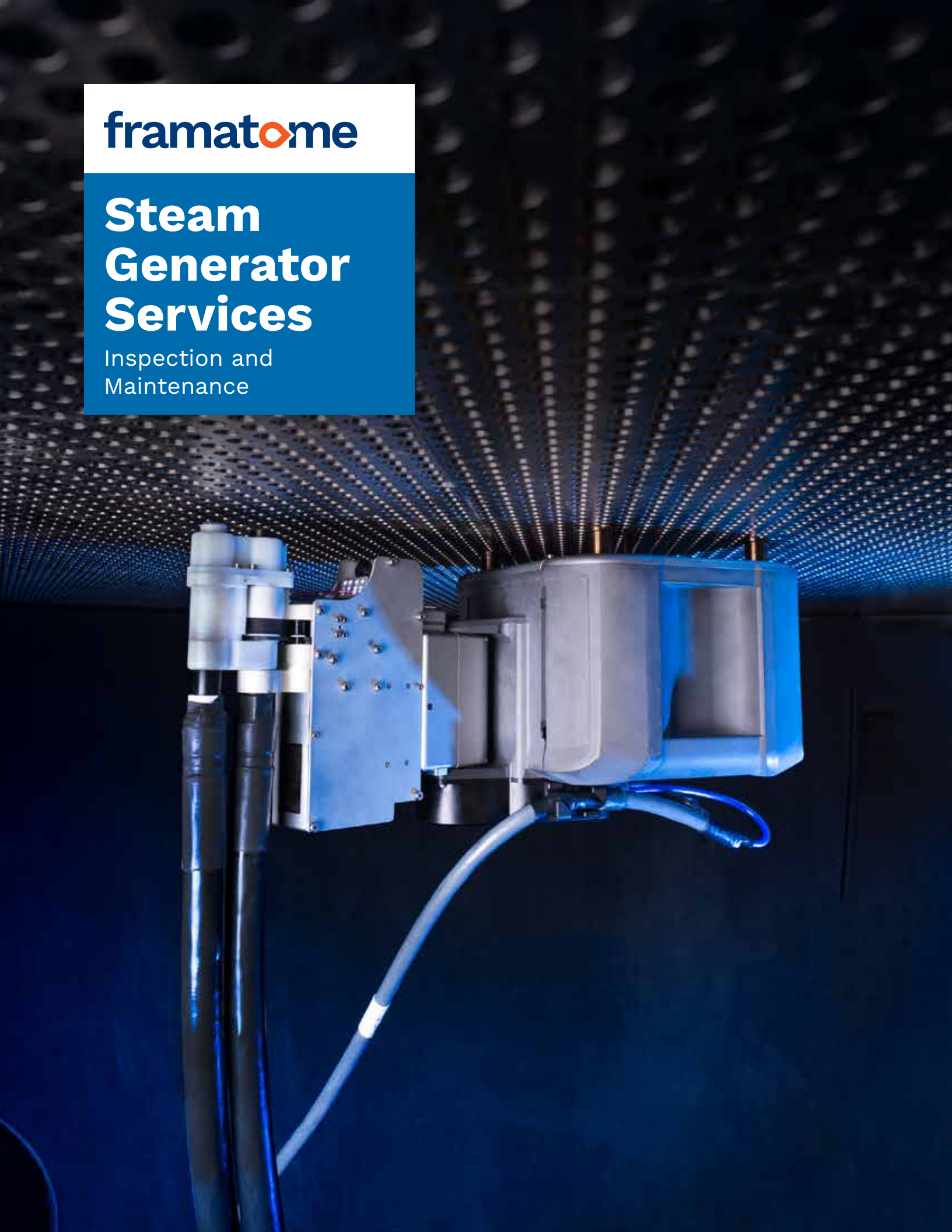
framatome

Steam Generator Services

Inspection and Maintenance

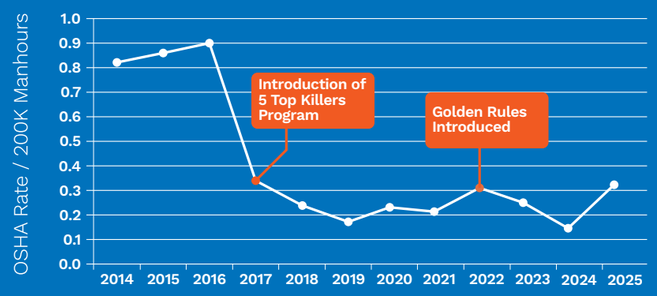


Framatome Safety Culture
Safe, Predictable Outages

Operational Excellence (OpX) and unique Institute of Nuclear Power Operations (INPO) participation along with rigorous training and execution standards make up the backbone of Framatome's approach to completing outages. With superior pre-outage planning, unmatched technology, and highly experienced staff driving our performance, we can meet, and exceed, our customer's expectations.

Framatome is committed to providing our customers with products and services consistent with our four pillars of operational excellence: safety, quality, performance and delivery. Framatome outlines and implements best-in-class standards of operational excellence to each and every employee, ensuring the consistent delivery of high-quality and error-free services.

Framatome Installed Base Safety Trend



A strong corporate safety program is critical in the nuclear services business. Creating and maintaining the right safety culture is the responsibility of executive and management leadership, who must set expectations while providing the resources and training that facilitate a safe working environment. The goal: every employee returns home safely at the end of every workday. Framatome is committed to continually improving our safety culture.

Framatome — Safety is our top priority:

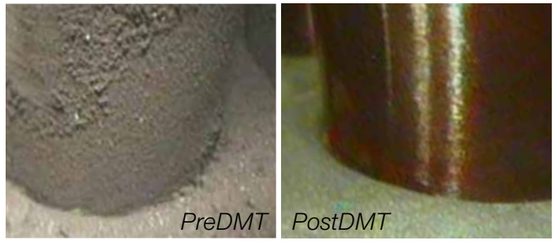
- SAFE ONE Program — The goal of SAFE ONE is to maximize employee participation in safety activities. "Individual action, shared success" creates an optimal environment for us to reach our goal of zero work-related injuries.
- Human Performance Observation Program — employee-led safety committee is dedicated to advanced planning and the early establishment of project safety and health procedures and responsibilities.
- Standards of Operational Excellence — This handbook outlines the standards, expectations and tools for delivering quality products and services to our customers.

Lancing

- Framatome was the first to implement high-pressure (3,000 psi) and high-flow (85–90 gpm) technology for sludge removal. Our patented static water lance system delivers this performance with a 90-degree sweeping action.
- New features:
  - — Lockable tungsten FME cover
  - — Fully remote-controlled process
  - — Enhanced quick-look inspection

Improves on industry's best water lance system

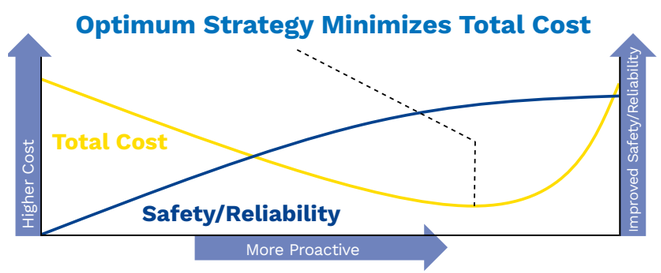
DMT (Deposit minimization treatment)



- Effective removal of secondary side deposits
- Prolongs steam generator (SG) life
- Can be applied multiple times within the SG lifetime corrosion allowance
- Significantly minimizes secondary liquid waste
- Fast and effective

A green process that results in dry sludge and clean water

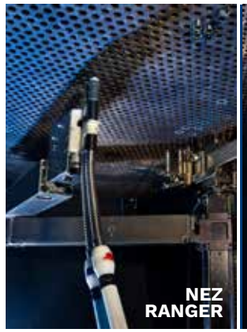
MAESTRO Asset Management Planning



Utilizing science and economics to optimize financial decisions

- Provides optimum maintenance strategies for component life
- Uses plant thermal performance data, tube degradation and other plant data
- Incorporates typical SG maintenance and remediation strategies
- Precisely models tube deposit progression for more efficient mitigation strategies and maintenance routines
  - — Calculates the correct time to perform various activities at the least cost and maximum economic benefit

Manipulators



Enhanced No Exclusion Zone (NEZ) RANGER

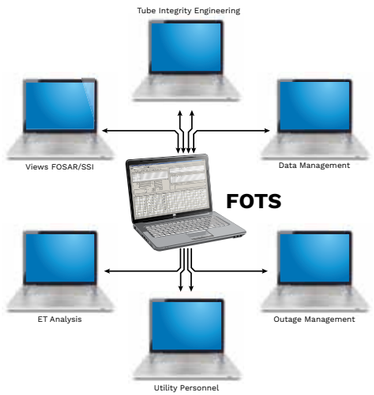
- Combines the speed of a long-reach manipulator arm with the flexibility of a tube walker
- Robust design to perform all examination and repairs

ZR-100 Manipulator

- Quick install and significant dose savings
- Install and start eddy current testing (ECT) in a few short hours
- Able to run multiple manipulators in parallel
- Ideal for small or large plugging/stabilization campaigns

Most versatile manipulators for inspections and repairs

Foreign Object Tracking System (FOTS)



- Real-time tracking
- Automatically define potential loose parts
- Initiate and control actions based on pre-established process requirements
- Display the ECT inspection plan and associated results allowing accurate assessment of required actions
- Graphic, video and other document files are available for convenient viewing
- Controlled access for foreign object data
- Integration with secondary side inspection software

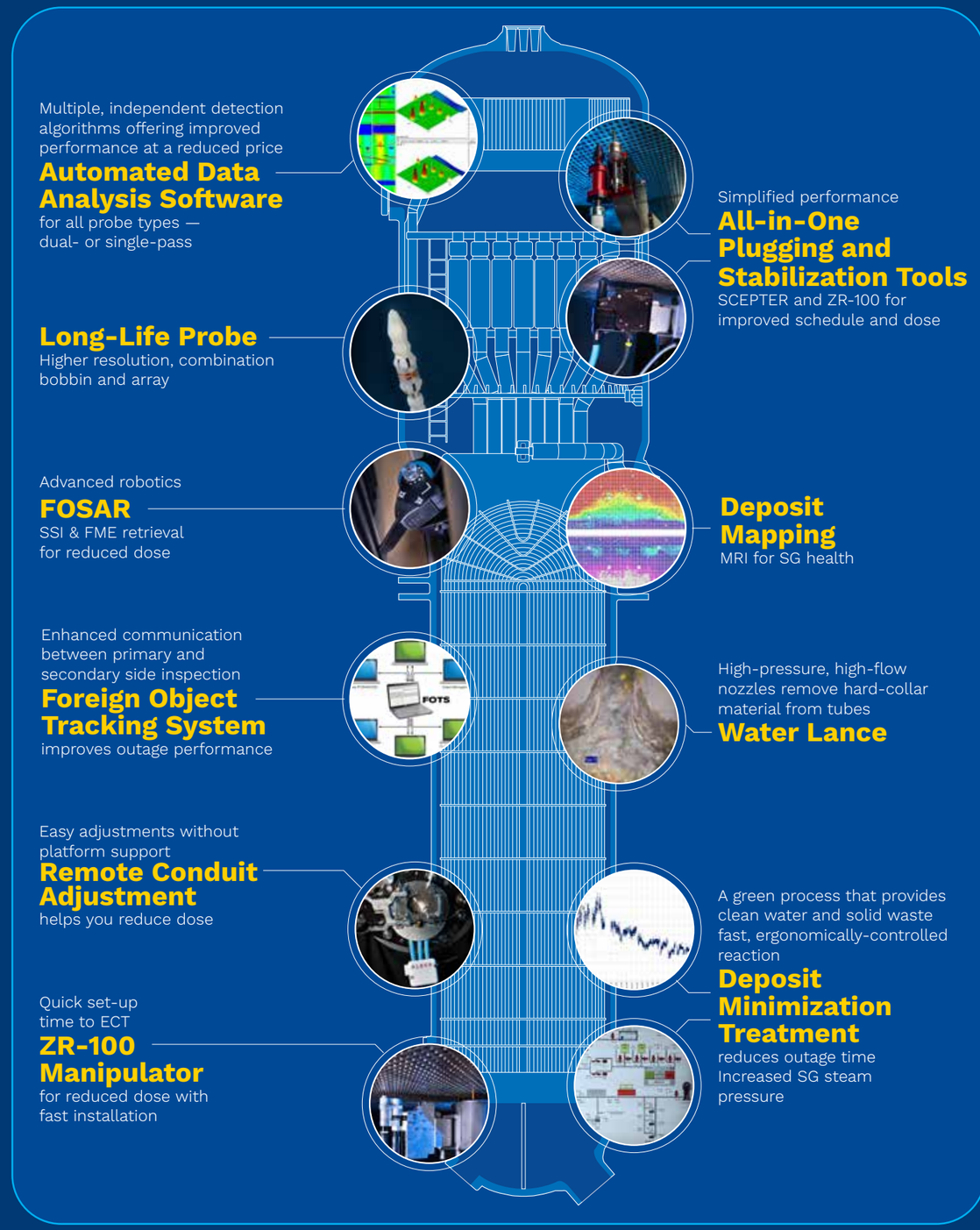
Improving communication through continued innovation

Secondary Side Inspection

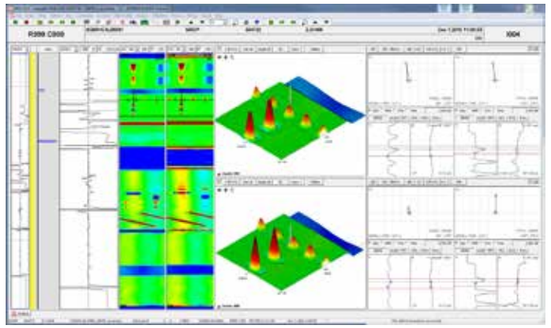
- Crawler position tracking verification using steam generator geometry and VIEWS system
- Inner bundle strip tool with position verification tracking software
- Fleet of crawlers and probes for HD inspections and FOSAR

Saving dose while advancing remote inspections

MAESTRO
Life Cycle Management



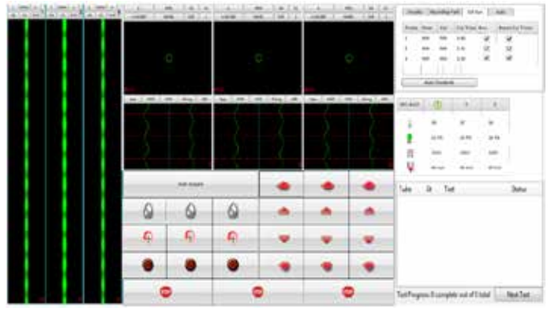
AIDA^3 Framatome's Auto Analysis Software



- EPRI AAPDD qualified for bobbin, array and MRPC
- Capable of any manual or automated analysis scenario
- Multitude of parallel analyses: flaw, non-flaw, deposit and structure mapping, noise monitoring
- Independent tube verification using ET signatures
- Extremely accurate and lowest false call rate
- Comparison of data from multiple inspections to assess change and detect new degradation

Tailored for each specific need

Fully Automated Data Acquisition



- Fully automated acquisition with all probe types
- Inspection plan management optimizes schedule
- Real-time data quality decision and automatic retest
- Systematic link with AIDA^3 to trigger analysis

Focus on continuous operation without human interaction

Advanced Eddy Current Probe Technology

- Long-life probe integrates with AIDA3 and acquisition software
- High stability probes minimize replacements during inspection
- No special tools, standards, or training needed
- Ultra flexible bobbin inspects full low-row U-bends from one head; no air assist
- New design requires only one scan and one probe with no adjustments, reducing both schedule time and radiation dose

Continuing to push the envelope to offer better solutions

Advancements in Technology | Steam Generator Services

Steam generator (SG) build-up can significantly impact plant performance, leading to reduced efficiency, increased wear, and potential safety risks. These deposits—whether from iron, corrosion by-products, or sludge—can block flow paths, disrupt heat transfer, and accelerate component degradation.

Framatome addresses these challenges with decades of chemical cleaning expertise, backed by in-depth research that includes corrosion studies, materials testing, and model boiler evaluations. Our proven, field-tested solutions safely remove stubborn deposits, helping utilities restore peak performance, reduce downtime, and extend the life of critical SG components.

Why Perform Chemical Cleaning

Chemical cleaning is a key maintenance method to address steam generator build-up threats and meet utility goals. It prevents tube fouling that lowers steam pressure and causes power loss. It clears tube support broach blockages that lead to mechanical wear, water instability, and tube fatigue. It also reduces outside diameter tube corrosion caused by aggressive crevice chemistry, protecting tube integrity.

Over four decades experience with over 100 chemical cleaning applications worldwide

Cleaning Type	Process	Purpose / Key Features	Notes / Special Requirements
Hard Chemical	EPRI SGOG (200°F)	• Bulk iron deposit removal • Corrosion inhibited	• Plant or external heat options • Off-site secondary waste processing
Hard Chemical	EPRI Crevice (225–250°F)	• Targets tube sheet crevices and TSPs after SGOG • Two-step iron removal	• Requires venting at each TSP • Larger waste volume • Off-site waste processing.
Soft Chemical	DMT Soft Clean (190°F)	• Partial SG deposit removal • Maintenance chemical cleaning must be performed more frequently than a hard chemical cleaning • Fast kinetics	• No corrosion inhibitor. Integral waste system (solids only) • Minimal outage time
Hard Chemical	Framatome US HTCC 290°F	• Fast, effective hard clean (broaches + crevices) • Shorter than EPRI SGOG	• Uses plant systems • Requires coordination with Plant OPS Mode 4 Process

We are committed to delivering the latest technology for your fleet — on time, on budget and by a team of experts that you can trust.

Framatome's steam generator technology will enhance safety, quality, performance and delivery at your plants with reduced dose, improved human performance, and cost and schedule certainty. Our committed steam generator experts have decades of experience successfully developing and implementing innovative tools and processes for the operating nuclear fleet. Why? Because we know that our success ensures your success.

Framatome teams bring flexibility, experience and best practices to every job we do. Forward-thinking people with a commitment to developing innovative technology lay the foundation for our success in the industry. We know steam generators inside and out.

We aren't just industry experts — we're your experts.

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www.framatome.com

Framatome is an international leader in nuclear energy recognized for its innovative, digital and value added solutions for the global nuclear fleet. With worldwide expertise and a proven track record for reliability and performance, the company designs, services and installs components, fuel, and instrumentation and control systems for nuclear power plants. Its more than 20,000 employees work every day to help Framatome's customers supply ever cleaner, safer and more economical low-carbon energy.

Visit us at www.framatome.com, and follow us on X and LinkedIn.

Framatome is owned by the EDF Group (80.5%) and Mitsubishi Heavy Industries (MHI – 19.5%)

B-US-659-ENG-06-25

Your performance
is **our** everyday **commitment**

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