
| P&ID Designer (Key User)  -  **2 Days** | 08.01 - 09.01.2019<br>05.03 - 06.03.2019<br>06.08 - 07.08.2019 |
| MATPIPE (Basic)  -  **2 Days** | 20.02 - 21.02.2019 |
| MATPIPE (Key User)  -  **2 Days** | 10.04 - 11.04.2019<br>21.08 - 22.08.2019 |

| Topics | Date |
|---|---|
| CADISON Administration  -  **2 Days** | 12.03 - 13.03.2019<br>04.06 - 05.06.2019 |
| Project Engineer (Basic)  -  **2 Days** | 19.03 - 20.03.2019 |
| Project Engineer (Key User)  -  **2 Days** | 16.01 - 17.01.2019<br>07.05 - 08.05.2019<br>30.07 - 31.07.2019 |
| Object Model Training  -  **3 Days** | 12.02 - 14.02.2019<br>17.09 - 19.09.2019 |
| Report Training  -  **2 Days** | 22.01 - 23.01.2019<br>14.05 - 15.05.2019 |

We have revised the methodology of our training and now offer 2 levels of training i.e. Basic Training and Key User Training.
In our new training session the users will get to learn and understand how to use CADISON in a more efficient way, with augmented and specific ways and ideas align to their system and organization environment.

**For Webinar Register @**  http://cadison.com/en/support-services/webinars

## Webinar Schedule

| Date | Time | Topic |
|---|---|---|
| 17.12.2018 | 11:00 -12:00 CET | CADISON R18 'Preview' (Language - German) |
| 09.01.2019 | 11:00 -12:00 CET | CADISON R18 'Preview' (Language - German/English) |
| 28.01.2019 | 11:00 -11:30 CET | 3D Designer - Latest Key Features (Language - German) |
| 25.02.2019 | 11:00 -11:30 CET | MATPIPE Creating Catalogs Using AutoCAD Blocks  (Language - German) |
| 25.03.2019 | 11:00 -11:30 CET | MATPIPE - CCC for Catalog Change Management (Language - German) |

**ITandFactory GmbH Participates
in Achema 2018 Held at Frankfurt, Germany.
Exhibited our Comprehensive BIM for Plant Engineering Solution through CADISON.**





**Neilsoft
organized an event
'BIM Conclave 2018' at Basel, Switzerland.**

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# it and factory
## solution provider

# Neilsoft