

THE DEPARTMENT OF HOMELAND SECURITY
SMALL BUSINESS INNOVATION RESEARCH (SBIR) PROGRAM
PROGRAM SOLICITATION FY07.2

Closing Date: 13 August 2007, 4:30pm ET

Important Dates:

- **11 June 2007:** Pre-release issued
- **27 June 2007:** Full-solicitation issued
- **06 August 2007:** Deadline for Questions to be Submitted to faq@hsarpasbir.com
- **27 June 2007 – 13 August 2007:** Full-proposals accepted
- **13 August 2007:** Deadline for receipt of proposals is **4:30 p.m. ET**

Contact with Technical Points of Contact: Please note that contact with the Technical Points of Contact for each topic is limited to 15 days prior to issuance of the full-solicitation.

Deadline for Receipt. Proposals must be completely submitted and electronically date stamped by **4:30 p.m. ET, 13 August 2007.**

All written questions must be submitted to faq@hsarpasbir.com; **no later than 06 August 2007.** Questions will be answered and posted electronically for general viewing on the FedBizOpps web site at <http://www.fedbizopps.gov> and on the DHS web site at <http://www.sbir.dhs.gov>.

No Printed Solicitation Books. Solicitations are available only in electronic format from the FedBizOpps web site, www.fedbizopps.gov, in accordance with the Government Paperwork Elimination Act (GPEA). For convenience, the solicitation will be available at <http://www.sbir.dhs.gov> after it is posted on the FedBizOpps web site.

DHS SBIR does not anticipate that proposals submitted in response to this solicitation will be classified.

Information: If you have questions about the DHS SBIR program, please submit your questions via the web site at <http://www.sbir.dhs.gov>

NOTICE: For administrative purposes only, submissions to this solicitation will be handled by a DHS Support Contractor.

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DHS SOLICITATION FOR THE SMALL BUSINESS INNOVATION RESEARCH (SBIR) PROGRAM

1.0 SBIR PROGRAM DESCRIPTION

1.1 SBIR Introduction

The Department of Homeland Security (DHS), hereafter referred to as DHS, invites small business firms to submit proposals under this solicitation for the Small Business Innovation Research (SBIR) Program. Firms with the capability to conduct research and development (R&D) in any of the topic areas described in Section 9.0, and to commercialize the results of that R&D, are encouraged to participate.

Objectives of the DHS SBIR Program include stimulating technological innovation, strengthening the role of small business in meeting research and development needs, fostering and encouraging participation by socially and economically disadvantaged small business concerns in technological innovation, and increasing the commercial application of DHS supported research or R&D results.

The Federal SBIR Program is mandated by the Small Business Innovation Development Act of 1982 (PL 97-219, as amended by PL 106-554). The basic design of the DHS SBIR program is in accordance with the Small Business Administration (SBA) SBIR Policy Directive, 2002. The SBIR program presented in this solicitation encourages scientific and technical innovation in areas specifically identified by the Science and Technology (S&T) Directorate and the Domestic Nuclear Detection Office (DNDO). The guidelines presented in this solicitation incorporate and exploit the flexibility of the SBA Policy Directive to encourage proposals based on scientific and technical approaches likely to yield results important to DHS and the private sector.

1.2 SBIR Three Phase Program

This program solicitation is issued pursuant to the Small Business Innovation Development Act of 1982 (PL 97-219, as amended by PL 106-554). Phase I is to determine, insofar as possible, the scientific, technical, and commercial merit and feasibility of ideas submitted under the SBIR Program. Phase I awards do not exceed \$100,000 in cost nor extend beyond a six-month period of performance. DHS has, however, permitted proposers submitting to the DNDO topics to propose up to \$150,000 for Phase I SBIR efforts, not to extend beyond a six-month period of performance. Proposals should concentrate on that research or research and development (R/R&D) which will significantly contribute to proving the scientific, technical, and commercial feasibility of the proposed effort, the successful completion of which is a prerequisite for further DHS support in Phase II. Several different proposed solutions to a given topic may be funded. The measure of Phase I success includes evaluations of the extent to which Phase II results would have the potential to yield a product or process of continuing importance to DHS and/or the private sector. Proposers are encouraged to consider whether the research or research and development they are proposing to DHS also has private sector potential, either for the proposed application or as a base for other applications.

Subsequent Phase II awards will be made to firms on the basis of results of their Phase I projects and the scientific, technical, and commercial merit of the Phase II proposal. Phase II awards are \$750,000 in cost (\$1,000,000 for DNDO topics) and do not exceed a 24-month period of performance. Phase II is the principal research or research and development effort and is expected

to produce a well-defined deliverable prototype. A more comprehensive proposal will be required for Phase II. (Further details are provided in Section 3.7.

Under Phase III, the small business is expected to obtain funding from the private sector and/or non-SBIR Government sources to develop the prototype into a viable product or non-R&D service for sale in Government and/or private sector markets.

This solicitation is for Phase I proposals only. Only proposals submitted in response to this solicitation will be considered for Phase I awards. Only proposals submitted in response to topics contained in this solicitation will be accepted and considered for Phase I award. Proposers who were not awarded a contract in response to a prior SBIR solicitation may update or modify and re-submit the same or modified proposal if it is responsive to any of the topics listed in Section 9.0

For SBIR Phase II, no separate solicitation will be issued. **Only those firms that were awarded Phase I contracts are eligible to participate in Phases II and III.**

DHS will invite Phase II proposals from a group of Phase I awardees to maintain the momentum of the Phase I R/R&D and to accomplish an expeditious review leading to Phase II award. Phase II proposals will be submitted online in accordance with Section 9.0.

DHS is not obligated to make any awards under either, Phase I, II, or III, and all awards are subject to the availability of funds. The DHS is not responsible for any monies expended by the proposer before award of any contract.

1.3 SBIR Proposer Eligibility and Limitations

Each proposer must qualify as a small business for research or research and development purposes as defined in Section 2.0 and must certify to this on the Cover Sheet of the proposal. For both SBIR Phases I and II, the primary employment of the principal investigator must be with the small business firm at the time of the award and during the conduct of the proposed effort. Primary employment means that more than one-half of the principal investigator's time is spent with the small business. Primary employment with a small business concern precludes full-time employment at another organization. For both Phase I and Phase II, all research or research and development work must be performed by the small business concern and its subcontractors in the United States.

Joint ventures and limited partnerships are permitted, provided that the entity created qualifies as a small business in accordance with the Small Business Act, 15 USC 631, and the definition included in Section 2.2.

1.4 SBIR Research and Analytical Work

a. **For Phase I**, a minimum of two-thirds of the research and/or analytical work must be performed by the proposing firm unless otherwise approved in writing by the contracting officer. The percentage of work is usually measured by both direct and indirect costs for Phase I.

b. **For Phase II**, a minimum of one-half of the research and/or analytical work must be performed by the proposing firm, unless otherwise approved in writing by the contracting officer. The percentage of work is usually measured by both direct and indirect cost for Phase II.

1.5 SBIR Conflicts of Interest

Awards made to firms owned by or employing current or previous Federal Government employees could create conflicts of interest for those employees and be in violation of federal law. Such proposers should contact the cognizant Ethics Counselor from the employee's Government agency for further guidance.

1.6 Questions About SBIR Solicitation Topics and Proposal Submission

- a. **Help Desk.** All questions about this solicitation, the proposal preparation and electronic submission should be submitted via the web site, <http://www.sbir.dhs.gov>, or via the Help Desk toll free number: 1-800-754-3043. The Help Desk may be contacted from 8:30 a.m to 5:00 p.m. ET.
- b. **The DHS SBIR web site** <http://www.sbir.dhs.gov> offers electronic access to the SBIR solicitation, submission of frequently asked questions (FAQs), answers to FAQs, and hyperlinks to other useful information.
- c. **Electronic Proposal Submission.** All Phase I and Phase II proposals must be submitted via the electronic submission web site at <http://www.sbir.dhs.gov>. The DHS submission procedure is a four (4) step process before final submission is complete. Upon completion of the cover sheets, technical proposal, and cost proposal, proposers must select "Submit Proposal" for the complete proposal to be electronically date stamped and officially received by the DHS SBIR Program Office. Once the "Submit Proposal," button has been selected, an email confirmation receipt will be forwarded to your email account upon successful submission of your proposal.
- d. **General Questions about the DHS SBIR Program.** General questions pertaining to the DHS SBIR program should be submitted to faq@hsarpasbir.com or by calling the DHS SBIR Program contacts: Mr. Vinny Schaper, SBIR Program Director, 202-254-6768 or Ms. Elissa I. Sobolewski, SBIR Program Manager, 202-254-6768. All General Questions must be submitted no later than 06 August 2007.
- e. **Technical Questions about Solicitation Topics.** This solicitation is issued for pre-release on the Federal Business Opportunities (FedBizOpps) web site (www.fedbizopps.gov) and the DHS SBIR web site (www.sbir.dhs.gov) from 11 June 2007 through 26 June 2007. During this time, you may call or email topic questions to the Technical Point of Contact for the topic, before you prepare a proposal for the FY07.2 solicitation. Technical questions will be researched and answers provided in a timely manner. Questions should be limited to specific information related to improving the understanding of the requirements of a particular topic. Proposers may not ask for advice or guidance on solution approach, nor submit additional material to the Technical Point of Contact. Contact with DHS after 26 June 2007, the pre-release closing date, is restricted for reasons of competitive fairness, and therefore, all written questions must be submitted to faq@hsarpasbir.com; no later than 06 August 2007. Questions will be answered and posted electronically for general viewing on the FedBizOpps web site at <http://www.fedbizopps.gov> and on the DHS web site at <http://www.sbir.dhs.gov>.

- f. **All proposers are advised to monitor the <http://www.fedbizopps.gov> and <http://www.sbir.dhs.gov> web sites during the solicitation period for questions and answers, and other information relevant to the topic under which they are proposing.**

1.7 Outreach Conferences and Events

The DHS SBIR program participates in two National SBIR Conferences each year and in many state-organized conferences for small business. For information on these events, visit the web site, <http://www.sbir.dhs.gov> located under “What’s New,” or refer to the <http://www.SBIRWorld.com> web site for upcoming SBIR outreach events.

2.0 DEFINITIONS

The following definitions apply for the purposes of this solicitation:

2.1 Research or Research and Development

Any activity that is:

- a. **Basic Research.** Scientific study and experimentation to provide fundamental knowledge required for the solution of problems.
- b. **Exploratory Development.** A study, investigation or minor development effort directed toward specific problem areas with a view toward developing and evaluating the feasibility and practicality of proposed solutions.
- c. **Advanced Development.** Proof of design efforts directed toward projects that have moved into the development of hardware for test.
- d. **Engineering Development.** Full-scale engineering development projects for Department of Homeland Security (DHS) or first responder use but which have not yet received approval for production.

2.2 Small Business Concern

A small business concern is one that at the time of award of a Phase I or Phase II contract meets all of the following criteria:

- a. Organized for profit, with a place of business located in the United States, which operates primarily within the United States or which makes a significant contribution to the United States economy through payment of taxes or use of American products, materials, or labor;
- b. In the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that where the form is a joint venture, there can be no more than 49 percent participation by foreign business entities in the joint venture;
- c. At least 51 percent owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States, except in the case of a joint venture, where each entity to the venture must be 51 percent owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States; and

- d. Not more than 500 employees, including its affiliates.

Control can be exercised through common ownership, common management, and contractual relationships. The term "affiliates" is defined in greater detail in 13 CFR 121.103. The term "number of employees" is defined in 13 CFR 121.106.

A business concern may be in the form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust, or cooperative. Further information may be obtained at <http://sba.gov/size>, or by contacting the Small Business Administration's Government Contracting Area Office or Office of Size Standards.

2.3 Research Institution

A Research Institution is any organization located in the United States that is:

- a. A university;
- b. A nonprofit institution as defined in section 4(5) of the Stevenson-Wydler Technology Innovation Act of 1980; or
- c. A contractor-operated federally funded research and development center, as identified by the National Science Foundation in accordance with the government-wide Federal Acquisition Regulation issued in accordance with section 35(c)(1) of the Office of Federal Procurement Policy Act. ([Click here](#) for a list of eligible FIRDCs.)

2.4 Socially and Economically Disadvantaged Small Business Concern

A socially and economically disadvantaged small business concern is one that is at least 51% owned and controlled by one or more socially and economically disadvantaged individuals, or an Indian tribe, including Alaska Native Corporation (ANCs), a Native Hawaiian Organization (NHO), or a Community Development Corporation (CDC). Control includes both the strategic planning (as that exercised by boards of directors) and the day-to-day management and administration of business operations. See 13 CFR 124.109, 124.110, and 124.111 for special rules pertaining to concerns owned by Indian tribes (including ANCs), NHOs or CDCs, respectively.

2.5 Women-Owned Small Business Concern

A women-owned small business is one that is at least 51 percent owned and controlled by one or more women, or in the case of a publicly owned business, at least 51 percent of the stock of which is owned by women, and who also control and operate it. "Control" in this context means exercising the power to make policy decisions. "Operate" in this context means being actively involved in the day-to-day management of the business.

2.6 Funding Agreement

Any contract, or grant, or cooperative agreement entered into between any Federal Agency and any small business concern for the performance of experimental, developmental, or research work funded in whole or in part by the Federal Government. *Only the contract method will be used by DHS for all SBIR awards.*

2.7 Subcontract

A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by an awardee of a funding agreement calling for supplies or services for the performance of the original funding agreement. This includes consultants. See Section 3.5.b (9).

2.8 Commercialization

The process of developing marketable products or services and delivering products or services for sale (whether by the originating party or by others) to Government or commercial markets.

2.9 Essentially Equivalent Work

This occurs when (1) substantially the same research is proposed for funding in more than one contract proposal or grant application submitted to the same Federal agency; (2) substantially the same research is submitted to two or more different Federal agencies for review and funding consideration; or (3) a specific research objective and the research plan for accomplishing an objective are the same or closely related in two or more proposals or awards, regardless of the funding source.

2.10 Historically Black Colleges and Universities/Minority Institutions (HBCU/MI)

Listings for the Historically Black Colleges and Universities (HBCU) and Minority Institutions (MI) are available through the DTIC web site, <http://www.dtic.mil/dtic/hbcumi/>.

2.11 Historically Underutilized Business Zone (HUBZone) Small Business Concern

HUBZone small business concern means a small business concern that appears on the List of Qualified HUB Zone Small Business Concerns maintained by the Small Business Administration. See <http://www.sba.gov/hubzone> for more details.

2.12 Service-Disabled Veteran

A veteran with a disability that is service connected as defined in Section 101 (16) of Title 38, United States Code.

2.13 Small Business Concern Owned and Controlled by Service-Disabled Veterans

A small business concern that:

- a. not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and
- b. the management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such a veteran.

2.14 Small Business Concern Owned and Controlled by Veterans

A small business concern that:

- a. not less than 51 percent of which is owned by one or more veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more; and
- b. the management and daily business operations of which are controlled by one or more veterans.

2.15 United States

"United States" means the fifty states, the territories and possessions of the Federal Government, the Commonwealth of Puerto Rico, the Republic of the Marshall Islands, the Federated States of Micronesia, the Republic of Palau, and the District of Columbia.

2.16 Manufacturing-related R&D as a result of Executive Order 13329

Relates to: (i) manufacturing processes, equipment and systems; or (ii) manufacturing workforce skills and protection.

2.17 Foreign National

Foreign National (Foreign Person) means any person who is not:

- a. a citizen or national of the United States; or
- b. a lawful permanent resident; or
- c. a protected individual as defined by 8 U.S.C. 1527(a)(3).

"Lawful permanent resident" is a person having the status of having been lawfully accorded the privilege of residing permanently in the United States as an immigrant in accordance with the immigration laws and such status not having changed.

"Protected individual" is an alien who is lawfully admitted for permanent residence, is granted the status of an alien lawfully admitted for temporary residence under 8 U.S.C.1160(a) or 8 U.S.C.1255a(a)(1), is admitted as a refugee under 8 U.S.C.1157, or is granted asylum under section 8 U.S.C.1158; but does not include (i) an alien who fails to apply for naturalization within six months of the date the alien first becomes eligible (by virtue of period of lawful permanent residence) to apply for naturalization or, if later, within six months after November 6, 1986, and (ii) an alien who has applied on a timely basis, but has not been naturalized as a citizen within 2 years after the date of the application, unless the alien can establish that the alien is actively pursuing naturalization, except that time consumed in the Service's processing the application shall not be counted toward the 2-year period.

3.0 PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS

3.1 Proposal Requirements

A proposal to any topic under the DHS SBIR Program is to provide sufficient information to persuade the Science and Technology Directorate, or DNDO, as appropriate, that the proposed work represents an innovative approach to the investigation of an important scientific or engineering problem and is worthy of support under the stated criteria. The quality of the

scientific or technical content of the proposal will be the principal basis upon which proposals will be evaluated. The proposed research or research and development must be responsive to the chosen topic, although need not use the exact approach specified in the topic (see Section 4.1). Any small business contemplating a proposal for work on any specific topic should determine that (a) the technical approach has a reasonable chance of meeting the topic objective, (b) this approach is innovative, not routine, with commercial application, and (c) the firm has the capability to implement the technical approach, i.e., has or can obtain people and equipment suitable to the task.

DHS SBIR does not anticipate that proposals submitted in response to this solicitation will be classified. If an offeror intends to submit a proposal containing classified information, submission instructions can be found in section 7.0.

3.2 Administrative and Technical Screening Checklist

Read and follow all instructions contained in this solicitation. All proposals that fail to address the following items will be considered "non-compliant" and will be eliminated from further consideration.

- a. Submit your proposal electronically via web site (<http://www.sbir.dhs.gov>) and prepare your SBIR proposal as instructed on the web site. A complete proposal consists of the proposal cover sheets, technical proposal and cost proposal. Your proposal is not a complete submission unless it has been finalized within the electronic submission system. You will receive email confirmation that your proposal has been submitted. If you do not receive and email, contact the Help Desk for the SBIR Program as instructed in Section 1.6.
- b. The proposal adheres to the topic criteria and the proposal cost adheres to the funding thresholds specified in the solicitation. The cost on the cover sheets match the cost on the cost proposal.
- c. The Project Summary on the cover sheets contains NO proprietary information. In the event of an award, this project summary will be posted at <http://www.sbir.dhs.gov>. Mark proprietary information within the technical proposal as instructed in Section 5.6.
- d. The content in the technical proposal, including supporting data (if applicable), shall include all of the items in Section 3.5(b) in the order specified.
- e. The header on each page of your technical proposal shall contain your company name, topic number, and proposal number. (The header may be included in the one-inch margins.)
- f. Limit your proposal to the page limitations established for Phase I and/or Phase II proposals.
- g. Use a type size no smaller than a 12-point font on standard 8 1/2 " X 11" paper with one (1) inch margins
- h. The technical proposal shall not be in two-column format.

Note: Public access to the internet is available at most public libraries, local schools or a Small Business Development Center (SBDC) in your area.

3.3 *Proprietary Information*

If information is provided that constitutes a trade secret, proprietary commercial or financial information, or personal information or data, it will be treated in confidence to the extent permitted by law, provided that it is clearly marked in accordance with Section 5.6. The cost proposal information will be treated as proprietary whether or not it is indicated as such.

3.4 *Limitations on Length of Proposal*

This solicitation is designed to reduce the investment of time and cost to small firms in preparing a formal proposal. Those who wish to respond must submit a direct, concise, and informative research or research and development proposal of no more than the page limitations established for Phase I and/or Phase II proposals, including proposal cover sheet and cost proposal. Promotional and non-project related discussion is discouraged. The space allocated to each section will depend on the problem chosen and the principal investigator's approach. In the interest of fairness, pages in excess of the 25-page limitation (including attachments, appendices, or references) will not be considered for review or award.

3.5 *Phase I Proposal Format*

The Phase I proposal length is limited to 25 pages.

- a. **Proposal Cover Sheets.** Prepare the proposal cover sheets (as provided on the electronic submission web site <http://www.sbir.dhs.gov>) including a brief technical abstract of the proposed R&D project and a discussion of anticipated benefits and potential commercial applications. Once you save the cover sheets, the system will assign a proposal number. You may edit the cover sheets as often as necessary until the solicitation closes. Your cover sheets will count as the first two pages of your proposal no matter how they print out. If your proposal is selected for award, the technical abstract and discussion of anticipated benefits will be publicly released on the DHS SBIR web site; therefore, do not include proprietary or classified information in these sections.
- b. **Technical Proposal.** Create a single file that covers the following items in the order given below. Begin your technical proposal on Page 3 (since the cover sheets are pages 1 and 2) and put your firm name, topic number, and proposal number in the header of each page. (The header may be included in the one-inch margins.) The technical proposal file must be in Portable Document Format (PDF) for evaluation purposes. You cannot upload the technical proposal to the DHS submission web site until you have created a cover sheet and have been assigned a proposal number. Perform a virus check before uploading the technical proposal file. If a virus is detected, it may cause rejection of the proposal. The technical proposal should be a single file, including graphics and attachments. **Do not lock or encrypt the file you upload.**
 - (1) **Identification and Significance of the Problem or Opportunity.** Define the specific technical problem or opportunity addressed and its importance. (Begin on Page 3 of your proposal.)
 - (2) **Phase I Technical Objectives.** Enumerate the specific objectives of the Phase I work, including the questions it will try to answer to determine the feasibility of the proposed approach.

- (3) **Phase I Work Plan.** Provide an explicit, detailed description of the Phase I approach. The plan should indicate what is planned, how, when, and where the work will be carried out, a schedule of major events, the final product to be delivered, and the completion date of the effort. The Phase I effort should determine the technical feasibility of the proposed concept. The methods planned to achieve each objective or task should be discussed explicitly and in detail. This section should be a substantial portion of the total proposal.
- (4) **Related Work.** Describe significant activities directly related to the proposed effort, including any conducted by the principal investigator, the proposing firm, consultants, or others. Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources. The proposal must persuade reviewers of the proposer's awareness of the state-of-the-art in the specific topic. Describe previous work not directly related to the proposed effort but similar. Provide the following: (a) short description, (b) client for which work was performed (including individual to be contacted and phone number), and (c) date of completion.
- (5) **Relationship with Future Research or Research and Development.** (a) State the anticipated results of the proposed approach, assuming project success. (b) Discuss the significance of the Phase I effort in providing a foundation for Phase II research or research and development effort.
- (6) **Commercialization Strategy.** Describe, in approximately two or more pages, your company's strategy for commercializing the technology in the DHS, other Federal Agencies, and/or private sector markets. Provide specific information on the market need the technology will address and the size of the market. Also, include a schedule showing the quantitative commercialization results from this SBIR project that your company expects to achieve and when (i.e., amount of additional investment, sales revenue, etc.).
- (7) **Key Personnel** Identify key personnel who will be involved in the Phase I effort including information on directly related education and experience. A concise resume of the principal investigator, including a list of relevant publications (if any), must be included. All resumes will count toward the 25-page limitation. Identify any non-U.S. citizen that you expect to be involved on this project, their country of origin and level of involvement.
- (8) **Facilities/Equipment.** Describe available instrumentation and physical facilities necessary to carry out the Phase I effort. Items of equipment to be purchased (as detailed in the cost proposal) shall be justified under this section. Also, state whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name), and local governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices, and handling and storage of toxic and hazardous materials.
- (9) **Subcontractors/Consultants.**
- a. **Subcontractors/Consultants.** Involvement of a university or other subcontractors or consultants in the project may be appropriate (see Section 2.3). If such involvement is intended, it should be described in detail and identified in the cost

proposal. A minimum of two-thirds of the research and/or analytical work in Phase I, as measured by direct and indirect costs, must be carried out by the proposing firm, unless otherwise approved in writing by the contracting officer. No portion of an SBIR award may be subcontracted back to any Federal Government Agency or Federally Funded Research and Development Centers (FFRDCs). SBA may issue a case-by-case waiver to this provision after review of the DHS written justification that includes the following information: (a) an explanation of why the SBIR research project requires the use of the Federal/FFRDC facility or personnel, including data that verifies the absence of non-federal facilities or personnel capable of supporting the research effort; (b) why the Agency will not and cannot fund the use of the Federal/FFRDC facility or personnel for the SBIR project with non-SBIR money; and (c) the concurrence of the small business concern's chief business official to use the Federal/FFRDC facility or personnel. Award is contingent on the sponsoring agency obtaining a waiver.

- (10) **Prior, Current, or Pending Support of Similar Proposal or Awards.** *Warning --* While it is permissible, with proposal notification, to submit identical proposals or proposals containing a significant amount of essentially equivalent work (see Section 2.9) for consideration under numerous Federal program solicitations, it is unlawful to enter into contracts or grants requiring essentially equivalent effort. If there is any question concerning this, it must be disclosed to the soliciting agency or agencies before award.

If a proposal submitted in response to this solicitation is substantially the same as another proposal that has been funded, is now being funded, or is pending with another Federal Agency, the proposer must so indicate on the Proposal Cover Sheet and provide the following information:

- (a) Name and address of the Federal Agency(s) to which a proposal was submitted, will be submitted, or from which an award is expected or has been received.
- (b) Date of proposal submission or date of award.
- (c) Title of proposal.
- (d) Name and title of principal investigator for each proposal submitted or award received.
- (e) Title, number, and date of solicitation(s) under which the proposal was submitted, will be submitted, or under which award is expected or has been received.
- (f) If award was received, state contract number.
- (g) Specify the applicable topics for each SBIR proposal submitted or award received.

Note: If Section 3.5.b (10) does not apply, state in the proposal "No prior, current, or pending support for proposed work."

- c. **Cost Proposal.** Complete the cost proposal in the format shown in the [Cost Breakdown Guidance](#), using the online cost proposal form on the electronic

submission web site. Some items in the [Cost Breakdown Guidance](#) may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item. What matters is that enough information be provided to allow DHS to understand how the proposer plans to use the requested funds if the contract is awarded.

- (1) List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
- (2) Special tooling and test equipment and material cost may be included under Phases I and II. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with DHS unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by DHS.
- (3) Cost for travel funds must be justified and related to the needs of the project. DHS requests that you budget, as a minimum, travel to attend a one day meeting with Science & Technology and DND O program management personnel. Reasonable travel costs may include this one day meeting. This meeting may consist of a Phase I Kick-Off meeting or a presentation of your project findings to your Phase I Program Manager. Hence, travel will typically be held at the beginning of your Phase I award or at the conclusion of the Phase I effort; depending on the Science & Technology and/or DND O program manager requirement.
- (4) Cost sharing is permitted for proposals under this solicitation; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a Phase I proposal.
- (5) The cost proposal form on the electronic submission web site is required to complete the Cost Proposal. If additional cost proposal information is required, it may be placed at the end of your technical proposal (and included in the page count limitation).

If applicable, a brief explanation of cost estimates for equipment, materials, and consultants or subcontractors can be placed in the comment section of the cost proposal. However, when a proposal is selected for award, the proposer should be prepared to submit further documentation to the contracting officer to substantiate costs (e.g., a brief explanation of cost estimates for equipment, materials, and consultants or subcontractors).

The cost proposal will count as one page of your proposal no matter how it prints out. For more information about cost proposals and accounting standards, see the DCAA publication called "Information for Contractors" available at <http://www.dcaa.mil>.

3.6 Page Numbering

Number all pages of your proposal consecutively. The cover sheets are pages 1 and 2. The technical proposal begins on page 3.

3.7 Phase II Proposal Invitation

This solicitation is for Phase I only. A Phase II proposal can be submitted only by a Phase I awardee and only in response to a request from the Contracting Officer. DHS Program Managers for the applicable topic may recommend that Phase I performers be invited to submit Phase II proposals based upon site visits, the monthly and/or final reports, and progress made towards the accomplishment of Phase I technical objectives and plans for Phase II. Not all Phase I performers will be invited to submit a Phase II proposal. The number of Phase II proposal invitations will depend upon the number of Phase I awards made in the topic, the funding available, and the quality of the Phase I research. DHS reserves the right to invite all, some, or none of the Phase I awardees in a topic to submit Phase II proposals.

The DHS SBIR program may recommend that a Phase I contractor be invited to submit a Phase II proposal, beginning no earlier than two thirds (2/3) into the Phase I period of performance. (*Example: four months into a six month period of performance.*) While some Phase II invitations will be made prior to completion of the Phase I period of performance, funding is reserved for those deserving Phase I projects that require the maximum period of performance to complete the Phase I effort. DHS will evaluate each Phase II proposal when received, and if the proposal is deemed to be highly rated, will enter into negotiations for award. The goal is to accelerate the technology development and reduce, or eliminate, the gap between the Phase I and Phase II efforts.

Invitations to submit a Phase II proposal is the onset of the Phase II review process and is not a commitment for award. An invitation to submit a Phase II proposal does not qualify as a Phase II award; each Phase II proposal must meet the SBIR Phase II criteria in the solicitation, as well as undergo the DHS source selection process. Phase II proposals must be received no later than 30 days from the Phase II invitation status notification.

Phase I awardees that do not receive an invitation to submit a Phase II proposal may submit a Phase II proposal. However, non-invited Phase I awardees may conclude that DHS assessed the accomplishments of the Phase I effort and determined it did not demonstrate further consideration beyond the Phase I funding level. Further, the probability of selection for funding is low, since DHS will consider the technical results and performance of the Phase I, as Phase II projects are a continuation of the research effort from the completed Phase I project.

All Phase I awardees will be notified of Phase II invitation status after the Phase I period of performance has been completed.

3.8 Phase II Proposal Format

Phase II proposal length is limited to 50 pages, using a type size no smaller than a 12-point font on standard 8 ½ X 11” paper with one (1) inch margins. No two-column format is allowed.

- a. **Each Phase II** proposal must contain Proposal Cover Sheets, a Technical Proposal, Cost Proposal and Company Commercialization report, if applicable. See section 3.8 (d). In addition, each Phase II proposal must contain approximately two or more pages of a Commercialization Strategy in the Technical Proposal.
- b. **Commercialization Strategy**
 1. What is the first product that this technology will go into?
 2. Who will be your customers, and what is your estimate of the market size?
 3. How much money will you need to bring the technology to market, and how will you raise that money?
 4. Does your company contain marketing expertise and, if not, how do you intend to bring that expertise into the company?
 5. Who are your competitors, and what is your price and/or quality advantage over your competitors?

The Commercialization Strategy must also include a schedule showing the quantitative results from the Phase II project that your company expects to report in its Company Commercialization Report Updates one year after the start of the Phase II, at the completion of Phase II, and after the completion of Phase II (i.e., amount of additional investment, sales revenue, etc. – see section 4.4).

- c. **Cost Match.** Proposers that request Phase II Cost Match funds have an opportunity in the Commercialization Strategy to present the compelling value of the proposed Phase II project. The Commercialization Strategy should provide qualitative and quantitative information directly related to the Cost Matching; explaining the improved time interval or acceleration between the completion of Phase II work and the of launching of the innovative products, processes, or services into the marketplace. Additional Phase II Cost Match guidance can be found in section 4.6.

d. Company Commercialization Report

For those firms that have received prior SBIR Phase II funding, a succinct Commercialization Report must be included with the proposal. The Company Commercialization Report is submitted online in accordance with Section 3.8 (a). The following are examples of company commercialization data expected in the Commercialization Report. Additional Commercialization Reporting requirements and Commercialization Update requirements can be found in sections 4.4 and 5.4.

1. Any business concern or subsidiary established for the commercial application of a product or service for which an SBIR award is made.
2. Revenue from the sale of new products or services resulting from the research conducted under each Phase II award;

3. Additional investment from any source, other than Phase I or Phase II awards, to further the research and development and/or commercialization conducted under each Phase II award.
4. Whether the Phase II technology has been used in a fielded DHS system or acquisition program, and, if so, which system or program.
5. The number of patents resulting from the contractor's participation in the SBIR program.
6. Whether the company has completed an initial public offering (IPO) of stock resulting, in part, from the Phase II project.

Update the information in the Company Commercialization Report for any prior Phase II award received by the company. The company may apportion sales or additional investment information relating to more than one Phase II award among those awards if it notes the apportionment for each award.

Additional instructions regarding Phase II proposal preparation and submission is on the <http://www.sbir.dhs.gov/UsefulLinks.asp> web site.

3.9 False Statements

Knowingly and willfully making any false, fictitious, or fraudulent statements or representations, may be a felony under the False Statement Act (18 U.S.C. §1001), punishable by a fine of up to \$10,000, up to five years in prison, or both.

4.0 METHOD OF SELECTION AND EVALUATION CRITERIA

4.1 Introduction

SBIR proposals will be processed and distributed to the appropriate technical program manager within DHS for evaluation and action. DHS Program Managers may seek technical advice from qualified Federal Government employees and/or from technical and business experts who may be non-Federal Government employees. In all cases, including designated DHS support contractor personnel who will handle the administrative responsibilities and procedures for the program, will be required to sign a Non-Disclosure Agreement. DHS will select proposals for funding based on technical merit and the evaluation criteria contained in this solicitation document.

Phase I SBIR proposals will be evaluated on a competitive basis and will be considered to be binding for six (6) months from the date of closing of this solicitation unless the proposer states otherwise. If selection has not been made prior to the proposal's expiration date, proposers will be requested as to whether or not they want to extend their proposal for an additional period of time. Proposals meeting stated solicitation requirements will be evaluated by scientists or engineers knowledgeable in the topic area. Proposals will be evaluated first on their relevance to the chosen

topic. A proposal that meets the goals of a solicitation topic but does not use the exact approach specified in the topic will be considered relevant. (Prospective proposers should contact the DHS SBIR program as described in Section 1.6 to determine whether submission of such a proposal would be useful.)

Proposals found to be relevant will then be evaluated using the criteria listed in Section 4.2 (and Section 4.3 for Phase II). Final decisions will be made based upon these criteria and consideration of other factors including possible duplication of other work and program balance. In the evaluation and handling of proposals, every effort will be made to protect the confidentiality of the proposal and any evaluations. There is no commitment by DHS to make any awards on any topic, to make a specific number of awards or to be responsible for any monies expended by the proposer before award of a contract.

For proposals that have been selected for contract award, a Government Contracting Officer will draw up an appropriate contract to be signed by both parties before work begins. Any negotiations that may be necessary will be conducted between the proposer and the Government Contracting Officer. It should be noted that only a duly appointed contracting officer has the authority to enter into a contract on behalf of the U.S. Government.

Prior to receiving a contract award, the proposer must be registered in the Central Contractor Registration (CCR) database. For information regarding registration, call 1-888-227-2423 or visit <http://www.ccr.gov>.

Phase II proposals will be subject to a technical review process similar to Phase I. Final decisions will be made by DHS based upon the scientific and technical evaluations and other factors, including a commitment for Phase III follow-on funding, the possible duplication with other research or research and development, program balance, budget limitations, and the potential of a successful Phase II effort leading to a product of continuing interest to DHS. DHS is not obligated to make any awards under Phase II, and all awards are subject to the availability of funds. DHS is not responsible for any monies expended by the proposer before award of a contract.

Upon written request and after final award decisions have been announced, evaluation results will be provided to unsuccessful proposers on their Phase II Proposals (see Section 6.4).

Restrictive notices notwithstanding, Phase I and Phase II proposals may be handled, for administrative purposes only, by support contractors. All support contractors are bound by appropriate non-disclosure agreements.

4.2 Evaluation Criteria - Phase I

DHS plans to select for award those proposals offering the best value to the Government and the Nation considering the following factors in decreasing order of importance:

- a. The soundness, technical merit, and innovation of the proposed approach and its incremental progress toward topic or subtopic solution.
- b. The qualifications of the proposed principal/key investigators, supporting staff, and consultants. Qualifications include not only the ability to perform the research and development but also the ability to commercialize the results.

- c. The potential for commercial (Government or private sector) application and the benefits expected to accrue from this commercialization as assessed utilizing the criteria in Section 4.4.

Each Cost Proposal will be evaluated for price/cost realism, reasonableness, and overall best value to the Government. Members of the evaluation team may presume that the technical approach provided by the Offeror serves as a rationale for the labor mix and labor hours used.

Technical reviewers will base their conclusions only on information contained in the proposal. It cannot be assumed that reviewers are acquainted with the firm or key individuals or any referenced experiments. Relevant supporting data such as journal articles, literature, including Government publications, etc., should be contained or referenced in the proposal and will count towards the 25-page limit.

4.3 Evaluation Criteria – Phase II

The Phase II proposal will be reviewed for overall merit based upon the criteria below in decreasing order of importance:

- a. The soundness, technical merit, and innovation of the proposed approach and its incremental progress toward topic or subtopic resolution.
- b. The potential for commercial (Government or private sector) application and the benefits expected to accrue from this commercialization as assessed utilizing the criteria in Section 4.4.
- c. The qualifications of the proposed principal/key investigators, supporting staff, and consultants. Qualifications include not only the ability to perform the research and development but also the ability to commercialize the results.

Each Cost Proposal will be evaluated for price/cost realism, reasonableness, and overall best value to the Government. Members of the evaluation team may presume that the technical approach provided by the Offeror serves as a rationale for the labor mix and labor hours used.

Phase II proposal evaluations may include on-site evaluations of the Phase I effort by Government personnel.

4.4 Assessing Commercial Potential of Proposals

The commercial potential of a proposal will be assessed using the following criteria:

- a. The proposer's commercialization strategy [see Section 3.5.b (6)] and, as discussed in that strategy:
 - (1) any commitments of additional investment in the technology during Phase II from the private sector, prime contractors, non-SBIR programs, or other sources, and
 - (2) any Phase III follow-on funding commitments; and
- b. The proposer's record of commercializing its prior SBIR projects.

A report showing that the proposing firm has no prior Phase II awards will not affect the firm's ability to win an award. Such a firm's proposal will be evaluated for commercial potential based on its commercialization strategy in item (a), above.

Government transition of the proposed effort is very important. The small business should include their transition vision in the Commercialization Strategy. The small business must understand the planned use of their effort and the needs of the DHS customer/end user.

4.5 Special Funding and Period of Performance Considerations

- a. Under special circumstances, requests for supplemental funds or modifications to an existing SBIR II contract and requests for an extension of the period of performance with or without funds may be considered.
- b. DHS SBIR has allowed flexibility regarding the award amount for the Domestic Nuclear Detection Office (DNDO), based on the wide variance of funds required for this technology. DHS SBIR will allow proposers submitting proposals for DNDO topics to propose up to \$150,000 for Phase I SBIR efforts without justification; and up to \$1,000,000 for Phase II SBIR efforts without justification.

4.6 SBIR Phase II Cost Match

- a. **General Provisions of the DHS SBIR Cost Match Program.** The DHS SBIR program has implemented a Cost Match program for Phase II projects to attract matching cash from an outside investor for the Phase II SBIR effort. The purpose is to focus SBIR funding on those projects that are most likely to be developed into viable new products that DHS and others will buy and that will thereby make a major contribution to homeland security and/or economic capabilities. The cost match can occur at the time of award, or during the Phase II period of performance.

Outside investors may include such entities as another company, a venture capital firm, an individual investor, or a non-SBIR government program; they do not include the owners of the small business, their family members, and/or affiliates of the small business. The outside investors must commit a minimum of \$100,000 up to a maximum of \$500,000. DHS will, at its option, match up to 50% of funds received. The SBIR Phase II basic awards will be made for a maximum of \$750,000 and the cost match award will be made for a maximum of \$250,000. The total cumulative SBIR funding for the Phase II award plus DHS cost match cannot exceed \$1,000,000. Outside investors may contribute funding above the \$1,000,000 cost match ceiling, however, DHS SBIR will only match 50% up to the \$250,000 maximum. For the DNDO topics, the total cumulative SBIR award for Phase II plus cost match is up to \$1,250,000. Outside investors may contribute funding above the SBIR DNDO \$1,250,000 cost match ceiling, however, DHS SBIR will only match 50% up to the \$250,000 maximum.

The additional work proposed should be an expansion of the technical work being performed in the Phase II project and must fall within the general scope of the present Phase II project.

- b. **How to Qualify for the SBIR Phase II Cost Match.** To qualify for the SBIR Cost Match program, a company must be a Phase I awardee submitting a Phase II proposal or a Phase II awardee. The company is encouraged to discuss the application with the SBIR program manager. The awardee is to follow Phase II proposal instructions and guidance, but provide the cost match documentation and request for matched funding.
1. A Phase II proposal must be submitted electronically on the DHS Electronic Submission web site (www.sbir.dhs.gov).
 2. The proposing company must:
 - a. State that the outside investor will match funding in the SBIR Phase II proposal, in cash, and state the amount of the outside investment, contingent on the company's selection for Phase II award.
 - b. Certify that the outside funding proposed in the application qualifies as a Cost Match investment, and the investor qualifies as an "outside investor," as defined above. Additional guidance on Cost Matching can be found at the on the web site: <http://www.sbir.dhs.gov/UsefulLinks.jsp>.
 - c. Provide a brief statement (less than one page) describing that portion of the effort that the investor will fund. The investor's funds may pay for additional research and development on the company's SBIR project or, alternatively, they may pay for other activities not included in the Phase II statement of work, provided these activities further the development and/or commercialization of the technology (e.g., marketing).
 - d. Provide qualitative and quantitative information reflecting any additional Period of Performance to complete the new or expanded effort. Provide a concise statement of work for the Cost Match effort (less than four pages) and detailed cost proposal (less than one page).
 3. The outside investor must provide:
 - a. A brief statement describing the investor's experience in evaluating companies' abilities to successfully commercialize technology, the investor's assessment of the market for this particular SBIR technology, and of the ability of the company to bring this technology to market.
 - b. A letter of commitment, signed by the investor(s), containing a commitment to provide a minimum of \$100,000 or up to \$500,000 Phase II Cost Match funding, in cash, contingent on the company's selection or performance of the Phase II award. An investor may contribute above the \$500,000 Phase II Cost Match; however Government matching funds will not exceed 50% up to the \$250,000 maximum.

4. The transfer of Investor Funding:

The company must certify within 60 days that the entire amount of the matching funds from the outside investor has been transferred to the company.

Certification consists of a letter, signed by both the company and its outside investor, stating that "\$ _____ in cash has been transferred to our company from our outside investor in accord with the SBIR Cost Match procedures." The letter must be sent to the DHS appointed contracting office along with a copy of the company's bank statement showing the funds have been deposited. The transfer of investor funds from another Government agency will be coordinated with the DHS SBIR designated contracting officer. **IMPORTANT:** If the contracting office does not receive, within 60 days, this certification showing the transfer of funds, the company will be ineligible to compete for a Phase II Cost Matching funding, unless a specific written exception is granted by the DHS SBIR program manager.

Failure to meet these conditions in their entirety and within the time frames indicated may disqualify a company from participation in the SBIR Cost Match. DHS maintains the right to award some, all, or none Phase II Cost Match requests. Phase II Cost Match funding is contingent upon, number of applications, availability of funds, and proper certification of investor funds.

c. **Additional Reporting Requirement.**

In the company's final Phase II progress report, a brief accounting must be included (in the company's own format or format that has been provided by the DHS PM) of how the investor's funds were expended to support the project.

5.0 CONTRACTUAL CONSIDERATIONS

Note: Eligibility and Limitation Requirements (Section 1.3) will be enforced.

5.1 Phase I Awards

- a. **Number of Phase I Awards.** The number of Phase I awards will be consistent with the Science and Technology Directorate's budget, and the Domestic Nuclear Detection Office's budget, and the number of anticipated Phase II contracts. No Phase I contracts will be awarded until all qualified proposals (received in accordance with Section 4.2) on a specific topic have been evaluated. Proposers will be notified of selection/non-selection within three (3) months of the closing date of this solicitation.
- b. **Type of Funding Agreement.** All winning proposals will be funded under negotiated contracts and may include a reasonable fee or profit consistent with normal profit margins provided to profit-making firms for R/R&D work, the firm fixed price contract will be used for all Phase I contracts.
- c. **Average Dollar Value of Awards.** Phase I awards to small businesses will typically cover a one-half person-year effort over a period not to exceed six months (subject to

negotiation). Public Law 102-564 allows agencies to award Phase I contracts up to \$100,000 without justification.

DHS SBIR has allowed flexibility regarding the Average Dollar Value with the DNDO topics based on the wide variance of funds required for this type of technology. DHS SBIR will allow Phase I proposers responding to the DNDO topics to propose up to \$150,000 without justification.

- d. **Timing of Phase I Awards.** The anticipated time between the date that this solicitation closes and the award of the Phase I is less than six (6) months.

5.2 *Phase II Awards*

- a. **Number of Phase II Awards.** The number of Phase II awards will depend upon the results of the Phase I efforts and the availability of funds. DHS anticipates that approximately 30 percent of its Phase I awards will result in Phase II projects. This is merely an advisory estimate and the government reserves the right and discretion not to award any or to award less than or more than this percentage of Phase II projects.
- b. **Type of Funding Agreements.** Each Phase II proposal selected for an award will be funded under a negotiated contract and may include a reasonable fee or profit consistent with normal profit margins provided to profit-making firms for R/R&D work.
- c. **Average Dollar Value of Awards.** Phase II awards will typically cover two to five person-years of effort over a period generally not to exceed 24 months. PL 102-564 states that the Phase II awards may be up to \$750,000 each without justification. DHS SBIR will allow Phase II proposers responding to the DNDO topics to propose up to \$1,000,000 without justification.
- d. **Timing of Phase II Awards.** Phase II awards will be made incrementally, as quickly as possible, to maintain the momentum of the Phase I effort. The Phase II proposal invitation process is an attempt to identify expeditiously those Phase I awardees deserving of Phase II awards. DHS reserves the right to evaluate individual Phase II proposals when received and make Phase II proposal invitations incrementally, to some, all, or none of the Phase I performers.

5.3 *Phase I Report*

- a. **Content.** A final report is required for each Phase I project. The report must contain in detail the project objectives, work performed, results obtained, and estimates of technical feasibility. In addition, monthly status and progress reports will be required by DHS. Please keep in mind that the monthly status reports and/or final reports are used as a basis to determine progress made towards the accomplishments of Phase I technical objectives when inviting Phase II proposals.
- b. **Preparation.**
 - 1) If desirable, language used by the company in its Phase II proposal to report Phase I progress may also be used in the final report.
 - 2) For each unclassified report, the company submitting the report must state one of the following statements:

- a) Approved for public release; distribution unlimited.
- b) Distribution authorized to U.S. Government Agencies only; contains proprietary information. Note: DHS, after reviewing the company's entry, has final responsibility for assigning a distribution statement.
- c. **Submission.** The company shall submit an electronic copy of the monthly reports and final report on each Phase I project in accordance with the Phase I contract and negotiated schedule via the DHS web site: <http://www.sbir.dhs.gov>. The monthly reports are normally every 30 days after the project start date, and the final report submission schedule will normally be within 15 days after completion of the Phase I technical effort. Please include the company name, topic number, proposal number and contract number in each report. Detailed submission instructions will be provided at contract award and on the DHS web site: <http://www.sbir.dhs.gov>.

5.4 Commercialization Updates in Phase II

If, after completion of Phase I, the contractor is awarded a Phase II contract, the contractor shall be required to periodically update the following commercialization results of the Phase II project through the web site at <http://www.sbir.dhs.gov>

- a. Sales revenue from new products and non-Research services resulting from the Phase II technology;
- b. Additional investment from sources other than the federal SBIR program in activities that further the development and/or commercialization of the Phase II technology;
- c. Whether the Phase II technology has been used in a fielded DHS system or acquisition program and, if so, which system or program;
- d. The number of patents resulting from the contractor's participation in the SBIR program;
- e. Growth in number of firm employees; and
- f. Whether the firm has completed an initial public offering of stock (IPO) resulting, in part, from the Phase II project.

These updates on the project will be required one year after the start of Phase II, at the completion of Phase II, and subsequently when the contractor submits a new SBIR proposal to DHS. Firms that do not submit a new proposal to DHS will be asked to provide updates on an annual basis for five years after the completion of Phase II.

5.5 Payment Schedule

The specific payment schedule (including payment amounts) for each contract will be incorporated into the contract upon completion of negotiations between the Government and the successful Phase I or Phase II proposer. Successful proposers may be paid periodically as work progresses in accordance with the negotiated price and payment schedule. Phase I contracts are primarily fixed price contracts, under which monthly payments may be made. Final payment will follow completion of contract performance and acceptance of all work required under the contract.

Phase II funding awards may be Cost Reimbursement type contracts. Progress payments are allowed in accordance with the negotiated price and payment schedule. Provisions for payment of a fee or profit are also allowable. Final payment will follow completion of contract performance and acceptance of all work required under the agreement.

5.6 *Markings of Proprietary Proposal Information*

The proposal submitted in response to this solicitation may contain technical and other data that the proposer does not want disclosed to the public or used by the Government for any purpose other than proposal evaluation. Information contained in unsuccessful proposals will remain the property of the proposer except for the proposal cover sheet. The Government may, however, retain copies of all proposals. Public release of information in any proposal submitted will be subject to existing statutory and regulatory requirements.

If proprietary information is provided by a proposer in a proposal that constitutes a trade secret, proprietary commercial or financial information, or personal information or data, it will be treated in confidence, to the extent permitted by law, provided this information is clearly marked by the proposer with the term "PROPRIETARY" (do not use "Company Confidential") and provided that the following legend that appears on the Proposal Cover Sheet of the proposal is completed:

"For any purpose other than to evaluate the proposal, this data except proposal cover sheet shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part, provided that if a contract is awarded to the proposer as a result of or in connection with the submission of this data, the Government shall have the right to duplicate, use or disclose the data to the extent provided in the funding agreement. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction. The data subject to this restriction is contained on the pages of the proposal listed on the line below."

Any other legend may be unacceptable to the Government and may constitute grounds for removing the proposal from further consideration and without assuming any liability for inadvertent disclosure. The Government will limit dissemination of properly marked information to within official channels. In addition, each page of the proposal containing proprietary data which the proposer wishes to restrict must be marked with the following legend:

"Use or disclosure of the proposal data on lines specifically identified by asterisk (*) are subject to the restriction on the Cover Sheet of this proposal."

If all of the information on a particular page is proprietary, the proposer should so note by including the word "PROPRIETARY" (do not use "Company Confidential") in both the header and footer on that page. The Government assumes no liability for disclosure or use of unmarked data and may use or disclose such data for any purpose.

In the event properly marked data contained in a proposal in response to this solicitation is requested pursuant to the Freedom of Information Act, 5 USC §552, the proposer will be advised of such request and prior to such release of information will be requested to expeditiously submit to DHS a detailed listing of all information in the proposal which the proposer believes to be exempt from disclosure under the Act. Such action and cooperation on the part of the proposer will ensure that any information released by DHS pursuant to the Act is properly determined.

DHS SBIR does not anticipate that proposals submitted in response to this solicitation will be classified.

5.7 Copyrights

With prior written permission of the contracting officer, the awardee may copyright (consistent with appropriate national security considerations, if any) material developed with DHS support. DHS receives a royalty-free license for the Federal Government and requires that each publication contain an appropriate acknowledgment and disclaimer statement.

5.8 Patents

Small business firms normally may retain the principal worldwide patent rights to any invention developed with Government support. The Government receives a royalty-free license for its use, reserves the right to require the patent holder to license others in certain limited circumstances, and requires that anyone exclusively licensed to sell the invention in the United States must normally manufacture it domestically.

5.9 Technical Data Rights

Rights in technical data, including software, developed under the terms of any contract resulting from proposals submitted in response to this solicitation generally remain with the contractor, except that the Government obtains a royalty-free license to use such technical data only for Government purposes during the period commencing with contract award and ending four years after completion of the project under which the data were generated. Upon expiration of the four-year restrictive license, the Government has unlimited rights in the SBIR data. See FAR clause 52.227-20, "Rights in Data -- SBIR Program."

5.10 Contractor Commitments

Upon award of a contract, the contractor will be required to make certain legal commitments through acceptance of Government contract clauses in the Phase I contract. The outline that follows is illustrative of the types of provisions required by the Federal Acquisition Regulations that will be included in the Phase I contract. This is not a complete list of provisions to be included in Phase I contracts, nor does it contain specific wording of these clauses. Copies of complete general provisions will be made available prior to award.

- a. **Standards of Work.** Work performed under the contract must conform to high professional standards.
- b. **Inspection.** Work performed under the contract is subject to Government inspection and evaluation at all reasonable times.
- c. **Examination of Records.** The Comptroller General (or a fully authorized representative) shall have the right to examine any directly pertinent records of the contractor involving transactions related to this contract.
- d. **Default.** The Government may terminate the contract if the contractor fails to perform the work contracted.

- e. **Termination for Convenience.** The contract may be terminated at any time by the Government if it deems termination to be in its best interest, in which case the contractor will be compensated for work performed and for reasonable termination costs.
- f. **Disputes.** Any dispute concerning the contract that cannot be resolved by agreement shall be decided by the contracting officer with right of appeal.
- g. **Contract Work Hours.** The contractor may not require an employee to work more than eight hours a day or forty hours a week unless the employee is compensated accordingly (that is, receives overtime pay).
- h. **Equal Opportunity.** The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin.
- i. **Affirmative Action for Veterans.** The contractor will not discriminate against any employee or applicant for employment because he or she is a disabled veteran or veteran of the Vietnam era.
- j. **Affirmative Action for Handicapped.** The contractor will not discriminate against any employee or applicant for employment because he or she is physically or mentally handicapped.
- k. **Officials Not to Benefit.** No member of, or delegate to Congress, shall benefit from the contract.
- l. **Covenant Against Contingent Fees.** No person or agency has been employed to solicit or secure the contract upon an understanding for compensation except bona fide employees or commercial agencies maintained by the contractor for the purpose of securing business.
- m. **Gratuities.** The contract may be terminated by the Government if any gratuities have been offered to any representative of the Government to secure the contract.
- n. **Patent Infringement.** The contractor shall report each notice or claim of patent infringement based on the performance of the contract.
- o. **Security Requirements.** The contractor shall safeguard any classified information associated with the contracted work in accordance with applicable regulations as specified in section 7.0.
- p. **American-Made Equipment and Products.** When purchasing equipment or a product under the SBIR funding agreement, purchase only American-made items whenever possible.

5.11 Contractor Registration

Before DHS can award a contract to a successful proposer under this solicitation, the proposer must be registered in the Central Contractor Registration (CCR) database. The CCR allows Federal Government contractors or firms interested in conducting business with DHS to provide basic information on business capabilities and financial information. To register, visit <http://www.ccr.gov> or call 1-888-227-2423.

5.12 *Invention Reporting*

SBIR awardees must report inventions to the awarding agency within two (2) months of the inventor's report to the awardee. Election to retain or not retain title to the subject invention must be reported two (2) years after disclosure to the Government unless there is a statutory bar (i.e., publication disclosing the invention). The reporting of inventions may be accomplished by submitting form DD0882, to the SBIR designated contracting officer. The form can be found on the DHS SBIR web site, <http://www.sbir.dhs.gov/UsefulLinks.asp>.

5.13 *Additional Information*

- a. **General.** This Program Solicitation is intended for informational purposes and reflects current planning. If there is any inconsistency between the information contained herein and the terms of any resulting SBIR contract, the terms of the contract are controlling.
- b. **Small Business Data.** Before award of an SBIR contract, the Government may request the proposer to submit certain organizational, management, personnel, and financial information to confirm responsibility of the proposer.
- c. **Proposal Preparation Costs.** The Government is not responsible for any monies expended by the proposer before award of any contract.
- d. **Government Obligations.** This Program Solicitation is not an offer by the Government and does not obligate the Government to make any specific number of awards. Also, awards under this program are contingent upon the availability of funds.
- e. **Duplication of Work.** If an award is made pursuant to a proposal submitted under this Program Solicitation, the contractor will be required to certify that he or she has not previously been, nor is currently being, paid for essentially equivalent work by an agency of the Federal Government.
- f. **Unsolicited Proposals.** Unsolicited proposals will not be accepted under the DHS SBIR program in either Phase I or Phase II. Phase III awards can only be made to recipients of Phase I or Phase II awards.
- g. **Classified Proposals.** DHS SBIR does not anticipate that proposals submitted in response to this solicitation will be classified.

6.0 **SUBMISSION OF PROPOSALS**

Each proposal must be submitted on the DHS electronic submission web site at <http://www.sbir.dhs.gov> and contain a completed:

- Proposal Cover Sheet,
- Technical Proposal,
- Cost Proposal, and
- Commercialization Report (Phase II Proposals only).

6.1 Electronic Proposal Submission

For complete electronic proposal submission on the DHS electronic submission web site, first prepare the proposal cover sheet (select "Prepare/Edit Phase I Cover Sheet" from the Main Menu). The web site will assign the cover sheet a proposal number, which will be used for tracking throughout the submission process. Prepare the technical proposal in a single Portable Document Format (PDF) file, check it for viruses, and upload it to the submission web site, following instructions on the web site. The cost proposal may be submitted either using the on-line form or as the last page(s) of your technical proposal file.

Technical proposals should be a single file, including all graphics and attachments, should have the company name and proposal number (from the cover sheets) in the header, and should be in PDF. Proposers are responsible for performing a virus check on each technical proposal prior to uploading. Every uploaded file will be scanned for viruses. If a virus is detected, the file will be deleted and may cause rejection of the proposal.

Once uploaded, the technical proposal file may be viewed or downloaded from the web site by clicking on the Check Upload button. Proposers are responsible for verifying that the technical proposal was received and converted properly. Technical proposals may be uploaded as often as necessary, each time overwriting the file previously submitted. Once a file is overwritten, the previous version is NOT retrievable. Proposers electing to modify their proposals in any way must allow enough time to upload a complete updated proposal. Failure to provide a complete modification by the solicitation closing will render the proposer's proposal as "late" regardless of whether the proposer had previously submitted a complete proposal.

Once the "Submit Proposal," button has been selected, an email confirmation receipt will be forwarded to your email account upon successful submission of your proposal. Signatures are not required on the cover sheets and cost proposal for electronic submission. If the proposal is selected for award, the DHS designated contracting office will contact you for all appropriate signatures.

6.2 Proposal Deadline

Proposals are accepted from **27 June 2007 – 13 August 2007**. Deadline for electronic receipt of proposals is 4:30 pm ET 13 August 2007. Proposals must be completely submitted to the DHS submission web site by the specified closing time. Complete submission means that the entire proposal (including the following three (3) parts: cover sheets, technical proposal, and cost proposal) has been properly completed and fully transmitted to the DHS submission web site and electronically date stamped. The solicitation deadline is firm. As the close date draws near, heavy traffic on the web server may cause delays. Plan ahead and leave ample time to prepare and submit your proposal. Proposers bear the risk of web site inaccessibility due to heavy usage in the final hours before the solicitation closing time. In accordance with FAR 52.215-1, proposers are responsible for submitting proposals, and any modification, or revisions, so as to reach the Government office designated in the solicitation by the time specified in the solicitation.

6.3 Notification of Proposal Receipt

Notification of receipt of proposal will be provided via e-mail.

6.4 Information on Proposal Status

Evaluation of Phase I proposals and award of contracts will be expedited, but no information on proposal status will be available until the final selection is made. However, contracting officers may contact any and all qualified proposers prior to contract award. Selections will be posted on the DHS SBIR web site when all selected proposals have been negotiated for award within six months of the solicitation closing date.

Evaluation of Phase II proposals will begin upon receipt of the individual proposals. DHS reserves the right to make Phase II awards incrementally as Phase II proposals are received and evaluated. Selections will be posted on the DHS SBIR web site as awards are made.

6.5 Evaluation Results

Any proposer that submits a request within 3 days of being notified of their proposal being selected, or non-selected, for award will be provided a copy of the evaluation results. The request should be emailed to faq@hsarpasbir.com.

6.6 Correspondence Relating to Proposals

All correspondence relating to proposals should cite the SBIR solicitation number, proposal number, and specific topic number.

7.0 SECURITY

7.1 Submitting a Classified Response to this Solicitation

DHS SBIR does not anticipate that proposals submitted in response to this solicitation will be classified. If an offeror intends to submit a proposal containing classified information, the proposal must be submitted via proper classified courier or proper classified mailing procedures as described in the National Industrial Security Program Operating Manual (NISPOM). Offerors may view the NISPOM document online at <http://www.dss.mil/isec/nispom.htm>. **CLASSIFIED SUBMITTALS CANNOT BE TRANSMITTED VIA THE WEB SITE.** Classified submittals must include 10 printed proposals and one electronic copy on compact disc recordable (CD-R) media (do not use re-writable media (CD-RW/RW-RW+)).

Classified proposals **MUST** be received by the applicable due date and time listed in this solicitation. Classification does not eliminate the requirement for Offerors to comply with all of the terms and conditions of this solicitation (e.g., deadlines, instructions, etc.).

Classified proposals can be delivered by courier to:

Director of Security
Department of Homeland Security
Science and Technology Directorate
1120 Vermont Avenue NW
Room 10-112

Washington, DC 20005

Electronic copies can be emailed to: Chris.featherston@dhs.gov

NOTE: Please send an unclassified alert email to Christopher.feathers@dhs.gov before emailing classified.

Classification does not eliminate the requirement for offerors to comply with all instructions and deadlines in this solicitation.

If an SBIR project funded under this solicitation requires access to and/or the generation of classified material and data as specified in the Technical Topic area, offerors for this solicitation must provide an acceptable information security plan. Even if initial phases of the work are unclassified, future phases of this program could be performed at classified levels.

8.0 SCIENTIFIC AND TECHNICAL INFORMATION ASSISTANCE

8.1 SAFETY Act

Congress enacted the Support Anti-terrorism by Fostering Effective Technologies Act of 2002 (the "SAFETY Act") as part of the Homeland Security Act of 2002. The SAFETY Act provides limitations on the potential liability of those firms that develop and provide qualified anti-terrorism technologies. DHS's Science and Technology Directorate, acting through its Office of SAFETY Act Implementation, encourages the development and deployment of anti-terrorism technologies by making available the SAFETY Act's system of "risk management" and "liability management."

Offerors submitting proposals in response to this solicitation are encouraged to submit SAFETY Act applications on their existing technologies and are invited to contact the Office of SAFETY Act Implementation (OSAI) for more information at 1-866-788-9318 or helpdesk@safetyact.gov or visit OSAI's web site at www.safetyact.gov.

8.2 Scientific and Technical Reference

Scientific and technical reference information is provided with each individual topic provided in Section 9.0.

8.3 State and Other Assistance Available

Many states have established programs to provide services to those small firms and individuals wishing to participate in the Federal SBIR program. These services vary from state to state, but may include:

- Information and technical assistance.
- Matching funds to SBIR recipients.
- Assistance in obtaining Phase III funding.

Contact your State SBIR Support office at www.ed.gov/offices/OERI/SBIR/statelink.html for further information.

Small businesses may seek general administrative guidance from small and disadvantaged business utilization specialists located in various activities throughout the continental United States.

9.0 TECHNICAL TOPICS

This section contains detailed topic descriptions outlining the technical areas in which DHS requests proposals. Topics are listed and numbered separately.

DHS invests in programs offering the potential for revolutionary changes in technologies that promote homeland security or accelerates the prototyping and deployment of technologies that reduce homeland vulnerabilities. Thus, the DHS SBIR goal is to pursue as many innovative research ideas and concepts that promote homeland security with the potential for commercialization.

DHS has identified technical topics to which small businesses may respond in the second part of the fiscal year (FY 2007) solicitation (FY07.2). Please note that these topics are UNCLASSIFIED and CLASSIFIED Phase I proposals are **not** anticipated. Although the topics are unclassified, the subject matter may be considered to be a "critical technology." If you plan to employ non-U.S. citizens in the performance of a DHS SBIR contract, please identify these individuals in your proposal as specified in Section 3.5.b (7) of the program solicitation. A list of the topics currently eligible for proposal submission is included in this section followed by full topic descriptions. These are the only topics for which proposals will be accepted at this time.

ELECTRONIC SUBMISSION of Cover Sheet, Technical and Cost proposal IS REQUIRED. Only proposals submitted through the on-line submission web site at <http://www.sbir.dhs.gov> will be accepted or considered for award. Proposals must be prepared and submitted in accordance with the instructions below.

HELPFUL HINTS:

Consider the file size of the technical proposal to allow sufficient time for uploading.

- Perform a virus check.
- Signature is no longer required at the time of submission.
- If you encounter problems during electronic submission call toll free at 1-800-754-3043.
- Facsimile (fax) or e-mail proposals submissions will not be accepted.

Phase I SBIR proposals shall not exceed \$100,000 (or \$150,000 for DNDO topics), and should be a **six-month or less effort**.

DHS Phase II proposals may be invited by the respective Phase I DHS Program Manager. Phase II invitations will be based upon progress toward meeting the Phase I technical objectives, on the technical results reflected in the monthly and/or final reports, by site visits conducted by DHS, and plans for Phase II.

Prior to receiving a contract award, the small business **MUST** be registered in the Central Contractor Registration (CCR) Program. You may obtain registration information by calling 1-888-227-2423 and pressing 3 or at <http://www.ccr.gov>.

As funding is limited, DHS reserves the right to select and fund only those proposals considered to be superior in overall technical quality and highly relevant to the DHS mission. As a result, DHS may fund more than one proposal in a specific topic area if the technical quality of the proposal(s) is deemed superior, or it may not fund any proposals in a topic area. Each proposal submitted to DHS must have a topic number and must be responsive to only one topic.

- Cost proposals will be considered to be binding for 180 days from closing date of solicitation.
- Successful proposers will be expected to begin work no later than 30 days after contract award.
- For planning purposes, the contract award process is normally completed within 45 to 60 days from issuance of the selection notification letter to Phase I proposers.
- DHS holds kick-offs meetings with all successful bidders approximately two weeks after contract award to discuss the SBIR program and reporting, invoicing, technical objectives and other subjects.

CLOSED

***DHS S&T DIRECTORATE TOPICS -- DHS Small Business Innovation Research (SBIR)
Fiscal Year 07 Publication 2***

- H-SB07.2-001 Spectroscopic Methods for Explosives Detection**
- H-SB07.2-002 Detection of Human Targets in Open Water**
- H-SB07.2-003 Optimizing Remote Capture of Biometrics for Screening Processes**
- H-SB07.2-004 Responder-Wireless Body Area Network**
- H-SB07.2-005 Secure and Reliable Wireless Communication for Control Systems**
- H-SB07.2-006 Robust Algorithm Development for Multidimensional Chemical Analysis**

***DHS DNDO TOPIC -- DNDO Small Business Innovation Research (SBIR) Fiscal Year 07
Publication 2***

- H-SB07.2-007 Neutron and Photon Generators for Advanced Special Nuclear Material (SNM) Interrogation and Verification Systems**

CLOSED

9.1 SBIR TOPIC NUMBER: H-SB07.2-001

TITLE: Spectroscopic Methods for Explosives Detection

TECHNOLOGY AREAS: Analytical Chemistry, Explosives Detection, Spectroscopy

OBJECTIVE: Develop spectroscopic methods for standoff detection of near-trace-level explosives for possible vehicle-borne improvised explosive devices (VBIED) or suicide-bomber threats.

DESCRIPTION: Trace explosive detection equipment has been developed for a broad range of applications and venues. In most cases, a physical swab of the suspect article is taken and introduced to the detection system for subsequent description and analysis. Although ideal for certain applications, this type of checkpoint detection is not well-suited for scenarios where the alarm must sound significantly in advance of the response. Furthermore, improvements to standoff detection capabilities are needed to avoid the terrorist's designation of the screening checkpoints as a fallback or secondary target. Desirable capabilities of the proposed system include the following:

- Flexible Concept of Operations (ConOps) options (e.g., vehicle and people screening)
- Near-trace-level sensitivity to multiple explosives (e.g., 10^{-6} g for this effort)
- Detection capabilities for multiple classes of explosives: military, inorganic, peroxide-based, etc.
- Noncontact, standoff detection (10m for this effort)
- Chemical selectivity against commonly encountered materials (cleaners, foods, etc.)
- Short interrogation time (< 6 sec for this effort)
- Eye-safe lasers, if applicable
- Nondestructive interrogation.

PHASE I: Demonstrate the feasibility of the proposed technical approach. A laboratory demonstration of feasibility is required via a mutually agreeable set of performance metrics. The chemical and/or physical basis of the proposed technology should be described.

PHASE II: Develop and deliver a prototype system for extended testing at an environmentally contained government facility. Based on the results of the Phase I project, a mutually agreeable set of performance metrics will be established. Provide the necessary training and support for test and evaluation.

PHASE III COMMERCIAL APPLICATIONS: In addition to homeland security and defense applications, standoff detection capabilities are required by state and Federal law-enforcement entities as well as private security organizations.

REFERENCES:

Survey of Commercially Available Explosives Detection Technologies and Equipment 2004, prepared by Sandia National Laboratories for The National Law Enforcement and Correction Technology Center, a Program of the National Institute of Justice, 11/04.

Advances in Analysis and Detection of Explosives; Jehuda Yinon, Ed.; ISBN-10: 0792321383; Springer, 2003.

KEYWORDS: trace explosives, explosives detection, standoff detection, spectroscopy, VBIEDs, suicide bombers

CLOSED

9.2 SBIR TOPIC NUMBER: H-SB07.2-002

TITLE: Detection of Human Targets in Open Water

TECHNOLOGY AREAS: Automated Target Recognition (ATR), Signal Processing, Infrared, Multispectral, Geo-registration, and Avionics Integration

OBJECTIVE: Develop an innovative prototype system for real time detection of human targets in seawater. The offeror's proposal should clearly state what the probability of detection (P_d) of a human head and neck in water is expected to be achieved with their proposed sensor and signal processing. Parameters affecting this analysis, such as aircraft altitude, search area (example 5x5 nautical mile box), must be specified and the affects of increased aircraft altitude and search area should be discussed. The effects of sea state and weather on system performance must be addressed.

DESCRIPTION: Current sensor systems on Department of Homeland Security aircraft do not support high probabilities of detection for human targets in the water. The addition of geo-registered anomaly detections, with broader geometric coverage than turreted systems, would allow for higher fidelity scans of open-ocean and littoral environments for humans. Currently, if a turreted system is in scan mode, it must be stopped to enter the classification and identification processes. A separate detection system that provides geo-registered targets could then cue a turreted system to slew to those positions for identification, classification, and tracking for more consistent coverage for detection of humans in water.

The system would have a standard interface to enable it to be part of an integrated sensor suite that would provide cross cueing of information to other components such as heads up displays, radar, turreted electro-optic/infrared (EO/IR), and recording systems. The system could display infrared or other spectral anomalies for operator assessment. The system will provide continuous coverage with estimated probabilities of detection (P_d) regardless of the status or employment of other onboard sensors. The system will have adjustable detection thresholds against various backgrounds for reduction of false alarms.

PHASE I: Phase I will deliver a robust, executable system design and integration approach. The design concept should include test and support plans that ensure the successful execution of subsequent phases. A discussion of the Concept of Operations and any critical operational issues will be provided. During Phase I, the feasibility of the concept must be demonstrated either through modeling and simulation or with data collected with engineering design hardware/software. A draft Developmental Test Plan and a draft Integrated Logistics Support Plan will be developed and delivered.

PHASE II: Phase II will deliver a working prototype system(s) for laboratory and then airborne testing. The prototype system will be tested in accordance with the Developmental Test Plan which will be an updated/refined version of the Phase I draft Developmental Plan. Provide analysis that shows that the Phase I Integrated Logistics Support Plan is reasonable. Based on data collections, assess uncertainties in the coverage models and identify/mitigate remaining risk.

PHASE III COMMERCIAL APPLICATIONS:

The detection system application has broad applicability in the areas of: counter terrorism in the Maritime Domain, search and rescue, open-ocean homeland security and law enforcement

patrols, disaster response, scientific observation of the maritime environment, special missions. Technologies that are likely to be inserted into the system are Automated Target Recognition (ATR), knowledge management information technologies, infrared or other spectral camera technology, standardized integration technologies, and digital video technologies.

REFERENCES:

C-130J Operational requirement 4.6.1.1.dated 16 October 2003 “Small targets (as small as a single person in the water) shall be detected and tracked by sensors with a probability of detection (on one pass) of at least 90% (threshold).”

The Integrated Deepwater Program <http://www.uscg.mil/deepwater/program/program.htm>

The Department of Homeland Security Mission Statement and Strategic Goals
<http://www.dhs.gov/xabout/strategicplan/>

KEY WORDS: Automated Target Recognition (ATR), signal processing, Search and Rescue (SAR)

CLOSED

9.3 SBIR TOPIC NUMBER: H-SB07.2-003

TITLE: Optimizing Remote Capture of Biometrics for Screening Processes

TECHNOLOGY AREAS: Biometrics, Screening Technologies

OBJECTIVE: Develop a methodology as well as a test and evaluation framework for assessing the maximum standoff ranges in which multiple biometrics can be captured while still ensuring accuracy in determining an individual's identity.

DESCRIPTION: The accuracy of identification using known biometrics depends on immediate or close contact with an individual. Remote capture techniques are now being developed for such biometrics techniques as facial recognition and iris scanning. Their operating ranges are, however, short. In addition, techniques such as speaker recognition, gait determination, and physiological or neurological measurements, while inherently noncontact, lose sensitivity as the distance between the subject and the sensor increase. The traditional approach to addressing such problems is to enhance the sensitivity and performance of individual measures. Advances here depend primarily on developments in sensor design, algorithm performance, and noise reduction. Another approach that offers the potential for application to the challenging screening environments that apply in diverse homeland security venues is the collection and simultaneous processing of multiple biometrics modes, or multimodal biometrics. Such environments require that remote or standoff techniques be used, especially when interference with the movement or the mobility of travelers is to be minimized.

PHASE I: Establish a set of multimodal biometrics that, when applied, can establish the identity of an individual.

PHASE II: Develop a framework for evaluating the performance of the combined multi-biometrics measure as the operating range (standoff or remote distance) increases and test the performance of the resulting capability in controlled settings.

PHASE III COMMERCIAL APPLICATIONS: Demonstrate the operation of a standoff multimodal biometrics identification capability in a relevant environment. If successful, the resultant methodology has potential application for law enforcement, future checkpoints, as well as military uses.

REFERENCES: Use web sites or references found through the National Technical Information Service (NTIS) or the Defense Technical Information Center (DTIC).

KEYWORDS: Biometrics, facial recognition, voice analysis, iris scans, identification, screening

9.4 SBIR TOPIC NUMBER: H-SB07.2-004

TITLE: Responder - Wireless Body Area Network

TECHNOLOGY AREAS: Network Technologies, Wireless Body Area Networks

OBJECTIVE: To develop a wireless body area network that will enable remote monitoring and tracking of sensors on a first responder.

DESCRIPTION: The safety of emergency responders is the highest priority of Incident Commanders. Currently, the ability to track and monitor responders is somewhat limited. Sensor technologies can provide various data about the responder including physiological monitoring and personal alert safety system (PASS) functionality. However, operating conditions such as distance and building construction can be limiting factors, requiring each sensor working alone to provide the power and flexible overhead to adapt to each environment.

Recent progress in the research and development of wireless body area networks might help facilitate cost effective and flexible solutions for first responders. Wireless body area network technology could provide the ability to use a less expensive array of plug and play sensors for different needs and responder requirements. A wireless body area network standard might allow responders to competitively select from various vendors with unique specialization in order to be equipped with the most appropriate sensor grouping for their job. Such a modular approach would allow for sensor and network technologies to evolve yet minimizing loss of total investment.

This topic description seeks to explore network technologies that can forward real time information about a specific first responder from a flexible array of multiple sensors to a receiver. The technology needs to be: easy to use (lightweight and small); non-invasive; able to be integrated with existing personal protective equipment; able to be used in all forms of structures; and not be cost prohibitive.

PHASE I: Develop an approach for network technologies that can be used for a wireless body area network in a responder environment. Perform analysis of special environmental needs of responder communities such as penetration through dense structures, ease of use, set up, and maintenance. Develop a design for a responder - wireless body area network.

PHASE II: Develop a prototype of a responder - wireless body area network. Evaluate the prototype in a simulated operational environment. Conduct tests of the responder – wireless body area network using multiple sensors and multiple units in multiple operating environments. Provide a draft operational standard.

PHASE III COMMERCIAL APPLICATIONS: The responder - wireless body area network has significant commercial application with the directly intended audience as well as indirect related applications such as the medical and sports. Networked sensors could be produced by various manufacturers as well as the network components creating a whole area diverse capabilities and flexible configurations.

REFERENCES:

CSE574S: Advanced Topics in Networking: Wireless and Mobile Networking (Spring 2006) Raj Jain Instructor. Ibrahim Noorzaie student "Survey Paper: Medical Applications of Wireless Networks" 4/24/2006

http://www.cse.wustl.edu/~jain/cse574-06/ftp/medical_wireless/index.html

Emil Jovanov, Aleksandar Milenkovic, Chris Otto, Piet C. de Groen, "A wireless body area network of intelligent motion sensors for computer assisted physical rehabilitation," Journal of NeuroEngineering and Rehabilitation, 2:6, March 1, 2005.

http://www.ece.uah.edu/%7Emilenka/docs/ejam_jner05.pdf

Emil Jovanov, Aleksandar Milenkovic, Chris Otto, Piet de Groen, Bruce Johnson, Steve Warren, Gueseppe Taibi, "A WBAN System for Ambulatory Monitoring of Physical Activity and Health Status: Applications and Challenges," Proceedings of the 27th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS), Shanghai, China, September 2005.

http://www.ece.uah.edu/~jovanov/papers/embs05_wban.pdf

N. Timmons and W. Scanlon, "Analysis of the performance of IEEE 802.15.4 for medical sensor body area networking," IEEE Sensor and Ad Hoc Communications and Networks Conference (SECON), 2004.

<http://www.ece.mtu.edu/ee/faculty/cchigan/EE5970-Seminar/BSN-802-15-4.pdf>

KEY WORDS: wireless body area network, sensors, personnel tracking, activity monitoring

CLOSED

9.5 SBIR TOPIC NUMBER: H-SB07.2-005

TITLE: Secure and Reliable Wireless Communication for Control Systems

TECHNOLOGY AREAS: Cyber Security

OBJECTIVE: There is a need for secure, reliable, and robust wireless communications in field settings.

DESCRIPTION: Wireless use beyond the information technology (IT) domain to the process control system domain is growing every day. It will be inevitable as long as it benefits the productivity of the automated critical infrastructure, and as long as it is cost-effective. Therefore, greater wireless availability is required as well as robustness, since the wireless signal in an industrial setting must always get to where it must be in the most efficient and fastest manner.

Over the past three years, advances in encryption and new Wi-Fi protocols have provided traditional wireless networks better security features for the control and industrial network environment. Additionally, wireless technology is advancing at a fast pace, and is continuing to offer the various automated industries products and features that will further decrease operating cost and increase production efficiencies. However, with the anticipated increased use of wireless, an increase in interference and therefore a decrease in availability is a growing and credible issue.

Efforts responding to this topic should investigate emerging wireless technologies that can be deployed as either add-ons or upgrades to existing systems, such as:

- Hybrid wire and wireless systems
- Field sensors consisting of micro-electronic-mechanical systems
- Self-assembling network arrays
- Cognitive radios

Research is required to develop recommended architectures, procedures, and practices for deploying these new products in ways that enhance security and ensure availability, as well as maintain their original functionality.

PHASE I: Identify most pertinent and viable emerging technologies for secure wireless communications and develop the system design (including algorithms) and procedures for the incorporation of these technologies in to existing systems.

PHASE II: Develop a potentially commercially viable method of real-time event information feedback to operations and control systems personnel, including specific standards and metrics that can decide what to log based on current and anticipated cyber exploits and vulnerabilities of control systems, how long to maintain log files, how to protect the integrity of logged data, and provide analysis of log file data.

PHASE III COMMERCIAL APPLICATIONS: New technology successfully developed in this program will transition to commercial internet and network security products for federal, state, and local homeland security applications. In addition, this technology has commercial potential for similar DOD applications.

REFERENCES:

Interagency Working Group on Cyber Security and Information Assurance. (2006, April). *Federal Plan for Cyber Security and Information Assurance Research and Development*. Retrieved from the Networking and Information Technology Research and Development (NITRD) Web site: http://www.nitrd.gov/pubs/csia/csia_federal_plan.pdf

KEY WORDS: wireless communication, network security, control systems

CLOSED

9.6 SBIR TOPIC NUMBER: H-SB07.2-006

TITLE: Robust Algorithm Development for Multidimensional Chemical Analysis

TECHNOLOGY AREAS: Chemical Detection, Chemometrics

OBJECTIVE: This effort will provide robust software congruent with the multi-dimensional chemical detection technologies currently being developed for the DHS S&T Directorate.

DESCRIPTION: Homeland security applications require highly reliable detection of hazardous materials in a highly cluttered ambient environment. Most often the rejection of signals from ubiquitous non-hazardous materials is a significant challenge, causing false positive alarms and thus forcing setting off alarm thresholds above concentration levels dangerous to life and health.

There are single chemical analysis techniques (such as mass spectrometry, gas chromatography or spectroscopy) that have necessary selectivity and sensitivity to reduce alarm thresholds and thus false positives, however, these technologies often are power-intensive, require appropriate expertise to operate and maintain, or represent logistical burden (e.g., external carrier gas), particularly for the first responder application.

Multidimensional (hyphenated) analytical techniques or multiple sensor arrays, increase the data space and thereby provide an effective means for implementing interferent rejection. However, the signal processing of the resulting data from such multidimensional systems can be complex.

This effort should be focused on the development of a robust signal processing algorithm with the following features:

- Automated peak detection and evaluation
- Low signal/noise (s/n) environments
- Low false positive rate
- High true positive rate
- Robust for noisy, variable data
- Non-ideal peak shapes
- Peak centroiding
- Specificity and sensitivity
- Low identification confusion (species interference)
- Peak discrimination
- Robust for low element discrimination (i.e., low resolution, low peak capacity systems)
- Supervised and unsupervised training (calibration)
- Low computing resource requirements

PHASE I: Develop and deliver a feasibility report that describes the approaches investigated toward development of an algorithm which encompasses all or as many of the above features as possible. Describe the proposed algorithm approach, including strengths and weaknesses. Include a preliminary discussion of the validation process.

PHASE II: Phase II should result in a fully validated algorithm performance and a beta test version of an executable software object available for Original Equipment Manufacturer (OEM) testing detectors.

PHASE III COMMERCIAL APPLICATIONS: The end product software will have application to a number of multidimensional and hyphenated techniques capable of providing X,Y,Z data input— for example, fluorescence, gas chromatography-mass spectrometry (GC-MS), gas chromatography – ion mobility spectrometry (GC-IMS), liquid chromatography chromatography –infrared spectroscopy (LC-IR), differential mobility spectrometry and ion mobility spectrometry (DMS-IMS), multisensor arrays, two dimensional nuclear magnetic resonance (NMR) — to the algorithm. In addition to the OEM product for instrument manufacturers, the end product software may be marketed in an end user data application for generalized post processing of a variety of multidimensional chemical detection data.

REFERENCES:

"Pattern Classification", R. O. Duda, P. E. Hart, D. G. Stork, (John Wiley, NY, 2001)

"Partial Least Squares Regression: A Tutorial", P. Geladi, B. R. Kowalski, *Analytica Chimica Acta*, v. 185 (1986), p. 1-17

"A Statistical View of Some Chemometrics Regression Tools", I. E. Frank, J. H. Friedman, *Technometrics*, May 1993, v. 35 (2), p. 109-148

KEY WORDS: pattern recognition, linear regression, matrices, neural networks, fuzzy logic, Bayesian classifiers, supervised and unsupervised training, artificial intelligence

CLOSED

9.7 SBIR TOPIC NUMBER: H-SB07.1-007 (DNDO Topic)

TITLE: Neutron and Photon Generators for Advanced Special Nuclear Material (SNM) Interrogation and Verification Systems

TECHNOLOGY AREAS: Radiological

OBJECTIVE: New neutron and photon (x-ray or gamma-ray) generators are sought as enabling technologies for advanced special nuclear material (SNM) interrogation and verification systems. The photon/neutron generators should be compact, efficient, and low power consumption for mobile applications.

DESCRIPTION: All proposed technologies must include a longer term, technology path forward leading to an affordable device with size, shape, weight, and power requirements commensurate or better than existing generators. All devices must be portable and must not include radioactive material. Specific generators of interest include:

- Continuous-wave, high-duty ratio or DC electron accelerator for the production of Bremsstrahlung x-rays with the following characteristics: high effective duty cycle; selectable set of highly repeatable energies (under 2% variation); and variable average current.
- High-energy neutron (less than 8.5 MeV) generator with the following characteristics: high-yield, short pulse width, sharp pulse front, selectable duty cycle between 10 Hz to 2000 Hz.

Near monochromatic high-energy (9-15 MeV) photon generator with the following characteristics: no neutron production, short pulse width, and a duty cycle greater than 200 Hz.

PHASE I: Demonstrate the feasibility of the proposed technical approach with a benchtop apparatus or with a clear design. The physics of critical design elements should be described. Provide information as to how this concept will be commercialized following a Phase II award.

PHASE II: Produce and test a prototype to demonstrate the viability and capabilities of the neutron and/or photon generators. Demonstrate a commercialization path.

PHASE III COMMERCIAL APPLICATIONS: In addition to homeland security applications (U.S. Customs, U.S. Coast Guard) effective neutron and photon generators are required by the Department of Defense, the Department of Energy, and the International Atomic Energy Agency.

REFERENCES: Use web sites or references found through the National Technical Information Service (NTIS) or the Defense Technical Information Center (DTIC).

KEY WORDS: Accelerator, neutron, gamma-ray, X-ray

10.0 DHS FY2007.2 PHASE I SBIR CHECKLIST

Page Numbering

- Number all pages of your proposal consecutively
- Total for each proposal is 25 pages inclusive of cover sheets, technical proposal, cost proposal and resumes
- Beyond the 25-page limit do not send appendices, attachments and/or additional references

Proposal Format:

- Cover Sheet, Technical and Cost proposals MUST be submitted electronically at <http://www.sbir.dhs.gov>

The Technical Proposal addresses:

- Identification and Significance of Problem or Opportunity
- Phase I Technical Objectives
- Phase I Work Plan
- Related Work
- Relationship with Future Research and/or Development
- Commercialization Strategy
- Key Personnel, Resumes
- Facilities/Equipment
- Consultants
- Prior, Current, or Pending Support

Final checklist:

- The Cover Sheet was prepared on-line
- The Technical Proposal was uploaded
- The Cost Proposal was prepared on-line and shows detailed cost breakout and the total cost is also listed on the Cover Sheet
- The Submit Proposal button was selected to transmit the proposal to DHS and time stamp the proposal
- Email confirmation of the receipt of your proposal was received
- Web site Help Desk 1-800-754-3043