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# TECHNOLOGY TRANSFER - MARKETING

## TOMORROW'S TECHNOLOGY

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## ABSTRACT

The globalization of the economy and the end of the Cold War have triggered many changes in the traditional practices of U.S. industry. To effectively apply the resources available to the United States, the federal government has firmly advocated a policy of technology transfer between private industry and government labs, in this case the National Aeronautics and Space Administration (NASA). NASA Administrator Daniel Goldin is a strong proponent of this policy and has organized technology transfer or commercialization programs at each of the NASA field centers. Here at Langley Research Center, the Technology Applications Group (TAG) is responsible for facilitating the transfer of Langley developed research and technology to U.S. industry.

Entering the program, I had many objectives for my summer research with TAG. Certainly, I wanted to gain a more thorough understanding of the concept of technology transfer and Langley's implementation of a system to promote it to both the Langley community and the community at large. Also, I hoped to become more familiar with Langley's research capabilities and technology inventory available to the public. More specifically, I wanted to learn about the technology transfer process at Langley. Because my mentor is a member of Materials and Manufacturing marketing sector of the Technology Transfer Team, another overriding objective for my research was to take advantage of his work and experience in materials research to learn about the Advanced Materials Research agency wide and help market these developments to private industry.

Through the various projects I have been assigned to work on in TAG, I have successfully satisfied the majority of these objectives. Work on the Problem Statement Process for TAG as well as the development of the Advanced Materials Research Brochure have provided me with the opportunity to learn about the technology transfer process from the outside looking in and the inside looking out. Because TAG covers all of the research efforts conducted at Langley, my studies with TAG were able to provide me an excellent overview of Langley's contribution to the aeronautics industry.

## **INTRODUCTION**

The globalization of economic competition coupled with the end of the Cold War necessitated several quick and drastic changes to the international marketplace. To remain competitive, U.S. industry has responded by changing its traditional business practices, and the federal government has followed along. Administrator of the National Aeronautics and Space Administration (NASA) Daniel Goldin writes, "to effectively use the technological, human, financial and other assets of NASA and the U.S. industrial base and to capitalize on the opportunities offered by an ever expanding technology base, we must carefully consider the marketplace and form partnerships with the private sector," (1:1). This new broader role focuses on transferring NASA developed technology to the private industry "to increase US. industrial competitiveness, to create US. jobs, and to improve the balance of trade" (2:3). The national technology transfer policy aims to convert NASA research and development (R&D) efforts into marketable, innovative products.

Currently, there are three forces driving NASA's evolution: President Clinton's technology policy, Vice President Gore's National Performance Review recommendation for NASA, and the growth of the Information Superhighway (1:3). These forces affect the technology push and pull in the United States differently. The President's policy challenges NASA to increase the effectiveness of NASA programs, thereby increasing the industry's economic competitiveness. By emphasizing a cooperative effort between private industry and NASA, the policy views technology as a force of change, an impetus for economic growth. Moreover, the National Performance Review recommends an implementation for technology transfer. The plan makes such suggestions as setting aside 10 to 20% of the research and development budget for partnerships with industry and promoting small business opportunities. Most importantly, the recommendation amends the agency's Vision-Mission-Values statement to include technology transfer as a major mission.

## **TECHNOLOGY TRANSFER AT LANGLEY RESEARCH CENTER**

The Technology Applications Group (TAG) at Langley Research Center was established in February 1994 to "encourage broader utilization of NASA Langley developed technologies in the American industrial community" (3:1). The document "Transferring Langley Research Center Technology" outlines TAG's responsibilities as the following:

- Leading the Center's processes for early identification of technologies of high commercial potential;
- Promoting the expedient transfer of new technologies to the commercial sector;
- Achieving the non-aerospace uses of Langley technology by identifying potential technology applications and creating teams of non-aerospace customers and Langley technologists to accomplish the transfer process;
- Coordinating the Langley program with appropriate NASA Headquarters Offices, other NASA Centers, and other Government Agencies; and
- Supporting the technology transfer processes for aerospace customers.

Furthermore, members of TAG are also charged with leading Langley's Small Business Innovation Research Program and the Small Business Technology Transfer Pilot Program, which

reach out to small businesses for collaborative research and development efforts. The group includes members of the Technology Transfer Team (TTT), who facilitate the transfer of Langley developed technology to private industry, the Patent Counsel Team, as well as Small Business Partnership Team. The TTT is further organized into the following four market sectors: Information Technology, Materials and Manufacturing, Transportation, and Medical, Sensors, Instrumentation, Environment, and Energy (MISEE).

## **APPROACH**

The approach to learning about the Technology Transfer program at Langley was two-fold. While the first project addressed Langley's reach-out to private industry for research ventures, the second project focused on industry's approach to Langley. The first project developed from a Headquarters' initiative to catalog the Advanced Materials research being conducted at the various NASA field centers. With this information, a document was to be created as a marketing tool for NASA's materials developments and distributed to the automobile industry. The second project involved TAG's problem statement process and the elimination of the backlog of Problem Statement Definitions (PSD) collected over the past year.

## ***ADVANCED MATERIALS BROCHURE***

The Advanced Materials Inter-Center Initiative involved working with members of the TTT, the Headquarters office, and the Regional Technology Transfer Centers (RTTC), in particular the Rhode Island Technology Transfer Center. Initially the majority of the work involved making contacts at each of the participating centers and determining the format as well as the type of information to be included in the brochure. The field centers which agreed to participate in the effort were Ames Research Center, Jet Propulsion Laboratory, Marshall Space Flight Center, Lewis Research Center, Goddard Space Flight Center, Johnson Space Center, Kennedy Space Center, and Langley Research Center. The next few weeks after making the initial contacts were spent waiting for the centers to collect and send their information. Once a substantial amount of information arrived at Langley, I met with some researchers in the Materials Division for guidance in consolidating and categorizing the research initiatives across the agency. Although the final version of the brochure will not be completed before the ten weeks are completed, all of the preliminary work has been completed. The materials research for each of the centers has been organized and the unique facilities and research have been identified. The first draft has been sent to each center for further review and we are now waiting for the suggested modifications. Once these changes are made, we will send the information to Headquarters for the graphics layout. The facilities and resources which proved to be the most helpful for this project were the NASA Technical Library, the researchers from the Langley Materials Division, and the World Wide Web.

This assignment provided an abundance of information about the extensive amount of research NASA conducts in the Materials research area, especially at Langley. With most of NASA's research conducted in the aeronautical field, it's focus on materials for engines and flight structures is highly marketable to the private sector, specifically the automotive and aeronautics industries. However, the difficulties in coordinating such an effort among the various NASA installations revealed another aspect of technology transfer. While marketing NASA research

increases the U.S. industrial international power base, effective technology transfer also requires a new way of thinking.

### ***PROBLEM STATEMENT PROCESS***

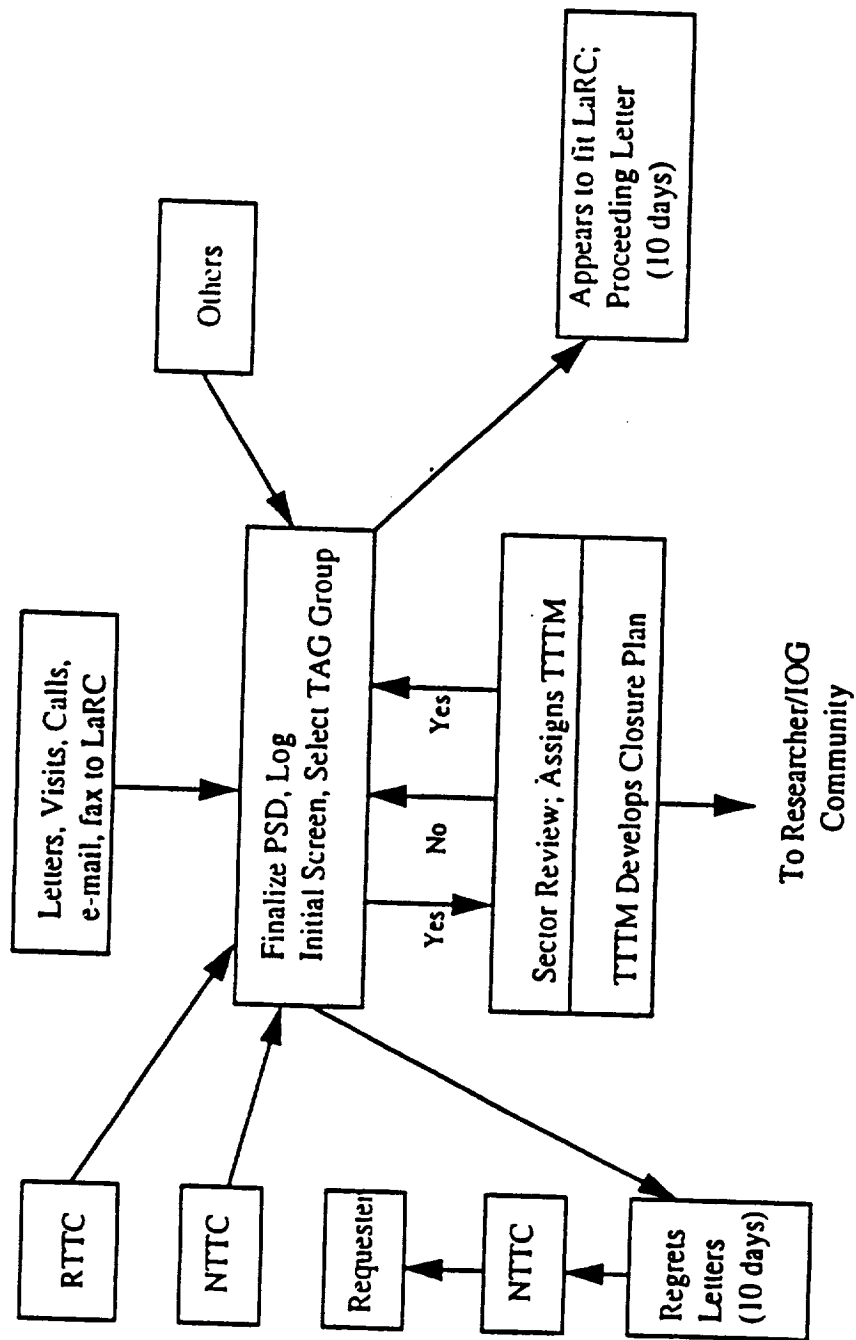
The Problem Statement Process (Appendix A) is the means through which industry approaches Langley with a problem or an inquiry to find a solution using Langley technologies or facilities. The process attempts to identify an optimum match between a customer's needs and Langley's capabilities, providing a mutual benefit to both the private sector and Langley. Within the last few months, TAG has centralized the process and created a position within the group to oversee its implementation and administration. The initial work was focused on eliminating the backlog of problem statements. This first step of this process was to centralize the problem statements into a database. Because this was not done in the past, PSDs were scattered among all of the members of the TTT. Once we were able to collect all of the statements, we entered them into the backlog database and assigned market sectors for each one. At that point, the sectors became responsible for deciding whether they wanted to pursue further action with the companies based on the technological match with Langley's resources. If the sector decided that the PSD was something that Langley should pursue, then we responded to the company notifying them of our decision. Likewise, if the sector decided that it was not in Langley's best interest to work a PSD, then we responded to the company telling them that we were unable to match their needs with Langley's resources. Within a month of beginning work on the process, the Data Systems Team for TAG completed work on the new TAG database Management Analysis of Scientific Knowledge (MASK), which tracks the majority of TAG's activities, including the problem statements. Thus, the incoming problem statements were tracked in MASK while the existing ones were left in the backlog.

Like the Advanced Materials Brochure, working with the Problem Statement Process broadened my knowledge of the technology transfer process. The sheer number of PSDs that are processed by the system indicates that numerous opportunities exist for cooperative efforts between private industry and NASA. However, limited resources such as funding, facilities, and personnel necessitate NASA's selectivity with whom and in what areas NASA pursues technology transfer. While much of my work on the Problem Statement Process was limited to administrative duties, I was given the freedom to make decisions on issues regarding the procedure. For example, I was responsible for working with the RTTCs and some of the companies on certain PSDs. I was also responsible for corresponding with the market sectors and organizing the correspondence. Finally, my work in this area of the Technology Applications Group revealed the significance of new programs, such as the one at Langley, to proceed with a strong sense of direction. As programs develop goals and solidify procedures, it is important that they build credibility to facilitate long lasting business partnerships.

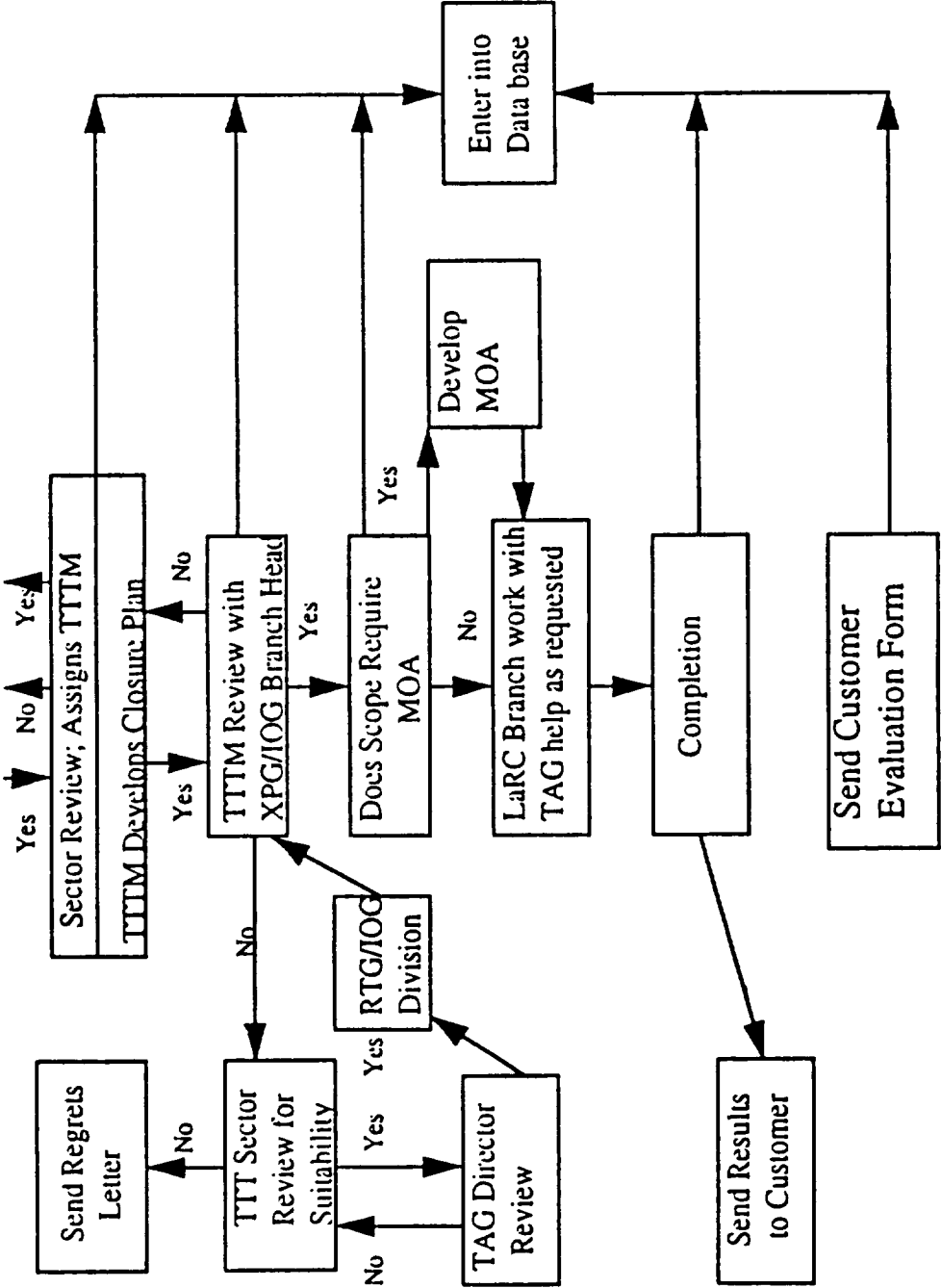
# TAG Problem Statement Process

## Problem Statement Process Actions

### APPENDIX A



## Problem Statement Process Actions



## **REFERENCES**

1. "NASA Commercial Technology - Agenda for Change," NASA Commercial Technology Team. July 1994.
2. " The Technology Transfer Process - Working with NASA Langley Research Center," March 3, 1995.
3. "Transferring Langley Research Center Technology."