



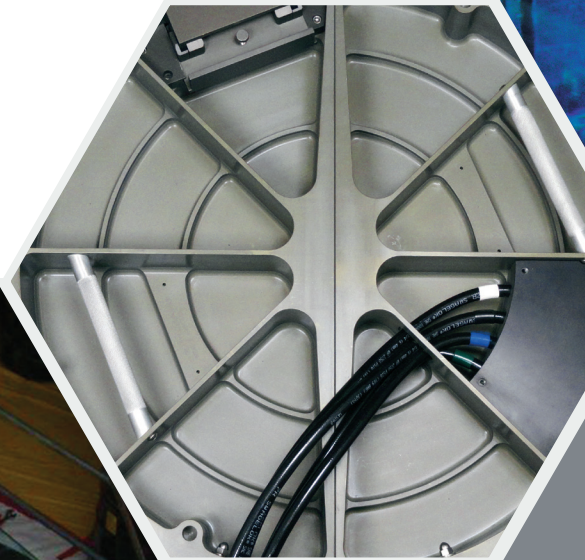
# **Outage & Fuel Management Solutions**

# Outage & Fuel Management Solutions

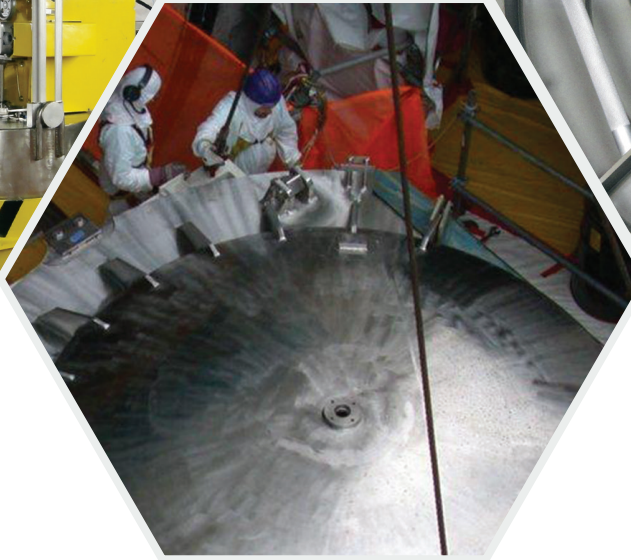
Curtiss-Wright Nuclear has a proven track record at nuclear plants worldwide. We are proud of our highly experienced personnel that enable us to supply innovative, custom-designed outage and maintenance equipment and services. Our products are designed to improve safety and reduce critical path outage time and associated radiation exposure to help you achieve your ALARA objectives.



Quality



Performance



Innovation

## ***Reactor Servicing*** –

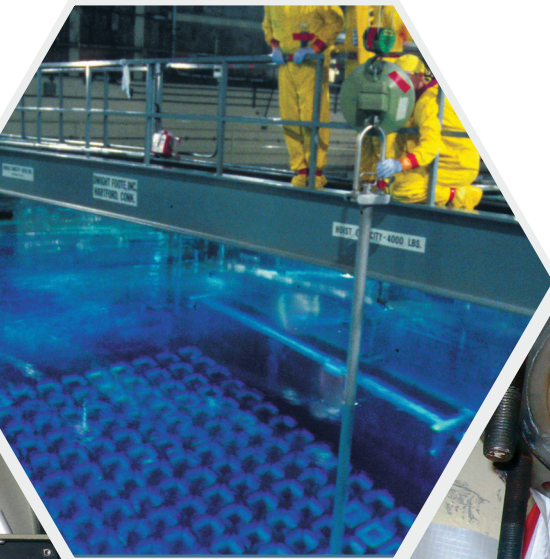
tooling, heavy lifting equipment and plugs/seals to support reactor disassembly/reassembly, in-vessel maintenance and facilitation of refueling and other maintenance activities

## ***Steam Generators*** –

a full range of servicing equipment from nozzle dams to closure tensioning and handling equipment including installation services

## ***Specialty Equipment*** –

specialty shielding, fuel handling equipment upgrades, quick bolts and dry cask storage support solutions



## Engineering



Focused on  
improving safety and  
reducing critical path  
time and radiation  
exposure

## Technology

*Custom-designed outage and  
maintenance equipment*

**Fuel Management** –  
neutron absorber products and  
services such as SNAP-IN<sup>®</sup>  
Inserts, BADGER testing, coupon  
testing, surveillance programs  
and material qualification

**Remote NDE Applications** –  
specializing in Pre-Service and In-  
Service Specialty Non-Destructive  
Examination services including  
Fully Encoded Delivery Systems  
for Phased Array Ultrasonic Testing  
and Balance of Plant Eddy Current  
Testing

**CRD Maintenance Services** –  
all the equipment necessary  
to perform BWR control rod  
drive, HCU and undervessel I&C  
maintenance as well as turnkey  
and supervisory services for both  
on-site and off-site CRD rebuild

# Plant Products & Services



The Outage & Fuel Management Solutions Group is a combination of three divisions concentrating on Nuclear Plant Outage and Maintenance excellence. Since 1973, we have amassed a highly experienced staff of scientists, engineers, designers, project managers and certified technicians. As part of Curtiss-Wright Nuclear, our accumulated expertise in nuclear plant operations enables us to supply custom-designed outage and maintenance equipment using proven technologies. Above all, our products are designed with you and your plant's requirements in mind.

*Putting the needs of our customers first*

## **Engineered Products**

We improve Nuclear Plant Outage and Maintenance activities by providing innovative solutions and quality services led by Subject Matter Experts. We provide value to our customers by improving critical path outage time, equipment reliability and improving worker and nuclear safety while reducing personnel radiation exposure.

## **Advanced NDE Solutions**

We have a successful history of providing NDE services to the majority of the US Nuclear Fleet for over three decades, most notably the delivery of fully encoded Phased Array Ultrasonic Testing of piping and components.

## **Fuel Management**

Providing safe, innovative solutions that address neutron absorber performance issues is one of our specialties. We use our extensive experience to provide effective neutron absorber product solutions like NETCO SNAP-IN® Inserts and service offerings including in-situ and laboratory testing of neutron absorber material as well as criticality safety analyses.

## **Quality Programs**

Our fully approved Quality Assurance Programs, in conformance with 10CFR50 Appendix B and NQA-1, demonstrate Curtiss-Wright Nuclear's commitment to complying with industry regulations, codes and standards for providing reliable products and services. Our audited quality programs have been accepted for design, product fabrication, off-site maintenance and on-site field services.

## **SG and BOP Eddy Current Testing**

Our experts deliver the latest procedures, program support and services to help ensure safe operation, equipment reliability and compliance with industry and regulatory codes and standards. Development of the IM-2 Manipulator system provides a flexible, reliable solution where remote operations are required. Our remote data center offers a cost-effective and efficient approach to data analysis.

# Products

## Above Vessel Reactor Servicing Equipment

- Blade Guides
- CEA Handling Tool
- Control Rod Blade/Fuel Support Piece Grapples
- Control Rod Blade/Blade Guide Storage Racks
- Drywell Head Alignment Pins
- Fuel Channel Handling Tool
- ICI Cutting and Withdrawal Tools
- LPRM Bending Tool
- Multiple Instrument Dry Tube Strongback
- Multiple Instrument Storage Container
- Neutron Source Retrieval Tool
- Radiation Shield and Strongback
- RCCA Handling Tool
- Reactor Disassembly/Wet Lift Tooling
- Reactor Head Tensioner Carousel/Strongback
- Refuel Floor Auxiliary Bridge
- RPV Head O-ring Storage Container
- RPV Closure Component Storage Rack
- RPV Service Platform
- RPV Stud Lifting Devices
- RPV Stud Storage Racks
- Segmented RPV Head Alignment Pins
- Shroud Head Bolt Wrench
- Temporary Reactor Head

## BWR CRD Undervessel Maintenance Equipment

- CRD Exchange/Rebuild Tools
- CRD Handling System
- CRD Shipping Containers
- CRD Storage Racks
- HCU Water Accumulator Handling Cart
- IRM/SRM/LPRM Insertion Tools
- TIP Tubing Quick Disconnect Modification
- Undervessel Mock-up
- Undervessel Platform Upgrade

## Fuel Management

- Criticality Analysis Software
- NETCO BADGER Equipment
- NETCO PINserts
- NETCO Smart Store System
- NETCO SNAP-IN® Inserts

## Plugs and Seals

- Core Flood Nozzle Plugs
- Drywell Vent Plug
- ICI Plugs
- Inspection Port (Sandbox) Covers
- Nuclear Instrumentation Port Covers
- Recirculation Outlet Nozzle Plugs
- RPV Drain Line Plug
- RPV Inlet/Outlet Nozzle Plugs
- RPV Stud Covers
- RPV Stud Hole Plugs
- Segmented Reactor Cavity Seal

## Steam Generator (SG) Servicing Equipment

- Channel Head/Manway Mock-up
- Fastener Cleaner
- FME Covers
- HydraNuts
- Manway Cover Handling Devices
- Manway Diaphragm Roller Set
- Manway Flange Protector
- Manway Multi-stud Tensioning Systems
- Nozzle Dams
- Nozzle Dam Analog and Digital Support Consoles
- Nozzle Dam Storage Cabinets
- Quick Bolts
- Radiation Shield Doors
- Single-stud Tensioning Systems
- Stud Elongation Measurement Devices
- Studs, Nuts, Spherical Washers
- Zero Entry Nozzle Covers
- Zero Entry Nozzle Dam Enhancements and Tooling

## Specialty Equipment & Services

- Cask Service Platform
- Dry Cask Storage/ISFSI Specialty Equipment
- Fuel Handling Equipment and Fuel Transfer System Upgrades
- Fuel Transfer Tube Quick Closure Modifications
- Quick Bolts
- RPV Bio-Shield Doors
- Sacrificial Shield Wall Door Handling Tool Sets
- Storage Baskets

# Services

## Fuel Management

- BADGER Testing
- Criticality Analyses
- NETCO SNAP-IN® Insert Installation
- Neutron Absorber Qualification Testing
- Surveillance Coupon Programs and Testing

## Outage Maintenance

- BWR CRD Exchange
- BWR CRD Rebuild (on-site and off-site)
- BWR I&C Maintenance
- HCU Maintenance
- HydraNut Support and Installation
- LLRT/ILRT Services
- PIP Refurbishment
- Plug and Seal Installation and Removal
- Product Installation and Training
- SG Closure Services
- SG Nozzle Dam Installation and Removal
- SG Nozzle Dam Refurbishment
- TIP Tubing Quick Disconnect Upgrades
- Training

## Innovation

- Innovation Team Programs
- Outage Optimization Walk-downs

## Nondestructive Testing

- Advanced Phased Array Ultrasonic Testing
- FAC and NDE Inspections
- In-Service Inspection
- NDE Qualification and Certification Training
- Remote Data Center

## Phased Array Ultrasonic Testing (PAUT)

- PAUT of Dissimilar Metal Welds, Weld Overlays
- PAUT Sensors and Motion Control Application
- PAUT Technique and Procedure Development Qualification

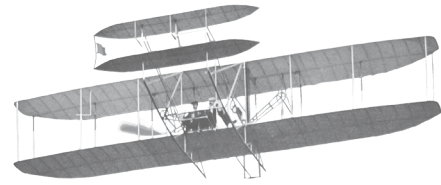
## Eddy Current Testing Services

- Auto Analysis Software
- IM-2 Manipulator System
- BOP Heat Exchanger Tubing Inspection
- SG Eddy Current Testing Independent Data Analysis
- Data Acquisition/Management and Tube Repair

## Quality Services

- ASME NDE Program Development and Review
- Quality Control Inspections

## Your Partner in Innovation



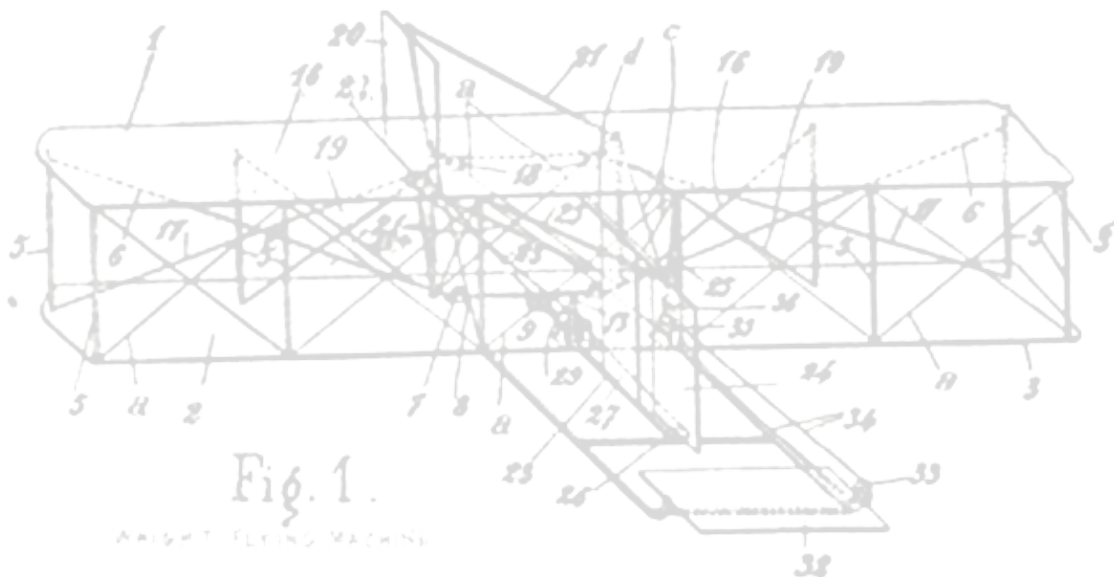
Innovation is one component of a continuous improvement cycle aimed at enhancing existing solutions and creating real technological breakthroughs for new market opportunities. Curtiss-Wright Nuclear seeks to be an “evolutionary” provider of nuclear products and services by engaging our customers to expand on proven technologies.

Our established Innovation Team observes the performance of plant outages to determine what proven technologies can be used to streamline various maintenance, refueling and reactor disassembly/reassembly tasks.

Our innovation process is also used to continuously improve our internal work flow and processes and service executions.

Curtiss-Wright Nuclear has always been in the forefront of using leading-edge technologies to improve the safety and operation of all nuclear power plants.

We strive for the best solutions, from innovative design using leading-edge technologies to world-class manufacturing – *delivering compelling value to our customers.*





## Contact Us

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**CURTISS -  
WRIGHT**

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