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THE AMTEX PARTNERSHIP™:  
CREATING AND IMPLEMENTING A VISION

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## THE AMTEX PARTNERSHIP™: CREATING AND IMPLEMENTING A VISION

The vision and creativity of the multilaboratory team nominated for a special award resulted in the AMTEX Partnership™, a pace-setting agreement between U.S. Department of Energy national laboratories and the U.S. textile industry. The AMTEX Partnership is a role model for America to follow that brings the resources of government to bear on industrial needs while preserving the American values of free enterprise and fairness of opportunity. Together, the nominees created an important vision of the future. They capitalized on a government-sponsored workshop that provided an opportunity for industry to hear about laboratory capabilities. At the workshop, they attracted the attention of the integrated textile industry, a major segment of U.S. industry whose economic future is very much at risk. They listened to the industry representatives, grasped the scope and implications of the industry's needs-- and recognized the potential for large-scale collaboration. In keeping with the scale of this prospect, they guided nine national laboratories from traditional ways of technology transfer into a cooperative venture with an entire vertically integrated industry.

The resulting AMTEX Master Cooperative Research and Development Agreement (CRADA), negotiated in only three months with a well-structured industrial plan and personal involvement by the U.S. Secretary of Energy, is a model for "industry pull." It also sets a precedent wherein multiple industrial companies, multiple national laboratories, and multiple DOE Program Offices are working together under the same umbrella. The AMTEX Partnership is shaping the future of government/industry alliance in the 1990s.

### The Nature of AMTEX

The AMTEX Partnership is a research and development collaboration between the U.S. Department of Energy, other government agencies, the DOE's multiprogram laboratories, universities, and the entire textile industry, including fibers, textiles, apparel, and other fabricated textile products. The goal of the Partnership is to strengthen the competitiveness of this vital U.S. industry and thereby preserve and create American jobs. The AMTEX Partnership is a role model for government and industry in working together effectively to achieve greater U.S. competitiveness.

The key features of the role model agreement are

- involvement of the entire industry
- involvement of all multiprogram laboratories (cooperative planning avoids redundancy and uses the combined technical strengths)
- research driven by industry (joint leadership at all levels).

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## Creating the Vision: How the Partnership Was Built

In the spring of 1992, the terms "partnership," "new vision," and "industry pull" were not notable on the federal laboratory technology transfer scene. CRADAs were still relatively new as a mechanism for laboratory/industry cooperation. A new way of thinking was needed. To make the AMTEX Partnership a reality, the DOE, the laboratories, and the industry moved beyond several traditional attitudes toward technology transfer, especially with regard to the relationships among the federal laboratories and between laboratories and industry.

- The laboratories have traditionally competed for funding and projects; within the AMTEX Partnership, they are cooperating with each other.
- The DOE and its laboratories have traditionally worked one-on-one with industry, and thus have rarely attracted an entire industrial segment; within The Partnership, they will be addressing the needs of an entire U.S. industrial sector.
- The DOE laboratories have traditionally "pushed" their technologies at industry, inviting industry to take on particular technologies for further development or commercialization through CRADAs or licenses. The AMTEX Partnership means that technologies would be developed through "industry pull"--with industry involvement "up front"--stating specific needs to be met through cooperative research and development.
- The DOE's first-year funding of \$25M for the AMTEX Partnership is a significant financial commitment. Federal budgets for technology development have traditionally focused on individual projects/programs and laboratories. This new way of thinking about budgets and support could only follow a new way of thinking about relationships with the private sector.

The new approach included government focus on a number of "critical technology" areas which were being used as a basis for activity with industry. That focus was the framework in which the following events took place.

**May 1992:** The DOE Office of Energy Research, Laboratory Technology Transfer Program, sponsored a "critical technology workshop" at which industry was encouraged to learn more about federal laboratories and technologies. The workshop was held in Berkeley on May 27-29, 1992. Among the several sessions was one about U.S. manufacturing; the lead person was Gerald Work, from Pacific Northwest Laboratory. Thomas Malone, President of Milliken, was one of the industry leaders who were invited to describe the massive needs of the textile industry for new technologies to increase competitiveness and jobs. The immediate synergism between Work and Malone triggered a desire for further exploration into the possibilities for collaboration. In other words, they "created the vision."

**June 1992:** Recognizing the significance of Malone's attendance and his message, and the importance of following up on it, Work and Marvin Erickson, also from the Laboratory, led a team of Pacific Northwest Laboratory

researchers and technology transfer staff to Spartanburg, South Carolina, and met with members of the textile industry research consortium. During an all-day meeting that extended well into the evening hours, they explored the possibilities of an integrated partnership. At this point, they received the support of Roger Milliken, CEO of Milliken, a major figure in the U.S. textile industry. This widely recognized and respected leader caught the vision. In the months to come, his support would be significant in bringing the industry into partnership with the government.

**July 1992:** Allan Bromley, Assistant to the President for Science and Technology, recognized the potential impact of this partnership and expressed support for the initiative. In preparation for a visit to Pacific Northwest Laboratory by industry leaders, each group drafted a vision statement, a mission statement, a set of objectives, a plan, and a list of expectations. At Pacific Northwest Laboratory, they wove these into one unified set. The already staggering size and significance of the opportunity were growing; both sides recognized that other national laboratories should be involved.

**August 1992:** Work and Douglas Lemon briefed technology transfer officials in the DOE's Office of Energy Research and received approval to continue development of the Integrated Industry/National Laboratories Initiative. The subsequent leadership and support by Alan Claflin and Anne Marie Zerega were critical to the formation and funding of a formal partnership organization.

**October 1992:** As the recognition grew that other DOE laboratories could contribute important capabilities, the laboratory alliance extended beyond the Office of Energy Research; along with the five national Energy Research laboratories, representatives from Sandia National Laboratories (Defense Programs) met in Spartanburg to define an organizational structure and begin building the Partnership. An important part of this meeting was the identification of a research agenda--truly demand-activated "industry pull" technology transfer. Industry described its problems, and the laboratories listened. This represented a significant departure from traditional technology transfer operations! Later, with the addition of Los Alamos National Laboratory and Lawrence Livermore National Laboratory (both under Defense Programs), the interlaboratory component continued to grow.

The partners decided to delay the formalization slightly to allow the Clinton administration an opportunity to understand the directions of this bold undertaking. This decision was crucial--an agreement on this scale was, after all, a new concept for the DOE. During that time, the new Secretary of Energy became a champion for the cause; her support (similar to Roger Milliken's support in the textile industry) helped considerably to hasten acceptance in government circles.

**December 1992:** On December 4, the DOE Office of Energy Research (Antoinette Joseph) and Defense Programs (Warren Chernock) and the industry signed a Letter of Intent to do cooperative research to improve U.S. competitiveness of the fiber/textile/fabricated products industry. The clock began ticking toward actualization of the Master CRADA that would make the AMTEX Partnership a reality.

**February 1993:** At a meeting in Atlanta, the Industry Operating Board approved the organizational policies and structure, the operational procedures, the Industry Board members, and the project.

**March 15-16, 1993:** At a historic meeting in Raleigh, North Carolina, the DOE, the national laboratories, and industry signed a document of understanding indicating acceptance of the terms and conditions of the AMTEX Master CRADA. The terms of the AMTEX Master CRADA were negotiated between the DOE, national laboratories, and industry in only three months! At the signing ceremony, Secretary O'Leary noted, "It's the first time we have been able to link an entire industry, from raw materials to retail stores, along with its research support and higher education, to the unique resources available at our DOE national laboratories. It [the Partnership] opens new doors for saving and creating jobs in the nation's largest manufacturing employer, textiles." Only three months had passed since the historic Letter of Intent--a record for CRADA implementation!

#### Who Benefits and How

The AMTEX Partnership is directed at a major segment of U.S. industry, the integrated U.S. textile industry. This industry consists of over 26,000 companies representing 1.8 million jobs, which is about 10 percent of the entire manufacturing work force. It represents over \$200 billion in annual consumer sales in the U.S. It is the largest component of the nondurable goods manufacturing sector and contributes \$53 billion to the Gross Domestic Product. This is more than the automotive, petroleum, or primary metals industries. Only the aerospace industry contributes more.

The goal of the AMTEX Partnership is to engage the unique technical resources of the DOE laboratories with those of industry and universities to develop and deploy technologies that will strengthen the competitiveness of this vital U.S. industry and thereby preserve and create American jobs.

Right now, the industry is hurting. The fiber and textile sectors are highly sophisticated, capital intensive, and internationally competitive. The labor-intensive fabricated products sector is losing ground to offshore competition. If this sector goes offshore, the other sectors may follow. Over 500,000 jobs have been lost to competition from imports during the last 12 years. If current trends continue, it is projected that an additional one million jobs will be lost in the fiber/textiles/sewn-fabricated products industry by the year 2002.

The technological needs of this industry have been mapped into five areas of R&D focus:

- improved materials and processes
- analysis, simulation, and computer integration (leading to demand-activated manufacturing)
- environmental quality and waste minimization
- energy
- apparel automation.

The participating laboratories will focus their expertise and resources, with those of the participating industry, on developing technologies that will develop a communication infrastructure and electronic commerce vehicle that will help the U.S. become a demand-activated, customer-driven manufacturing enterprise. This will reduce product costs, increase responsiveness, and improve quality. Another project will develop computer-aided systems to detect color or structural defects in textiles. Fabrication of apparel will be enhanced through development of high-speed cutting devices, sensor, and control systems. Reducing the energy consumption and environmental impacts of fiber, textile, and apparel production will be yet another area of focus.

A vital benefit of this Partnership is that a new model has been developed for government and industry to cooperate in meeting industry's needs through joint, long-range, strategic R&D planning. Moreover, it provides an operational framework that brings about up-front coordination of proposed work across the entire DOE sector.

**Significance of Benefits:** According to the AMTEX Partnership vision:

**"The U.S. integrated textile industry will become a dominant global force in providing high-value products to the world market in an environment of industry growth, environmental responsibility, profitability, and worker satisfaction."**

Furthermore, the industry seeks to lead the world in technical innovation, quality, value, and rapid responsiveness to customer needs. Achieving this vision will be one of the greatest economic accomplishments of recent times.

#### About the Nominees

Each nominee is a senior-level representative of his laboratory. Gerald Work is Manager of the Pacific Northwest Laboratory Applied Physics Center; he serves as Chairman of the DOE National Laboratory Board for the AMTEX Partnership.

William Alzheimer is Director of the Center for Manufacturing Technology at Sandia National Laboratories; he serves on the Board.

Norman Peterson is Special Assistant for Strategic Planning for Argonne National Laboratory; he serves on the Board.

Seymour Baron is Associate Director of Applied Programs for Brookhaven National Laboratory; he serves on the Board.

Edward Burgess is Director of Engineering at Lawrence Berkeley Laboratory; he serves on the Board.

John Umbarger is Deputy Director of Industrial Partnerships at Los Alamos National Laboratory; he serves on the Board.

Daniel McDonald heads the Measurement and Controls Engineering Section at Oak Ridge National Laboratory; he serves on the Board.

Irving Stowers is Program Leader of the Precision Engineering Program at Lawrence Livermore National Laboratory; he serves on the Board.

Douglas Lemon from the Pacific Northwest Laboratory is the AMTEX Laboratory Program Manager.

Marvin Erickson is Manager of the Applied Physics Center Technology Partnerships Department at Pacific Northwest Laboratory.

Each of these people, recognized experts in their fields and respected by their laboratories, helped create and implement the vision. Each continues to be a major force in shaping and moving the AMTEX Partnership.

### Results/Follow-up

The budget for Partnership activities is increasing. The DOE is investing up to \$100M over a five-year period; the textile industry will provide matching funds. Program offices have been established for the laboratory and industrial sectors. An infrastructure is established, and work has already begun on specific technological issues.

At present, the DOE offices of Energy Research and Defense Programs are active supporters of the AMTEX Partnership program. A long-term, broad-based research and development program is envisioned, with programs eventually being supported also by the Offices of Energy Efficiency and Renewable Energy and Environmental Restoration and Waste Management.

### What the Future Holds: Leveraging New Relationships

This relationship between the national laboratories and the textile industry is new; a new member of the industrial sector is now working with the government.

Secretary O'Leary called the AMTEX Partnership "a model for other industrial partnerships for our nation." It is already being copied across the federal laboratory spectrum. Thus, the government can leverage this model to create other strong partnerships.

The following is quoted from the Department of Energy's Strategic Plan-- "Partnerships for Global Competitiveness":

...an umbrella CRADA involving nine Departmental laboratories and the fully-integrated textiles industry (AMTEX). The first project in this collaboration is focused on demand-activated manufacturing, which could result in prototype technologies applicable broadly within the American manufacturing sector.

The AMTEX agreement could well be a model for the future--that model consisting of: 1) broad involvement across an industrial sector; 2) the existence of an industrial technical "road map," which helps define the research agenda; 3) research on generic, pre-competitive technologies considered necessary for breakthroughs in the commercial marketplace; and, in many cases, 4) integrated resources from the federal government, involving multiple agencies. What the Departmental laboratories bring to these arrangements is high-value problem-solving expertise, focused directly on research that holds the potential for considerable economic impact.

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