

# Stearns Roger® Services

## Fuel Handling Equipment







## **AREVA Outage Services**

**Lessons Learned, Operating Experience, and Customer Feedback Enable Revolutionary Fuel Handling Equipment Upgrades**

Utilities expect a full range of services for all PWR and BWR fuel handling systems including mechanical, electrical and electronic design and support.

Working with your teams, AREVA can assess, upgrade or replace Manipulator Cranes, Spent Fuel Bridges and Fuel Transfer Systems to ensure total reliability and optimal performance during all of your specific fuel handling operations. AREVA's full-scale, wet BWR and PWR

bridges and fuel handling training provide practical experience in a controlled, safe, real-world environment.

In addition, you get exclusive advantages from working with a turnkey supplier. AREVA provides engineering, equipment, and installation – all with trained, qualified craft personnel, CFR 50.59, DCP and responsive services during outages.



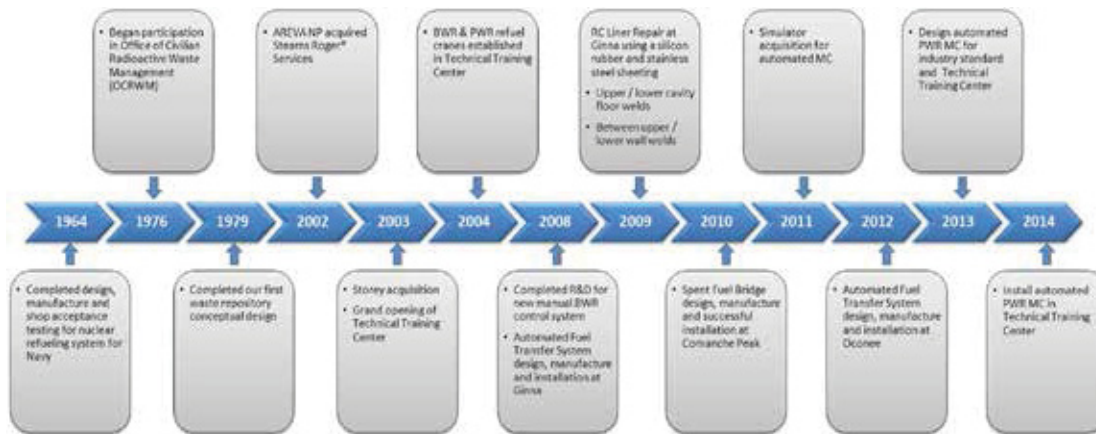
# AREVA's Stearns Roger® Services

## Enhancing Safety, Quality, Performance and Delivery

### Who is Stearns Roger® Services

AREVA's Stearns Roger® Services (SRS) is a product line within the Outage Services organization in the Reactors and Services Installed Base Business.

#### AREVA's Stearns Roger® Services Timeline & Organization



### Commitment to Refueling Equipment

SRS Products and Services include:

- Refurbishment and maintenance of existing fuel handling equipment
- Equipment upgrades and replacements – manipulator cranes, spent fuel bridges, fuel transfer systems
- Installation of upgrades and replacements
- Inspection and testing
- Engineering
- Field services
- Spare Parts Supplier

SRS is aligned with the Outage Execution organization for services and equipment implementation focusing on safety, quality, performance and delivery.

SRS has experience on all nuclear fuel handling equipment in the United States, and ensures that each customer receives the best qualified resources tailored to their specific needs.



# AREVA's Stearns Roger® Services

## Advanced Refueling Equipment

### Reliable Equipment



### Benefits

- Improved safety
- Reliability
- Increased speed
- Improved loading / unloading control
- Reduced maintenance time
- System fault tracking
- Reduced down time
- 24-hour support
- Standardized equipment

### Improvements

- Advanced system diagnostics
- Reduced terminal connections
- Cabinet power division for safety
- Supervisory SCADA system
- Redundant PLC processing and controls
- Human machine interfaces
- Updated control information
- Increased operator visibility during fuel movement
- Plug & play technology
- Up-to-date procedures / controls





# AREVA's Stearns Roger® Services Advanced Refueling Equipment

## Improved Safety, Reliability and Enhanced Performance

### Manipulator Crane

- Operating features & improvements
- Automatic and manual modes
- Plug & play technology
- Smooth positioning and acceleration
- X/Y combined movements for fast circulation (specific trajectories)
- Redundant encoders / lasers
- Boundary control
- Cyber security compliant
- Redundant digital processing

### Control Desk Features

- Human machine interfaces
- Streamlined controls
- Joysticks
- Gripper engage / disengage
- Emergency stop
- Fuel transfer system auto initiate
- Ergonomic and sturdy design
- Optimizes floor space
- Reliable joystick control with dead man switches
- Simultaneous screens for system data visibility

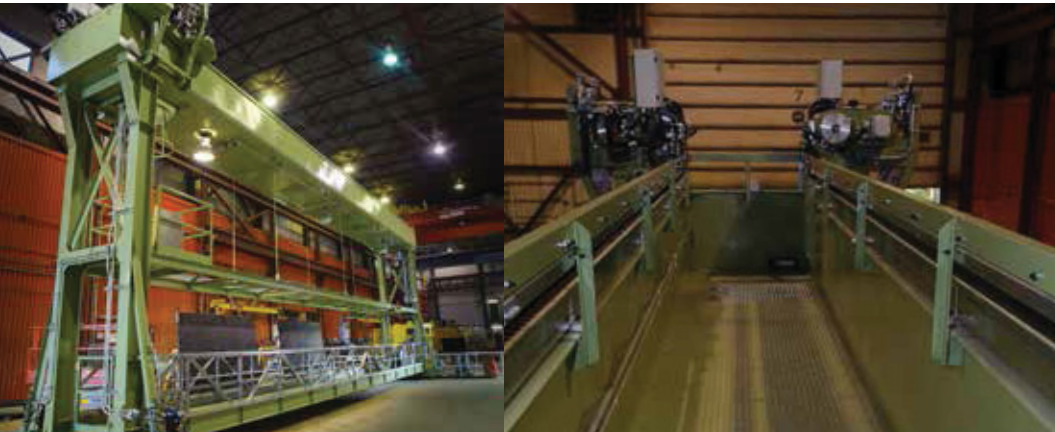




# AREVA's Stearns Roger® Services

Automated Spent Fuel Bridge

**Improved Functionality and Maintenance  
Accessibility**



## Features

- Automatic, Semi-automatic and Manual modes
  - proven, optimized I&C architecture; high safety features with redundancies and interlocks
  - SIL3 Compliant
- Increased speed
- Cyber security compliant – critical digital asset
- Precise positioning of trolley and bridge during refueling operations; mechanical architecture and mechanisms based on proven technologies with improved safety and reliability
- Laser positioning
- X/Y combined movements for optimized travel paths (specific trajectories)
- Human machine interface for increased functionality
- Dual hoist design, added versatility
- Transfer system auto initiate from bridge, eliminates FTS operators requirements
- Collision avoidance system – added safety feature
- Wider work platforms with stainless steel handrails
- Quality control validation of software and interlocks through extensive functional testing
- Off-bridge system monitoring and diagnostics – verify system operation during use

## Upper Platform

- Upper platform can access hoist during scheduled PM's
- Components on upper platform to improve ergonomics
- Maintenance walkways for hoist and controllers – removes scaffolding requirement

## Operator Control

- Touch screen, with on-the-screen control
- Advanced diagnostics
- Ergonomic joystick controls
- Fuel tracking
- Adaptable controls
- Improved human performance

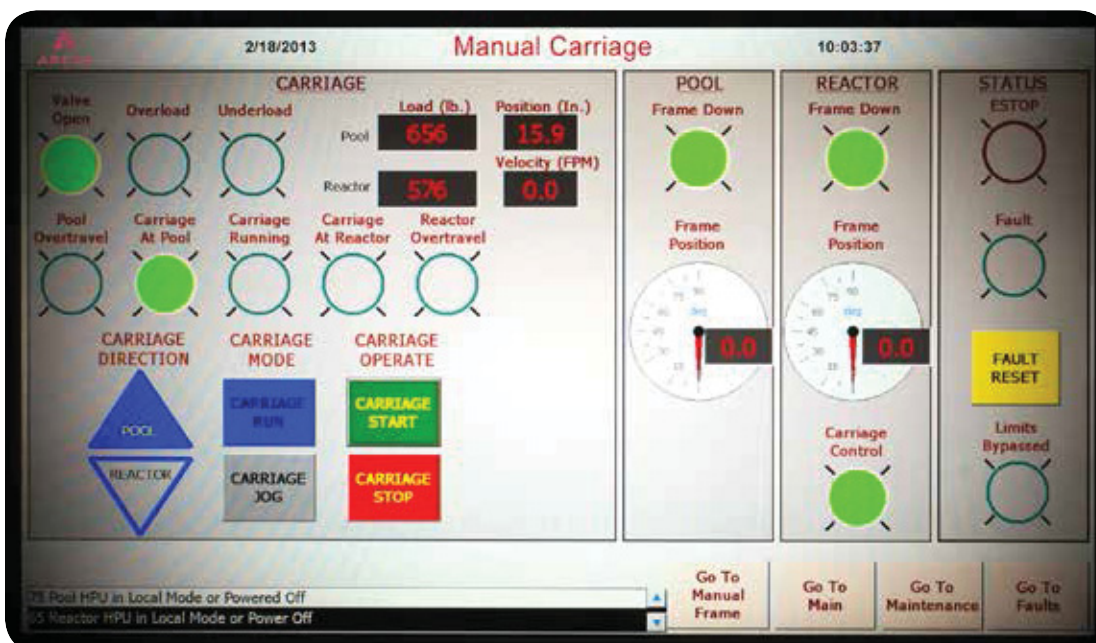
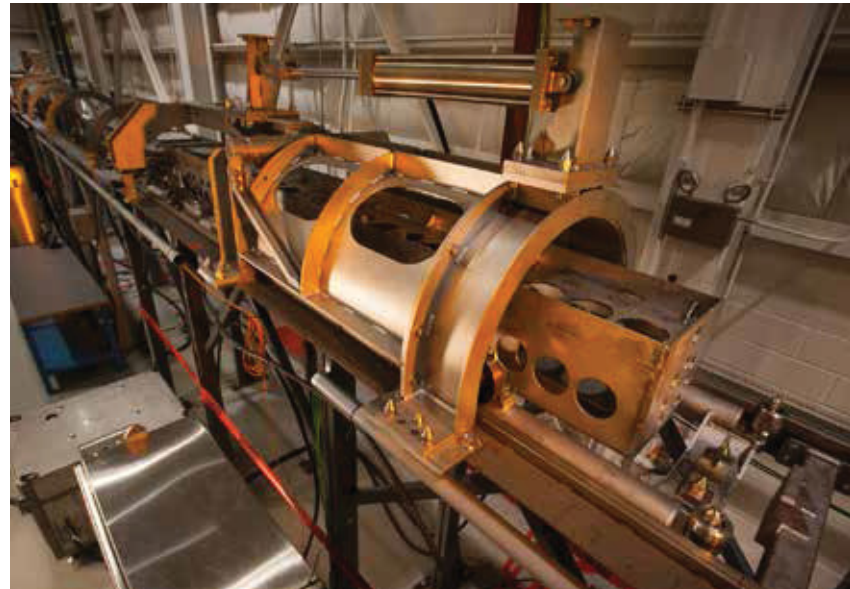


# AREVA's Stearns Roger® Services Automated Transfer System

## Safety Improvement — Programming / Adjusting from Front Panel Away from Live 480v

### Benefits

- PLC control with Human Machine Interface
- Increased flexibility
- Variable speed control
- Speed profiling for uneven tracks
- Quick disconnect consoles can be removed from RB at end of outage
- Improved troubleshooting and trending
- Manual control available as necessary
- Above water limit switches
- Display shows cart position during transfer move
- Installation not on critical path
- Less than 60 hours for RB install





AREVA provides its customers with solutions for low-carbon power generation in North America and all over the world.

As the leader in nuclear energy and a significant, growing player in the renewable energies sector, AREVA combines U.S. and Canadian leadership, access to worldwide expertise and a proven track record of performance. Sustainable development is a core component of AREVA's strategy.

Its nearly 5,000 U.S. and Canadian employees work every day to make AREVA a responsible industrial player helping to supply ever cleaner, safer and more economical energy to the greatest number of people.

[us.aveva.com](http://us.aveva.com)

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