

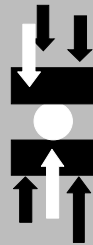
COLLABORATIVE RESEARCH IN THE FORGING INDUSTRY:

**A guide to encourage
interest and participation
by FIA Members**

Presented by

**Forging
Industry
Association**

**Forging
Industry
Educational
and Research
Foundation**



INTRODUCTION

The Forging Industry Association (FIA) and the Forging Industry Educational and Research Foundation (FIERF) are pleased to present this pamphlet on the collaborative research process. Collaborative research is a critical tool for the development of technologies that will enable the forging industry to remain competitive in the twenty-first century. It is intended to provide the reader with a quick overview of the process and the support that FIA and FIERF can provide. A detailed explanation of the process can be obtained by contacting George F. Mochnal, FIA/FIERF Director of Research and Education (DRE), by phone at 216-781-6260 or by e-mail at george@forging.org.

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COLLABORATIVE RESEARCH IN THE FORGING INDUSTRY

Need for Technical Advances in the Forging Industry

Customers are demanding higher quality, faster delivery and lower prices. They shop the world to achieve these goals.

New competing processes threaten our business base.

Why Collaborate?

Large research and development projects are costly and may not produce commercially viable results yet they are essential to the long-term financial health of the forging industry.

Joint (collaborative) ventures spread the economic risk of large scale R&D through shared costs, facilities, and expertise. They also serve to integrate the strengths of the participants be they academia, industry, or government.

Why is the Federal Government Involved?

Technological advances contribute to the economic growth and stability of the country.

Global competition has provided the impetus for the U.S. Congress to develop strategies that allow the federal government to stimulate technological innovation in the private sector.

The role of FIA and FIERF in collaborative research in the Forging Industry

Together FIA and FIERF will guide you and your team through the organizational stages of the collaborative process.

Another FIA/FIERF function will be the identification of possible funding sources for the collaborative project.

WHAT ARE THE STEPS IN THE COLLABORATIVE PROCESS?

The Forging Industry Technology Roadmap has identified needed research.

A company or group of companies determines what specific technology or device would increase their near-term or long-term profitability and competitiveness. The company sponsoring the project (Project Champion) emerges during this stage.

A concept paper (one or two pages) is prepared. It can be written by the Project Champion or this task may be delegated to FIA/FIERF Director of Research and Education and the FIA Technical Committee.

The concept paper is approved by the Project Champion.

A preliminary team is assembled and participation of other interested parties is solicited. Interested parties may include companies, federal laboratories, universities and other technology providers.

The project team is finalized and enters into an agreement with a research program management organization (Program Manager). The program manager oversees the performance of the work and ensures that the team members are working together efficiently.

A state-of-the-art assessment and a Statement of Work (SOW) are drafted by the project team. These documents define the technical plan and schedule, and possible funding sources for the program. Projects usually last from one to three years.

Agreement to initiate work. This provides the necessary legal protection for companies working together on the research project and is the instrument for safeguarding intellectual property. The legal agreements are usually drafted by the organization that is serving as Project Manager.

The project proposal is then finalized and submitted to a funding agency.

When the project is funded all of the elements of the project will be in place and implementation can commence.

THE COLLABORATIVE PROCESS



COLLABORATIVE RESEARCH LEGAL AND INSTITUTIONAL ARRANGEMENTS

The flexibility associated with collaborative research allows the development of organizational plans tailored to the specific needs of projects and their participants.

Legal Arrangements

Issues of patent ownership, information disclosure, licensing, and antitrust are resolved on an individual basis within the general guidelines established by law governing joint ventures.

Institutional Arrangements

- (1) Industry/Industry joint projects. Two or more companies agree to support specific research.
- (2) Industry/University programs revolve around activities in which industry supports research centers at universities, funds individual research projects at a university, and/or exchanges personnel with a university. Traditionally, universities have focused on basic research and industry has translated the research results into commercially viable products.
- (3) Industry/Federal Government programs are one of the most effective ways to maximize R&D investment returns. They use federal facilities, researchers and federal funding for technology transfer from government agencies to industry for commercialization.

Government laboratories have equipment, and scientists and engineers with experience and skills not available elsewhere.

- (4) Industry/State Government/Federal Government partnerships are often led and partially funded by the interested state government and involve industries located within the sponsoring state.

PARTICIPATION BY FORGING INDUSTRY ASSOCIATION MEMBERS

HOW DO YOU AND YOUR COMPANY BECOME INVOLVED IN THE PROCESS?

- (1) Fill out the forms found on pages 6 and 7 of this document.
- (2) Indicate areas of interest to you and your company. This will ensure that you receive notification of project solicitations in specific technical areas, such as die lubrication.
- (3) Submit your project ideas for review. The forms for project submittal can also be found at *www.forgings.org* and *www.forging.org*. If your project is selected, you will have the opportunity to act as Project Champion.

We encourage you to initiate or participate in a project effort of this nature, and to contact FIA for additional information about how to start.

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Remember, the Forging Industry Association and Forging Industry Educational and Research Foundation together with the Project Management organization will be there to help and assist you and your team through the process.

Project Proposal Submittal Form

Project Description:

Problem Description:

Proposed Solution (Optional):

Forging Industry Technology roadmap Reference:

Stated impact or benefit to the industry of this project:

Anticipated cost of program (optional):

Submitted by: _____

Company: _____

Date: _____

GLOSSARY

<u>TERM</u>	<u>DEFINITION</u>
ATP	Advanced Technology Program - An annual solicitation or series of solicitations from National Institute of Standards and Technology.
Funding	The reimbursement a project participant receives for the cost of work performed as agreed under the Project Agreement and Task Assignment contracts.
In-kind	Cost incurred by a project participant for work performed as agreed under the Project Agreement and Task Assignment contracts but not reimbursed. In-kind funds form the industry matching funds required under all federal funding agreements. In-kind contributions may include cash payments to the project, labor, travel, and other direct expenses, facilities usage costs, purchased materials, and equipment rental or depreciation. They may not include profits.
JV	Joint Venture
Project Agreement Contract	A legal document that essentially forms a joint venture (JV) to perform a collaborative R&D project. It includes the terms and conditions under which the JV is formed plus attachments such as the SOW (see below), background technology disposition, and project level cost summary. All Participants sign and receive copies of the Project Agreement Contract.
R&D	Research & Development
SOW	Statement of Work – A document that defines the why, how, who, and when of a technical project plus specific details of deliverables, etc.
Task Assignment Contract	A legal document binding an individual project participant to the tasks to perform and the cost to perform those tasks. They may contain specific economic data and therefore are not shared among project participants.
WBS	Work Breakdown Structure – A document that defines task descriptions and performance details (what, who, when) plus milestones. A WBS is normally embedded in the SOW.

EXAMPLES OF ORGANIZATIONS INVOLVED IN COLLABORATIVE RESEARCH

Advanced Technology Institute (ATI) unites teams of industry, government, and academia to work on key technology initiatives, catalyzing research, even among competitors.

Defense Logistics Agency (DLA) is a logistics combat support agency whose primary role is to provide supplies and services to America's military forces worldwide.

National Center for Manufacturing Sciences (NCMS) provides comprehensive support related to the formation and management of multi-partner collaborative manufacturing R&D programs.

National Center for Excellence in Metalworking Technology (NCEMT) National resource for the improvement of the technical and competitive posture of the United States of America's civil-military industrial base through effective transition of leading edge technologies for the application of conventional and advanced materials in Department Of Defence and commercial engineering systems.

NIST — Manufacturing Engineering Laboratory Central research laboratory for improving the competitiveness of U.S. Manufacturing by working with industry to develop and apply measurements, standards, and infrastructural technology.

Oak Ridge National Laboratory (ORNL) conducts a wide range of basic and applied research and development to advance in several core competencies: the nation's energy resources, environmental quality, scientific knowledge, educational foundations, and economic competitiveness.

Office of Industrial Technology (OIT) The Department of Energy's Office of Industrial Technologies creates partnerships among industry, trade groups, government agencies, and other organizations to research, develop and deliver advanced energy efficiency, renewable energy and pollution prevention technologies for industrial customers.

Ohio Aerospace Institute (OAI) OAI creates "virtual companies" by teaming collaborators from industries, universities, and federal laboratories who work together to develop solutions for market-driven needs.

Sandia National Laboratories Designs all of the non-nuclear components of the nation's nuclear weapons and works closely with many U.S. government and industry groups in various ways to help preserve the nation's security.

United States Department of Energy (DOE) Mission is to foster a secure and reliable energy system that is environmentally and economically sustainable and to support continued United States leadership in science and technology.

FEDERAL INITIATIVES IN COOPERATIVE R&D (LEGISLATIVE FOUNDATION FOR COLLABORATIVE R&D)

Most legislation has been enacted to facilitate technological advances across industries but there have been several recent efforts to provide direct assistance for cooperative ventures in a particular industry. Industry specific initiatives are based, in part, on national defense and economic security concerns over specific technologies that are, or are perceived as, potentially critical to a wide range of businesses.

Federal government support may be either direct or indirect. Direct initiatives involve government financing (on a cost shared basis) of joint research efforts. Indirect funding measures include areas such as tax policies, intellectual property rights, and antitrust laws that create incentives for the private sector. Below is a brief review of significant legislation that supports collaborative research.

INDUSTRY—UNIVERSITY COOPERATIVE RESEARCH CENTERS PROGRAM

In the early 1970s, the National Science Foundation established its Industry-University Cooperative Research Centers program. The first significant collaborative effort under this program was the Electric Power Research Institute (EPRI), a research organization supported by electric power utilities, which has been in operation since 1973.

THE NATIONAL COOPERATIVE RESEARCH ACT

Designed to encourage companies to undertake joint research that is long-term, risky, and/or too expensive for one company to finance. This act clarified the antitrust laws and requires that the “rule of reason” standard be applied in determinations of violations of these laws; that cooperative research ventures are not to be judged illegal “per se”.

THE OMNIBUS TRADE AND COMPETITIVENESS ACT OF 1988

Created the Advanced Technology Program (ATP) at the Department of Commerce’s National Institute of Standards and Technology (NIST). This program provides matching funds to the private sector or consortia (universities, companies, and/or government laboratories) for the high-risk development of technologies that have broad, cross industry, application potential.

THE STEVENSON-WYDLER TECHNOLOGY INNOVATION ACT

As amended by the Federal Technology Transfer Act and the Department of Defense FY1990 authorizations, provides, in part, a legislative mandate for technology transfer from the federal government to the private sector, establishes a series of offices in federal agencies and/or laboratories to administer transfer efforts, and provides incentives for federal laboratory personnel to actively engage in technology transfer.

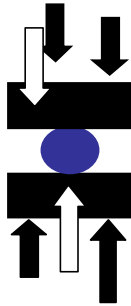
THE NATIONAL COOPERATIVE PRODUCTION AMENDMENTS ACT OF 1993

Amends the National Cooperative Research Act (see above) by, among other things, extending the original law's provisions relating to joint manufacturing ventures. These provisions are only applicable to cooperative production when the principal manufacturing facilities are "located in the United States or its territories".

THE OMNIBUS TRADE AND COMPETITIVENESS ACT

Resulted in the National Institute of Standards and Technology's (NIST) establishment of regional Centers for the Transfer of Manufacturing Technology. The program, Manufacturing Extension Partnership (MEP), is a nationwide network of over 400 not-for-profit centers that makes it possible for small and medium-sized manufacturers to access the expertise of manufacturing and business specialists throughout the U.S. "Each Center has the ability to assess where your company stands today, to provide technical and business solutions to help you create successful partnerships, and to help you keep learning through seminars and training programs."

In addition, the law requires that NIST provide technical assistance to state technology extension programs in an effort to improve private sector access to federal technology.



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