



**U.S. Department of Homeland Security (DHS)**

**Small Business Innovation Research (SBIR) Program**

**Solicitation #: HSHQDC-14-R-00005**

Due Date: January 22, 2014 at 2:00 pm ET

Issued By:  
DHS Office of Procurement Operations  
on behalf of:  
the Science and Technology Directorate  
and the Domestic Nuclear Detection Office

## TABLE OF CONTENTS

<b>1.0</b>	<b>PROGRAM DESCRIPTION</b>	<b>1</b>
1.1	Summary	1
1.2	DHS SBIR Program, Purpose and Objectives	1
1.3	Three Phase Program	2
1.4	Key Dates and Events	3
1.5	SBIR Office Contacts	3
1.6	Definitions	3
1.7	Fraud, Waste and Abuse	3
<b>2.0</b>	<b>REGISTRATION, CERTIFICATIONS, AND DATA COLLECTION</b>	<b>4</b>
2.1	Mandatory Registrations	4
2.2	Required Certifications	5
2.3	Data Collection Requirement	5
<b>3.0</b>	<b>PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS</b>	<b>6</b>
3.1	Proposal Preparation and Length of Proposal	6
3.2	Proposal Coversheet, Technical Abstract, Project Aims, and Summary of Results	6
3.3	Technical Proposal Format and Content	7
3.4	Cost Proposal	12
3.5	Briefing Chart	13
3.6	Commercialization Report	13
3.7	Company Financial Information	14
3.8	Eligibility	14
3.9	Phase I to Phase II Transition Rate Benchmarks	14
3.10	Commercialization Rate Benchmark	15
3.11	Questions	15
<b>4.0</b>	<b>METHOD OF SELECTION AND EVALUATION CRITERIA</b>	<b>16</b>
4.1	Evaluation Criteria, Factors and Ratings	16
4.2	Proposal Review Feedback	19
4.3	Contractor Support Services In Support of the Selection Process	19
<b>5.0</b>	<b>CONSIDERATIONS</b>	<b>20</b>
5.1	Awards	20
5.2	Reports and Deliverables	20
5.3	Invoice Instructions	20
5.4	Innovations, Inventions and Patents	21
5.5	Cost-Sharing	23
5.6	Profit or Fee	23
5.7	Joint Ventures or Limited Partnerships	23
5.8	Research and Analytical Work	23

5.9	Awardee Commitments and Summary Statements .....	23
5.10	Release of Proposal Information .....	25
5.11	Discretionary Technical Assistance.....	25
5.12	Classified and Unsolicited Proposals .....	26
5.13	Animal and/or Human Subjects.....	26
5.14	DHS SBIR Phase II Enhancement Programs .....	26
5.16	Additional Information .....	27
<b>6.0</b>	<b>SUBMISSION OF PROPOSALS.....</b>	<b>28</b>
<b>7.0</b>	<b>RESEARCH TOPICS .....</b>	<b>28</b>
7.1	S&T Directorate Topics .....	28
7.2	DNDO Topics .....	29

**APPENDIX A – RESEARCH TOPIC DESCRIPTIONS**

H-SB014.1-001.....	A-1
H-SB014.1-002.....	A-2
H-SB014.1-003.....	A-4
H-SB014.1-004.....	A-5
H-SB014.1-005.....	A-8
H-SB014.1-006.....	A-9
H-SB014.1-007.....	A-11

**APPENDIX B – DEFINITIONS**

**ATTACHMENT 1: SBIR Funding Agreement Certification – Time of Award**

**ATTACHMENT 2: SBIR Funding Agreement Certification – Life Cycle Certification**

**ATTACHMENT 3: Briefing Chart Template**

**ATTACHMENT 4: Sample Non-Disclosure Agreement**

## 1.0 PROGRAM DESCRIPTION

### 1.1 Summary

The Department of Homeland Security (DHS) Small Business Innovation Research (SBIR) Program, comprised of the Science and Technology (S&T) Directorate's SBIR Program and the Domestic Nuclear Detection Office's (DNDO) SBIR Program, invites small business concerns (SBCs) to submit innovative proposals under this Solicitation. Eligible small businesses with the capability to conduct research or research and development (R/R&D) in any of the homeland security-related topic areas described in **Appendix A**, and to commercialize the results of that R/R&D, are encouraged to participate. The DHS SBIR Program Office encourages all small businesses, particularly small disadvantaged, women-owned, veteran-owned, service-disabled veteran-owned, and socially and economically disadvantaged small businesses to submit proposals in response to topics described in this Solicitation.

#### **IMPORTANT:**

- In order to streamline the DHS SBIR solicitation process, this Solicitation has been rewritten and restructured. Please read the solicitation carefully.
- Only proposals submitted in response to topics contained in this Solicitation will be accepted and considered for awards. **Section 7.0** outlines the seven (7) research topics – five (5) S&T topics and two (2) DNDO topics. Unsolicited proposals will not be accepted.
- While the Phase II proposal process is covered in this Solicitation, this Solicitation requests Phase I proposals only at this time. In accordance with the SBIR/STTR Reauthorization Act of 2011 (Section 5105, Public Law 112-81), **DHS no longer uses an invitation process for Phase II**. All small businesses awarded a Phase I contract(s) originating from this Solicitation will be eligible to participate in Phases II and III. **A Contracting Officer will notify Phase I awardees of the Phase II proposal submission requirements and the deadline for Phase II submissions.**
- DHS is not obligated to make any awards under Phase I, Phase II, or Phase III, and all awards are subject to the availability of funds. DHS is not responsible for any monies expended or costs incurred by the Offeror before contract award.
- Small businesses that are majority-owned by multiple venture capital operating companies, hedge funds or private equity firms are not eligible to submit proposals in response to this Solicitation. See **Section 3.8**, Eligibility.

### 1.2 DHS SBIR Program, Purpose and Objectives

The statutory purpose of the SBIR Program is to strengthen the role of innovative small business concerns in Federally-funded R/R&D. Program objectives are to: (1) stimulate technological innovation; (2) strengthen the role of small business in meeting Federal R/R&D needs; (3) foster and encourage participation by socially and economically disadvantaged small businesses (SDBs) and by women-owned small businesses (WOSBs); and (4) increase private sector commercialization of innovations developed through Federal R/R&D, thereby increasing

competition, productivity, and economic growth. The federal SBIR Program is mandated by the Small Business Research and Development Act of 1982 (Public Law 97-219), the Small Business Research and Development Act of 1992 (Public Law 102-564), and the SBIR/STTR Reauthorization Act of 2011 (Public Law 112-81).

The DHS SBIR Program follows the policies and practices of the Small Business Administration (SBA) SBIR Policy Directive, dated August 6, 2012. This Solicitation incorporates and uses the flexibility of the SBA SBIR Policy Directive to encourage innovative proposals in response to the research topics listed in **Section 7.0**.

In its commitment to also support Executive Order 13329 which encourages innovation in manufacturing-related research and development, DHS seeks, through its SBIR Program and topic descriptions, research related to advanced processing, manufacturing processes, equipment and systems; or manufacturing workforce skills and protection.

### 1.3 Three Phase Program

The SBIR Program is a three phase program. The objective of Phase I is to determine the scientific, technical, and commercial merit and feasibility of the proposed effort, and the quality of performance of the small business concern, with a relatively small agency investment prior to providing further Federal support in Phase II. Phase I proposals should concentrate on that R/R&D which will significantly contribute to proving the scientific and technical feasibility, and commercialization potential of the proposed effort, the successful completion of which is a prerequisite for further DHS support in Phase II. Offerors are encouraged to consider whether the R/R&D being proposed also has private sector potential, either for the proposed application or as a base for other applications.

The objective of Phase II is to continue the R/R&D effort from the completed Phase I. Phase II efforts further develop work from Phase I that meets particular program needs and exhibits potential for commercial application. Phase II is the principal R&D effort and is expected to produce a well-defined deliverable prototype. Phase II awards may be made to small business concerns on the basis of the results of their Phase I projects, and the scientific merit, technical merit, and commercialization potential of the Phase II proposal. Phase II awardees may receive up to one additional, sequential Phase II award to continue the work of an initial Phase II award. In addition, Phase II awardees may receive additional funding under the DHS SBIR Commercialization Readiness Pilot Program (see **Section 5.14**).

For details on the S&T and DNDO Phase I and II Cost Proposal thresholds, see **Section 3.4**.

SBIR Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. Phase III work is typically oriented towards commercialization of SBIR research or technology. Under Phase III, the SBIR awardee is expected to seek contracts and obtain funding from the private sector and/or the Federal government (non-SBIR federal government sources) to develop the

prototype or supply goods or services related to the work performed under the SBIR contract(s) into a viable product or non-R&D service for sale in DHS and/or private sector markets.

A Phase III award, by its nature, is an SBIR award, has SBIR status, and must be accorded SBIR data rights. Phase III proposals can only be submitted by, and made to, a Phase I and/or Phase II awardee. The competition for SBIR Phase I and Phase II awards satisfies any competition requirement of the Armed Services Procurement Act, the Federal Property and Administrative Services Act, and the Competition in Contracting Act. Therefore, an agency that wishes to fund an SBIR Phase III project is not required to conduct another competition in order to satisfy those statutory provisions.

#### 1.4 Key Dates and Events

The following chart shows the important events and corresponding dates of the FY14.1 DHS SBIR Solicitation, HSHQDC-14-R-00005.

EVENT	DATE
<b>Pre-solicitation issued:</b>	December 3, 2013
<b>Direct contact with Topic POC permitted:</b>	December 3, 2013 – December 17, 2013
<b>Solicitation released:</b>	December 18, 2013
<b>Phase I proposals submission:</b>	December 18, 2013 – January 22, 2014
<b>Last day to submit questions:</b>	January 8, 2014 no later than 2:00 p.m. ET
<b>Last day Q&amp;A Posted on FedBizOpps</b>	January 15, 2014
<b>Deadline for receipt of proposals:</b>	January 22, 2014, 2:00 p.m. ET

#### 1.5 SBIR Office Contacts

For general questions about the S&T Directorate’s SBIR Program, please contact [STSBIR.PROGRAM@hq.dhs.gov](mailto:STSBIR.PROGRAM@hq.dhs.gov). For general questions about the DNDO SBIR Program, please contact [dndosbir@hq.dhs.gov](mailto:dndosbir@hq.dhs.gov).

#### 1.6 Definitions

Definitions provided in SBA’s SBIR Policy Directive (dated August 6, 2012) and the Federal Acquisition Regulation (FAR) apply for the purposes of this Solicitation. Terms that are unique to the SBIR Program, this specific SBIR solicitation, or may be unfamiliar to small business concerns, are defined in **Appendix B**.

#### 1.7 Fraud, Waste and Abuse

DHS and the SBIR Program Office are taking proactive measures to reduce the vulnerability of the SBIR Program to fraud, waste, and abuse. The SBIR Policy Directive (dated August 6, 2012),

Section 9 (f)(1) (i through ix), provides examples of fraud, waste and abuse relating to the SBIR Program. To report SBIR fraud, please contact the DHS Office of the Inspector General (OIG):

- Anonymous Hotline: 1-800-323-8603
- OIG Online Allegation Form: <http://www.oig.dhs.gov/hotline/hotline.php>
- Fax: (202) 254-4297
- Mail: DHS Office of Inspector General/MAIL STOP 2600  
Attention: Office of Investigations-Hotline  
245 Murray Drive SW, Building 410  
Washington, DC 20528

To reach someone within the S&T's SBIR Program Office about fraud, waste and abuse, please contact Frank Barros, DHS S&T SBIR Program Analyst, at (202) 254 -6966 or [francis.barros@hq.dhs.gov](mailto:francis.barros@hq.dhs.gov).

To reach someone within the DNDO SBIR Program Office about fraud, waste and abuse, please contact the DHS DNDO SBIR PM at [dndosbir@hq.dhs.gov](mailto:dndosbir@hq.dhs.gov).

## **2.0 REGISTRATION, CERTIFICATIONS, AND DATA COLLECTION**

### **2.1 Mandatory Registrations**

In order to prepare and submit SBIR proposals to DHS under this Solicitation, offerors must be registered in the DHS SBIR electronic online proposal submission system at <https://sbir2.st.dhs.gov>.

Company registration is also required in the U.S. Small Business Administration's (SBA) Company Registry Database at <http://sbir.gov/registration>. Prior to submitting the complete proposal to DHS, every offeror must:

1. Affirm registration in the SBA Company Registry;
2. Input the company's SBC Control ID number in the Company Data section of the DHS SBIR Cover Sheet; and
3. Append a copy of the completed SBA Company Registration information as the last page of the Technical Proposal.

Before an SBIR contract can be awarded, proposing firms must also be registered in the System for Award Management (SAM). SAM is the official U.S. Government system that consolidated the capabilities of the Central Contractor Registration (CCR)/Federal Register, Online Representations and Certifications Application (ORCA), and the Excluded Parties List System (EPLS) databases. Although not required at the time of proposal submission to the DHS SBIR Program, it is highly recommended that offerors register in SAM during the proposal process. To register in SAM and/or update company's records, visit <https://www.sam.gov/portal/public/SAM/>.

Offerors are encouraged, but not required, to have a DUNS number and a CAGE code at the time of proposal submission. Companies must obtain these before a contract can be awarded to the company. To obtain a DUNS number, visit <https://fedgov.dnb.com/webform>. CAGE Codes are automatically assigned upon registration in SAM. For more information about the Commercial and Government Entry (CAGE) code, please visit [www.fsd.gov](http://www.fsd.gov).

## 2.2 Required Certifications

At the time of proposal submission, each small business concern must certify via the Cover Sheet of the proposal that it meets the size, ownership and other requirements of the SBIR Program. In addition, the SBA SBIR Policy Directive (dated August 6, 2012) includes certifications requirements set forth in Section 5143 of the SBIR/STTR Reauthorization Act of 2011. The certifications require small businesses to certify that they are meeting the Program's requirements during the life cycle of the funding agreement.

The DHS SBIR Programs will implement the certifications as follows:

1. SBIR Funding Agreement Certification – Time of Award (**Attachment 1**) – If selected for award, this certification will be provided by the Contracting Officer to the small business for completion prior to issuing the Phase I and Phase II award.
2. SBIR Funding Agreement Certification – Life Cycle Certification (**Attachment 2**) - The Life Cycle Certification will be included in resultant Phase I and Phase II contracts and considered a deliverable.

## 2.3 Data Collection Requirement

Each Phase I and Phase II applicant is required to either enter information into SBA's database at [www.SBIR.gov](http://www.SBIR.gov) or to update previously entered information. Companies should login to [www.SBIR.gov](http://www.SBIR.gov) using the account created when registering for the SBA company registry database. The following are examples of data to be entered into the database:

- Any business concern or subsidiary established for the commercial application of a product or service for which an SBIR award is made.
- Revenue from the sale of new products or services resulting from the research conducted under each Phase II award;
- Additional investment from any source, other than Phase I or Phase II awards, to further the research and development conducted under each Phase II award.

The SBC 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.

In addition, each Phase II awardee is required to update the appropriate information on the award in the database upon completion of the last deliverable under the funding agreement



and is requested to voluntarily update the information in the database annually thereafter for a minimum period of 5 years.

### 3.0 PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS

#### 3.1 Proposal Preparation and Length of Proposal

Offerors responding to this Solicitation must submit a direct, concise, and informative research or research and development proposal. Each complete proposal must be submitted via the DHS SBIR electronic online proposal submission system portal at <https://sbir2.st.dhs.gov>.

Complete proposals contain the following:

Proposal Requirements		
	Phase I	Phase II
Page Limitation	25 pages	50 pages
Cover Sheet <sup>1</sup>	Pages 1-2	Pages 1-2
Technical Proposal	Pages 3-24	Pages 3-49
SBA Company Registry Information <sup>2</sup>	Mandatory	Mandatory
Cost Proposal <sup>3</sup>	Page 25	Page 50
Briefing Chart ( <b>Attachment 3</b> ) <sup>4</sup>	Mandatory	Mandatory
Commercialization Report <sup>4</sup>	N/A	If Applicable
Company Financial Information <sup>5</sup>	N/A	Mandatory
Non-disclosure Agreement <sup>6</sup>	Mandatory (DNDO Topics ONLY)	Mandatory (DNDO Topics ONLY)

<sup>1</sup> Counts as two pages no matter how it prints out

<sup>2</sup> Appended to the Technical Proposal (See **Section 2.1**), but not included in the page count

<sup>3</sup> Counts as one page no matter how it prints out

<sup>4</sup> Not included in page count

<sup>5</sup> Company Financial Information must not be included in the proposal, instead it must be submitted via email; Applies to S&T Topics ONLY; See **Section 3.7**

<sup>6</sup> NDA must not be included in the proposal; DNDO topics ONLY; See **Section 4.3**.

The Cover Sheet and the Cost Proposal are completed online via the DHS SBIR electronic online proposal submissions system, while the Technical Proposal, Briefing Chart, and the Commercialization Report, if applicable, are uploaded as PDF documents.

No additional attachments, appendices or referenced material beyond the page limitations shall be considered in proposal evaluation.

#### 3.2 Proposal Coversheet, Technical Abstract, Project Aims, and Summary of Results

Offerors are required to provide basic details about the proposed effort on the proposal cover sheet. Additionally, the cover sheet includes the following fillable sections: Technical Abstract,

## Project Aims, and Summary of Results.

The Technical Abstract is limited to 250 words. The abstract must identify the purpose of the work and briefly describe the work to be carried out, the finding or results, and the potential commercial applications of the effort. If the offeror's proposal is selected for award, the Technical Abstract section will be publicly posted on the DHS SBIR website and on the Small Business Administration's website; therefore, do not include proprietary or classified information in the Technical Abstract section of the Cover Sheet.

The Project Aims section is limited to 500 words and is for Government use only. **For Phase I proposals only**, the offeror must state the specific objectives of the Phase I R/R&D effort, including the technical questions the offeror will answer to determine the Phase I feasibility of the proposed approach and the impact that the results of the proposed research will exert on the research field(s) involved. The offeror must state concisely and realistically what the proposed research is intended to accomplish in terms of its potential for technological innovation and commercial application. The proposed product, process or service that will ultimately be developed must be defined. Milestones for each of the aims must be included, as these will be used in the evaluation process. **For Phase II proposals only (including second Phase II awards and CRPP awards)**, the offeror must state the specific objectives of the Phase II research and development effort including the impact that the results of the proposed research will exert on the research field(s). The offeror must state concisely and realistically what the proposed research is intended to accomplish in terms of its potential for technological innovation and commercial application. The proposed product, process or service that will ultimately be developed must be defined. Milestones for each of the aims must be included, as these will be used in the evaluation process.

The Summary of Results section is limited to 500 words, must not contain proprietary information, and is for Government use only. The offeror must provide the anticipated results and implications of the approach (both Phases I and II) and the potential commercial applications of the research.

### 3.3 Technical Proposal Format and Content

Prepare the Technical Proposal in single column format, 12-point Times New Roman, with 1" margins on 8 ½" x 11" paper. Company name, topic number, and proposal number should be included in the header of each page. (The header may be included in the 1" margin.) The use of 10-point font is permissible for imbedded tables, figures and graphics. See **Section 3.1** for page limitations for Phase I and Phase II proposals.

The Technical Proposal must be a single file, including tables, figures, graphics and table of contents (if included). Do not lock, password protect, or encrypt the file to be uploaded. 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 must include the following sections in the order provided:

Proposal Format	
Phase I Proposal	Phase II Proposal
I. Identification And Significance Of The Problem Or Opportunity	I. Identification and significance of the problem or Opportunity
II. Phase I Technical Objectives	II. Phase I Technical Objectives and Results
III. Phase I Work Plan	III. Phase II Work Plan
IV. Related R/R&D	IV. Related R/R&D
V. Key Individuals and Bibliography of Directly Related Work	V. Key Individuals and Bibliography of Directly Related Work
VI. Relationship with Future R/R&D	VI. Relationship with Future R/R&D
VII. Commercialization Strategy	VII. Commercialization Plan
VIII. Facilities/Equipment	VIII. Facilities/Equipment
IX. Subcontractors/Consultants	IX. Subcontractors/Consultants
X. Potential Post Applications	X. Prior, Current, or Pending Support of Similar Proposals or Awards
XI. Prior, Current, or Pending Support of Similar Proposals or Awards	

The following is a brief description of each section of the Technical Proposal as applicable for each Phase:

- Identification and Significance of the Problem or Opportunity – Succinctly define the specific technical problem or opportunity addressed; the proposed innovation; the relevance and significance of the proposed innovation to a need(s) within the topic description; the proposed innovation relative to the state of the art; and the importance of the work proposed.
- Technical Objectives (Phase I proposals only) – State the specific objectives of the Phase I R/R&D effort, including the technical questions that must be answered to determine the feasibility of the proposed innovation/approach.
- Technical Objectives and Results (Phase II proposals only) – State the specific objectives of the Phase I R/R&D effort including the technical questions addressed to determine the feasibility. Address the progress, results and findings of the Phase I effort.
- Work Plan (Phase I proposals only) (including the efforts of the subcontractor(s)/consultant(s), if applicable) – Provide an explicit, detailed description of the Phase I approach. The Plan must indicate what tasks are planned, how, when, and where the work will be conducted, a schedule of major events, and the final product(s) to be delivered. The Phase I effort must determine the technical feasibility of the proposed concept, and address the questions cited in the Technical Objectives immediately above. The methods planned to achieve each objective or task must be discussed explicitly and in detail. Task descriptions, schedules, resource allocations, estimated task hours for each key personnel and planned accomplishments, including project milestones, must be included. This section will be a substantial portion of the total Technical Proposal.

- Work Plan (Phase II proposals only) (including the efforts of the subcontractor(s)/consultant(s), if applicable) – Provide an explicit, detailed description of the Phase II approach. The Plan must indicate what tasks are planned, how, when, and where the work will be conducted, a schedule of major events, the final product to be delivered, and the completion date of the effort. The Phase II effort must satisfy the anticipated results, as specified in the topic description. The methods planned to achieve each objective or task must be discussed explicitly and in detail. Task descriptions, schedules, resource allocations, estimated task hours for each key personnel and planned accomplishments, including project milestones, must be included. This section must be a substantial portion of the total proposal.
- Related Research/Research and Development – Describe significant (current and/or previous) R/R&D activities that are directly related to the proposed effort, including any conducted by the principal investigator, the offeror, consultants, or others. Discuss any planned coordination with outside sources. Describe how these activities relate to the proposed project. Describe previous efforts similar but directly related to the proposed effort. For each effort, 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. The offeror must persuade reviewers of his or her awareness of key, recent R/R&D conducted by others in the specific topic area.
- Key Individuals and Bibliography of Directly Related Work – Identify key personnel who will be involved in the effort including information on directly related education, experience, and bibliographic information. A concise resume of the principal investigator and key personnel, including a list of relevant publications (if any), must be included. All resumes will count toward the appropriate page limitation, see **Section 3.1. Offerors must identify any non-U.S. citizen(s) expected to be involved on proposed project** [including direct employees, subcontractors and consultants], their country of origin, type of visa or work permit under which they are performing, and an explanation of their anticipated level of involvement on this project. **Do not include Privacy Act Information.**
- Relationship with Future Research/Research and Development (Phase I proposals only) – State the anticipated results of the proposed approach if the project is successful through Phase I and Phase II. Discuss the significance of the Phase I effort in providing a foundation for Phase II research or research and development effort, application and commercialization efforts (Phase III).
- Relationship with Future Research/Research and Development (Phase II proposals only) – State the anticipated results of the proposed approach if the project is successful through Phase II and Phase III. Discuss the significance of the Phase II effort in providing a foundation for Phase III commercialization efforts.
- Commercialization Strategy (Phase I proposals only) - Explicitly describe the company's strategy (vision) for commercializing the proposed technology and how it will transition in DHS, other Federal Agencies, and/or private sector markets. Provide specific information on the market need the technology will address, the size of the market, and how this information was ascertained. Also, include a schedule showing the quantitative

commercialization results from this SBIR project that the company expects to achieve, the resources, both personnel and financial that will be required to meet this expected achievement and the time frame.

- **Commercialization Plan (Phase II proposals only)** – The Commercialization Plan must address the following:
  - a. *Company Information.* Focused objectives/core competencies; specialization area(s); products and significant product sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization. Does the offeror have marketing expertise and, if not, how does the offeror intend to bring that expertise into the company?
  - b. *Customer and Competition.* Provide a clear description of key technology objectives, current competitors, and advantages (cost and technical) compared to competing products or services. Address who the customers will be, and an estimate of the market size. Has the offeror made contact with anyone in the projected base? – Identify potential factors that would address a significant positive and negative impact regarding the transition of the proposed product.
  - c. *Market.* Provide milestones, target dates, analyses of market size, and the estimated market share after first and five year sales. Provide detailed explanation on the plan to obtain market share.
  - d. *Financing.* Provide detailed information on the identification and acquisition of costs associated in transitioning the proposed product/services into the market. If available, provide brief discussion on potential financial sources. What are the plans for securing necessary funding for Phase III?
  - e. *Intellectual Property (IP).* Provide a detailed description on how the company plans to acquire and protect appropriate IP of the proposed product/service. What is the IP strategy and how will it be protected? Address patent status, technology lead, trade secrets or other demonstrations of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
  - f. *Assistance and Mentoring.* Provide plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with state assistance programs, small business development centers, Federally-funded research laboratories, Manufacturing Extension Partnership centers, or other assistance providers. Address how the product will be produced.

The Commercialization Plan must also include a schedule showing the quantitative results from the Phase II project that the 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).

- **Facilities/Equipment** – Provide information to allow the evaluators to assess the ability of the proposer to carry out the activities of the proposed phase as well as all subsequent phases. Describe available instrumentation and physical facilities necessary to carry out the proposed effort. Equipment to be purchased, as detailed in the Cost Proposal, must 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, 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.

- Subcontractors/Consultants – Involvement of any subcontractor(s) or consultant(s) (including Federal Laboratories, FFRDCs, universities, and technical assistance providers) is permitted. If such involvement is proposed, it must be described in detail in this section and also in the Cost Proposal. Subcontractors' or consultants' involvement under Discretionary Technical Assistance (see **Section 5.11**) must be clearly delineated from involvement by other subcontractors and consultants. A minimum of two-thirds (66%) of the research and/or analytical work in Phase I, as measured by total contract value, must be carried out by the proposing small business concern. A minimum of one-half (50%) of the research and/or analytical work in Phase II, as measured by total contract value, must be carried out by the proposing small business concern.

If the small business determines that it needs to acquire services from a non-U.S. source, it must fully explain in its proposal why a non-U.S. source must be used, and why no qualified U.S. source exists to perform the same services.

- Potential Post Applications – Briefly describe the following: (1) whether and by what means the proposed project appears to have potential commercial application; and (2) whether and by what means the proposed project appears to have potential use by the Federal Government.
- Prior, Current, or Pending Support of Similar Proposals 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 **Appendix B**) for consideration under numerous Federal program solicitations, it is unlawful to enter into funding agreements (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 an offeror elects to submit identical proposals or proposals containing a significant amount of essentially equivalent work in response to this Solicitation, or other Federal program solicitations, or is substantially the same as another proposal that has been funded, is now being funded, will be submitted to other agencies for funding consideration, or is pending with DHS or another Federal Agency, the proposer must so indicate on the Proposal Cover Sheet and provide the following information in the Technical Proposal:

- 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 or project manager 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 this section does not apply, the following statement should be included in the Technical Proposal: "No prior, current, or pending support for proposed work."

### 3.4 Cost Proposal

All offerors must submit a cost proposal via <https://sbir2.st.dhs.gov>. Proposed costs must not exceed the maximum thresholds outlined below.

S&T SBIR Topics		DNDO SBIR Topics	
Phase I	Phase II	Phase I	Phase II
\$100,000	\$750,000	\$150,000	\$1,000,000
6 months	24 months	6 months	24 months

**Note:** Phase totals are exclusive of Discretionary Technical Assistance (**Section 5.11**) and Cost Match (**Section 5.14**), if applicable.

For additional information on the items in the Cost Proposal, reference *the DHS SBIR Cost Proposal Guide* at <https://sbir2.st.dhs.gov> under "Reference Materials."

Additionally, more information about cost proposals and accounting standards can be found in the DCAA publication, *Information for Contractors*, available at [www.dcaa.mil/dcaap\\_7641.90.pdf](http://www.dcaa.mil/dcaap_7641.90.pdf).

Proposals submitted under this Solicitation will be considered valid for 90 days. If a proposal is selected for award, offerors should be prepared to submit further cost/pricing documentation to the Contracting Officer in order to justify items on the cost proposal.

The following are required elements of the cost proposal:

- Direct Labor – list the name, labor category, labor hours and labor rate of each employee working on the project
- Overhead Cost – specify the current overhead rate. Use overhead rate approved by a cognizant federal agency, if available.
- Other Direct Cost – include direct material, special testing, equipment, travel, subcontracts, etc.

For planning purposes, offerors should budget for travel to Washington, DC for a mandatory one-day post-award kick-off meeting and an additional one-day meeting to present the results in the final report.

### 3.5 Briefing Chart

The mandatory one-page Briefing Chart should provide a very concise summary of the overall effort. The Briefing Chart is uploaded during proposal submission and may be used in the evaluation process. The briefing chart **MUST NOT** contain proprietary or classified data. Offerors must use the Briefing Chart template provided in **Attachment 3**.

### 3.6 Commercialization Report

Offerors that have not received any Phase II awards should check the appropriate box on the cover sheet certifying that the company has not received SBIR Phase II funding from any agency. Offerors with no prior Phase II awards will not be negatively impacted in the evaluation process. Instead, such companies will be evaluated based on the Commercialization Plan, see **Section 3.3**.

All Phase II offerors with previous Phase II awards must submit a Commercialization Report.

If applicable, the succinct Commercialization Report should be in PDF format and submitted as a separate upload during the Phase II proposal submission. The following are examples of company commercialization data expected in the Commercialization Report:

- Any business concern or subsidiary established for the commercial application of a product or service for which an SBIR award is made.
- Revenue from the sale of new products or services resulting from the research conducted under each Phase II award; delineate revenue by government, open market, prime contractors, other awards, and when this revenue event occurred.
- 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.
- Whether the Phase II technology has been used in a fielded DHS system or acquisition program, and, if so, which system or program.
- The number of patents resulting from the contractor's participation in the SBIR Program and whether any licenses based on these patents have been issued.
- Whether the company has completed an initial public offering (IPO) of stock, merged or been acquired resulting, in part, from any DHS SBIR Phase II project.

The Commercialization Report for any prior Phase II award received by the company must be current as of the end of the company's last full fiscal year (FY). 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.



### 3.7 Company Financial Information (For S&T Topics ONLY)

As part of the S&T Phase II proposal submission, companies are required to submit financial information, including current balance sheet and income statement delineating sales to the government and prime contractors, and sales derived from SBIR developed products whether as stand-alone or enablers. Financial information should be from the previous twelve months or the most recent company fiscal year. **This information must not be included as a part of the Phase II proposal** which is uploaded to the system. Financials must be sent via email to [stsbir.program@hq.dhs.gov](mailto:stsbir.program@hq.dhs.gov) and must be received by the SBIR Program Office prior to Phase II proposal due date/time.

### 3.8 Eligibility

Small business offerors that are majority-owned by multiple venture capital operating companies, hedge funds or private equity firms are not eligible to submit proposals in response to this Solicitation nor are they eligible to receive a DHS SBIR award.

To receive SBIR funds, each awardee of a Phase I or Phase II award must qualify as a small business concern at the time of award and at any other time set forth in SBA's regulations at 13 CFR 121.701 through 121.705.

For both Phase I and Phase II, the primary employment of the principal investigator must be with the small business concern at the time of the award and during contract performance. Primary employment means that more than one-half of the principal investigator's time is spent in the employ of the small business offeror. This precludes full-time employment with another organization.

For both Phase I and Phase II, all research or research and development must be performed by the small business concern and its subcontractors in the United States.

### 3.9 Phase I to Phase II Transition Rate Benchmarks

***For this Solicitation, the Phase I to Phase II Transition Rate benchmark requirement applies only to offerors that have received 21 or more Phase I awards over the five (5) fiscal year period, from October 1, 2007 through September 30, 2012.***

The Phase I to Phase II Transition Rate sets the minimum required number of Phase II awards an offeror must have received for a given number of Phase I awards during a specified period. SBA calculates individual company Phase I to Phase II Transition Rates daily using SBIR and STTR award information across all federal agencies. SBA posts the company transition rates on the Company Registry at <http://www.sbir.gov>.

Offerors to this Solicitation that have received more than 20 Phase I awards across all federal SBIR/STTR agencies over the five (5) year period should, prior to proposal preparation, verify

that the company's Transition Rate in the Company Registry at <http://www.sbir.gov> meets or exceeds DHS' minimum benchmark.

The Phase I to Phase II Transition Benchmark that DHS will use for this Solicitation is 25%.

Companies that apply for a Phase I award and do not meet or exceed the benchmark rate will not be eligible for a Phase I award for a period of one year from the date of the application submission.

### 3.10 Commercialization Rate Benchmark

***The Commercialization Rate benchmark requirement applies only to SBIR applicants that have received more than 16 or more Phase II awards over the past 10 fiscal years, excluding the last two years.***

The Commercialization Rate benchmark sets the minimum Phase III commercialization results a Phase I applicant must have realized from its prior Phase II awards. The Commercialization Rate benchmark establishes the commercialization results it is required to achieve from work it performed under its prior Phase II awards in order to be eligible to receive a new Phase I award.

**The Commercialization Rate benchmark is not yet in effect.** DHS will apply its Commercialization Rate benchmark in future solicitations.

### 3.11 Questions

General questions pertaining to the S&T's SBIR Program should be submitted to [STSBIR.PROGRAM@hq.dhs.gov](mailto:STSBIR.PROGRAM@hq.dhs.gov).

General questions pertaining to the DNDO's SBIR Program should be submitted to [dndosbir@hq.dhs.gov](mailto:dndosbir@hq.dhs.gov).

Technical questions concerning the topics in this Solicitation during the pre-release period from **December 3, 2013 through December 17, 2013** should be directed towards the Technical Point of Contact for each topic listed in **Section 7.0**. During the pre-release period, potential offerors have an opportunity to contact topic authors by telephone and/or email to ask technical questions about specific technical topics contained in this Solicitation. Questions should be limited to specific information related to improving the understanding of a particular topic's requirements. Potential offerors are prohibited from seeking advice or guidance on its solution approach, or submitting any materials. No further direct contact between offerors and Technical Points of Contact shall occur after 5:00 pm ET on December 17, 2013.

On or after December 18, 2013, no further direct contact between offerors and topic authors is permitted; however, offerors may submit questions to [STSBIR.PROPOSALS@hq.dhs.gov](mailto:STSBIR.PROPOSALS@hq.dhs.gov). Questions must be limited to technical information related to improving the understanding of a

particular topic's requirements. Any other questions or inquiries seeking advice or guidance on a solution approach are unacceptable and will not receive a response. Responses to questions received by January 8, 2014 by 2:00 p.m. ET will be posted on FedBizOpps.gov as an amendment to the Solicitation and will be posted on the DHS SBIR Program website at <https://sbir2.st.dhs.gov>. DHS will not respond to technical questions related to the technical topics if received after the last day to submit questions.

All offerors are advised to monitor both the FedBizOpps website and the DHS SBIR Program website during the Solicitations period for questions and answers, and other information relevant to the topic in this Solicitation.

Questions about the electronic submission of proposals should be submitted to the Help Desk at (703) 480-7676, or via email to [dhssbir@reisystems.com](mailto:dhssbir@reisystems.com). The Help Desk may be contacted from 9:00 a.m. to 5:00 p.m. ET, Monday through Friday.

#### **4.0 METHOD OF SELECTION AND EVALUATION CRITERIA**

All Phase I and II proposals will be evaluated on a competitive basis. Each proposal will be evaluated on its own merit and the relevance of the specific concept as it relates to the SBIR topic rather than against other proposals submitted for the same topic area. DHS is under no obligation to fund any proposal or any specific number of proposals in a given topic. DHS may elect to fund several or none of the proposed approaches to the same topic or subtopic.

##### **4.1 Evaluation Criteria, Factors and Ratings**

The Phase I evaluation criteria, listed in decreasing order of importance, are as follows:

- a. Technical Merit – the soundness, technical merit, and innovation of the proposed approach and its incremental progress toward topic or subtopic solution. The following elements will be considered:
  - Soundness of the technical concept and the likelihood the research is achievable as proposed;
  - Demonstrated understanding of the scope of the problem, research objectives, and performance goals;
  - Degree of innovation and potential to offer a significant increase in capability or a significant reduction in cost commensurate with the potential risk of the innovative (i.e., not incremental) proposed approach; and
  - Details of the technology development strategy to be followed for the proposed concept. Clarity, fidelity, and completeness of the proposed work plan to achieve research objectives, to include: identification of a schedule and milestones, identification of risks and mitigation strategies, and method for assessing technical progress.
- b. Staff Qualifications and Capability – the qualifications of the proposed principal investigator, key personnel, supporting staff, and consultants. Qualifications include

not only the ability to perform the research and development but also the ability of the company to commercialize the results. The following elements will be considered:

- Team's understanding of past scientific and technical accomplishments, and the current state-of-the-art of knowledge or technology in the field; and
  - Quality of the proposed team (i.e., key personnel and partners identified have the breadth/range of competencies to execute the proposed effort).
- c. Potential for Commercialization – the potential for commercial application, either in the Government or private sector, and the benefits expected to accrue from this commercialization. The following element will be considered:
- Commercialization Strategy, as stated in the Solicitation.
- d. Cost/Price – the appropriateness of the elements of the cost proposal for the proposed effort. The following elements will be considered:
- Level of effort proposed, as appropriate for Phase I; and
  - Completeness of the proposed level of effort.

The Phase II evaluation criteria, listed in decreasing order of importance, are as follows:

- a. Technical Merit – the soundness, technical merit, and innovation of the proposed approach and its incremental progress toward topic or subtopic solution. The following elements will be considered:
- Soundness of the technical concept and the likelihood the research is achievable as proposed;
  - Understanding the scope of the problem, research objectives, and performance goals;
  - Degree of innovation and potential to offer a significant increase in capability or a significant reduction in cost commensurate with the potential risk of the innovative (i.e., not incremental) proposed approach; and
  - Details of the technology development strategy to be followed for the proposed concept. Clarity, fidelity, and completeness of the proposed work plan to achieve research objectives, to include identification of risks and mitigation strategies, and method for assessing technical progress.
- b. Potential for Commercialization – the potential for commercial application, either in the Government or private sector, and the benefits expected to accrue from this commercialization. The following element will be considered:
- Completeness of the Commercialization Plan, as stated in the Solicitation.
- The lack of a Company Commercialization Report, due to the proposing company having no prior Phase II awards, will not affect its ability to receive an award.*
- c. Staff Qualifications and Capability – the qualifications of the proposed principal investigator, key personnel, supporting staff, and consultants. Qualifications include not only the ability to perform the research and development but also the ability of the company to commercialize the results. The following elements will be considered:
- Teams understanding of past scientific and technical accomplishments, and the current state-of-the-art of knowledge or technology in the field; and

- Quality of the proposed team (i.e., key personnel and partners identified have the breadth/range of competencies to execute the proposed effort).
- d. Cost/Price – the appropriateness of the elements of the cost proposal for the proposed effort. The following elements will be considered:
- Level of effort proposed, as appropriate for Phase II; and
  - Completeness of the proposed level of effort.

Evaluators will assess the strengths, weaknesses, and deficiencies of the above criteria using the following definitions:

- a. Strength – An aspect of the proposal that benefits the Government in terms of the quality of the offeror’s performance, cost effectiveness, or reduced risk towards successful contract performance. Note: an offeror’s approach may offer more than what the solicitation/topic description requires; however, the Government may not benefit from such approach.
- b. Weakness – A flaw in the proposal that decreases the likelihood successful contract performance. A “significant weakness” is a flaw that dramatically increases the risk of unsuccessful contract performance. When weaknesses are identified, the Government will provide comment(s) on the significance of the weakness.
- c. Deficiency – A material failure of a proposal that would result in an unacceptable level of contractor performance.

Evaluators will use one of the following adjectival ratings for each of the Technical Merit, Staff Qualifications and Capability, and Potential for Commercialization criterion:

- a. Excellent – Offeror’s proposed approach is highly likely to satisfy and/or exceed all topic objectives and shows the highest probability of successful contract performance. Offeror’s proposal has strengths that will significantly benefit the Government and no weaknesses.
- b. Very Good – Offeror’s proposed approach is likely to satisfy most of the topic objectives and shows a high probability of successful contract performance. Offeror’s proposal has strengths that will benefit the Government and one or more weaknesses, but no significant weaknesses.
- c. Good – Offeror’s proposed approach has a reasonable likelihood of satisfying the topic objectives and shows a good probability of successful contract performance. Offeror’s proposal has some strengths that will benefit the Government, and some weaknesses.
- d. Fair – Offeror’s proposed approach is unlikely meet the topic objectives and shows a low probability of successful contract performance. Offeror’s proposal has weaknesses, some that maybe significant, and few strengths, if any, that will benefit the Government.
- e. Unacceptable – The Offeror’s proposed approach fails to meet the topic objectives and requirements.

The Cost/Price criterion is not adjectively rated as outlined above; rather, the evaluation team will determine if the cost proposal is either acceptable or unacceptable as defined below:

- a. Acceptable - The proposed cost elements, including labor mix, labor hours, material, special testing, special equipment, travel, subcontracts, if applicable, are appropriate for the proposed effort.
- b. Unacceptable - The proposed cost elements, including labor mix, labor hours, material, special testing, special equipment, travel, subcontracts, if applicable, are not appropriate for the proposed effort.

#### 4.2 Proposal Review Feedback

DHS will make award decisions, and notify applicants of its decisions, within 90 calendar days from the closing date of this Solicitation. Specific instructions on requesting feedback will be provided to each offeror upon notification that their proposal was not selected for award. Requests for proposal feedback must be received within three (3) days of the notification and will only be provided to offerors upon request.

#### 4.3 Contractor Support Services In Support of the Selection Process

Offerors are advised that employees of the firms identified below may serve as Source Selection Organization (SSO) members in the source selection process. These individuals will be authorized access to only those portions of proposal data and discussions that are necessary to enable them to perform their respective duties. Such firms are expressly prohibited from competing on the subject acquisition and from scoring or rating of proposals or recommending the selection of a source.

**Applies to H-SB014.1-006 and H-SB014.1-007 ONLY**

Schafer Corporation  
Jeanne Ralls  
(978)735-4555  
[Jeanne.ralls@schafercorp.com](mailto:Jeanne.ralls@schafercorp.com)

In accomplishing their duties related to the source selection process, the aforementioned firms may require access to proprietary information contained in the offerors' proposals. Therefore, pursuant to FAR 9.505-4, these firms must execute an agreement with each offeror that states that they will (1) protect the offerors' information from unauthorized use or disclosure for as long as it remains proprietary and (2) refrain from using the information for any purpose other than that for which it was furnished. To expedite the evaluation process, each offeror must contact the above companies to effect execution of such an agreement prior to submission of proposals.

A sample company-to-company, non-disclosure agreement can be found in **Attachment 4**. Offerors submitting proposals for **Topics H-SB014.1-006 or H-SB014.1-007** shall submit a copy

of their signed agreement to [dndosbir@hq.dhs.gov](mailto:dndosbir@hq.dhs.gov). Proposals submitted to these topics will not be considered complete until the submission of the signed non-disclosure agreement.

Additionally, non-federal, contract support personnel will be used to carryout administrative functions for the SBIR Program Office and may have access to proposals. Administrative duties may include, but are not limited to, making and distributing copies of proposal, scheduling and attending meeting, taking and compiling notes, etc.

## 5.0 CONSIDERATIONS

### 5.1 Awards

Each proposal selected for funding in the DHS SBIR Program will be awarded a negotiated contract. No contracts will be awarded until all relevant proposals submitted in response to a specific topic have been evaluated and an award decision rendered. The number of S&T SBIR Phase I and Phase II awards will be consistent with the S&T SBIR budget. The number of DNDO SBIR Phase I and Phase II awards will be consistent with the DNDO SBIR budget. All DHS SBIR awards resulting from this Solicitation will be posted at <https://sbir2.st.dhs.gov>.

A firm-fixed price (FFP) contract will be awarded for all Phase I awards. Phase II contracts can either be awarded as a cost-plus fixed-fee (CPFF) contract or firm-fixed price contract; however, in accordance with FAR 16.301-3, in order to award a CPFF contract, offerors must have an accounting system that is adequate for determining cost applicable to the contract. Additionally, certified cost and pricing data may be required for Phase II or Phase III contracts over \$700,000.00. Fee and profit may be included in the Cost Proposal (see **Section 5.6**).

The anticipated time between the date that this Solicitation closes and the award of the Phase I contracts is approximately four (4) months. In general, Phase II awards will be awarded as quickly as possible after proposal selection to maintain the momentum of the Phase I effort. Phase II contracts are typically awarded within 90 – 120 days after the proposal due date.

### 5.2 Reports and Deliverables

Monthly reports and a final comprehensive report will be required in all resultant Phase I and Phase II contracts. Additionally, Phase II awards may require an interim report at the end of 12 month of performance. Phase I and II awardees will be required to submit the *SBIR Funding Agreement Certification – Life Cycle Certification (Attachment 2)* during the contract period of performance. Other deliverables specific to the topic description may also be required.

### 5.3 Invoice Instructions

The specific invoicing instructions will be incorporated into the contract upon completion of negotiations between the Government and the successful Phase I or Phase II offeror.

Successful offerors may submit invoices monthly in accordance with the negotiated price and invoice instructions.

#### 5.4 Innovations, Inventions and Patents

Proprietary Information. Information contained in unsuccessful proposals will remain the property of the applicant. 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 an applicant in a proposal, which constitutes a trade secret, proprietary commercial or financial information, confidential personal information or data affecting the national security, it will be treated in confidence, to the extent permitted by law. This information must be clearly marked by the applicant with the term “proprietary information” (see the Marking of Proprietary section below) and the “Proposal Contains Proprietary Information” box on the DHS SBIR Cover Sheet must be checked “Yes”. This will automatically electronically place the following statement on the proposal:

“These data, except the proposal Cover Sheet data, shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part for any purpose other than evaluation of this proposal. If a funding agreement is awarded to this applicant as a result of or in connection with the submission of these data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the funding agreement and pursuant to applicable law. 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 are contained on pages appropriately marked in this proposal.”

DHS assumes no liability for inadvertent disclosure or use of unmarked data. The Government will limit dissemination of such proprietary information to within official channels.

Marking of Proprietary Information. Identify all proposal data deemed proprietary by the offeror by an asterisk (\*) in the right and left margins. If all information on a page is deemed proprietary by the offeror, the words “Entire page is proprietary” should be included in both the header and footer on that page. Do not label the entire proposal “proprietary”. Do not use the “Company Confidential” marking.

Rights in Data Developed Under SBIR Funding Agreements. 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. During the license period, the



Government may not release or disclose SBIR data to any person other than its support services contractor except: a) for evaluation purposes; b) as expressly permitted by the contractor; or c) a use, release, or disclosure that is necessary for emergency repair or overhaul of items operated by the Government. Please refer to FAR clause 52.227-20, "Rights in Data – SBIR Program," which will be included in all resultant contracts.

To preserve the SBIR data rights of the awardee, the legend (or statements) used in the SBIR Data Rights clause included in the SBIR award must be affixed to any submissions of technical data developed under that SBIR award. If no Data Rights clause is included in the SBIR award, the following legend, at a minimum, should be affixed to any submissions of technical data developed under that SBIR award.

"These SBIR data are furnished with SBIR rights under Contract Number \_\_\_\_\_ (and subcontract Number \_\_\_\_\_ if appropriate), Awardee Name \_\_\_\_\_, Address, Expiration Period of SBIR Data Rights \_\_\_\_\_. The Government may not use, modify, reproduce, release, perform, display, or disclose technical data or computer software marked with this legend for four (4) years. After expiration of the 4-year period, the Government has a royalty-free license to use, and to authorize others to use on its behalf, these data for Government purposes, and is relieved of all disclosure prohibitions and assumes no liability for unauthorized use of these data by third parties, except that any such data that is also protected and referenced under a subsequent SBIR award shall remain protected through the protection period of that subsequent SBIR award. Reproductions of these data or software must include this legend."

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

Patents. Small business concerns normally may retain the principal worldwide patent rights to any invention developed with Government support. In such circumstances, the Government receives a royalty-free license for Federal Government use, reserves the right to require the patent holder to license others in certain circumstances, and may require that anyone exclusively licensed to sell the invention in the United States must normally manufacture it domestically. To the extent authorized by 35 U.S.C. 205, the Government will not make public any information disclosing a Government-supported invention for a minimum 4-year period (that may be extended by subsequent SBIR funding agreements) to allow the awardee a reasonable time to pursue a patent.

Invention Reporting. SBIR awardees must report inventions to the awarding agency within 2 months of the inventor's report to the awardee. Awardees may report inventions to DHS through the NIH iEdison Invention Reporting Systems at [www.iedison.gov](http://www.iedison.gov). Use of the iEdison

System satisfies all invention reporting requirements mandated by 37 CFR Part 401, with particular emphasis on the Standard Patent Rights Clauses, 37 CFR 401.14.

#### 5.5 Cost-Sharing

Cost-sharing is permitted for proposals under this program solicitation; however, cost-sharing is not required and will not be an evaluation factor in consideration of the proposal.

#### 5.6 Profit or Fee

In accordance with FAR 15.404-4, offerors may include a reasonable fee or profit consistent with R/R&D work.

#### 5.7 Joint Ventures or Limited Partnerships

Joint ventures and limited partnerships are eligible provided that the entity created qualifies as a small business in accordance with the Small Business Act, 15 U.S.C. 631.

#### 5.8 Research and Analytical Work

For Phase I, a minimum of two-thirds (66%) of the research and/or analytical work must be performed by the proposing small business concern. For Phase II, a minimum of one-half (50%) the research and/or analytical work must be performed by the proposing small business concern. Subcontract cost will be calculated as a percentage of the total contract value.

#### 5.9 Awardee Commitments and Summary Statements

Upon award of an SBIR contract, the awardee will be required to make certain legal commitments through acceptance of numerous clauses in the Phase I and Phase II contracts. The outline that follows is illustrative of the types of clauses to which the contractor would be committed. This list is not a complete list of clauses to be included in Phase I funding agreements, and is not the specific wording of such clauses. Copies of complete terms and conditions are available upon request.

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

- e. *Termination for Convenience.* The funding agreement may be terminated at any time by the Government if it deems termination to be in its best interest, in which case the awardee will be compensated for work performed and for reasonable termination costs.
- f. *Disputes.* Any dispute concerning the funding agreement that cannot be resolved by agreement must be decided by the contracting officer with right of appeal.
- g. *Contract Work Hours.* The awardee may not require an employee to work more than 8 hours a day or 40 hours a week unless the employee is compensated accordingly (for example, overtime pay).
- h. *Equal Opportunity.* The awardee 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 awardee will not discriminate against any employee or application for employment because he or she is a disabled veteran or veteran of the Vietnam era.
- j. *Affirmative Action for Handicapped.* The awardee 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 Government official must benefit personally from the SBIR funding agreement.
- l. *Covenant Against Contingent Fees.* No person or agency has been employed to solicit or secure the funding agreement upon an understanding for compensation except bona fide employees or commercial agencies maintained by the awardee for the purpose of securing business.
- m. *Gratuities.* The funding agreement may be terminated by the Government if any gratuities have been offered to any representative of the Government to secure the award.
- n. *Patent Infringement.* The awardee must report each notice or claim of patent infringement based on the performance of the funding agreement.
- o. *American Made Equipment and Products.* When purchasing equipment or a product under the SBIR funding agreement, purchase only American-made items whenever possible.
- p. *Advertisements, Publicizing Awards, and News Releases.* All press releases or announcements about agency programs, projects, and contract awards must be cleared by the Contracting Officer's Representative (COR) and the Contracting Officer. Under no circumstances shall the Contractor, or anyone acting on behalf of the Contractor, refer to the supplies, services, or equipment furnished pursuant to the provisions of this contract in any publicity news release or commercial advertising without first obtaining explicit written consent to do so from the Program Manager/COR and the Contracting Officer. The Contractor agrees not to refer to awards in commercial advertising in such a manner as to state or imply that the product or service provided is endorsed or preferred by the Federal Government or is considered by the Government to be superior to other products or services.
- q. *E-Verify.* Contracts exceeding the simplified acquisition threshold may include the FAR clause 52.222-54 "Employment Eligibility Verification" unless exempted by the conditions listed at FAR 22.1803.

- r. *Prohibition on Contracting with Inverted Domestic Corporation.* Section 835 of the Homeland Security Act, 6 U.S.C. 395, prohibits the Department of Homeland Security from entering into any contract with a foreign incorporated entity which is treated as an inverted domestic corporation as defined in HSAR 3052.209-70. The Prohibition on Contracting with Inverted Domestic Corporation clause will be incorporated into awards resulting from this solicitation.

#### 5.10 Release of Proposal Information

In submitting a proposal, the offeror agrees to permit the Government to disclose publicly the information on the proposal Cover Sheet (with the exception of the Project Aims and Summary of Results). Other proposal data is considered to be the property of the offeror, and DHS will protect it from public disclosure to the extent permitted by law including the Freedom of Information Act. Please note, in accordance with the Small Business Administration's SBIR Policy Directive dated August 6, 2012, the DHS SBIR Office will provide the basic proposal information to the Small Business Administration's Application Information database at [www.SBIR.gov](http://www.SBIR.gov), as identified in the Policy Directive.

In an effort to increase the transition of SBIR technologies and facilitate partnerships between small businesses, large integrators, and program offices, the DHS SBIR Program Office may provide proposal information to the Department of the Navy's SBIR Program Office for inclusion in its Navy SBIR/STTR search database at [www.navysbirsearch.com](http://www.navysbirsearch.com). Awardees who do not want their proposal to be included in this database must opt out by answering "No" on the Cover Sheet.

#### 5.11 Discretionary Technical Assistance

DHS SBIR may provide up to \$5,000.00 per year for technical assistance to a SBIR awardee. Technical Assistance funds are in addition to the maximum award amount stated in **Section 3.5**. The purpose of Technical Assistance is to assist SBIR awardees in: (1) making better technical decisions on SBIR projects; (2) solving technical problems that arise during SBIR projects; (3) minimizing technical risks associated with SBIR projects; and (4) commercializing the SBIR products or processes.

Small business concerns can receive Technical Assistance in two ways:

1. Awardees can receive Technical Assistance through the DHS SBIR Program Office. The SBIR Program Office is under contract with a company that can provide technical assistance to Phase I or Phase II awardees. Awardees will receive notification from the DHS SBIR Office on what services are available and how to obtain these services at no cost to the small business. If an offeror would like to receive Technical Assistance through the DHS SBIR Program Office, Technical Assistance costs should not be included in the Cost Proposal.

2. Awardees can also receive Technical Assistance outside of the SBIR Program Office. To do so, offerors must enter into an agreement with a subcontractor for up to \$5,000.00 per year in Technical Assistance. (For example – offerors can propose up to \$5,000 for a Phase I and up to \$10,000 for a 24 month Phase II effort). These subcontract costs must be accounted for in the Cost Proposal; however, profit or fee should not be applied to Technical Assistance costs. Offerors must provide a budget justification, an outline of the specific services technical assistance to be provided, and the detailed qualifications and experience of the proposed subcontractor/consultant being requested. Further, the offeror must demonstrate in the Technical Proposal that the outside vendor selected can provide the specific technical services needed. Reimbursement is limited to services received that comply with 15 U.S.C. 638(q). Note, unspent funds for technical assistance services cannot be budgeted for other project costs. If all of the Technical Assistance funds are not spent, the balance will be de-obligated from the resultant contract. If an offeror receives Technical Assistance from a vendor of its choice, they will not be eligible to receive assistance from the DHS Technical Assistance contractor on the Phase I or Phase II contract.

#### 5.12 Classified and Unsolicited Proposals

Classified proposals are not accepted under the DHS SBIR Program. Classified proposals will be appropriately destroyed upon receipt.

The DHS SBIR Program is not a substitute for existing unsolicited proposal submissions and does not accept unsolicited proposals. The DHS SBIR Program is a competitive program designed to meet the needs of the DHS. If a proposal does not meet the objectives of the topics listed in this Solicitation, the proposal will be determined “non-responsive” to the topic area.

#### 5.13 Animal and/or Human Subjects

Funds cannot be released or used for any portion of the project involving animal and/or human subjects until all of the proper approvals have been obtained in accordance with applicable regulations. See **Appendix B** for more details concerning the use of Animal and/or Human Subjects.

#### 5.14 DHS SBIR Phase II Enhancement Programs

To further encourage the transition of SBIR-funded research into DHS acquisition programs as well as to the private sector, the DHS SBIR Program offers several opportunities for an SBIR Phase II awardee to receive additional funding. Specifically, the DHS SBIR Program Office offers Cost Match, and the SBIR Commercialization Readiness Pilot Program (CRPP) award.

Cost Match. The DHS SBIR Program includes a Cost Match feature for SBIR projects that attract matching funds from an outside investor for the Phase II SBIR effort. The purpose of the cost match is to focus DHS SBIR funding on those projects that are most likely to be developed into

viable new products that DHS and others will purchase and that will make a major contribution to homeland security and/or economic capabilities. The cost match can occur 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. In order to be considered for DHS SBIR cost match, the outside investors must commit a minimum of \$100,000 up to a maximum of \$500,000. DHS will, at its discretion and subject to availability of funds, match up to 50% of funds received.

The additional work proposed for the Cost Match feature 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.

For more information about Cost Match visit <https://sbir2.st.dhs.gov>.

Commercialization Readiness Pilot Program (CRPP) Award. The SBIR/STTR Reauthorization Act of 2011 established the Civilian Commercialization Readiness Pilot Program (CRPP). The purpose of this program is to address the basic issues involved in transitioning any new product to the open market: (1) technology maturation, (2) business maturation, and (3) end-user product knowledge. The DHS SBIR Program received approval for its FY2014 CRPP plan from the SBA on August 29, 2013.

At the discretion of DHS, a separate SBIR CRPP award may be issued to continue funding Phase II activities. A 24-month CRPP award will further mature the technology for inclusion into a larger DHS Program or DHS acquisition program. A project's inclusion in the CRPP is selective and at the discretion of DHS. If selected, contractors will be contacted during the SBIR Phase II period of performance.

#### 5.16 Additional Information

This 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 funding agreement, the terms of the funding agreement are controlling.

Before award of an SBIR funding agreement, the Government may request the applicant to submit certain organizational, management, personnel, and financial information to assure responsibility of the applicant.

DHS shall not be liable for any costs incurred by the offerors prior to award of any SBIR contract.

This Solicitation is not an offer by the Government and does not obligate the Government to make any specific number of awards. Also, awards under the SBIR Program are contingent upon the availability of funds.

If an award is made pursuant to a proposal submitted under this Solicitation, a representative of the contractor or grantee or party to a cooperative agreement will be required to certify that the concern has not previously been, nor is currently being, paid for essentially equivalent work by any Federal agency.

In the event that DHS has a need to share sensitive information with the SBIR awardee, the contractor must clear DHS suitability.

## **6.0 SUBMISSION OF PROPOSALS**

**Proposals are due no later than 2:00 pm ET on January 22, 2014.** The DHS SBIR Programs use an electronic online proposal submission system located at <https://sbir2.st.dhs.gov>. All offerors must submit proposals through this online system. Paper submissions and proposals received by any other means will not be accepted, evaluated, or considered for award.

Offerors are strongly encouraged to read the *Portal Registration and Submissions Training Guide* and follow the instructions for proposal submission. This guide can be found at <https://sbir2.st.dhs.gov> under "Reference Materials." The Guide provides step-by-step instructions for company registration and proposal submission.

Questions about the electronic submission of proposals should be submitted to the Help Desk. The Help Desk may be contacted at (703) 480-7676, or [dhssbir@reisystems.com](mailto:dhssbir@reisystems.com) from 9:00 a.m. to 5:00 p.m. ET, Monday through Friday.

Late proposals will not be accepted or evaluated. Note: As the close of the solicitation approaches, heavy traffic on the web servers may cause delays. Plan ahead and leave ample time to prepare and submit your proposal. Offerors bear the risk of website inaccessibility due to heavy usage in the final hours before the Solicitation closing time. In accordance with the FAR clause 52.215-1, offerors are responsible for submitting proposals, and any modifications or revisions, so as to reach the Government office designated in the Solicitation by the time specified in the Solicitation. FAR clause 52.215-1, Instructions to Offerors – Competitive Acquisition (Jan 2004) is hereby incorporated in this Solicitation by reference.

## **7.0 RESEARCH TOPICS**

### **7.1 S&T Directorate Topics**

The following are the topics for the FY14.1 S&T Directorate's SBIR Program:

**H-SB014.1-001**      Mobile Footprint Detection

- H-SB014.1-002** Mass Delivery of Countermeasure for High Consequences Diseases in Wildlife
- H-SB014.1-003** System Simulation Tools for X-ray based Explosive Detection Equipment
- H-SB014.1-004** Physiological Monitoring and Environmental Scanning Technology
- H-SB014.1-005** Machine to Machine Architecture to Improve First Responder Communications

Specific details for each topic are included in this **Appendix A**.

## 7.2 DNDO Topics

The following are the topics for the FY14.1 DNDO SBIR Program:

- H-SB014.1-006** Smart Device Compatible Module for Radiation Identification, Categorization, and Quantification.
- H-SB014.1-007** Miniaturization of Support Infrastructure for Non-Intrusive Inspection X-Ray Systems

Specific details for each topic are included in **Appendix A**.



## APPENDIX A – RESEARCH TOPIC DESCRIPTIONS

**SBIR TOPIC NUMBER:** H-SB014.1-001

**TITLE:** Mobile Footprint Detection

**TECHNOLOGY AREAS:** Border Security and Surveillance

**OBJECTIVE:** Develop vehicle mounted device to detect footprints of illegal border crossers while the Border Patrol Agent is driving.

**DESCRIPTION:** Illegal cross-border traffic along the southern border often traverse unimproved roads as they head towards their final destination. As a starting point for their pursuit, Border Patrol Agents look for signs of human activity (e.g., footprints in the dirt, broken branches, empty water bottles) to determine direction, time of crossing, and number of illegals. This “sign cutting” is performed for both daylight and nighttime operations while walking or driving their vehicles. The desired result of this research effort is a forward looking cost effective device (approximately \$1,000 installed per vehicle) that can be mounted specifically to a Border Patrol vehicle that provides an alert when a likely footprint trail is detected. The device must feature day/night capability and operate on Border Patrol vehicles traveling up to 25 mph. Nighttime illumination is allowed. For nighttime illumination it would be preferable if the vehicle’s own headlights could be used as the source for this illumination. The solution must also be capable of surviving the harsh environment of the desert southwest as well as the shock/vibration of vehicles traversing extremely rough, unimproved roads.

**PHASE I:** Demonstrate an initial prototype in an area near the offeror’s facility. Deliver a final technical report that includes demonstration results, demonstration anomalies (e.g., not conducted at desired speed or rugged environment), anticipated costs, and proposed Phase II solutions to address resulting shortcomings and demonstration anomaly issues.

**PHASE II:** Demonstrate two “near production ready” prototypes in an operationally relevant environment along the southwest border. U.S. Government personnel will participate in two design reviews prior to this demonstration and observe the demonstration. Deliver a final technical report that includes demonstration results and proposed solutions to address resulting shortcomings

**PHASE III: COMMERCIAL OR GOVERNMENT APPLICATIONS:** Resulting technology will be used throughout the southern border by U.S. Border Patrol and may have application for search and rescue missions conducted by federal, state, and local law enforcement.

### REFERENCES:

U.S. Customs and Border Protection. *2012-2016 Border Patrol Strategic Plan*. Retrieved from [http://www.cbp.gov/xp/cgov/border\\_security/border\\_patrol/bp\\_strat\\_plan/](http://www.cbp.gov/xp/cgov/border_security/border_patrol/bp_strat_plan/). For images of Border Patrol Vehicles enter “border patrol vehicles” in browser search window.

**KEY WORDS:** multi-spectral, video, infrared, mobile surveillance, trail detection

## APPENDIX A – RESEARCH TOPIC DESCRIPTIONS

---

**SBIR TOPIC NUMBER:** H-SB014.1-002

**TITLE:** Mass Delivery of Countermeasures to High Consequence Diseases (HCD) in Wildlife

**TECHNOLOGY AREAS:** Vaccine Development, Biotherapeutics, Medical Countermeasures Delivery Systems

**OBJECTIVE:** Develop an enhanced ability for the mass distribution of medical countermeasures to wildlife.

**DESCRIPTION:** Free ranging wildlife (terrestrial and aquatic) species could play a significant role in the introduction, maintenance or persistence of a high consequence animal disease event impacting livestock species. Their involvement could lead to unprecedented disease control challenges with a substantial economic cost. There is a need to proactively develop tools to mitigate the impact of outbreaks in wildlife and prevent transmission to livestock. One of the high priority gaps identified during a HCD (disease that has large-scale biological (e.g., highly infectious, high mortality rate, etc.) and/or economic consequences) in wildlife workshop was the lack of mass “hands-off” delivery tools for vaccines, therapeutics and other countermeasures for use with wildlife. These tools could be used in a preventive or responsive manner, depending on the HCD and the species of interest.

Individual administration of countermeasures (vaccines, biotherapeutics, paraciticides, sterilants or lethal intoxicants) to wildlife is extremely costly, often not possible and grossly inefficient. The ability to reliably deliver countermeasures en mass to wildlife either by oral, transdermal (via water for aquatic species), aerosol or other means is desired. Environmental stability of the countermeasure will need to be considered as will the ability to exclude non-target species. Field tests with current vaccines should be completed as part of proof-of-concept. Potential applications include emergency disease management in both domestic livestock and wildlife.

Phase I efforts would be focused on developing proof of concept ideas for novel methods for mass distribution such as options for converting traditional vaccines into oral vaccines, oral baiting, water or powder distribution, in a manner that allows vaccination or treatment of large numbers of free ranging wildlife (and potentially livestock) and the exclusion of non-target species (i.e., how to vaccinate only white tail deer and not elk).

**PHASE I:** The primary deliverables from Phase I are a well-researched and documented concept on the proof of concept for a proposed approach and a plan for moving to Phases II and III. This plan should include: (1) an evaluation of the proposed approach with clear metrics outlined as decision points for Phase II continuation; (2) a clear description of deliverable envisioned and transition plan for the end of Phase II; (3) a description of engagement and transition to commercial partners; and (4) an assessment of commercialization potential.

## APPENDIX A – RESEARCH TOPIC DESCRIPTIONS

**PHASE II:** A prototype of the proposed delivery device or enhanced capability should be developed and exercised in a pilot test. If needed, the proposed delivery device or enhanced capability could be developed and demonstrated for another non-HCD agent of concern, with proof of how it could be adapted to a HCD. Attributes of this novel or enhanced capability must include the following:

- Cost-effective;
- Provide long term protection, treatment, and/or immunity;
- High efficacy and efficiency;
- Species-specific;
- Safe for humans, non-targeted species, and the environment;
- Can be spread over a wide area and reach large populations quickly and effectively; and
- Environmentally stable.

In addition, a clear plan for transition to and a list of commercial/government partners should be developed and provided in the final report.

### **PHASE III: COMMERCIAL OR GOVERNMENT APPLICATIONS**

Potential government applications in the U.S. include use as a prevention tool in the absence of an outbreak or a mitigation tool during a HCD outbreak. Potential commercial applications are marketing and sales to international markets in countries where targeted HCDs are endemic or emerging.

### **REFERENCES:**

- Brauer A, Lange E, Kaden V. "Oral immunisation of wild boar against classical swine fever: uptake studies of new baits and investigations on the stability of lyophilised C-strain vaccine." *European J Wildlife Res*, 2006. 52(4): 271-6.
- Campbell T, Lapidge SJ, Long DB. "Using Baits to Deliver Pharmaceuticals to Feral Swine in South Texas." *Wildlife Society Bulletin*, 2006. 34(4): 1184-9.
- Cross ML, Buddle BM, Aldwell FE. "The potential of oral vaccines for disease control in wildlife species." *The Vet J*, 2007. 174(3): 472-80.
- Fletcher WO, et al. "A field trial to determine the feasibility of delivering oral vaccines to wild swine." *J Wildlife Diseases*, 1990. 76(4): 502-10.
- Miller et al. "Diseases at the livestock-wildlife interface: Status, challenges, and opportunities in the United States." *Prev Vet Med*, 2013. 110: 119-32.
- Wobeser G. "Disease management strategies for wildlife." *Rev sci tech Off int Epiz*, 2002. 21(1): 158-78.

**KEY WORDS:** biotherapeutics, delivery systems, mass distribution, medical countermeasures, paracitocides, sterilants, vaccines, wildlife

---

## APPENDIX A – RESEARCH TOPIC DESCRIPTIONS

**SBIR TOPIC NUMBER:** H-SB014.1-003

**TITLE:** System Simulation Tools for X-ray based Explosive Detection Equipment

**TECHNOLOGY AREAS:** Explosive Detection Systems, Passenger Checkpoint, Checked Baggage, Air Cargo

**OBJECTIVE:** Develop methods to simulate raw data from x-ray based explosive detection equipment.

**DESCRIPTION:** Currently fielded explosive detection equipment utilize x-rays to interrogate checked and carry-on baggage, and in cargo. Development of new and revised equipment may be time-consuming and expensive because of the need to develop prototype systems to measure and understand the interaction of x-rays with explosives in various containment configurations. Deployable products may have to be designed from scratch based on information derived from the prototype systems. Today it is difficult to assess the performance of new technologies without the investment in prototype systems. In order to accelerate the advancement of this equipment, the DHS S&T Directorate is seeking to develop tools to simulate the raw data (also known as detector or measurement data) for present and future scanners. The tools will be used to assess technology for detecting explosives in checked baggage, cargo and items divested at the check point. The specific x-ray technologies to be simulated include computerized tomography, and single and multi-view line scanners. These technologies may use transmission, diffraction, scatter and phase contrast to detect explosives. The tools will include the interaction of x-rays with simulated explosives packed in simulated bags and cargo containers; the simulated bags and cargo containers will be supplied to the performer of this project. The resulting raw data will need to closely resemble raw data produced by existing systems. Therefore, the following effects may need to be simulated: Photoelectric absorption, Compton Scatter, Rayleigh Scatter, pair production, polychromatic spectra, focal spots, detector apertures, electronic noise, crosstalk, afterglow and various system geometries. The tools should use public-domain descriptions of simulated bags and cargo. The tools shall be extensible for future explosive detection technologies, perhaps using object oriented code with user-supplied modules. In Phase I of the project, publically and commercially applicable tools for simulating x-ray interactions shall be evaluated. Initial simulations should be performed to determine if raw data representative of existing systems can be created.

**PHASE I:** Evaluate commercially and publically available simulation tools. Perform initial simulations to assess matching an existing CT scanner, which may be a medical CT scanner that is representative of existing security CT scanners. Write a project plan, including costs and schedule, for Phase II. The final report must include technical reports reviewing the available tools, and describing how existing scanners are matched and project plans for Phase II.

## APPENDIX A – RESEARCH TOPIC DESCRIPTIONS

**PHASE II:** Develop software to simulate raw data for checked baggage, check point and cargo explosive detection systems. Deliverables include object or source code for the simulation program and technical reports describing how the tools operate and how they were validated.

**PHASE III: COMMERCIAL OR GOVERNMENT APPLICATIONS:** The tools could be sold commercially for use by existing or new vendors. The source code for the tools could be put in the public domain and the provider could sell services to help vendors use the tools. There will be on-going expenses to modify the tools based on user feedback. DHS could supply them to vendors as part of future programs.

### REFERENCES:

- Arbeitsgruppe Phantome. *FORBILD phantoms (standard for medical CT)*. Retrieved from <http://www.imp.uni-erlangen.de/phantoms/>
- Computational Human Phantom. (n.d.). Retrieved from [en.wikipedia.org/wiki/Computational\\_human\\_phantom](en.wikipedia.org/wiki/Computational_human_phantom)
- Geant4. (2013). *A toolkit for the simulation of the passage of particles through matter*. Retrieved from [geant4.cern.ch/](http://geant4.cern.ch/).
- Gilat-Schmidt, T. (2012). *Tools For Simulating CT Scanners*, in *Algorithm Development for Security Applications, Seventh Workshop (ADSA07): CT-Based Explosive Detection Equipment: Improved Reconstruction and Accelerated Deployment*, Northeastern University, Boston, MA. Retrieved from [https://myfiles.neu.edu/groups/ALERT/strategic\\_studies/ADSA07\\_final\\_report.pdf](https://myfiles.neu.edu/groups/ALERT/strategic_studies/ADSA07_final_report.pdf)
- Kak, A. and Slaney, M. *Principles of Computerized Tomography*, IEEE Press, released into the public domain at: [www.slaney.org/pct/](http://www.slaney.org/pct/)

**KEY WORDS:** x-ray, simulation, computerized tomography, diffraction, phase contrast, scatter

---

**SBIR TOPIC NUMBER:** H-SB014.1-004

**TITLE:** Physiological Monitoring and Environmental Scanning Technology

**TECHNOLOGY AREAS:** Personal Protective Equipment (PPE), Chemical/Biological Protection

**OBJECTIVE:** Develop a single wireless device that will monitor physiological and environmental conditions of and surrounding a first responder, and relay the information to the incident command.

**DESCRIPTION:** First responders often experience physiologically and environmentally hazardous situations. To help ensure the safety of first responders in emergencies, a device is needed that would record and transmit real-time, physiological and environmental monitoring data of first responders to the incident command. This device would only be worn and monitored by first responders while in performance of their operational field duties. The

## APPENDIX A – RESEARCH TOPIC DESCRIPTIONS

device shall uniquely identify the wearer, such as through a radio-frequency identification (RFID) chip or an automated biometric reading that is transparent to the first responder.

The device should be small and lightweight. Ideally, it would:

- Weigh less than 16 ounces (preferably less than 8 ounces) and be smaller than 25 square inches;
- Operate on less than one milliwatt of power;
- Be self-contained;
- Operate automatically; and
- Integrate with other first responder PPE, such as the Self-Contained Breathing Apparatus (SCBA) or the Personal Alert Safety System (PASS).

The device shall, at a minimum, monitor the following physiological characteristics:

- Respiratory rate;
- Heart rate;
- Body temperature; and
- Blood pressure.

The environmental monitoring portion of the device shall include an active 4-gas sensor for monitoring oxygen and carbon monoxide, at minimum. The device must also monitor for two other gases, which typically include hydrogen sulfide and methane, although other gases may be substituted. Moreover, the device shall monitor combustible gases and alert when they approach their lower explosive limit (LEL).

Ideally the device will be a single unit. However, the need for environmental readings external to the PPE and physiological readings of the wearer (i.e., beneath the PPE) may require a multiple-unit solution. A multiple-unit device is acceptable as long as it also operates wirelessly and meets the minimum objectives outlined.

The device shall be intrinsically safe for the first responder to wear and be resistant to excessive heat, water, and dropping/shock. The device must meet all applicable certification requirements, including any National Fire Protection Association (NFPA) certifications for fire protection, United States Occupational Safety and Health Administration (OSHA) safety standards, and the Department of Justice's National Institute of Justice (NIJ) standards regarding protective equipment.

**PHASE I:** During Phase I, the offeror should obtain data required to provide a detailed technical proposal for a Phase II research and development effort and specify the threats for which the prototype device will provide protection. Any test data available from previous research that supports the suggested technical approach should also be included, as well as information obtained from collaboration with academia or industry, from journal articles, or from technical presentations, etc.

## APPENDIX A – RESEARCH TOPIC DESCRIPTIONS

At the end of Phase I, the offeror shall provide a Final Report that summarizes the work conducted during Phase I, the data obtained, understanding of the testing that will be required to determine the prototype's performance, and a detailed summary discussing the technical approach for the work that would be performed during Phase II.

**PHASE II:** During the Phase II effort, the offeror shall implement the technical approach that was summarized in the Phase I Final Report. The prototype device shall be built in accordance with the specifications outlined in the Phase I of the detailed technical report. Development of a prototype during Phase II will include development and manufacture of the prototype device and conducting preliminary testing to ensure that the prototype device can meet any identified certification requirements. The Final Report must detail the work that was performed and contain test data that indicate that the device meets the performance/certification requirements established in Phase I. A prototype device shall also be provided so that DHS can conduct testing at independent laboratories to confirm the device's performance.

**PHASE III: COMMERCIAL OR GOVERNMENT APPLICATIONS:** If a new prototype is developed that can monitor both physiological and environmental conditions, this prototype should be made available to manufacturers so that a future device is available for firefighters and other emergency first responder use.

### REFERENCES:

- Cooper, C., Mapar, J., and Batalin, M. (2012, April 1). PHASER Advances Firefighter Physiological Monitoring. *FIREFIGHTER NATION*. Retrieved from <http://www.firefighternation.com/article/technology/phaser-advances-firefighter-physiological-monitoring>
- FirstResponder.gov. (2013, January 17). Monitoring Vital Signs, Wirelessly. Retrieved from <http://www.firstresponder.gov/frblog/Post.aspx?ID=143>
- Mordecai, M. (2008). Physiological Status Monitoring for Firefighters. *Firefighter Engineering*. <http://www.fireengineering.com/articles/2008/06/physiological-status-monitoring-for-firefighters.html>
- RKI Instruments, Inc. (2013). Smallest Four Gas Confined Space Monitor. *Gas Detection For Life*. Retrieved from <http://www.rkiinstruments.com/pages/gx2009.htm>

**KEY WORDS:** 4-gas monitor, gas detection, physiological monitoring, environmental monitoring

---

**SBIR TOPIC NUMBER:** H-SB014.1-005

**TITLE:** Machine-to-Machine Architectures to Improve First Responder Communications

**TECHNOLOGY AREAS:** Machine-to-Machine, Wearable Technologies, Situational Awareness, Internet of Everything (IoE), Pervasive Computing

## APPENDIX A – RESEARCH TOPIC DESCRIPTIONS

**OBJECTIVE:** Develop a high-level scalable architecture and prototype that allows first responder networks to connect via wearable technologies to other existing networks and devices.

**DESCRIPTION:** Machine-to-machine communications is revolutionizing many industries in the commercial sector and improving communications and operations, such as connected cars, homes, utility grids, buildings, etc. The concepts and technologies used in these connected networks could greatly benefit and enhance first responder communications; however adoption in public safety is still in its infancy.

While traditional land mobile radio (LMR) devices will continue being the primary voice communications device for many years to come, there is both a desire and a need to complement LMR devices with new broadband services and capabilities. One such way is through the use of a “wearable computer” or a “wearable device”. Many first responders already use variations of wearable devices such as in firefighter safety and law enforcement head-mounted cameras.

Rather than looking at a piece-meal solution, the focus of this effort is to identify scalable technical approaches that demonstrate how different networks could facilitate and improve first responder communications (including both LMR and broadband wearable devices). This effort will include identifying, evaluating, and recommending relevant standards, protocols and interface specifications that are suitable in a first responder environment.

**PHASE I:** Develop a high level concept of operations that includes a list of the various connected networks and relevant use cases. This will also include a conceptual scalable architecture involving multiple networks (LMR, Commercial Broadband, Wi-Fi, etc.) connected to existing and theoretical first responder devices, along with a section outlining the technical feasibility and potential improvement in operations. The concept should embrace a standards-based approach.

**PHASE II:** Develop a detailed technical architecture along with identifying and proposing relevant standards, and interfaces. Develop a working prototype and conduct a pilot(s) and/or trial(s) to evaluate the operational use of the proof of concept. Include a comprehensive security assessment.

**PHASE III: COMMERCIAL OR GOVERNMENT APPLICATIONS:** Based on the pilots/trials, refine the prototype. Include a plan to commercialize the technology.

### REFERENCES:

- Chen, M., Jiafu W., and Li, F. (2012). Machine-to-Machine Communications: Architectures, Standards and Applications.
- Chen, M. (2012). Towards smart city: M2M communications with software agent intelligence. *Multimedia Tools and Applications*: 1-12.



## APPENDIX A – RESEARCH TOPIC DESCRIPTIONS

Lien, S., Chen, K., and Lin, Y. (2011). Toward ubiquitous massive accesses in 3GPP machine-to-machine communications. *IEEE Communications Magazine*, 49, no. 4: 66-74.

Wu, G., Shilpa, T., Johnsson, K., Himayat, N. and Johnson, N. (2011). M2M: From mobile to embedded internet. *Communications Magazine, IEEE* 49, no. 4: 36-43.

**KEY WORDS:** machine-to-machine, Internet of Everything, wearable devices, sensors, situational awareness

---

**SBIR TOPIC NUMBER:** H-SB014.1-006

**Title:** Smartphone or Tablet Controlled Devices for Radiation Detection, Identification, Classification and Quantification

**TECHNOLOGY AREAS:** Radiation detection, radionuclide identification, spectroscopic personal radiation detector

**OBJECTIVE:** Successful research will result in a prototype device(s) that provides a compact, low-cost, high-performance, smart phone compatible “module” to readily identify and categorize radiation sources. The device may also support radiation safety or consequence management requirements. The module would support all required radiation sensing performance, whereas the smart phone would provide the user interface to control the module, display data and analysis results, and provide data storage and reach-back support capabilities.

**DESCRIPTION:** There is the continued need for low-cost, high performance alternatives to facilitate detection, identification and classification of radioactive materials and radiation sources that may be encountered by law enforcement and first responders.

There is also a need for expedited capabilities to detect and measure radiation and evaluate samples for their radioactive material content following a contaminating event.

Phase 1 efforts should focus on developing a comprehensive preliminary design for the prototype device that can achieve the following performance objectives (the performance that the device should meet) and goals (the performance that would be desirable for the device to meet):

- Objective: Exceed performance as indicated in American National Standards Institute (ANSI) Standard N42.48, Performance Requirements for Spectroscopic Personal Radiation Detectors (SPRDs) for Homeland Security, while significantly improving on mass and volume requirements of this standard.

## APPENDIX A – RESEARCH TOPIC DESCRIPTIONS

- Goal: Exceed performance as indicated in ANSI Standard N42.34, Criteria for Hand-Held Instruments for the Detection and Identification of Radionuclides, while significantly improving on mass and volume requirements of ANSI N42.48.
- Goal: Provide an expedited, low-cost capability to support measuring and monitoring requirements during the intermediate and late phases following a nuclear or radiological event.
- Goal: Capable to provide a near-real time data log of spectral detector data that may be synchronized with the smartphone/tablet device position data
- Objective costs for the device once in full production should be <\$1000 (exclusive of the smart phone or tablet device to which it is connected). Goal costs for the device once in full production should be <\$500.

**PHASE I:** An end-user and subject matter expert vetted preliminary design resulting from a systems engineering approach to capability-based design. The design should include a preliminary hardware and software architecture for the concept, initial hardware and software evaluation and selection, and identification of any major risks and risk mitigation strategies in achieving a design that achieves performance objectives or goals. Developers are expected to establish a user advisory group to support the design effort.

**PHASE II:** An end-user and subject matter expert vetted critical design review at the end of the first year, and development and delivery of two or more prototype devices by the end of the Phase II. Design review may include: complete module hardware and system software, and communication interface protocols to include wireless (i.e., Wi-Fi, Bluetooth, or ZigBee) and wired connectivity. Additional design review features may include power management integration, data encryption, user interface features, and message queuing prioritization between device and detector. Phase II should also include formal or informal evaluation of device performance.

**PHASE III: COMMERCIAL OR GOVERNMENT APPLICATIONS:** Produce a device compatible with smart device technology (e.g., smart phones, tablets, and the like) that can be readily procured and used by the law enforcement or community first responder with performance and cost that meets or exceeds topic area goals.

### REFERENCES:

ANSI N42.34-2006: Performance Criteria for Hand-held Instruments for the Detection and Identification of Radionuclides

ANSI N42.48-2008: American National Standard Performance Requirements for Spectroscopic Personal Radiation Detectors (SPRDs) for Homeland Security

U.S. Environmental Protection Agency, Protective Action Guides and Planning Guidance for Radiological Incidents, Draft for Interim Use and Public Comment, Mar 2013

## APPENDIX A – RESEARCH TOPIC DESCRIPTIONS

Department of Homeland Security/ Federal Emergency Management Agency: Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents (2008)

Food and Drug Administration: Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies (1998)

**KEY WORDS:** Radionuclide identification, gamma-ray spectroscopy, semiconductor detectors, scintillator detectors, smart phones (e.g., iPhones, Androids), tablets

---

**SBIR TOPIC NUMBER:** H-SB014.1-007

**TITLE:** Miniaturization of Support Infrastructure for Non-Intrusive Inspection X-Ray Systems

**TECHNOLOGY AREAS:** Electronics, Cooling Systems, Vacuum Systems, Power Supplies, Radiation Shielding, High Energy X-ray Sources

**OBJECTIVE:** Non-Intrusive Inspection (NII) systems, such as x-ray radiography, are used for the scanning of land, sea, and air conveyances, such as cargo containers, to screen for contraband such as Special Nuclear Material (SNM). Mobile NII systems are advantageous because they can be deployed on demand and moved to areas where the greatest need exists. Unique physics signatures from SNM can be detected with the use of high energy x-rays, however the support infrastructure to run high energy x-ray sources have a large footprint that make high energy x-ray systems difficult to deploy, and their mobility is extremely limited. Proposals are sought to shrink the footprint for support infrastructure necessary to run high energy (up to 9 MeV) x-ray sources.

**DESCRIPTION:** Support infrastructure includes equipment necessary to run the source such as electronics, cooling systems, power supplies, and vacuum systems, as well as radiation shielding to protect system operators and nearby personnel from unnecessary exposure. Successful proposals for Phase I will provide adequate evidence/estimates that the infrastructure component being investigated can be miniaturized and to what extent. Phase II would focus on the proof-of-concept of the ideas proposed. Teaming with existing NII system integrators or x-ray source manufacturers is encouraged. Proposals can concentrate on any or all specific component(s) of support infrastructure (electronics, cooling, vacuum, power supplies, radiation shielding, etc.). Proposals that are investigating a complete system miniaturization should show how a full NII x-ray system (source, detectors, and support infrastructure) can fit inside of a small truck trailer or large SUV.

**PHASE I:** Preliminary design would be best completed with consultation of a subject matter expert (SME) in NII systems. The design should include a comparison of the current state-of-the-art for volume occupied by NII high energy x-ray sources to that of the preliminary design, plus any issues that limit the miniaturization of system support infrastructure.

## APPENDIX A – RESEARCH TOPIC DESCRIPTIONS

**PHASE II:** Development will continue toward a critical design and, if successful, prototype development that demonstrates the proof-of-concept of support infrastructure miniaturization.

**PHASE III: COMMERCIAL OR GOVERNMENT APPLICATIONS:** Develop a packaging process that NII system integrators or x-ray source manufacturers can use to decrease the footprint of systems.

### REFERENCES:

Dylla, H. F., "Development of ultrahigh vacuum technology for particle accelerators and magnetic fusion devices," *Journal of Vacuum Science & Technology A: Vacuum, Surfaces, and Films*, vol.12, no.4, pp.962-978, Jul 1994

doi: 10.1116/1.579074

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4929427&isnumber=4929416>

USPAT 8,022,116: Lightweight rigid structural compositions with integral radiation shielding including lead-free structural compositions: <http://patft1.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnethtml%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=8,022,116.PN.&OS=PN/8,022,116&RS=PN/8,022,116>

**KEY WORDS:** Electronics, cooling systems, vacuum systems, power supplies, radiation, shielding, x-ray sources

---

## APPENDIX B - DEFINITIONS

Commercialization. The processes of developing products, processes, technologies, or services and the production and delivery (whether by the originating party or others) of products, processes, technologies, or services for sale to or use by the Federal Government or commercial markets.

Conflicts of Interest. Contract awards made to small business concerns owned by or employing current or previous Federal Government employees could create conflicts of interest for those employees, which may be a violation of federal law of FAR Part 3.601 and the Ethics in Government Act of 1978, as amended. Small business offerors that are owned by or employ current or previous Federal Government employees should seek guidance from the cognizant Ethics Counselor from the employee's Government agency.

Essentially Equivalent Work. Work that is substantially the same research, which is proposed for funding in more than one contract proposal or grant application submitted to the same Federal agency or submitted to two or more different Federal agencies for review and funding consideration; or work where a specific research objective and the research design for accomplishing an objective are the same or closely related to another proposal or award, regardless of the funding source.

Foreign National (Foreign Person). A 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. 1324b(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 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 two (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.

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.

## APPENDIX B - DEFINITIONS

### Fraud, Waste and Abuse.

Fraud – Includes any false representations about a material fact or any intentional deception designed to deprive the United States unlawfully of something of value or to secure from the United States a benefit, privilege, allowance, or consideration to which an individual or business is not entitled.

Waste – Includes extravagant, careless or needless expenditure of Government funds, or the consumption of Government property, that results from deficient practices, systems, controls, or decisions.

Abuse – Includes any intentional or improper use of Government resources, such as misuse of rank, position, or authority or resources.

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, including products or services, funded in whole or in part by the Federal Government.

Joint Venture. See 13 CFR 121.103(h).

Key Individual (Key Personnel). The principal investigator/project manager and any other person named as a “key” employee in a proposal submitted in response to this program solicitation.

Principal Investigator/Project Manager. The one individual designated by the offeror to provide the scientific and technical direction to a project support by the funding agreement.

Proprietary Information. Proprietary information is information that is provided which constitutes a trade secret, proprietary commercial or financial information, confidential personal information or data affecting the national security.

Research or Research and Development (R/R&D). Any activity that is:

- a) A systematic, intensive study directed toward greater knowledge or understanding of the subject studies;
- b) A systematic study directed specifically toward applying new knowledge to meet a recognized need; or
- c) A systematic application of knowledge toward the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements.

Research Involving Animal Subjects. DHS has adopted the principles of the U.S. Department of Agriculture (USDA) implementation of the Animal Welfare Act, the Public Health Service (PHS) implementation of the Health Care extension Act, and the other related federal principles and guidelines as they represent the ethical foundation for the care and use of animals in research. All research involving the care and use of animals in research shall be conducted in accordance with DHS Management Directive Number 026-01.

## APPENDIX B - DEFINITIONS

Research Involving Human Subjects. DHS has adopted Department of Health and Human Services (HHS) policies governing human subjects research, as set forth in 45 C.F.R. Part 46 (Subparts A-D). Subpart A of 45 C.F.R. part 46 is HHS' codification of the Federal Policy for the Protection of Human Subjects (also known as The Common Rule) which represents the basic foundation for the protection of human subjects in most research conduct or supported by U.S. Federal departments and agencies. All research involving human subjects shall be conducted in accordance with DHS Management Directive Number 026-04.

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 concerns that develop and provide qualified anti-terrorism technologies. The DHS 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/products and are invited to contact the Office of SAFETY Act Implementation (OSAI) for more information at 1-866-788-9318 or visit OSAI's website at [www.safetyact.gov](http://www.safetyact.gov).

SBIR Technical Data. All data generated during the performance of an SBIR award.

SBIR Technical Data Rights. The rights an SBIR awardee obtains in data generated during the performance of any SBIR Phase I, Phase II, or Phase III award that an awardee delivers to the Government during or upon completion of a Federally-funded project, and to which the Government receives a license.

Small Business Concern. A concern that meets the requirements set forth in 13 C.F.R. 121.702.

State Assistance. Many states have established programs to provide services to those small business concerns 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; and/or
- Assistance in obtaining Phase III funding.

Visit [https://www2.ed.gov/programs/sbir/state\\_awards.html](https://www2.ed.gov/programs/sbir/state_awards.html) for further information.

## **APPENDIX B - DEFINITIONS**

Subcontract. 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.



## ATTACHMENT 1 – SBIR Funding Agreement Certification

All small businesses that are selected for award of an SBIR funding agreement must complete this certification at the time of award and any other time set forth in the funding agreement that is prior to performance of work under this award. This includes checking all of the boxes and having an authorized officer of the awardee sign and date the certification each time it is requested.

Please read carefully the following certification statements. The Federal government relies on the information to determine whether the business is eligible for a Small Business Innovation Research (SBIR) Program award. A similar certification will be used to ensure continued compliance with specific program requirements during the life of the funding agreement. The definitions for the terms used in this certification are set forth in the Small Business Act, SBA regulations (13 C.F.R. Part 121), the SBIR Policy Directive and also any statutory and regulatory provisions referenced in those authorities.

If the funding agreement officer believes that the business may not meet certain eligibility requirements at the time of award, they are required to file a size protest with the U.S. Small Business Administration (SBA), who will determine eligibility. At that time, SBA will request further clarification and supporting documentation in order to assist in the verification of any of the information provided as part of a protest. If the funding agreement officer believes, after award, that the business is not meeting certain funding agreement requirements, the agency may request further clarification and supporting documentation in order to assist in the verification of any of the information provided.

Even if correct information has been included in other materials submitted to the Federal government, any action taken with respect to this certification does not affect the Government's right to pursue criminal, civil or administrative remedies for incorrect or incomplete information given in the certification. Each person signing this certification may be prosecuted if they have provided false information.

The undersigned has reviewed, verified and certifies that:

1. The business concern meets the ownership and control requirements set forth in 13 C.F.R. §121.702.

Yes      No

- (2) If a corporation, all corporate documents (articles of incorporation and any amendments, articles of conversion, by-laws and amendments, shareholder meeting minutes showing director elections, shareholder meeting minutes showing officer elections, organizational meeting minutes, all issued stock certificates, stock ledger, buy-sell agreements, stock transfer agreements, voting agreements, and documents relating to stock options, including the right to convert non-voting stock or debentures into voting stock) evidence that it meets the ownership and control requirements set forth in 13 C.F.R. §121.702.

Yes      No      N/A Explain why N/A: \_\_\_\_\_

- (3) If a partnership, the partnership agreement evidences that it meets the ownership and control requirements set forth in 13 C.F.R. §121.702.  
Yes    No    N/A Explain why N/A: \_\_\_\_\_
- (4) If a limited liability company, the articles of organization and any amendments, and operating agreement and amendments, evidence that it meets the ownership and control requirements set forth in 13 C.F.R. §121.702.  
Yes    No    N/A Explain why N/A: \_\_\_\_\_
- (5) The birth certificates, naturalization papers, or passports show that any individuals it relies upon to meet the eligibility requirements are U.S. citizens or permanent resident aliens in the United States.  
Yes    No    N/A Explain why N/A: \_\_\_\_\_
- (6) It has no more than 500 employees, including the employees of its affiliates.  
Yes    No
- (7) SBA has not issued a size determination currently in effect finding that this business concern exceeds the 500 employee size standard.  
Yes    No
- (8) During the performance of the award, the principal investigator will spend more than one half of his/her time as an employee of the awardee or has requested and received a written deviation from this requirement from the funding agreement officer.  
Yes    No    Deviation approved in writing by funding agreement officer: \_\_\_\_%
- (9) All, essentially equivalent work, or a portion of the work proposed under this project (check the applicable line):
- Has not been submitted for funding by another Federal agency.
  - Has been submitted for funding by another Federal agency but has not been funded under any other Federal grant, contract, subcontract or other transaction.
  - A portion has been funded by another grant, contract, or subcontract as described in detail in the proposal and approved in writing by the funding agreement officer.
- (10) During the performance of award, it will perform the applicable percentage of work unless a deviation from this requirement is approved in writing by the funding agreement officer (check the applicable line and fill in if needed):
- SBIR Phase I: at least two-thirds (66 2/3%) of the research.
  - SBIR Phase II: at least half (50%) of the research.
  - Deviation approved in writing by the funding agreement officer: \_\_\_\_%
- (11) During performance of award, the research/research and development will be performed in the United States unless a deviation is approved in writing by the funding agreement officer.  
Yes    No    Waiver has been granted
- (12) During performance of award, the research/research and development will be performed at my facilities with my employees, except as otherwise indicated in the SBIR application and approved in the funding agreement.  
Yes    No

(13) It has registered itself on SBA's database as majority-owned by venture capital operating companies, hedge funds or private equity firms.

Yes    No    N/A Explain why N/A: \_\_\_\_\_

(14) It is a Covered Small Business Concern that (a) was not majority-owned by multiple venture capital operating companies(VCOCs), hedge funds, or private equity firms on the date on which it submitted an application in response to an SBIR solicitation; and (b) on the date of the SBIR award, which is made more than 9 months after the closing date of the solicitation, is majority-owned by multiple venture capital operating companies, hedge funds, or private equity firms).

Yes    No

It will notify the Federal agency immediately if all or a portion of the work proposed is subsequently funded by another Federal agency.

I understand that the information submitted may be given to Federal, State and local agencies for determining violations of law and other purposes.

I am an officer of the business concern authorized to represent it and sign this certification on its behalf. By signing this certification, I am representing on my own behalf, and on behalf of the business concern that the information provided in this certification, the application, and all other information submitted in connection with this application, is true and correct as of the date of submission. I acknowledge that any intentional or negligent misrepresentation of the information contained in this certification may result in criminal, civil or administrative sanctions, including but not limited to: (1) fines, restitution and/or imprisonment under 18 U.S.C. §1001; (2) treble damages and civil penalties under the False Claims Act (31 U.S.C. §3729 *et seq.*); (3) double damages and civil penalties under the Program Fraud Civil Remedies Act (31 U.S.C. §3801 *et seq.*); (4) civil recovery of award funds, (5) suspension and/or debarment from all Federal procurement and non-procurement transactions (FAR Subpart 9.4 or 2 C.F.R. part 180); and (6) other administrative penalties including termination of SBIR/STTR awards.

<i>Signature</i>	<i>Date</i> ___/___/___
<i>Print Name (First, MI, Last)</i>	
<i>Title</i>	
<i>Company Name</i>	

## ATTACHMENT 2 – SBIR FUNDING CERTIFICATION – LIFECYCLE CERTIFICATION

All SBIR Phase I and Phase II awardees must complete this certification at all times set forth in the funding agreement (see §8(h) of the SBIR Policy Directive). This includes checking all of the boxes and having an authorized officer of the awardee sign and date the certification each time it is requested.

Please read carefully the following certification statements. The Federal government relies on the information to ensure compliance with specific program requirements during the life of the funding agreement. The definitions for the terms used in this certification are set forth in the Small Business Act, the SBIR Policy Directive, and also any statutory and regulatory provisions referenced in those authorities.

If the funding agreement officer believes that the business is not meeting certain funding agreement requirements, the agency may request further clarification and supporting documentation in order to assist in the verification of any of the information provided. Even if correct information has been included in other materials submitted to the Federal government, any action taken with respect to this certification does not affect the Government's right to pursue criminal, civil or administrative remedies for incorrect or incomplete information given in the certification. Each person signing this certification may be prosecuted if they have provided false information.

The undersigned has reviewed, verified and certifies that (all boxes must be checked):

(1) The principal investigator spent more than one half of his/her time as an employee of the awardee or the awardee has requested and received a written deviation from this requirement from the funding agreement officer.

Yes No Deviation approved in writing by funding agreement officer: \_\_\_\_%

(2) All, essentially equivalent work, or a portion of the work performed under this project (check the applicable line):

- Has not been submitted for funding by another Federal agency.
- Has been submitted for funding by another Federal agency but has not been funded under any other Federal grant, contract, subcontract or other transaction.
- A portion has been funded by another grant, contract, or subcontract as described in detail in the proposal and approved in writing by the funding agreement officer.

(3) Upon completion of the award it will have performed the applicable percentage of work, unless a deviation from this requirement is approved in writing by the funding agreement officer (check the applicable line and fill in if needed):

- SBIR Phase I: at least two-thirds (66 2/3%) of the research.
- SBIR Phase II: at least half (50%) of the research.
- Deviation approved in writing by the funding agreement officer: \_\_\_\_%

(4) The work is completed and it has performed the applicable percentage of work, unless a deviation from this requirement is approved in writing by the funding agreement officer (check the applicable line and fill in if needed):

- SBIR Phase I: at least two-thirds (66.6%) of the research.
- SBIR Phase II: at least half (50%) of the research.
- Deviation approved in writing by the funding agreement officer: \_\_\_\_\_%
- N/A because work is not completed

(5) The research/research and development is performed in the United States unless a deviation is approved in writing by the funding agreement officer.

- Yes
- No
- Waiver has been granted

(6) The research/research and development is performed at my facilities with my employees, except as otherwise indicated in the SBIR application and approved in the funding agreement.

- Yes
- No
- It will notify the Federal agency immediately if all or a portion of the work proposed is subsequently funded by another Federal agency.
- I understand that the information submitted may be given to Federal, State and local agencies for determining violations of law and other purposes.
- I am an officer of the business concern authorized to represent it and sign this certification on its behalf. By signing this certification, I am representing on my own behalf, and on behalf of the business concern, that the information provided in this certification, the application, and all other information submitted in connection with the award, is true and correct as of the date of submission. I acknowledge that any intentional or negligent misrepresentation of the information contained in this certification may result in criminal, civil or administrative sanctions, including but not limited to: (1) fines, restitution and/or imprisonment under 18 U.S.C. §1001; (2) treble damages and civil penalties under the False Claims Act (31 U.S.C. §3729 *et seq.*); (3) double damages and civil penalties under the Program Fraud Civil Remedies Act (31 U.S.C. §3801 *et seq.*); (4) civil recovery of award funds, (5) suspension and/or debarment from all Federal procurement and nonprocurement transactions (FAR Subpart 9.4 or 2 C.F.R. part 180); and (6) other administrative penalties including termination of SBIR/STTR awards.

<i>Signature</i>	<i>Date</i> __ / __ / __
<i>Print Name (First, Middle, Last)</i>	
<i>Title</i>	
<i>Business Name</i>	

**ATTACHMENT 3: BRIEFING CHART TEMPLATE**

<p><b><u>Proposal Title</u></b>  <b><u>Company</u></b>  <b><u>City, State</u></b>  <b><u>Proposal Number:</u></b></p>	
<p>Place a clear photograph, drawing, graphic or diagram of the concept related to innovation here</p> <p><i>Provide a simple, legible, but sufficiently detailed graphic to convey the main concept or idea of the research effort and/or development prototype.</i></p>	<p><b><u>Relevance and Goals and Commercialization</u></b></p> <p>Relevance and Goals:</p> <ul style="list-style-type: none"> <li>• Research goals and desired end state including performance targets</li> <li>• Advantages over other state-of-the-art solutions</li> <li>• Key technical challenges</li> </ul> <p>Commercialization Strategy:</p> <ul style="list-style-type: none"> <li>• Describe the current market potential for product/service development and estimated unit cost of the product</li> <li>• Identify end user interests or agreements</li> </ul>
<p><b><u>Technical Objectives and Work Plan</u></b>  Address:</p> <ul style="list-style-type: none"> <li>• Technological innovations supporting the approach, as appropriate</li> <li>• How the problem will be addressed</li> <li>• The current status of the proposed effort</li> <li>• The key technical challenges and/or risks</li> <li>• The planned technical accomplishments/key milestones</li> </ul> <p><u>Estimate the Technology Readiness Level (TRL 1 - 9) at beginning and end of contract</u></p>	<p><b><u>Milestones, Deliverables, Schedule and Team</u></b></p> <p>Milestones, Deliverables and Schedule:</p> <ul style="list-style-type: none"> <li>• Provide milestones, primary deliverables, and task durations for Phase I and Phase II, as appropriate</li> </ul> <p>Team:</p> <ul style="list-style-type: none"> <li>• List the proposing organization and principal investigator</li> <li>• List subcontractors</li> </ul>
<p><b>NON-PROPRIETARY, UNCLASSIFIED DATA</b></p>	

**ATTACHMENT 4: SAMPLE NON-DISCLOSURE AGREEMENT**

NON-DISCLOSURE AGREEMENT  
SOLICITATION HSHQDC-14-R-00005

The Parties to this Agreement agree that Schafer Corporation may have access to proprietary information of [Name of Offeror] contained within the technical and cost proposals, solely to perform technical advisory services for the Government, in evaluating proposals submitted in response to this Solicitation.

The Parties agree to protect the proprietary information from unauthorized use or disclosure for as long as it remains proprietary, and to refrain from using the information for any purpose other than that for which it was furnished.

\_\_\_\_\_  
Company Name (Offeror)

\_\_\_\_\_  
Name of Company Official, Printed

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Dated

\_\_\_\_\_  
Name of Company Official, Printed  
Schafer Corporation

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Dated