

**Weir Power & Industrial**

Excellent  
Power & Industrial  
Solutions

**WEIR**  
POWER & INDUSTRIAL

First choice  
for process protection



### Product portfolio

Weir Power & Industrial has a portfolio of products to support global best practice in power generation and safety. We have market leading products for nuclear and subsea applications, and a strong portfolio of specialized critical service and safety related valves. We have a unique, customer accessible design and configuration system, which enables us to optimize the valve and control solution for any project. This is complemented by fast track new product development, and our commitment to long-term maintenance and service.

*Weir Power & Industrial world-leading product brands include:*



### Geographical footprint

Weir Power & Industrial has a strong geographical presence in the major markets around the world. Our global sales and marketing network means we can effectively support our customers' operations worldwide, and as part of the wider Weir Group, we have the reach and resource to grow into emerging markets alongside our customers.

*Weir Power & Industrial has operations in:*

- North & South America
- Europe
- Middle East
- Africa
- Asia Pacific

### Customer profile

Weir Power & Industrial customers include many of the world's leading companies in power generation, both fossil fuel and nuclear, as well as leading oil and gas explorers and producers. We also have a developed general industrial customer base, particularly in the food, pulp and process industries.

We build close, long term relationships with our customers, based on our understanding of their priorities, and our ability to provide long-term technical support and service.

*Weir Power & Industrial customers include:*

- |                            |                                   |
|----------------------------|-----------------------------------|
| • Bruce Power              | • Pennsylvania Power & Light Corp |
| • Ontario Power Generation | • Sargent Lundy                   |
| • Hydro Quebec             | • Daelim Ind Co Ltd               |
| • AECL                     | • Rolls Royce                     |
| • Westinghouse             | • Duke Energy                     |
| • Alstom Power             | • Mitsui Babcock Energy           |
| • Black & Veatch           | • Woodside Energy                 |
| • Score Group PLC          |                                   |

# Meeting customer needs

The key to the success of Weir Power & Industrial is our capability to deliver engineering solutions that add value to the customer's process. We offer a total package of products to meet end-to-end project requirements.

Using our own analysis and configuration system, we will design and deliver the optimum valves and controls solution to protect the value of the production process.

*With best in class engineering Weir Power & Industrial can:*

- Minimize downtime and reduce the risk of disruption to our customers' operations, particularly in inaccessible and safety critical environments.
- Help our customers rationalize their supply base by integrating whole project solutions with service and maintenance.
- Support our customers worldwide, to achieve consistent global processes and standards.
- Bring new products to market in the shortest time scales, to meet current and future needs and deliver competitive advantage.



**Phil Clifton**  
*Divisional Managing Director*

Weir Power & Industrial has the capability to design, deliver and maintain project-wide solutions.

We work in many of the world's most technically challenging environments, engineering our products to overcome site-specific and process problems.

Reliability is essential in the areas where we operate, whether we are providing critical pressure control valves for subsea oil exploration, where maintenance is impossible, or designing a safety valve system for a nuclear power plant. Weir's global reputation for engineering excellence is based on our ability to satisfy the most stringent process requirements.

# Whole project, whole process solutions



## **Rapid configuration**

Weir Power & Industrial has developed an innovative configuration tool to accelerate specification on major projects, and ensures our solution represents the optimum configuration for the task. We use the system in partnership with contractors and end users to assist in planning and design from the earliest stage.

When combined with our design engineering expertise, this unique software enables us to consider alternative configurations rapidly, and discuss them with our customers, keeping the whole solution more competitive. It also minimizes the risk to the project, by allowing us to present accurate detailed quotations at an early stage.



*Above: Atwood & Morrill Bled Steam Non-return Valve for use in power generation.*

By packaging a complete range of high quality engineered equipment, we can deliver an end-to-end system that will offer the best protection to our customers' processes.

We have a front-end engineering and specification system designed for use in collaboration with customers to optimize the configuration of our solution for value and performance.

- Optimizing productivity, safety and efficiency
- Specialist experience of customer process
- Rapid configuration
- Integrated design and implementation
- Partnership working on major projects
- Consolidated supply base for through-life efficiency

#### Comprehensive product range

Weir Power & Industrial has an extensive range of products providing full project solutions:

Acid service	Petrochemical
Chemical processing	Pharmaceuticals
Corrosive gases	Power generation
Fire protection	Sewage/water
Gas pressure	Steam pressure
Marine seawater	Subsea
Nuclear plant	Special application

**Right:** Sarasin/RSBD Spring Operated Safety Valve for use in process protection.



**Above:** Sevim Pilot Operated Safety Valve.



**Right:** Hopkinsons Full Bore Parallel Slide Gate Valve for use in power generation.



Weir Power & Industrial enjoys industry leadership in products for critical control and isolation applications.

A linked network of specialist manufacturing locations provides an effective platform for rapid new product deployment.

Our product development activities are focused into global centres of excellence. Based throughout the world, the advances made in these 'hothouse' environments are shared right across the division.

This clear focus gives us unrivalled capability to meet the needs of customers for continuous improvement. It also facilitates the rapid adoption of new material technologies, in which Weir holds a strong portfolio of intellectual property.

## Best product for process

### World-class product brands

We are accredited with one of the best, and most preferred, valves in the global nuclear industry. We produce the world standard solution for turbine protection, and we are a recognized leader in safety valves and controls for offshore oil and gas operations.

Weir Power & Industrial are at the forefront of developing technologies and materials, serving all sectors of the energy industry, as well as pulp, process and general industrial customers.

Weir Power & Industrial have a worldwide reputation for quality and reliability in oil, hydrocarbon, gas and chemical processes, and the power industry.

Weir Power & Industrial set the standard in power generation, with key strengths in both nuclear power and fossil fuels; petrochemicals; land and offshore oil and gas; food and paper processing.

### Weir production system

The Weir production system is based on the latest lean thinking. It is the mechanism by which we deliver projects on schedule and manage the rapid deployment of spares.

A culture of continuous improvement is fundamental to the Weir production system, which rewards innovation from the shop floor to project management. Since the introduction of the system, we have dramatically improved on time delivery of target product lines, and reduced lead times significantly.

### New materials

The development of new materials is integral to the development of new products. We conduct our own research and development work, and also benefit from the considerable advances made by other Weir divisions. For example, the development of hard, extremely corrosion resistant alloys by Weir Minerals.

**Below:** MAC Valves Side Entry Ball valve for topside & subsea and oil & gas applications.



*"The biggest factor in new valve design relates not so much to function, but to the range of environments in which our products are now subject to extremes of pressure, temperature and acidity. Our continuing advances in metallurgy, design engineering and manufacturing enable us to anticipate and meet the challenges posed by such environments."*

**Roger Griffin**

Commercial Director

Weir Power & Industrial engineering excellence is supplemented by a global purchasing network, which enables us to analyze, test and source standard components from quality-assured third party suppliers. This allows us to focus on designing and manufacturing the core products that add value to customer processes.

Weir Power & Industrial products are at the forefront of industry best practice in:

- Chemical processing
- Corrosive gases
- Fire protection
- Gas pressure
- Seawater handling
- Nuclear plant
- Offshore oil
- Petrochemicals
- Pharmaceuticals
- Power generation
- Sewage and water treatment
- Subsea applications



Above: Batley Butterfly valve undergoing fire safe testing.



Above: Sarasin/RSBD Pilot Operated Safety valve for process protection.

	Acid service	Chemical processing	Corrosive gases	Fire protection	Gas pressure	Marine seawater	Nuclear plant	Petrochemical	Pharmaceuticals	Power generation	Sewage/water	Steam pressure	Subsea	Special application
Globe angle control valve	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Choke valve		■		■	■									■
Desuperheater							■		■		■			■
Ball valve	■	■	■	■	■	■		■	■	■	■	■	■	■
Parallel slide gate valve		■		■		■	■	■	■		■			■
Safety relief valve							■	■	■	■	■			■
Pilot operated safety relief valve	■	■	■	■		■	■	■	■	■	■			■
Spring operated safety relief valve	■	■	■	■	■	■	■	■	■	■	■			■
Swing check valve							■	■	■	■	■			■
Globe valve							■	■	■	■	■			■
Isolation butterfly valve	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Control butterfly valve	■	■	■	■	■	■		■	■	■	■			■
Tricentric isolation butterfly valve	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Power operated check valve		■		■	■	■	■		■		■			■

Meeting customer specifications is simply the first step in delivering whole life cycle performance.

Weir Power & Industrial can offer on-going process enhancement, with tailored maintenance, repair and operational support.

The design and durability of our products reduces downtime and keeps the routine replacement of parts to a minimum. Product capacity maximizes flow, accelerating processes. And the engineering expertise of Weir Power & Industrial does not end once the plant is operational. We provide a dedicated service resource to monitor and maintain our installed equipment.



## Total reliability in operation

- Reliable solutions
- Installation expertise and support
- Consolidated maintenance
- On-site aftercare and engineering
- Fast delivery of spares

### **Tricentric Triple Offset High Performance Butterfly Valves**

#### *Triple Offset Design*

Wafer, lug and double flanged butterfly valves for isolation, check, combination stop-check and control.

#### **Features**

Bubble tight, zero leakage  
Triple offset, metal seal, fire tested, bidirectional sealing  
Predictable seating/ unseating torque value  
Quick acting  
Seismic qualified designs  
Full range of materials  
Minimal maintenance  
Available in corrosion resistant materials (MIC)

#### **Applications**

Isolation, control and combination valves  
Containment vent and purge  
Core spray system  
Service water system  
Pump discharge isolation  
Brackish cooling water

#### **Sizes**

- 3" - 96" ANSI Class 150 - 900



**Left:** *Tricentric Triple Offset Butterfly Valve for industrial and nuclear applications.*

By providing total valve and control solutions and a complete aftercare service, we help customers consolidate their maintenance and service programs. With local workshop facilities, and an on-site presence where appropriate, we will tailor our level of service to provide the optimum level of protection for the customer's operation.



### **Whole-life efficiency**

The business, environmental and human risks associated with the failure of critical service, safety, isolation, and control valves cannot be underestimated. We are committed to maintaining the high standards set by our products throughout their life span.

For this reason, we have invested in a comprehensive customer support and aftercare capability, servicing both land-based and offshore sites through a range of maintenance, repair and operation agreements.

This allows us to introduce product upgrades and enhancements as they are developed, extending the life of a plant, or increasing capacity, for example.

By working closely with customer maintenance teams in a partnership that is tailored to each organization, we help ensure that operating efficiency and safety are never compromised.



### **Repairs and spares**

Weir Power & Industrial has a network of service and repair workshops located in our key markets to complement our on-site service. This strong global presence, combined with the additional resources of the Weir Power & Industrial Services division, offers an outstanding level of customer support.

We also have a dedicated information management system that facilitates the rapid call up of spares. Our global manufacturing and sourcing capability ensures those spares are of the highest quality, and available immediately.

*"We will supply a valves and controls solution that adds value to our customer's business. Not only reducing costs by reducing the supply base, but crucially reducing running costs and minimizing the risk of failure and lost production"*

**Neil Williams**  
Manufacturing Director

Weir Power & Industrial offers the local know-how and presence necessary for major projects in many regions backed by a global supply network. This enables us to provide our customers with consistent products and standards of service worldwide.

Weir Power & Industrial solutions are individually designed to meet plant-specific requirements. Nevertheless, where customers are operating multiple sites, using products from a single source has a number of operational advantages.

Efficiencies realized on one site can be repeated elsewhere. And as customers move their people around the world, they will encounter familiar equipment and

# Global supply and support

## **Closer to the customer**

We recognize that in order to deliver world-class solutions to an increasingly global customer base, we need to be wherever our customers are.

We therefore have a presence on the ground in all our key markets. This presence is increasingly focused on providing total process solutions for customers in local markets representing all of the Weir Power & Industrial brands.

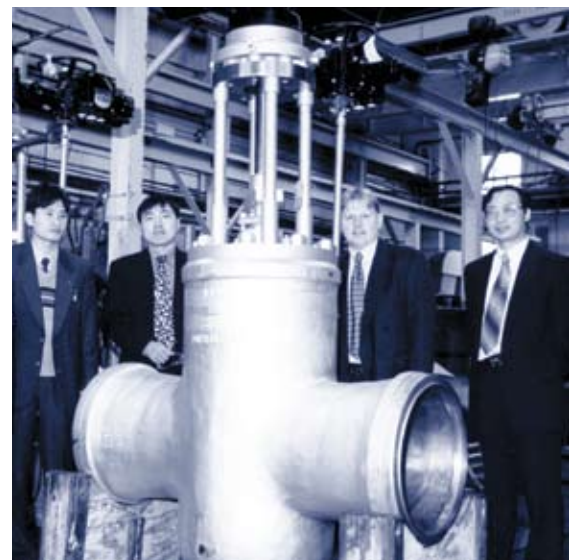
For example, we have established sales, marketing and project management expertise in Dubai, Kuala Lumpur, Korea and China. These teams have seamless access to our configuration and quotation systems, and are linked to our global centres of excellence. Through a single, local point of contact, our customers benefit from a strong, global network.

## **Emerging markets**

Asia is expected to account for 40% of new build in nuclear power generation, and South East Asia will play a major role in oil and gas exploration.

We have clearly established routes into these markets. Where there are indigenous valve suppliers able to meet our quality standards, we utilise the local technical base creating competitive advantage.

By co-operating with our sister companies in the Weir Group, we are also expanding our capability into South America and South Africa.



processes, and be able to call on the same team for technical support. Our geographical strength plays a major role in establishing close relationships with our customers.

We have access to the global infrastructure of the whole Weir Group, enabling us to source components more competitively and to move alongside our customers into emerging markets in the developing world.

- Global supply capability
- Best value purchasing
- Expanding geographical footprint
- Synergy with Weir Group divisions
- Local engineering services
- Global project tracking

#### **Atwood & Morrill Free Flow Check Valve**

*Reverse Current Swing Check*

Positive closing swing check valve for steam turbine protection. Low pressure drop.

#### **Features**

Air operated, spring loaded closing cylinder assures rapid positive closure

Activated on turbine trip and heater high water level alarm

Free swinging disc provides responsive movement in flow stream

Self aligning disc provides tight sealing. Inclined seat design improves flow characteristics and reducing swing enables valve to close more quickly

Valves 14" and larger provided with external lever and counterweight which reduces pressure drop and stabilizes disc movement in flow stream

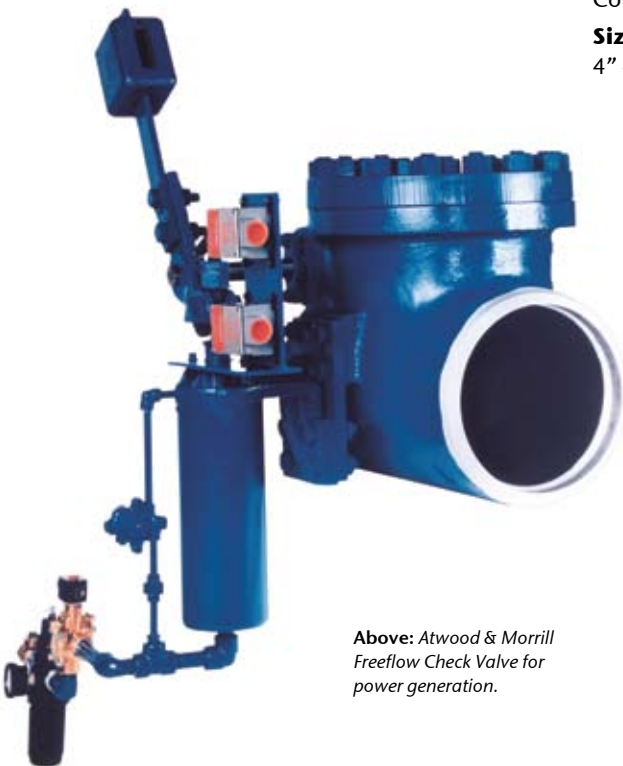
#### **Applications**

Steam turbine extraction lines (Bled Steam)

Cold Reheat Line

#### **Sizes**

4" - 60" ANSI Class 150, 300, 600 and 900



**Above:** Atwood & Morrill Freeflow Check Valve for power generation.

*“By being flexible and responsive, and maintaining a good geographical balance, Weir Power & Industrial can support our customers’ ambitions in new markets and win new, long term relationships.”*

**Roger Griffin**  
Commercial Director

Weir Power & Industrial employs approximately 800 people around the world. Our customers have direct access to specialist engineering expertise and world-class project management.

The people who work for Weir Power & Industrial are the driving force behind our success. Through our project managers, we work closely with our customers, anticipating their requirements and understanding their processes.

# The best people **in the business**



- Operational champions
- Leadership development
- Multidisciplinary teams
- Rewarding performance
- Apprenticeships and training



## **Leadership development**

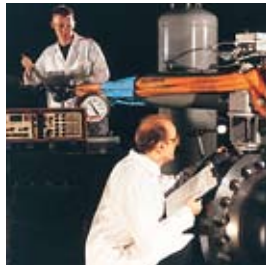
For Weir Power & Industrial to maintain a market-leading role in the industry, we rely on developing leadership within our own business. We have a fast track executive development scheme, designed to identify and promote the individuals who will be the next generation of managers. We have a flexible approach to mentoring and formal and informal knowledge sharing.

Our robust appraisal system, which is consistent across all our operations, allows every employee to set personal goals and realize their potential, and we are committed to training at every level, from apprenticeships to business management.



Our skilled designers ensure that our products are value engineered to maximize performance and quality, while retaining a competitive edge. And our support engineers on the ground have a depth of knowledge gained over many years working alongside customer teams.

Our managers have a broad range of commercial and personal skills, often gained in other disciplines. Together, we are creating a learning culture, where excellence and innovation are rewarded.



### Building teamwork

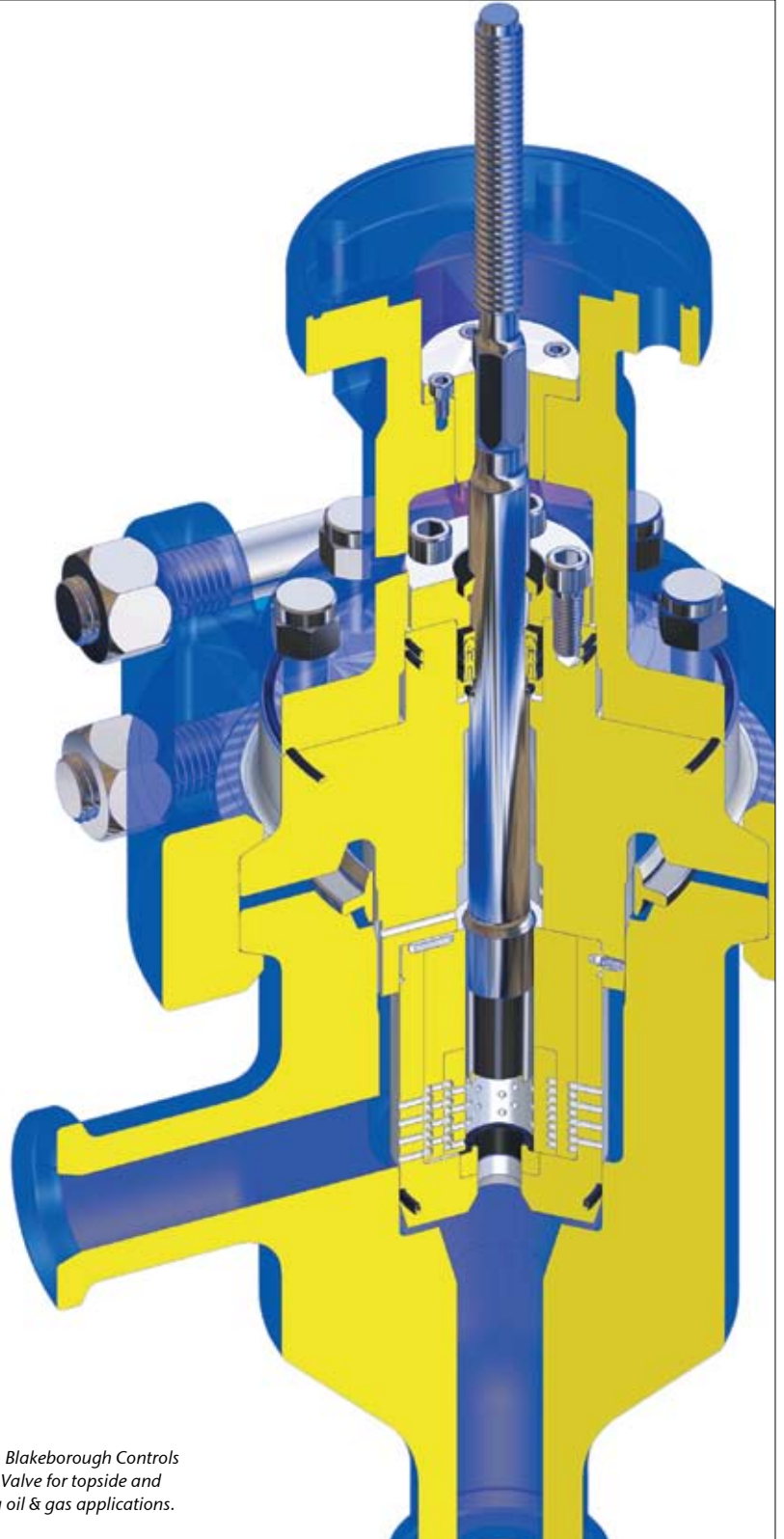
Weir Power & Industrial is a key player in major schemes and installations where our people often form part of a broader project team. Our ability to listen, respond and integrate with contractor and end user teams makes a significant difference to the outcome.

Within our own organization, we build multidisciplinary project teams. The links this creates, and the breadth of learning that results, give us a genuine competitive edge over our competitors, as well as making us easy to work with.



*"We invest in people because it works. We measure key performance indicators because they tell us what is happening. It's not just a matter of lip service. Our processes support our people, and not the other way around."*

**Steve Smallburn**  
HR Director



**Right:** Blakeborough Controls Choke Valve for topside and subsea oil & gas applications.

# Our products...



## **Atwood & Morrill Controlled Closure Check**

### *Swing Check*

An automatic self regulated check to reduce water hammer effects and piping loads after feedwater line break.

### **Features**

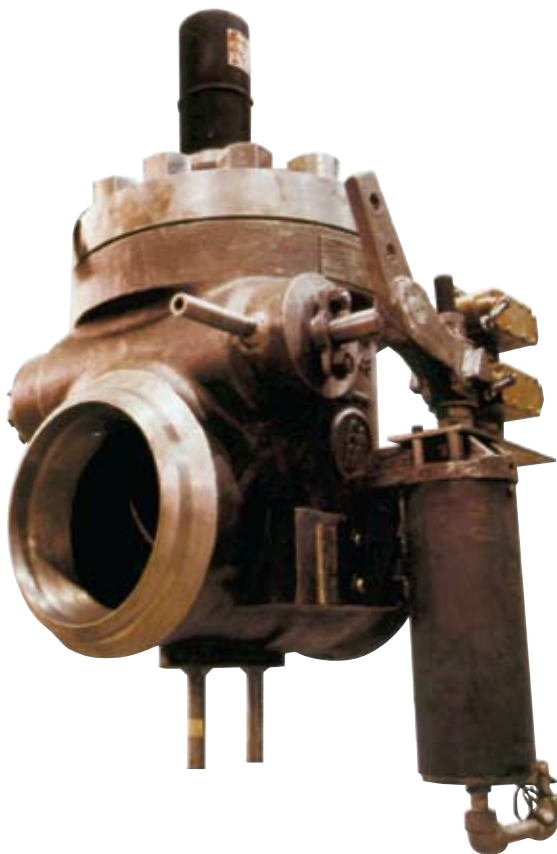
Internal dashpot for self controlled closure  
Slow closure rate reduces pressure surge to acceptable levels  
Reverse flow is checked with throttling effect

### **Applications**

Feedwater lines in nuclear power stations

### **Sizes**

10" - 24" ANSI Class 600 - 900



## **Atwood & Morrill Testable Check**

### *Swing Check*

A check valve for emergency cooling systems which can be remotely or manually exercised and tested.

### **Features**

Manual lever or air cylinder actuator permits local or remote testing  
Internal lost motion device allows free swing of disc independent of actuator and packing friction  
Magnetically tripped switches give positive direct indications of disc position

### **Applications**

High and low pressure core cooling in nuclear power stations.

### **Sizes**

2 1/2" - 24" ANSI Class 600 - 1500



### **Atwood & Morrill Three Way Valve**

#### *Diverter Valve*

A diverting or modulating valve for uninterrupted flow transfer.

#### **Features**

In-line tee shaped body

Flat seat design for tight seal

#### **Applications**

High and low pressure feedwater heater bypass

HRSG Economizer temperature control

#### **Sizes & Pressure Range**

6" - 24" ASME Class 150 - 2500



### **Atwood & Morrill Feedwater Check**

#### *Swing Check*

A rugged swing check valve for pump or system protection.

#### **Features**

Air actuated spring loaded cylinder assures rapid positive closure

Minimum water hammer with rapid closing

Low pressure drop and streamlined flow

Flat seats for maximum tightness with no wedging action

Rugged integral disc and arm construction

Pressure balanced disc assembly isolated from stuffing box friction and shaft end thrust

#### **Applications**

Low and high pressure pump discharge

#### **Sizes**

3" - 24" ANSI Class 900, 1500 and 2500



### **Atwood & Morrill WYE Globe Valve**

*Lift Check, Stop-Check, Stop*

The Atwood & Morrill “Wye” Globe Valve is a highly engineered valve for utilities, power generation, industrial and process applications. Design variations assure optimum performance under a wide range of operating conditions and environments.

#### **Features**

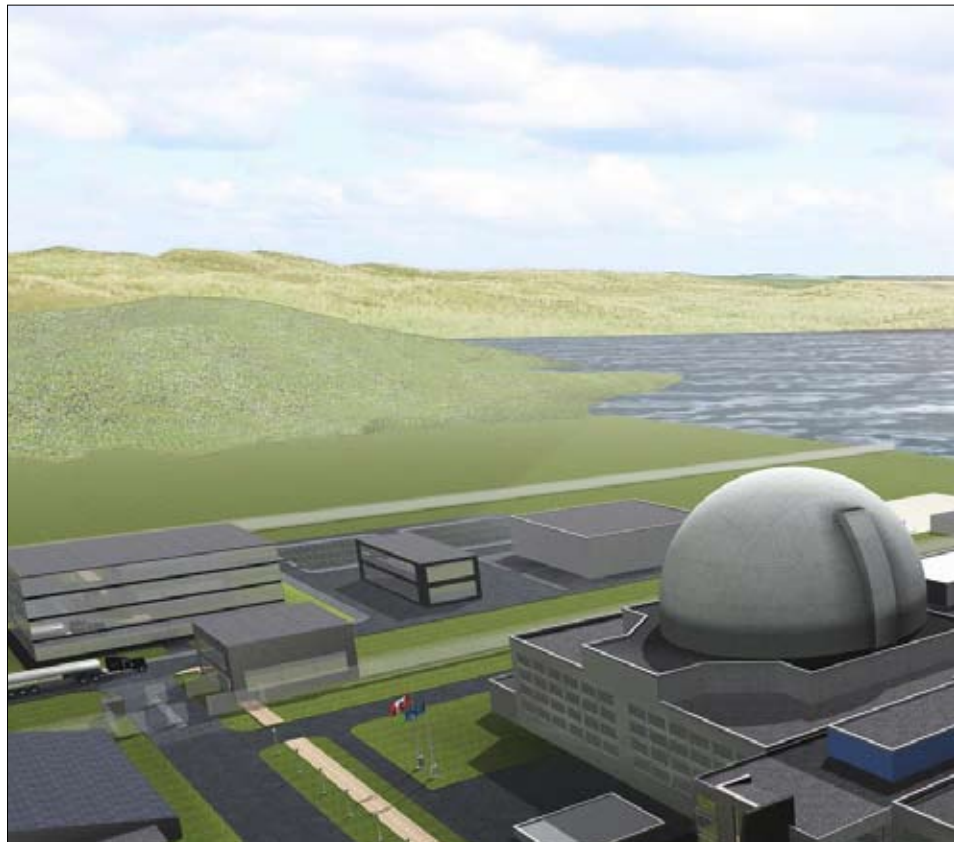
- Tight shutoff
- Low pressure drop
- Fast operation
- Direct seating offers resistance to thermal distortion
- Less space requirement

#### **Applications**

- Boiler Feedwater Pump non-return and stop
- Economizer inlet and stop
- Boiler outlet stop & non-return (multiple boilers)
- Feedwater heater isolation
- Main steam Sstop
- Auxiliary equipment

#### **Sizes & Pressure Range**

16” - 34” ASME Class 600 – 900



### **Atwood & Morrill Parallel Slide Gate Valve**

#### *Isolation Valve*

The Atwood & Morrill Parallel slide gate valve is tight shutoff valves isolation for high pressure and high temperature during emergency and faulted conditions.

#### **Features**

Tight shutoff  
Position seated , less torque for opening and closing  
No thermal or pressure locking  
Fast operation

#### **Applications**

Quick closing for primary containment in nuclear plant  
Main steam isolation  
Feedwater isolation  
Recirc isolation  
High pressure core injection

#### **Sizes & Pressure Range**

6"-24" ASME class 600-2500

### **Atwood & Morrill Swing Check Valve**

#### *Balance of Plant*

The Atwood & Morrill swing check valve is designed to effectively prevent reverse flow and is ideally suited for liquid, steam and other gases requiring assured performance, tight shut off and low maintenance.

#### **Applications**

Condensate pump discharge  
Heater drains  
Liquid, steam and gas check valve

### **Atwood & Morrill Other Power Generation Valve**

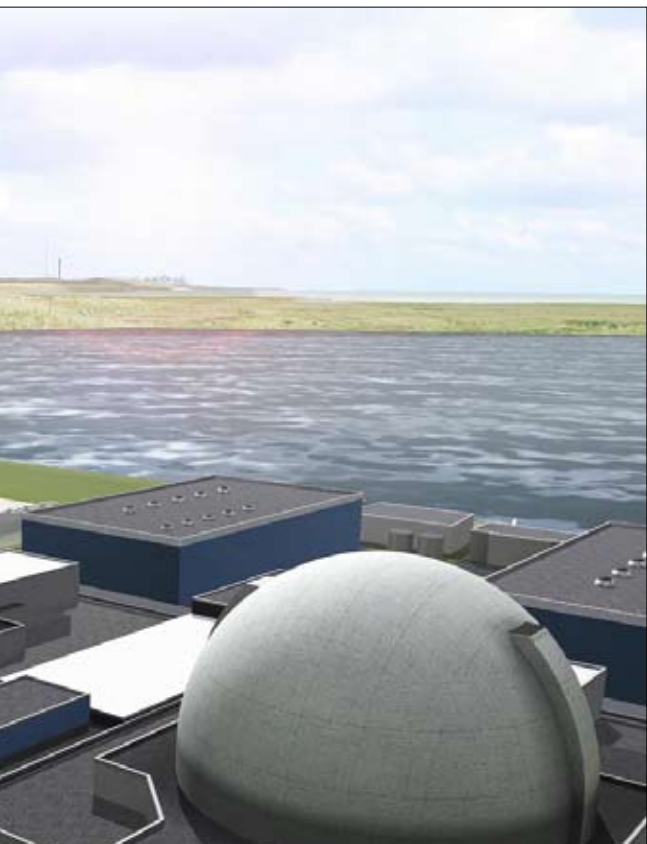
#### *Trip Throttle Valve*

Trip Throttle Valves are designed to protect steam turbines from over speed during upset conditions. The valves close quickly upon the loss of turbine lube oil pressure or a mechanical trip of the turbine.

#### **Condenser protection**

Atmospheric Relief Valves are protective devices for emergency service, providing automatic protection for costly turbine and condenser equipment. They should be considered equally as important as Trip Throttle Valves, overspeed governors, and other devices for power plant protection.

The Atwood & Morrill Atmospheric Relief Valve for condenser service was developed after long experience in manufacturing protective equipment. The finest materials and workmanship assure our customers a completely dependable valve when an emergency occurs.





**Legend**  
 Existing service centres  
 Planned service centres

## Call us today

### Toronto

1180 Aerowood Drive  
 Mississauga, ON L4W 1Y5  
 T (905) 625-7202  
 F (905) 624-0097

### Calgary

2715, 18th Street N.E.  
 Calgary, AB T2E 7E6  
 T (403) 250-7000  
 F (403) 250-2032

### Fort St. John

10508, 89th Avenue  
 Fort St. John, BC V1J 5P9  
 T (250) 785-6627  
 F (250) 785-4501

### Montreal

8600 St. Patrick Street  
 LaSalle, QB H8N 1V1  
 T (514) 366-5907  
 F (514) 366-2067

### Alloa

The Harlands, Alloa  
 Clackmanshire, FK10 1TB  
 T +44 (0)1259 722 100  
 F +44 (0)1259 722 918