The former Nafta (B) terminal, one of the Belgian port of Antwerp’s major petroleum products and biofuels, was acquired in October 2009 by Mercuria Energy, one of the world’s largest independent energy trading companies. Vesta Terminal Antwerp NV became the new name of the tank terminal and offers 830 thousand cubic meters of storage capacity for petroleum products and biofuels in the Port of Antwerp with excellent accessibility to sea, road, rail and pipeline infrastructure. The terminal is equipped to load and unload a major seagoing vessel and three barges simultaneously.

Business Challenge
Vesta faced the challenge to upgrade the plant to fulfill the SEVESO safety and reporting requirements imposed by Europe. Archiving and internal distribution of documents and reports was done manually based on hardcopies. It was impossible to get important business KPI’s out of the different systems.

Technical Challenge
The tank terminal that Vesta took over was mainly equipped with relay technology and systems of different manufacturers. Pumps and valves were controlled with local start/stop switches. Several utilities like heating and water treatment were locally controlled by stand-alone systems. The loading results of trucks and railcars needed a manual daily import into the administrative Access database.

The administrative and operational processes were handled within different systems like Microsoft Word, Excel and an Access database with in-house developments. Each department created their own documents and methods to fulfill the activities and business requirements.

Vesta Terminal Antwerp decided to launch a major project called “Vesta Administrative and Process Automation System” or VAPAS.

The goal of VAPAS is to achieve at least:
• Compliancy to the latest legal requirements and regulations: customs, ADNR, Vlarem, Seveso, Atex, SIL
• Implementation of 1 process layer to supervise and control the automated equipments of the whole plant with centralization of alarms and historical trending
• Implementation of 1 centralized data and document management system which needs to be able to be linked to SAP finance and accounting (future)
• Optimization of existing business processes controlled by a centralized system for the product movements (nomination), the loading/unloading and the order administration.
• Increase overall efficiency and terminal performance
Solution
The VAPAS project is split into 3 distinct parts and implementation will be done in 4 phases, spread over 4 years:
• Administrative Automation System
• Process Automation System
• Electrical and Instrumentation

For the Administrative Automation System, Vesta has chosen to work with Brainum.

For the Process Automation System and the Electrical and Instrumentation implementation, Vesta has chosen to work with TopTech Systems NV as main contractor because of its huge experience in the sector.

The solution consists of one large S7-400 safety PLC with ET 200iSP stations with failsafe distributed IO, linked to a redundant WinCC server/client configuration as process automation system to control and monitor the whole plant. WinCC’s integrated OPC Server is used to exchange data with the Brainum management system.

Vesta has chosen Toptech Systems and Siemens because of the following factors:
• Experience in Factory & Process Safety since 1980 with S5-110F
• Integrated diagnostics in WinCC and STEP7
• One bus system for standard en safety-related signals
• Cheaper and easier to implement, maintain and expand
• References (Vopak, Leftbank Terminal Antwerp, Oilanking)
• Product support and training on safety directives.

### TIA Product Inventory

<table>
<thead>
<tr>
<th>Product</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC Controllers</td>
<td>1 x SIMATIC S7-416F-3 PN/DP</td>
</tr>
<tr>
<td>Decentralized IO</td>
<td>11 x ET 200iSP stations with failsafe IO</td>
</tr>
<tr>
<td></td>
<td>5 x ET 200iSP with IO (no failsafe)</td>
</tr>
<tr>
<td>Industrial Network</td>
<td>Profibus DP (distr.I/O......)</td>
</tr>
<tr>
<td></td>
<td>Optical Link Modules for fiber optic</td>
</tr>
<tr>
<td>HMI software</td>
<td>2 x WinCC V7 8K RT servers</td>
</tr>
<tr>
<td></td>
<td>Redundancy option</td>
</tr>
<tr>
<td></td>
<td>2 x WinCC Clients</td>
</tr>
</tbody>
</table>

### Results at a glance

• Fulfill Seveso requirements
• Increased efficiency, performance, flexibility & safety
• Full traceability of all load operations
• Automation concept with best in class flexibility
• Easily expandable system
• TIA advantages: 1 engineering system for Scada and PLC with easily integrated Safety

### Sales Order

Branch: Chemicals
Application typical: Tank farms
End-Customer: Vesta Tank Terminal Antwerp NV
General Contractor & System Integration: TopTech Systems NV

### Project Roll-out

Kick-off: Q4.2010
Engineering phase: Q1.2011 – Q2 2011 (Phase1)
Go Live: Q4.2011 (Phase 1)
In planning

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Sales Order Report

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