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THE NASA/IITRI MANUFACTURING APPLICATIONS TEAM (MATEam):  
THE TRANSFER OF TECHNOLOGY TO THE INDUSTRIAL SECTOR 1977-1980

by

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In 1977 the NASA Office of Technology Utilization established a Manufacturing Applications Team (MATEam) at the Illinois Institute of Technology Research Institute. The goal of the team is to successfully use aerospace technology to solve significant industry problems. Since its inception the team has become a critical link between NASA technology sources and industries technology users. In this essential intermediary role the team has been able to strengthen the communication process and assist in the movement of new technology across organizational and government agency boundaries. As a result of the time required for technological development team effort and its broad and effective implementation has been reduced.

The establishment of a team devoted to manufacturing applications is essential at a point in our country's history in which our world position in manufacturing productivity continues to diminish. The team has been a combatant force to declining productivity by aiding the industrial sector with the speed up in adaptation of new manufacturing technologies.

Achieving significant technology transfer and widespread implementation has not occurred quickly. The competitive nature of industry in the adaptation and protection of potential problem solving technology increases the complexity in the identification of significant problems and the matching with solutions. The solutions must be both technically sound and economically feasible. The matching of problems with solutions has not guaranteed technology transfer. The state of the economy has reduced development funds and has created unexpected decisions by industrial firms to not pursue potential problem solving technology identified. Thus, the MATEam's task is analogous to that of identifying and implementing new business opportunities, and carries with it the many pitfalls normally associated with new venture development.

The team's mode of operation has effectively in a systematic way identified significant manufacturing problems. The comprehensive problem statement screening procedure has minimized the disappointments normally associated with new venture technology.

An effective communication link between the team, industry associations, individual companies, and other government agencies is one of the team's strongest assets and it continues to strengthen. The MATEam has established a good reputation with the industrial sector which continues to grow in presentations, press releases, technology demonstrations and on site visits to individual companies. The arrangement of direct telephone contacts between industrial sources and field center scientists has also proven to be an effective rapid way in which the industrial source may obtain assistance.

There has been a total of (292) problems that have been prepared in the form of problem statements since initiation of the program in 1977. The problem statement is the most effective means of documenting the problem since it defines the details of the problem in addition to its solution constraints and restraints. Each year a bound volume of current problem statements is forwarded to NASA scientists at all of the field centers and laboratories. Prior to problem distribution the problems have been edited to delete the name of the problem originator and information of proprietary nature. The problem statement screening process and the identification of potential problem solving technology has depended strongly on factors that make up the screening process:

- o the problem must be manufacturing related
- o the problem must apply to more than one company
- o solutions to problems must be based on NASA technology

- o Do commercial solutions already exist
- o What is the likelihood of identifying relevant NASA technology
- o What is the magnitude of the benefits to be gained by solving the problem
- o How can the problem solution be widely disseminated.

Since 1977 there has been a total of 1,011 contacts with industrial companies. There is presently 185 document problems presently being circulated within the NASA research center network in the form of a problem statement.

The MATEam has used NASA's Scientific and Technical Information facility, the STAR Indices and tech briefs as data sources in search for potential problem solving technology. A fast and efficient means has been direct contact with field center scientists and engineers.

When potential problem solving technology has been screened and a solution has been identified implementation strategy is carefully planned. Strategy utilized since the start of the program has fallen into three categories:

- a. The direct transfer of the technology and its immediate application. Ordinarily there is no additional development required.
- b. The further development of the basic NASA technology in an applications engineering program funded by the industrial user and or marketing source.
- c. The performance of an applications engineering program as described in (b) above, however, it may be joint funded by the user, marketing source, NASA and another government agency.

During the program duration transfers have consisted principally of direct transfers and transfers that resulted from industry funded applications engineering programs. However, two programs related to orbital tube fluring and the nondestructive testing of printed circuit board soldered joints using lasers are presently being considered for joint NASA-Navy and NASA-Army funding.

The program in its performance period of three years has produced transfers in (12) technology areas which include laser wire insulation stripping, robotics, cutting tools, portable x-ray equipment, solar cell coatings, torque measurement devices, soldering technology welding flux, wire selector calculator, A-C motor control, bearing failure detector and the magnetic hammer coil design.

At present there is a total of eight applications engineering programs in various stages of progress. They are related to Orbital tube fluring device, infra red technology, laser stripping magnet wire, carbide coated cutting tools, nondestructive fracture toughness testing, portable solar system, and anerobic methane gas generator.

The team continues to focus on the identification of manufacturing problem and the screening of potential NASA problem solving technology.