hydraulic analysis group

Hydraulic Analysis Group

Global leaders of pressure transient analysis, network management systems and digital twins

Company Background

We are the leading global experts for the provision of pipeline digital twins, tailored hydraulic real-time leak detection modelling solutions, surge analysis and specialised on-site diagnostics.

With over 50 years of experience and over 10,000 pipeline studies completed in over 50 countries, we are trusted by the world's major **Water, Energy, Oil, Gas and Petrochemical** companies to understand complex pipeline operational issues and deliver meaningful solutions.

Driven by our purpose to collect, analyse and provide factual data and analysis of our client's valued pipeline assets, we ensure that critical decisions can be made with confidence.

As an independent consultancy and software supplier, we can offer our clients unbiased advice on all aspects of pipeline hydraulic operation, pressure transients and equipment selection.

Sectors and Services

Technology

VariSim, developed within the group by **Simulation Software**, is integral to group solutions. The plug-in applications provide the ultimate support for the **Engineering, Operational and Training** environments that are integral components to the businesses of all pipeline owners.

As a desktop product it supports the **Design, Planning and Analysis** of hydraulic and control system behaviour for safety, efficiency, and damage avoidance.

Our application has proven ability to operate in a real time and a desktop environment. It can provide a pipeline operator with exceptional tools that can substantially improve safety, operational flexibility, and profitability all whilst ensuring compliance with environmental requirements.

Bespoke solutions are available for the modelling and optimisation of pipelines and pipe networks at the design stage, in addition we also investigate operating problems and proposed changes in operating philosophy on existing systems to verify existing pipeline and control system design.

Advantages of VariSim when compared to other commercially available products is the use of a continually varying pipeline wave speed together with the ability to model complex control systems. When combined with our ability to model accurate temperature variations along the system, this results in accurate computer simulation of pipelines.

Design, Plan, Troubleshoot, Optimise

Simulator models are created with **VariBuild** using the inbuilt user interface with graphical drag, and drop functionality and/or the model build wizard that imports models from third party packages and databases, such as EPANET or GIS shape files.

Care has been taken to ensure that VariSim's output is easily accessible and easy to understand using industry familiar terminology. This capability and its unique ability to model variable wavepeed and variable time steps make this product extremely competitive within in its market and we are sure that you will find VariSim commands a challenging position in industry.

We can display all VariSim output in a GIS format against any background shape files, such as street layout.

Starting conditions can be based on design data, field observed data or logger data depending on the objective of the study which can include:

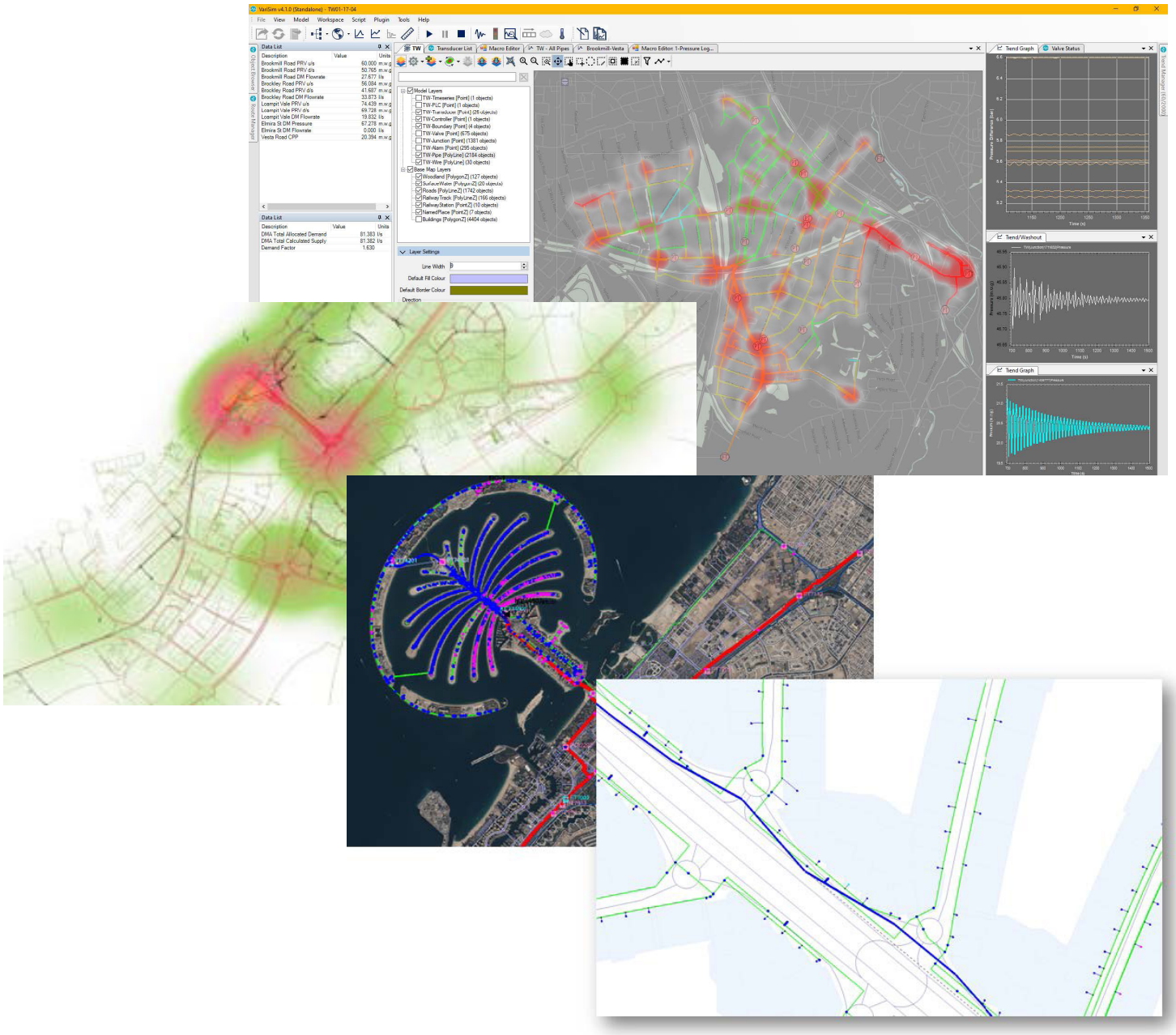
- Distribution of water to identify source, quality, age and any other component, such as chlorine
- Dynamic hydraulic reaction to equipment operation, control schemes and supply / consumer changes

Water Industry

Hydraulic Analysis can offer a wide variety of services to the water industry, ranging from a simple, low-cost appraisals and surge analysis to detailed hydraulic design and optimisation studies.

Systems analysed range from raw / potable water pipelines and sewage pumping mains to water distribution networks, sea outfalls and sludge and slurry systems.

We can also study the effects of air in pipelines, air valve operation and priming of drained sections, and our free surface (open channel) flow capabilities have allowed us to work on projects as diverse as water and sewage treatment plants, theme park water rides and lazy river rides.



Site Services

Whilst most investigations can be undertaken as theoretical desk studies, another aspect of **Hydraulic Analysis** capabilities is on-site pressure and flow testing as well as troubleshooting expertise.

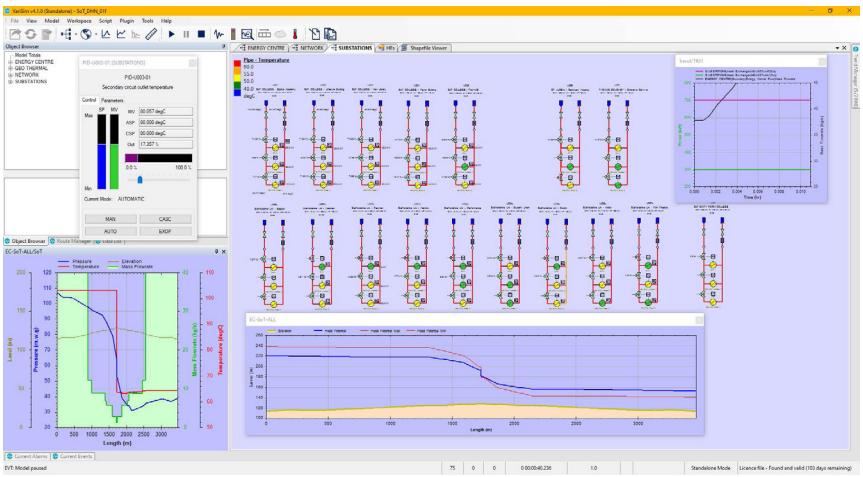
Site visits by our experienced engineers and dedicated site testing team can be used to determine steady state and transient operating conditions in conjunction with observing a system's operation and identifying existing or potential problems. Pressure and flow instrumentation can be installed at multiple locations on the system and the recorded output provides system understanding to immediately identify operational issues. We can identify any bottlenecks in existing facilities and can determine the current performance levels of existing pumps and pipelines (internal roughness coefficients).

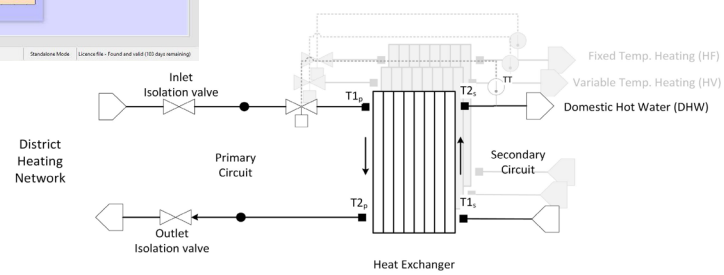
This is particularly beneficial to clients for the commissioning of systems and for mathematical model validation and verification.

District Heating

Experience in the delivery of district heating systems modelling, we are on hand to support district heating schemes to:

- Optimise the piping design
- Confirm pump selection
- Calculate the range of system pressure and temperature losses
- Determine the maximum surge pressures and pipe loads
- Provide hydraulic and temperature grade lines for operating conditions (winter, summer and mid-point demands)



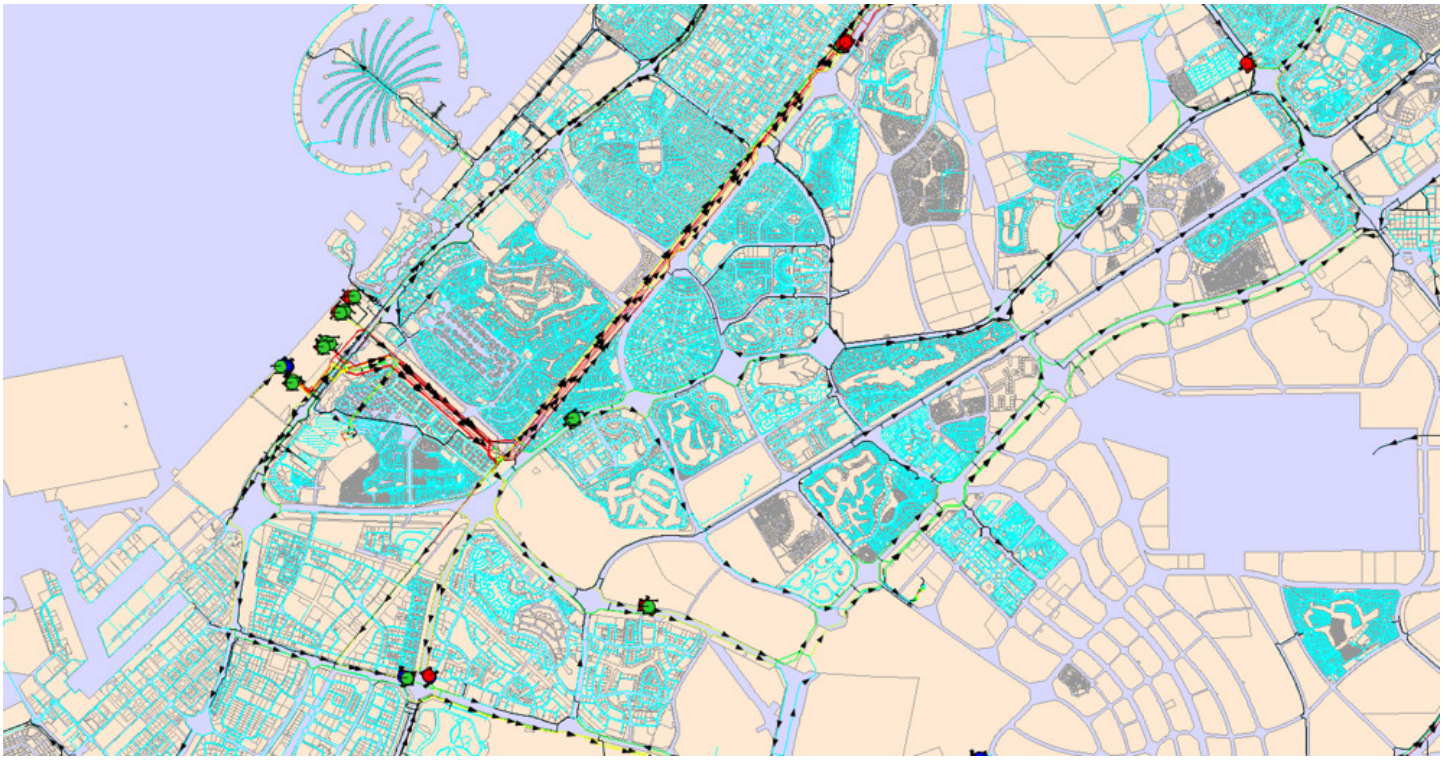


Digital Twins

By driving our VariSim™ pipeline hydraulic simulators (digital twins) with pressure and flow data from SCADA systems and GPRS loggers, water companies are realising the operational benefits that are gained by utilizing our 50 years of experience, with around 50 installed systems to date. We are seeing a huge increase in the supply and installation of our digital twins all over the world. The majority of our clients are SCADA suppliers who need to install a robust and reliable digital twin that is not prone to failure. They understand that the twin must be able to model pressure transients so it will match the real system at all times.

Dubai Water Supply Network

Our gold standard real-time simulator is installed in the Dubai Water Control Centre and includes the complete water distribution network of Dubai. It is driven by hundreds of pressure and flow sensors across the city which update every 4 seconds to give a highly accurate picture of the live operation of the network in the SCADA control room. It is quite simply the most advanced real-time water network simulator in the world. Our hydraulic simulator shows the pressure, flow, valve position and control system status at every point in the water supply network throughout Dubai. The DEWA Hydraulic Management System (HMS) includes all control systems and is used for many different functions, including water balancing, event replay and training. The data flow from the pipelines, reservoirs and treatment plants into the control centre is truly impressive. Around one million data points are processed by our VariSim™ hydraulic simulator every minute and this does not include any high-speed pressure transient data.



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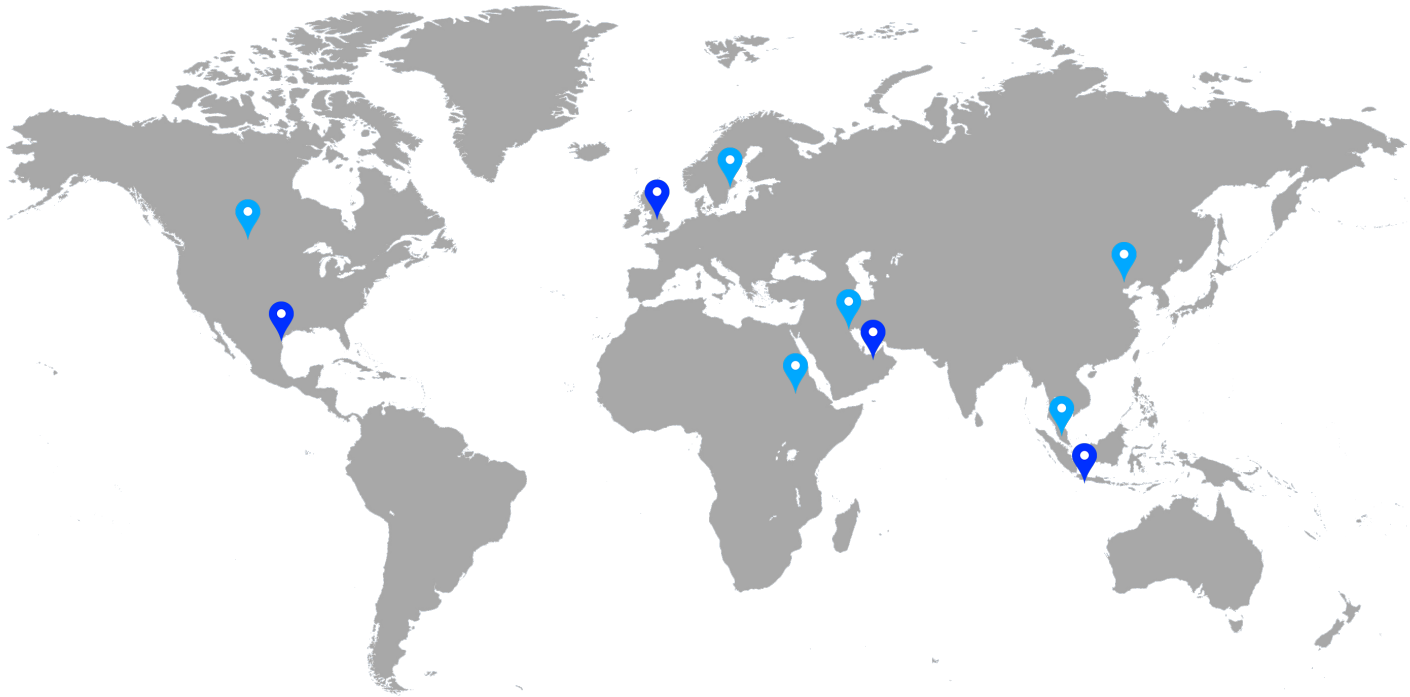

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