Web based
Plant Information System
Refinery
Agenda

• Managing information
  How can the Plant Information System help?

• Tools
  What is the basis of the system?

• Plant Information System
  Which functionalities are integrated?
**Chronicle: refinery site in Gelsenkirchen-Scholven**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
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<tbody>
<tr>
<td>1935</td>
<td>Foundation of Hydrogenation Plant Scholven (fuel synthesis) by Hibernia Bergwerks AG</td>
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<td>1938</td>
<td>Conversion of production (aviation gasoline), output: 180,000 t p.a.</td>
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<td>1943</td>
<td>Production output rises to 220,000 t p.a., Workforce: 5,900 employees</td>
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<td>1939-1945</td>
<td>2nd World War: Destruction of the plant. Post-war reconstruction, plant extension: broad munition clearance</td>
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<td>1951</td>
<td>Restart of production: Scholven Chemie AG</td>
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<td>1952</td>
<td>Conversion of production (from coal to oil)</td>
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<tr>
<td>1959</td>
<td>Start of polyethylene production</td>
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<tr>
<td>1963</td>
<td>Start of olefin production</td>
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<tr>
<td>1969</td>
<td>Scholven Chemie AG changes into Veba Chemie AG</td>
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<td>1979</td>
<td>Renaming in Veba Oel AG</td>
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<td>1983</td>
<td>Plant Scholven becomes a part of Ruhr Oel GmbH (joint venture Veba Oel and Petroleos de Venezuela S.A.)</td>
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<td>2002</td>
<td>Deutsche BP AG assumes shares from Veba Oel and E.ON AG. Workforce refinery sites Scholven and Gelsenkirchen-Horst: 2,400</td>
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</tbody>
</table>
Problem: prevent diffusion of information

Chronicle

- Industrial production for over 70 years
- Extensive building activities
- Intraplant reorganisations
- Outsourcing
- Sellings and absorptions

Information – if available – mostly analog or CAD Data. Responsibility of different departments causes decentralised storage of information.

Diffusion of knowledge (existence, description, location of objects)

Expensive (re-)capture of information

Interface problems

Added coordination actions
Requirements  Information availability, information flow

Examples

• Increase in productivity
• Internal information needs
• Compliance of safety regulations and standards
• Licensing requirements and orders (e.g. environmental protection)
• Social Responsibility
• Emission Management and Trading
• Environmental remediation, site redevelopment (e.g. contaminates, manholes)
Problem solving *Plant Information System*

User, Demands (selection)
- Construction division, maintenance and planning
- Monitoring, Production site analysis
- Networks, facilities
- Stocks, logistics, supply and disposal
- Industrial safety, plant security, fire brigade
- Marketing, PR ("responsible care")

Needs (selection)
- Net analysis, cost analysis, reporting
- 3-D visualisation
- Fast and easy handling
- Network access
- User-specific views

Networks
Munition Clearance
Land use
Borders
Reality
• Managing information
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Centralised data storage  

Server architecture

GIS Server

- Roles and rights management
- GEO-Database
- Tasks
- Data
- ArcSDE SQL-Server

Web server
- Web application
- Web service

RSA Server

Competent department
- Desktop
- Desktop
- Geo-Browser
- Browser

Firewall

Web

Competent department
- Desktop
- Desktop
- Geo-Browser
- Browser

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Basis  GIS-Products established by ESRI Inc.
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Data Geodatabase layers

Examples

- Buildings
- Climbing systems
- Roofs
- Tank and repository register
- Interstice register
- Pipe bridge register
- Supply and disposal network systems
- Pipelines (products)
- Cable ducts
- Grids (energy, IT)
- Transport network (e.g. streets, railways)
- Orthophoto
- 3-D model
Tasks *Imaging, analysis, management*

**Examples**
- Facility Management
- Munition clearance
- Reconstruction of development
- Hazard Study
- Managing licensing requirements and orders
- Container and stock management
- Safety Management
- Environmental Management
Functionalities  *Plant Information System: central platform*

- Planning (including conflict management)
- Building analysis (e.g. reconstruction costs)
- automatic reporting
- automatic map creation
- Storage area management
- Net analysis
- Routing
- complex 3-D tasks
- Concept of roles and rights

- Link-up to SAP
- Link-up to Facility Management
- Link-up to process control

- Connection of other users:
  - Plant security
  - Plant fire brigade
  - …
Web application *working without borders*

- Web user interface or Desktop-Client
- Selectable Topics (Layer)
- Standardised display
- User profile based data and functionalities
- Output display usable without GIS experience
- Web-Editing
- Hosting
- Administration via Desktop-Products
Conclusion: Benefits and reduction of costs

Benefits
- Increase effectiveness
  - Precise location
  - Identification of defects
  - Routing (action forces)
- Optimised workflow
  - Improved controlling (ERP-integration)
  - Avoidance of double capture and assignment
- Prompt information allocation
- Simulation basis
- Completion of licensing requirements and orders

Plant Information System

Integration
- ERP
- FM
- ELS
- GIS
- Process control engineering
- SCM

User Interface
- Functionalities
- Data

Application module

Holistic approach

Reduction of costs
- Effective planning and optimised usage of resources
- Repair management
- Coordination of sanctions
- Optimised data sharing and data availability
- Centralised data storage
- User specific data supply
- Centrally managed administration
- System administration
- Database administration
Thank you...

Petroleum User Group 2008!