NASA-CR-202385

Final Report -- 1991

NASA Industrial Applications Center (NIAC)
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Networking

The year 1991 was a transition year for the NASA Technology Utilization Program. The program was evolving from a central emphasis on technical assistance services to an emphasis on technology management and technology commercialization services. Hence, NIAC devoted a great deal of attention during this transition year to the development of new relationships with organizations that would enhance NIAC's ability to provide a new range of services to companies in the Mid-Atlantic region. Efforts were made to create a Mid-Atlantic Technology Management Consortium (TMC). The TMC was envisioned as a networks of organizations interested in sharing information and resources in an effort to enhance their own technology transfer and industrial assistance programs. During 1991, working relationships were forged with the following organizations that expressed interest in becoming members of the TMC:

National Environmental Technology Applications Corporation (NETAC)
Center for Hazardous Materials Research (CHMR)
Metalworking Technology, Inc. (MTI)
National Defense Environmental Corporation (NDEC)
Pittsburgh Applied Research Corporation (PARC)
Carnegie Mellon Research Institute (CMRI)
Pennsylvania Technical Assistance Program (PENNTAP)
Pennsylvania State University's Center for Cell Research
Northwestern Pennsylvania Industrial Resource Center
Illinois Institute of Technology Research Institute (IITRI)
University of Maryland
Advanced Technology Center, Hagerstown Community College
Maryland Foundation for Manufacturing Excellence
Virginia Center for Innovative Technology
West Virginia University
George Washington University
University of Delaware

NIAC also expanded its efforts in forming alliances with NASA Field Centers during 1991. Meetings were held with representatives of Goddard Space Flight Center, Marshall Space Flight Center, Kennedy Space Center, and Lewis Research Center for the purpose of learning more about the commercializable technologies developed by their scientists and engineers.

Other organizations with which NIAC interacted for the purposes of developing activities of mutual interest include:

High Technology of Rochester
Southern Technology Applications Center
Pittsburgh High Technology Council
Southwest Pennsylvania Industrial Resource Center
University of Pittsburgh -- Titusville Campus
Graphic Arts Technical Foundation
National Technology Transfer Center
University of Pittsburgh School of Business
Carnegie Mellon University Materials Center
Pennsylvania Smaller Manufacturers Council

American Iron and Steel Institute
Ben Franklin Technology Center of Western Pennsylvania
University of Pittsburgh -- Bradford Campus
Enterprise Corporation
University of Pittsburgh Small Business Development Center
Advanced Technology Entrepreneurial Center
Technology Marketing Center
Allegheny Research and Development Center
SPEDD Corporation
National Business Incubation Association

Client Services

NIAC provided services to 264 small businesses during 1991, as well as assisting several Fortune 500 corporations and professional societies/trade associations with their technical and informational problems. Some representative recent projects are as follows:

Ceramics Manufacturing -- On behalf of the economic development department of an electric utility, NIAC was invited to tour ceramic insulator manufacturing plants in their West Virginia service region and make recommendations as to areas within the plants that could be upgraded in order to improve the efficiency and productivity of the plants. NIAC recruited a ceramic sciences specialist with several years of ceramics manufacturing experience to tour the plants and provide an unbiased assessment of problem areas that could be improved.

Metalworking Technology -- The Forging Industry Association (FIA) entered into a one-year information search contract with NIAC to develop comprehensive listings of citations and abstracts on subjects of greatest interest to their members, including the causes and cures of die failure, gauging hot forgings for statistical process control (SPC), processing requirements for microalloy steel, nondestructive testing limits for forgings, and modeling methods used in forgings, among others. Over 140 executives from 100 member firms called for and were furnished with more than 570 sets of abstracts. The FIA plans to expand this service to include a current awareness product regarding international standards for forging.

Sensor Technologies -- The American Iron and Steel Institute (AISI) retained NIAC to conduct a study on state-of-the-art developments in sensor technologies and related computerized process control systems. The project was targeted at those sensors that would be required to meet the needs of the steel mill of the future, and was designed to lay the foundation for a ten-year development program for the steel industry. Particular emphasis was placed on identifying organizations, including Federal laboratories, whose research and development initiatives showed the greatest progress and were judged most likely to perform the desired measurements with the least modification.

Energy Conservation -- As a service to its members, the American Iron and Steel Institute (AISE) publishes a series of bibliographies titled "Energy Conservation and Utilization in the Steel Industry." NIAC Assisted AISE in the development of these bibliographies through an iterative computer searching and culling process, after which citations were presented to the AISE Energy Combustion Engineering Division for selection of references to be included in the final publication.

SBIR Assistance -- NIAC frequently provides information services to companies that are preparing proposals for the Small Business Innovation (SBIR) program. A typical example is a search conducted for an Aberdeen, MD company. Their proposal was directed toward NASA-SBIR topic 12.07, "Extra-Vehicular Activity." In particular, they were responding to a sub-topic

concerning an astronaut rescue system that could be carried by an EVA crew member and could retrieve an object or disabled crew person. A search of the NASA/RECON database yielded more than 30 reports regarding methods for conducting rescue operations during extravehicular activities. The ability of the client to cite this previous research considerably strengthened its SBIR proposal.

Patent Literature -- A common type of NIAC information search is directed toward patent literature. In these cases, clients typically are not interested in a comprehensive review of a technological area. Rather, the interest is in patents issued. A leading manufacturer of refractory bricks used in large part by metals processing companies had a keen interest in monitoring the patents of their domestic and international competitors. A search of the World Patents Index for new patents issued to other designated refractory brick companies gave the client insights into possible products their competitors would be marketing in the future.

Technical Document Delivery -- The technical library of a major industrial research laboratory receives numerous requests for hard copies of technical reports in support of ongoing research projects. In order to acquire documents in a timely manner in the face of a growing number of requests, the corporation established an account with NIAC to handle a portion of their document orders. NIAC was able to provide all of the NASA documents requested. In addition, NIAC was able to handle "overflow" orders for journal articles, conference papers, and other types of documents when the client required large numbers of documents to be ordered within a short period of time.

Construction Industry -- A small construction business which has developed a unique method of home construction using space age building technologies that will make quality housing more available and affordable for low- and middle-income families can to NIAC for assistance in improving their methods. NIAC worked with the client to identify NASA technologies that might be applicable in their home designs. The client is now using several NASA-developed technologies in home and office construction.

Automotive Technology Assessment -- NIAC was asked by the Manufacturing Systems Research Division of a large company in the automobile industry to examine potential alternative technologies for automobile ride evaluation. The company hoped to develop a more accurate and objective method of quantifying human response to such factors as automobile vibration, noise, and handling. NIAC assembled a project team that included experts from the University of Pittsburgh's Center for Biotechnology and Bioengineering and the Aberdeen Proving Ground's Human Engineering Laboratory to conduct a five-month study of the subject. The results of the project -- a comprehensive inventory of human response measurement technologies (with special emphasis on those under development by Federal laboratories) -- will be used to lay the foundation for future development initiatives by the client.

Materials Separation -- One of the R&D centers of a large chemical and materials company requested that NIAC identify profitable alternative applications for its fiberglass-based materials separation technology, which has previously been applied to the separation of proteins and to other chromatographic separations. A literature investigation was used as the basis of a telephone survey to gather information on the appropriateness of the client's technology for particular applications. Several new applications were identified and several companies expressed an interest in testing the technology in actual field conditions. The most promising alternative applications were removal of proteins responsible for the clouding and hazing of alcoholic beverages, and removal of benzene, polynuclear aromatic compounds, and metal porphyrins from fuels and petrochemicals.

Shoe Manufacturing -- A start-up company was seeking funds to acquire equipment for manufacturing custom-fitted running shoes. Individuals' unique foot shapes would first be outlined with a scanner jointly developed by NASA and the Veterans Administration. The computerized scan would the n be used to create custom-fit shoes. NIAC arranged meetings between the company and two regional business assistance organizations -- the Ben Franklin Technology Center of Western Pennsylvania and the Enterprise Corporation. In the first case, the company was advised as to ways to respond to a state-funded seed grant program; in the second case, it was informed of the requirements and procedures for qualifying for several sources of venture capital.

Aircraft Ice Protection -- A manufacturer of paints and coatings applied for a NASA SBIR grant in area 3.01, "Aircraft Ice Protection Systems." Since the company had no experience with government grants or contracts, NIAC provided two types of assistance. First, the Federal laboratories and Federal research programs relating to ice protection were identified. Program descriptions and contact names were provided. In this way, the company could discuss their ideas with specialists who were currently conducting similar research. Secondly, NIAC advised the client as to proposal format and content; after the proposal was written, NIAC read and critiqued it.

Electric Service Costs -- As part of an ongoing program to improve the quality of its service, an electric utility company requested that NIAC conduct a survey to determine the actual and perceived costs of power outages to its industrial, commercial, and residential customers. Information provided by NIAC assisted the utility in determining where improved service reliability was required. A paper authored jointly by NIAC and the client was published on this study for the benefit of the entire electric utility community.

Program Development

A major initiative for NIAC during 1991 was the development of a proposal to NASA for the operation and management of a Regional Technology Transfer Center (RTTC) for the Mid-Atlantic region. In putting together a program plan for the years 1992 through 1996, NIAC had the opportunity to augment its traditional service offerings with new offerings in the areas of technology marketing and technology commercialization. To help NIAC carry out this program plan, a regional network of field associates was created through contractual relationships with university- and state-based technology assistance and economic development assistance organizations. The partners in the Mid-Atlantic RTTC included:

University of Maryland, Technology Extension Service
West Virginia University, Industrial Extension Service
Pennsylvania State University, Pennsylvania Technical Assistance Program (PENNTAP)
Virginia Center for Innovative Technology, Technology Assistance and Transfer Program
University of Delaware, Center for Composite Materials
George Washington University, School of Business and Public Management