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**CRADA Final Report
for
CRADA Number ORNL 95-0329**

**ESTABLISHING THE
SOUTHEASTERN REGIONAL
ALLIANCE (SRA) PROGRAM
IN
DEVELOPMENT OF TECHNOLOGY
COMMERCIALIZATION**

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**CRADA Final Report for
CRADA ORNL95-039**

**Establishing the
Southeastern Regional Alliance (SRA) Program in
Development of Technology Commercialization**

**L. G. Tornatzky
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and

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September 1996

**Prepared for
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Final Report

**Cooperative Research and Development Agreement (CRADA)
between the
Southern Technology Council
and
Lockheed Martin Energy Research Corporation (LMER)
(formerly Martin Marietta Energy Systems, Inc.)
Establishing the Southeastern Regional Alliance (SRA) Program
in
Development of Technology Commercialization**

Abstract

The Southeastern Regional Alliance(SRA) was formed to create a proactive network of public and private leaders for the purpose of invigorating economic development on a regional basis. This Cooperative Research and Development Agreement (CRADA) was established to evaluate various activities of potential cooperation and support the development of the SRA. This was to cultivate partnerships between Oak Ridge and the stakeholders involved in the SRA's creation.

SRA Participants initially included the following who all have a relationship with or membership in the Southern Technology Council or both:

- States of Georgia, North Carolina, South Carolina, and Tennessee
- University of Tennessee, University of South Carolina, Georgia Institute of Technology, the University of North Carolina, and North Carolina State University
- Private, not-for-profit organizations--MCNC, South Carolina Enterprise Development, Inc., Georgia Research Alliance, and the Southern Growth Policies Board
- Federal Organizations--Department of Energy through Lockheed Martin Energy Research Corp., Appalachian Regional Commission, Tennessee Valley Authority, Southeastern Manufacturing Technology Center, and NASA's Southern Technology Applications Center

Job creation and retention has been attributed to the creation and growth of smaller enterprise to a much greater extent than to the growth of large industry. Recent experience has demonstrated that expertise resident in Department of Energy (DOE) facilities can directly and significantly benefit smaller enterprise. However, smaller enterprise is constrained from accessing many public resources due to limited assets (personnel, capital) and the need for proximity. To insure that smaller enterprise shares the benefits of technological advantages available in DOE laboratories and other regional resources, technology transfer endeavors must recognize and capitalize on local infrastructure, cultural allegiance, and industrial clusters that naturally evolve in regions.

This project was created to address these issues and develop a model of collaboration between the various public sector stakeholders that affect the smaller business' life. DOE's cooperation and leadership in pulling together this endeavor is unique and the lessons learned should be valuable for future initiatives.

Establishing the Southeastern Regional Alliance (SRA) Program

I. Statement of the Objectives of the CRADA

The goal of the CRADA was to establish partnerships of and between states, key resources, and other infrastructure elements in a region to provide a comprehensive team effort through the SRA to accelerate the deployment of technology, provide support for growth, and bolster industrial efforts to achieve global competitiveness.

The project objectives for the SRA were:

- Development of a strategic plan that accommodates all the stakeholders and brings a common vision to focus on regional economic development with particular emphasis on commercialization of available technology.
- Creation of an organizational structure and administrative and working agreements which will enable a variety of follow-on action projects. (Including evaluation of technology transfer practices to optimize those functions to respond to industry needs.)
- Facilitation of a multi-state telecommunications system with a wide array of private and public applications.
- Gaining an understanding of the "technological geography," its intellectual and organizational assets, and the needs of its key industries. (Including development of understanding and agreement between state technological resources and national laboratories to maximize collaboration for economic development.)

The SRA technical objectives were:

- Define technology application and commercialization opportunities with industry.
- Explain technology applications and intellectual property available from DOE, the regions universities and major institutions and the means to access the technology.
- Develop improved methods for increasing awareness and easing access to DOE and other sources of technology and creativity.
- Research different approaches to licensing and other commercialization mechanisms and practices providing evaluations to determine optimum methods.
- Develop partnerships with institutions and private sector enterprises to further develop or mature technologies based on programs and intellectual property of DOE operations in Oak Ridge, including the Oak Ridge National Laboratory, the Centers for Manufacturing Technology, and the Center for Environmental Technology.

Statement of the Objectives of the CRADA (continued)

Based upon these objectives of the SRA, the following breakdown of CRADA work by tasks with stated objectives was conducted (all tasks continuous throughout the project):

1. Developing Organizational Structure and Necessary Agreements. Leading and facilitating the SRA program through the creation of a strategic plan and implementation of the first years' pilot activities. *Draft concept completed within three months and implemented in six months from execution of this CRADA.*

2. Form Industrial Advisory Council. Identifying key industrial sectors based on economic impact to the region and exploring needs for public-private collaborative involvement in regional industry endeavors. Leaders will be invited to advise and guide in developing technology applications teams and endeavors in order to achieve competitive advantage in the global marketplace. *Initial formation by the end of the third month.*

3. Conduct of Asset Inventory and Needs Analysis. Coordinate assessment and analysis efforts of various regional organizations relative to the economic opportunities and consequent application of science and technology by private industry. *Completion by the ninth month.*

4. Strategic Planning. Facilitating broad stakeholder input and review of current activities and practices to develop a central regional plan that complements the states' strategy and builds upon the regions' assets to distinguish it in global opportunities. *Launched during the first month and completed by projects' end.*

5. Operational Planning and Pilot Project Development. As an outgrowth of the entire planning process, cultivate and facilitate the establishment of pilot projects representative of the goals of the project and complementary to the participating organizations.

Establishing the Southeastern Regional Alliance (SRA) Program

II. Discussion about Meeting the objectives of the CRADA

1. Developed an organizational structure with definition of roles and responsibilities that was agreed to by the Executive Steering Board in July 1996. After surveying all participants in stakeholder meetings as well as the heads of each state's economic development organization, the organization and charter were drafted, reviewed and approved by the steering board.

The organization was led by a program director reporting to an Executive Steering Board comprised of Governors' designated representatives and the directors of the Southern Technology Council and the Southern Growth Policies Board. It included an operations group consisting of representatives of each state's industrial extension service and an information management group consisting of each state's Office of Information Resources representative. The organization chart is attached.

The operations group provided the primary interface to industry and took the lead in developing potential projects and activities involving industry. This role insured consistency with existing state programs and infrastructure and well as the natural interface between the state and the private sector. It was through this group's efforts that the needs analysis was conducted including workshops and meetings to gain significant input and awareness of the initiative.

2. Developed and published a strategic plan with a comprehensive set of SRA goals, objectives, and strategies that are provided in Appendix A. The meetings of stakeholders conducted during the early conceptual development stages of the SRA resulted in the definition of a range of interests, evaluation of broad industry sectors important to the four states, and specification of economic objectives common to all the states. This input was used as the basis for the Executive Steering Board to establish operational criteria and strategic options. From this platform, a survey of stakeholders was conducted to prioritize objectives and desired outcomes of the initiative as well as define the most desirable methods of operation. This input was then compiled as the basis of operation, and the operations group developed possible projects with private sector constituents to complete the strategies and actions appropriate for each of the SRA goals. The strategic plan was subsequently drafted, distributed for comment, refined, and approved by the Executive Steering Board.

3. Formed an industrial advisory council in concept and by agreement with representatives from leading companies in all four states. The participants represented the industrial sector focus: plastics and polymers, the telecommunications services, the financial community, and major Original Equipment Manufacturers. The participants were initially identified by the end of the third month; however, the council was never officially developed due to delays in gaining state commitments, differing institutional priorities of participants, and delayed contributions to the planning endeavors as well as long-term commitments for program implementation. This activity enabled the extension services to secure a more focused relationship with these participants than would have predictably occurred without this initiative.

Establishing the Southeastern Regional Alliance (SRA) Program

Discussion about Meeting the objectives of the CRADA (continued)

4. Conducted an inventory of assets and industry needs relative to the plastic and polymer matrix material processors, the selected focus of industrial opportunity. The results of this endeavor produced several outcomes, such as the compilation of state inventories of private firms in this specific segment and state-sponsored activities to benefit these firms. The CRADA product of this effort was published as a "market opportunity analysis" and distributed to participating companies, public/institutional service providers, and SRA stakeholders. This document is a tool for developing needed services and baseline for strategic planning for the private sector. Additionally, this effort served as a catalyst for several institutions to develop or update their internal directories and internet accessible databases of relevant expertise and resources.

5. Operational planning and pilot project development was an outcome to a limited extent as several initiatives were started across the participating institutions and a coordinated focus was achieved between the four states' industrial extension services. There was considerable enthusiasm for this part of the project among the participating institutions, but there was difficulty engaging groups of private companies. Companies participated individually and collectively were willing to discuss concepts; nonetheless, the efforts were not successful in gaining commitment for multiple company projects. Part of the challenge was attributable to the inherent competition among the institutions who did not always "play the same tune" in group meetings and "private" interactions.

III. Discussion of DOE Benefit of the CRADA

The program is consistent with the DOE's mission of Technology Transfer, and the provision of the prime contract. This was a funds-in CRADA with no program sponsor. This program provided benefits and positive impact to DOE and the region by:

- Developing substantial relationship between DOE and Southeastern states while enhancing DOE's interface to major industry in the region.
- Establishing public and private support for DOE initiatives in the region.
- Developing guidance on the deployment and utilization of technology.
- Developing a model for commercializing technology.

This CRADA created the means to link the transfer of DOE technology with other critical support activities, like economic development organizations and public-private ventures, and build a network to nurture industry in the adoption of advanced technology. DOE's early successes in Tennessee were the catalyst for an Alliance of States, including Georgia, North Carolina, South Carolina, and Tennessee. LMES worked with the STC and its parent organization, the Southern Growth Policies Board, to develop this CRADA and a program of activities for the next step beyond technological assistance in providing the mechanism for sharing between states.

Establishing the Southeastern Regional Alliance (SRA) Program

IV. Technical discussion of the work accomplished

The CRADA-facilitated activities between participants were envisioned to include organizing exchanges of personnel between resources for short periods, assessing industry needs and strategies relative to technological expertise of participating resources, conducting joint technology evaluation and applications projects, and the development of industry groups leading to "virtual" enterprise formation. Utilizing plant visits, classroom training, demonstration facility validation, extensive video teleconferencing, expert problem-solving, and "design of experiments" techniques, the smaller enterprise participants were to commit to and experience a long-term regimen of interactions.

An important mechanism for the performance of tasks and interactions under the SRA was the use of an advanced information highway with video teleconference hubs at Oak Ridge, the MCNC (formerly the Microelectronics Center of North Carolina) at Research Triangle Park, the Georgia Institute of Technology Economic Development Institute (EDI) at Atlanta, and the Tennessee-Bell South Economic Development Telecommunications Center at Nashville.

The CRADA supported an individual effort of the author to initiate, develop and lead activities described. Initial endeavors involved the conduct of meetings of the many stakeholders from state governments, public-private initiatives, academic institutions, and leading industries to gain a consensus on supportable strategies and projects. These were complimented by a survey of stakeholder interests and the development of documentation that eventually evolved into the strategic plan, position papers, and proposals. There was a significant effort made over the duration of this CRADA in the development and submission of proposals for the SRA to the National Institute of Standards and Technology (NIST), the National Telecommunications and Information Agency (NTIA), the Advanced Research Projects Agency (ARPA), and various industry leaders. None of these activities resulted in the substantial funding desired by the participants, and that had a dampening effect on the long-term commitment and enthusiasm of leaders.

Specifically, meetings and workshops conducted throughout the period demonstrated the viability of video teleconferencing and business conduct via advanced telecommunications. These activities not only improved awareness among the stakeholders but also led to several collateral benefits to participants, including the expansion of a "Business Gateway" internet exchange service from a South Carolina pilot to the other SRA states, the introduction of several valuable applications of internet systems to smaller enterprises (several claims of adoption from attendees of workshops), and the introduction of interstate telecommunications cooperation with commercial applications to the states' telecommunications directors.

Coordination of industrial extension services between the four states resulted in several beneficial interactions leading to potential long-term collaboration. As well as training exchanges between the University of Tennessee, Georgia Tech, South Carolina's EDI and the University of North Carolina-Charlotte's CC Cameron Center, multiple joint projects evolved. One involves the Edison Welding/Joining Institute's partnership program which has now initiated joint activities with the four institutions cited in developing polymer joining projects. A second involves the Society for Plastics Industry engaging these four institutions in piloting training curricula to satisfy evolving skills standards for the plastics industry. And, a third is the development and sharing of industry characterization data between these institutions as they proceed to develop databases for each of the states.

Establishing the Southeastern Regional Alliance (SRA) Program

Technical discussion of the work accomplished (continued)

One of the most valuable products of the CRADA is the Plastics and Polymer processors Market Opportunity Analysis which encompasses much of what was determined and learned about the industry over the year. Comparing trends and evolving requirements of the major OEMs for this market segment, it compiled the needs analysis of processors in the SRA states and compared that data to national benchmarks of this category presented by ITI of Ann Arbor, Michigan. This report also tied together what the institutions and public programs should do to respond to industrial challenges and opportunities.

Quarterly reports of progress and activities are attached to reflect the progress of various endeavors during the period of the CRADA. This effort involved no technical work, therefore, the activities represent the content of satisfying the requirements of the statement of work.

V. Inventions

No inventions were envisioned, none were made. Interactions focused on facilitating and building public-private coalitions, and no technical research was performed.

VI. Commercialization

This was an initiative in technology commercialization. The purpose of this CRADA was to develop an interstate model for public-private collaboration.

VII. Plans for Future Collaboration

The project was converted to a regional project in workforce development specifically focused on distance learning sponsored and managed by the Southern Technology Council (STC). Lockheed Martin Energy Systems, Inc., and Lockheed Martin Energy Research Corporation are members of the STC and will continue to participate in this evolving activity. Certainly, in view of the devolution movement that will have bipartisan support, regional activism will be an important element of national laboratory strategy.

Establishing the Southeastern Regional Alliance (SRA) Program**VIII. Conclusions**

This endeavor was a major challenge since it endeavored to facilitate the development of consensus on cooperative projects between several federal agencies, four state governments (representing both political parties), several competitive institutions, and a broad segment of industry. Many valuable lessons have been learned and it has been proven that such collaboration is possible with pragmatic expectations. This endeavor initially attempted to engage too much in too broad an agenda; however, the fundamental political and cultural changes occurring in the United States at this time will make such aggressive initiatives more viable in the near future.

Clearly, there is a significant role for National Laboratories in this type of regional initiative, and as the political framework is fundamentally altered through devolution it is apparent that such a role may be critical to the lab's future. The need to coordinate public services and public resources and private interests to maximize the impact for economic growth is well documented by economic analysis and congressional record. The question is how to organize and perform the coordination and collaboration in light of the inherent competition among both public institutions and private companies.

This CRADA has been one approach which revealed many opportunities and encountered numerous obstacles. It can represent a pilot that, with a much higher level (in DOE or other federal agency) of involvement, could yield significant, long-term benefits to the nation. The inability of state government to invest in ventures that extend beyond the borders and that cannot guarantee a return for its constituents is intuitively understood, and it is therefore necessary for a national organization to catalyze the acquisition of resources. A regional organization, such as the STC, can certainly nurture the contributions and solicit state participation, but a federal investment was obviously needed.

Although many federal agencies articulate the values of regional cooperation and challenge states to develop joint endeavors with their neighbors, little has been done to substantially seed and support such activities. NIST is a proponent of regional collaboration, but funding for these type projects is far below traditional extension service activities. It appears that the realities of regional cooperation and regional programs is poorly understood except by the practitioners who have successfully developed models. The STC has led various endeavors that developed such models and devoted significant research to benchmarking and defining best practices. It is incumbent upon the DOE and other federal organizations to participate in the STC and continue to experiment with roles that support and catalyze regional cooperation.

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Appendix A

Strategic Plan Southeastern Regional Alliance

GOAL I. Develop and maintain a strategic focus on industry requirements, stressing advanced telecommunications applications, and providing organizational arrangements and funding provisions.

Objective 1. Develop a market opportunity analysis for synthetic, non-metallic materials products in transportation, microelectronics, and construction.

Strategy 1 Assemble a comprehensive analysis of applicable industry sector to characterize the capabilities, shortcomings, needs, and trends for this group across the four states. This evaluation will also point out potential teaming opportunities to aggregate capabilities for emerging market opportunities.

Strategy 2 Acquire surveys of major OEMs (such as Delphi reports) for trends and strategic objectives to augment generic data compiled by trade and professional associations providing a general market picture.

Strategy 3 Utilize plastics market "Electronic Bulletin Boards" to advertise joint capabilities and resources as a response to new requirements (by cooperative projects of producers).

Objective 2. Form an industrial advisory board to meet semi-annually and evaluate plans, provide input to market assessment, define benefits, and champion the initiative within industry.

Strategy 1 Establish cooperative arrangement with the Society for Plastics Industry.

Strategy 2 Identify advisory board members through participation in workshops and other appropriate forum.

Strategy 3 Develop funding plans for projects and activities with industry participants.

GOAL II. Deploy and utilize advanced technology communications in pilot activities across the region for commercial and economic requirements, including manufacturing competitiveness and development of human resources.

Objective 1. Develop plastic and polymer materials selection information and design tool resource.

Strategy 1 Using a contributed commercial database, develop a WWW page and interface to search by material identification and certain characteristics with "pointers" to other databases, such as the Naval Surface Warfare Center.

Strategy 2 Work with the Society for Plastic Engineers, develop engineering rules and proven practices for designing with references to publications and documentation that are available through the extension services.

Strategy 3 Develop and distribute awareness brochures that MEP field agents can use to introduce and inform clients of new services and tools.

Strategy 4 Propose development efforts in response to anticipated federal solicitations.

Strategic Plan (continued)**GOAL II. (continued)**

Objective 2. Plan and conduct on-site training for engineering and technician continuing education of existing workforce.

Strategy 1 Catalogue existing training courses and modules relevant to the needs of client companies from across the participating universities, and ultimately the technical/community college networks, of the four states.

Strategy 2 Package non-credit engineering continuing education and technical skills training for initial pilot demonstration. Utilize interactive video, voice and data telecommunications to specific company sites and conduct pilot courses.

Strategy 3 Propose development effort in response to anticipated federal solicitations for "workforce development."

GOAL III. Encourage and establish teaming activities among regional public organizations to assess capabilities, characterize resources, and apply those resources/ capabilities to requirements for industry competitiveness.

Objective 1. Develop State Policy Leaders' Task Force to coordinate interstate telecommunications plans and activities (platform and system interconnectivity and interoperability strategy).

Strategy 1 Provide review of project planning to assure compliance with applicable statutory and state policy requirements and provide guidance to assure conformity with and compliment for each state's strategy.

Strategy 2 Evaluate and articulate statutory and policy constraints for public and private partnering to use common systems within each state on interstate initiatives.

Strategy 3 Develop state policy criteria and allowances that support appropriate activities as a pilot in the use of advanced telecommunications.

Objective 2. Develop telecommunications trials and experiments (physical and systems support).

Strategy 1 Develop the understanding and agreement among telecommunications enterprises necessary to support planned demonstration projects.

Strategy 2 Establish the plans to implement telecommunications services on an interstate basis to demonstrate applications for smaller manufacturing firms.

Objective 3. Survey and characterize the available resources and capabilities accessible by a structured network of the SRA and to provide a resource plan that drives network requirements.

Strategic Plan (continued)

GOAL IV. Foster and develop collaborative R&D to satisfy industry needs and commercial market opportunities, maximizing advanced telecommunications.

Objective 1. Develop product design and process improvement engineering assistance network.

Strategy 1 Initially develop directories of regional plastic and polymer materials and process resources.

Strategy 2 Create a WWW interface to access databases of these directories. MEP agents will utilize this resource to identify expertise and centers best equipped to respond to problems and issues presented by clients.

Strategy 3 Develop "engineering design and supply chain integration services" that will constitute new MEP activities to aid client collaboration in product design.

Strategy 4 Establish tools to include modeling, simulation, and rapid prototyping services of participating institutional centers accessible electronically using TCP/IP protocol.

Objective 2. Plan and conduct process and practices improvement applications project.

Strategy 1 As a progression of the assistance network, the MEPs will coordinate and establish cooperative projects between client companies and institutional centers offering capabilities appropriate to the company's needs.

Strategy 2 Pilot the applications of specific technological innovations with small teams of companies, such as an improved process or rapid prototyping—innovations that increase their ability in the market but are typically beyond the reach of a single enterprise.

Objective 3. Establish virtual enterprise teaming experiment to exploit new market opportunity.

Strategy 1 Develop trial teaming arrangements between private companies to pursue and capture new market opportunities that require resources and/or capabilities in excess of any one of the participants.

Strategy 2 Building on early successes achieved with South Carolina companies, facilitate interstate teaming.

GOAL V. Develop industry teaming to capitalize on integrated resources offered by the alliance, leveraging use of advanced telecommunications.

Objective 1. Establish OEM—Supplier business interactions via EDI trials.

Strategy 1 Demonstrate and familiarize groups of smaller establishments on the conduct of and benefits to be gained from EDI to gain commitment of companies to pilot EDI with selected customers.

Strategy 2 Leveraging prior activities of the extension services, gain significant participation of telecommunications service companies, and conduct trials with volunteer participants.

Strategic Plan (continued)

GOAL V. (continued)

Objective 2. Demonstrate process control technology deployment and applications for smaller producers (woven textile production pilot initially with the hosiery industry).

Strategy 1 Establish deployment trials for the "Computer Aided Fabric Evaluation System" with smaller establishments (less than 500 employees) within the hosiery industry.

Strategy 2 Evaluate applications across all industry sectors involving continuous "web" processes, like sheet extrusion.

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