NUCLEAR POWER PLANT WATER TREATMENT

Integral solutions, powered by Dow.
Enhance safety, efficiency and productivity.

For decades, innovative technologies from Dow have purified the water that drives the turbines in generators producing the power communities need worldwide.

Today, as challenges in generating power are growing along with the demand, Dow is helping to ensure reliable operation and improve worker safety in nuclear power plants of every type. With world-class innovation and quality in water treatment technologies, along with local expertise and global experience, we offer products that can help protect your assets, increase efficiencies and keep your plant running optimally.

We work closely with utilities, service providers and equipment manufacturers to provide integrated solutions in applications that include:

- Primary Loop Chemistry (CVCS)
- Make-up Water Treatment System
- Steam Generator Blowdown
- Condensate Polishing
- Stator Cooling Water
- Cooling Water Make-up
- Cooling Tower Blowdown
- Fuel Pool
- Rad Waste
- Reactor Coolant Purification
Technologies that treat water better.

Ultrafiltration

Ultrafiltration (UF) removes colloids, particles and bacteria in a continuous system, helping to deliver higher reliability and lower maintenance with a smaller system footprint. An excellent choice as a pretreatment for downstream units like reverse osmosis (RO), UF helps to reduce the impact of poor or variable make-up water on boiler and cooling system management.

**Recommended Products**
- DOW IntegraFlux™ SFP-2880XP Module
- DOW™ Ultrafiltration SFP-2880 Module
- DOW IntegraPac™ IP-77XP Skid
- DOW IntegraPac™ IP-77 Skid

Reverse Osmosis & Nanofiltration

RO and nanofiltration (NF), using sustainable Dow technologies, offer an excellent balance between efficient contaminant removal, demineralization, reliability and cost-effectiveness. Dow’s elements remove a broad range of molecules and ions helping to minimize scaling, fouling-causing components and ions from the steam cycle; increase the number of cooling tower cycles; and facilitate the use of alternative water sources to address water scarcity challenges.

**Recommended Products**
- DOW FILMTEC™ brackish and seawater elements, especially:
  - DOW FILMTEC™ ECO Elements
  - DOW FILMTEC™ FORTILIFE Elements

Ion Exchange

Ion exchange (IX) resins efficiently remove ionic impurities, producing softened, partially or fully demineralized water, up to ultrapure water quality. IX resins can be highly specialized to remove a narrow or wide range of contaminants.

Dow’s resins, particularly our nuclear-grade ion exchange resins, are trusted in nuclear power plants worldwide for specific applications, from make-up water and condensate polishing to rad waste and fuel cleanup.

**Recommended Products**
- AMBERLITE™ Ion Exchange Resins

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Dow Water Treatment Technologies for Boiling Water Reactors

DID YOU KNOW?
Nuclear range nuclear-grade resins offer 20% longer resin life, compared to standard SGBD resins, reducing replacement cost in SGBD.

DID YOU KNOW?
Plants can extend the life of fuel pool resin with lower sulfate levels by using AMBERLITE™ IRN170 resins.
MAKE-UP WATER TREATMENT SYSTEM
- Help reduce corrosion, scale, fouling and other asset-limiting concerns in reactors, steam generators and cooling towers.
- Safeguard equipment with one of the widest ranges of products for pretreating (UF), demineralizing (RO and IX) and polishing (IX) make-up water, in a design configuration that helps address your needs.
- Dow has integrated solutions for your water environment, including source, condition and availability.

CONDENSATE POLISHING PLANT
- Improve plant reliability by protecting critical components, such as reactors and turbines.
- Dow IX resins are suitable for deep beds or powdered resin beds to remove dissolved impurities such as silica oxides and sodium, and suspended matter such as iron oxide particulates from corrosion, as well as other contaminants.

RADIOACTIVE WASTE, SPENT FUEL POOL AND REACTOR COOLANT PURIFICATION
- Help ensure the quality and clarity of reactor water, fuel pool water, and re-use or discharged water utilizing IX technologies.
- Dow nuclear-grade IX resins offer excellent water purity.

STATOR COOLING WATER
- Prevent corrosion of stator bars to help prevent failure of the generator.
- Use a mixed bed polisher to remove soluble contaminants.

COOLING TOWER BLOWDOWN
- Recover and return up to 90% of blowdown water for make-up.
- Reduce water usage and costs, while complying with regulations more cost-effectively.
- Combine UF, RO and NF for solutions tailored to help address your needs.
Dow Water Treatment Technologies for Pressurized Water Reactors

- Ultrafiltration can help reduce RO cleaning by 30% compared to media filters.

DID YOU KNOW?

Resin analysis can measure resin condition and troubleshoot problems like extended rinsedowns or elevated connectivity.
The resources to run optimally.

Dow provides the support you need to operate productively and minimize unscheduled outages. From the stability of manufacturing on a global scale to technical expertise in addressing challenging conditions and situations, we are here to help – with systems design, field support, plant optimization and more.

Technical support
Our technical service and development specialists can work with you at any point in the design and operation of your plant in order to optimize performance; from water quality evaluation and system design consultation with our Water Application Value Engine (WAVE) design software, to monitoring and analyzing operational data, to troubleshooting and problem solving.

Research and development
Dow has been a partner to the nuclear power industry for decades, with a history of innovations in IX and membrane technologies that have driven key improvements in safety, productivity and efficiency. Our global R&D capabilities allow us to address specific local water conditions and requirements, with a holistic focus on water quality and component-based design and research, providing improved performance.

Powering performance worldwide.

With a large global manufacturing footprint, strong R&D expertise and technical support services and systems, we supply high market volumes with high quality. Dow partners with you, our customer, to understand unmet needs and develop tailored solutions.
**MAKE-UP WATER TREATMENT SYSTEM**
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- Dow IX resins are suitable for deep beds or powdered resin beds to remove dissolved impurities such as silica oxides and sodium, and suspended matter such as iron oxide particulates from corrosion, as well as other contaminants.

**PRIMARY AND CHEMICAL VOLUME CONTROL SYSTEM (CVCS)**
- Purify reactor coolant and control pH and B levels in a lithium and borate environment.
- Dow nuclear-grade IX resins are trusted worldwide as a first-class choice for nuclear power applications.

**RADIOACTIVE WASTE, SPENT FUEL POOL AND REACTOR COOLANT PURIFICATION**
- Help ensure the quality and clarity of reactor water, fuel pool water, and re-use or discharged water utilizing IX technologies.
- Dow nuclear-grade IX resins offer excellent water purity.

**STEAM GENERATOR BLOWDOWN**
- Minimize corrosion and reduce ionic hideout.
- Treat a high percentage of total steam generator flow with Dow nuclear-grade IX resins.

**STATOR COOLING WATER**
- Prevent corrosion of stator bars to help prevent failure of the generator.
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**DID YOU KNOW?**
High rejection RO elements can help reduce mixed bed regenerations by 50% without increasing operational pressure.