

REINDUSTRIALIZATION – AN OVERVIEW OF THE DEPARTMENT OF ENERGY'S OAK RIDGE STRATEGY

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ABSTRACT

Realignment of Department of Energy missions made necessary by the end of the Cold War, coupled with the declining Department of Energy budgets, has left a legacy of underutilized yet valuable tooling, equipment, materials, and facilities. These productive resources, however, are intertwined with varying degrees of chemical and radiological contamination. Through a new initiative termed "reindustrialization" that involves creating innovative partnerships with private industry, the Department of Energy-Oak Ridge Operations Office is securing a new future for retired nuclear production plants and support facilities. Firms engaged in manufacturing, value-added processing, and services are leasing and rehabilitating these facilities and resources for private commercial use. In exchange for favorable lease terms, these firms agree to provide decontamination and decommissioning or other needed cleanup-related service to the Department of Energy. In this manner, the Environmental Management missions of decontamination and decommissioning and environmental restoration are executed in a less costly manner and at an accelerated rate while helping achieve regional economic stability through facility reuse by providing jobs and new opportunities for the local economy.

INTRODUCTION

Department of Energy facilities around the country host well-appointed manufacturing facilities once used to support national defense as well as commercial nuclear power programs. Large numbers of radioactively and chemically contaminated facilities, machine tools, and analytical equipment have been permanently removed from service to await dispositioning through the Environmental Management Decontamination and Decommissioning Program.

Reindustrialization is a method of accomplishing decontamination and decommissioning of such facilities and equipment while returning them to a productive use in the commercial sector. Through reindustrialization, facilities, equipment, and materials are processed by commercial industry for reuse. Costs of reclamation are assumed by the firm interested in returning the facility, equipment, or material to productive use. Costs to the government for decontamination and decommissioning are thus minimized.

Reindustrialization also incorporates the community's right to participate in environmental decision making. All arrangements with private industry to clean and operate commercial enterprises are reviewed and concurred with by the Community Reuse Organization of East Tennessee. Lastly, through the reindustrialization process, regional economic stability is encouraged by repatriating unproductive government assets to viable commercial business uses.

Functionally speaking, reindustrialization is the development of relationships with private industry based on the need businesses have for manufacturing assets (e.g., space, equipment, facilities, transportation, etc.) and the need for the Department of Energy to disposition these facilities and equipment in the best interests of the United States government. Complicating the Department of Energy requirement is the fact that nearly all of these business or manufacturing

“assets” have the potential for contamination by radioactive and/or hazardous chemical materials. Traditionally, the Department of Energy has treated these materials and facilities as a liability, labeling them as low level radioactive waste or mixed hazardous/low level waste. This determination has resulted in the disposal of large quantities of working, functional and valuable assets without regard for any residual business value to commercial industry and the community at large.

Reindustrialization reduces the cost of cleanup of Department of Energy facilities by trading the residual value in facilities and equipment for cleanup services. In cooperation with the Community Reuse Organization of East Tennessee, the Department of Energy will consider lease of facilities and equipment. Terms of the lease include, as prerequisites to beneficial occupancy, cleaning and decontaminating space and equipment to applicable Environmental Protection Agency and Department of Energy standards. Further, the costs for utilities and maintenance of space leased for reuse are assumed by the commercial firm leasing the space, eliminating surveillance and maintenance costs for that space.

In April 1996, the Department of Energy-Oak Ridge Operations Office held a workshop for interested business and industry to tour Oak Ridge facilities and suggest means whereby the costs of decontamination and decommissioning could be lowered through reuse and rehabilitation of facilities and equipment, especially those located at East Tennessee Technology Park (formerly known as the K-25 Site), a former uranium enrichment gaseous diffusion plant. Out of this extensive interaction came several concepts for removing gaseous diffusion plant process equipment, decontaminating the remaining structures, and rendering the buildings ready for commercial reuse.

These interactions have evolved into a management process that actively and continually assesses the commercial reuse potential of underutilized facilities and equipment managed by the Environmental Management Program. This process, known as reindustrialization, continues to develop linkages and partnerships with private industry to accelerate and make more cost effective the cleanup of Department of Energy-Oak Ridge Operations Office facilities.

The impact of reindustrialization on the projected cost of cleanup of the gaseous diffusion plants, followed by descriptions of specific applications of the reindustrialization process will be examined in this paper.

The following discussion highlights examples of how the Oak Ridge Reindustrialization Program is a tool of effective and efficient environmental management. Studies of several cases where the principles of reindustrialization were applied are presented in the next section.

PRACTICAL EXAMPLES OF DECONTAMINATION AND DECOMMISSIONING COST REDUCTION USING REINDUSTRIALIZATION

Principles of rehabilitation and reuse that differentiate reindustrialization from traditional means of accomplishing Environmental Management mission objectives are typically applied in a variety of ways. No one path forward is appropriate for all initiatives. Discussed below are several pathways through which the philosophy of reindustrialization is being applied to accelerate cleanup at lower cost. Each path has been crafted for the specific facility and

interested commercial entities. The success of each project is tied to a close partnership with private industry that includes a transition of the subject property to an alternate commercial use. Oversight, quality assurance, and compliance management for these cleanup projects remains a Department of Energy responsibility.

Gaseous Diffusion Plant Process Building Decontamination and Decommissioning.

Materials and process equipment are being conveyed to BNFL, Inc. (the U.S. subsidiary of British Nuclear Fuels, Limited) under a Department of Energy prime contract to offset decontamination and decommissioning project costs. The salvage value of decontaminated process equipment and materials is being used to reduce total project costs by over \$50 million. Upon completion of decontamination and decommissioning activities by BNFL, the decontaminated facility will be turned over to the Community Reuse Organization of East Tennessee for lease to commercial entities, eliminating future surveillance and maintenance costs to the Department of Energy for this property. Total cost avoided through this approach is estimated at over \$550 million.

Reallocation of Surveillance and Maintenance Budget to Decontamination and Decommissioning.

Through a competitive procurement, the K-1420 Process Equipment Decontamination Facility has been turned over to a contractor team for decontamination and decommissioning, rehabilitation, and reuse by the commercial sector. A high priority for decontamination and decommissioning, this facility has been maintained in safe storage due to the high projected cost of cleanup. This contract will make the estimated \$3 million annual Surveillance and Maintenance budget for this facility available for a period of three years to support facility decontamination and decommissioning; however, these funds are insufficient to support the required scope of work for decontamination and decommissioning using traditional approaches. Estimated cost for this scope of work is approximately \$26 million. Under this project, the selected contractor team will invest whatever corporate funds are necessary to decontaminate and decommission the facility to industrial reuse project endpoints. This investment will be recovered through an exclusive lease of the facility at the conclusion of decontamination and decommissioning activities to the contractor team for commercial use. Using this approach, approximately \$16 million of Environmental Management Program funds and three years of schedule will be saved.

Decontamination and Decommissioning Project Funded Solely on the Value of Materials and Equipment to be Recovered.

Approximately 126,000 square feet of space has been decontaminated in exchange for recoverable equipment and materials currently radioactively contaminated and considered as waste. This contract was developed after approximately twelve months of effort to identify firms interested in this project concept. Further, this project was previously not funded or scheduled and represents a \$400,000 savings to the government over traditional decontamination and decommissioning methods.

Lump-Sum Lease Payments Made in Advance to Fund Cleanup of Contaminated Space.

A lease was negotiated for uncontaminated space whereby ten years of rental payments for the property were paid in advance. These funds will be used to

decontaminate property outside the lease footprint that would otherwise not be initiated prior to 2010. The lease payment fund available for this additional decontamination and decommissioning work is \$250,000.

Transfer of Building and Maintenance and Utilities Responsibilities. As facilities are leased to private commercial firms, financial responsibility for upkeep and utilities is also transferred via a triple net lease. Projected savings for the forty-one completed leases is projected at approximately \$170 million discounted over thirty years.

EFFECT OF REINDUSTRIALIZATION ON THE COST OF GASEOUS DIFFUSION PLANT DECONTAMINATION AND DECOMMISSIONING

In 1992, Congress passed the Energy Policy Act establishing a special fund for cleanup and disposition of the three United States gaseous diffusion plants. This fund was to be capitalized by contributions from nuclear utilities that have purchased uranium enrichment services from the Department of Energy and its predecessor agencies as well as from annual appropriations from the United States government budget. All gaseous diffusion plant decontamination and decommissioning and site cleanup activities were to be paid for by this fund. Therefore, estimates of the total cost of cleanup of these plants are critical to establish a realistic and adequate schedule for capitalization of the fund.

The Department of Energy's Baseline Environmental Management Report (BEMR), drafted in 1996, estimated the total cost for decommissioning the three gaseous diffusion plants at \$9.22 billion. Of this sum, \$3.25 billion was allocated to East Tennessee Technology Park, \$3.22 billion to Paducah, and \$2.75 billion to Portsmouth. This estimate assumes that all structures and facilities are demolished to grade with rubble managed on site in disposal cells with earthen covers. Process equipment and tooling would be decontaminated and sold for scrap value only. Land now hosting the gaseous diffusion plants would remain access controlled, permanently withdrawn from public use and subject to perpetual monitoring by the federal government.

To decrease these costs and accelerate the schedule for gaseous diffusion plant cleanup, the Department of Energy-Oak Ridge Operations Office is fully integrating future land considerations for Oak Ridge facilities, in particular East Tennessee Technology Park, into Environmental Management and Decontamination and Decommissioning project planning and execution. Land use considerations have been developed from an intensive community and stakeholder involvement process known as Common Ground. The result of this process is a recommendation that Oak Ridge plant areas should be remediated to cleanup standards that would support industrial use. Therefore, the Department of Energy-Oak Ridge Operations Office has embarked on a management process directed at identifying facilities, materials, and equipment that could be used to support commercial industrial operations as well as ways of making these items available to commercial enterprises interested in configuring them for reuse.

This reindustrialization process is having a profound impact on reducing the costs previously projected to disposition the three gaseous diffusion plants. In general, this is possible because facilities, equipment, and materials that remain after termination of the uranium enrichment missions at these plants are capable of supporting a wide variety of industrial manufacturing enterprises. The strategy is to make these items available to interested parties in exchange for

cleanup services to be provided at the site. Further savings are realized upon commercial occupancy of these facilities as utility, maintenance, and other landlord type costs are assumed by the commercial firm leasing the space.

Further, abatement of risk to human health and the environment is accelerated through this approach. Specifically:

- Risk to the public, workers, and the environment will be reduced by accomplishing decontamination and decommissioning of the buildings sooner than planned. Risk is related to the deposited uranium products left in the gaseous diffusion plant systems at shutdown coupled with the fact that neither the systems nor buildings are designed for long-term storage of nuclear materials.
- Removal of process systems eliminates fissile material hold-up, as well as risk of potential criticality accidents. This is consistent with requirements within the Defense Nuclear Facilities Safety Board 94-1 Implementation Plan.

Table 1 presents the estimates for decontamination and decommissioning of the gaseous diffusion plants provided in the 1996 Baseline Environmental Management Report and new estimates for dispositioning the plants by integrating reindustrialization into decontamination and decommissioning efforts. Oak Ridge successes in reindustrialization are being extended to decontamination and decommissioning of the Portsmouth and Paducah gaseous diffusion plants.

Presently, the estimate for the government liability for decontamination and decommissioning of East Tennessee Technology Park facilities is approximately \$1 billion in contrast to the Baseline Environmental Management Report estimate of \$3.25 billion. This reduction assumes commercial reuse of 190 of the 538 buildings and facilities at East Tennessee Technology Park (38%). The \$2.25 billion of avoided decontamination and decommissioning cost is attributed to a mixture of commercial reuse, the receipt of cleanup services in exchange for occupancy privileges, and savings of Surveillance and Maintenance costs associated with commercial (i.e., non-government) occupancy. Other unusable facilities will be salvaged and demolished to grade as foreseen in the Baseline Environmental Management Report.

Decontamination and decommissioning of the Portsmouth and Paducah gaseous diffusion plants were projected to require \$2.75 and \$3.22 billion, respectively in the 1996 Baseline Environmental Management Report. These estimates have been reduced to \$1.1 billion and \$1.0 billion respectively through application of the reindustrialization method of accomplishment to these plants.

Table I. Estimates for Decontamination and Decommissioning of the Gaseous Diffusion Plants

Sub-element	1995 Report (BEMR-1996) (1996\$ in billions)	November 1997 Revised Estimates (1998\$ in billions)
ETTP (D&D)	3.25	0.99
PAD (D&D)	3.22	1.01
PORTS (D&D)	2.75	1.04
GDP D&D total	9.22	3.04
Remedial Actions, Landlord & Waste Mgt.	4.6	1.66
Total for D&D Plus RA ,LL & WM	13.82	4.70

Acronyms: D&D - decontamination and decommissioning; ETTP - East Tennessee Technology Park; GDP - gaseous diffusion plant; LL - Landlord Program; PAD - Paducah Gaseous Diffusion Plant; PORTS - Portsmouth Gaseous Diffusion Plant; RA - remedial action; WM - Waste Management Program

THE ROLE OF THE COMMUNITY REUSE ORGANIZATION

Community reuse organizations have been organized to represent the local interest in determining the future of underutilized defense-related facilities located within that community. Community reuse organizations are comprised of representatives of local governments, civic groups, and community organizations that have been affected economically by the presence of these facilities.

Community reuse organizations are afforded special status in the sense that they can obtain exclusive long-term leases for underutilized government property at these facilities non-competitively. The community reuse organization can then lease this property to industrial concerns. This is permitted in an effort to give individual communities the choice of their own economic future. For example, a community reuse organization might decide to avoid leasing to warehousing firms in favor of developing larger numbers of more highly paid manufacturing jobs.

Within the context of the Reindustrialization Program in Oak Ridge, the Community Reuse Organization of East Tennessee performs a critical and pivotal role. Since the Department of Energy-Oak Ridge Operations Office leases directly to the Community Reuse Organization of East Tennessee, in most cases, the Community Reuse Organization of East Tennessee must decide if an industrial candidate for space meets its goals and expectations with regard to the future of the region — a diverse and robust regional economy not overly dependant on any one industrial sector for long-term stability.

By exercising its prerogatives in determining which industries to target and lease property to, the Community Reuse Organization of East Tennessee performs an essential function to reindustrialization — that of ensuring the community's vision for the future is not contradicted by short-term successes. The Community Reuse Organization of East Tennessee's essential function to reindustrialization is to ensure all stakeholder concerns regarding potential leases are aired and considered in a community-based forum.

CONCLUSIONS

In summary, estimates for environmental cleanup and risk reduction have been revised downward to reflect efficiencies associated with applying the philosophy of reindustrialization to these tasks. Reindustrialization accomplishes these reductions by leveraging facilities and equipment into commercial reuse, and through encouraging the use of nuclear decontamination and decommissioning techniques, the efficacy of which has been proven in commercial facilities around the world. Reindustrialization builds on stakeholder involvement in Oak Ridge through facility leasing actions that depend on interactions with the local community reuse organization. This official body, made up of interested local officials and members of the general public, reviews and endorses applications of commercial firms wishing to establish tenancy at East Tennessee Technology Park. Reindustrialization is thus a flexible and interactive process intimately tied to the community providing cost-effective cleanup while allowing affected localities to meaningfully participate in transitioning employment from government to commercial industry.