



People Building Success
Nuclear Decommissioning Solutions



Burns and Roe Enterprises, Inc.

Burns and Roe is a full-service engineering, construction, operations and maintenance firm headquartered in Oradell, New Jersey. With over 1,700 personnel worldwide, we provide comprehensive technical services to government and commercial clients. Our experience includes engineering solutions for the decontamination and decommissioning (D&D) of nuclear facilities and equipment safely, within budget, and ahead of schedule.



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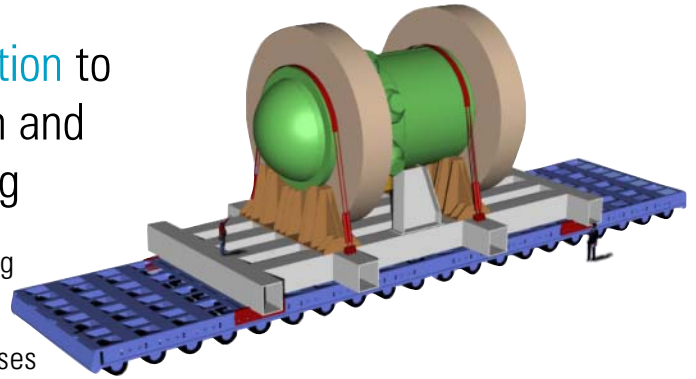
- 1) Steam generator side shielding installation
- 2) Positioning a reactor vessel on cradles
- 3) 3 - Dimensional model of a shielded reactor vessel with impact limiters
- 4) Packaged reactor vessel loaded for barge transportation
- 5) Transportation of a steam generator from the Trojan Nuclear Plant (opposite page)



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A Complete Solution to Decontamination and Decommissioning

Burns and Roe is a leading provider of D&D services and developed processes that result in more cost effective and efficient D&D programs. We pride ourselves in not just our unequalled and quality performance, but in the services we provide, including:



- Engineering, Design, Procurement, Construction Services (EPC)
- Decommissioning and Dismantling Planning
- Program and Project Management
- System Analysis
- Cost Analysis
- Technology and D&D Alternatives Assessment
- Health and Safety Oversight and Management
- Regulatory Analysis
- Decommissioning Operations Activity Specifications and Procedures
- Radiological Characterization Surveys and Monitoring
- Waste Management Dismantling/Segmentation/Demolition
- Facility Stabilization/Site Restoration

Our expertise includes D&D at NRC licensed power plants, research facilities, commercial process plants, and DOE facilities. In all cases we focus our efforts on real solutions that produce results.

A Case Study: The Trojan Nuclear Plant



Burns and Roe was contracted under two separate projects by Portland General Electric Co. to decommission the Trojan Nuclear Plant in Rainier, Oregon. Burns and Roe's D&D services at the Trojan Nuclear Plant involved numerous innovative technologies that were performed during the Large Component Removal (LCR) project and the Reactor Vessel and Internals Removal (RVAIR) project.

LCR Project

Scope: Burns and Roe provided structural, thermal and shielding analysis, as well as construction and construction management.

- project was completed on-schedule
- more than \$1.6 million under budget.

RVAIR Project

Scope: Burns and Roe removed Trojan's nuclear reactor pressure vessel using an innovative one-piece removal process, thereby:

- eliminating the costly, thick steel can shielding
- reducing radiation dose to the workers
- reducing the cost, estimated at \$15 million (compared to segmentation)
- reducing burial site volume and disposal cost.

An Innovative Solution with Proven Results

Decommissioning and transporting reactor coolant system large components and the reactor vessels provide many challenges that are detrimental to the success of the project. Segmenting the vessel into many small pieces and placing these pieces into liners and shielded casks is a very time consuming method of disposal and exposes workers to a significant radiation dose. Alternatively, placing the entire reactor vessel inside a large, thick steel can transport cask is a quicker method of disposal, but very costly. We have a better solution.

Burns and Roe developed a process of one-piece reactor removal utilizing a shielding jacket instead of steel can shielding. This innovative process was developed for the Trojan Nuclear Plant's Reactor Vessel and Internals Removal (RVAIR) project and was the first-of-its-kind. The results of this system were phenomenal with significant cost savings (\$15 million for the RVAIR project), reduced worker radiation dose, shorter schedule and reduced burial site disposal volume. In addition, the shielding system has been reviewed and accepted by the US Nuclear Regulatory Commission.





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A Responsive Solution Focused on Team Effort

Decommissioning a facility or plant is not just a project, but an undertaking. Burns and Roe understands the difference. We know that in order to supersede the goals established by our clients, we need to listen to our clients, understand the project scope and work as a team. We not only take comprehensive responsibility for the services we provide, but we also work closely with our clients to ensure the greatest customer satisfaction.



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6) Stack removal at the Humboldt Bay Nuclear Generating Station

7) Jacket shielding for one-piece removal of reactor vessel

Burns and Roe's D&D Accomplishments

- ✓ Won the PMI® Project of the Year Award for the Trojan RVAIR Project
- ✓ First large-scale commercial reactor vessel decommissioning at the Trojan Nuclear Plant
- ✓ Developed the Decommissioning Plan for the first one-piece reactor vessel at Shippingport Atomic Power Station
- ✓ Provided decommissioning, decontamination and dismantling of the AIRCO Radioactive Gases Facility
- ✓ Prepared Decommissioning Plans for the NASA Plum Brook Reactor Facility
- ✓ Provided the Cost Estimation, Dismantling Plans and Scheduling for the Saxton Nuclear Experimental Facility
- ✓ Decommissioning and Disposal of the Radioactive Waste Tank and Sludge at the Brookhaven National Laboratory
- ✓ Dismantlement and Decontamination of the stack at the Humboldt Bay Nuclear Generating Station



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