

**Audit**



**Report**

OFFICE OF THE INSPECTOR GENERAL

**SMALL BUSINESS INNOVATION RESEARCH PROGRAM  
AT THE BALLISTIC MISSILE DEFENSE  
ORGANIZATION**

Report No. 95-153

March 21, 1995

**Department of Defense**

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### **Acronyms**

BMDO  
SBIR

Ballistic Missile Defense Organization  
Small Business Innovation Research



**INSPECTOR GENERAL  
DEPARTMENT OF DEFENSE  
400 ARMY NAVY DRIVE  
ARLINGTON, VIRGINIA 22202-2884**



March 21, 1995

**MEMORANDUM FOR DIRECTOR, SMALL AND DISADVANTAGED BUSINESS  
UTILIZATION  
DIRECTOR, BALLISTIC MISSILE DEFENSE  
ORGANIZATION**

**SUBJECT: Audit Report on the Small Business Innovation Research Program at the  
Ballistic Missile Defense Organization (Report No. 95-153)**

We are providing this report for your review and comments. The audit was performed in response to a complaint to the DoD Hotline regarding the implementation of the Small Business Innovation Research program at the Ballistic Missile Defense Organization. Comments on a draft of this report were considered in preparing the final report.

DoD Directive 7650.3 requires that all recommendations be resolved promptly. The Director, Small and Disadvantaged and Business Utilization, is requested to provide additional comments on Recommendations 1.b. and 1.c. by May 22, 1995. The Ballistic Missile Defense Organization comments were fully responsive.

We appreciate the courtesies extended to the audit staff. If you have questions on this audit, please contact Mr. Garold E. Stephenson, Audit Program Director, at (703) 604-9332 (DSN 664-9332) or Mr. Henry F. Kleinknecht, Audit Project Manager, at (703) 604-9324 (DSN 664-9324). The distribution of this report is in Appendix F. The audit team members are listed inside the back cover.

*David K. Steensma*

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Office of the Inspector General, DoD

Report No. 95-153

(Project No. 2CH-5031.03)

March 21, 1995

**SMALL BUSINESS INNOVATION RESEARCH PROGRAM  
AT THE BALLISTIC MISSILE DEFENSE ORGANIZATION**

**EXECUTIVE SUMMARY**

**Introduction.** This audit was performed in response to a complaint to the DoD Hotline regarding implementation of the Small Business Innovation Research (SBIR) program at the Ballistic Missile Defense Organization. The complainant alleged that the Ballistic Missile Defense Organization did not comply with the SBIR program Phase I selection criteria published in the DoD FY 1994 SBIR Program Solicitation. This report was based on our evaluation of Ballistic Missile Defense Organization compliance with legislation and DoD policy for Phase I of the three phases of the SBIR program. The overall SBIR program within the Federal Government provides about \$1 billion annually to small businesses. DoD budgeted \$343 million in FY 1994 for the SBIR program.

**Objectives.** The audit objective was to determine whether the Ballistic Missile Defense Organization complied with legislation and DoD policy covering commercial potential requirements for Phase I of the SBIR program. To answer the DoD Hotline complaint, we determined whether the Ballistic Missile Defense Organization FY 1994 SBIR program Phase I evaluation criteria and other evaluation procedures adequately addressed Phase I evaluation criteria for commercial potential in the DoD FY 1994 SBIR Program Solicitation. We also reviewed the internal controls applicable to the audit objectives.

**Audit Results.** The Ballistic Missile Defense Organization funded SBIR program Phase I projects that did not satisfy the legislative requirement for commercial potential to identify Phase II funding commitments for Phase I proposals. As a result, DoD and the Ballistic Missile Defense Organization may be funding SBIR projects without adequate potential for private-sector commercialization of technology developed through Federal research and development. We did not substantiate the complaint that the Ballistic Missile Defense Organization did not adequately address commercial potential in evaluating proposals for Phase I award. Details of the DoD Hotline complaint are discussed in Other Matters of Interest. Audit results are discussed in Part II.

**Internal Controls.** The Office of Small and Disadvantaged Business Utilization did not have procedures in place to ensure that the DoD SBIR program policy complied with legislative guidance. We conclude the internal control weakness is material. See Part I for the internal controls reviewed and Part II for details on the weakness.

**Potential Benefits of Audit.** Strengthening internal controls for the SBIR program will increase emphasis on commercial potential for SBIR projects and adherence to legislative requirements. However, the benefits cannot be quantified. Appendix D summarizes potential benefits from the audit.

**Summary of Recommendations.** We recommend that the Director, Small and Disadvantaged Business Utilization, either revise the DoD SBIR program Phase I evaluation criteria to address commercial potential, including the requirement for the existence of Phase II funding commitments from private-sector or non-SBIR funding sources, or propose legislative changes to eliminate the requirement. We recommend that the Director, Small and Disadvantaged Business Utilization, obtain all appropriate coordinations, including legal review, of future DoD SBIR program policy to ensure compliance with statutory requirements for the SBIR program. We also recommend that the Director, Ballistic Missile Defense Organization, require the Ballistic Missile Defense Organization SBIR program manager to document Phase I program evaluation criteria used when evaluating SBIR proposals.

**Management Comments.** The Office of Small and Disadvantaged Business Utilization stated that the SBIR legislation included a drafting error and agreed to propose that DoD support a technical correction in the SBIR legislation. The Ballistic Missile Defense Organization agreed to document consideration of commercial potential in review of future SBIR Phase I proposals. See Part II for a summary of the management comments on the recommendations and Part IV for the full text of management comments.

**Audit Response.** The Director, Small and Disadvantaged Business Utilization, did not provide a completion date for the agreement to propose that DoD support a technical correction in the SBIR legislation and did not address internal control procedures to ensure that the SBIR program policy complied with legislative guidance. We request additional comments from the Director, Small and Disadvantaged Business Utilization, by May 22, 1995. The Ballistic Missile Defense Organization comments on the recommendation were fully responsive.

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This report was prepared by the Contract Management Directorate, Office of the Assistant Inspector General for Auditing, Department of Defense.

## **Part I - Introduction**

## Background

**The SBIR Program.** The SBIR program provides funding for the technological innovations of small businesses working on Federal research and development projects. This funding brings cost-effective research and development expertise to Federal agencies and encourages entrepreneurs to find new commercial uses for Federal technology and innovative goods and services that can be sold in domestic and international markets.

The purpose of the program is to develop and stimulate technological innovations that meet the research and development needs of the Federal Government. The goal of the SBIR program is to increase private-sector commercialization and utilization of the inventions developed by Federal research. The SBIR Program is explained more fully in Appendix A. The entire text of the original SBIR Program legislation and amendments are in Appendix B.

**Small Business Administration and DoD SBIR Program Policy.** As mandated, the Small Business Administration developed an SBIR program policy directive that DoD used to establish DoD SBIR program policy. The basic design of the DoD SBIR Program was in accordance with the Small Business Administration SBIR Policy Directive. The DoD FY 1994 SBIR program solicitation 94.2 states, "The guidelines presented in this solicitation incorporate and exploit the flexibility of the Small Business Administration Policy Directive to encourage proposals based on scientific and technical approaches most likely to yield results important to DoD and the private sector." The entire text of the Small Business Administration and DoD evaluation criteria for SBIR are in Appendix C.

**DoD Hotline Complaint.** A small business contractor submitted a DoD Hotline complaint regarding BMDO implementation of the SBIR program. The complaint alleged that BMDO failed to consider one of the four evaluation criteria described in section 4.2 of the FY 1994 DoD SBIR program solicitation 94.1. That criterion is "b. the potential for commercial (Government or private sector) application and the benefits expected to accrue from this commercialization."

The DoD Hotline complaint was not substantiated. Even though BMDO evaluation criteria for FY 1994 SBIR program Phase I proposals did not specifically address the cited evaluation criterion as described in the DoD FY 1994 SBIR program solicitation 94.1, commercial potential was considered in the evaluation and selection process for Phase I awards.

We determined, however, that Small Business Administration and DoD SBIR program policy did not adequately cover legislative requirements defining commercial potential for SBIR program Phase I projects. Results of the audit are in Part II.

## Objectives

We conducted this audit in response to a complaint to the DoD Hotline that the Ballistic Missile Defense Organization (BMDO) did not comply with the Small Business Innovation Research (SBIR) program Phase I selection criteria published in the DoD FY 1994 SBIR program solicitation 94.1.

The primary audit objective was to determine whether BMDO complied with SBIR program Phase I legislation and DoD policy covering commercial potential for SBIR projects. To answer a complaint to the DoD Hotline, we determined whether the BMDO FY 1994 SBIR program Phase I evaluation criteria and evaluation procedures adequately addressed commercial potential criteria in the DoD FY 1994 SBIR program solicitation 94.1. We also reviewed the internal controls applicable to the audit objective.

## Scope and Methodology

**BMDO SBIR Program Phase I Proposals.** BMDO received about 600 SBIR program Phase I proposals in response to the DoD FY 1994 SBIR program solicitation 94.1. Of the 600 SBIR Phase I proposals, BMDO selected 115 for funding, at a cost of about \$7 million. We judgmentally selected 10 of the funded SBIR program Phase I proposals for review.

**SBIR Program Legislation and Policy.** We reviewed the public laws establishing and enhancing the SBIR program and the Small Business Administration, DoD, and BMDO policy or guidance governing the implementation of the SBIR program. We also interviewed Small Business Administration, DoD, and BMDO officials responsible for implementing the SBIR program.

**Audit Period, Standards, and Locations.** This program audit was made from August through November 1994. The audit was made in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. Accordingly, we included tests of internal controls considered necessary. We did not use computer-processed data or statistical sampling procedures to conduct this audit. Organizations visited or contacted are listed in Appendix E.

## Internal Controls

**Internal Controls Reviewed.** We reviewed internal controls at the Office of Small and Disadvantaged Business Utilization to verify that DoD SBIR program policy complied with significant legislated requirements applicable to the SBIR program.

**Adequacy of Internal Controls.** The audit identified a material internal control weakness as defined by DoD Directive 5010.38, "Internal Management Control Program," April 14, 1987. Internal controls for the SBIR program were not adequate to ensure that DoD SBIR program policy complied with significant legislated requirements. Management's self-evaluation of its internal controls did not address appropriate coordinations of SBIR program policy, including legal review, to ensure compliance with legislative requirements. Recommendation 1.c., if implemented, will correct the weakness. The benefits from correcting the internal control weakness are nonmonetary. See Appendix D for the nonmonetary benefits resulting from the audit. A copy of the report will be provided to the senior official responsible for internal controls in the Office of the Under Secretary of Defense for Acquisition and Technology.

## Prior Audits and Other Reviews

General Accounting Office Report No. GAO/RECD-92-37 (OSD Case No. 8853-A), "Small Business Innovation Research Shows Success but Can be Strengthened," March 30, 1992, states that, even though many SBIR projects have not yet had sufficient time to achieve their full commercial potential, the program is showing success in Phase III activity. As of July 1991, the program generated about \$1.1 billion in Phase III sales and additional funding for technical development, two key indicators of the program's commercial trends. In addition, as much as \$3 billion more was expected to be generated by the end of 1993. The majority of this Phase III activity occurred in the private sector, showing a trend toward one of the program's goals: increasing private-sector commercialization.

However, the major Federal SBIR agencies differ in their responses to the goal of private-sector commercialization, as shown by their wide variation in average sales per project. Average sales per project ranged from a low of \$161,000 for the National Aeronautics and Space Administration to a high of \$677,000 for the Department of Health and Human Services. Another difference in the commercialization goal is that the percentage of project sales to the private sector ranged from a low of 40 percent for DoD to a high of 92 percent for the Department of Health and Human Services. The General Accounting Office made no recommendations but states, under Matters for Congressional Consideration:

To further the goal of increasing private-sector commercialization, the Congress may want to consider whether DoD should place greater emphasis on commercialization through such means as identifying and selecting dual-use technologies for SBIR awards.

DoD objected to the comparison of DoD's commercialization results with those of other agencies because of major differences in agency mission that affect commercialization.

## **Part II - Finding and Recommendations**

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## **Commercial Potential Requirements for Phase I of the Small Business Innovation Research Program**

BMDO funded SBIR program Phase I projects that did not satisfy legislative requirements for commercial potential to identify Phase II funding commitments from private-sector or non-SBIR funding sources. This inappropriate funding occurred because the Small Business Administration and DoD did not issue policy for the SBIR program that adequately addressed commercial potential requirements legislated for Phase I of the SBIR program and because no internal controls required coordination to ensure compliance with legislated SBIR requirements. In addition, BMDO did not document that it used the evaluation criteria that DoD established for SBIR program Phase I projects. As a result, DoD and BMDO may be funding SBIR projects that do not meet the primary goal of the SBIR program, which is to fund projects that have adequate potential for private-sector commercialization.

### **Legislative Requirements for Commercial Potential**

We reviewed 10 SBIR program Phase I proposals that BMDO funded. Although most proposals identified some commercial potential, none of the proposals identified Phase II funding commitments from private-sector or non-SBIR funding sources as required by Public Law 102-564. Two of the 10 proposals did identify private-sector companies that expressed interest in the technologies being developed but, again, the proposals did not identify any private-sector or non-SBIR funding commitments.

The table shows whether the SBIR proposals identified potential commercial applications and whether the SBIR proposals identified the existence of Phase II funding commitments from private-sector or non-SBIR funding sources.

## Commercial Potential Requirements for Phase I of the Small Business Innovation Research Program

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<b>Commercial Potential Identified for SBIR Phase I Projects</b>		
<u>SBIR Proposal Reviewed</u>	<u>Potential Commercial Application Identified in Proposal</u>	<u>Existence of Phase II Funding Commitments from Private-Sector or Non-SBIR Funding Sources</u>
1	Yes	No
2	Yes	No
3	Yes	No
4	Yes	No
5	Yes	No
6	No	No
7	Yes	No
8	Yes	No
9	Yes	No
10	Yes	No

### Adherence of Program Policy and Guidance to SBIR Legislation

**Legislation.** Public Law 97-219 established and defined the SBIR program. Public Law 102-564 amends and redefines the SBIR program, placing significantly more emphasis on commercial potential for SBIR projects. The increased emphasis on commercial potential includes a Phase I requirement for the existence of Phase II funding commitments from private-sector or non-SBIR funding sources.

**Small Business Administration and DoD SBIR Program Policy.** Based on the public laws, the Small Business Administration developed an SBIR program policy directive that DoD used to establish DoD SBIR program policy.

Both the Small Business Administration policy and the DoD policy include evaluation criteria for SBIR program Phase I projects. However, the legislation, Small Business Administration evaluation criteria, and DoD evaluation criteria for the SBIR program each place different degrees of emphasis on evaluating commercial potential for SBIR projects.

**Requirements Not in Small Business Administration or DoD SBIR Program Evaluation Criteria.** Neither the Small Business Administration nor the DoD SBIR program Phase I evaluation criteria require the existence of Phase II funding commitments from private-sector or non-SBIR funding sources for SBIR program Phase I projects, as required by public law. As a result, SBIR program administrators and participants may not have implemented the SBIR program as legislated. The DoD SBIR program policy should address the SBIR program Phase I commercial potential requirement defined in Public Law 102-564 that requires the existence of Phase II funding commitments from private-sector or non-SBIR funding sources.

## **Commercial Potential Requirements for Phase I of the Small Business Innovation Research Program**

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**Adequacy of DoD Internal Controls Over SBIR Program Policy.** Because DoD did not have internal controls that require appropriate coordinations, including legal reviews, DoD had no assurance that SBIR policy complied with legislative requirements.

**Documentation of BMDO SBIR Program Evaluation Criteria.** BMDO used the DoD SBIR program Phase I evaluation criteria to establish the BMDO SBIR program Phase I evaluation criteria. However, the BMDO evaluation criteria are more vague than the DoD evaluation criteria and do not directly mention any commercial potential, as required by public law. The program manager for the BMDO SBIR program stated that commercial potential is considered for each proposal considered for Phase I funding award. The evaluators of the proposals discuss commercial potential during the selection process; however, the BMDO SBIR program manager does not document these discussions. As a result, consideration of commercial potential is not available for any review.

**Small Business Administration, DoD, and BMDO Interpretation of the SBIR Program Legislation.** Small Business Administration, DoD, and BMDO representatives for the SBIR program stated the intent of Public Law 102-564 was not to require SBIR program Phase I proposals to identify Phase II funding commitments from private-sector or non-SBIR funding sources. The SBIR program representatives stated the scientific and technical ideas for SBIR program Phase I proposals were so innovative that the requirement for Phase II private-sector or non-SBIR funding commitments was unreasonable and would severely hinder the SBIR program.

SBIR program representatives should propose legislative changes to the SBIR program if they believe the legislation does not intend to require the existence of Phase II funding commitments from private-sector or non-SBIR funding sources to demonstrate commercial potential for SBIR Phase I projects.

## **Meeting the Primary Goal of the SBIR Program**

**Legislative History for SBIR Program.** The SBIR program purpose is to fund innovative proposals that have clear market potential, not to provide hand-outs to small businesses. The SBIR goal is designed to provide small businesses with research and development seed money to encourage additional private investment in the small businesses. The SBIR program legislation facilitates the ability of small businesses to attract venture capital as well as other financial commitments from the private sector.

**SBIR Program Goal for Private-Sector Commercialization.** One purpose of Public Law 102-564 is to "emphasize the program's goal of increasing private-sector commercialization of technology developed through Federal research and development." However, without appropriate guidance from the Small Business Administration, DoD, and BMDO, the SBIR program may not achieve the intended results.

## Recommendations, Management Comments, and Audit Response

1. We recommend that the Director, Small and Disadvantaged Business Utilization, Office of the Under Secretary of Defense for Acquisition and Technology:

a. Revise the DoD Small Business Innovation Research Program Phase I evaluation criteria to more fully address commercial potential, including a requirement for the existence of Phase II funding commitments from private-sector or non-SBIR funding sources, or

b. Propose legislative changes to eliminate the Small Business Innovation Research program Phase I requirement for commercial potential that includes existence of Phase II funding commitments from private-sector or non-SBIR funding sources.

c. Obtain all appropriate coordinations, including legal review, of future DoD Small Business Innovation Research program policy to ensure compliance with legislative requirements for the Small Business Innovation Research program.

**Management Comments.** The Office of Small and Disadvantaged Business Utilization concurred with recommendation 1.b. and stated its office will propose that DoD support a technical correction to the SBIR program legislation that corrects the mistaken paragraph referenced in Section 103(a). For the full text of management comments, see Part IV.

**Audit Response.** The Office of Small and Disadvantaged Business Utilization comments did not provide a completion date for the proposed technical correction to the SBIR program legislation and did not address internal controls to ensure that DoD SBIR program policy complies with legislative requirements for the SBIR program. We request the Office of Small and Disadvantaged Business Utilization comment on the final report.

2. We recommend that the Director, Ballistic Missile Defense Organization, require the Ballistic Missile Defense Organization's Small Business Innovation Research program manager to formally document that the DoD Small Business Innovation Research program evaluation criteria are used to evaluate Small Business Innovation Research proposals.

**Management Comments.** BMDO concurred with the recommendation to document consideration of commercial potential. BMDO implemented the recommendation as of February 13, 1995, by adding a question regarding the existence of commercial potential to the SBIR proposal evaluation. For the full text of management comments, see Part IV.

## **Part III - Additional Information**

## Appendix A. Small Business Innovation Research Program

**Three Phases of the SBIR Program.** Public Law 97-219, "Small Business Innovation Development Act of 1982," July 22, 1982, mandated that the SBIR program be administered in three phases. Phases I and II are intended to determine and develop the scientific and technical merit and feasibility of ideas that appear to have commercial potential. Phase I provides up to 6 months and \$100,000 for the company to explore the viability and feasibility of the proposed idea. Phase II provides up to 2 years and allots \$750,000 to the company to further develop the idea to meet program needs. Completion of the total research and development requirement is not necessary at the end of Phase II and, rather, extends through Phase III. Phase III is a follow-on stage, in which the completion and commercial application of a technology is funded with non-Federal or non-SBIR Federal funds.

The table shows the funding and time period associated with each phase of the SBIR Program according to Public Laws 97-219 and 102-564.

<u>Phase</u>	<u>Threshold</u>	<u>Time Period</u>	<u>Stage</u>	<u>Legislative Requirement</u>
I	\$100,000	6 months	Concept exploration for viability and feasibility	Phase II funding commitment required from private-sector or non-SBIR funding sources.
II	\$750,000	2 years	Prototype and further testing of viability and feasibility	Phase III funding commitment required from private-sector or non-SBIR funding sources.
III	Determined by commitments received	Determined by contracts made	Completion of testing/application and/or manufacturing within public or private sectors	Funding required solely by non-Federal or non-SBIR sources.

The overall SBIR program within the Federal Government provides about \$1 billion annually to small businesses. DoD budgeted \$343 million in FY 1994 for the SBIR program.

**Responsibility for Coordination of the SBIR Program.** The Small Business Administration has responsibility for coordinating the SBIR program within the Federal Government.

**Policies Governing the SBIR Program.** Federal law, the Small Business Administration, and each appropriate DoD organization issue policies governing the SBIR program. The Small Business Administration and DoD policies each reflect the Federal guidance slightly differently. The following discusses the

## Appendix A. Small Business Innovation Research Program

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original and amended legislation, the Small Business Administration policy, the DoD policy, and the BMDO guidance for Phase I of the SBIR program, with emphasis added to the areas that address commercial potential.

**Original SBIR Program Legislation.** Public Law 97-219 established the SBIR program. The legislation states that Phase I awards will be made based, ". . . insofar as possible, on the scientific and technical merit and feasibility of ideas submitted pursuant to SBIR program Solicitations."

**SBIR Program Amendments.** Public Law 102-564, "Small Business Research and Development Enhancement Act of 1992," October 28, 1992, amends and redefines the SBIR program, placing significantly more emphasis on commercial potential for SBIR projects. The increased emphasis on commercial potential includes a requirement that a Phase II funding commitment from private-sector or non-SBIR funding sources has to exist in Phase I. Public Law 102-564 reads:

(4) the term "Small Business Innovation Research Program" or "SBIR" means a program under which a portion of a Federal agency's research or research and development effort is reserved for award to small business concerns through a uniform process having-

(A) a first phase for determining, insofar as possible, the scientific and technical merit and feasibility of ideas *that appear to have commercial potential, as described in subparagraph (B)(ii)* submitted pursuant to SBIR program solicitations;

(B) a second phase, to further develop proposals which meet particular programs needs, in which awards shall be made based on the scientific and technical merit and feasibility of the proposals, as evidenced by the first phase, considering, among other things, the proposal's commercial potential, as evidenced by-

*(ii) the existence of second phase funding commitments from private sector or non-SBIR funding sources.*  
[emphasis added]

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## **Appendix B. Small Business Innovation Research Program Legislation**

### **Public Law 97-219, "Small Business Innovation Development Act of 1982," July 22, 1982**

Public Law 97-219 established and defined the SBIR Program. SBIR is a program under which a portion of a Federal agency's research or research and development funding is reserved for award to small business concerns through a uniform process having:

(A) *a first phase for determining, insofar as possible, the scientific and technical merit and feasibility of ideas submitted pursuant to SBIR program Solicitations; [emphasis added]*

(B) a second phase to further develop the proposed ideas to meet the particular program needs, the awarding of which shall take into consideration the scientific and technical merit and feasibility evidenced by the first phase and, where two or more proposals are evaluated as being of approximately equal scientific and technical merit and feasibility, special consideration shall be given to those proposals that have demonstrated third phase, non-Federal capital commitments; and

(C) where appropriate, a third phase in which non-federal capital pursues commercial applications of the research or research and development and which may involve follow-on non-SBIR funded production contracts with a Federal agency for products or processes intended for use by the United States Government;

### **Public Law 102-564, "Small Business Research and Development Enhancement Act of 1992," October 28, 1992**

Public Law 102-564 amends and redefines the SBIR program. The Public Law reads:

(4) the term "Small Business Innovation Research Program" or "SBIR" means a program under which a portion of a Federal agency's research or research and development effort is reserved for award to small business concerns through a uniform process having-

(A) a first phase for determining, insofar as possible, the scientific and technical merit and feasibility of ideas *that appear to have commercial potential, as described in subparagraph (B)(ii) submitted pursuant to SBIR program solicitations; [emphasis added]*

## Appendix B. Small Business Innovation Research Program Legislation

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(B) a second phase, to further develop proposals which meet particular programs needs, in which awards shall be made based on the scientific and technical merit and feasibility of the proposals, as evidenced by the first phase, considering, among other things, the proposal's commercial potential, as evidenced by-

(i) the small business concern's record of successfully commercializing SBIR or other research;

(ii) *the existence of second phase funding commitments from private sector or non-SBIR funding sources*; [emphasis added]

(iii) the existence of third phase, follow-on commitments for the subject of the research; and

(iv) the presence of other indicators of commercial potential of the idea; and

(C) where appropriate, a third phase-

(i) in which commercial applications of SBIR-funded research or research and development are funded by non-Federal sources of capital or, for products or services intended for use by the Federal Government, by follow-on non-SBIR Federal funding awards; and

(ii) for which awards from non-SBIR Federal funding sources are used for the continuation of research or research and development that has been competitively selected using peer review or scientific review criteria.

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## Appendix C. Small Business Administration and DoD Small Business Innovation Research Program Policies

**Policy Directives.** The Small Business Administration "SBIR Program Policy Directive," January 26, 1993, revises the existing policy to reflect new statutory requirements and comments received from members of Congress, the public, participating agencies, associations, and small business concerns. The directive provides guidance to participating Federal agencies for the general conduct of their SBIR programs. Section IV, "Method of Selection and Evaluation Criteria," paragraph (B), "Evaluation Criteria," of the directive provides that each agency in its evaluation process shall develop a standardized method that will consider, among other things, the ". . . commercial benefits that may be derived from the research."

**DoD Policy.** In addressing commercial potential, the DoD "SBIR Program Policy Letter," April 1, 1994, and the FY 1994 DoD SBIR program solicitation 94.1, section 4.2, "Evaluation Criteria - Phase I," requires the evaluator to consider "the potential for commercial (Government or private sector) application and benefits expected to accrue from this commercialization" when selecting proposals for award.

**BMDO Guidance.** BMDO established its own evaluation criteria for FY 1994 SBIR program Phase I proposals. The evaluation criteria are:

- How good is the science or engineering?
- How is the Innovation exciting?
- Are the PI [principal investigators] and firm qualified?
- How will BMDO benefit after Phase 2?
- How will Phase 1 get BMDO to a Phase 2 decision?

**Small Business Administration Policy.** Section IV, "Method of Selection and Evaluation Criteria," paragraph (B) "Evaluation Criteria," of the Small Business Administration "SBIR Program Policy Directive," January 26, 1993, provides that each agency, in its evaluation process, shall develop a standardized method that will consider, as a minimum, the following factors for Phase I:

- a. The technical approach and the anticipated agency and *commercial benefits that may be derived from the research.* [emphasis added]
- b. The adequacy of the proposed effort and its relationship to the fulfillment of requirements of the research topic or subtopics.
- c. The soundness and technical merit of the proposed approach and its incremental progress toward topic or subtopic solution.

## Appendix C. Small Business Administration and DoD Small Business Innovation Research Program

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d. Qualifications of the proposed principal/key investigators supporting staff and consultants.

**DoD Policy.** DoD "SBIR Program Policy Letter," April 1, 1994, and the FY 1994 DoD SBIR program solicitation section 4.2, "Evaluation Criteria - Phase I," state that the following factors should be considered when selecting SBIR proposals.

a) The soundness and technical merit of the proposed approach and its incremental progress toward topic or subtopic solution.

b) *The potential for commercial (Government or private sector) application and the benefits expected to accrue from this commercialization.* [emphasis added]

c) The adequacy of proposed effort for fulfillment of requirements of the research topic.

d) The qualification of proposed principal/key investigators supporting staff and consultants. Qualification include not only the ability to perform the research and development but also the ability to commercialize the results.

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## Appendix D. Summary of Potential Benefits Resulting From Audit

Recommendation Reference	Description of Benefit	Type of Benefit
1.a.	Compliance with Regulations or Laws. Requires DoD to increase emphasis on commercial potential for SBIR program Phase I projects as required by Public Law 102-564.	Nonmonetary.
1.b.	Compliance with Regulations or Laws. Proposes legislative changes to the SBIR program if compliance with Recommendation 1.a. is not possible.	Nonmonetary.
1.c.	Internal Controls. Requires coordination, including legal review, of future DoD SBIR program policy to ensure compliance with SBIR program legislation.	Nonmonetary.
2.	Compliance with Regulations or Laws. Requires the BMDO SBIR program manager to document that DoD SBIR program evaluation criteria are used.	Nonmonetary.

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## **Appendix E. Organizations Visited or Contacted**

### **Office of the Secretary of Defense**

Office of Small and Disadvantaged Business Utilization, Washington, DC

### **Defense Organization**

Ballistic Missile Defense Organization, Washington, DC

### **Non-Defense Federal Organization**

Small Business Administration, Washington, DC

### **Non-Government Organization**

The Analytix Group, Houston, TX

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## **Appendix F. Report Distribution**

### **Office of the Secretary of Defense**

Under Secretary of Defense for Acquisition and Technology  
Deputy Under Secretary of Defense (Acquisition Reform)  
Assistant to the Secretary of Defense (Public Affairs)  
Director, Small and Disadvantaged Business Utilization

### **Defense Organizations**

Director, Ballistic Missile Defense Organization  
Director, Defense Contract Audit Agency  
Director, Defense Logistics Agency  
Director, National Security Agency  
Inspector General, Central Imagery Office  
Inspector General, National Security Agency  
Director, Defense Logistics Studies Information Exchange

### **Non-Defense Federal Organizations**

Office of Management and Budget  
Small Business Administration  
Technical Information Center, National Security and International Affairs Division,  
General Accounting Office  
Chairman and Ranking Minority Member of each of the following Congressional  
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Senate Subcommittee on Defense, Committee on Appropriations  
Senate Committee on Armed Services  
Senate Committee on Governmental Affairs  
House Committee on Appropriations  
House Subcommittee on National Security, Committee on Appropriations  
House Committee on Government Reform and Oversight  
House Subcommittee on National Security, International Affairs, and Criminal  
Justice, Committee on Government Reform and Oversight  
House Committee on National Security

## **Part IV - Management Comments**

# Office of Small and Disadvantaged Business Utilization Comments



## OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON DC 20301-3000

19 FEB 1995



MEMORANDUM FOR DIRECTOR, CONTRACT MANAGEMENT DIRECTORATE,  
OFFICE OF THE INSPECTOR GENERAL

SUBJECT: Response to Audit Report on the Small Business  
Innovation Research (SBIR) Program

Thank you for asking our office to comment on your recent report on the SBIR program. The report has highlighted a technical correction that is needed in the SBIR legislation.

The report cites a provision in Section 103(a) of the 1992 SBIR legislation (Public Law 102-564) as directing the SBIR program to require, in phase I SBIR proposals, a phase II funding commitment from private-sector or non-SBIR funding sources. We were surprised to learn, through your report, of the existence of this provision, given that it had never been discussed during Congressional deliberations on the legislation or during implementation of the legislation by the Small Business Administration and the ten federal agencies other than DoD which participate in the SBIR program. We also discussed the provision with the lead staffer on the 1992 SBIR legislation for the House Committee on Small Business, who now works here in the Office of the Secretary of Defense. He expressed as much surprise at the provision's existence as we did.

It turns out that the provision can be traced to a relatively simple error in the drafting of Section 103(a) of the legislation, involving a mistaken paragraph reference, as follows:

(1) As shown at Tab A, the House-passed version of the SBIR legislation, H.R. 4400, provided that phase I SBIR projects are to "determine, insofar as possible, the scientific and technical merit and feasibility of ideas that appear to have commercial potential (as described in subparagraph (C)) . . . ." Subparagraph C refers generally to phase III, in which private sector or non-SBIR federal funds develop the SBIR research into an actual product for sale on commercial and/or government markets. No mention is made of requiring phase II funding commitments in phase I proposals.

(2) The Senate, in drafting its version of the SBIR legislation, S. 2941, worked off the House-passed bill, in many cases making minor clarifying revisions. One such revision was to shift the paragraph reference in the phase I language, as follows: phase I SBIR



projects are to "determine, insofar as possible, the scientific and technical merit and feasibility of ideas that appear to have commercial potential, as described in subparagraph (B)(ii)." [our emphasis] As shown at Tab A, subparagraph (B)(ii) in the House bill described the four "factors relating to commercial potential of the idea" which should be "taken into consideration" in making phase II awards.

(3) Unfortunately, as seen at Tab B, the Senate also renumbered the paragraphs in this section, so that B(ii) in the Senate bill (which ultimately was enacted) now mistakenly refers only to the second of the four factors relating to commercial potential -- namely, "the existence of second phase funding commitments from private sector or non-SBIR funding sources."

That this is a drafting error, as described, is made clear in the report language and floor statements on H.R. 4400 and S. 2941, shown at Tab C. Nowhere in this language is it contemplated that phase I proposals would be required to contain phase II funding commitments. Rather, this language indicates that Section 103(a) was, more generally, intended to make commercial potential a factor in the phase I evaluation process, and that phase II funding commitments are just one type of evidence of commercial potential that SBIR evaluators may look to:

(Senate Section-By-Section Analysis of S. 2941:)  
"Subsection (a) -- This subsection adds 'commercial potential' as a consideration in the proposal process. SBIR evaluators may look to the following as evidence of commercial potential:

- (1) the small business' record of successfully commercializing SBIR or other research;
- (2) the existence of Phase II funding commitments from private sector or non-SBIR Federal funding sources;
- (3) the existence of Phase III follow-on commitments, which may be funding commitments or other types of substantial commitments, i.e., production agreements; and
- (4) such other indicators of commercial potential as may be appropriate."

(The Senate language makes no distinction between the phase I and phase II evaluation process.)

## Office of Small and Disadvantage Business Utilization Comments

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(House report language on H.R. 4400:) "Section 4(a) would require that phase I proposals meet a minimum standard of appearance of commercial potential before they are evaluated on the basis of scientific and technical merit. Current law, by contrast, does not require the agencies to consider commercial potential in evaluating phase I proposals."

As noted in your report, DoD has undertaken a number of measures to ensure that commercial potential is given serious consideration in the phase I and phase II proposal evaluation process. In addition, a DoD process action team on the SBIR program is currently developing a set of policy recommendations designed to, among other things, "increase the commercialization of SBIR research in both private sector and military markets."

On the basis of your report, our office will propose that DoD support a technical correction in the SBIR legislation, to change the mistaken paragraph reference in Section 103(a). Again, I appreciate the opportunity to comment on the draft report, and I look forward to the final product.



DANIEL R. GILL  
Director, Office of Small and  
Disadvantaged Business Utilization

Attachment

## EXCERPT FROM H.R. 4400, AS PASSED BY THE HOUSE OF REPRESENTATIVES

August 11, 1992

CONGRESSIONAL RECORD—HOUSE

H 7955

(3) to increase the opportunity for participation in Federal research and development by small businesses.

## SEC. 3. EXTENSION OF SMALL BUSINESS INNOVATION RESEARCH PROGRAM.

Section 5 of the Small Business Innovation Development Act of 1982 (15 U.S.C. 632 note) is amended by striking "1983" and inserting "2000".

## SEC. 4. AMENDMENTS TO SMALL BUSINESS INNOVATION RESEARCH PROGRAM.

(a) DEFINITION OF SBIR.—Subsection (e)(4) of section 9 of the Small Business Act (15 U.S.C. 632) is amended—

(1) in subparagraph (A), by inserting "that appear to have commercial potential (as described in subparagraph (C) and that are" after "ideas"; and

(2) by striking subparagraphs (B) and (C) and inserting the following:

"(B) a second phase, to further develop proposed ideas which meet particular program needs, in which awards shall be made—

"(i) based on the scientific and technical merit and feasibility of the idea as evidenced by the first phase; and

"(ii) taking into consideration factors relating to the commercial potential of the idea, including—

"(I) whether or not the idea is proposed by a small business concern that has been as successful as comparable awardees in the commercial application of SBIR research;

"(II) whether or not there are commitments for contributions to second phase funding of the idea;

"(III) whether or not there are third phase, follow-on commitments for the idea; and

"(IV) whether or not the idea has other qualities indicating commercial potential that will be difficult to achieve without SBIR assistance or similar assistance; and

"(C) where appropriate, a third phase in which non-Federal capital pursues commercial applications of the research or research and development and which may also involve follow-on, non-SBIR funded awards with a Federal agency for products or processes intended for use by the United States Government and which is a continuation of research or research and development that has been competitively selected using peer review or scientific review criteria established pursuant to subparagraphs (A) and (B)."

(b) REPEAL OF EXCLUSION OF CERTAIN ACTIVITIES.—

(1) DOD OPERATIONAL SYSTEMS DEVELOPMENT.—Subsection (e)(1) of such section is amended by striking "except that for the Department of Defense" and all that follows through "development, and".

(2) DOE DEFENSE-RELATED R&D ACTIVITIES.—

(A) Subsection (e)(1) of such section is further amended by striking the semicolon at the end and inserting ", and except that for the Department of Energy it shall not include amounts obligated for atomic energy defense programs solely for weapons activities or for naval reactor programs;"

(B) Subsection (f) of such section is amended by striking paragraph (2).

(c) REQUIRED EXPENDITURES FOR SBIR BY FEDERAL AGENCIES.—

(1) Subsection (f) of such section, as amended by subsection (b)(2), is amended to read as follows:

"(f)(1) Each Federal agency which for any fiscal year has an extramural budget for research, or for research and development, in excess of \$100,000,000 shall expend for that fiscal year and each fiscal year thereafter not less than the percentage of that extramural budget for that year specified in paragraph (2) with small business concerns specifically in connection with a small business innovation research program that meets the re-

quirements of this section and regulations issued under this section.

"(2)(A) The percentage under paragraph (1) for any fiscal year for each Federal agency is determined in accordance with the following table:

For fiscal year:	The percentage is:
1983	1.5%
1984	1.5%
1985	1.7%
1986	1.7%
1987	2.0%
1988 and thereafter	2.0%

"(B) If the determination of the head of a Federal agency under subparagraph (C) is a negative determination (as set forth in that subparagraph), then the percentage under paragraph (1) for that Federal agency for fiscal years after fiscal year 1986 shall remain at the level applicable for fiscal year 1986 (notwithstanding the percentages specified in subparagraph (A) for fiscal years after fiscal year 1986).

"(C) Not later than June 30, 1986, the head of each Federal agency that is covered by paragraph (1) during fiscal year 1986 shall determine whether there has been a demonstrable reduction in the quality of research performed under funding agreements awarded by that agency under the SBIR program since the beginning of fiscal year 1983 such that increasing the percentage under subparagraph (A) for fiscal years after fiscal year 1986 with respect to that agency would adversely affect the performance of the agency's research programs. If the determination of the head of the agency is that there has been such a demonstrable reduction in the quality of research such that increasing the percentage under subparagraph (B) for fiscal years after fiscal year 1986 with respect to that agency would adversely affect the performance of the agency's research programs, the head of the agency shall be considered for purposes of subparagraph (B) to have made a negative determination. The determination of the head of an agency under this subparagraph shall be made after considering the assessment of the Comptroller General with respect to that agency in the report transmitted under subparagraph (D).

"(D) Not later than March 31, 1986, the Comptroller General shall transmit to the Congress and the head of each agency that is covered by paragraph (1) during fiscal year 1986 a report setting forth the Comptroller General's assessment, with respect to each such agency, of whether there has been a demonstrable reduction in the quality of research performed under funding agreements awarded by that agency under the SBIR program since the beginning of fiscal year 1983 such that increasing the percentage under subparagraph (A) for fiscal years after fiscal year 1986 with respect to that agency would adversely affect the performance of the agency's research programs.

"(E) The results of each determination under subparagraph (C) shall be transmitted to the Congress not later than June 30, 1986.

"(3) A Federal agency may not make available for the purpose of meeting the requirements of paragraph (1) an amount of its extramural budget for any fiscal year for basic research that exceeds the percentage specified in paragraph (1) applicable to that fiscal year.

"(4) A funding agreement with a small business concern for research, or for research and development, that results from competitive or single source selection other than a small business innovation research program shall not be counted as meeting any portion of the percentage requirements of paragraph (1) for any fiscal year."

(2) The amendment made by paragraph (1) shall take effect on October 1, 1982.

(4) SBIR SOLICITATIONS.—Section 9(g) of such Act (15 U.S.C. 632(g)) is amended—

(1) by inserting after paragraph (2) the following new paragraph:

"(3) unilaterally determine research topics within the agency's SBIR solicitations, giving special consideration to topics which permit substantial applicant participation in the formulation of the research project consistent with the agency's mission;" and

(2) by redesignating paragraphs (3), (4), (5), (6), and (7) as paragraphs (4), (5), (6), (7), and (8), respectively.

(c) DEADLINE FOR FINAL PAYMENT UNDER SBIR AGREEMENTS.—Paragraph (7) of section 9(g) of such Act (as redesignated by subsection (d)(2)) is amended by inserting before the semicolon the following: "and, in all cases, make payment to recipients under such agreements in full subject to audit on or before the last day of the 13-month period beginning on the date of completion of such requirements".

(f) MODIFICATIONS TO SBIR POLICY DIRECTIVES.—

(1) IN GENERAL.—Section 9(i) of such Act is amended—

(A) in the matter preceding paragraph (1)—

(i) by striking ", within one hundred and twenty days" and all that follows through "of 1982."; and

(ii) by striking "providing for—" and inserting "providing for the following:"

(B) by capitalizing the first letter of the first word of each of paragraphs (1) through (7);

(C) by striking the semicolon at the end of each of paragraphs (1) through (5) and inserting a period;

(D) by striking "and" at the end of paragraph (6) and inserting a period; and

(E) by adding at the end the following new paragraphs:

"(8) Retention by a small business concern of the rights to data generated by the concern in the performance of an SBIR award for a period of at least four years.

"(9) Continued use by a small business concern as a directed bailment for a period of not less than two years beginning on the date of participation in phase III of a small business innovation research program of any property transferred by a Federal agency to the small business concern in phase II of the program.

"(10) Procedures to ensure that, to the extent practicable, an agency which intends to pursue research, development, or production of a technology developed by a small business concern under a small business innovation research program enter into follow-on, non-SBIR funded contracts with the small business concern for such research, development, or production.

"(11) A level of \$75,000 for the amount of funds which an agency may award in the first phase of a small business innovation research program, such amount to be adjusted by the Administration on October 1, 1997, and each five years thereafter to reflect economic adjustments and programmatic considerations.

"(12) Procedures to ensure that a small business concern that submits a proposal for a phase II SBIR funding agreement and that has received more than 20 phase I SBIR awards during the preceding five fiscal years is required to document in its proposal the extent to which it has been able to commercialize previous SBIR research."

(3) EFFECTIVE DATE.—The policy directives required by paragraphs (8), (9), (10), (11), and (12) of section 9(i) of the Small Business Act, as added by paragraph (1), shall be issued not later than 90 days after the date of the enactment of this Act.

(g) ELIMINATION OF OFFICE OF SCIENCE AND TECHNOLOGY POLICY REPORTING REQUIREMENT.—Section 9 of such Act (15 U.S.C. 632) is amended by striking subsection (k).

## EXCERPT FROM SECTION-BY-SECTION ANALYSIS OF S. 2941, UPON FINAL SENATE PASSAGE

S16514

CONGRESSIONAL RECORD—SENATE

October 3, 1992

eral research and development funds to commercialize Federal and other technology.

STTR is closely patterned after the SBIR Program in terms of its funding source and its competitive process. Five agencies—the Departments of Defense, Energy, Health and Human Services, and the National Aeronautics and Space Administration and the National Science Foundation—may allocate a small percentage of their extramural research or research and development funds to STTR awards. The percentage increases as follows: 0.05 percent in 1994, 0.1 percent in 1995, and 0.15 percent in 1996. This equates to approximately \$25 million the first year, over \$50 million the second year, and over \$75 million in the third year, depending on those agencies' future appropriations.

The STTR Program is authorized for only 3 years. The General Accounting Office will conduct a review of its success in its final year. At that point, it will be up to Congress to decide whether to continue the program. The STTR program is designed as a pilot program because concerns have been raised about the ability of small businesses and large nonprofit institutions to work together effectively and equitably to commercialize. Various safeguards have been included to ensure that STTR funds are used in the manner for which they are intended.

Mr. President, the cold war is over, but the struggle for global economic security continues. We need the SBIR program and others like it to ensure that we are able to compete in an increasingly complex, technology-driven world. Our major competitors have no qualms about their governments providing means to encourage innovation at small or large businesses. The SBIR Program is a tool that our country must have to out-commercialize our competitors and give our small businesses a chance to compete in the big leagues.

Finally, as I stated earlier, this substitute amendment is the product of much compromise and negotiation. It reflects the work of the Small Business Committees and Senate Armed Services Committees on both sides, and the House Science and Technology Committee. I would particularly like to recognize Congressman LEX SKELTON's efforts at shepherding the bill through the House. Also, Patty Forbes of the Senate Small Business Committee staff has been of great assistance in preparing this amendment.

Mr. President, I urge passage of the amendment in the nature of a substitute and the bill, S. 2941, the Small Business Innovation Research Program Reauthorization of 1992.

I ask unanimous consent that a section-by-section analysis be printed in the RECORD.

There being no objection, the material was ordered to be printed in the RECORD, as follows:

## SECTION-BY-SECTION ANALYSIS OF SUBSTITUTE AMEND. TO S. 2941

## TITLE I

## Section 101.—Title

The Small Business Innovation Research Program Reauthorization Act of 1992.

## Section 102.—Findings and Purposes

Congress finds that the Small Business Innovation Research program (SBIR) has been a successful method of involving small businesses in furthering Federal research and development, encouraging technological innovation and stimulating commercialization of Federal technologies. The program has improved the nation's competitiveness and increased U.S. exports from small businesses. However, small business' share of Federal research and development funds has not significantly changed over the life of the program. Additional outreach efforts are necessary to meet the goal of the original enabling legislation to encourage socially and economically disadvantaged firms' participation in SBIR. Congress believes the SBIR program should be expanded and improved.

## Section 103.—Amendments to the SBIR program

This section makes several changes to the Small Business Innovation Research (SBIR) program as authorized by Section 9 of the Small Business Act, which are intended to: encourage Federal agencies to provide greater attention to commercialization; increase the total extramural research and development (R & D) funds allocated for SBIR and the size of individual awards made to small business; and, improve the administrative processes by which small businesses receive awards and ensure that they retain appropriate intellectual property rights and appropriate rights to perform follow-on funding agreements relating to research they developed under SBIR Phases I and II.

Subsection (a)—This subsection adds "commercial potential" as a consideration in the proposal process. SBIR evaluators may look to the following as evidence of commercial potential:

- (1) the small business' record of successfully commercializing SBIR or other research;
- (2) the existence of Phase II funding commitments from private sector or non-SBIR Federal funding sources;
- (3) the existence of Phase III follow-on commitments, which may be funding commitments or other types of substantial commitments, i.e., production agreements; and,
- (4) such other indicators of commercial potential as may be appropriate.

Though some agencies intentionally direct their programs toward proposals with greater commercial potential, insufficient attention has been paid to this aspect of the SBIR program. Federal extramural R & D funds are best spent on awards which can further individual agencies' missions and the country's economic security. Specifically, the Department of Defense could enhance its program significantly through greater attention to prospects for commercialization. Through SBIR, the Department should, to the maximum extent practicable, provide emphasis on converting the capabilities of businesses that are economically dependent on Department of Defense business to capabilities having both defense and non-defense commercial applications.

Subsection (b)—This subsection increases the percentage of Federal extramural R & D funds allocated for SBIR awards by agencies with extramural R & D budgets of more than \$100 million. The percentage will increase from 1.25% to 1.5% for fiscal years 1993 and 1994, to 2% for fiscal years 1995 and 1996, and to 2.5% in fiscal years thereafter. This subsection also prohibits the use of SBIR fund-

ing for the purpose of funding administrative costs of the program, including costs associated with salaries and expenses.

Subsection (c)—This subsection includes, in the total funds dedicated by the Department of Defense to SBIR awards, certain Department activities related to operational systems development and atomic energy research, excluding the Department of Energy's nuclear weapons and naval reactors programs. This is not intended to exclude the nuclear weapons complex remediation activity budget from the total funding available to the SBIR program.

Subsection (d)—This subsection requires agencies to give special consideration to the critical technologies lists prepared by the Secretary of Defense and the Director of the Office of Science and Technology Policy when preparing general research topics lists. These lists identify technologies which are important to the Nation's national and economic security. This section is not intended to require that agencies show a preference in making awards to proposals for R & D in critical technologies areas. However, according to the Small Business Administration, nearly 80% of all awards are now made in critical technologies areas. When practicable, agencies are encouraged to maintain this level and to work to achieve a goal of 90%. Agencies are also encouraged to develop broad research topics to ensure that proposals are not limited by narrow solicitations.

Subsection (e)—This subsection requires agencies to make award payments to recipients within 12 months of the award and completion of all pertinent requirements. Payments are subject to later audit by the agencies should unallowable costs be identified subsequent to payment. Many awardees have experienced unacceptable delays in receiving full payment from Federal agencies. Many awardees have also experienced delays in receiving the results of technical evaluations. To improve efficiency and enhance the quality of future proposals, the participating agencies are encouraged to respond to requests for technical evaluations in a timely and appropriate manner.

Subsection (f)—This section requires the Small Business Administration to make several modifications to its SBIR program policy directive to provide for:

- (A) retention of small business' rights to SBIR project-related data for four years;
- (B) continued use of transferred Federal property by small businesses for two years as part of a Phase III SBIR project;

These provisions—A & B—address concerns raised about fair and appropriate treatment of small business intellectual property rights. They do not prohibit the Federal Government from offering to purchase or otherwise negotiating and making an agreement with an SBIR awardee regarding the rights to data in less than four years.

(C) procedures to ensure that, to the extent practicable, an agency enters into follow-on, non-SBIR funding agreements with an SBIR awardee, if the agency intends to pursue the further development of technology which was the subject of that awardee's first and second phase research or research and development;

This change should help encourage SBIR agencies planning to work on a company's SBIR-developed technology after SBIR funding ends to enter into Phase III or non-SBIR funding agreements with the SBIR company. This change is intended to protect small businesses from agencies which attempt to take over a small business' research effort without adequate compensation. The General Accounting Office has recommended that descriptive procedures be developed to guide agencies wishing to conduct follow-on

EXCERPT FROM S. 2941, AS PASSED BY THE SENATE ON OCTOBER 3, 1992

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "Small Business Research and Development Enhancement Act of 1992".

(b) TABLE OF CONTENTS.—The table of contents for this Act is as follows:

Sec. 1. Short title; table of contents.  
**TITLE I—SMALL BUSINESS INNOVATION RESEARCH PROGRAM**

Sec. 101. Short title.  
 Sec. 102. Findings and purposes.  
 Sec. 103. Amendments to small business innovation research program.  
 Sec. 104. Extension of SBIR program.  
 Sec. 105. Reports of the Comptroller General.  
 Sec. 106. Recommendations of the Secretary of Defense.

**TITLE II—SMALL BUSINESS TECHNOLOGY TRANSFER PILOT PROGRAM**

Sec. 201. Short title.  
 Sec. 202. Establishment of small business technology transfer pilot program.

**TITLE III—MISCELLANEOUS PROVISIONS**

Sec. 301. Discretionary technical assistance to SBIR awardees.  
 Sec. 302. Extension of the technology transfer demonstration program.  
 Sec. 303. Reporting requirements.  
 Sec. 304. Small Business Institutes.  
 Sec. 305. Additional SBIR and STTR provisions.  
 Sec. 306. Sense of the Congress concerning American-made equipment and products.  
 Sec. 307. Technical corrections.

**TITLE I—SMALL BUSINESS INNOVATION RESEARCH PROGRAM**

SEC. 101. SHORT TITLE.

This title may be cited as the "Small Business Innovation Research Program Reauthorization Act of 1992".

SEC. 102. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress finds that—

- (1) the small business innovation research program established under the Small Business Innovation Development Act of 1982, (hereafter in this Act referred to as the "SBIR" program) has been a successful method of involving small business concerns in Federal research and development;
- (2) the small business innovation research program has been an effective catalyst for the development of technological innovations by small business concerns;
- (3) small business innovation research program participants have provided high quality research and development in a cost-effective manner;
- (4) the innovative products and services developed by small business concerns participating in the small business innovation research program have been important to the national defense, as well as to the missions of the other participating Federal agencies;
- (5) the small business innovation research program has effectively stimulated the commercialization of technology developed through Federal research and development, benefiting both the public and private sectors of the Nation;
- (6) by encouraging the development and commercialization of technological innovations, the small business innovation research program has created jobs, expanded business opportunities for small firms, stimulated the development of new products and services, and improved the competitiveness of the Nation's high technology industries;
- (7) the small business innovation research program has also helped to increase exports from small business concerns;
- (8) despite the general success of the small business innovation research program, the

proportion of Federal research and development funds received by small business concerns has not increased over the life of the program, but has remained at 3 percent; and

(B) although the participating Federal agencies have successfully implemented most aspects of the small business innovation research program, additional outreach efforts are necessary to stimulate increased participation of socially and economically disadvantaged small business concerns.

(b) PURPOSES.—The purposes of this title are—

- (1) to expand and improve the small business innovation research program;
- (2) to emphasize the program's goal of increasing private sector commercialization of technology developed through Federal research and development;
- (3) to increase small business participation in Federal research and development; and
- (4) to improve the Federal Government's dissemination of information concerning the small business innovation research program, particularly with regard to program participation by women-owned small business concerns and by socially and economically disadvantaged small business concerns.

SEC. 103. AMENDMENTS TO SMALL BUSINESS INNOVATION RESEARCH PROGRAM.

(a) DEFINITION OF THE SMALL BUSINESS INNOVATION RESEARCH PROGRAM.—Section 5(e)(4) of the Small Business Act (15 U.S.C. 636(e)(4)) is amended—

- (1) in subparagraph (A), by inserting "that appear to have commercial potential, as described in subparagraph (B)(ii)," after "ideas"; and
- (2) by striking subparagraphs (B) and (C) and inserting the following:

"(B) a second phase, to further develop proposals which meet particular program needs, in which awards shall be made based on the scientific and technical merit and feasibility of the proposals, as evidenced by the first phase, considering, among other things, the proposal's commercial potential, as evidenced by—

"(i) the small business concern's record of successfully commercializing SBIR or other research;

"(ii) the existence of second phase funding commitments from private sector or non-SBIR funding sources;

"(iii) the existence of third phase, follow-on commitments for the subject of the research; and

"(iv) the presence of other indicators of the commercial potential of the idea; and

"(C) where appropriate, a third phase—

"(i) in which commercial applications of SBIR-funded research or research and development are funded by non-Federal sources of capital or, for products or services intended for use by the Federal Government, by follow-on non-SBIR Federal funding awards; and

"(ii) for which awards from non-SBIR Federal funding sources are used for the continuation of research or research and development that has been competitively selected using peer review or scientific review criteria; and"

(b) REQUIRED EXPENDITURES FOR SBIR BY FEDERAL AGENCIES.—Section 5(f) of the Small Business Act (15 U.S.C. 636(f)) is amended to read as follows:

"(f) FEDERAL AGENCY EXPENDITURES FOR THE SBIR PROGRAM.—

"(1) REQUIRED EXPENDITURE AMOUNTS.—Each Federal agency which has an extramural budget for research or research and development in excess of \$100,000,000 for fiscal year 1992, or any fiscal year thereafter, shall expend with small business concerns—

"(A) not less than 1.5 percent of such budget in each of fiscal years 1993 and 1994;

"(B) not less than 2.5 percent of such budget in each of fiscal years 1996 and 1997; and

"(C) not less than 2.5 percent of such budget in each fiscal year thereafter, specifically in connection with SBIR programs which meet the requirements of this section, policy directives, and regulations issued under this section.

"(2) LIMITATIONS.—A Federal agency shall not—

- (A) use any of its SBIR budget established pursuant to paragraph (1) for the purpose of funding administrative costs of the program, including costs associated with salaries and expenses; or
- (B) make available for the purpose of meeting the requirements of paragraph (1) an amount of its extramural budget for basic research which exceeds the percentages specified in paragraph (1).

"(3) EXCLUSION OF CERTAIN FUNDING AGREEMENTS.—Funding agreements with small business concerns for research or research and development which result from competitive or single source selections other than an SBIR program shall not be considered to meet any portion of the percentage requirements of paragraph (1)."

(c) INCLUSION OF CERTAIN DEPARTMENT OF DEFENSE RESEARCH AND DEVELOPMENT ACTIVITIES.—Section 5(e) of the Small Business Act (15 U.S.C. 636(e)) is amended in paragraph (1), by striking "for the Department of Defense" and all that follows through "development" and inserting "for the Department of Energy it shall not include amounts obligated for atomic energy defense programs solely for weapons activities or for naval reactor programs".

(d) SBIR SOLICITATIONS.—Section 5(g) of the Small Business Act (15 U.S.C. 636(g)) is amended—

- (1) by redesignating paragraphs (3) through (7) as paragraphs (4) through (8), respectively; and
- (2) by inserting after paragraph (2) the following new paragraph:

"(3) unilaterally determine research topics within the agency's SBIR solicitations, giving special consideration to broad research topics and to topics that further 1 or more critical technologies, as identified by—

"(A) the National Critical Technologies Panel (or its successor) in the 1991 report required under section 603 of the National Science and Technology Policy, Organization, and Priorities Act of 1978, and in subsequent reports issued under that authority; or

"(B) the Secretary of Defense, in the 1992 report issued in accordance with section 2522 of title 10, United States Code, and in subsequent reports issued under that authority."

(e) DEADLINE FOR FINAL PAYMENT UNDER SBIR FUNDING AGREEMENTS.—Section 5(g)(7) of the Small Business Act (15 U.S.C. 636(g)(7)) (as redesignated by subsection (d)(2)) is amended by inserting before the semicolon the following: "and, in all cases, make payment to recipients under such agreements in full, subject to audit, on or before the last day of the 12-month period beginning on the date of completion of such requirements".

(f) MODIFICATIONS TO SBIR POLICY DIRECTIVES.—Section 5(j) of the Small Business Act (15 U.S.C. 636(j)) is amended—

- (1) in paragraph (2), by redesignating subparagraphs (A) through (H) as classes (I) through (viii), respectively;
- (2) by redesignating paragraphs (1) through (7) as subparagraphs (A) through (G), respectively;
- (3) by inserting before "The Small Business Administration" the following: "Policy Directives.—"; and
- (4) by adding at the end the following new paragraph:

"(7) MODIFICATIONS.—Not later than 90 days after the date of enactment of the

"(B) not less than 2.5 percent of such budget in each of fiscal years 1996 and 1997; and

"(C) not less than 2.5 percent of such budget in each fiscal year thereafter, specifically in connection with SBIR programs which meet the requirements of this section, policy directives, and regulations issued under this section.

"(2) LIMITATIONS.—A Federal agency shall not—

- (A) use any of its SBIR budget established pursuant to paragraph (1) for the purpose of funding administrative costs of the program, including costs associated with salaries and expenses; or
- (B) make available for the purpose of meeting the requirements of paragraph (1) an amount of its extramural budget for basic research which exceeds the percentages specified in paragraph (1).

"(3) EXCLUSION OF CERTAIN FUNDING AGREEMENTS.—Funding agreements with small business concerns for research or research and development which result from competitive or single source selections other than an SBIR program shall not be considered to meet any portion of the percentage requirements of paragraph (1)."

(c) INCLUSION OF CERTAIN DEPARTMENT OF DEFENSE RESEARCH AND DEVELOPMENT ACTIVITIES.—Section 5(e) of the Small Business Act (15 U.S.C. 636(e)) is amended in paragraph (1), by striking "for the Department of Defense" and all that follows through "development" and inserting "for the Department of Energy it shall not include amounts obligated for atomic energy defense programs solely for weapons activities or for naval reactor programs".

(d) SBIR SOLICITATIONS.—Section 5(g) of the Small Business Act (15 U.S.C. 636(g)) is amended—

- (1) by redesignating paragraphs (3) through (7) as paragraphs (4) through (8), respectively; and
- (2) by inserting after paragraph (2) the following new paragraph:

"(3) unilaterally determine research topics within the agency's SBIR solicitations, giving special consideration to broad research topics and to topics that further 1 or more critical technologies, as identified by—

"(A) the National Critical Technologies Panel (or its successor) in the 1991 report required under section 603 of the National Science and Technology Policy, Organization, and Priorities Act of 1978, and in subsequent reports issued under that authority; or

"(B) the Secretary of Defense, in the 1992 report issued in accordance with section 2522 of title 10, United States Code, and in subsequent reports issued under that authority."

(e) DEADLINE FOR FINAL PAYMENT UNDER SBIR FUNDING AGREEMENTS.—Section 5(g)(7) of the Small Business Act (15 U.S.C. 636(g)(7)) (as redesignated by subsection (d)(2)) is amended by inserting before the semicolon the following: "and, in all cases, make payment to recipients under such agreements in full, subject to audit, on or before the last day of the 12-month period beginning on the date of completion of such requirements".

(f) MODIFICATIONS TO SBIR POLICY DIRECTIVES.—Section 5(j) of the Small Business Act (15 U.S.C. 636(j)) is amended—

- (1) in paragraph (2), by redesignating subparagraphs (A) through (H) as classes (I) through (viii), respectively;
- (2) by redesignating paragraphs (1) through (7) as subparagraphs (A) through (G), respectively;
- (3) by inserting before "The Small Business Administration" the following: "Policy Directives.—"; and
- (4) by adding at the end the following new paragraph:

"(7) MODIFICATIONS.—Not later than 90 days after the date of enactment of the

EXCERPT FROM REPORT OF THE HOUSE COMMITTEE ON SMALL BUSINESS ON H.R. 4400  
(June 9, 1992)

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WHAT H.R. 4400 WOULD DO

I. EXTENSION OF SBIR THROUGH FY 2000

Section 3 of the bill would extend the SBIR program for seven additional years, until October 1, 2000. The Committee chose not to make the program permanent because, as the GAO noted in its June 1989 report, to do so would diminish the authority of Congressional Committees in the oversight process.

II. EXPANSION OF THE SBIR PROGRAM

Section 4(b), as reported, increases the percentage of participating federal agencies' extramural R&D budgets that must be set aside for the SBIR program from 1.25 percent in FY 1993 to 3 percent in FY 1997. This expansion would be accomplished gradually, through an increase in the set-aside of .25 percent in 1994 and .5 percent in each of the three following years. Based on current extramural R&D budgets, this expansion would bring the total program funding level to roughly \$1 billion.

III. INCREASED EMPHASIS ON COMMERCIALIZATION

A. Phase I evaluation

Section 4(a) would require that phase I proposals meet a minimum standard of appearance of commercial potential before they are evaluated on the basis on scientific and technical merit. Current law, by contrast, does not require the agencies to consider commercial potential in evaluating phase I proposals.

This change would have the effect of requiring potential SBIR applicants to think through the commercial potential of their proposed projects from the start, and could thereby increase the probability of successful commercialization. Empirical evidence indicates that the probability of ultimate commercial success of an R&D project is significantly higher when the innovating company begins thinking about commercial potential from the start of the project (Mansfield, 1975).

Of course, proposals may have commercial potential in either private sector markets or government procurement markets. But the Committee intends the agencies to give at least as much weight to private-sector commercial potential as to commercial potential in government procurement markets. It is no longer sufficient for mission-oriented agencies like DoD to interpret commercial potential as referring solely to government procurement. The primary purpose of the legislative changes discussed in this section is to increase private-sector commercialization of SBIR research.

B. Phase II evaluation

Section 4(a) also requires agencies to increase the weight given to commercial potential in the phase II evaluation process. Current law requires the agencies to consider commercial potential (in the form of a phase III follow-on funding commitment) only in the event that two competing proposals are of approximately equal scientific and technical merit. Under H.R. 4400, scientific and technical merit and feasibility would still be the main evaluation criteria in phase II, but the agency would have to consider commercial po-

# Ballistic Missile Defense Organization Comments

Final Report  
Reference



DEPARTMENT OF DEFENSE  
BALLISTIC MISSILE DEFENSE ORGANIZATION  
WASHINGTON, DC 20301-7100

TRI

February 13, 1995

MEMORANDUM FOR DIRECTOR, CONTRACT MANAGEMENT DIRECTORATE,  
INSPECTOR GENERAL

SUBJECT: Comments on DoD Inspector General Draft Audit Report of  
Small Business Innovation Research (SBIR) Program at  
the Ballistic Missile Defense Organization (Project  
No. 2CH-5031.03), December 9, 1994

The Ballistic Missile Defense Organization (BMDO) submits  
the following comments on the subject Draft Audit Report:

a. Part II, "Findings and Recommendations," Recom-  
mendations for Corrective Action Number 2, page 13. This  
recommendation stems from the finding that the BMDO evaluation  
criteria for a Phase I project do not directly mention the  
commercial potential of the idea. In selecting SBIR projects,  
BMDO has been consistent in considering commercial potential (as  
required by the DoD "SBIR Program Policy Letter"), but has not  
been consistent in documenting its consideration of commercial  
potential. We will implement the Draft Audit Report recommen-  
dation by adding questions regarding commercial potential to our  
review process, in order to document our consideration of  
commercial potential in review of future SBIR Phase I proposals.

Page 11

b. Part II, "Finding and Recommendations,"  
Legislative Requirements for Commercial Potential, page 10. For  
the following reasons, we do not agree with the finding that BMDO  
funded SBIR projects without satisfying legislative requirements:

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(1) BMDO follows DoD policy, which in turn  
properly defers to policy directives from the Small Business  
Administration. The specific issue disputed by DoDIG is whether  
Congress requires that ideas being considered for Phase I funding  
must already have commercial funding commitments for Phase II.  
The Draft Audit Report maintains that prior Phase II funding  
commitments are a statutory requirement; the Small Business  
Administration (SBA) "SBIR Program Policy Directive" dated  
January 26, 1993, disagrees.

The governing statute, 15 U.S.C. section 638, directs the  
SBA to issue policy directives for the general conduct of SBIR  
programs within the Federal Government, section 638(j)(1). The  
SBA is to provide for standardized SBIR solicitations and a  
standardized funding process, section 638(j)(1)(A) and (B).  
Though BMDO unilaterally receives and evaluates SBIR proposals and

selects awardees, section 638(g)(4) and (5), the SBA is authorized to independently monitor the operation of the SBIR program within all participating federal agencies, section 638(b)(6).

The Draft Audit Report expressly acknowledges that DoD and BMDO follow the SBA policy directives. Because the SBA is the agency charged by Congress to prescribe Government-wide policies and to oversee the SBIR program operation in all agencies, it is a legislative requirement for BMDO to follow the SBA's "SBIR Program Policy Directive" since it is not inconsistent with the law.

(2) BMDO has followed what it understands to be the intent of Congress, correctly implemented by the SBA. The statute at issue, 15 U.S.C., section 638(e)(4), as amended in 1992 by Public Law 102-564, provides in pertinent part:

the term "Small Business Innovation Research Program" or "SBIR" means a program under which a portion of a federal agency's research or research and development effort is reserved for award to small business concerns through a uniform process having--

(A) a first phase for determining, insofar as possible, the scientific and technical merit and feasibility of ideas that appear to have commercial potential, as described in subparagraph (B)(ii) submitted pursuant to SBIR program solicitations [emphasis added];

(B) a second phase...considering, among other things, the proposal's commercial potential, as evidenced by--

....

(ii) the existence of second phase funding commitments from private sector or non-SBIR funding sources[.]

First, the words "as described in subparagraph (B)(ii)" do not have the clear meaning attributed to them by DoDIG. These words do not fit their context in subparagraph (A) and add ambiguity rather than clarity to the statute. To interpret them, we look to the unambiguous language of subparagraph (A), which requires only apparent commercial potential for Phase I projects. Actual evidence of commercial potential is not required until Phase II. We interpret the quoted words consistent with this overall statutory scheme, *i.e.*, a Phase I project must have the potential of second phase funding commitments "as described in subparagraph (B)(ii)."

Second, DoDIG ignores the legislative history. House Report 102-554, page 21, explains that the purpose of the amendments to section 638(e)(4) was to require that:

phase I proposals meet a minimum standard of appearance of commercial potential before they are evaluated on the basis of scientific and technical merit. Current law, by contrast, does not require the agencies to consider commercial potential in evaluating the proposals. This change would have the effect of requiring potential SBIR applicants to think through the commercial potential of their proposed projects from the start...[emphasis added].

The congressional intent was to require "thinking through" an idea's commercial potential. There is no mention of any requirement to secure actual funding commitments at the Phase I stage. Such a major change from the prior law surely would have been mentioned if it had been intended.

Third, the statutory construction proposed by DoDIG is impractical. The purpose of Phase I is to consider ideas. The scientific and technical proposals presented to BMDO for Phase I consideration are highly innovative, and to expect funding commitments at the idea stage is unrealistic.

Fourth, it is indisputable that Congress, in enacting Public Law 102-564, intended to expand the SBIR program. See section 102(b). The language at issue, at least if read in the narrow way proposed by DoDIG, would greatly shrink the program. For that and other reasons, the SBA, the agency that monitored the progress of the legislation most closely, has apparently concluded that the wording resulted from a typographical error that went uncorrected in the end-of-session rush to adjournment of the 102nd Congress. We agree and urge DoDIG to accept this explanation as the most reasonable one under the circumstances.

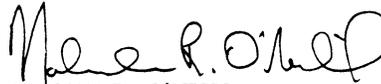
(3) The Draft Audit Report focuses on a narrow and dubious legal point and does not consider the success of the BMDO SBIR program.

A helpful report might have focused on constructive suggestions to improve the operations and effectiveness of the SBIR program at BMDO. The report makes no such suggestions. DoDIG ignores BMDO's record of successful commercialization of SBIR projects. For example, during 1993, nine of BMDO's SBIR companies issued public stock offerings, which raised more than \$100 million in capital from private investors. Projects receiving BMDO Phase II funding over the last two years have raised, or will raise as a condition of their funding,

\$20 million in private capital. Our average Phase II recipient expands its work force by nearly 50 percent. A White House spokesman last year identified the BMDO SBIR program as a model.

In Public Law 102-564, Congress declared that SBIR participants have been of great importance to the national defense, as well as being some of the most competent and cost-effective providers of innovative, high-quality research and development (see section 102(a)). Yet the narrow and, in our view, incorrect legal construction urged by DoDIG would foreclose participation in the SBIR program to many that Congress clearly intends to assist, and ultimately limit their contributions to the national defense.

In sum, it is our assessment that both BMDO and the DoD have fully followed the legislative requirements and the intent of Congress in administering the SBIR program.



MALCOLM R. O'NEILL  
Lieutenant General, USA  
Director

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