

NUCLEAR SAFETY VALVES

SEBIM®
Sarasin-RSBD®

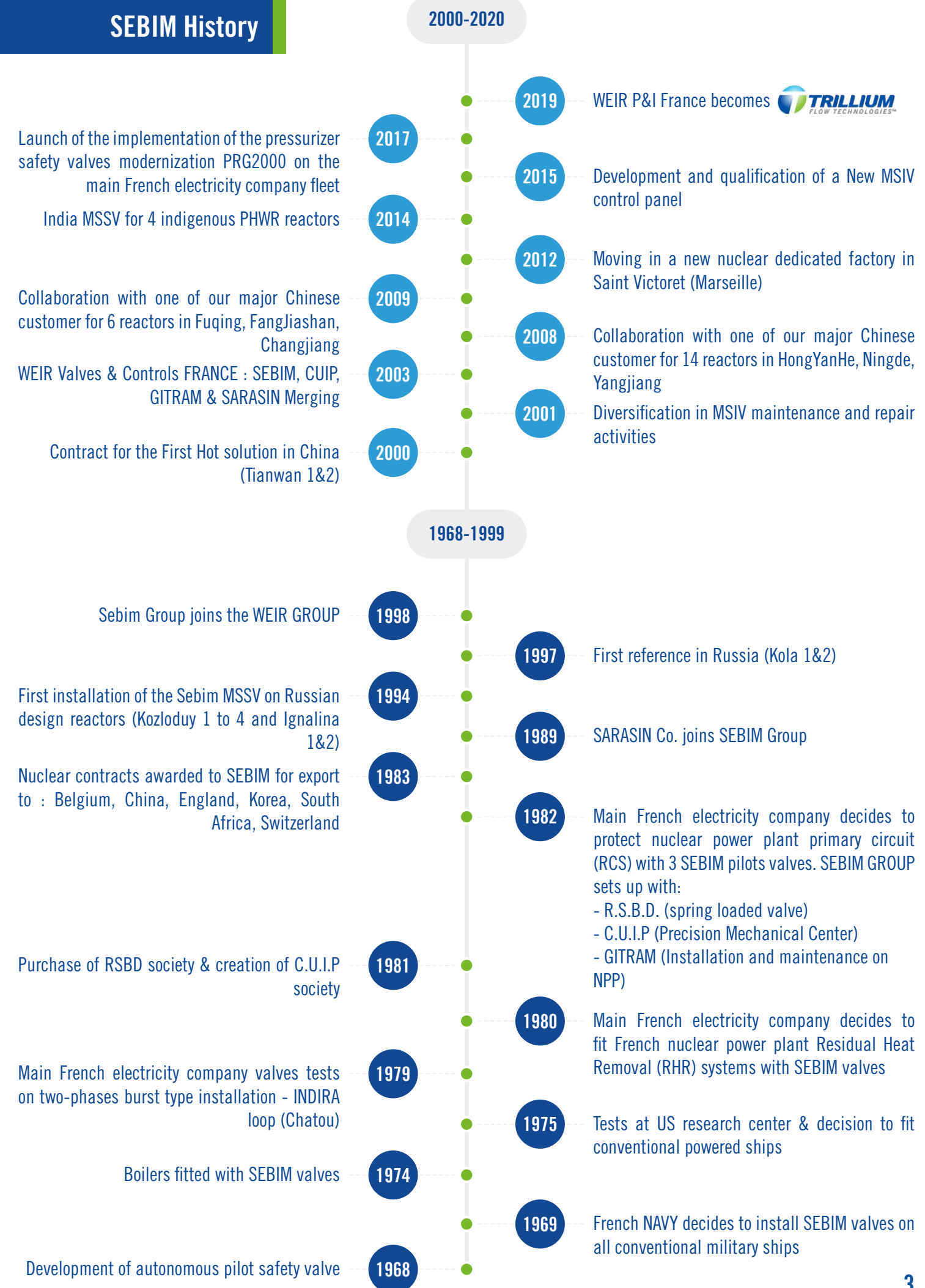


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 **TRILLIUM**
FLOW TECHNOLOGIES™

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SEBIM History



Sarasin-RSBD History



Benefits of SEBIM® Products

For more than 50 years, SEBIM® nuclear pilot operated safety valves have provided high and low overpressure protection on liquid, steam, gas and steam/water mix applications in all types of nuclear reactors (PWR, BWR, CANDU, PHWR, RBMK LWGR, HTGR, etc.)

SEBIM® NUCLEAR PILOT OPERATED SAFETY VALVES BENEFITS :

- › Large temperature range of application
- › Accuracy of pilot set pressure value with repeatability better than 1%
- › Low or high pressure in-situ test during operation for preventive maintenance
- › Perfect stability even when flow capacities are well below the maximum rate
- › No erosion of sealing faces, no chattering and reduced maintenance
- › Non-flowing pilot valve minimises mechanism's rate of ageing
- › Proven perfect reliability
- › Compact design, reduced size and weight
- › Interfaces (upstream & downstream pipes) customized to special specifications



TSV 2000 - TANDEM SAFETY VALVE

Sizes

4" x 6" or 6" x 2*6"
(N4 stage version with 6" double outlet)

Pressure

From 10 to 20 MPa (1450 to 2900 PSI)

Temperature

High Temperature Applications up to 360°C (680° F)

Applications

- › Primary circuit

Features and Benefits

- › Unique design for redundant safe closure in over pressure protection of cooling circuits

CSSV 3000 - COMPACT SINGLE SAFETY VALVE

Sizes

DN 100 – DN 400 (4" - 16")

Pressure

From 1 to 40 MPa (145 to 5800 PSI)

Temperature

High Temperature Applications up to 600°C (1100° F)

Applications

- › On all type of nuclear reactors (PWR, BWR, CANDU, PHWR, BMK LWGR, HTGR, etc.)
- › RCS / RHR overpressure protection

Features and Benefits

- › Qualified for inside & outside reactor containment
- › Safety functions during accidental conditions (Feed & bleed)
- › Excellent operation whatever the type of medium : steam, gas, liquid or two phases
- › Prevent LOCA (Loss of Coolant Accident)



PRG 2000 - TANDEM SAFETY VALVE

Sizes

4" x 6" or 6" x 2*6"
(N4 stage version with 6" double outlet)

Pressure

From 10 to 20 MPa (1450 to 2900 PSI)

Temperature

High Temperature Applications up to 360°C (680° F)

Applications

- › Primary circuit

Features and Benefits

- › Unique design for redundant safe closure in over pressure protection of cooling circuits
- › PRG2000 valves are able to stay opened at very low pressure (8 bars) in emergency situation (feed and bleed)



CTSV 3000 - COMPACT TANDEM SAFETY VALVE

Sizes

DN 100 – DN 400 (4" - 16")

Pressure

From 1 to 40 MPa (145 to 5800 PSI)

Temperature

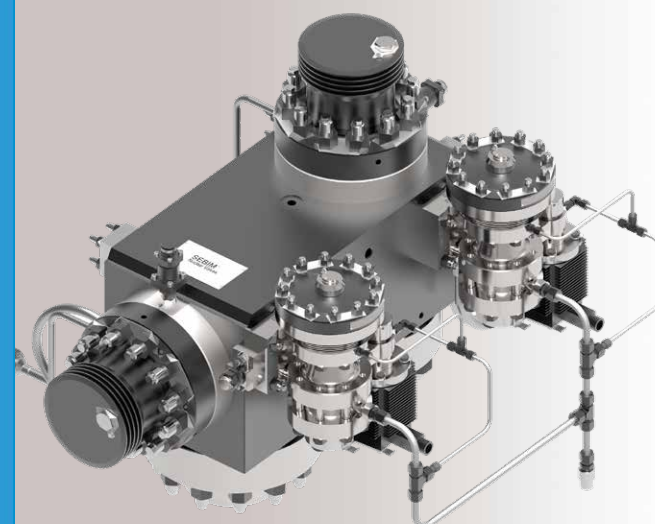
High Temperature Applications up to 600°C (1100° F)

Applications

- › On all type of nuclear reactors (PWR, BWR, CANDU, PHWR, RBMK LWGR, HTGR, etc.)
- › High & low pressure overpressure protection on steam, water, gas or mixture lines

Features and Benefits

- › Qualified for inside & outside reactor containment
- › Safety functions during accidental conditions (Feed & bleed)



DSM 3000 - SMALL SIZE REACTOR SAFETY VALVE

Sizes

DN 15 – DN 65 (½" - 2 ½")

Pressure

From 1 to 20 MPa (145 to 2900 PSI)

Temperature

High Temperature Applications up to 600°C (1100° F)

Applications

- › On all type of nuclear reactors (PWR, BWR, CANDU, PHWR, RBMK, LWGR, HTGR, etc.)
- › SMR primary and secondary coolant safety valves

Features and Benefits

- › Leak tightness up to the set-pressure minimises the mechanism's rate of ageing
- › Qualified for inside & outside reactor containment
- › Safety functions during accidental conditions (Feed & bleed)



STARFLOW®

Sizes

15mm to 400mm (1" to 16")

Pressure

Up to 431 barg (6251 PSIG)

Temperature

270°C to 538°C (454°F to 1000°F)

Applications

- › Suitable for all types of nuclear reactors (PWR, BWR, CANDU, PHWR, RBMK, LWGR, HTGR, SMR, etc.)
- › High and low pressure overpressure protection on steam, water and gas lines
- › Nuclear Steam Supply System (NSSS) and balance of nuclear island

Features and Benefits

- › Full lift
- › Semi or full nozzle design
- › Metal or soft seat
- › Cast or forged body
- › Carbon, alloy or stainless steel
- › Flanged, threaded, and welded connections
- › Available with a damping system to prevent acoustic vibration phenomena in liquid (alternative to hydraulic dampers)



GVG 3000 - SUPER COMPACT STEAM GENERATOR SAFETY VALVE

Sizes

DN 100 – DN 400 (4" - 16")

Pressure

From 1 to 20 MPa (145 to 2900 PSI)

Temperature

High Temperature Applications up to 600°C (1100° F)

Applications

- › Steam generator safety valves for PWR, VVER, EPR & CANDU
- › Flow rate up to 1600t/h (saturated steam)

Features and Benefits

- › Forged body carbon steel - Special material upon request
- › Leak tightness up to the set-pressure minimises the mechanism's rate of ageing
- › Soft opening/closing decreases load on surrounding equipment



9 SERIES (WITH FORGED BODY)

Sizes

15mm to 40mm (½" to 1 ½")

Pressure

Up to 431 barg (6251 PSIG)

Temperature

196°C to 400°C (320°F to 752°F)

Applications

- › Suitable for all types of nuclear reactors (PWR, BWR, CANDU, PHWR, RBMK, LWGR, HTGR, SMR, etc.)
- › High and low pressure overpressure protection on steam, water and gas lines
- › Nuclear Steam Supply System (NSSS) and balance of nuclear island

Features and Benefits

- › Full lift
- › Semi or full nozzle design
- › Metal or soft seat
- › Cast or forged body
- › Carbon, alloy or stainless steel
- › Flanged, threaded, and welded connections
- › Available with a damping system to prevent acoustic vibration phenomena in liquid (alternative to hydraulic dampers)



STARSTEAM®

Starsteam® uses the large experience return on SEBIM® pilot operated pressure relief valves technology :

- › **No wearing, jamming** : Thermoglide™ guiding, meaning no metal contact in between the disc-holder (piston) and the guide. This unique design eliminates friction i.e. potential wearing, jamming
- › **Response time improvement** : The use of the Thermoglide™ rings improves response times of the valve in both the opening and closing direction
- › **Avoid leakage** : Stardisc™ is a proven reliable disc design combined with key materials. The lip of the disc guarantees the perfect tightness due to its flexibility in steam
- › **Reliable reseating** : a spindle loading point lower than the seating surface guarantees repeated and accurate positioning of the disc i.e. a repeatable leaktightness



Other Trillium Flow Technologies™ partners with nuclear projects throughout their operational lifecycles

- | ATWOOD & MORRILL®
- | BATLEY VALVE®
- | BLAKEBOROUGH®
- | HOPKINSONS®
- | TRICENTRIC®

Certifications and Map



Services and Training

SPECIAL TOOLS

- › Mobil Adjustment and Testing System (MATS) uses latest version of software and highest equipment standard in order to maintain our piloted safety valves
- › Operational setting verification can be done on line with or without pressure in the protected system
- › Set pressure checking report is done automatically

SERVICES AND TRAINING

- › Worldwide support for onsite service, annual outage and maintenance
- › Life extension upgrade and expansion
- › Training for Trillium France valves servicing
- › Training for expert in system design



VENDIN-LE-VIEIL PREMISES

- › ISO 9001
- › ISO 14001
- › OHSAS 18001
- › RCC- M Class 2 & 3 valves
- › ASME I & VIII (UV stamp)
- › HAF604 China

SAINT-VICTORET PREMISES

- › ISO 9001
- › ISO 14001
- › OHSAS 18001
- › RCC-M Class 1,2,3 valves
- › TSSA N285.0 / CSA Z299.2
- › ASME Sect III, Div. 1 class 1 to 3: Certificates of Authorization “NV”, “NPT” & MO
- › HAF604 China



Over
160
reactors worldwide

Over
1,500
nuclear valves delivered

Over
30,600
reactor year's experience



Trillium Flow Technologies France SAS

SEBIM®

106 Boulevard Paul Raphel
13730 Saint Victoret, France
+33 442 070 095
Nuclearsales.eu@trilliumflow.com

Sarasin-RSBD®

Rue Jean Baptiste Grison Z.I du Bois Rigault
62880 Vendin-Le-Vieil, France
+33 442 070 095
Nuclearsales.eu@trilliumflow.com

