

# Piping and Component Repair and Replacement

## Background

Westinghouse, through its welding and machining group of companies, has the technology and capability to provide safe, effective and reliable repair techniques that contribute to shorter outages. Furthermore, Westinghouse has the design engineering expertise and the technology needed to meet or exceed all code, regulatory and design requirements.

## Description

- Each project is reviewed to implement the best possible repair or replacement methodology
- Welding technicians are fully certified according to American Society of Mechanical Engineers Section IX standards
- A vast library of welding procedure specifications and personnel qualification records is available to facilitate a response to emergent needs

Westinghouse's piping and component repair and replacement capabilities include:

- Control rod drive mechanism/control element drive mechanism repair/replacement
- Steam generator drain line repair/replacement
- Valve replacement
- Nuclear steam supply system nozzle inside diameter (ID) and outside diameter (OD) repairs
- Thermocouple column replacement
- Steam generator secondary side repair/modification
- Flow-accelerated corrosion pipe repair/replacement
- Turbine cylinder replacement
- Pump repair/replacement

- Resistance temperature detector bypass elimination
- Permanent cavity seal installations
- Conoseal repair/replacement
- Fuel pool modification
- Guide funnel welding
- Reactor upflow modification
- Main steam isolation valve, feedwater check valve repair/replacement
- Canopy seal weld overlay
- Reactor core former bolt replacement
- Reactor coolant pump machining
- Flow splitter removal/modification

Project management is available for:

- Turnkey replacement services
- Pre-replacement metrology to verify component dimensions
- Pre-fabrication and in situ machining and welding services to implement the chosen repair methodology

Field machining inventory includes conventional equipment such as:



Large nozzle repair

- OD- and ID-mountable pipe lathes
- Mills
- Drills
- Saws

Advanced machining technologies include:

- Electrical discharge machining
- Metal disintegration machining
- Abrasive water jet cutting
- Plasma arc cutting
- Underwater machining and welding – allows for repair or modification of highly activated reactor internal components while maintaining as-low-as-reasonably achievable personnel exposure

Welding equipment inventory encompasses the following manual and machine welding processes:

- Gas tungsten arc welding
- Gas metal arc welding
- Flux-cored arc welding
- Shielded metal arc welding

## Benefits

Westinghouse can provide specially designed equipment or modify standard welding systems as needed, including underwater remote welding.

All custom machine and welding equipment is thoroughly tested and qualified before being released for service. Whatever the discipline, Westinghouse employees receive project-specific training and qualification prior to mobilization to the site.

Westinghouse can also provide direction in modifying equipment from inventory if needed.



Outer diameter mounted pipe lathe shown installed on a replacement steam generator for severance cutting of the hydrostatic test cover



Prefabrication of feedwater piping for a piping replacement project