

Extend the power of your solution

Extend the power of your business solution with complementing products and services from GL. GL's line of software and services for water distribution companies ensures that you get the right solution for your exact business needs. GL can help optimize asset performance with a broad range of services and software products for asset management, hydraulic modeling, operations management, and related IT services. We help turn your asset data into actionable intelligence, and we can deliver that information to decision-makers across your company.

Related Services

GL can also provide services to extend our solutions to match your unique requirements. Our services group can help you with historical data loading, custom report design, systems integration, custom procedures, extended GIS functionality and integration, additional facilities and events handling, and installation and configuration to meet your exact needs.

Highly Experienced Consultants

Unanticipated events within pipelines are the major causes of severe transients in the system. GL's hydraulic consulting team provides you with access to highly experienced consultants and their problem-solving expertise in pipeline hydraulics, giving you greater insight into the system's operational capabilities and performance, resulting in time and money saved.

The GL Advantage

Industry-leading Experts Delivering World-Class Solutions

GL's comprehensive knowledge and experience in the gas industry is unmatched around the world. Not only do we supply you with software products tailored to your individual needs, but we also offer comprehensive services relating to all aspects of managing, maintaining, and investing in a delivery network.

Technical Support

When you choose GL, you're not just getting the world's best network analysis capability... you're also getting the most obsessive technical support in the industry. Our team of professional engineers is committed to deliver world-class support, training, and education to you. Rest assured that our technical support team is ready to help you get the most out of your software solutions.

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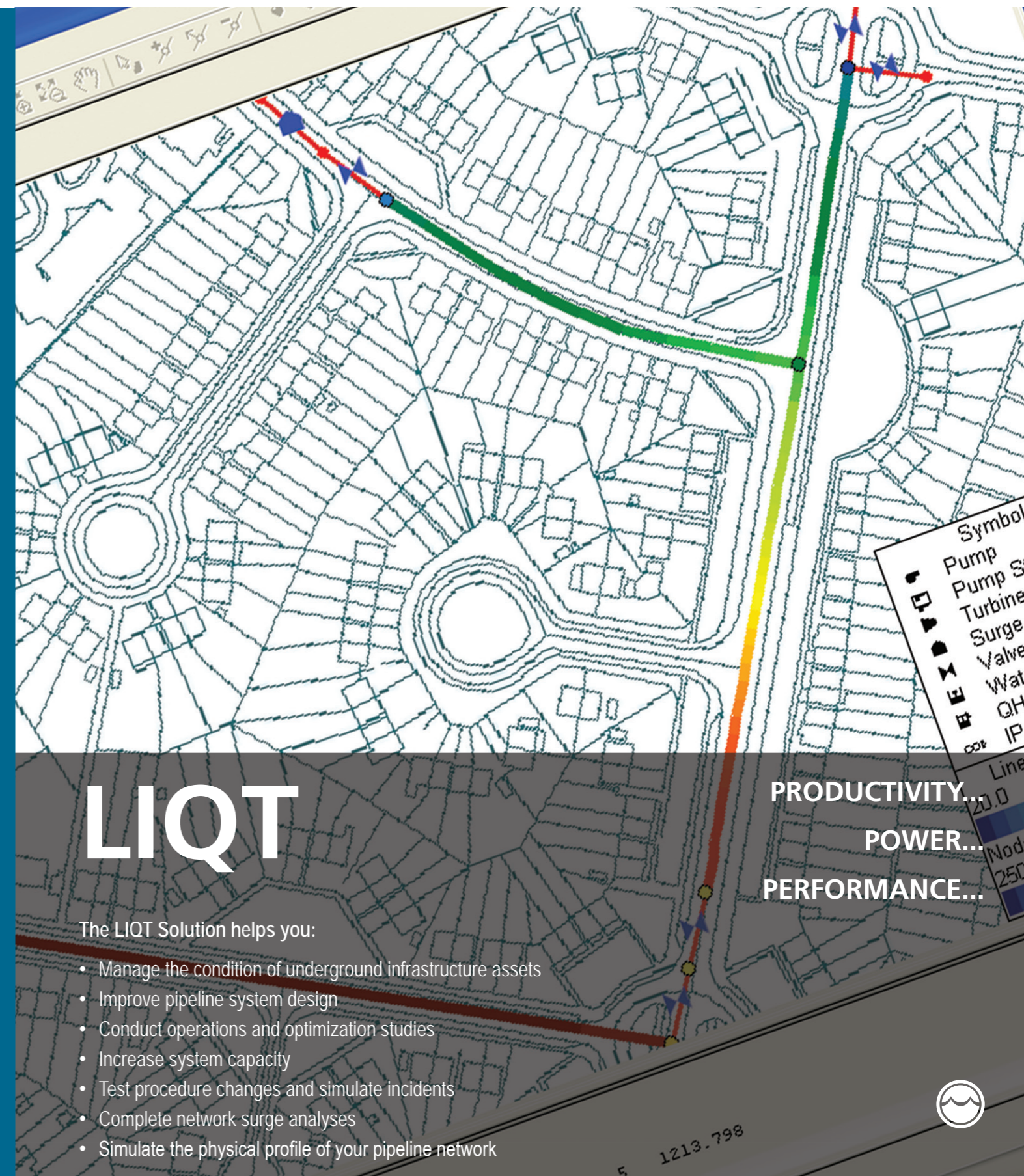
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LIQT

PRODUCTIVITY...
POWER...
PERFORMANCE...

The LIQT Solution helps you:

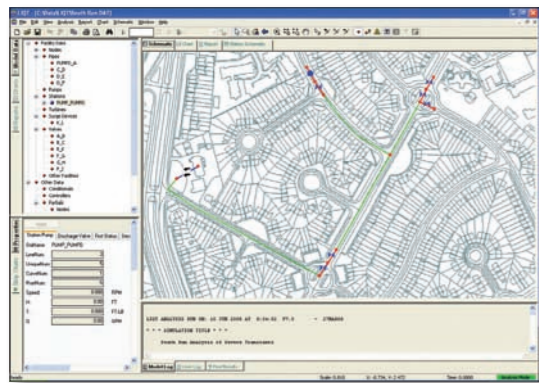
- Manage the condition of underground infrastructure assets
- Improve pipeline system design
- Conduct operations and optimization studies
- Increase system capacity
- Test procedure changes and simulate incidents
- Complete network surge analyses
- Simulate the physical profile of your pipeline network



GL offers distribution operators comprehensive software tools and consulting services to manage underground infrastructure assets. Through decades of experience in providing consulting services to water distribution utilities we are able to precisely model hydraulic transients. Our LIQT product, industry recognized for its accuracy and versatility, delivers a quick cost-effective solution to specific hydraulic problems.

LIQT is an advanced, interactive, simulation software product that can be used to perform transient analysis of closed conduit liquid piping networks of any complexity. It models liquid piping systems composed of pipelines, pumps, valves, reservoirs, accumulators, surge devices, and other typical pipeline hardware.

Analysis provided by LIQT gives the information needed to make accurate decisions concerning materials, cost, operating procedures and construction alternatives all resulting in decisions which will help insure the reliable service of the water system.

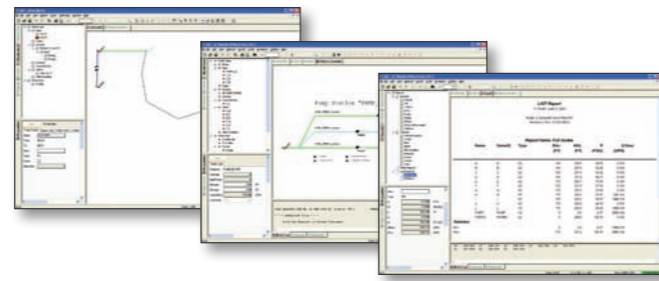


Typical applications of LIQT include:

- Analyzing normal or emergency pump start-up and shutdown procedures
- Analyzing the effect of a sudden pump power outage
- Modeling various turbine operations such as system start up or load rejection
- Modeling effects of valve operation
- Designing surge management systems
- Optimizing system dynamic controllers
- Assessing the effectiveness of pipeline hardware such as air inlet/air relief valves, accumulators, surge tanks or relief valves
- Developing realistic system pressure envelopes
- Determining probable causes of system failure during upset conditions
- Training operators by simulating real system response

Achieve pipeline flow rate under restricted pressures

Now you can create system models with a detailed pipeline elevation profile and inlet and outlet pressures, and simulate intermediate pump stations. LIQT determines an acceptable flow rate to identify the limiting factor in your system. Determining your pipeline's contractual demands and identifying your need for a larger diameter pipe or additional pumps where demands are set is now much simpler.



Maintaining MASP after pump fault

A tripped pump may push your surge beyond the maximum allowable surge pressure (MASP). LIQT can help you avoid these dangers. The software enables you to develop a detailed model to run steady state conditions including flow rate, pressure and pump speed that includes the MASP for each section of the pipeline. By simulating a tripped pump, you can accurately model the surge and associated pressure traveling through your pipeline. Detailed charts generated from the model clearly demonstrate whether or not you have exceeded your MASP.

Where MASP is exceeded, additional analysis can help you determine remedial action necessary. LIQT enables you to simulate a change in the control logic for a trip, add a surge vessel or reduce the steady state flow rate directly in your model. Significant safety and financial value can be realized by preventing pipelines from exceeding the MASP and rupturing.

Closing valves safely

Closing valves creates transient surge in your system. Faster closure times result in greater surges. LIQT simulates the shortest valve closure time possible and one that does not result in a pressure surge to exceed your pipe's MASP.

Choosing start-up control logic

Pump start-up surges need to be analyzed to check for MASP violations and cavitation. Pipelines exceeding the MASP become subject to bursting. Suction conditions resulting in cavitation can damage your pumps, significantly reducing their usable life. With LIQT you can simulate various start up control schemes (one pump at a time, valve opening times, soft starts) to determine the safest start-up procedure for your system and prevent burst incidents.

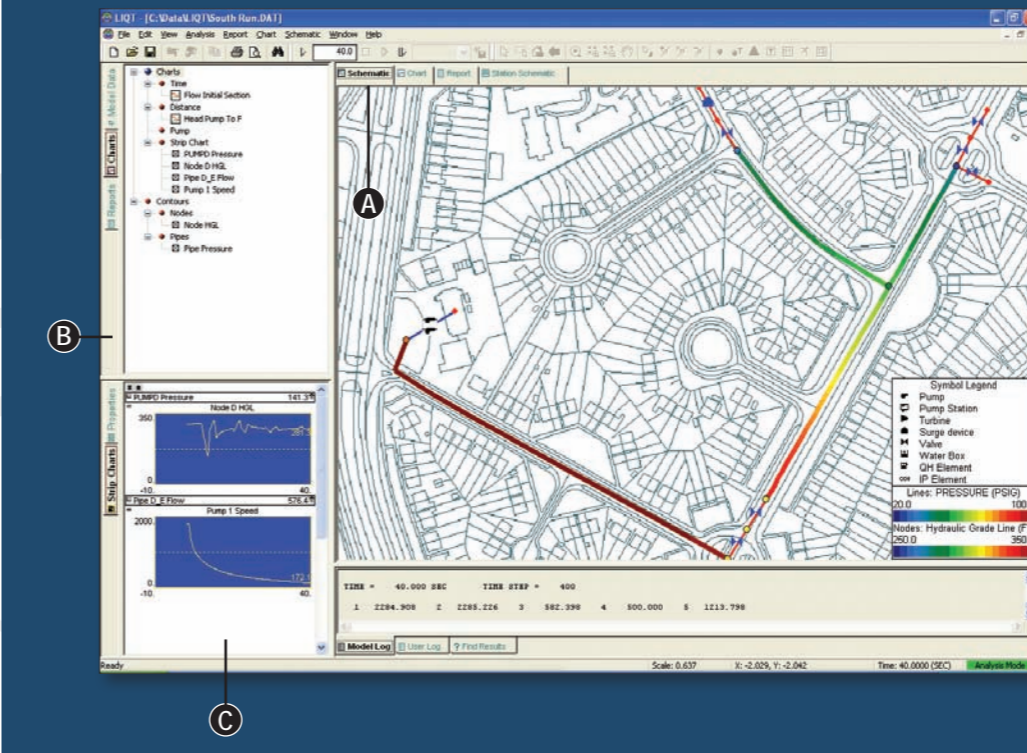
Identifying incident causes

Pipeline incidents can be catastrophic, both operationally and financially. LIQT allows you to develop transient pipeline models using actual conditions and operations to identify the root cause of failure, preventing future incidents from occurring.

Preventing pipe movement

Surges that create large velocity changes in your pipeline place significant pressure on pipe elbows. Insufficient anchoring may allow excessive movement and potential rupture. GL's LIQT can help you identify maximum transient forces and recommend a sufficient strength for your anchors. By properly securing your pipeline, the cost of repair and equipment loss is reduced or eliminated.

Productivity, Power and Performance



A The control console for your model, the schematic display provides you with a graphical model view and allows you to make direct updates to the model. Station schematic views are also available to show model detail at pump stations.

B The personal assistant to your map display, the model explorer neatly organizes your related model data (including nodes and facilities, the equipment warehouse, and system variables) into a windows expandable tree view.

C Model results can be reviewed with customizable charts and reports that are updated as the analysis progresses through modeled time. LIQT includes a customizable "dashboard" of critical time charts that allows for the concurrent display of critical model results.

Robust System Features

Interactive flexibility

The execution of the LIQT software is entirely interactive providing significant flexibility for monitoring and controlling the simulation as it progresses. With a high level of control over a simulation, an engineer experiences a realistic modeling of the transient event.

Extensive reporting capability

The reporting and graphics capabilities available in the LIQT service will provide as much or as little data as required to interpret and evaluate a transient event as it unfolds. Custom tailored reports highlighting crucial maxima/minima and summarizing the system's status during a simulation are available, as well as interactive plots of variables versus tie or distance along the pipeline.

Ongoing support

LIQT software comes with the security of a comprehensive support package to ensure you get the most out of the product. A fully developed "hands-on" training program, comprehensive documentation and personal support provide the theoretical background and practical problem-solving techniques needed to effectively use the LIQT service.

Cost-effective and time-saving

Running LIQT simulations is more cost-effective than improper or unnecessary surge protection installations and significant savings on the cost of design, materials required and construction of pipeline networks can be achieved. The detailed analysis output from simulations enables engineers and operators to make the right decisions quickly and with confidence.