WATERFALL®
Stronger Than Firewalls

SECURING DIGITAL WATER TREATMENT PLANTS

PROTECTING WATER UTILITIES FROM EVOLVING CYBER THREATS

Customer	Water and Wastewater Plant in North America
Customer Requirement	To protect the safety and reliability of water utility operations networks while preserving access to real-time data for equipment monitoring and hydraulic analysis applications on the corporate network.
Waterfall's Unidirectional Solution	Unidirectional Security Gateways protect industrial control systems, including SCADA systems, individual controllers and PLCs with an impassable physical barrier to external network threats, while enabling enterprise-wide access to real-time production data.

WATER PROCESSING MODERNIZATION AND CONTAINING REMOTE CYBER THREATS

Water utilities have embraced industrial digitization to enhance the efficiency of treatment plant operations. Critical goals such as keeping a consistent supply of raw water, eliminating contaminants, and maintaining supply of finished water, are more easily achieved when leveraging technology enabling real-time visibility into plant operations. Industrial digitization offers a multitude of benefits including preserving water chemistry, efficient storage processes, and efficient distribution methods. However, the increased digitization of water production also leads to an increase in cybersecurity vulnerabilities potentially leading to a loss of control of connected devices that regulate water quality, plant production and consumer safety.

THE CHALLENGE

To secure the safe, reliable and continuous operation of water and wastewater process control system networks from threats emanating from less trusted external networks, yet still provide real-time access to operations data for the corporate network.

Hydraulic analysis applications reside on the enterprise network as they require access to GIS information and applications describing the water system, yet must receive real-time reservoir levels, pressures and pump status indications from the operational network.

Equipment status information, 5-minute sewer billing information and other readings must also be pushed from the operational network to the enterprise network.

WATERFALL SOLUTION

A Waterfall Unidirectional Gateway installed between the industrial control system (ICS) and the enterprise network replicates an OSIsoft PI server from the ICS to the enterprise network where enterprise clients interact normally and bi-directionally with the replica. An additional connector replicates a file server for routine file transfers to the enterprise network, eliminating routine use of USB drives and other removable media.


RESULTS & BENEFITS

100% Security: The industrial network is now physically protected from threats emanating from external, less-trusted networks.

100% Visibility: The enterprise network continues to operate as if nothing has changed. Instead of accessing servers on the critical operational network, users on the external network now access real-time data from replicated servers for all informational and analytical requirements.

100% Compliance: Unidirectional Gateways facilitate compliance with AWWA standards, as well as other North American and global industrial cyber security standards and regulations.

THEORY OF OPERATION

Industrial Control System Network — Unidirectional Security Gateway — Enterprise Network — Internet
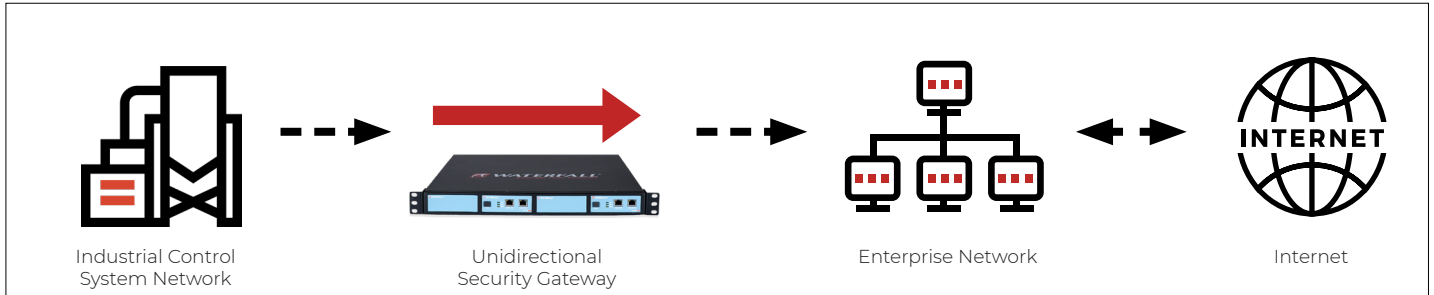
Waterfall Unidirectional Security Gateways replace firewalls in industrial network environments, **providing absolute protection to control systems and industrial control networks from attacks emanating from external less-trusted networks.** Unidirectional Gateways contain both hardware and software components. The hardware components include a TX Module, containing a fiber-optic transmitter/laser, and an RX Module, containing an optical receiver, but no laser. The gateway hardware can transmit information from an industrial network to an external network, but is physically incapable of propagating any virus, DOS attack, human error or any cyber attack at all back into the protected industrial network.

The Gateways **enable vendor monitoring, industrial cloud services, and visibility into operations** for modern enterprises and customers. Unidirectional Gateways replicate servers, emulate industrial devices and translate industrial data to cloud formats. As a result, Unidirectional Gateway technology represents a plug-and-play replacement for firewalls, without the vulnerabilities and maintenance issues that accompany firewall deployments.

UNIDIRECTIONAL SECURITY GATEWAYS BENEFITS:

» Safe, continuous monitoring of critical systems

» Protects product quality, safety of personnel, property and the environment

» Simplifies audits, change reviews, and security system documentation

» Disciplined, on-demand and scheduled updates of plant systems, without introducing firewall vulnerabilities

» Replaces at least one layer of firewalls in a defense-in-depth architecture thereby breaking the chain of infection and pivoting attacks

GLOBAL CYBERSECURITY STANDARDS ARE RECOMMENDING UNIDIRECTIONAL SECURITY GATEWAYS

Waterfall Security is the market leader in Unidirectional Gateway technology with installations at critical infrastructure sites across the globe. The enhanced level of protection provided by Waterfall's Unidirectional Security Gateway technology is recognized as best practice by many leading industry standards bodies such as AWWA, NIST, ANSSI, the IEC, the US DHS, ENISA and may more.

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ABOUT WATERFALL SECURITY

Waterfall Security Solutions is the global leader in industrial cybersecurity technology. Waterfall products, based on its innovative Unidirectional Security Gateway technology, represent an evolutionary alternative to firewalls. The company›s expanding portfolio of customers includes national infrastructures, power plants, nuclear plants, offshore oil and gas facilities, rail transport, refineries, manufacturing plants, utility companies, and many more. Deployed throughout North America, Europe, the Middle East and Asia, Waterfall products support the widest range of leading industrial remote monitoring platforms, applications, databases and protocols in the market. Please contact: info@waterfall-security.com.