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Report to the Ranking Minority Member,
Committee on Science, Space, and
Technology, House of Representatives

January 1994

ADVANCED TECHNOLOGY

Proposal Review Process and Treatment of Foreign-Owned Businesses





United States
General Accounting Office
Washington, D.C. 20548

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**Resources, Community, and
Economic Development Division**

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January 18, 1994

The Honorable Robert S. Walker
Ranking Minority Member
Committee on Science, Space, and
Technology
House of Representatives

Dear Mr. Walker:

This report responds to your February 16, 1993, request that we assess the implementation of the Advanced Technology Program (ATP) by the National Institute of Standards and Technology (NIST), which is within the Department of Commerce. ATP was established by the Omnibus Trade and Competitiveness Act of 1988 (P.L. 100-418) and modified by the American Technology Preeminence Act of 1991 (P.L. 102-245). According to these acts, ATP's purpose is to assist U.S. businesses in creating and applying the generic technology and research necessary to (1) rapidly commercialize significant new scientific discoveries and technologies and (2) refine manufacturing technologies. The acts require that ATP focus on improving the competitive position of the United States and its businesses, give preference to discoveries and technologies that have great economic potential, and avoid providing undue advantages to specific companies. Funding for ATP has increased from \$68 million in fiscal year 1993 to \$200 million in fiscal year 1994—an increase of 194 percent. Since April 1991, NIST has made awards to 89 individual companies or joint ventures in four rounds of competition. NIST announced the winners of the fourth round of competition on November 4, 1993.

In September 1993, we provided you with an interim report on the indirect cost rates of ATP awardees and the status of the Department of Commerce's efforts to evaluate ATP's performance.¹ As agreed with your office, this report discusses (1) how ATP limits its awards to research and development (R&D) on "precompetitive generic technology" and (2) the treatment of foreign-owned businesses that submit proposals for ATP awards. Although four rounds of competition have been completed, we focused our analysis on the second and third rounds for the following reasons. During round one, the program was still undergoing changes and ATP did not compile information on the foreign ownership of applicants. Round four data on the treatment of foreign-owned companies were not

¹Federal Research: Advanced Technology Program's Indirect Cost Rates and Program Evaluation Status (GAO/RCED-93-221, Sept. 10, 1993).

available in time for our analysis. However, we have included summary data from round four in this report.

Background

NIST's regulations state that ATP is to assist U.S. businesses in carrying out R&D on precompetitive generic technologies. These terms are defined in the regulations as follows:

- Precompetitive technology represents R&D activities up to the stage at which technical uncertainties are sufficiently reduced to permit preliminary assessment of commercial potential, but prior to the development of application-specific commercial prototypes. At the stage of precompetitive R&D, for example, results can be shared within a consortium that can include potential competitors without reducing the incentives for individual firms to develop and market commercial products and processes on the basis of the results.
- Generic technology is a concept, component, or process—or the further investigation of scientific phenomena—that has the potential to be applied to a broad range of products or processes. A generic technology may require subsequent R&D for commercial application.

Under current law, a company is eligible to receive ATP funding only if the Secretary of Commerce finds that the company's participation would be in the economic interest of the United States. In addition, the company must be either (1) a U.S.-owned company or (2) a company that the Secretary finds is incorporated in the United States and has a parent company that is incorporated in a country that affords U.S. companies certain comparable opportunities and intellectual property protections. The legislation defines a U.S.-owned company as a company that has a majority ownership or control by individuals who are citizens of the United States.

Results in Brief

ATP relies on a consensus decision by its Source Evaluation Board (SEB) to eliminate from review any proposal that does not involve precompetitive generic technology. All of the SEB's members have technical or business expertise and make this determination on the basis of definitions in federal regulations along with personal judgment, the opinions of internal ATP and external expert reviewers, and discussions with colleagues. As can be expected, the SEB, at times, must resolve disputes when integrating different opinions into the decision-making process. ATP officials acknowledge that the interpretation of precompetitive generic technology has caused confusion to prospective applicants and other interested

parties. ATP has efforts under way to clarify explanations of the current regulations so that understanding the type of R&D ATP supports is made easier.

We found no evidence of unfair treatment in the SEB's review of proposals submitted by foreign-owned businesses. No foreign-owned businesses won awards in the second and third rounds of competition for ATP funding. Proposals from foreign-owned businesses amounted to 3.7 percent of all proposals submitted in these two rounds. We also found that reviewers' comments and criticisms of proposals from foreign-owned companies were similar to those of proposals from U.S.-owned companies that were eliminated during these same rounds of competition. Moreover, we contacted company representatives who participated in debriefings on their proposals after they were eliminated from review. All of the representatives were generally satisfied with the treatment of their proposals and said that there was no evidence of anything unfair in ATP's review of their proposals. In its latest round of awards, ATP made two awards to foreign-owned businesses. An ATP official said that these businesses met the eligibility requirements for foreign-owned businesses.

The SEB Eliminates Proposals That Do Not Involve Precompetitive Generic Research

A determination by the SEB that a proposal does not involve precompetitive generic R&D results in the elimination of the proposal from further consideration for ATP funding.² During the review process, the SEB makes all decisions on proposals except final selection for funding. Internal proposal reviewers make recommendations about a proposal to the SEB, but the SEB's subsequent discussions determine the proposal's fate.

Determination of Precompetitive Generic Content of Proposals Is Based on Many Factors

Technical expertise, expert reviewers' comments, and discussions among ATP staff all come together in determining if a proposal involves R&D on precompetitive generic technology. ATP officials said that this determination is a judgment call. ATP staff and outside experts assess and evaluate proposals individually, and differences of opinion do occur. It is up to the SEB to consider different individual opinions when making the final consensus judgment. For example, we found that some proposals went to the SEB with reviewers' comments noting that they contained R&D that was not generic. In one case, a reviewer described the proposed R&D as "not a generic technology—rather application specific." In another case,

²For each round of competition, ATP establishes an SEB composed of federal employees with technical or business expertise. See app. I for a detailed description of the SEB and the ATP review process.

the ATP sponsor did not recommend the proposal for oral review because it was "low in potential broad economic impact," which often means that it is not generic. Both of these proposals went on to win ATP funding. Alternatively, ATP officials said that the SEB may eliminate proposals because the research is not judged to involve precompetitive generic technology even if the reviewers did not make any comments about this.

These examples are consistent with SEB documents that state that the SEB's role is to manage the review and selection process so that "sensible decisions" are reached. In fulfilling this role, the SEB, among other duties, ensures that a rigorous and fair review takes place, appropriate technical and business experts are utilized, and experts' recommendations are integrated into the decision-making process.

ATP keeps the minutes of SEB meetings and summaries of its decisions. Program officials said that more detailed documentation is now being kept than in earlier rounds on the SEB's decisions, primarily for two reasons. First, increased documentation provides a case history for proposals that can be used in evaluating resubmittals. Second, the information is used to aid in the debriefings that ATP offers to provide on proposals that are eliminated. In addition, more complete documentation aids in oversight of the award process.

Proposals May Be Eliminated at Any Time for Not Including Precompetitive Generic Research

In each of the stages of the review process, concerns about the precompetitive generic R&D content of a proposal may be brought up, according to ATP officials. These concerns may be based on the views of ATP staff, outside technical and business reviewers, or members of the SEB. During Phase I (screening), an explicit determination is made by an ATP staff member on the precompetitive generic R&D content of a proposal. The determinations at this stage are usually straightforward, according to ATP officials. We found that in rounds two, three, and four of competition, the SEB eliminated 4 percent of the submitted proposals, or 27 out of 663, in this phase because they were not precompetitive generic R&D. (See app. II for details on the outcome of proposal reviews by phase.)

During phases II and III, an explicit determination that a proposal does not involve precompetitive generic R&D may still be made while other related determinations on technical and business merit are also being made. For example, proposals may be eliminated after technical evaluation because they do not score well on technical risk and broad-based benefits. ATP officials said that, in reviewing proposals, they use high technical risk as

an indication of precompetitive R&D and broad-based benefits as an indication of generic R&D. In fact, most of the proposals eliminated—89 percent—were eliminated during or after technical review. This may have occurred because, according to ATP officials, the SEB often gives proposals the benefit of the doubt if it is unclear whether the R&D is on precompetitive generic technology. The officials said that when this occurs, the proposals are likely to be eliminated anyway for other reasons, such as the technical risk and broad-based benefits criteria.

ATP officials said that information is continually being gathered throughout the review process, which may lead to a determination that a proposal does not contain precompetitive generic R&D. An ATP official said that, in one case, a proposal was eliminated because information supplied to ATP during the oral briefing (in the phase before final selection) led to the determination that the proposal did not involve precompetitive generic R&D.

Guidance on Precompetitive Generic Technology Is Being Revised

ATP officials said that the term precompetitive generic technology is confusing to prospective applicants and other interested parties. This confusion has forced program officials to spend a large portion of their time explaining the terminology. The officials also believed that the program would improve if they explained the R&D that ATP supports by linking their explanations to the selection criteria used in the proposal review process. Accordingly, ATP plans to use the terms “high-risk” and “broad-based” to more precisely describe the types of projects it seeks to fund. These terms are linked to the “Scientific and Technical Merit” and “Potential Broad-Based Benefits” selection criteria, respectively. The new guidance will be included in the proposal preparation materials for the next solicitation in January 1994.

No Evidence Is Found of Unfair Treatment of ATP Proposals From Foreign-Owned Businesses

No foreign-owned business had won an ATP award until the recently completed fourth round of competition for ATP funding, when two such businesses won awards. In the second and third rounds, eight foreign-owned businesses submitted 15 proposals, but none of them received funding. This is not unusual, however, because 411 proposals were submitted in these two rounds, while only 49 received funding. Proposals from foreign-owned businesses amounted to 3.7 percent of all proposals submitted in these two rounds.

We examined documentation on the review that each proposal received. Reviewers' comments and criticisms were similar to those of proposals from U.S.-owned companies that were also eliminated during these rounds of competition. Moreover, we contacted company representatives who participated in debriefings on their proposals after the companies were eliminated from review. All of the representatives were generally satisfied with the treatment of their proposals by ATP and said that there was no evidence of anything unfair in the review. In the representatives' opinion, the reasons ATP staff gave for their elimination were justified. In three cases, the proposal was resubmitted after having addressed the concerns raised by ATP. Two of these companies had proposals that were finalists in the current round of competition, and one of them won an award.

Agency Comments

We discussed the facts in this report with cognizant NIST officials, including the ATP Deputy Director, the Deputy General Counsel for NIST, and a NIST grants officer. We incorporated their comments to ensure that the report correctly represents the ATP foreign-owned business statutes and the proposal review process. However, as requested by your office, we did not obtain written agency comments on a draft of this report.

Scope and Methodology

In conducting our work at NIST in Gaithersburg, Maryland, we interviewed ATP officials and reviewed proposal folders and award records. We focused our analysis on rounds two and three of competition, although four rounds have been completed. During round one, the program was still undergoing changes, and ATP did not compile information concerning the foreign ownership of applicants. We included summary data for round four in this report, but data on the treatment of foreign-owned companies were not available in time for our analysis. ATP officials reviewed sections of this report to ensure that no proprietary company information was divulged.

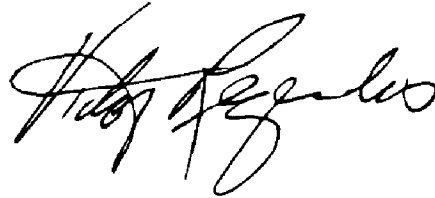
We did not evaluate ATP's technical decisions because this type of evaluation requires highly specialized expertise. Rather, we concentrated on the process—and the functioning of the process—that was designed to ensure that precompetitive generic technology R&D was being supported. We performed our review between March and November 1993 in accordance with generally accepted government auditing standards.

As arranged with your office, unless you announce its contents earlier, we plan no further distribution of this report until 15 days after the date of

this letter. At that time, we will send copies to the Secretary of Commerce; the Director of NIST; the Director of ATP; Commerce's Inspector General; the Director, Office of Management and Budget; and other interested parties. We will make copies available to others on request.

Please contact me at (202) 512-3841 if you or your staff have any questions. Major contributors to this report are listed in appendix III.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Victor S. Rezendes". The signature is fluid and cursive, with the first name "Victor" and last name "Rezendes" clearly legible.

Victor S. Rezendes
Director, Energy and Science Issues

Contents

Letter	1
Appendix I Advanced Technology Program Proposal Review Process	10
Appendix II Outcome of ATP Proposal Review by Phase	13
Appendix III Major Contributors to This Report	14

Abbreviations

ATP	Advanced Technology Program
GAO	General Accounting Office
NIST	National Institute of Standards and Technology
R&D	research and development
SEB	Source Evaluation Board

Advanced Technology Program Proposal Review Process

All proposals submitted to the Advanced Technology Program (ATP) in response to a solicitation undergo a multiphase review process. At each phase, information is compiled on a proposal to enable the Source Evaluation Board (SEB) to determine if the proposal should continue through the process. Proposers not selected to receive funding are provided with a telephone debriefing upon request after the award selection is made. The entire review process consists of Phase I-Screening, Phase II-Technical Review, Phase III-Business and Oral Reviews, and Phase IV-Final Selection. An ATP official said that the program determines if a foreign-owned company satisfies the additional requirements if the company's proposal is selected in Phase IV.

The Director, National Institute of Standards and Technology (NIST), selects an SEB for each ATP solicitation, and the SEB makes the final determination as to whether a proposal will advance to the next review phase or be eliminated from consideration. At each phase, the SEB receives a recommendation on the proposal. The SEB discusses the recommendation on the basis of information supplied with the recommendation as well as its own assessment of the proposal. During the discussion, disagreements may arise, but the SEB's consensus decision on the elimination of proposals is final.

Members of the SEB must be federal government employees—to date only NIST employees have been selected—and have had various technical and business backgrounds. The number of members assigned to each of the first four boards ranged from 10 to 13. The boards generally comprise a chairperson, a deputy chairperson, and technical and business panels. Board members have included an electronics engineer, electrical engineer, physicist, computer scientist, research scientist, mathematician, economist, metallurgist, research psychologist, physical scientist, and one or more business specialists.

During phase I, a member of the ATP staff uses a checklist to determine if the proposal is in compliance with the request for proposals. The checklist comprises three main sections—general, technical, and business. The screener checks a “yes” or “no” response to individual criteria within each section. If anything is checked “no,” the proposal can be recommended for elimination. The criteria in the general section include whether the required number of copies have been submitted and whether an assurance statement of ownership has been included. Examples of criteria in the technical section include whether (1) the proposed R&D is precompetitive in terms of having high technical risks, (2) the proposed R&D is generic in

terms of potential widespread applicability, and (3) the Research and Development Plan is coherent and presents a clear technical objective. Criteria in the business section include whether the proposal has an adequate technology transfer plan and whether an adequate analysis of the potential U.S. impact has been done. On the basis of this review, the screener recommends to the SEB that the proposal continue for technical review or that it be rejected and states the reasons for rejection.

Proposals that advance to phase II are assigned to a member of the SEB or an SEB technical consultant who is designated as the proposal's sponsor. The sponsor decides if it is a particularly weak proposal for which a single technical expert reviewer is sufficient. If it is a strong proposal, it should have more than one expert reviewer. The number of technical experts selected to review individual proposals ranges from one to five, depending on the proposal's complexity and the particular field that the proposal addresses. The sponsor selects reviewers with the most appropriate backgrounds from a data base maintained by ATP of technical experts who have volunteered to do reviews. New technical reviewers are added to the data base with each competition. These reviewers have technical expertise in such fields as electronics, materials, information technology, and biotechnology. They are required to sign a nondisclosure statement before receiving a copy of the proposal for evaluation and are warned to recuse themselves if there is any possibility of a conflict of interest. The reviewers complete a technical reviewer data sheet to provide comments relative to questions on the data sheet and rate the proposal for each question on a scale from zero to 10. They evaluate proposals for quality, innovativeness, technical risk, feasibility, coherency of the plan, and systems integration. Also, reviewers summarize the most important strengths and weaknesses of the proposal. After receiving the reviewers' comments, the sponsor prepares a Technical Evaluation Worksheet. The worksheet shows how each reviewer rated the proposal relative to each question asked along with the sponsor's narrative assessment, excerpts from the reviewers' comments, and an overall summary. The worksheet concludes with a recommendation on whether the proposal should or should not advance to the next review phase. The SEB's Technical Panel reviews the worksheet and recommends to the full SEB that the proposal be eliminated or continue through the process. The full SEB then makes the final determination on the fate of the proposal for this stage.

Proposals that advance to phase III are evaluated by reviewers with expertise in business. ATP maintains a data base of experts who have volunteered to participate in the program as reviewers. These reviewers

include business leaders, venture capitalists, economists, and business professionals. They evaluate the project's commercial and technology transfer benefits, the experience/qualifications of the proposing organization, and the proposer's commitment and organizational structure. Unlike the technical reviewers, who submit their comments by mail, the business reviewers visit NIST to make their evaluations. Once again, they are required to sign a nondisclosure statement and to recuse themselves if there is a possibility of a conflict of interest. The reviewers conduct their individual evaluations using a business review data sheet with questions on each of the categories cited above and rate each proposal for each question on a scale from zero to 10. After the individual evaluations are done, the business reviewers meet as a panel to discuss each proposal and work out any significant rating differences that may exist. On the basis of these discussions, the ATP sponsor then completes a Business Evaluation Worksheet that has a format similar to the Technical Evaluation Worksheet and includes a recommendation as to whether the proposal should be a semifinalist.

Individual SEB members rate each proposal on five criteria listed in the regulations—Scientific and Technical Merit, Potential Broad-Based Benefits, Technology Transfer Benefits, Experience and Qualifications of the Proposing Organization, and Proposer's Level of Commitment and Organizational Structure. Points from zero to 200 are assigned for each criterion, with a total possible score of 1,000 points. The SEB then determines a score and rank for each proposal. The highest-ranked proposals are selected as semifinalists and their sponsors are invited to participate in an Oral Review conducted by the SEB. Site visits may also be performed. With the new information gained in the oral review and/or site visits, the SEB makes necessary adjustments to the score and rank of each semifinalist proposal.

For the final phase, a list of the finalists is prepared in the order of the total points assigned and is submitted to the source selection official,¹ who makes the final selection of proposals to be funded on the basis of (1) the availability of funds, (2) rank order of the proposal, and (3) the appropriate distribution of funds among technologies and their applications. To date, the selecting official's determinations have not differed significantly from the list provided by the SEB.

¹In every round to date, the source selection official has been the Director of NIST.

Outcome of ATP Proposal Review by Phase

Number of proposals				
Review phase	Round 2	Round 3	Round 4	Total
Total proposals submitted	271	140	252	663
Phase I-Screening (proposals eliminated)	33	17	16	66
Phase II-Technical Review (proposals eliminated)	152	86	172	410
Phase III-Business and Oral Reviews (proposals eliminated)	54	10	27	91
Phase IV-Final Selection (proposals eliminated)	4	6	8	18
Total proposals selected	28	21	29	78

Source: ATP.

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