

REDUCING PRESSURE DROP AND IMPROVING RELIABILITY

IN CRITICAL POWER
GENERATION SYSTEMS

When conventional check valves couldn't deliver the flow performance critical power generation systems demand, US Valve engineered a solution built around the system, **not the other way around.**

The Challenge

A major power generation facility sought to enhance the performance and reliability of its critical auxiliary systems—condenser exhausters, vacuum priming pumps, and cooling water infrastructure. The engineering team required a valve solution that could withstand high-pressure, high-temperature conditions while optimizing overall system efficiency.

Like many power plants, the facility struggled with conventional valve designs that restricted flow and reduced hydraulic performance. Each pressure loss increased the workload on pumps, fans, and auxiliary equipment, driving up energy consumption and maintenance costs. Restrictive seating designs further limited flow capacity, causing pressure drops, turbulence, and water hammer events. The team needed a valve that prevented backflow without compromising flow performance.

Faced with these challenges, US Valve partnered with the facility to engineer a high-performance solution tailored to its demanding environment. Drawing on more than 70 years of valve expertise, the team collaborated closely to design a system that delivered measurable improvements in efficiency, durability, and operational stability.

CORE APPLICATION OBJECTIVES

- ✓ **Minimize pressure drop** throughout the system
- ✓ **Reduce head loss** and unnecessary pump load
- ✓ **Prevent backflow** during operation and shutdown events
- ✓ **Eliminate water hammer** to protect equipment integrity
- ✓ **Improve long-term reliability** and reduce maintenance demands

The Solution

US Valve engineered Full Port Elastomer Hinge Check Valves to deliver maximum flow performance with minimal restriction. The design eliminates the restrictive valve seat common in traditional check valves, substantially increasing open flow area and valve flow coefficient (Cv).

Why It Worked

Lowest Pressure Drop in the Industry: The increased flow coefficient reduces system resistance, lowers pumping requirements, and improves overall operating efficiency.

Water Hammer Reduction: The elastomer hinge design helps mitigate damaging water hammer, improving system protection and reducing mechanical stress on piping and equipment.

Quiet, Reliable Operation: Smoother flow paths and reduced turbulence support quieter operation, improved flow stability, and reduced wear on system components.

Installation Flexibility: A wide range of connection styles (Male/Female NPT, wafer-style, grooved end, plain end, API configurations) and materials (316 stainless steel, carbon steel, cast iron, brass, aluminum) to fit existing plant infrastructure.

LOWEST ΔP

INDUSTRY-LEADING PRESSURE DROP REDUCTION

HIGHER Cv

SUBSTANTIALLY INCREASED VALVE FLOW COEFFICIENT

1–2 DAYS

RAPID ASSEMBLY, TESTING & SHIPPING CAPABILITY

70+ YEARS

PROVEN VALVE ENGINEERING EXPERTISE

[Insert Patent Numbers Here?]

The US Valve Approach — From Spec to Quote

STEP 1

START WITH REQUIREMENTS

Every application has its own constraints, from size and material to pressure, media, and end connection. Bring the spec you have, and we will help shape the valve your system actually needs.

STEP 2

WORK THROUGH DETAILS

When application demands are high, the small decisions matter. Collaborate with a team that understands complex environments and helps you sort through fit, performance, and configuration early.

STEP 3

MOVE FORWARD WITH CONFIDENCE

Once requirements are clear, the next step should be clear too. Get responsive support that helps turn technical direction into a quote, a sample, or the right path to purchase.

STEP 4

READY TO CONNECT?

Direct engineering collaboration to get your system quoted and built fast.



Engineering Capabilities Brought to the Project:

- Custom designs, connections, and piping solutions tailored to layout constraints
- Rapid prototyping and manufacturing capacity to meet aggressive delivery schedules
- Design support with CFD analysis for tight or space-constrained piping systems
- IDEX portfolio integration for comprehensive power generation flow control solutions

Results from the Power Plant

US Valve partnered with the power plant to address flow-control challenges affecting overall system performance and equipment protection. By implementing a valve solution tailored to the facility’s operating conditions, the plant improved hydraulic performance, enhanced operational stability, and reduced maintenance concerns associated with traditional valve designs. This solution helps safeguard critical infrastructure from transient pressure events while increasing system reliability.



IMPROVED SYSTEM EFFICIENCY:

Reduced pressure drop and head loss, directly increasing available flow capacity.



INCREASED RELIABILITY:

Low-maintenance elastomer hinge check valve design provides dependable backflow prevention.



MITIGATED OPERATIONAL RISK:

Reduced risk of water hammer and damaging pressure surges, supporting equipment protection and longer service life.



IMPROVED SYSTEM EFFICIENCY:

Engineering support and application expertise from specification through delivery, aligning valve selection with long-term operational objectives.

The US Valve Advantage

When reliable performance, efficient flow control, and long-term system protection are critical, power producers turn to US Valve's engineered valve solutions.

Optimized Flow Performance: Designed for lower pressure loss and improved overall system efficiency.

Proven Reliability: Engineered for long service life and reduced maintenance in demanding environments.

Engineered-to-Fit Solutions: Tailored specifically to unique application and operating requirements.

Validated Performance: Rigorous testing, documentation, and quality assurance back every valve.

Fast Response & Delivery: Supported by extensive inventory and rapid shipment capabilities.



Experiencing Excessive Pressure Drop or Water Hammer?

Whether you're optimizing condenser systems, upgrading vacuum pumps, improving blower performance, or reducing head loss across your facility, US Valve can help identify the right solution. Contact our engineering team today for a complimentary application review and discover how US Valve's Full Port Check Valve technology can improve performance throughout your power generation operation.

Talk to an Engineer Today

Scan to schedule your complimentary application review.



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