

SULZER

Sulzer Pumps

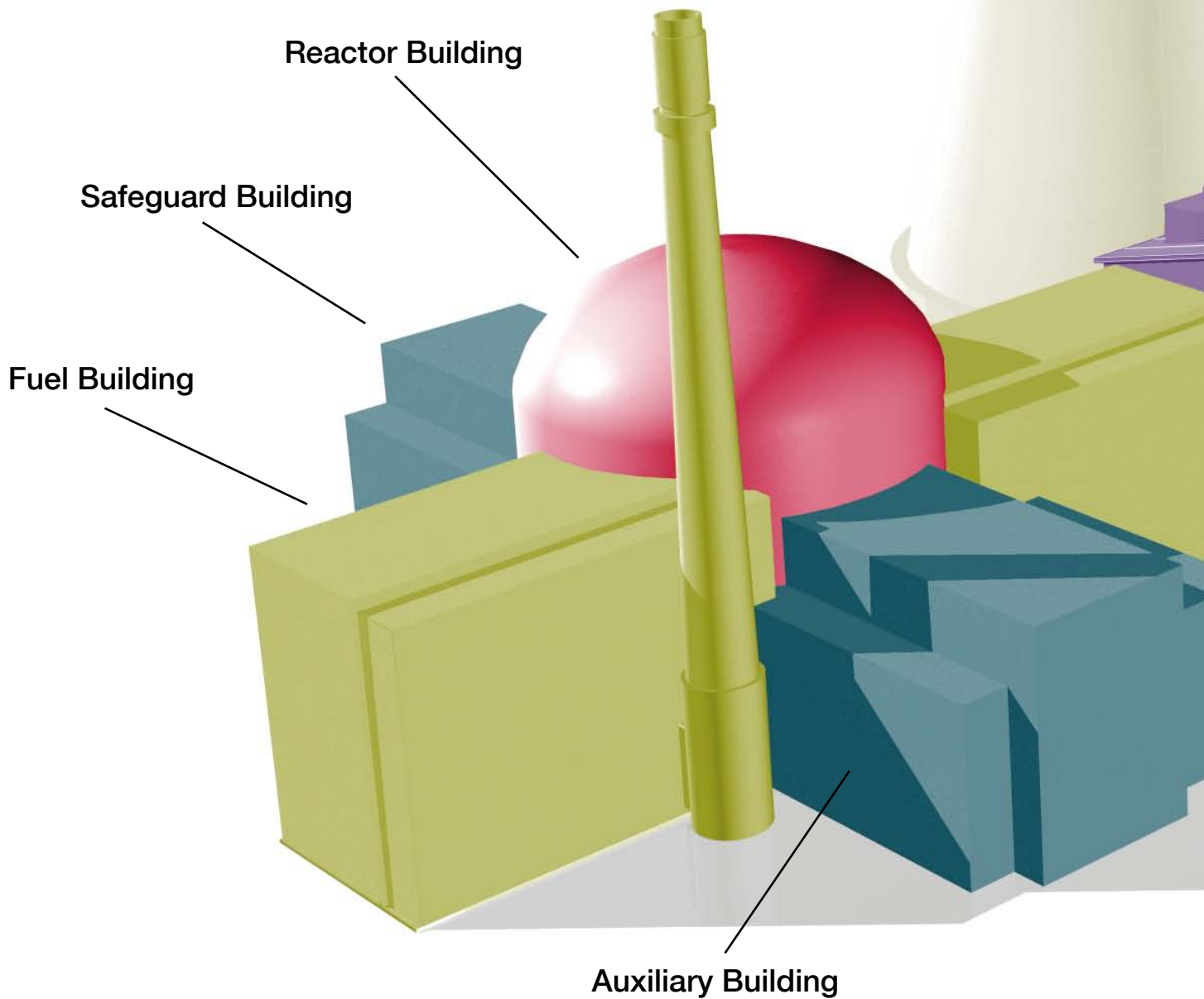
Your Partner for the Nuclear Power Industry



The Heart of Your Process

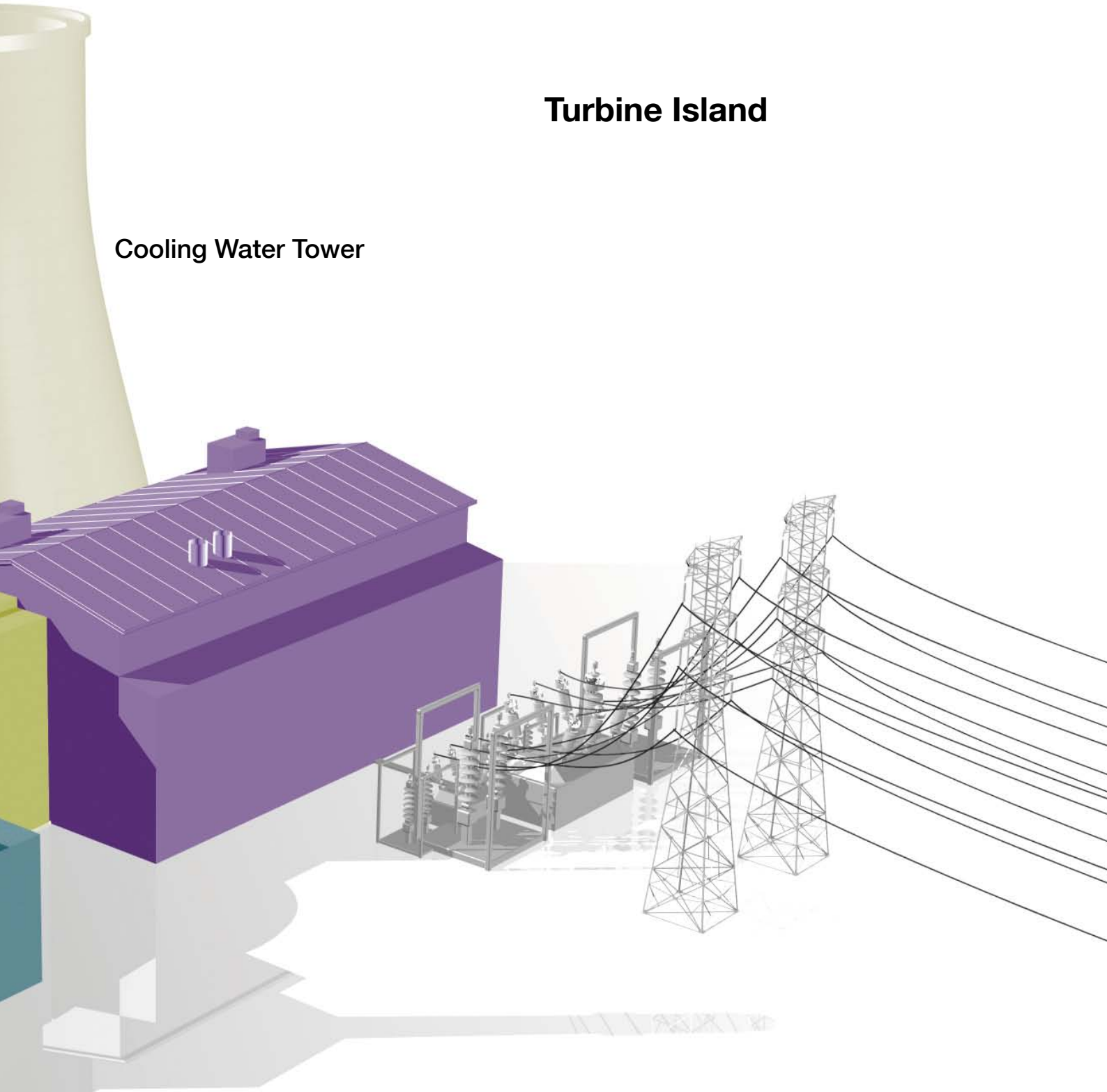
Sulzer Pumping Solutions for Nuclear Power Generation

Nuclear Island



Turbine Island

Cooling Water Tower





Experience and Solutions You Can Rely on

Nuclear power generation produces the energy for the future. Sulzer Pumps supports all processes in nuclear power plants with forward-looking pump technology. Innovative power plant concepts need to be able to rely on efficient and sustainable solutions. High performance, high availability and innovative pumping solutions support the requirements of operational safety and long life cycle.

Your needs drive our engineers to develop a solution that suits you best. With our research centers and advanced engineering we support you in selecting the customized pump solution. We are your single source for research, development, project management and service.

Understanding Your Process

Choosing Sulzer Pumps, you have the one-interface supplier advantage of our comprehensive portfolio, which meets all process requirements in a nuclear power plant. From a single pump to a total system solution, we work closely with you to develop the optimum pump solution. We focus on delivering efficient and safe equipment to the major processes of a nuclear island, such as:

- **Chemical and Volume Control System**
- **Containment Heat Removal System**
- **Safety Injection/Residual Heat Removal System**
- **In-containment Refueling Water Storage System**
- **Emergency Feed Water System**
- **Component Cooling Water System**
- **Essential Service Water System**
- **Extra Borating System**
- **Fuel Pool Cooling System**
- **Auxiliary Systems**

About Sulzer Pumps

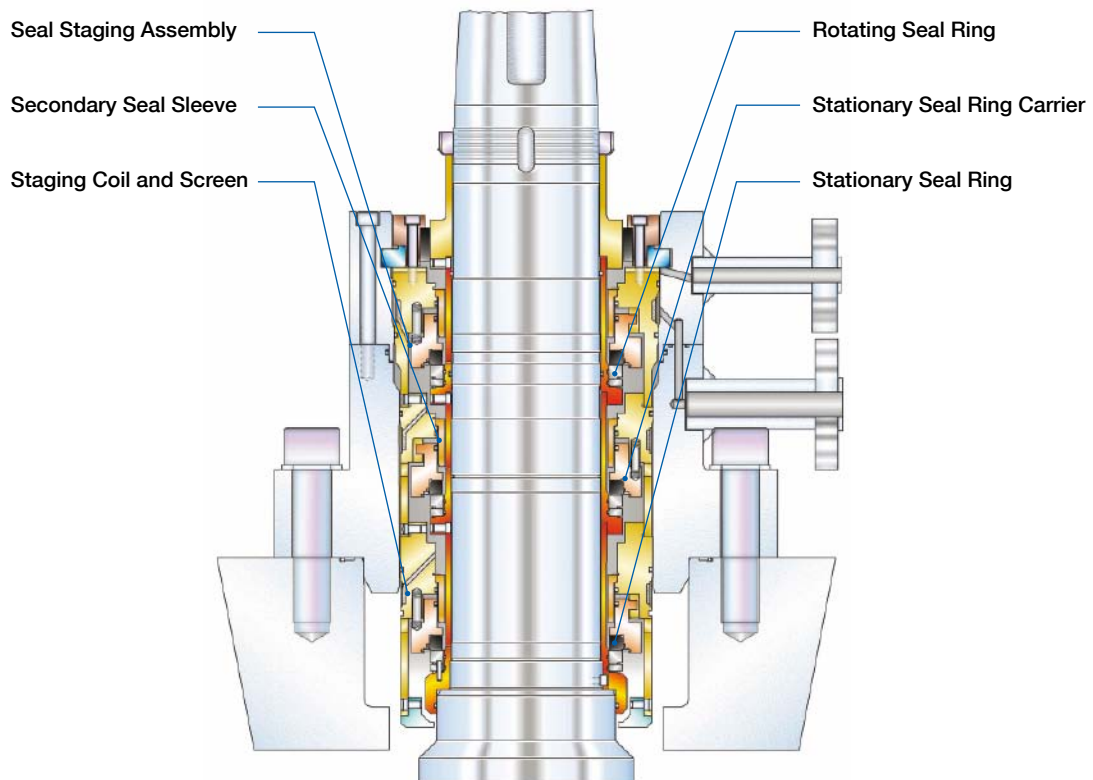
Sulzer Pumps is recognized for state-of-the-art product quality, performance reliability and technical innovation. We provide a full line of pumps, equipment and related technologies to the Oil and Gas, Hydrocarbon Processing, Power Generation, Pulp and Paper, Water and Wastewater and General Industries. Combining global capabilities, local market understanding and application expertise we support customers with more than 150 locations around the world, including manufacturing facilities, sales offices and service centers close to our customers.



Reactor Coolant Pump Reliability

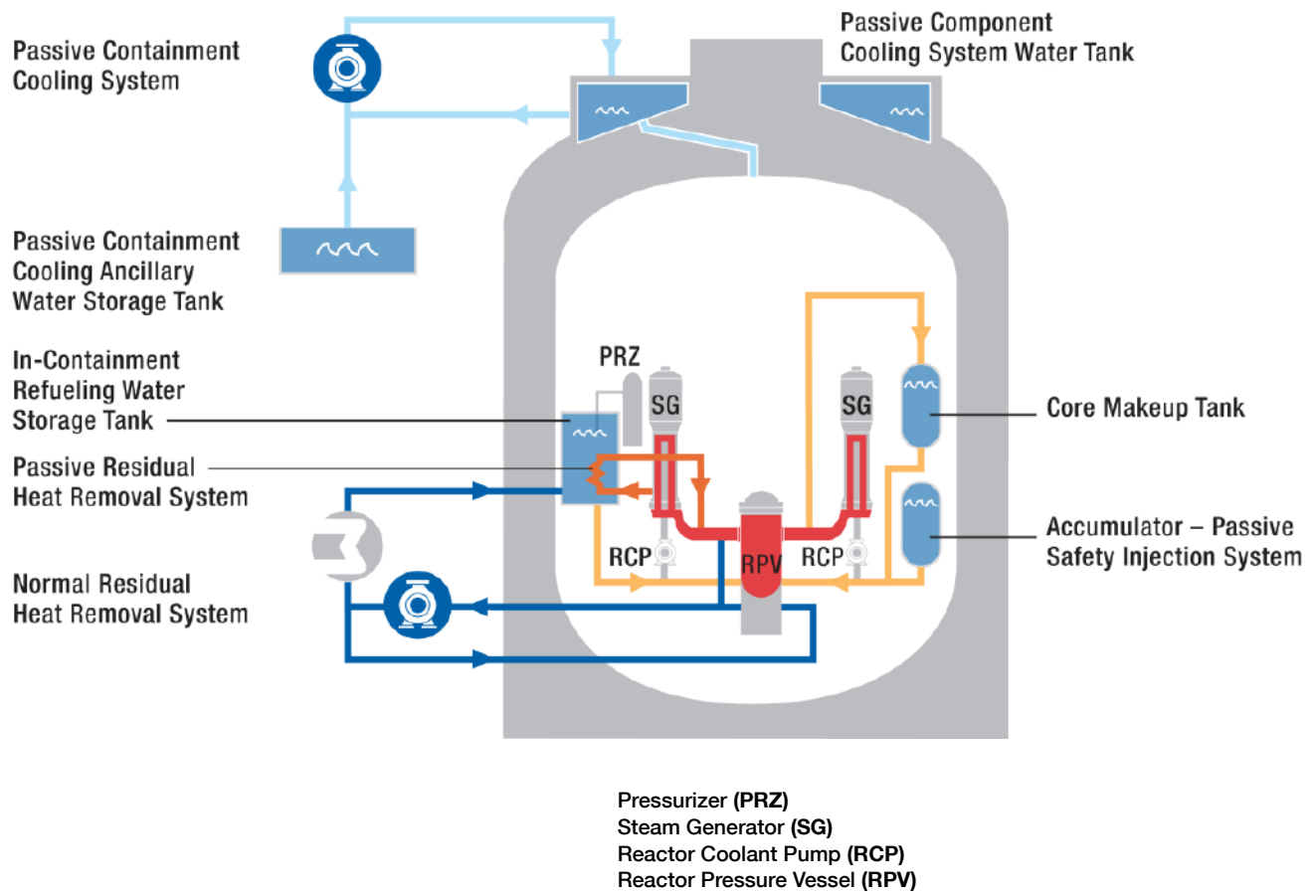
Safe operation and plant reliability is the key focus of the nuclear power generation industry. Main coolant pump seal performance is the core component responsible for the availability of reactor coolant pumps.

The Sulzer Balanced Stator™ seal is an ultra-high performance cartridge unit that provides lifespan and leakage control unmatched by conventional seals. Employing patented flexible stator geometry, the Sulzer Balanced Stator™ seal automatically compensates for pump shaft deflections. The seal installs as a single cartridge, controls leakage, and functions under all transients. The installation of the Balanced Stator™ seal requires a minimum of downtime. It is available for any reactor coolant or recirculation pump.

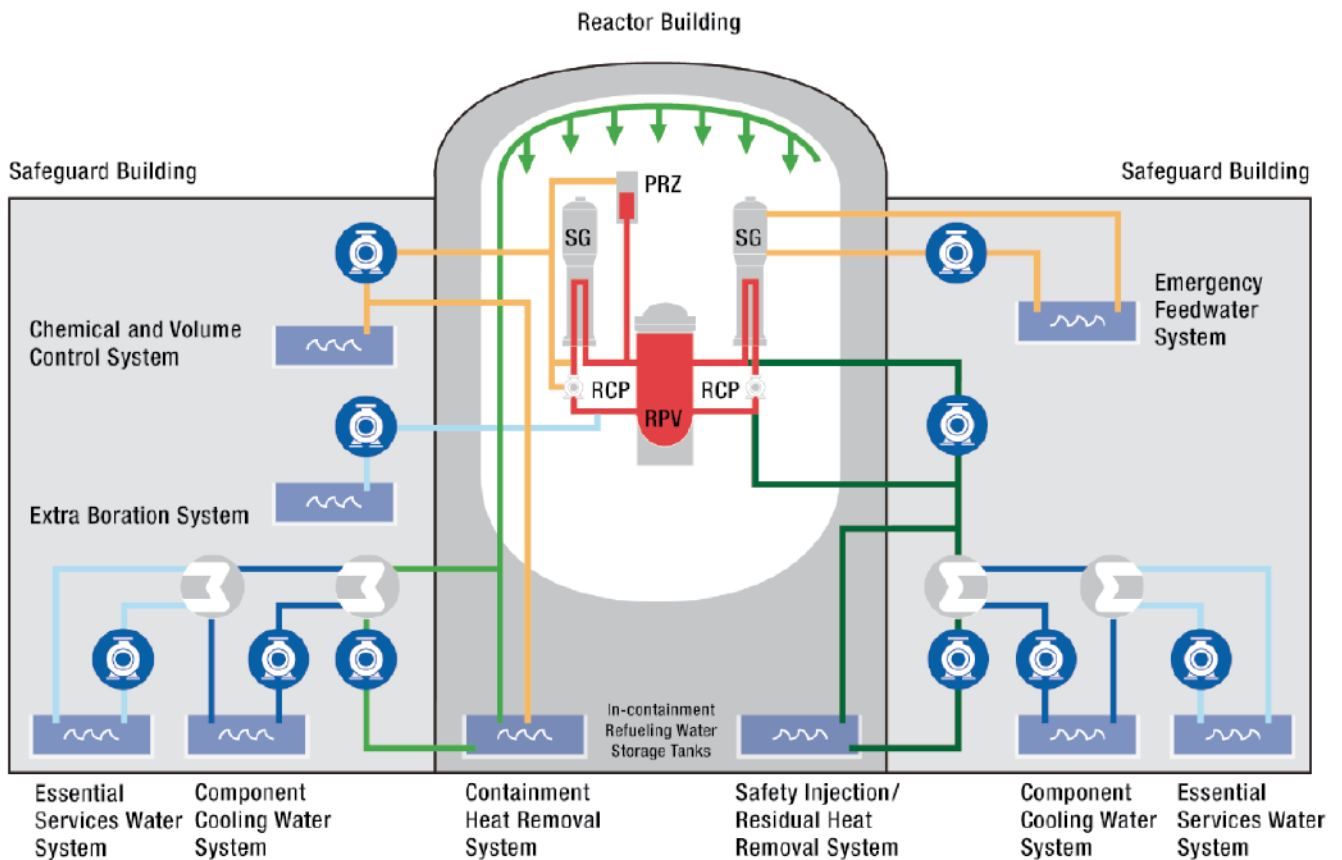




Advanced Pressurized Water Reactor



European Pressurized Water Reactor



Pressurizer (PRZ)
 Steam Generator (SG)
 Reactor Coolant Pump (RCP)
 Reactor Pressure Vessel (RPV)



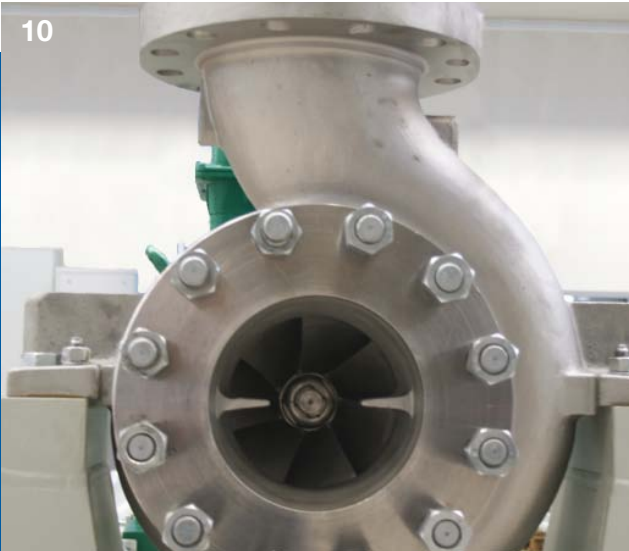
Applications and Pumps for the Nuclear Island

NUCLEAR ISLAND SYSTEMS					
Pump Design	Chemical and Volume Control	Containment Heat Removal	Safety Injection/ Residual Heat Removal	In-containment Refueling Water Storage	Emergency Feed Water
Overhung		ZFn		ZFn	
Multistage Barrel Vertical	GVG				
Multistage Barrel			GSG/CP		GSG/CP
Multistage Axially Split					MSD
Pump Design	Component Cooling Water	Essential Service Water	Extra Borating	Fuel Pool Cooling	Other
Overhung		ZAPn/REL	ZFn	ZFn	ZFn / ZF
Double Suction Radially Split	HZB/REL		REL		



Applications and Pumps for the Turbine Island

TURBINE ISLAND SYSTEMS					
Pump Design	Feed Water	Booster	Cooling Water	Condensate Extraction	Auxiliary
Double Suction	HPTd	HZB			
Vertical Can				SJD (CEP)	
Vertical Turbine			SJT/SJM		
Overhung					A/APP/CPT/ZE
Double Suction Axially Split					SMN/ZPP



Nuclear Island Pumps

GSG/GVG

GSG radially split barrel casing pumps are used in nuclear services such as Safety Injection and Emergency Feed Water Systems. Their design is optimized for synchronous speed direct drive applications. The entire cartridge is removable for quick assembly and maintenance.

The vertical version, the GVG, is primarily used in Chemical and Volume Control Systems.

Pressure 250 bar / 3,625 psi

Temperature 250 °C / 480 °F

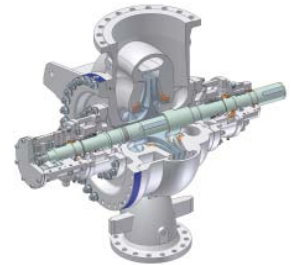


HZB

HZB pumps are designed for hot water services in Component Cooling Water Systems. Their design is optimized for pumping hot water with relatively low NPSH available. The rugged design ensures the long term reliable operation.

Pressure 48 bar / 700 psi

Temperature 210 °C / 410 °F

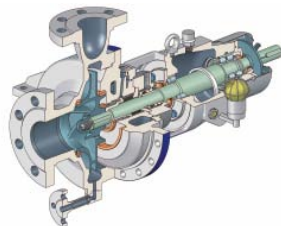


ZF/ZFn

ZF/ZFn end suction pumps are a modular construction design. Manufactured in two casing pressure ranges with over 50 sizes and six bearing frames, ZF/ZFn pumps are used in Fuel Pooling Cooling Systems, In-containment Refueling Systems, and Extra Borating Systems.

Pressure 60 bar / 870 psi

Temperature 250 °C / 480 °F

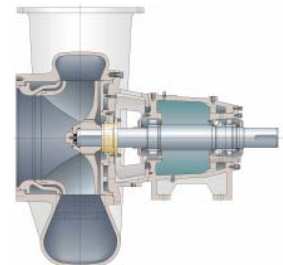


ZAPn

ZAPn pumps are used in Essential Service Water Systems. The pumps comply with extreme requirements on corrosion and wear resistance. Their design is a single stage, horizontal, radially split volute casing pump with back pull-out cartridge.

Pressure 16 bar / 230 psi

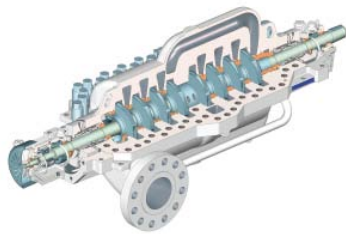
Temperature 80 °C / 180 °F





MSD

MSD multistage pumps are widely used in power generation applications, such as emergency feed water services. The broad range of standard hydraulics and mechanical design options ensure optimum fit to customers' duty requirements, using proven pre-engineered solutions. They are designed in accordance to ASME Class III, ND category. Axial thrust is compensated by back-to-back impeller configuration.

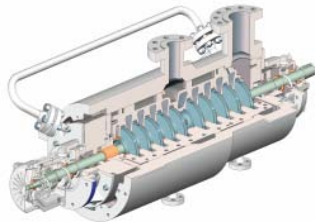


Pressure 310 bar / 4,500 psi

Temperature 200 °C / 400 °F

CP

CP axially split barrel casing pumps are used in the safety injection and residual heat removal system. This is particularly suited to low specific gravity applications where the back-to-back design and center bush provide natural axial balance and additional shaft support. These pumps also utilize the Sulzer high temperature Twistlock design.



Pressure 410 bar / 6,000 psi

Temperature 425 °C / 800 °F

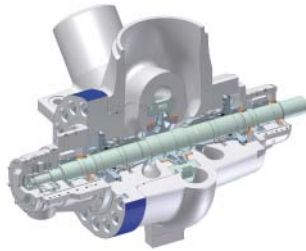


Turbine Island Pumps Feed Water

HPTd

HPTd pumps are specifically designed for boiler feed applications in nuclear power plants. These pumps are optimized to provide high efficiency operation over an extended period of time, reducing operation and maintenance costs. High availability and robust construction makes them suitable for cyclic operation.

Pressure 150 bar / 2,175 psi
Temperature 210 °C / 410 °F



Condensate Extraction

SJD (CEP)

SJD pumps for condensate extraction (CEP) are ideal for applications where NPSHa is limited. The pumps are used in a wide range of applications from simple industrial booster pumps to high pressure condensate return and heater drain pumps in power plants.

Pressure 50 bar / 725 psi
Temperature 100 °C / 210 °F

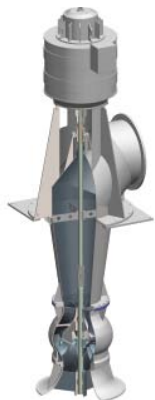


Cooling Water

SJT

The SJT vertical turbine range offers incredible flexibility due to an extensive range of standard features. These include oil, grease, product or flushed bearing lubrication, sealing plans for all liquids above or below ground discharge and a wide range of materials of construction. SJT pumps can be supplied to comply with ASME, Class III and Class VII standards.

Pressure 40 bar / 570 psi
Temperature 85 °C / 185 °F





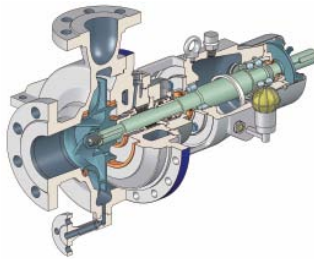
Auxiliary Pumps

ZE

The ZE end suction industrial process pumps are a modular construction design. Manufactured in two casing pressure ranges with over 50 sizes and six bearing frames, ZE pumps are used in auxiliary applications in the Turbine Island.

Pressure 40 bar / 580 psi

Temperature 250 °C / 480 °F



CPT

The CPT pump is designed for continuous operation in the power generation industry for pumping clean, abrasive or corrosive liquids. It is ideal for auxiliary services.

**Pressure 16 bar (25 bar) /
230 psi (360 psi)**

Temperature 260 °C / 500 °F

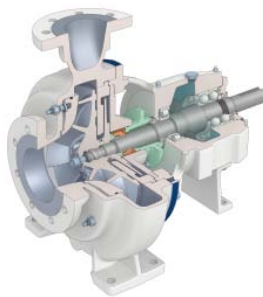


AHLSTAR

AHLSTAR and APP pumps are designed for pumping clean, abrasive or corrosive liquids. If the liquid contains gas or air the pump can be modified with either internal or external gas removal construction which stabilizes the operation. The Sulzer Dynamic Seal is specially designed for difficult liquids offering reliable operation and low total sealing costs.

Pressure 16 bar / 230 psi

Temperature 180 °C / 355 °F



ZPP

ZPP double suction, axially split pumps are designed for cooling water services in power plants and other industries requiring low pulsation and high efficiencies.

Pressure 10 bar / 150 psi

Temperature 120 °C / 250 °F





Sulzer Pumps Germany, Bruchsal

Our Manufacturing Network

Sulzer Pumps US, Portland

This facility is a leading N-Stamp producer of engineered pumps for the Nuclear and Turbine Island. It contains state-of-the-art manufacturing processes, machine tools, and test facilities for the production of single and multistage pumps.

Sulzer Pumps US, Houston

This facility specializes in the design, manufacture, and test of vertical pumps used for cooling water and condensate extraction services in the Turbine Island.

Sulzer Pumps Brazil, Jundiai

This facility is focusing on the supply of a wide range of engineered and standard pumps for the Nuclear Island.

Sulzer Pumps UK, Leeds

This facility is a leading manufacturer of engineered pumps focusing on the Turbine Island with state-of-the-art manufacturing facilities including world-class testbeds with full string and hot test capabilities.

Sulzer Pumps Headquarters, Winterthur

Sulzer Pumps France, Mantes

This facility supplies engineered pumps focusing on pump solutions for the Turbine Island. The facility is equipped with one of the largest pump test beds in Europe and specializes in supplying high energy boiler feed pump packages to the world's major power plant turn key contractors.





Sulzer Pumps China, Suzhou

Sulzer Pumps Germany, Bruchsal

This facility is an internationally recognized and experienced manufacturer and service partner for pre-engineered and engineered pumps with focus on the applications for the Nuclear and Turbine Island.

Sulzer Pumps Finland, Karhula

This facility manufactures pre-engineered pumps focusing on the auxiliary services in the Nuclear and Turbine Island. It contains state of the art manufacturing processes and machining tools.

Sulzer Pumps China, Dalian

This facility has complete pump manufacturing capabilities starting with pattern production, through component making, assembly, performance testing, painting and final packaging for the Nuclear and Turbine Island.

Sulzer Pumps China, Suzhou

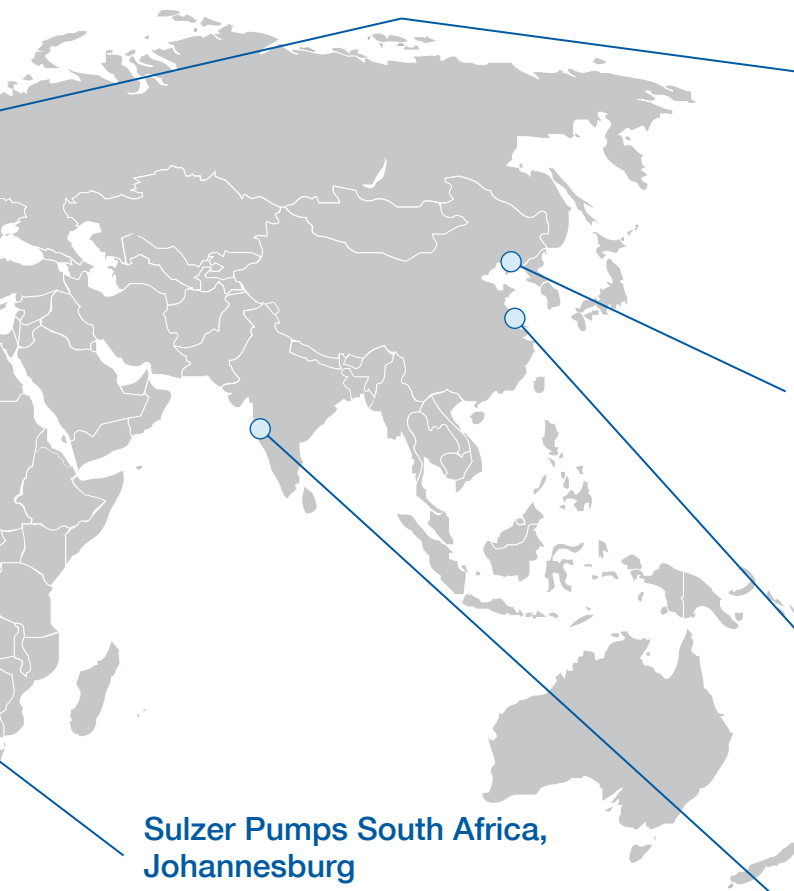
This facility is part of our global production network and is manufacturing pumps for the Nuclear and Turbine Island. The factory has a total shop-floor area of 13,500 m² and is equipped with hot water test field.

Sulzer Pumps South Africa, Johannesburg

This facility specializes in the production of engineered and standard pumps for the Turbine Island, relying upon proven technology, mainly for the local and Africa markets.

Sulzer Pumps India, Navi Mumbai

This facility is one of our main locations for export within our manufacturing network. This factory produces pumps and systems for the Nuclear and Turbine Island.



www.sulzerpumps.com



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