

Steam Power Generation

Sample Conditioning and Analysis Solutions



Biomass | Coal | Geothermal | Natural Gas | Nuclear | Petroleum | Solar



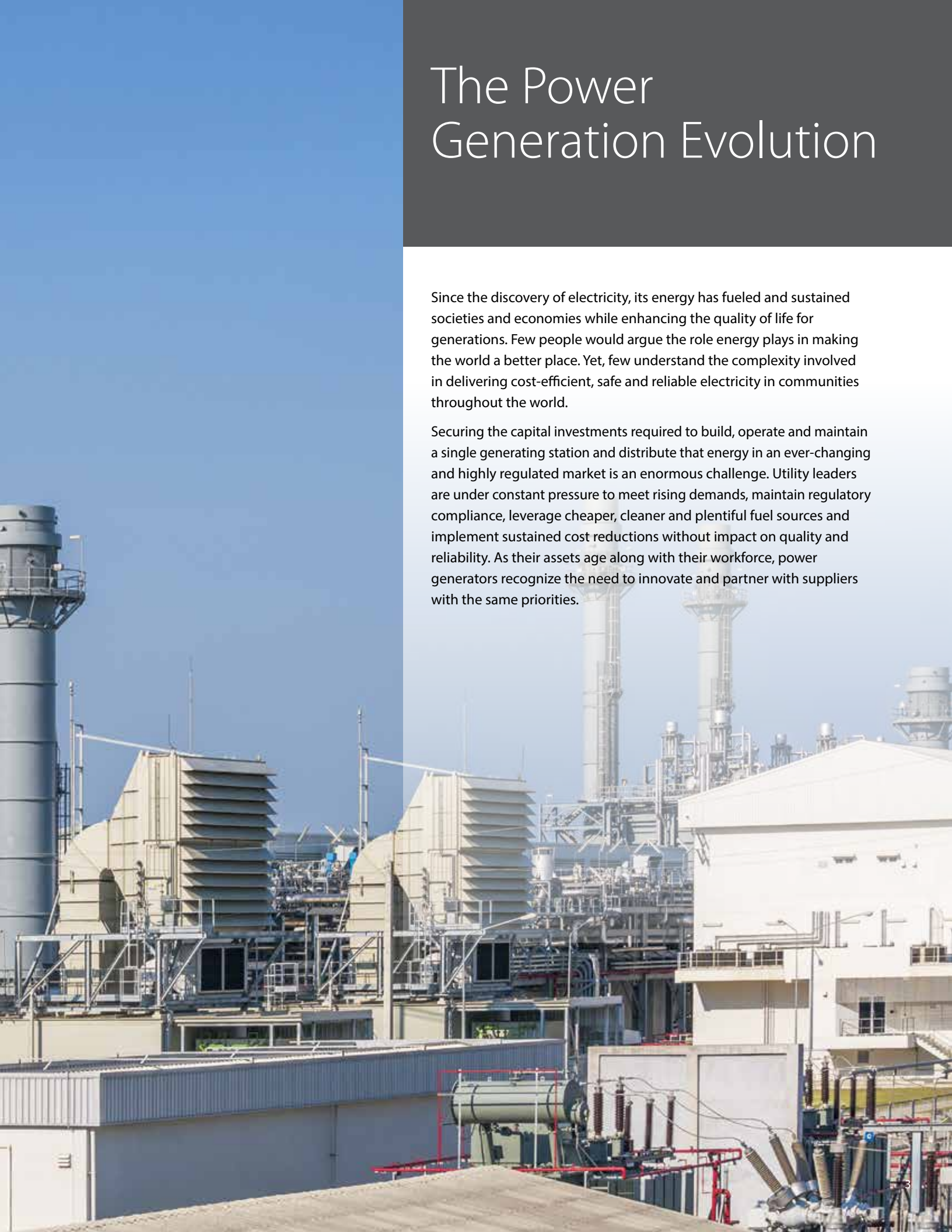
Sample. Monitor. Measure.

WITH PROVEN SAMPLING EXPERTISE SINCE 1924, Sentry® products and services provide power generators the critical insights to optimize processes and control corrosion. We deliver true representative sample conditioning and analysis techniques to customers around the globe, empowering them to accurately monitor and measure their water chemistry for improved production efficiency, output and safety.

The Power Generation Evolution

Since the discovery of electricity, its energy has fueled and sustained societies and economies while enhancing the quality of life for generations. Few people would argue the role energy plays in making the world a better place. Yet, few understand the complexity involved in delivering cost-efficient, safe and reliable electricity in communities throughout the world.

Securing the capital investments required to build, operate and maintain a single generating station and distribute that energy in an ever-changing and highly regulated market is an enormous challenge. Utility leaders are under constant pressure to meet rising demands, maintain regulatory compliance, leverage cheaper, cleaner and plentiful fuel sources and implement sustained cost reductions without impact on quality and reliability. As their assets age along with their workforce, power generators recognize the need to innovate and partner with suppliers with the same priorities.

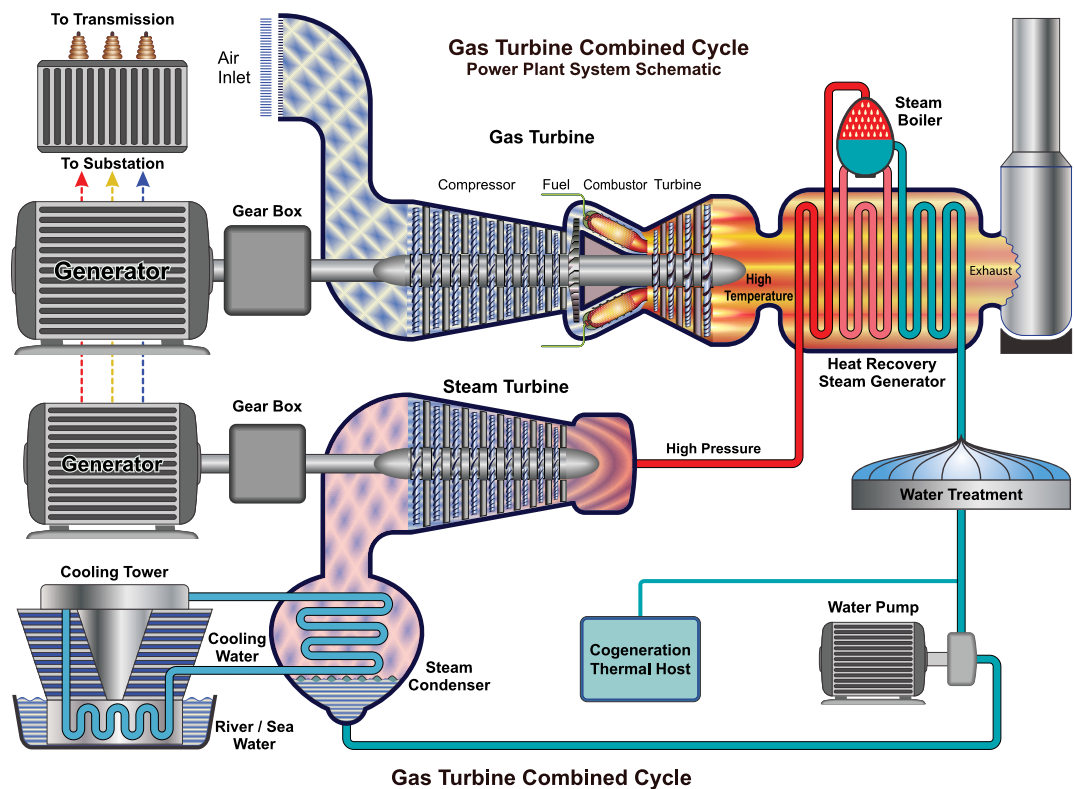


Water Chemistry Cycle Management



Across nearly all energy sources, water is an essential natural resource in generating power on a mass scale – at a public utility power station or at an independent industrial generating facility. Water withdrawal or intake from a local water source is converted to steam to turn turbines, used for cooling, and employed to transport fuel sources such as coal slurries. Because of the role water plays in the generation of electricity and its impact on plant assets, safety and the environment, water chemistry must be carefully monitored and managed.

As water passes through a conventional cycle or combined cycle power plant, generating reliable and cost-sustaining electricity is not possible without steam and water chemistry management to prevent corrosion and microorganism growth.



Protect Assets, Operators and the Environment

Steam and water conditioning and analysis systems provide the real-time data and critical insights needed to control and optimize water chemistry. From sample conditioning – temperature, pressure, flow rate – to analyzers that identify and quantify chemical properties, we enable leading energy companies worldwide to develop higher performing, safer processes and output while protecting their assets, operators and the environment.

Choose from one of our two industry-leading steam and water conditioning and analysis systems:

Sentry custom-engineered solutions or Waters Equipment pre-engineered solutions. These systems and components currently protect more power plants around the world than any other systems on the market.

The Sentry custom-engineered steam and water analysis systems meet the most demanding and unique customer requirements for leading energy companies worldwide.

Sample Conditioning and Analysis Systems	Sentry
Engineered to specifications	Custom-engineered
Sample conditioning automation	Available
Online analyzer automation	Multi-vendor integration
Nuclear post-accident sampling systems	Yes
Operator ergonomics	Advanced
International certifications	Yes
Installation services	Available
Startup and commissioning	Standard option
Warranty	18 months
ProShield Lifecycle Services	Guardian Service Agreements

The Waters Equipment pre-engineered steam and water analysis systems are a turnkey solution offered in North America for customers with more standard requirements.

Sample Conditioning and Analysis Systems	Waters Equipment
Engineered to specifications	Pre-engineered
Sample conditioning automation	Limited
Online analyzer automation	Multi-vendor integration
Operator ergonomics	Basic
Installation services	Available
Startup and commissioning	Bid upon request
Warranty	12 months
ProShield Lifecycle Services	Guardian Service Agreements



Robert
Employee-owner since 2011

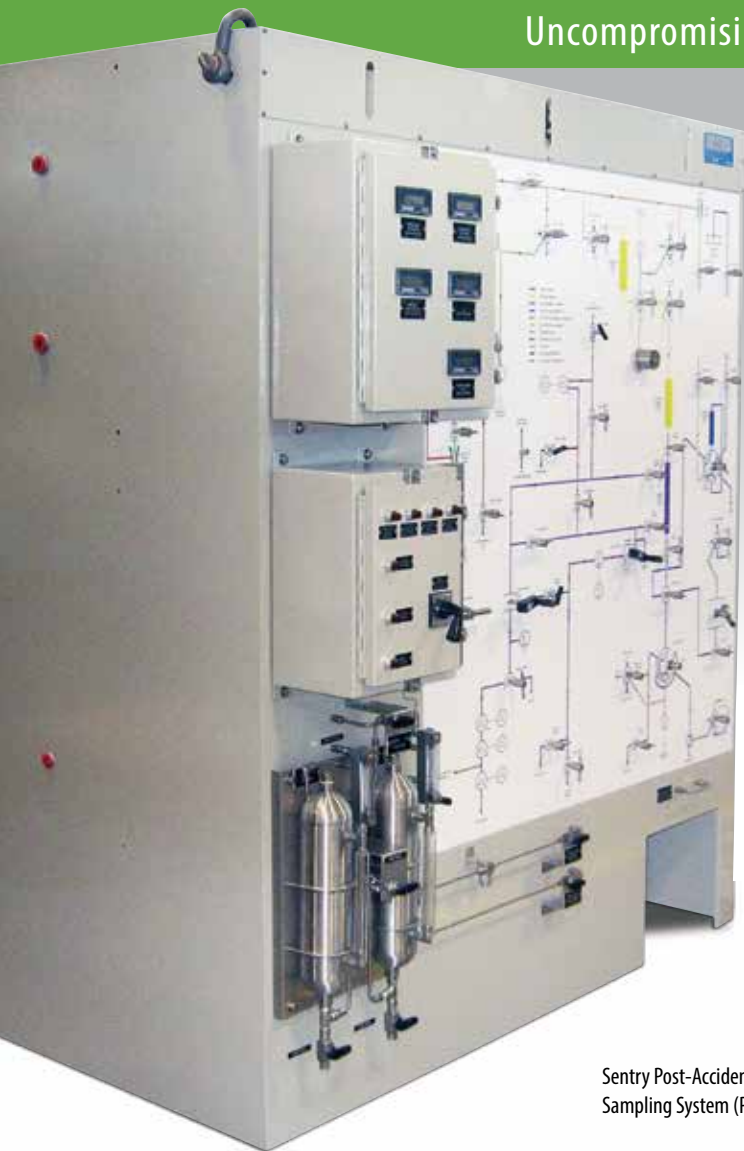
Water Chemistry Monitoring

- Maximize heat transfer efficiency
- Reduce chemical cleanings
- Protect boiler and turbine life
- Minimize operational costs
- Ensure operator safety





Uncompromising Safety in Nuclear Water Chemistry Sampling



Sentry Post-Accident
Sampling System (PASS)

Monitoring and measuring steam and water chemistry in a nuclear plant requires specialized systems to accommodate radioactive uranium during the nuclear fission process. The Sentry portfolio of high radiation steam and water analysis systems is specially engineered and manufactured to handle normal and post-accident sampling for pressurized water reactor (PWR) or boiling water reactor (BWR) operating plants.

As a result of the potential risk from the U.S. Three Mile Island radiation leak, sweeping changes were made to enhance reactor safety. The expertise of our engineers was called upon to develop a first in nuclear sampling – the Sentry Post-Accident Sampling System (PASS).

To ensure utmost safety and protection of nuclear plant operators, each system in the full line of Sentry primary and secondary sampling, high radiation sampling systems (HRSS) and PASS is designed with leaded materials, radiation shielding and sample transport devices, with fume hood options available.

Enhance Systems with Sampling Products and Accessories

In addition to our industry-leading systems, we offer a comprehensive portfolio of boiler blowdown heat recovery systems, single line sample panels, sample coolers/heat exchangers, sample conditioning components and analytical accessories.

With more than 150 different types available, Sentry sample coolers and heat exchangers are relied upon for their quality and durability by customers around the globe.

The Sentry Magnetic Trap is an innovative magnetite removal solution with implementation growing rapidly in combined cycle plants due to its success in trapping and removing iron oxide particulates, allowing quick plant start ups.

These sampling products are just a few among the many available to ensure your power plant systems continue to operate at peak performance.



Missy
Employee-owner since 2013



Sentry Single Line
Sample Assemblies



Sentry Twist-Lock Cell Holder



Sentry Magnetic Trap Magnetite Removal



Sentry Single Helical Tube Sample Coolers



Lae
Employee-owner since 2008

Byproduct Recycling and Waste Disposal



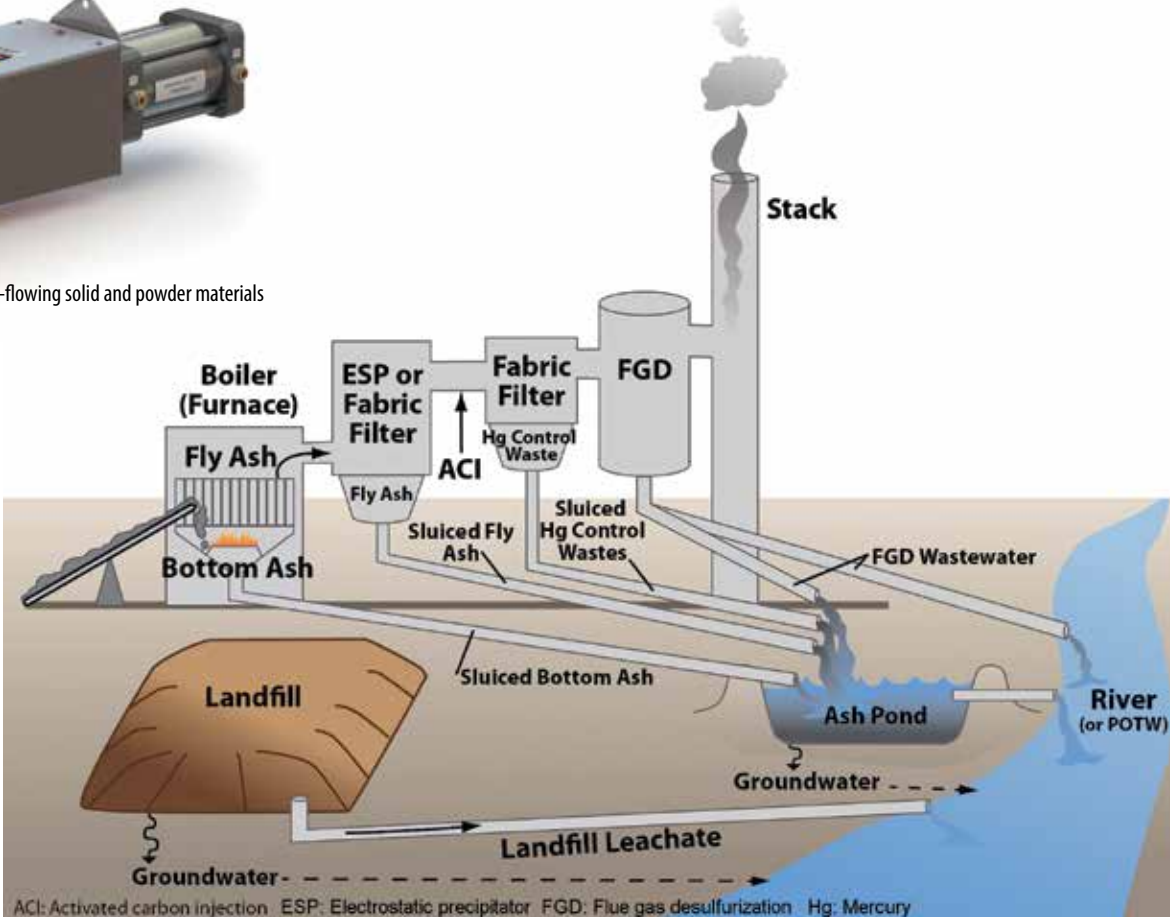
From coal fly ash to radioactive nuclear waste, generating electricity produces recyclable byproducts or wastes that require strict, proper handling for disposal. Representative sampling of bulk solids and powders is needed to meet industry standards for monitoring fly ash for loss on ignition (LOI) or the chemical composition for

resale as a raw material in the manufacturing of gypsum, concrete, grout or cement. The Sentry PR automatic point sampler eliminates the degradation of materials while taking a representative sample from free-flowing pneumatic conveying lines to ensure accurate and repeatable chemical analysis.



Sentry PR automatic point sampler for free-flowing solid and powder materials

U.S. EPA coal-fired power plant wastestreams





Brian
Employee-owner since 2007

Reduce Waste Disposal Costs with Representative Sampling Techniques

In nuclear power generation, whether a PWR or BWR operating plant, monitoring and measuring radioactive waste (radwaste) is not unlike other fuel source waste, which is highly regulated to protect people and the environment. To help minimize waste disposal costs, the radiochemical characteristics of radwaste must be measured. And because sampling and measuring radwaste can be hazardous to operators, the Sentry ISOLOK® RSS radioactive slurry sampler provides automated sampling from the safety of a remote operator station.

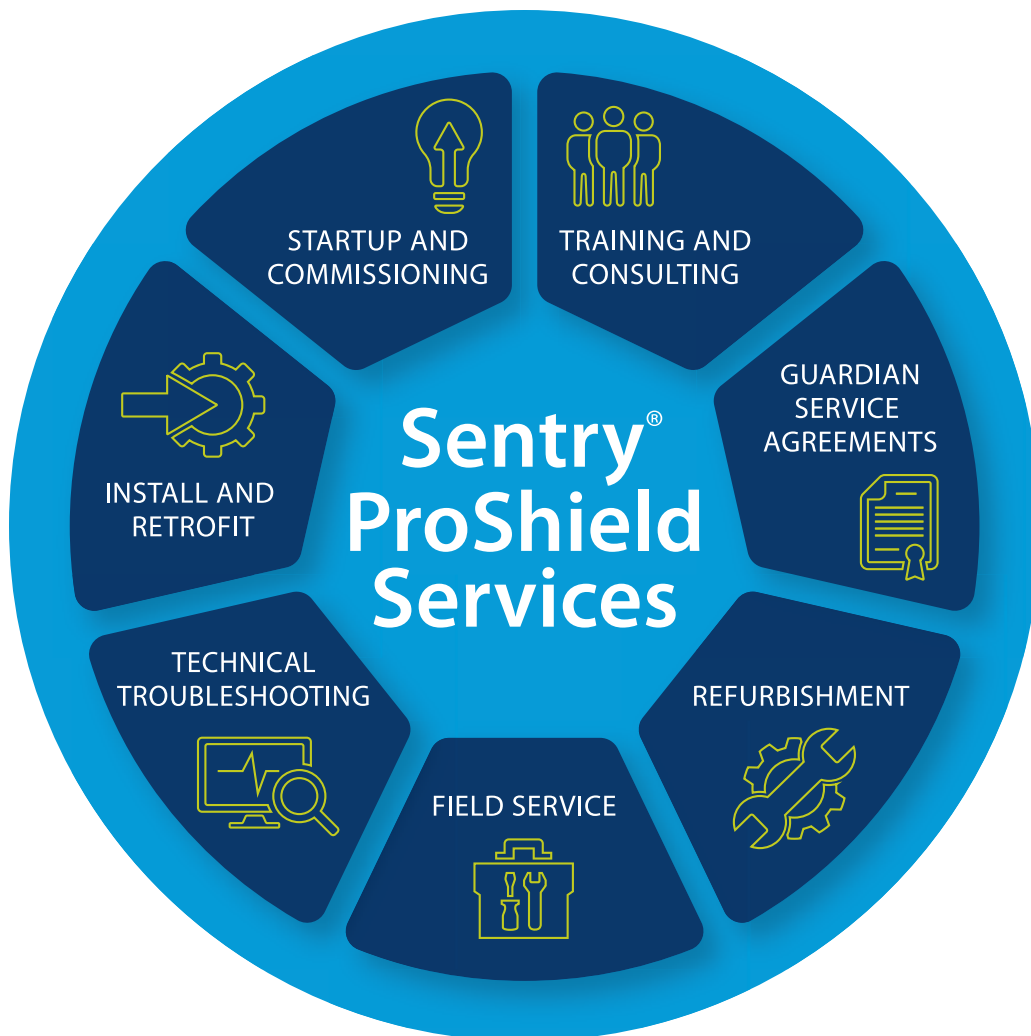
Choosing the right sampling solution depends heavily on your application specifications such as your sample type, process stream, application conditions and the characteristics of the materials being sampled and measured. Sentry engineers who specialize in industrial sampling can advise and design the right solution for any application within a power generation plant across a variety of fuel sources.

The Sentry ISOLOK RSS samples hazardous and radioactive liquids and slurries.



Multi-Vendor Lifecycle Services

Power providers with limited resources rely on the multi-vendor approach of our ProShield Guardian service plans to maintain water and steam purity, keep corrosion under control and ensure compliance with wastewater disposal regulations. Our continually expanding, factory authorized training program means power generators can rely on a single supplier for system design, manufacturing and services. With the leading brands of sample conditioning and chemical analyzers as partners, our technicians can provide expertise in the entire water chemistry workflow – from water intake and steam cycling to final wastewater discharge. In fact, power generators who partner with a single supplier for product engineering and manufacturing to parts, consumables and multi-vendor services benefit from that relationship with an extended team of application experts throughout the life of their equipment.



Authorized Service Provider

SAMPLE CONDITIONING

- **Sentry:**
factory trained, certified and exclusively authorized
- **Waters Equipment:**
factory trained, certified and exclusively authorized
- **All Other Leading Brands:**
in-depth service experience

SAMPLE ANALYSIS

- **Swan:**
factory trained on sodium, silica and dissolved oxygen analyzers
- **Emerson™:**
factory trained on analyzers for the power industry
- **Thermo Scientific™:**
factory trained and authorized representative for the power industry

The Sentry Advantage

We know that running an efficient operation isn't easy. It requires thorough, careful analysis of controlled, real-time data achieved through reliable, accurate and repeatable process monitoring and measuring. By effectively conditioning, sampling and measuring gas, liquid, slurry, powder, solids, steam or water within their production environments, our customers obtain the critical insights they need to control and optimize their processes.

Driving operational efficiency by obtaining and analyzing critical data is at the heart of what we have been doing since 1924. Our proven representative sampling techniques matched with comprehensive analytical systems take the guesswork out of interpreting results, delivering the intelligence needed to make strategic operational decisions with confidence.

INDUSTRY-LEADING EXPERIENCE

Our experts are well-respected throughout the industry for their technical competencies and engineering capabilities, which allow us to consistently offer the reliable technical solutions and support our customers demand.

WORLD-CLASS SAMPLING APPLICATION EXPERTISE

Our advanced technical knowledge and experience is employed not only to simply meet standards, but in many cases, sets the industry standards by which all others operate.

ISO 9001:2008 | 3-A | ASME | ATEX | CE | CRN | CSA | DOT | EPRI | NACE | NDE | PED | TPED

IMPROVE SAFETY AND PROTECTION

From sample conditioning – temperature, pressure, flow – to analyzers to identify and quantify chemical properties of the process stream, we enable our customers to develop higher performing, safer processes and products while protecting their assets, operators and the environment.

EMPLOYEE-OWNED

As an employee-owned company, our team fully appreciates the value of every customer and the importance of every relationship. With a vested interest, we take pride in everything we do, deliver on our promises and stand behind our commitments.

COMMITTED TO LONG-TERM PARTNERSHIPS

We continually invest in finding more and better ways to serve our customers. Over the years, we have expanded our Sentry brand by introducing new products, new services and acquiring companies with strong reputations, expertise, technologies or reach, and successfully uniting each company's competencies with our own. With sampling remaining at our core, we continue to extend our breadth of expertise to deliver more value to customers.



Any Application. Anywhere.





Serving customers
in over 50 countries across
six continents worldwide.



Sample. Monitor. Measure.

SENTRY

Any Application. Anywhere.

sentry-equip.com

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