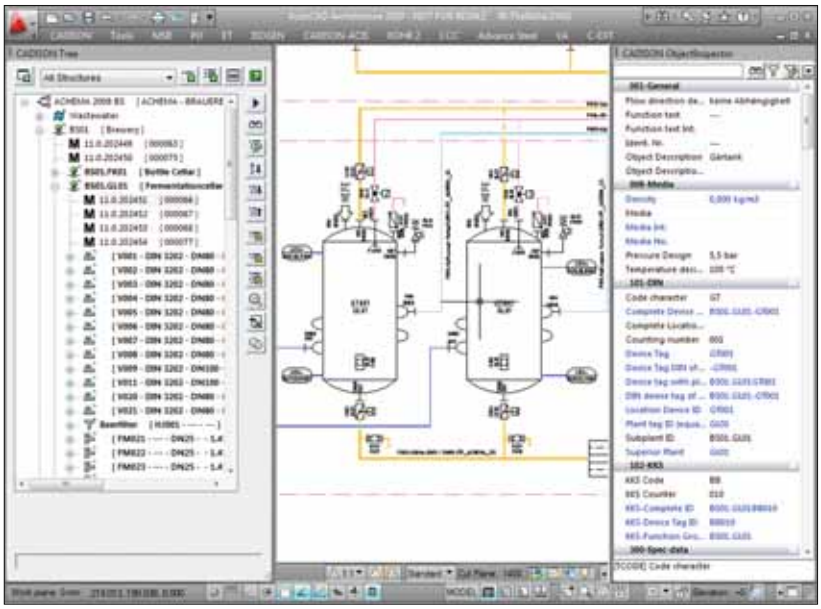
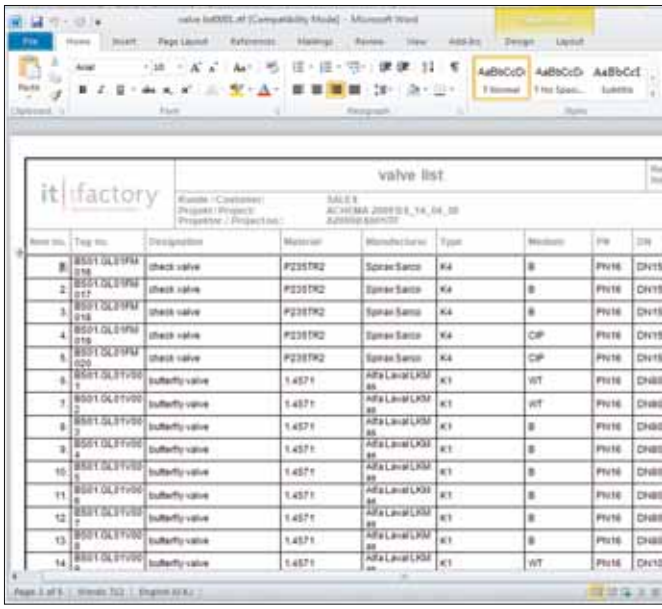


Cadison P&ID Designer



Cadison Engineer

Flexible data model supports integrated 3D design

Almost all plant engineering projects today face the not-so-easy challenge of integrating the different sub-disciplines in one overall process – this starts with the first idea for a rough-cut plant workflow during the sales process and leads through detailing in the process flow diagram, costing, 3D layout and pipeline design to the handover of the as-built documentation and scheduling of service and maintenance intervals. Modern integrated 3D design tools can help master this challenge.

In ever shorter development cycles, complex projects must be realized with fewer and fewer resources. At the same time the cost and effort involved in documentation and the quality requirements for the documents to be ultimately handed over are increasing enormously while project times are decreasing.

The greatest difficulties are in the communication between those involved in the project and in overcoming the boundaries of the respective design step. Most design solutions do have options for synchronization of information between the different disciplines, but really integrated and always up-to-date data management is generally not realized. Lists and reports, for instance,are still manually compiled and the project manager still has to actively source the latest information, only hoping to have all project information up to date by the time he talks to the client.

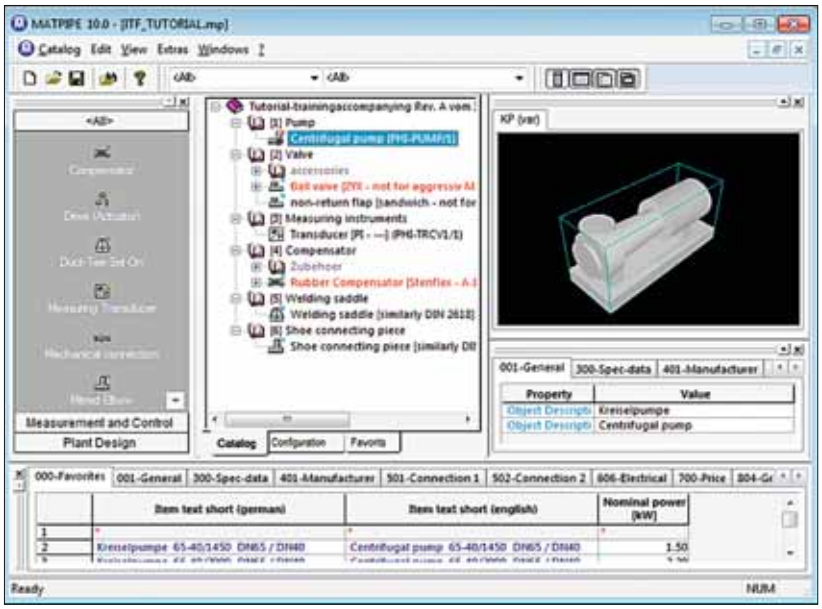
In the model of an integrated engineering solution, all sub-disciplines in the plant engineering process are brought together and realized in an end-to-end workflow covering all process steps. The different disciplines can only be smoothly integrated providing all information flows into a shared database and all involved always have access to the latest engineering data in the project without first having to initiate complex synchronization mechanisms.

In modern design systems, a highly flexible data model serves as a basis for this redundancy-free engineering workflow. Only this can ensure integration from tender costing, P&ID generation through 3D design to instrumentation. The process is supported by a parametrically structured pipe class and master data management module.

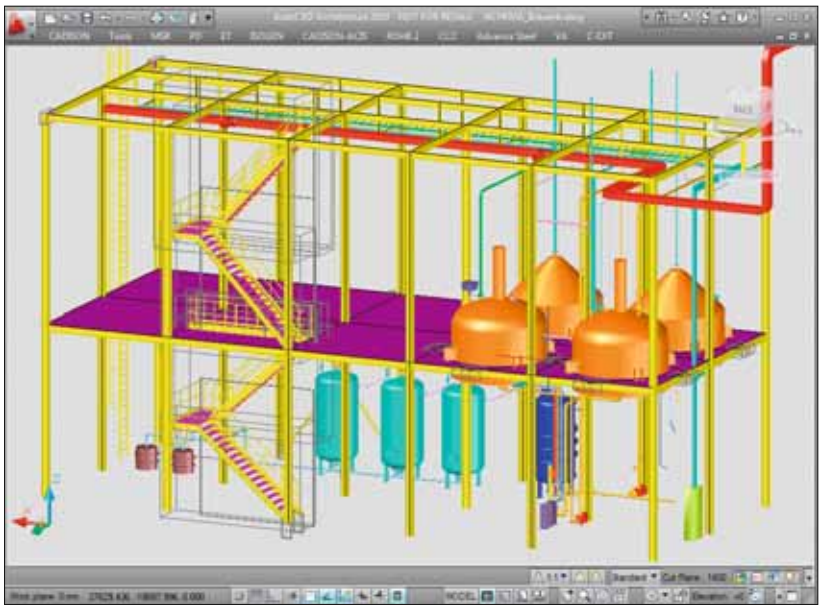
With the parametrically based master data system, project pipe classes must be simply defined based on the standard pipe classes and then used accordingly. The use of parametrics facilitates for the engineer the generation and management of component catalogues that are used as a basis for 3D design but also for materials management. With a link to ERP systems, data such as

- standard and third-party orders
- inventory reservations
- transfers as individual or collective items
- materials with/without material number
- materials in the material master
- can be automatically synchronized between the ERP and engineering systems.

Project engineers often don't work graphically. In a sort of "black-box" process, plant design concepts must be generated and configured fast and efficiently. Depending on requirements, different views and structures displayed in one window (KKS, media, piping, fittings and equipment) are necessary for the engineer's work. To be



Cadison Matpipe



Cadison Steel

Pictures: ITandFactory

able to store and use relevant project information securely and in a structured manner, the integration of project management and document management functions is essential. It must be possible to generate up-to-date reports such as BOMs or motor lists from the list management.

An integrated rights and role concept ensures that each employee gets the information he needs for his work within the project. Fully integrated engineering solutions realize end-to-end and redundancy-free graphic design from block diagrams through process flow diagrams to 3D pipeline planning and the generation of isometries.

The process flow diagram and 3D design access one and the same data repository, and accordingly they are instantly and consistently synchronized. The objects from the flow diagram can be dragged and dropped into the 3D model. An integrated logic analyzer checks the processing status. From the 3D model, isometries for assembly and production can be derived in line with customer-specific requirements. In P&ID, information for instrumentation such as hook-ups, measuring points and other details can be edited. In instrumentation, in addition the generation of typicals, detailed cable route planning and the generation of logic diagrams as well as the planning of switch cabinets are enabled.

The plant engineering designer rightly expects an easy-to-operate and logically structured graphic tool that supports him with design aids. To satisfy today's market requirements, everything must be fast and simple. It is especially difficult to realize plant design in the scheduled time frames without technical aids. For this reason, the designer needs simple aids supported by the design tool, such as an autorouter function for simple pipeline planning or a tank and nozzle wizard for P&ID design. The functions include

- pipeline planning and automatic positioning of elements as well as autorouting
- simple moving of fittings in the pipeline
- full access to project data thanks to a direct connection to the engineering database
- synchronization between 3D design, P&ID Designer and project data
- tank and nozzle wizards for easy design
- automatic generation of isometries.

Besides the 3D pipeline design and layout design, easy integration of complex structural steel and/or building concepts in the design must also be supported.

Conclusion

Only with the integration of all phases of plant design in one workflow is an end-to-end design process from block diagram through P&ID, 3D design and ordering enabled. This massively reduces change costs and avoids potential sources of error.

Only consistent data management and structured storage of all information in one central database can guarantee this. Interfaces to other IT infrastructure such as ERP, financial accounting software, document management must be easily and efficiently possible.

Only with one common database for all engineering information can risks be minimized and projects designed more efficiently and effectively.

FRANK JANKOWIAK,
MATHIAS KÖHLER

INFOCORNER

The authors work at ITandFactory GmbH based in Bad Soden, Germany. For further information on integrated 3D design visit **www.cadison.com**