

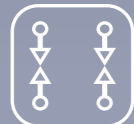
varisim

pipeline simulation



know your network

VariSim simulates the transient hydraulic behaviour of pipelines within the water, gas, oil, heat and power industries. Our software's vast potential is revealed through the ability to operate in a real time and a desktop environment. It can provide a pipeline operator with unprecedented tools that can substantially improve safety, operational flexibility and profitability all whilst ensuring compliance with environmental requirements.



simulation

Robust, accurate, proven real-time transient simulator with variable wave-speed and sophisticated air valve and control scheme modelling.



network modelling

Our network modelling capabilities include simulator construction direct from GIS data, AI based forecasting and demand allocation with optimal zoning. Track water sources and water age in real time throughout the network.



leak detection

VariSim allows you to protect high risk assets and reduce response time by pinpointing pipeline anomalies using our advanced detection techniques. This can reduce failures in your network and prevent future leakages.



optimisation

Optimise pump operation to minimise energy usage and the network's carbon footprint. Lower cost, improve delivery routes, maximise storage capacity and ensure security of supply.



network repair management

Detect background leakage, bursts and anomalies, forecast hydraulic behaviour, trace the source of detrimental operations then use the platform to raise points of interest and manage the remedial works and repairs.



engineer support

The Hydraulic Analysis Group is a unique family of companies with a wealth of pipeline hydraulic experience who are able to offer comprehensive support to the users of VariSim.

consolidate your data

Based in the UK and now an industry standard worldwide, VariSim has been developed over 5 decades. It supports the largest global deployment of digital twins in the water industry, and has been used for over 10,000 pipeline studies completed in over 50 countries. We're driven to collect, analyse and provide highly accurate data analysis for your pipeline assets, to ensure critical decisions can be made with confidence.



Business statistics



Fixed asset data



Live hydraulic behaviour



Asset & supplier data

Automatic data acquisition

Enhanced data quality

Fast simulated outputs



All data gathered and presented efficiently to operators

Consolidate all network management data into one application that includes fixed asset data, business related information and live hydraulic behaviour. The data hub gathers and historises measurement data and compares it to the simulated output. Any discrepancies are raised as points of interest which can be managed on the platform or fed directly into your asset management system.

VariSim is unique in providing full live hydraulic information anywhere in your network, calculated by its fully transient engine. The information is brought directly to your desktop browser in a convenient geographical format alongside any other relevant asset information of your choice.

varisim at work:

water industry

monitoring & optimisation

VariSim provides robust, accurate real-time transient network modelling that has proven itself time and again the world over.

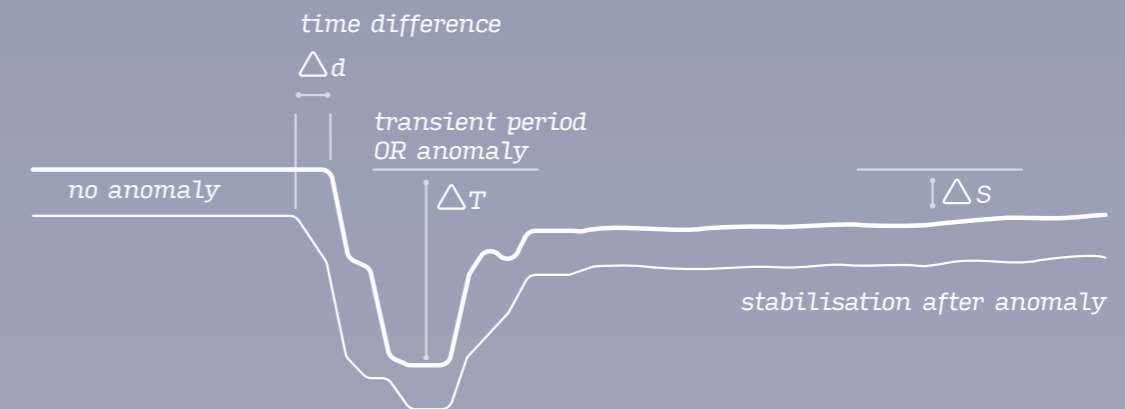
Use machine learning to forecast demand from historical data, weather, holidays and future unknown events and link them to the network model to estimate the future hydraulic behaviour, network inventories and tank levels.

Network optimisation is a key requirement for today's networks. VariSim can optimise your network using its pump optimiser to minimise energy usage and maximise performance. Since the real time system is fully aware of current tank levels and equipment statuses, the optimiser can quickly determine more optimal pumping configurations in real time whilst ensuring security of supply. When coupled with forecasted demands, this capability can extend to optimise future energy requirements.

leak prevention

The best way to minimise leakage on water networks is to prevent them occurring in the first place. Our solution uniquely centralises all required network information and includes GIS layout, pipeline characteristics, environmental data and hydraulic conditions calculated by VariSim.

Probability of failure (POF) and consequence of failure (COF) calculations are performed on the centralised data set. This risk-based approach for prioritising pipe rehabilitation provides a holistic view of pipe criticality. Artificial intelligence algorithms determine the regions of a network that are most susceptible to leakage. Additionally, the simulator can identify causes of surge that overstress the network and displays heat maps to clearly demonstrate the distribution of any over-pressurisation.



Dubai E&W authority - 2015:

- Real time water management
- Water balance module
- Operator training centre
- Dual redundancy
- Source tracking & quality monitoring



Yorkshire Water - 2023:

- Web based display & dashboard overview
- Real time simulation of critical DMAs
- Auto-determined points of interest
- Burst detection, acoustic analysis
- Fixed asset & measurement data, one location

Leak and Burst detection

Analysis of both measured and simulated data sets enables our unique methodologies to detect bursts, fast leaks, slow leaks and background leakage on metallic and plastic pipework.

- E-RTTM (extended real time transient modelling) is used for the simpler water transmission pipelines when supported by adequate instrumentation. It conforms to the requirements of API 1130 and can detect and locate bursts to a high degree of accuracy.
- Pattern recognition techniques quickly identify network regions that have suffered leaks and bursts. It is based on machine learning principles and uses VariSim to calculate and store the signature for every possible leak situation in advance.
- Water Balancing calculations identify leakage and non-revenue water using zonal water balancing techniques and can take account of water tank inventory.
- Background leakage is determined by trending and monitoring the minimum daily flow imbalance on a zone.
- Distributed acoustic measurements are analysed for leak signatures in the noise pattern and used for detecting and locating leaks on zones.

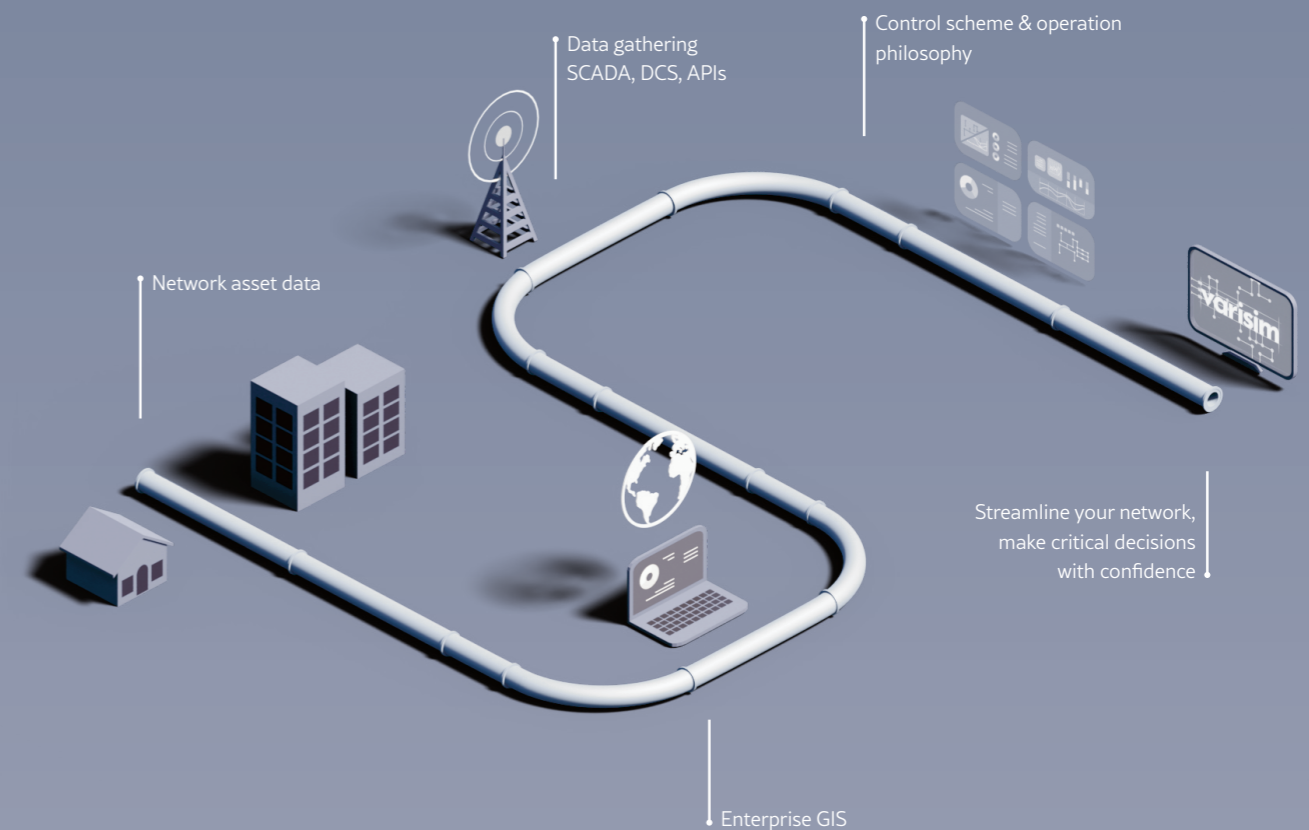
complete network monitoring & repair management

The software platform provides an unrivalled set of functions and tools in one location for complete network monitoring and the management of repairs.

A transient simulation is created, commissioned, and calibrated for entire networks or sub-networks / district metered areas. The simulations continually run in a cloud environment, fed by 'live' flow and pressure measurement from loggers and meters, user demands derived from the forecaster and status signals from equipment.

It is then used for monitoring and deriving an understanding of a networks' true behaviour. It detects leaks, bursts and anomalies, balances water distribution, tracks water source, contaminants, and additives.

It can be used for prediction and analysis of past behaviour including the ability to replay previous events, it can identify customers isolated due to valve closure and can predict areas of a network prone to bursts or performance issues.



The output is provided to the user in a clear, concise, and familiar format, with a range of monitoring and management functions.

- Web based GIS style output with Street view for easy identification of network locations.
- Dashboards for rapid evaluation of network behaviour and performance
- Heat maps that identify regions for investigation
- Polygon creation highlighting key information within it such as:
 - Number of valves open or closed.
 - No. pumps that are operational
 - Water balance in the identified region
 - Maximum and minimum pressures
 - Maximum and minimum velocities
- Raise points of interest that allow the user to register (automatically or manually) anomalies, leaks, and other items for investigation.
- Add comments and track their development from initiation to completion.
- Derive KPI's that identify POIs raised, closed, and successfully completed.

why varisim?

VariSim upholds its reputation as the most accurate, tried and tested real-time network simulator on the market. It has been in use for decades in major water companies, operates in the cloud and supplies all of your current network information to the user's web browser. Sophisticated leak detection, job tracking information, email alerts and information enrichment from external sources are all available out of the box.

Our software is continually proving itself in the real-time environment; providing a practical decision-support tool for water pipeline networks, with professional engineering support and model generation capability available from the Hydraulic Analysis Group. VariSim shows how valuable an in depth knowledge of your network can be, and can provide you with a higher level of assurance when making critical decisions, allowing you to achieve the full potential of your network.

Energy optimisation

Economical operation

Digital twin

Know your network

find out more - contact us →

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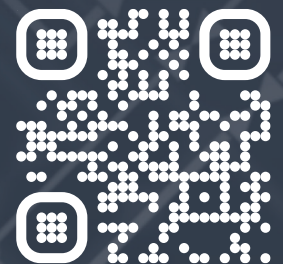
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