GIS, supporting efficient asset management on industrial plants

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Challenges
Industrial Asset Management
Challenges

- Strategic
- Tactical
- Operational

Keep Track on Changes, Retaining Control
Challenges

Plan – Do – Check - Act -

Level in the organization

Strategic

Tactic

Operational

Your Organization
Challenges

Keep Track on Changes
Multiple Independent Construction Activities

Comply with law and regulations
Increasing Demands Regarding Burden of Proof

Aging Workforce
Retirement: 50% in 10 Years, Loss of Expertise

Aging Infrastructure & Installations
Purposive Maintenance

Information Management
Secure, Accurate, Timely Sharing information

Last but not least:
Being cost effective
Challenges

Information Management
What is where and how?

GIS is complementary to CAD
- **CAD** shows the ‘technical what’ in detail
- **GIS** adds where and how everything is spatially related, including the functional spatial analytics & calculations
Challenges

Information Management

Integration

GIS allows the integration with other business systems, enabling site managers to analyze and make timely decisions.
Challenges

Information Management
Disparate Data:
- Analogue paper based maps
- Database / excel storage of administrative data
- File based CAD Drawings)
Challenges

Information Management
Decentralized Storage
This all leads to:

- Un-Secure Access to Information
- Discrepancy between Map and Reality
- Related information in multiple systems with different “owners”
- Synchronization of Information
Who are we?
And this is what we offer...
Castor, GIS Based Asset Management
Powered by GEONIS / ArcGIS
Assets touch our daily lives
Asset Management
Finding optimal balance

Risk based asset management, based on ISO 55000

Needs the right information,
- on the right time
- In the right place
- In the right scale
- On the right device
It’s all about location

We live and act in an information driven society

Computers, phones and tablets gives us access to any information, anywhere and at anytime

Over 70 percent of this information is location based
The coordinate of an asset represents
– Position
– Size
– Spatial impact
– Interspatial relationships with other assets

Adding the spatial component:
– Opens your world
– Adds value
– Makes you more efficient

...and the same goes for our assets
A geo-based approach for Asset Management
The Essence
A geo-based approach for Asset Management

What is means

Location is known

Interspatial relationship between assets is known

Spatial calculations ready to use

Combination of data sources, maps and web services

Visualization and mapping
A geo-based approach for Asset Management

The difference

Geo Database

Rods
Wires
Green
Pipes

Not: projection
Risk based Asset Management
the geographical way
Sustainability through Configuration

Castor “sits” on ArcGIS and GEONIS.

Castor was configured, using the standard components from GEONIS and ArcGIS.
Geographical Based Asset Management
One among other GIS supported processes at industrial plants

GEONIS Network Solutions
- GEONIS District Heating
- GEONIS Sewer
- GEONIS Gas
- GEONIS Electro
- GEONIS Water
- GEONIS Material Supply
  - Custom

GEONIS Facility Solutions
- Pipe bridges
- Technical Facilities / Installations indoor/outdoor
- Tank Farm Management
- Chimneys
- Boundary Fencing
- Individual Objects
  - Custom

GEONIS Area Solutions
- Green Areas
- Security Management, Risk Areas, Security Zones
- Parcel Management, Real Estate
- Location and Construction Areas
- Contaminated soils, Soil Management
  - Custom

GEONIS Logistics Solutions
- Rail
- Roads, Parking
- Street Network Manager
  - Custom

Process
- Turnaround
- Workforce Management
- Castor Asset Management
- Construction Planning
- Risk Management

Service Packages
- Consulting
- Configuration
- Customization Support

GEONIS / ArcGIS Core Solutions Technology
Database
One solution, many options

- Castor Desktop Applications
- Castor Web Applications
- Castor Runtime Applications
- ArcGIS for Desktop
- ArcGIS Runtime
- ArcGIS for Server
- GEONIS Solution Framework
- Solution Castor

Platforms:
- Workstation/Laptop
- Server
- Toughbook/Tablet
- Smartphone

Data

GEONIS Configuration

ArcGIS Online
Sustainability through Configuration
And this is how it works

GEONIS Solution Framework
Esri Technology Platform

Electricity by Geocom
Sewer by Geocom
Oil and Gas by Geocom
Water by Geocom
Industrial Plants by Geocom
Solution XY by Partner
Solution XZ by Partner

Geocom Developer Network
XML Configuration Shell
Sustainability through Configuration

And this is how it works
Sustainability through Configuration
And this is how it works

Sustainable GEONIS Overloading Mechanism
And this is what we cover...

3 User Cases examples
Site Construction / Maintenance
Incident Management
Site Navigation
Site Construction / Maintenance

Example Chemelot (NL)

195 km sewerage
80 km roads & 20 parking lots
200 hectare landscaping on site
500 hectare landscaping off site
3 contractor shed parks
16 bridges and structures
40 km column racks
1 harbor
80 km rail
Site Construction / Maintenance

Spatial Search Query
We need to build a new Installation. How does this fit to the excising infrastructure?
Site Construction / Maintenance

Scalable, Configurable

Custom form per asset

Linking objects and information

Including the datamodel

Controlled update conditions
Is there a free space on pipe bridges?

Including safety & connectivity information

Site Construction / Maintenance
How are the relations?

Site Construction / Maintenance

- Networks
- Munition Clearance
- Land use
- Borders
- Reality
Environmental issues (subsurface)?
Site Construction / Maintenance

GIS helps to understand the physical relation of the surroundings

GIS brings specialized information to everyone
Incident Management Process

- Alerting
- Location Identify
- Resolve
- Effects
- Classification
- Mission Scheduling
Fast acting is key!

It’s a location based problem
Castor is a location intelligence application
Castor is a location intelligence application

Where is the problem?

Leakage... Gas escapes. What kind of Gas? Steam? Chloride?

What is connected? What is affected?

Which valves need to be closed?

Can we re-route the production?
Resolve

- Improve coordination of activities
- Timely and accurate decision making
- Fast resolving
Site Navigation
Common situation on industrial plants

- A large portion of the plant traffic consists of the delivery vehicles of different carriers
- Large, complex infrastructures
- (Temporary) restrictions
- High traffic
- Often confusing / unfamiliar infrastructure
- Deliveries to spec. timeslots
- Access via gates
- Delivery to loading points
- No local knowledge of the drivers
Actors Involved in Plant Navigation

Different stakeholders are involved in the processes and procedures of the plant navigation.
GIS-based Navigation

Routing is based on your own road network with specific rules

- Roadway Arrangement
- Barriers
- Live Traffic Situation
- Specific Driving Instructions
GIS-based Navigation
What we support

- Add the plant infrastructure to e.g. Navteq Data
- Support the delivery traffic with navigation
- Safe bypass of restrictions and obstacles
- Smooth delivery traffic
- Traffic control and monitoring
- Avoid traffic backlog on factory premises and parking areas
- Increase the utilization of the loading points
- Risk reduction by minimizing the time on the site
References
References

...and many more
Summarizing
Solution

GIS Based Asset Management

GIS Based Asset Management With Castor

GEONIS for Industrial Plant Management
powered by ArcGIS

Spatial Information
• Network Intelligence
• Asset Reporting
• Validation / Consistency
• Network Analyses
• Visualization in global spatial context

Maintenance Operations
• Work Order Management
• Resource planning
• Financial Controlling

Bring together what belong together
Solution

GIS based Asset Management enables Site Managers:

• To improve coordination of activities
• Making timely and accurate decisions
• Stream Line maintenance activities – set the right focus
• Keep the information systems in sync with each other and with reality
• Make the data available throughout the Esri Technology Platform

See the Big Picture
Lower the Cost of Ownership
Thank you for attending!