Advanced Engineered Solutions for Critical Nuclear Applications

PAR SYSTEMS

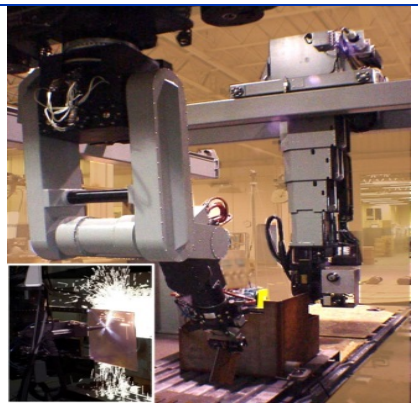
Since 1961, PaR Systems has supplied hundreds of remote handlng and critical lift systems to the worldwide nuclear industry

- *Argonne National Lab*
- *Bechtel*
- *Fluor*
- *General Atomics*
- *General Electric*
- *Hanford*
- *Idaho National Lab*
- *Institute of Nuclear Energy Research*
- *Japan Atomic Energy Agency*
- *Japan Nuclear Fuels, Ltd.*
- *Lawrence Livermore National Lab*
- *Los Alamos National Lab*
- *National Nuclear Lab*
- *NOVARKA*
- *Oak Ridge National Lab*
- *Pantex*
- *Sandia National Lab*
- *Savannah River Site*
- *Sellafield Sites*
- *Studsvik*
- *URS*
- *Westinghouse*
- *Waste Isolation Pilot Plant*

Remote Maintenance

Hot Cell and Process Facility Remote Handling:

- Remotely Operated Manipulator Systems
- In-Cell Crane Systems
- Remotely Operated Tooling and End Effectors
- In-Cell fixtures and stands



Process Equipment Size Reduction

Size Reduction:

- Plasma arc, water jet and mechancial cutting
- Large envelope cutting
- Heavy equipment volume reduction
- Remote and automated cutting

Tensile Truss™ Deployment

Decommissioning:

- Cranes & Tensile Truss™
- Deployment over 100 feet (30m) below rails
- Payloads over 120 tons
- Large Dynamic Tooling Forces

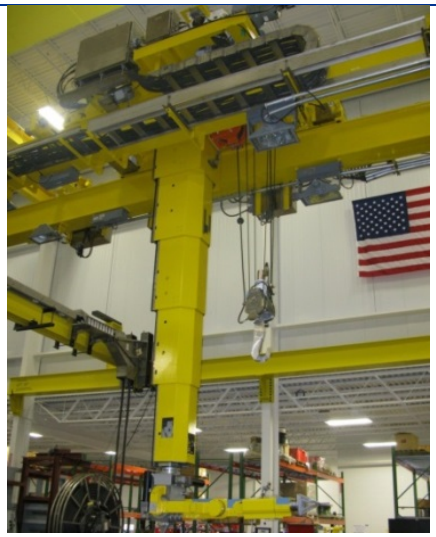
Nondestructive Inspection System

Nondestructive Testing Solutions:

- Radiography
  - Digital and CR
  - Computed Tomography
- Ultrasonic Testing
  - Pulse Echo
  - Immersion
  - Phased Array

PaR Systems, Inc. 707 County Road E West Shoreview, Minnesota 55126-7007 USA
Toll Free: 1.800.464.1320 Tel: 651.484.7261 Fax: 651.483.2689 www.par.com

REMOTELY OPERATED SYSTEMS



Hanford Waste Treatment Plant

Remotely Operated Manipulator Systems

- Traveling Bridge/Telescoping Tube Deployment
- Manipulator Payloads from 150 to 300 Pounds (70kg to 140kg)
- Remote Recovery
- Auxilary Hoists
- CCTV and Lights
- Programmable Positioning
- Seismic Retention
- Fire Suppression Systems
- End Effectors and Remotely Operated Tooling

Argonne National Laboratory

Manipulator Vehicle Systems

- Tracked and Wheeled Vehicles
- Simplified Joystick Operation
- High Payload (120 pounds/55kg)
- Cable Retrieval
- Modular Components
- Mobile remote handling system introduction

Savannah River National Laboratory

Through Wall Deployment

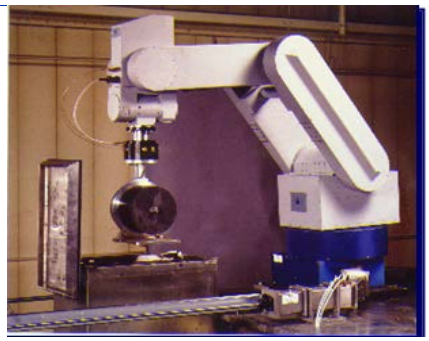
- Extended Reach – up to 19 feet (5.7m)
- 150+ pounds Payload (70kg)
- Automated or Remote Operation
- Docking Using Standard MSM Ports
- Stainless Steel Construction for Decon Solution Resistance

PaR Systems, Inc. 707 County Road E West Shoreview, Minnesota 55126-7007 USA
Toll Free: 1.800.464.1320 Tel: 651.484.7261 Fax: 651.483.2689 www.par.com

ROBOTIC AND PROGRAMABLE SYSTEMS

Accelerator Target Handling System

- High Radiation Operation
- Fully Automated
- Electrical Isolation
- Repeatable Positioning
- Design for Electrical Isolation



Oak Ridge National Laboratory

Box Opening Gantry Robotic System (BOGR)

- Automated Sawing System
- Automatic Tool Changing
- Force Sensing Blade Anti-binding System
- Automatic Box Surface Detection
- Debris Vacuum System

Advanced Mixed Waste Treatment Plant

CRITICAL LIFT SYSTEMS

Tensile Truss (Mobile Tool Platform)

- Deployment over 130 feet (40m) vertically
- Platform for remote tool deployment
- Deployment of hydrualic waste breaking systems
- Mobile tool platform vertical, pan and tilt motion

PaR Sytstems Demo Facility

Canister Crane

- Single Failure Proof – 110 Ton Payload
- Spent Nuclear Fuel Canister Handling
- Retrofit to Existing Facility
- Auxilary Hoists
- Seismic Design

Fuel Cycle Faciity Customers

PaR Systems, Inc. 707 County Road E West Shoreview, Minnesota 55126-7007 USA
Toll Free: 1.800.464.1320 Tel: 651.484.7261 Fax: 651.483.2689 www.par.com

FACILITY ENHANCEMENT, DECONTAMINATION AND DECOMMISSIONING

Plug Manipulator System

- Retrofit using hot cell ceiling plug
- Restore hot cell remote handling access
- Remotely operated
- Mechanical recovery system
- Deploys remotely operated tooling
- Significant mast exension
- Horizontal trolley motion
- Utility deployment through shield plug

Oak Ridge National Laboratory

Electromechanical Manipulator/ Decontamination System

- Vertical Bridge Deployment
- Remotely operated boom and manipulator system
- Replaceable using in-cell crane
- Deploys decon hose/nozzles
- Stainless steel construction

Savannah River National Laboratory

COMPREHENSIVE TEST FACILITIES

PaR Systems Testing Facility 36" Pit

- Facilities designed for remote handling, robotic and critical lift manufacture, testing and demonstration
- Crane Hook Height of 55 feet (17m)
- Floor Pits to 36 feet (11m) deep (91 feet/27m below Crane Hook)
- Floor Pit can be flooded
- Over 50 years of remote handling and critical lift system testing and demonstration experience

PaR Systems, Inc. 707 County Road E West Shoreview, Minnesota 55126-7007 USA
Toll Free: 1.800.464.1320 Tel: 651.484.7261 Fax: 651.483.2689 www.par.com