framatome

Stearns Roger Services
Fuel Handling Equipment





Challenge

Utilities rely on a comprehensive suite of services for PWR and BWR fuel handling systems, since these are vital for ensuring a successful refueling outage. Achieving reliable equipment performance is critical, especially in the face of aging and obsolete equipment, compounded by intermittent use between outages. To assure operational functionality during outages, thorough inspections, regular maintenance and timely upgrades are essential.

Solution

Framatome's Stearns Roger Services (SRS) incorporates outage services lessons learned, operating experience and customer feedback to achieve evolutionary fuel handling equipment upgrades. Working with your teams, SRS can assess, upgrade or replace all fuel handling equipment to ensure total reliability and optimal performance during all of your fuel handling operations. Our Technical Training Center houses an operational BWR refueling platform, PWR manipulator crane and fuel transfer system to provide practical experience in a controlled, safe, real-world environment. The exclusive advantages of working with a turnkey supplier include our expertise at providing engineering, equipment and installation support with 10 CFR 50.59 evaluations and DCP writing. And we have a 24-hour hotline to ensure rapid response services during outages. We are committed to minimizing downtime and strive for 100% equipment availability, ensuring uninterrupted service and optimal outage performance.

Framatome's Stearns Roger Services

Enhancing Safety, Quality, Performance and Delivery

SRS is an OEM product line within the Framatome Outage Services organization. SRS is aligned with Framatome's Outage Execution organization for services and equipment implementation focusing on safety, quality, performance and delivery. SRS has a vast amount of experience providing and servicing most nuclear fuel handling equipment in the U.S., and ensures that each customer receives the best qualified resources tailored to their specific needs.

Commitment to refueling equipment includes:

- Turnkey engineering
- Equipment upgrades and replacements — manipulator cranes, refueling platforms, spent fuel pool bridges, fuel transfer systems and new fuel elevators
- Installation of upgrades and replacements
- Refurbishment and maintenance of existing fuel handling equipment
- SMR and Advanced Reactor fuel handling system design, fabrication, and installation
- Inspection and testing
- Outage field service support
- Supply of spare parts

2002
Framatome acquires Stearns Roger Services, established in 1964

2004
BWR & PWR refuel cranes installed in Technical Training Center

2008
Completed R&D for new manual BWR control system; Automated fuel transfer system design, manufacture and installation

2010
Completed spent fuel bridge design, manufacture and 3-day installation

2012
Completed automated fuel transfer system design, manufacture and installation with remote-replaceable wear features

2013
Designed automated PWR manipulator crane for Technical Training Center

2014
Installed automated PWR manipulator crane in Technical Training Center

2016
Designed and installed new BWR bridge controls and VFD; Designed and fabricated PWR bridge control utilizing intuitive joysticks & HMI

2017
Designed and installed automated SFP bridge controls

2018
Designed, fabricated and installed complete automated BWR refuel platform

2019
Installed automated BWR refuel platform; Installed automated transfer system controls

2020
Installed automated BWR bridge controls; Installed enhanced PWR manipulator crane controls; Installed automated transfer system controls

2021
Installed two automated BWR bridge controls upgrades and two complete automated spent fuel handling bridge replacements

2022
Installed automated transfer system controls upgrade

2024
Installed two PWR manipular crane upgrades, three fuel transfer system upgrades and completed SMR fuel handling equipment design (machine, elevator, jib crane)

2025
Installed trolley and automated control upgrades for refuel machine and spent fuel handling machine; Installed major fuel transfer system upgrade, including automated controls

2026
Complete design of two large Advance Reactor automated refueling transports and handling components, designing complete SMR refueling system

Advanced Refueling Equipment

Robust Design, Dependable Performance

Our fuel handling equipment is installed in many plants that have been operating for over 50 years. We apply lessons learned alongside modern technology to deliver robust system upgrades and “wheels-up” full replacements.

Reliable, Cost-Effective Fuel Handling Equipment



Stearns Roger
Advanced Refueling Bridge



Stearns Roger
Automated Fuel Transfer System



Stearns Roger
Automated Spent Fuel Bridge



Stearns Roger
New SMR and AR Refueling Systems Concept to Installation

Customer Benefits

- Improved safety and reliability
- Increased speed
- Improved loading/unloading control
- Reduced maintenance and down time
- Historian database for system fault tracking
- Advanced system diagnostics
- Standardized equipment across systems
- Reduced terminal connections
- Cabinet power division for safety
- Supervisor monitoring system
- 24-hour support

Automated Refueling Bridge for PWR and BWR Facilities

Improved Safety, Reliability and Enhanced Performance

- Automatic, semi-automatic and manual modes
- Field-configurable boundary control
- Cybersecurity compliant
- Advanced operating features and improved performance
- Advanced encoders/lasers for precise positioning
- Reliable digital processing
- Smooth positioning and acceleration
- X/Y combined movements for optimized travel paths
- Automatic moves loaded from electronic move sheet
- Ergonomic interfaces
- Simultaneous screens for system data visbility
- Intuative Human Machine Interfaces (HMI)
- Safe gripper engage/disengage
- Fuel transfer system auto initiate
- Reliable joystick control with dead man switches



Automated Spent Fuel Bridge

Improved Functionality and Maintenance Access







Features

- Automatic, semi-automatic and manual modes – proven, optimized I&C architecture; high-safety features with redundancies and interlocks
- Increased equipment speeds
- Cybersecurity compliant
- Precise positioning of trolley and bridge during refueling operations
- Mechanical architecture and mechanisms based on proven technologies with improved safety and reliability
- Laser and encoder positioning
- X/Y combined movements for optimized travel paths
- HMI for increased functionality
- Optional dual hoist design, added versatility
- Transfer system auto initiate from bridge, eliminates Fuel Transfer System (FTS) operator requirements
- Boundary zone protection system with programmable, in-work area exclusion zones
- Wider work platforms
- Quality control validation of software and interlocks through extensive functional testing
- Off-bridge system monitoring and diagnostics

Maintenance Platform

- Upper platform can access hoist during scheduled preventative maintenance
- Components on upper platform positioned to improve ergonomics
- Maintenance walkways for hoist and electronics — removes scaffolding requirement

Operator Control

- Touchscreen, with on-the-screen control
- Advanced diagnostics
- Ergonomic industrial joystick controls
- Fuel tracking
- Field-configurable controls
- Optimized human performance

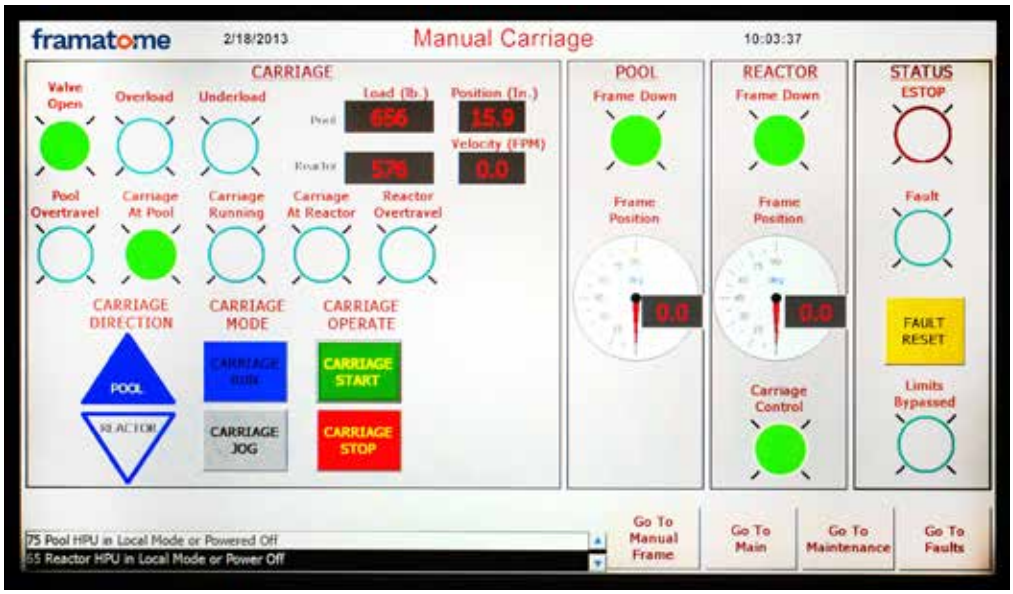
Automated Transfer System

Safety Improvement — Reliable operation and control from an easy-to-use Human Machine Interface

Benefits

- Programmable Logic Controller (PLC) control with Human Machine Interface
- Advanced torque control transfer system winches constantly manages rope tension
- Variable speed control
- Speed profiling for uneven tracks
- Quick disconnect consoles can be removed from containment at end of outage for component protection
- Rapid troubleshooting and data trending
- Manual control capabilities
- Above-water limit switches
- Display shows cart position during transfer move
- Remote underwater component replacement option





New SMR and AR Refueling Equipment



- Turn-key fuel handling equipment to meet small modular reactor and advanced reactor requirements
  - Design, engineering, fabrication, delivery
- Adapting proven commercial fleet equipment to meet the demands of SMRs/ARs
  - Using proven designs where applicable to support cost/risk avoidance, quality and delivery
  - Ability to customize FHE to meet specific needs of the equipment/customer
- Framatome's Stearns Roger (SRS) is the sole fuel handling equipment and fuel rack supplier for Nuscale's VOYGR™ modular reactors
- SRS is the fuel handling equipment provider for the TerraPower Ex-Vessel Handling Machines
  - Complete design and analysis, with option for fabrication and installation
- SRS is the fuel handling supplier for Holtec SMR
  - Complete design, analysis, fabrication and installation

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 22,000 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%).

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