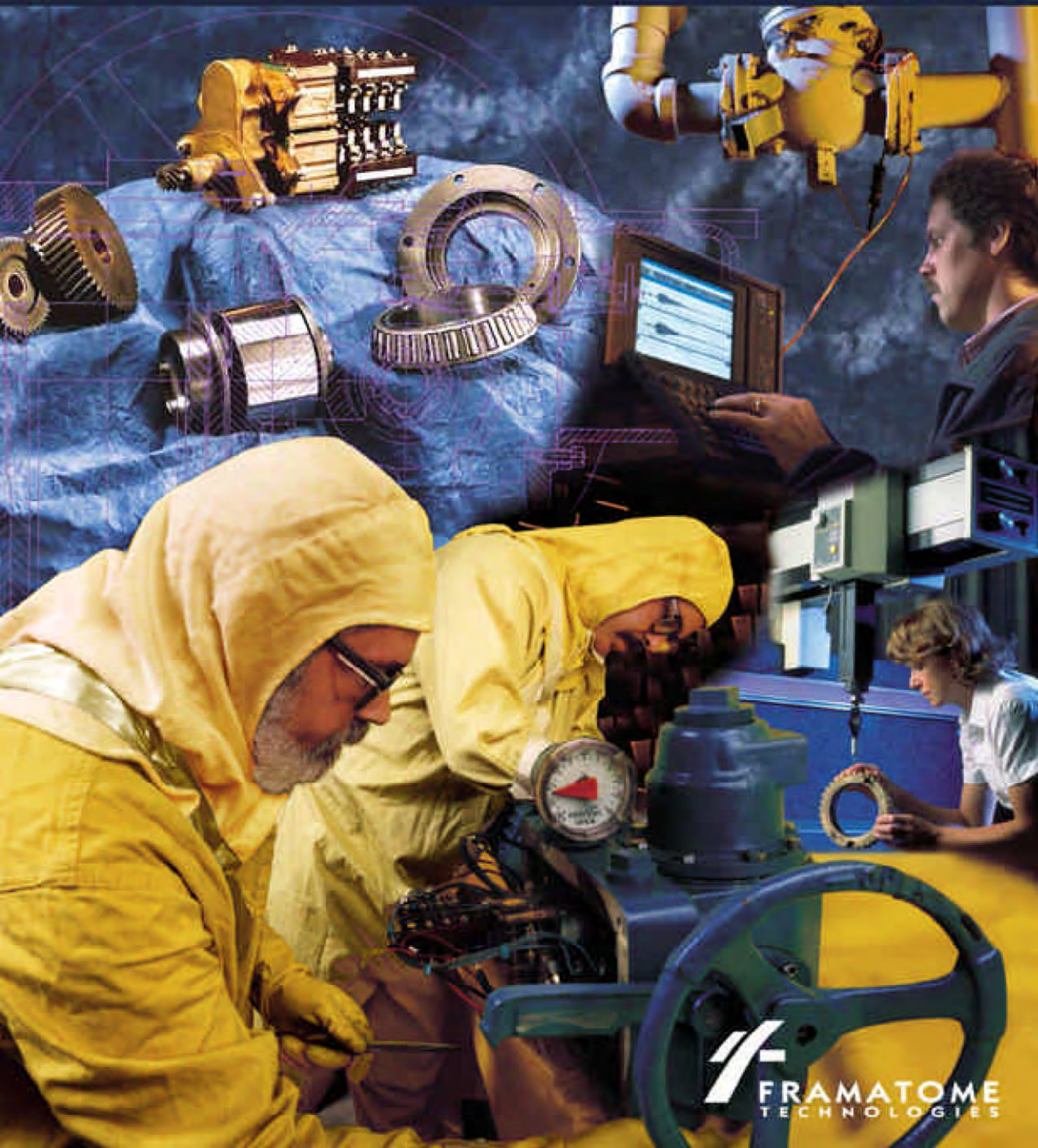


ENVISION

SUMMER 1999



FRAMATOME
TECHNOLOGIES

INSIGHT

By John Bohart,
President and CEO,
Framatome Technologies Group



During our recent EFFECT Conference (Executive Forum for Emerging Challenges and Trends), we were privileged to hear from numerous industry experts and individuals with particular insight into the nuclear power industry.

John Stossel, a long-time reporter for ABC News 20/20 bluntly told us that we need to do a much better job of telling the public about the safety record of nuclear power. Using relative risk figures, Stossel showed us that nuclear power is one of the safest technologies going. He challenged us to not bury our heads in the sand, but to tell the good news about our business and to not be afraid to say nuclear power is safe.

Often times, we in the nuclear industry may believe we are better off keeping a low profile due to a few sensationalized events with our technology, and believe that if we say nothing, individuals will then believe that nuclear power is safe by default. Unfortunately, there are other individuals and groups telling the public that nuclear is not safe. It is time we begin to tell the general public the truth — that nuclear power is one of the safest ways available to generate electricity and should not be abandoned as we head into the 21st Century.

Recent attitudinal surveys completed by NEI indicate that there is favorable opinion about nuclear power. This positive attitude can be reinforced with continued industry discussion of our excellent safety record. Couple good safety with good economics and perhaps we can begin to turn around the indifference and opposition to building new plants that show up not only in public responses, but also among our own industry when the conversation turns to the future of the nuclear power industry.

New plants are being built in China and are being considered elsewhere. But in the U.S., the world's leader in nuclear technology, no new plants have even been considered in the last twenty-plus years. In addition, some of the public still believes that nuclear is not safe, despite our fantastic safety record in the past four decades. However, the public also seems to understand that nuclear is a type of power generation that helps to preserve clean air and reduce harmful emissions.

I would like to pass on the challenge made by John Stossel at EFFECT. Now is the time for us to reinforce the positives about nuclear power and tell the public that ours is a safe and clean technology for generating electricity.

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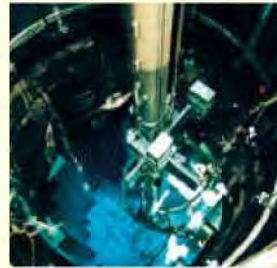
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Parts Center

Responsiveness Key to Success

Customer's Needs. Risk Sharing. Innovative Arrangements. Supply Chain Agreements. These have established the FTI Nuclear Parts Center as a responsive supplier of nuclear parts.

"All of our programs are designed with the customer in mind. We strive to shorten time frames for delivery, cut costs, or share some risk with the customer," said Sandy Hellman, FTI's Vice President of Valve Services and the Nuclear Parts Center.

FTI's Nuclear Parts Center (NPC) offers a full-range of nuclear grade replacement parts to the nuclear power industry. The Parts Center teams with numerous companies to offer a variety of nuclear grade parts; those companies include Anderson-Greenwood, Automatic Switch Company (ASCO), Limitorque, Technical Sealing Products (Latty Packing), Velan, Yarway and Graver Technologies.

The Parts Center specializes in nuclear grade parts that have been manufactured for use in nuclear plants. "A program we are working to expand right now is to conduct a dedication process for manufacturers' valves and valve products," said Hellman.

"Many valve manufacturers are finding it difficult to continue to offer nuclear grade parts because of the high cost of maintaining nuclear grade quality assurance programs and the infrequent demand for the product," he said. "Under FTI's dedication program the manufacturer supplies the parts to us commercially, and we dedicate the parts for nuclear use."

The dedication process includes testing to verify the part can be considered nuclear grade, and strict record keeping and

reportability as required by the NRC. FTI has dedicated Velan valves for nuclear use since 1998, when FTI and Velan teamed to supply valves to Vermont Yankee.

The NPC is also developing an actuator exchange program for both Limitorque and Hydramotor actuators. Under the program nuclear plants would send actuators needing overhaul to FTI, and FTI would then immediately supply an already overhauled actuator to be installed at the plant. FTI would then overhaul the "exchanged" actuator and retain it for future use by the utility.

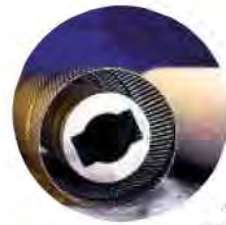
"The swap program helps improve schedules for the utility," Hellman said, "by allowing them to perform work other than actuator overhaul during outages, taking the actuator work out of critical path time."

FTI recently expanded its long-standing relationship with Automatic Switch Company (ASCO), establishing FTI as the exclusive stocking distributor of ASCO Hydramotor commercial and nuclear grade parts kits. NPC is the only authorized ASCO Service Center for overhauling and repairing these ASCO actuators used for valve and damper control in nuclear power plants.

"The agreement with ASCO allows a much quicker turn around for the utilities on actuator repairs," said John Shively, NPC Senior Business Manager.

"Nuclear grade parts are a long lead item, often taking as long as six months to produce, but since we now keep ASCO parts in stock we can accomplish actuator refurb in a few weeks."

NPC is also working with utilities and



suppliers to establish long-term supply chain management agreements by employing "just-in-time" processes. Supply chain management helps speed up parts delivery, since the parts undergo engineering review at the time the supply agreement is signed, instead of when an order is placed. Once the agreement is signed, the Parts Center stocks the parts the customer is most likely to need, said Shively. Supply chain management also helps to reduce the utility's warehousing, shifting that burden to FTI.

"All of these programs, the dedication program, the exchange program, the ASCO program and our supply chain agreements have allowed us to provide parts and service to the utility in a much shorter time frame, which helps the utilities to reduce cost," said Shively.

Other new initiatives in the NPC have also been successful. "Replacement cartridge filters manufactured by Framatome Technologies have been embraced by the industry," said Shively, "since they help utilities reduce cost and improve delivery times."

"Other manufacturers may take as long as 10 weeks to prepare a filter order, but because we have our manufacturing capability in-house and have in stock all the media and piece parts for filters, we can manufacture them in as little as two to three weeks," Shively said. "We are recognized as the most responsive supplier in the industry."

The Nuclear Parts Center is also assisting nuclear plants applying for license extensions by identifying and providing parts that will need to be replaced as part of a license extension program. "Items like CRDMs, reactor coolant pump motors and pump seals and extended life ASCO solenoid valves have all been discussed as parts needing replacement with the extension of a license," said Shively.

Customers are increasingly using the NPC's Internet Site and electronic data interchange (EDI)

The dedication program, the exchange program, the ASCO distributor program, and supply chain agreements allow FTI to provide parts and services to utilities in a shorter time frame, helping utilities to reduce cost.

for ordering of parts. Typically a customer will look on the Parts Center's Internet site (www.framatech.com/cisweb/cisqbe.asp) to determine if the part needed is in stock and the price. If in stock, the part is then entered into the EDI for ordering and once FTI receives the order it can be sent out. Some customers enter their order into their own ordering system, which automatically sends a fax order to the Parts Center.

"The nice thing about the Internet site is that 24-hours-a-day, plant personnel can determine if we have a part in stock and can plan their work accordingly," Shively said.



FTI offers a full range of nuclear grade replacement parts, teaming with numerous companies to offer a variety of parts. FTI is developing an actuator exchange program, which would eliminate the waiting typically accompanying actuator overhaul.

Valve Services

FTI Provides One-Stop Valve Services Shopping



In this age of deregulation induced cost cutting, nuclear plant operators are looking for every opportunity to improve efficiency and reliability. One opportunity to improve efficiency and reliability is in the servicing of valves. Increasingly, nuclear plant operators are looking for valve services vendors that understand their business and can offer an integrated approach to valves.

Framatome Technologies, Inc. offers a complete line of valve-related products and services designed to keep nuclear-grade valves and actuators in top-operating condition, improving plant performance and reducing outage downtime, while limiting unnecessary work and saving money. FTI performs in-line valve repairs, valve repacking, actuator rebuilding, diagnostic testing, scheduling, QC activities, ALARA functions, engineering, work order management, and parts procurement.

FTI's integration and management of turnkey valve projects provides a single point of contact for all aspects of valves related to nuclear plants.

"What really differentiates Framatome Technologies Valve Services from other valve service companies is that besides supplying nuclear qualified parts, we also do repair and refurbishment," said Sandy Hellman, FTI's Vice President of the Nuclear Parts



Center and Valve Services. "So our customers get a supplier that understands the nuclear business and can provide a full range of valve services."

When working with a plant on valve services, FTI assumes full ownership for its scope of work with innovative risk-sharing and performance-based contract clauses.

"Our people are really what make the difference for us during outages," said FTI's Alex Kurasz, Business Manager of Valve Services. "This includes not only our employees, many of whom are responsible for managing the projects, but also any subcontractors we hire."

During PSE&G's recent outage at Hope Creek station, a major success for FTI was the refurbishment of six 72-inch butterfly valves and six 78-inch butterfly valves in the plant's circulating water system. "This was critical path work during the outage," said Kurasz, "so the logistics of the work were very important. It was necessary for these huge valves to be removed, shipped to the original equipment manufacturer for refurbishment and then returned and reinstalled, all on critical path."

"Our customers get a supplier that understands the nuclear business and can provide a full range of valve services."

"We accomplished the work and met a tight schedule," said Kurasz. "Because of the size of the valves, the logistics were especially challenging. Not only did we accomplish the work, but the valve OEM, Pratt Valves, who did the refurbishment, has recommended us for other similar work based on our experience working together."

That refurbishment of Hope Creek's circulating water system by FTI helped PSE&G to more quickly restore full power following a recent condenser tube leak. Once the leak was discovered, the plant was powered down, Hope Creek personnel stroked the new and refurbished circulating water valves electrically, isolating and dewatering the water boxes in about one hour with no leakage.

"This was the first time we have not had to manually manipulate those valves," said PSE&G's Hope Creek Outage Manager Kurt Krueger.

PSE&G's Krueger added that he was impressed with FTI's attention to detail. "When the valves were shipped off for refurbishment we found that some of them needed to be replaced. I was impressed that Framatome had a person stay at Pratt Valve to make sure the replacements were built right," he said.

A large part of Valve Services' work involves the inspection and maintenance of valves. "Combining our engineering expertise with specialty software allows us to automate the evaluation and maintenance process and enhance plant valve performance for our customers," said Kurasz.



FTI's experienced technicians provide diagnostic valve testing using a portfolio of trademarked systems that give an accurate and comprehensive profile of a plant's valve functions, identifying failures, degradation conditions or potential non-performance.

FTI designed diagnostic systems allow plants to diagnose their own valve problems, using innovative acoustic, magnetic and ultrasonic technologies. UltraCheck C, FTI's advanced non-intrusive diagnostics for check valves, is the industry leader in check valve diagnostics, and is in use at numerous plants.

FTI's UltraCheck A provides similar features for use with air operated valves (AOVs).

FTI is also developing a diagnostic system for testing relief valves, with features similar to those found in UltraCheck A & C.

FTI's industry leadership was recently acknowledged when it was awarded a contract for diagnostic testing on motor-operated valves and air-operated valves for PECO Energy, covering six outages over the next three years at the Limerick



Installing a refurbished butterfly valve at Hope Creek Station. FTI assumes full ownership for its workscope related to valves, offering innovative risk-sharing and performance-based contract clauses.

and Peach Bottom Nuclear Generating Stations. FTI's teaming partner, Flowserve Corporation, was awarded the inline valve work.

"Our first outage at PECO was very successful and we look forward to working with PECO Energy and with Flowserve over the next three years," said Kurasz. "This kind of long-term contract allows us to be a stakeholder in PECO Energy's outage success."

In addition to teaming with Flowserve (a parts and service partner), FTI works with numerous other companies to accomplish its valve services goals including Copes-Vulcan, Limitorque, Qualified Maintenance Support Specialists (QMSS), and Teledyne Brown Engineering. Working in an integrated team with these partners means a full

scope of readily available services are there for plants needing valve services.

"In partnering with FTI, there is a lot of value added for the customer," said Jim Tarbatton of Flowserve. "There are

"FTI provides plant operators one source to meet all their valve needs including engineering, diagnostic testing, parts, and repair and refurbishment"

two separate sets of expertise that we bring to the table with different perspectives and different ways of attacking problems."

Framatome Technologies will be teaming with other companies to provide MOV testing, MOV actuator refurbishment, and inline valve repair services for Carolina Power & Light's Brunswick plants during their upcoming outages. While Teledyne Brown Engineering is the prime contractor at Brunswick, FTI will provide the majority

of the diagnostic testing technicians.

While performing testing, repair and refurbishment, Valve Services can accomplish the work on site or at Framatome Technologies' facility in Lynchburg, VA. "Our parts trailer goes to site and contains the necessary parts for refurb of actuators at a particular plant," Hellman said, "or the actuators can be transported to us here. For instance, at Navajo Station in Arizona we sent our parts trailer and did the work at site, but Seabrook Station sent their actuators here for refurb. The job size and the types of work being done normally determine where the work is done."

Just as the industry focused on motor-operated valves in the last few years, so has FTI. "The industry's MOV focus was driven by the NRC's Generic Letter 89-10," said Hellman, "but now we are

seeing the industry beginning to look more closely at the air-operated valves, or AOVs. We work on both types of valves, and we are seeing more requests for support on AOVs."

FTI's Valve Services group is enthusiastic about what the future holds. "As our industry changes, we are excited about the fact that we offer the full range of valve services to our customers," said Hellman, "essentially providing plant operators one source to meet all their valve needs including engineering, diagnostic testing, parts, and repair and refurbishment."

Extending Heat Exchanger Operating Life with Sleeving



Framatome Technologies, Inc. has more than 20 years of sleeving experience in steam generator tube repairs. That experience is now being applied to BOP heat exchangers as an alternative to costly component replacement.

Heat exchanger tube degradation resulting from chemical or mechanical (wear) damage can be corrected by installing a new tube segment across the defect area, thus allowing continued heat transfer and flow through the original tube. Sleeving heat exchanger tubes can help plant operators avoid plugging damaged tubes, the traditional method of tube repair, and thus extend the useful life of the heat exchanger.

The FTI tube sleeving system uses a hydraulic expansion joint to mechanically seal the sleeve beyond the tube's defective area, creating a bridge over the defect(s). The installation process is computer-controlled by monitoring both pressure and hydraulic volume. As a result, each expansion joint is custom-fit, independent of variations in individual tube diameters and yield strengths within the heat exchanger. This sleeving system allows repairs to be made anywhere along straight sections of tubing, as much as 30 feet from the tube end. The process only requires access to one end of the tube, making it possible to install sleeves in straight sections of U-tube heat exchangers.

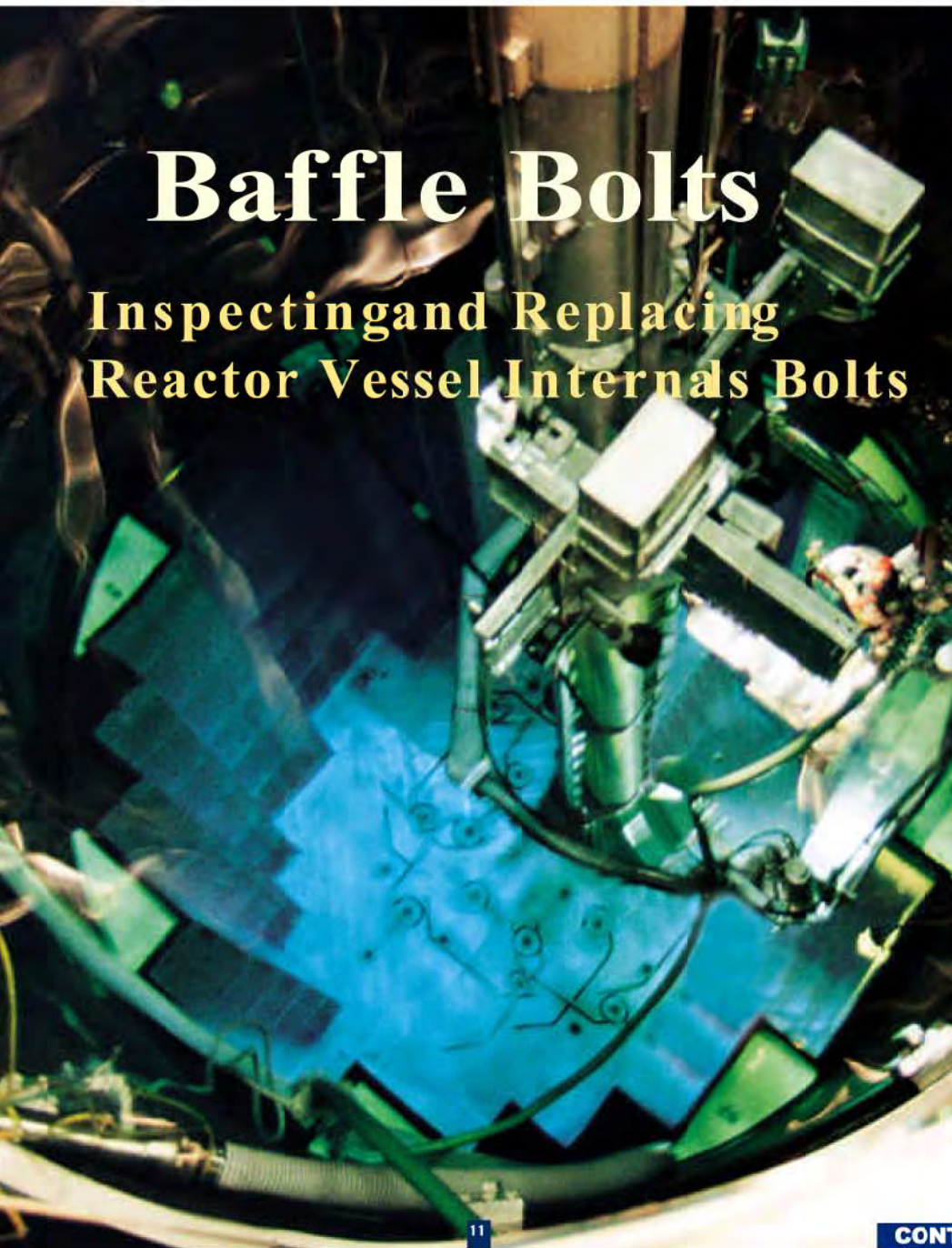
FTI has installed sleeves as short as 12 inches and as long as 11 ft. 2 in., depending on the length of tube damage being repaired and access available at the tube ends. Even though heat exchanger designs vary greatly, sleeving is feasible in a variety of tube diameters and materials.

The heat exchanger tube-sleeving process can also be performed within the time period of regular outage work. In addition to repairing newly discovered defects, the sleeving process has proven effective in reclaiming plugged tubes and returning them to service. If desired by the utility, FTI can manage the entire heat exchanger workscope including tube inspection, plug removal, and sleeving.

The system is specifically designed to accommodate variations in individual tube diameters and yield strengths, ensuring that each sleeve expansion joint is consistently produced to the requirements for successful operation within the heat exchanger's operating parameters.

FTI recently completed heat exchanger work at Didcot Power station in the UK, at Mercer Generating Station (PSE&G -Fossil) and at Nine Mile Point (Unit 1). At those three plants, more than 1,200 sleeves were installed.





Baffle Bolts

Inspecting and Replacing Reactor Vessel Internals Bolts

A nemesis of pressurized water reactor vessels, Stress Corrosion Cracking (SCC), has once again raised its ugly head - this time in the bolts that join baffle and former plates. Bolt cracking on reactor vessel (RV) internals was first discovered in the 1990s in the early European reactor designs, and the problem is exacerbated in many cases with the added effects of plant aging.

Since the early 1980s, Framatome has successfully addressed problems with reactor vessel internals bolting. Through the years, technology and technological upgrades have crossed and re-crossed the Atlantic, as teams worked to refine systems, hone personnel knowledge, and share experience gained while providing service the world over. Between the U.S. and Europe, Framatome has inspected 26,557 RV bolts and replaced 1,790 RV internals bolts.

"Our long history inspecting and repairing reactor vessel internals bolting made us uniquely qualified for the work," said Framatome Technologies' Gary Mignogna, Manager, Plant Component Repair.

In 1997, four utilities (Wisconsin Electric Power, Rochester Gas & Electric, Northern States Power, and Wisconsin Public Service) that operate Westinghouse two-loop plants in the United States began developing a proactive plan to perform the appropriate analyses, and then inspect and replace damaged baffle bolts.

Through materials evaluations and analysis, the group determined that there was a significant risk for cracking susceptibility in some U.S. reactors. Framatome Technologies, teamed with Master Lee, won bolt inspection and replacement at all six nuclear plants in the group. Framatome Technologies provided personnel and technology, and Master Lee provided additional experienced field engineers and peripheral support equipment. These inspections and repairs were performed without any additional data from the OEM.

Point Beach Unit 2

Wisconsin Electric (WE) presented the FTI/ML team with a very aggressive schedule for bolt inspection and replacement at Point Beach Unit 2, according to Jim Pfeifferle, WE project manager. The work at Point Beach was

undertaken and completed in a matter of days in December 1998-January 1999, proceeding in spite of a blizzard. All of the 728 baffle-to-former-plate bolts were inspected in three days, 242 bolts a day.

Inspection rates at Point Beach were faster than realized on previous baffle bolt deployments, in part because tooling was re-designed by FTI to be multi-functional, thus saving set-up and delivery times. All the processes used in the operation are qualified to 10CFR50, Appendix B, as well as ANSI/ASME code. The equipment was designed so it could be staged through the personnel hatch rather than the larger equipment hatch. The work is done without using the polar crane, except for setup and takedown operations. Bolts were inspected by ultrasonic testing (UT), delivered using technology proven in other reactor vessel internals bolt campaigns abroad.

The original UT inspection procedure was revised on-site based on destructive tensile testing results of those bolts removed first. The revised procedure identified 31 additional bolts as having indications of possible defects, bringing the total defective population to 55. All told, 176 bolts were replaced.



Framatome Technologies, teamed with Master Lee, won baffle bolt inspection and replacement contracts at all U.S. two-loop plants.

In the U.S. and Europe, Framatome has inspected 26,557 reactor vessel bolts and replaced 1,790 RV internals bolts.

Replacement bolts were fabricated essentially the same in form, fit and function as the originals, from strain-hardened 316-alloy material in accordance with 10CFR50, Appendix E and the ASME code. Enhancements made to the replacement bolts included surface treatment to prevent future stress corrosion cracking and transforming the underhead to reduce stress intensity.

Prior to deployment at Point Beach, FTI developed several contingency approaches to bolt removal based on feedback from previous campaigns at Tihange-1, Mihama-2, and Farley-1. Implementation of these contingency processes saved several days of critical-path time.

Doing something for the first time always presents an educational opportunity. "It was fascinating to watch the FTI/ML crew come up the learning curve in the use of equipment in its first field application," Pfefferle said. "It happened overnight with the inspection equipment, but the curve was a little longer learning the techniques of the replacement equipment."

In addition, the specialized contingency removal equipment was employed on the job as situations outside the original project scope evolved. "FTI did not hesitate to request additional resources from their offices as new challenges arose," said Pfefferle.

Ginna

The techniques and lessons learned at WE were valuable when the crew went on to Ginna.

In March 1999, FTI inspected 90 percent of the 728 bolts at Rochester Gas and Electric's Ginna plant, and replaced



FTI baffle bolt inspection rates have been faster than realized on previous baffle bolt deployments, in part because tooling was re-designed by FTI to be multi-functional, saving setup and delivery times.

56 bolts. But the crew faced a whole new set of challenges. Operations were hampered by excessive welds on the bolt-locking washers, restricting inspection and limiting access to the internal hex necessary to remove the bolt. Of the 56 bolts designated for replacement, 38 had to be removed by contingency methods, thus lengthening the repair time. In addition, 14 bolts required multiple contingency measures.

"No one anticipated the conditions we encountered, and the whole situation was taxing on people and processes," said Jim Duane, senior engineer at Ginna. "However, the Framatome and Master Lee people were willing to work with our team, and they did all they could to accommodate our critical path activities."

In the two-loop Westinghouse plant design, there are 36 baffle plates and seven former plates located in the periphery of the core region within the core barrel. Baffle bolts join the baffle plates to the former plates, creating part of the support structure of the fuel core. In addition to directing the primary coolant flow, the plates ensure that the RV internals maintain structural integrity in the core region during normal operating and upset conditions, so that the plant can safely shut down.

Bolt replacement was accomplished at Point Beach and Ginna using an Electro-Discharge Machining (EDM) process that does not generate chips, which could damage fuel assemblies. Throughout both projects, radiological dose was of concern. It was determined that the swarf generated by the EDM was finer than expected, requiring a much finer filter in order to meet dose rate projections.

"[FTI personnel] were willing to work with us, and tried to accommodate our scheduling," said Dunne. "The people were great to work with under the conditions."

"The teamwork between Framatome, Master Lee, and the utility personnel was great at both Point Beach and Ginna," said FTI's Mignogna. "Everyone pulled together, and the team was successful."

BOP for PSE&G

At PSE&G's Salem and Hope Creek Nuclear Generating Station 1999 spring outages, FTI provided numerous Balance of Plant (BOP) services. At Hope Creek, BOP tasks included replacing seven Emergency Core Cooling System (ECCS) Suction Strainers, and at Salem 2, replacing six low pressure feedwater heaters (FWH) and two low pressure Moisture Separator Reheater (MSR) tube bundles.

The new ECCS Suction Strainers installed at Hope Creek significantly increase strainer surface area, minimizing the potential for the strainers to clog during a design basis accident. Because of their large size, it was necessary for the strainer components to be lowered into the torus, where they were assembled underwater by divers utilizing drill techniques and tooling developed by FTI for the project. The new drill techniques allowed hole-drilling time to be reduced from an hour per hole to 10 minutes.

Prior planning was the key to the suction strainer installation going smoothly. Lessons learned by team members from participating in and observing other recent suction strainer replacements were incorporated into the outage plan. Dry fit-up of the assemblies was performed in an on-site warehouse prior to the outage, allowing for resolution of any possible assembly problems. These pre-planning efforts allowed the installation team to anticipate potential problems and develop appropriate contingency plans.

"Overall, we were quite pleased with the work done by Framatome," said Hope Creek Outage Manager Kurt Krueger. "The outage leaders were very professional and able to meet the commitments that they made."

At Salem 2, FTI replaced six low-pressure feedwater heaters that had been damaged as a result of a recent turbine overspeed incident. To replace the feedwater heaters, FTI removed wall panels in the turbine building, fire protection systems, level columns and

several electrical systems which then had to be replaced following installation of the new heaters. The feedwater heater project took approximately 40,000 man-hours to complete.

FTI also replaced two low pressure MSR tube bundles, including significant modifications to the MSRs internal structures, installation of new nozzle reinforcements and vent line resizing to accommodate the new tube bundles. The bundles were replaced as a result of an EPRI study indicating that copper from components in the plant's secondary systems could be carried to other plant components, resulting in long-term degradation. The original copper-containing tube bundles were replaced with stainless steel to eliminate the possibility of this problem occurring, and to provide other performance enhancements. The MSR modifications took approximately 35,000 man-hours to complete.

FTI's role for the Salem activities was to act as the installation management organization. To accomplish this task, FTI established a Project Task Leader and a team of lead technicians with the responsibility for oversight of work and coordination with PSE&G and several FTI subcontractors. This oversight included coordination of craft labor totaling up to eighty personnel for each project on any one day. FTI on-site management performed as the focal point for coordination in the MSR and FWH replacement.

"This work posed new challenges for FTI, as we expand our utility services business to include an integral role in BOP work," said Matt Marston, FTI's Site Director. "In their mission to provide safe, cost effective power in a newly deregulated industry, PSE&G relied on FTI to provide a quality job, on time and within budget."

With both the Hope Creek and Salem 2 stations now returned to power, FTI and PSE&G are using lessons learned there to ensure the success of this fall's outage at Salem.



photos courtesy of PSE&G

Top, technicians prepare to install the moisture separator reheater tube bundle at Salem 2. Middle, the old feedwater heater is removed at Salem 2. Bottom, aligning piping on the feedwater heater replacement.

Did you know that...

- FTI has provided service or parts to every nuclear utility in the United States.
- FTI has gained 18 percent of the domestic BWR internal inspection and repair market in the 4 years since entering the market.
- FCF has provided fuel for one-third of PWR reactors in the United States.
- FTI installed more than 800 feedwater heater sleeves at Mercer Station, a PSE&G fossil unit.
- Since 1983 FTI has inspected 2.5 million steam generator tubes and repaired 70,000 tubes.
- More than half of all North American steam generator chemical cleanings have been performed by FTI.

RCCAs to FPL

FCF has been awarded a contract from Florida Power and Light for replacement Rod Cluster Control Assemblies (RCCA) for Turkey Point Units 3 and 4. The scope is 41 RCCAs for each unit, for a total of 82 RCCAs.

The RCCAs will include Ion-Nitride HARMONI™ surface treatment of the cladding. HARMONI™ is a superior wear protection feature developed by Framatome SA in France and provided to FCF by Franco Belge de Fabrication de Combustible, Framatome SA's fuel manufacturing company.

EMPATH Provides Motor Testing Flexibility

Recent improvements to the Framatome Technologies, Inc. (FTI) Electric Motor Performance Analysis and Trending Hardware (EMPATH) system have helped to increase sales of this industry-leading motor testing system. These new improvements to EMPATH, implemented in response to customer needs, include a triggering capability that determines if a motor is operating prior to data collection, and remote unattended monitoring capability for testing motors that operate only occasionally or for continuous monitoring of critical motors.

FTI has sold numerous EMPATH systems, including sales to The Boeing Company (Boeing's 9th EMPATH purchase), Eli Lilly Pharmaceuticals, Taiwan Power and two sales to Florida Power & Light for use in nuclear generating stations.

"Our recent improvements have made EMPATH appealing to many different types of industries," said Don Ferree, FTI's EMPATH Business Manager. "Eli Lilly pharmaceuticals has found EMPATH very effective in testing motors that operate only occasionally."

EMPATH conveniently measures and analyzes electric motors to determine impending machinery problems due to deterioration and damage so that timely repairs can be made to avoid serious damage. The key to the EMPATH system lies in harnessing the technology of Motor Current Signature Analysis (MCSA), a proven indicator of the health or deterioration of electric motors and the machinery being driven.

The EMPATH system consists of a portable personal computer, analysis software and probes. The system can be used periodically or installed permanently to collect data continuously.



BetzDearborn's Ferroquest™ Allows Chemical Cleaning While Plant Continues to Generate Power

Framatome Technologies, Inc. is teaming with the BetzDearborn Division of Hercules Incorporated to apply BetzDearborn's patented Ferroquest™ technology for iron deposit removal at a neutral pH level on plant systems and components. These photos are before and after the application of Ferroquest in a tube bundle.



The teaming agreement for nuclear power plants and other industrial facilities combines FTI's chemical application experience with BetzDearborn's specialty chemical experience.

"Ferroquest's great advantage for electric generating facilities is that it can be applied and the cleaning accomplished while the

plant continues to generate power," said Cary Bowles, FTI's Manager of Projects in Chemistry Services.

Ferroquest is an easy-to-use, non-acid liquid product that slowly dissolves rust and iron deposits while protecting system metallurgy from corrosion and plugging caused by particulate iron. Requiring no post treatment neutralization, it is especially suited to cleaning closed cooling and service water systems like those found in nuclear power plants.



BWR at Santa Maria de Garoña

In the last several months, FTI has accomplished several BWR projects. Pictured is work at Spain's Santa Maria de Garoña plant where the BWR group accomplished In-Vessel Visual Inspection and Jet Pump Diffuser Inspection. Left, monitoring progress of diffuser



inspection; right, examining the diffuser inspection tool prior to use.

FTI has also recently completed BWR work at Nine Mile Point, where core shroud repair inspection and core shroud weld repair were done, and at Vermont Yankee, where core spray piping repair was done.



FTG Completes Ginna Fuel Pool Re-rack

Framatome Technologies Group (FTG) has completed re-racking the spent fuel pool at R.E. Ginna Nuclear Plant, operated by Rochester Gas and Electric Corporation (RG&E).

By replacing three older racks with seven new ones, Ginna expanded its spent fuel capacity, adding positions for 305 additional fuel assemblies for a total of 1321 assemblies. The modifications, completed as wet installations, allow for additional storage since the new racks can also accommodate consolidated fuel canisters. The new racks will receive both new and irradiated fuel.

The additional space obtained by re-racking will provide on-site storage for Ginna's spent nuclear fuel until the end of its current operating license in 2009. Ginna had previously re-racked its spent fuel pool in 1977 and 1985, also as wet installations.

The seven new racks were designed and manufactured by ATEA (Société Atlantique de Techniques Avancées), a subsidiary of FTI's parent company, Framatome SA. ATEA has produced specialized equipment for PWRs for more than 25 years.

In addition to re-racking, FTI personnel and contracted labor performed fuel handling, site modification and in-pool inspection.

Framatome Cogema Fuels performed the licensing analysis that included analyzing the degradation of the previous fuel racks, and prepared the report that was approved by the NRC allowing the re-racking.



Letter from the Editor

For those of us involved in planning Framatome Technologies' Executive Forum for Emerging Challenges and Trends (EFFECT), narrowing down the number of topics affecting the nuclear industry during these changing times was a major challenge. Another challenge was to provide the attendees with something they could use in their everyday business lives. Based on attendee feedback, not only did we meet those challenges, but we exceeded them.

EFFECT combined discussions of issues from nuclear industry leaders and business leaders, providing new insights into how we may want to conduct our business in the future and what we might need to do to improve the outlook for the nuclear industry. Speakers provided insights into competition in a deregulated marketplace, talked of strategic alliances, the future of the electric industry, and plant life extension — all challenges we face today and will face to an even greater extent in the future.

And so, it is our continued challenge with EnVision to provide our readers with updates on what is happening with Framatome Technologies and throughout the industry. We hope this issue will tell you more about our capabilities, how we've worked with our customers to make their outages a success, and how we might be able to assist you as you work toward achieving your goals for the year 2000 and beyond.

As in everything we do at Framatome Technologies, we look forward to hearing from you so we can continue to meet and exceed your expectations. Please contact us at envision@framatech.com or call 804-832-2379.

Thanks for reading.



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In these days of turbulent change and uncertainty in the energy industry, Framatome Technologies offers true peace of mind. With strategic global resources and a customer-focused culture, we provide reliable services and products, and intelligent solutions that can help improve your plant performance and reduce cost. Our commitment to the future of nuclear power is affirmed by new investments in BWR services, PWR services, in balance-of-plant capabilities, D&D resources, and in advanced PWR fuel. We embrace innovative win-win contracting and we are exploring long-term relationships to further enhance customer benefits. Amid the howling winds of change, we listen intently to your needs... and respond....Because we believe that your future success and ours are one.



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EnVision is a production of
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