Viken District Heating

District Heating

Norway

Viken Fjernvarme (VF) owns and runs the largest district heating facility in Norway with a yearly production of 1000 GWh. VF expects a considerable growth rate in the supply of district heating in the near future. They were therefore searching for a reliable and efficient tool, which could easily transform their GIS registrations to usable hydraulic calculation models of the network. It is no big surprise that VF chose to use Model Manager and TERMIS from 7-Technologies for building network models and for simulating hydraulics respectively.
VF's overall goal was to find a network calculation solution capable of utilizing their GIS information. They needed to be able to build new hydraulic models of the network on the basis of existing data in their GIS application from Smallworld. Yet another requirement was to be able to maintain and update VF models via GIS. The solution was to create an export file of GIS data in Smallworld. This file is imported by Model Manager, which then automatically builds a hydraulic model of the entire network. The model is then transferred to TERMIS for further processing and simulation.

GIS application

The GIS application used by VF is produced by Smallworld Systems, Norway. This district heating application has been developed specifically for Scandinavian district heating clients and is based upon the so-called Smallworld Core Spatial Technology.

The application consists of a standard Smallworld Core Spatial Technology module containing the basic functionality, topological relational database, effective user access versioning and user adapted data access (called ACE) object control.

Once designed and customized for the individual plant, this application enables operators to collect information and to monitor and analyze individual network elements or the whole district heating network.

Model Manager & TERMIS

Shape files are generated in Smallworld and imported into Model Manager, in which association of attributes occurs, for example pipes and consumers. The result of the import of VF's Shape file data into Model Manager is shown in the figures below.

CUSTOMER CASE

Subsequently, Model Manager builds a hydraulic model from this GIS information. Model Manager analyzes all the information and transforms the data into a TERMIS model – all accomplished in an automatic calculation process.

When building the model, Model Manager performs numerous consistency checks on the GIS data. This makes it a very useful tool for quality control of GIS data.

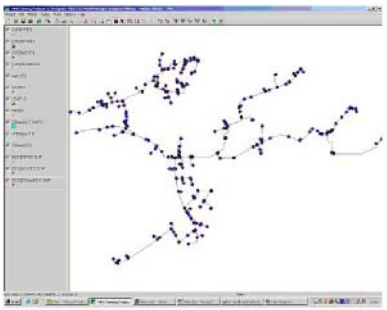
Furthermore, Model Manager is capable of defining the level of detail in models. Thus, it is possible to build a general strategic model of the entire supply area with a few hundred pipes and nodes, which may be supplemented with very detailed models for the individual zones in the network. All quickly and easily done in Model Manager.

The last step is transferring all the data to TERMIS. Now hydraulic calculations can be performed in order to test alternative operational strategies and to undertake design and planning for extensions to the existing district heating network. The result of the Viken model in TERMIS is displayed in the last illustration.

Viken Fjernvarme

"It was very important for us to choose a software package enabling us to make use of all our GIS registrations and give us the opportunity to integrate our SCADA, GIS and billing systems with online network calculations."

Ronald Eivind Thauland
IT Manager, Viken Fjernvarme A/S



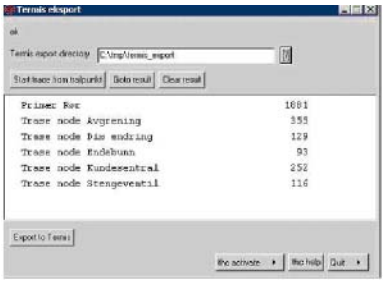
The ***Viken*** model in Model Manager

The TERMIS model is always ready to use

- Saves time
- No manual collection or network adjustment
- All necessary information is present in the model
- Speedy and accurate calculations

A common user interface bridging

- Operation
- Planning
- Maintenance
- Based on Smallworld GIS



Fully integrated system with direct links between GIS, process, SCADA and network calculation. Everytime GIS data is updated, previous network calculations are recalculated to always ensure data consistency throughout the system.