



# ENABLING THE DIGITAL REFINERY

## PROTECTING THE REFINING & PETROCHEMICAL INDUSTRY FROM EVOLVING CYBER THREATS

<b>Customer</b>	North American Petrochemical Refinery
<b>Customer Requirement</b>	To protect critical equipment and on-going productivity of a highly sensitive production environment involving the processing of petrochemicals, while at the same time improve the performance of plant production with real-time, actionable and predictive analytics.
<b>Waterfall's Unidirectional Solution</b>	Secure the production environment perimeter from external threats and provide real-time enterprise visibility - Unidirectional Security Gateways protect all industrial control systems (DCS, individual controllers and logic controllers) with an impassable physical barrier to external network threats, while enabling enterprise access to real-time production data.

### REFINING & PETROCHEMICALS PROCESSING MODERNIZATION AND CONTAINING REMOTE CYBER THREATS

The energy industry has become the second most prone to cyber attacks with **nearly three-quarters of U.S. oil & gas companies experiencing at least one cyber incident**. Remote cyber attacks on oil and gas refining & production can result in severe consequences to human and environmental safety in the form of ruptures, explosions, fires, releases, and spills. In addition, disruption of service and deliverability can be devastating for key infrastructure end users such as power plants, airports or national defense.

#### THE CHALLENGE

To secure the safe, reliable and continuous operation of oil & gas processing control and safety networks from threats emanating from less trusted external networks. At the same time provide real-time access to operations data to the enterprise users and applications, as well as provide periodic and on-demand inbound access for anti-virus and other updates to turbine vendors and other third parties.



#### WATERFALL SOLUTION

A Waterfall Unidirectional Gateway was installed between the process control network (PCN) and the enterprise network. Unidirectional Gateway software connectors replicate OSISoft PI, GE OSM and ICCP servers from the PCN to the enterprise network where enterprise clients can interact normally and bi-directionally with the replicas. A file server replication connector was also deployed, to eliminate the routine use of USB drives and other removable media.

A Waterfall FLIP, a hardware-enforced Unidirectional Security Gateway whose orientation is reversible, was also installed between the PCN and IT networks. By schedule, or by exception, an independent control mechanism inside the protected OT network triggers the FLIP hardware to change orientation, allowing information to flow back into the protected OT network as needed.

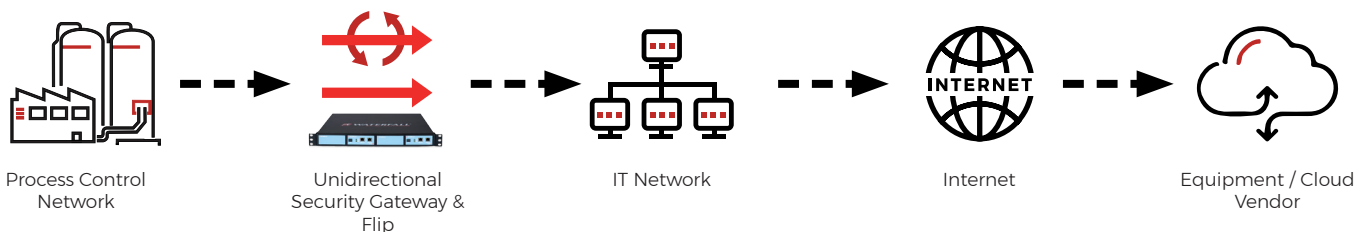
#### RESULTS & BENEFITS

**100% Security:** With the gateways, the PCN is now physically protected from threats emanating from external, less-trusted networks. The FLIP permits disciplined, on-demand and scheduled updates of plant systems, without introducing firewall vulnerabilities.

**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 are recognized manufacturing cyber security standards as well as by global industrial control system cyber security standards and regulations.

**THEORY OF OPERATION**



Waterfall Unidirectional Security Gateways replace firewalls in industrial network environments, **providing absolute protection to control systems and operations networks from attacks originating on external networks**. 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 always accompany firewall deployments.

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 network.

## UNIDIRECTIONAL SECURITY GATEWAYS BENEFITS:

- » Safe, continuous monitoring of critical systems
- » Protects product quality, safety of personnel, property and the environment
- » Protects safety and preventative maintenance systems of physical assets from remote Internet-based threats
- » 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 RECOMMEND 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 NIST, ANSSI, NERC, the IEC, the US DHS, ENISA and may more.

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### ABOUT WATERFALL SECURITY SOLUTIONS

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](mailto:info@waterfall-security.com)

Waterfall's products are covered by U.S. Patents 8,223,205, 7,649,452, and by other pending patent applications in the US and other countries. "Waterfall", the Waterfall Logo, "Stronger than Firewalls", "In Logs We Trust", "Unidirectional CloudConnect", and "CloudConnect, and "One Way to Connect" are trademarks of Waterfall Security Solutions Ltd. All other trademarks mentioned above are the property of their respective owners.

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