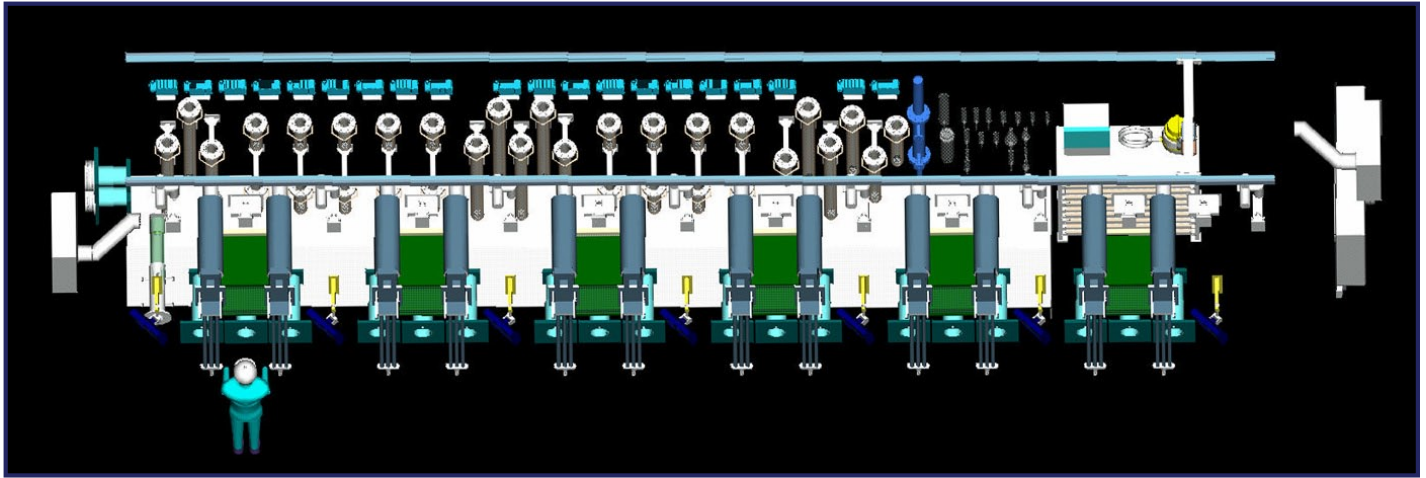


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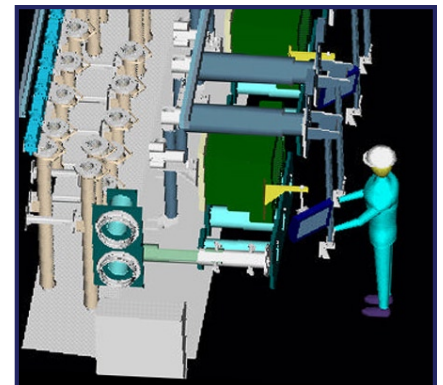
Merrick & Company was a pre-selected key subcontractor for Isotek Systems, LLC to provide remote systems design support for the Uranium-233 disposition project at the Oak Ridge National Laboratory. Under a subcontract to Burns and Roe Enterprises, Inc. (BREI), a member of the Isotek Systems LLC, Merrick was tasked to perform detailed design of shielded facilities and for adapting processes for remote operability and maintainability. Other LLC members included Nuclear Fuel Services (NFS, the process lead) and Duratek Federal Services (DFS, the project management and operations lead). The project systems will open a variety of retrieved storage containers, remove and separate uranium-bearing materials, oxidize and dissolve those materials, extract trace amounts of inbred thorium isotopes, downblend enriched U-233 below safeguards limits, and package the recovered thorium in a form suitable for extraction of medically valuable radioisotopes, such as Bismuth-213. These radioisotopes will be used for clinical trials and ultimate treatment of several types of human cancers.

Merrick provided the following:

- Design of container opening and material handling equipment for items with dose rates up to several hundred rem/hour
- Shielding design for three new shielded facilities (hot cells) required to fit within constraints of the existing building
- “Remotizing” the uranium chemistry processes, including oxidation, dissolution, ion exchange, and thermal denitration
- Design of thorium product storage equipment
- Design of custom maintenance gloveboxes for support of hot cell operations

Merrick coordinated utility, process, structural, and space allocation requirements with BREI and NFS. Merrick also coordinated operations and maintenance requirements, waste management and certification, safety analysis, and permit application support with designated Isotek personnel. Merrick provided key expertise to ensure incorporation of ALARA principles throughout the project design.

Merrick provided the project design team with expertise and design details for localized shielding and remote operations applications throughout the balance of the plant.



Merrick conducted an Independent Peer Review (by outside hot cell experts) to evaluate the adequacy of the design for operability and maintainability.

Project deliverables included 30%, 60%, 90%, and final design review submittal packages. Each design review package included drawings, specifications, and electronic 3-D models (on the Pro/ENGINEER<sup>®</sup> design platform) of the three hot cells and associated equipment.

One of the greatest design challenges faced by the project, and solved by Merrick, was the incorporation of the downblending operations into an existing facility without the addition of new floor space. Merrick was able to uniquely configure all three hot cell operations to fit within existing reinforced concrete rooms.