Seamless Integration of MIKE URBAN with a professional web and desktop-based sewage and water utilities application

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ABSTRACT

The integration of hydraulic models and professional GIS applications for utilities becomes increasingly important. GEONIS expert is a GIS framework for the desktop, server and web platforms, allowing the development of professional applications, among others, for sewage, water and gas management. Based on the widely used ArcGIS platform, MIKE URBAN was integrated with GEONIS expert sewage.

Pipe, damage and hydraulic data are initially created in the GIS environment using GEONIS expert sewage, either through the desktop or web interface. Additionally, as an example for an alternative workflow, data can be imported from standardized formats such as the German Isybau XML format. Data used for hydraulic calculations is exchanged to MIKE URBAN using a special interface within the standard Import/Export functionality of MIKE URBAN. The results of the hydraulic calculations are then stored as statistics in the MIKE URBAN database, from where they are then written back to the GEONIS expert sewage application. The results can now be visualized and used for additional analyses and processing (damage with integrated video, asset management, profiles, etc.). In addition, due to the integration of the desktop and web interface in GEONIS, reports, hydraulic maps, easy search interfaces, etc. are available automatically for the public not only on the desktop, but also through a web interface. The integration of these two products has become a standard for users of both the MIKE URBAN and the GEONIS platform.

INTEGRATION

The creation, inspection, management and redevelopment of urban infrastructure networks necessitates the need for effective data management and optimized information management. Data is further processed for hydraulic modelling in urban water and wastewater networks, in which adjustments and presentation of hydraulic structures can be carried out. Hydraulic calculation results are fed back into the network information system and used for additional analyses such as redevelopment planning.

A solution for a holistic management system for the municipal wastewater treatment sector is provided by integrating subject-specific network information and hydraulic calculation models with separate data management. With the integration of MIKE URBAN CS MOUSE (for modeling waste water systems and GEONIS Sewage (as the network information system for sewage), two expert systems are
brought together into a single software solution.

Figure 1: Conceptual view of the MikeUrban GEONIS Sewage integration

Since both systems use the ArcGIS Platform as their core technology, they can be easily integrated. Data entry for pipelines, damage data and the important hydraulic data occurs in GEONIS Sewage and can be done manually or by importing standardized formats such as ISYBAU XML or Interlis.

Figure 2: GEONIS expert Sewage user interface

Data used for hydraulic calculations is imported to MIKE URBAN using a special interface within the standard Import/Export functionality of MIKE URBAN. The results of the hydraulic calculations are then stored as statistics in the MIKE URBAN database, from where they can be rewritten back to the GEONIS application for further analyses.
CONCLUSION

Through the integration of GEONIS Sewage and MIKE URBAN and their shared basic technology, an efficient and holistic solution is being offered. On the one hand, an important expert component is covered with a specific expert application for hydraulic calculations. On the other hand, GEONIS Sewage offers a central platform for urban drainage and wastewater treatment systems by combining the inspection of network information data, video analysis and assessments. The combination of structural and hydraulic condition assessments, based on network information data, forms the ideal foundation for developing a holistic analysis and redevelopment plan for wastewater treatment systems.