SPIE-Controlec Engineering

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SPIE-Controlec Engineering B.V. is a NEN-ISO-9001 certified multi disciplined engineering company specialised in Feasibility studies, Basic & Detailed Engineering, Procurement, Construction & Project Management projects in the process industry for petrochemical, power, pharmaceutical, food nutrition and governmental services.

SPIE-Controlec Engineering is a division of SPIE Nederland B.V.

SPIE Nederland B.V. is part of SPIE SA and worldwide active in more than 28 countries, revenue of € 3.5 billion (2008) and more than 27.000 employees.

SPIE SA has its Head Quarters in Cercy, France.

SPIE Nederland exists of the following divisions
- SPIE-Industrie
- SPIE-Asset Management
- SPIE-Building Systems
- SPIE-Controlec Engineering
- SPIE-Infra

SPIE-Controlec Engineering is based in Schiedam (Rotterdam), Elsloo and Terneuzen, both operating in the local region with a vast variety of clients in the region i.e. AKZO, AVR, Shell, Esso, Exxon-Mobil, Vopak, Total, Eneco, DSM, Tronox, DOW Chemical, Purac, Kuwait Petroleum etc.

SPIE-Controlec Engineering employs approximately 350 employees.

The engineering disciplines consist of:
- Process
- Electrical
- Instrumentation
- Mechanical
- Piping
- Civil and Structural
- Procurement
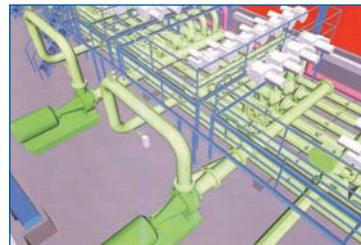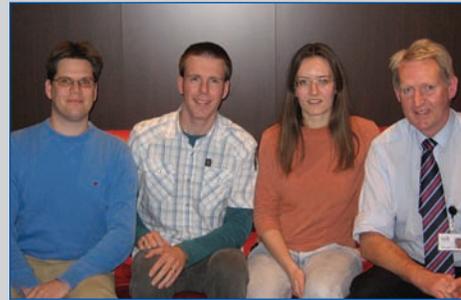
Tank pit for Euro Tank Terminal Amsterdam

The project concerns a tank pit on the premises of Eurotank Terminal Amsterdam. A number of distribution manifolds are required to load and unload oil from storage tanks to cargo vessels and vice versa. A manifold consists of a number of pumps, valves, piping, measuring devices etc. to distribute the oils as required.
The manifold for the Euro Tank Terminal Amsterdam project has been established with the following SPIE-Controlec Engineering and design disciplines:
Piping – Mechanical – Electrical – Instrumentation – Process - Civil & Structural.
All disciplines started with their design in the 3D Autoplant Model, then all relevant piping data were imported into the Caesar II application, the output of these calculations were exported to Scia Engineer and afterwards was the entire structural configuration was imported in 3D Autoplant XM.

Owner: SPIE-Controlec Engineering
Architect: n/a
General Contractor: n/a
Engineering Office: Schiedam

Construction Start: 01/11/2008
Construction End: 12/08/2009
Location: Amsterdam, Netherlands

Introduction

On the premises of Eurotank Terminal Amsterdam a number of distribution manifolds are required to load and unload oil from storage tanks to cargo vessels and vice versa. A manifold exists of number of pumps, valves, piping, measuring devices etc. to distribute the oils as required.

The manifold for the Euro Tank Terminal Amsterdam project has been established with the following SPIE-Controlec Engineering and design disciplines:
- Piping
- Mechanical
- Electrical
- Instrumentation
- Process
- Civil and Structural

Structure

The structure consists of:
- A piled concrete pit with two slabs on different elevations. Dimensions in lay-out: 13.0 x 40 m^2.
- A steel structure to support piping, valves, electrical and instrument devices, as well as access platforms.

Multi disciplined organisation

Generating documents for the design and engineering is a complex electronic exchange of data where precision (specifically location and orientation of all designed components) plays important role, and therefore all disciplines involved give their input in the 3D Autoplant XM model.

The purpose of multi disciplined and integrated 3D modelling is as follows:
- Avoid clashes during design and engineering and construction.
- Generate 2D documents/drawings out of the 3D Autoplant XM model for all disciplines.
- Excellence of quality through multi disciplined cooperation.

Applications

The following applications are involved:
- 3D Autoplant XM - used for 3D modelling by all departments.
- Scia Engineer - used by Civil and Structural department to perform structural analysis.
- Caesar II by Mechanical department to perform mechanical analysis.

Data exchange

All disciplines start with their design in the 3D Autoplant model. The Mechanical department imports relevant piping data to Caesar II application in order to start preparing piping calculations. The output of Caesar II usually consists of a large number of forces and moments usually grouped in four load cases. Manual definition of all those load values in Scia Engineer is time-consuming and may result in many mistakes due to incompatible coordinate systems (ZScia =YC2, XScia=XC2, YScia= - ZC2). To enhance the efficiency of data exchange between abovementioned applications SPIE-Asset Management has designed two lightweight software applications/interfaces. These two interfaces communicate with Scia Engineer and Caesar II.

The basic principle of both interface applications is converting a file that can be exported from one program to a file format that can be imported in the other one. Extra features are added to filter the data that is transferred, because not all data is relevant in both situations.

This way an xml file is created, which can be easily imported in Scia Engineer with already defined loads and load cases.

Scia Engineer calculates the steel and concrete structure. The structural configuration can then be imported to 3D Autoplant XM and developed into structural model with connection details, hand railings, grating, etc.

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