

# Nuclear Capabilities

Industrial Valves & Gears Nuclear Team

Taking nuclear energy forward for more than 60 years.



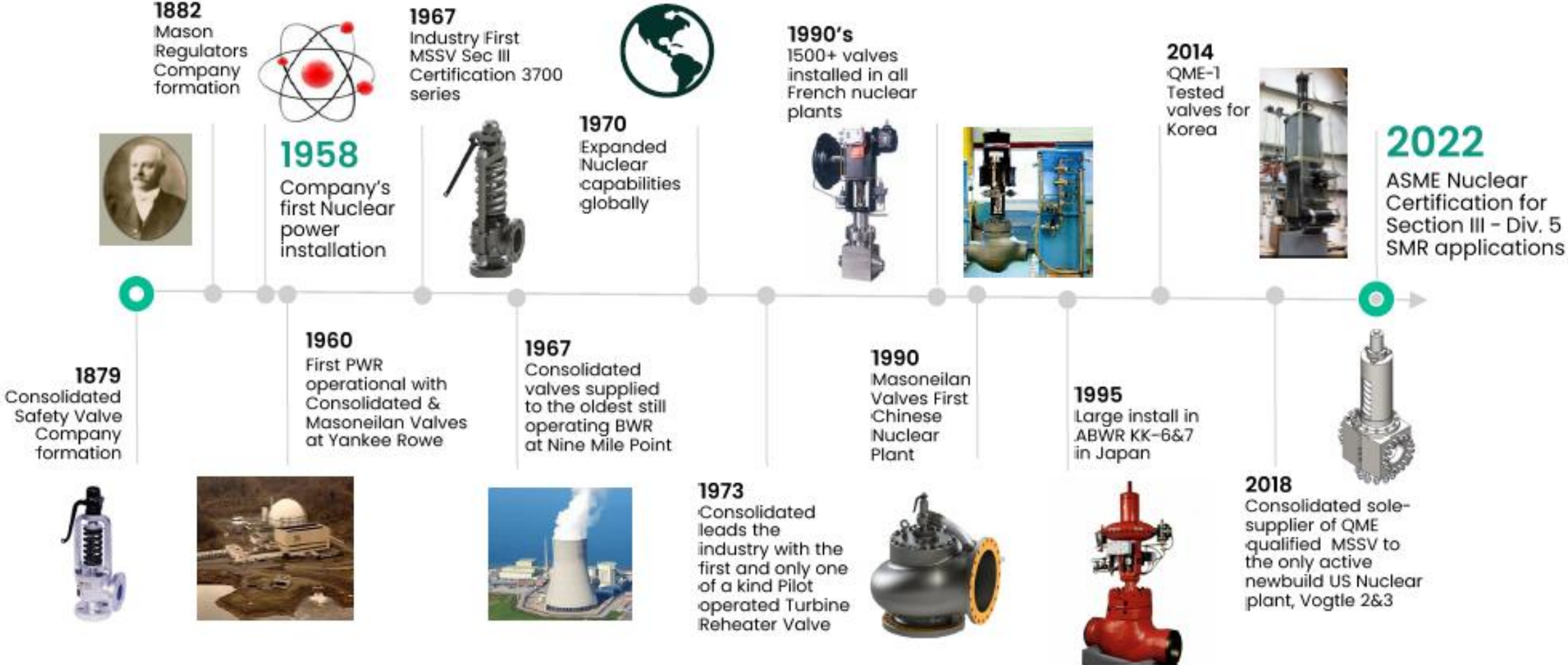
# In 1958...

Baker Hughes introduced nuclear power to our portfolio by completing our first installation. Since then, our team has continued to advance our products to provide safe, reliable and robust solutions for the nuclear industry.

We have always been at the forefront, developing solutions and solving the toughest challenges and we remain committed to providing exceptional customer support and advanced technology in the nuclear space as it continues to evolve .

# Our Nuclear Journey

Nuclear Installed Base in over 18 countries...



# Baker Hughes Provides Top of the Line Technology and World Class Support

Dedicated Engineering Team



Manufacturing & Lab Capabilities



Certifications & Quality Programs



Reactor Types & Applications



Broad Portfolio of Products



Global Presence & Support Network



# Dedicated Engineering Team



Our nuclear engineering team holds high level skills combined with decades of retained nuclear know-how.

We ensure each opportunity receives a dedicated engineering team to work directly with our customer to meet their specific needs.

## Our Global Nuclear Team:

- 40+ engineers
- Hundreds of years of combined experience
- 40,000+ valves installed





## Manufacturing & Lab Capabilities

### Site Details

- Multiple facilities across the globe
- Over 1M ft<sup>2</sup> combined manufacturing space
- 700+ manufacturing employees
- State of the art production capabilities
- World class pump testing ability

### Nuclear Center of Excellence Organization

- 60+ years of experience in nuclear codes and technology
- 30+ employees fully dedicated to nuclear segment
- Highly skilled engineering and documentation staff
- Approved and well-established nuclear suppliers

# Certifications & Quality Programs

## Nuclear QA Program

### Compliance to industry standards

- 10CFR Part 50 Appendix B / 10CFR Part 21
- ASME Section III / CSA Z299/N299
- RCCM/RCCE
- ESPN (European Nuclear regulation) / AREVA (Framatome) QN100
- HAF604 China

### QME 1 Qualifications

- (1) valve type for AP1000 reactor
- (6) valve types for APR1400 reactor

## Quality Organization

NIAC Member #248

### Audited by

- NUPIC
- CANPAC
- NRC
- ASME
- ISO 19443

### ASME Certificates

- N, NV, and NPT
- Sec III Div 5

## Recent Reference Projects

### Vogtle 3 & 4 (PWR)

- Class 2 3700 safety valve

### OPG and Bruce Power (CANDU)

- Class 1 1900 for helium blanket system

### OPG (CANDU)

- Class 1 19000 for fueling machine head

### Cernavoda (CANDU)

- Class 1 glove control valves for condenser degasser spray

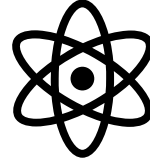
### Nine Mile Point (BWR)

- Class 1 Main Steam Relieve ERV

### Hinkley Point C (PWR)

- Class 2 Atmospheric Steam Dump

# Reactor Types & Applications



## PWR (1960)

### Installs in:

- Belgium
- Brazil
- China
- France
- Japan
- Korea
- Slovenia
- South Africa
- Spain
- Sweden
- Taiwan
- UK
- US

## BWR (1969)

### Installs in:

- Japan
- Mexico
- Spain
- Sweden
- Taiwan
- USA

## CANDU (1971)

### Installs in:

- Argentina
- Canada
- China
- India
- Korea
- Romania

## Key Applications

### Masoneilan Control Valves

- Turbine Bypass
- Feedwater Control
- Atmospheric Dump
- Normal and Emergency Heater Drain
- Chemical and Volume Control
- Nuclear Island

### Consolidated Safety Valves

- Pressurizer Safety
- Power Actuation
- Main Steam
- BOP
- MSR

### Lufkin Gears

- Safety Pump Reducers and Expanders
- Gear Coupling – safety and circulating pumps
- Reducers – cranes in reactor, turbine and fuel buildings

# Typical Power Island Applications

## Control Valves

Feedpump Recirculation



Continuous & Emergency Heater Drain



Liquid Level Control



Feedwater Control



Start-up Vent



Advanced Valve Positioning



Deaerator Level Control



Steam Turbine Bypass



Air Filter & Pressure Regulation

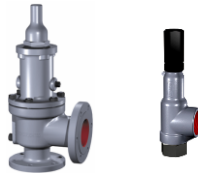


## Safety Valves

Steamline Safety



Tube and Shell Safety



Deaerator, Air Ejector Safety



Economizer Safety



## Capabilities

### Manufacturing Locations

- Jacksonville FL USA
- Deer Park TX USA
- Conde FR
- Coimbatore IN
- Kariwa JP
- Suzhou CN

### Nuclear Standards

- 10CFR part 50 Appendix B
- 10CFR Part 21
- ASME Section III
- NCA-3800/4200
- NCA-4000, CSA Z299/N299

### ASME Certificates

- N, NV, and NPT
- Section III Division 1 construction of pressure relief valves and line valves

# Broad Portfolio of Products – Masoneilan™ Control Valves



## General Service

### 35000 (Camflex™)

Range: 1" – 16" sizes

Applications: water, steam, gas, general & severe service applications



### 21000 (Top Guided)

Range: ¾" – 8" sizes

Applications: water, steam, gas, general service applications



### 80000 (3-Way)

Range: 1" – 8" sizes

Applications: High pressure drop liquid; severe service applications



## Engineered Products

### 41000 (Cage Guided)

Range: 2" – 32" sizes

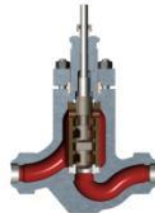
Applications: water, steam, gas, general & severe service applications



### 18400 (LincolnLog™)

Range: 1" – 8" sizes

Applications: High pressure drop liquid; severe service applications



### 84000 (SteamForm™)

Range: 3" – 30" (Inlet); 6" – 50" (Outlet)

Applications: Turbine Bypass, Steam conditioning



## Accessories & Instrumentation

### Actuators

Spring Diaphragm & Piston Type

Electric (buy out)



### Digital Level Transmitter

Floating Type

Applications: Tank Level control



### Advanced Smart Positioner (SVI™3) HART & FF

Applications: Linear and Rotary control valves



### Air Filter Regulators

Applications: Linear and Rotary control valves



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# Broad Portfolio of Products – Consolidated™ Relief Valves

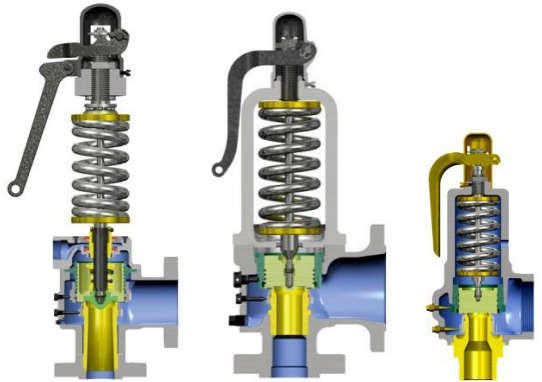


## Safety Valves

## Safety Relief Valves

## Pilot Valves

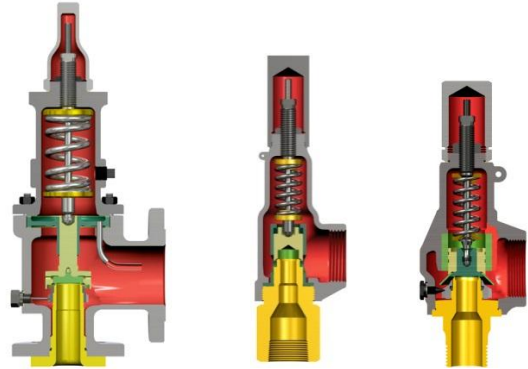
## Capabilities



ASME Section I & III

### Applications:

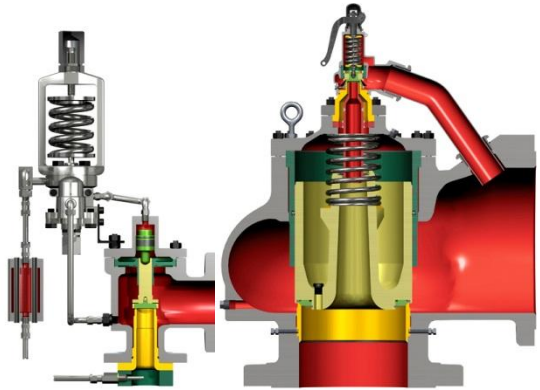
Main Steam Safety Valves,  
Reheat Line, Drum, Once Through  
System safety valves



ASME Section VIII

### Applications:

LP Steam Line, Steam Supply Line,  
Shell & Tube, Deaerator, Ejector,  
Thermal Relief safety relief valves



ASME Section VIII

### Applications:

HP, IP, LP Economizer safety  
valves

### Manufacturing Locations

- Jacksonville FL USA
- Deer Park TX USA
- Naples IT
- Suzhou CN

### Nuclear Standards

- 10CFR part 50 Appendix B
- 10CFR Part 21
- ASME Section III
- NCA-3800/4200
- NCA-4000, CSA Z299/N299

### ASME Certificates

- N, NV, and NPT
- Section III Division 1  
construction of pressure relief  
valves and line valves

# Broad Portfolio of Products – Gears Systems



## Safety Pump Reducers and Increasers

- RCV
- RIS
- ASG

## Gear Couplings

- Safety and circulating pumps

## Reducers for maintenance cranes in:

- Reactor building
- Turbine building
- Fuel building



# Global Presence & Support Network



350+ Members  
Commercial  
Team

200 Channel  
Partners

9 Factories and  
Aftermarket  
Centers

# We believe you must know energy to change energy

How do we meet the world's growing demand for energy, and the demands from energy – to be cleaner, safer and more efficient? We believe the answer lies in technology. As an energy technology company, this is the core of our mission: to deliver the highest efficiency solutions today and advance the path to energy decarbonization.

## Want to find out more?

We have a team of experts ready to answer your questions and help you get the information you need.



**Baker Hughes** 