

DEPARTMENT OF THE NAVY (DON)
16.3 Small Business Innovation Research (SBIR)
Direct to Phase II Announcement and Proposal Submission Instructions

INTRODUCTION

Responsibility for the implementation, administration, and management of the Department of the Navy (DON) SBIR Program is with the Office of Naval Research (ONR). The Director of the DON SBIR Program is Mr. Robert Smith, robert.l.smith6@navy.mil. For program and administrative questions, please contact the Program Managers listed in [Table 1](#); **do not** contact them for technical questions. For technical questions about the topic, contact the Topic Authors listed for each topic during the period **26 August 2016 through 25 September 2016**. Beginning **26 September 2016**, the SBIR/STTR Interactive Technical Information System (SITIS) (<https://sbir.defensebusiness.org/>) listed in Section 4.15.d of the DoD SBIR Program Broad Agency Announcement must be used for any technical inquiry. For inquiries or problems with electronic submission, contact the DoD SBIR/STTR Help Desk at 1-800-348-0787 (9:00 a.m. to 6:00 p.m. ET).

TABLE 1: DON SYSTEMS COMMAND (SYSCOM) SBIR PROGRAM MANAGERS

<u>Topic Numbers</u>	<u>Point of Contact</u>	<u>Activity</u>	<u>Email</u>
N163-D01	Mr. Jeffrey Kent	MARCOR	jeffrey.a.kent@usmc.mil
N163-D02	Mr. Shadi Azoum	SPAWAR	shadi.azoum@navy.mil

The DON's SBIR Program is a mission oriented program that integrates the needs and requirements of the DON's Fleet through R&D topics that have dual-use potential, but primarily address the needs of the DON. Companies are encouraged to address the manufacturing needs of the defense sector in their proposals. Information on the DON SBIR Program can be found on the DON SBIR/STTR website at www.navysbir.com. Additional information pertaining to the DON's mission can be obtained from the DON website at www.navy.mil.

15 U.S.C. §638 (cc), as amended by NDAA FY2012, Sec. 5106, PILOT TO ALLOW PHASE FLEXIBILITY, allows the Department of Defense to make an award to a small business concern (SBC) under Phase II of the SBIR program with respect to a project, without regard to whether the SBC was provided an award under Phase I of an SBIR program with respect to such project. As such, DON is conducting a "Direct to Phase II" (DP2) pilot implementation of this authority for the SBIR 16.3 Announcement only and does not guarantee the pilot will be offered in future Announcements.

The DON SBIR DP2 pilot is a two-step process:

STEP ONE: Prepare and Submit a Phase I Feasibility Proposal (instructions and link to template provided below). The purpose of the Phase I Feasibility Proposal is for the SBC to provide documentation to substantiate that both Phase I feasibility and the scientific and technical merit described in the topic have been met. The Phase I Feasibility Proposal must: demonstrate that the SBC performed Phase I-type research and development (R&D) using non-SBIR funding sources and provide a concise summary of Phase II objectives, work plan, related research, key personnel, transition/commercialization plan, and estimated costs. The government will evaluate Phase I

Feasibility Proposals and select SBCs to submit a Full DP2 Proposal. The SBC must submit a Phase I Feasibility Proposal to be considered for selection to submit a Full DP2 Proposal.

STEP TWO: Prepare and Submit a Full DP2 Proposal. If selected, the cognizant SYSCOM Program Office will contact the SBC directly to provide instructions on how to submit a Full DP2 Proposal.

DON SBIR reserves the right to refuse to make any awards under the DP2 pilot. All awards are subject to availability of funds and successful negotiations. Offerors should read the topic requirements carefully. The Government is not responsible for expenditures by the offeror prior to award of a contract. For 16.3 topics designated as DP2, DON will accept only Phase I Feasibility Proposals (described below).

Phase I Proposals will NOT be accepted for this Announcement.

DIRECT TO PHASE II PILOT PROGRAM REQUIREMENTS

Each proposing SBC must:

- Have demonstrated project feasibility of Phase I-type R&D work.
- Have submitted a Phase I Feasibility Proposal for evaluation.
- Qualify as a small business (defined in the most recent DoD SBIR Announcement and certify to this on the Cover Sheet of the Phase I Feasibility proposal).
- During Phase II, perform a minimum of one-half of the research or research and development (R/R&D) effort in house.
- During Phase II, primarily employ the Principal Investigator (PI) at the time of award and during the conduct of the proposed effort (primary employment means that more than one-half of the PI's time is spent with the SBC).
- During Phase II, perform the R/R&D within the United States ("United States" means the fifty states, the Territories and possessions of the United States, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, and the District of Columbia).
- Complete annual electronic representations and certifications at www.sam.gov/portal/public/SAM/. The Online Representations and Certifications Application (ORCA) will be supplemented by DFARS and contract-specific representations and certifications found at DFARS and Contract Specific Representations and Certifications.

PHASE I FEASIBILITY PROPOSAL PREPARATION AND SUBMISSION REQUIREMENTS

1. **Proposal Template.** Small business concerns should download and follow the format of the DON Phase I Feasibility Proposal template at www.navysbir.com/submission.htm. Additional requirements include:
 - **Proposal Length.** The Phase I Feasibility Proposal shall include the following sections and corresponding not to exceed page lengths.

Section Name	Not to Exceed (NTE) Page Length
Title Page	NTE a total of one (1) page
Phase I Proof of Feasibility <ol style="list-style-type: none"> 1. Introductory Statement 2. Phase I Proof of Feasibility 3. Assertions 4. Commercialization Potential/Transition Plan Summary 	NTE a total of 35 pages
Snapshot of Proposed Phase II Effort <ol style="list-style-type: none"> 1. Description of Proposed DP2 Technical Effort and Objectives 2. DP2 Work Plan 3. Key Personnel 4. Subcontractors/Consultants 5. Order of Magnitude Cost Estimate 6. Resumes for Key Personnel 	NTE a total of 15 pages
Attachments <ol style="list-style-type: none"> 1. Letters of Endorsement 2. Other Data and Analysis 	NTE a total of 25 pages

- Paper/Font Size. The proposal shall be prepared in size 12 point font on 8 ½ x 11 inch paper with 1 inch margins (including header and footer).
- File Format. The Phase I Feasibility Proposal shall be uploaded as a single Adobe PDF file.
- Non-Disclosure. Offerors that include data in their proposals that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall:

a. Mark the first page of the proposal with the following legend:

"This proposal includes data that 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 to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of, or in connection with, the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in pages <insert numbers or other identification of sheets>"; and

b. Mark each sheet of restricted data with the following legend:

- "Use or disclosure of data contained on this page is subject to the restriction on the first page of this proposal."

DON assumes no liability for disclosure or use of unmarked data and may use or disclose such data for any purpose.

Restrictive notices notwithstanding, proposals and final reports submitted through the DON electronic submission website may be handled, for administrative purposes only, by support contractors. All support contractors are bound by appropriate non-disclosure agreements.

- 2. Firm Registration.** Register on the secure, password-protected DoD Submission website at <https://sbir.defensebusiness.org/> and, as instructed on the website, prepare the SBC's submission. Register the SBC with SBA's Company Registry at www.sbir.gov and provide the SBA SBC Identification Number on each proposal Cover Sheet submitted in response to this Announcement. If the SBC is already registered, proceed to proposal submission.
- 3. Cost.** Questions related to the cost of your proposed effort must be answered in the Cost Volume (Step 3) of the proposal submission at <https://sbir.defensebusiness.org/> but no separate cost volume for the DON SBIR Phase I Feasibility Proposal is required. Include your Cost Estimate in the Rough Order of Magnitude Table in the Phase I Feasibility Proposal template. The Phase II Base and Option amounts vary by SYSCOM. Please refer to the table below for guidelines. Costs for the Base and Option should be separate and identified on the Proposal Cover Sheet and in the Rough Order of Magnitude Table in Section 4 of the Phase I Feasibility Proposal template. If Discretionary Technical Assistance (DTA) is proposed, the information required to support DTA should be added in the "Description of Proposed Phase II Technical Effort and Objectives" section of the Phase I Feasibility Proposal template. If proposing DTA, a total of up to \$5,000 may be added to the Base or Option periods.

SBIR Base and Option Guidelines

SYSCOM	Base		Option One (if proposed)		Option Two (if proposed)		Total (NTE)
	Cost (NTE)	POP (NTE)	Cost (NTE)	POP (NTE)	Cost (NTE)	POP (NTE)	
SPAWAR	\$500,000	12 mos.	\$500,000	12 mos.	--	--	\$1,000,000
MCSC	\$500,000	18 mos.	\$250,000	9 mos.	--	--	\$750,000

- 4. Submission.** Upload the SBC's Phase I Feasibility Proposal submission to the DoD SBIR/STTR web portal <https://sbir.defensebusiness.org/submission>.
- 5. Selection.** The cognizant SYSCOM Program Office will contact the SBC directly if it is selected to submit a Full DP2 Proposal and provide further instructions.
- 6. Help.** For inquiries or problems with electronic submission, contact the DoD SBIR/STTR Help Desk at 1-800-348-0787 (9:00 a.m. to 6:00 p.m. ET).

DISCRETIONARY TECHNICAL ASSISTANCE (DTA)

The SBIR Policy Directive section 9(b) allows the DON to provide DTA to its awardees to assist in minimizing the technical risks associated with SBIR projects and commercializing products and processes. SBCs may request, in their DP2 proposals, to contract these services themselves in an amount not to exceed \$5,000 per year. This amount is in addition to the award amount for the DP2 project.

Approval of direct funding for DTA will be evaluated for approval by the DON SBIR Program Office if the SBC's proposal (1) clearly identifies the need for assistance (purpose and objective of required assistance), (2) provides details on the provider of the assistance (name and point of contact for performer); and unique skills/specific experience to carry out the assistance proposed, and (3) includes a cost for the required assistance that does not exceed \$5,000 (costs and hours proposed or other details on arrangement that would justify the proposed expense). This information must be included in the SBC's cost proposal specifically identified as "Discretionary Technical Assistance" and cannot be subject to any profit or fee by the requesting SBIR SBC. In addition, the provider of the DTA may not be the requesting SBC, an affiliate of the requesting firm, an investor of the requesting SBC, or a subcontractor or consultant of the requesting SBC otherwise required as part of the paid portion of the research effort (e.g., research partner, consultant, tester or administrative service provider).

If an SBC requests and is awarded DTA in a DP2 proposal, it will be eliminated from participating in the DON SBIR/STTR Transition Program (STP), the DON Forum for SBIR/STTR Transition (FST), and any other assistance the DON provides directly to awardees.

All DP2 awardees not receiving funds for DTA in their award must attend a one-day DON STP meeting during the second year of the Phase II typically held in the summer in the Washington, DC area. Information can be obtained at www.navysbir.com/Transition.htm. Awardees will be contacted separately regarding this program. It is recommended that Phase II cost estimates include travel to Washington, DC for this event.

EVALUATION AND SELECTION

The DON will evaluate Phase I Feasibility Proposals and select DP2 Proposals using the evaluation criteria in Sections 6.0 and 8.0 of the DoD SBIR Program Announcement respectively, with technical merit being most important, followed by qualifications of key personnel and commercialization potential of equal importance. Due to limited funding, the DON reserves the right to limit awards under any topic and only proposals considered to be of superior quality will be funded.

Approximately one week after the DP2 Announcement closing, e-mail notifications that Phase I Feasibility proposals have been received and processed for evaluation will be sent. Consequently, e-mail addresses on the proposal coversheets must be correct.

Selected Phase I Feasibility offerors will be notified directly to submit Full DP2 Proposals. SYSCOM-specific Full DP2 Proposal guidance is provided at www.navysbir.com/phaseii.htm.

For SBCs not selected for award, requests for a debrief must be made within 15 calendar days of non-award notification. Please note the DON debrief request period is shorter than the DoD debrief request period specified in section 4.10 of the DoD Instructions.

Protests of Phase I Feasibility evaluations and DP2 selections shall be directed to the cognizant Contracting Officer for the DON Topic Number. Contact information for Contracting Officers may be obtained from the DON SYSCOM SBIR Program Managers listed in Table 1.

PHASE II GUIDELINES

The DON typically awards a cost plus fixed fee contract for Phase II. The Phase II contracts can be structured in a way that allows for increased funding levels based on the project's transition potential. To accelerate the transition of SBIR-funded technologies to Phase III, especially those that lead to Programs of Record and fielded systems, the Commercialization Readiness Program was authorized and created as part of section 5122 of the National Defense Authorization Act of Fiscal Year 2012. The statute set-aside is 1% of the available SBIR funding to be used for administrative support to accelerate transition of SBIR-developed technologies and provide non-financial resources for the SBCs (e.g., the DON's SBIR/STTR Transition Program).

PHASE III GUIDELINES

A Phase III SBIR award is any work that derives from, extends, or completes effort(s) performed under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. Thus, any contract or grant where the technology is the same as, derived from, or evolved from a Phase I or a Phase II SBIR contract and awarded to the company that was awarded the Phase I/II SBIR is a Phase III SBIR contract. This covers any contract/grant issued as a follow-on Phase III SBIR award or any contract/grant award issued as a result of a competitive process where the awardee was an SBIR SBC that developed the technology as a result of a Phase I or Phase II SBIR. The DON will give SBIR Phase III status to any award that falls within the above-mentioned description, which includes assigning SBIR Data Rights to any noncommercial technical data and/or noncommercial computer software delivered in Phase III that was developed under SBIR Phase I/II effort(s). Government prime contractors and/or their subcontractors follow the same guidelines as above and ensure that companies operating on behalf of the DON protect the rights of the SBIR company.

CONTRACT DELIVERABLES

Contract deliverables are typically progress reports and final reports. Deliverables required by the contract shall be uploaded to <https://www.navybirprogram.com/navydeliverables/>.

AWARD AND FUNDING LIMITATIONS

The DON typically awards a Cost Plus Fixed Fee contract for DP2. In accordance with SBIR Policy Directive section 4(b)(5), there is a limit of one sequential Phase II award per SBC per topic. Additionally in accordance with SBIR Policy Directive section 7(i)(1), each award may not exceed the award guidelines (currently \$1 million for DP2, excluding DTA) by more than 50% (SBIR/STTR program funds only) without a specific waiver granted by the SBA.

TOPIC AWARD BY OTHER THAN THE SPONSORING AGENCY

Due to specific limitations on the amount of funding and number of awards that may be awarded to a particular SBC per topic using SBIR program funds (see above), Head of Agency Determinations are now required (for all awards related to topics issued in or after the SBIR 13.1 solicitations) before a different agency may make an award using another agency's topic. This limitation does not apply to Phase III funding. Please contact the original sponsoring agency before submitting a Phase II proposal to an agency other than the one that sponsored the original topic. (For DON awardees, this includes other DON SYSCOMs.)

TRANSFER BETWEEN SBIR AND STTR PROGRAMS

Section 4(b)(1)(i) of the SBIR Policy Directive provides that, at the agency's discretion, projects awarded a Phase I under a solicitation for SBIR may transition in Phase II to STTR and vice versa. A SBC wishing to transfer from one program to another must contact its designated technical monitor to discuss the reasons for the request and the agency's ability to support the request. The transition may be proposed prior to award or during the performance of the Phase II effort. No transfers will be authorized prior to or during the Phase I award. Agency disapproval of a request to change programs will not be grounds for granting relief from any contractual performance requirement(s) including but not limited to the percentage of effort required to be performed by the small business and the research institution (if applicable). All approved transitions between programs must be noted in the Phase II award or an award modification signed by the contracting officer that indicates the removal or addition of the research institution and the revised percentage of work requirements.

ADDITIONAL NOTES

Any SBC proposing research that requires human, animal, and recombinant DNA use under a DP2 proposal should carefully review the requirements at www.onr.navy.mil/About-ONR/compliance-protections/Research-Protections/Human-Subject-Research.aspx. This webpage provides guidance and lists approvals that may be required before contract/work can begin.

For topics indicating ITAR restrictions or the potential for classified work, there are generally limitations placed on disclosure of information involving topics of a classified nature or those involving export control restrictions, which may curtail or preclude the involvement of universities and certain non-profit institutions beyond the basic research level. Small businesses must structure their proposals to clearly identify the work that will be performed that is of a basic research nature and how it can be segregated from work that falls under the classification and export control restrictions. As a result, information must also be provided on how efforts can be performed in later Phases if the university/research institution is the source of critical knowledge, effort, or infrastructure (facilities and equipment).

NAVY SBIR 16.3 Direct to Phase II Topic Index

N163-D01	Direct to Phase II - Non Powered Hearing Protection Device with Enhanced Situational Awareness and Localization for Impulse and Blast Noise
N163-D02	Direct to Phase II – Supply Chain Risk Analysis Management Solution (SCRAMS)

NAVY SBIR 16.3 Direct to Phase II Topic Descriptions

N163-D01 TITLE: Direct to Phase II - Non Powered Hearing Protection Device with Enhanced Situational Awareness and Localization for Impulse and Blast Noise

TECHNOLOGY AREA(S): Battlespace, Human Systems

ACQUISITION PROGRAM: PdM ICE Hearing Conservation Program Infantry Weapon Systems PPE

OBJECTIVE: This SBIR topic seeks to mature the technology for a low cost, passive ear protection device to be worn as an earplug and/or in a headset that will allow the warfighter to maintain situational awareness but filter out harmful noise threats with a Noise Reduction Rating (NRR) performance of greater than 30dB for both impulse and continuous noise.

DESCRIPTION: Military personnel are frequently exposed to high intensity noise resulting from blast explosions and urban warfare, and during routine military operations such as on ship decks, helicopters and armored vehicle transports. Noise levels produced by modern aircraft engines exceed 150 dB; UH-60 Blackhawk generates 85 to 120 dB. Impulse pressure from the M16 Rifle ranges between 140-190 dB. Noise level in the Marine Corps' Expeditionary Fighting Vehicle (EFV) reaches 110 dB forcing the crew to wear double hearing protection that comprises both plugs inside the ears and coverings over the ears. This high intensity noise exposure can lead to damage or loss in hearing if protective measures are not employed in advance. A recent report estimates that only about 7% of Marines insert earplugs correctly. It is not surprising that Blast and Noise-Induced Hearing Loss (B/NIHL) and tinnitus are the top two disability claims for US soldiers and veterans [GAO Report, GAO-11-114].

According to Air Force Staff Sgt. Lee Adams, an ear, nose and throat (ENT) technician at Bagram Air Field, more than 50 percent of the patients seen in the ENT walk-in clinics are there for hearing-related issues [Hood, 2009].

Furthermore, many troops do not use hearing protection while out on missions because they feel that the hearing protection negatively affects their ability to do their job and complete their missions. When service members are exposed to loud noises such as improvised explosive devices (IEDs), they are at risk of conductive hearing loss and tinnitus. Hearing protection is just as important to a U.S. military service member's safety as their body armor and helmet. A soldier who suffers severe hearing loss could find his career ending as quickly as if he had suffered other combat-related injuries [Hood, 2009].

Conventional passive hearing protection technology has evolved and matured for over half a century since it was introduced at the end of World War II. Currently, the most commonly used military passive Hearing Protection Devices (HPDs), the foam ear plugs, are inexpensive and provide good protection against acoustic noise but degrade operational capabilities to the point of danger on the practice range and the battlefield. In many circumstances the foam ear plugs are not worn properly and a dramatic loss of performance is observed with poor insertion of the earplug.

Custom molded earplugs, with deep insert provide much better protection only if the plugs are inserted completely (past the second bend of the ear canal). Deep insertion significantly improves attenuation. Active hearing protection, also known as active noise reduction (ANR), has been the subject of much research and many claims. These devices incorporate noise-canceling circuitry into hearing protectors to sense the sounds that pass through the earmuff, invert them in phase, and rebroadcast them toward the tympanic membrane via an earphone to provide active noise reduction. One of the best ANR devices was developed at the Air Force Research Laboratory (AFRL), Wright-Patterson Air Force Base. The ANR is not always beneficial if one needs to provide the maximum attenuation possible. The data [Berger 2002] comparing the attenuation for a well-fitted foam earplug, conventional earmuff, and an ANR earmuff shows that the passive dual protection substantially outperforms the ANR earmuff at nearly all frequencies. However, in situations where active radio communication is required, such as in aviation and certain military environments, ANR does provide valuable performance benefits. But, one must consider that an ANR earmuff generally costs more than \$300 per pair, versus about \$15 for a conventional earmuff, and a few dollars for

a pair of foam ear plugs. ANR also requires regular battery replacement or recharging, which is more susceptible to damage, and will weigh more than a conventional earmuff.

This topic seeks to mature the technology for a low cost, passive ear protection device to be worn as an earplug, custom ear mold and/or in a headset that will allow the warfighter to maintain situational awareness but filter out harmful noise threats with NRR performance of greater than 30 dB for both impulse and continuous noise.

This topic seeks further development of a passive earplug and custom molded earpiece that protects the hearing of Marines in a variety of loud noise environments, while permitting spoken communications to be heard. Although the underlying technology initially will be deployed in re-useable, "universal fit" ear plugs, subsequent iterations can include placing the technology in custom-molded earplugs (with or without communications capacity) and disposable ear plugs. The base technology should not contain any moving mechanical parts or electronics eliminating the need for Marines to have access to a power source for hearing protection. Effort is to include appropriate independent lab testing and samples for field user trials.

A summary of performance attributes are:

- Attenuate by >30 dB the following impact noise levels while providing situational awareness: 125 dB, 140 dB, 160 dB, and 171 dB (Required) and 190 dB (Desired)
- Provide adequate fit across the majority of the population (5th percentile – 95th percentile)
- Perform in a military operational environment without any user intervention
- Provide hearing protection with low level pass through of NRR >12
- Provide compatibility with current combat helmets and headphones
- Operate without electronic components
- Be insertable into a custom molded ear piece (if custom molding technology is used)
- Cost less than \$15

PHASE I: It is expected that the proposing small business will have completed work leading up to the Phase II effort to demonstrate the achievability of the above attributes to include:

- Determined technical feasibility of the concept to address the requirements listed above in the Description section of having an approach that provided protection for high level continuous and impulse noise while still allowing detection and localization of low level sound(80 dB and below).
- Defined and developed a concept with appropriate analysis and modeling to demonstrate performance across the audible frequency spectrum and noise levels up to 171 dB (T) 190 dB (O).
- Identified, designed, and constructed a concept model and validated the performance of the concept model ideally through independent testing of attenuation of impulse and continuous sound at amplitude above 90 dB.
- Determined technical feasibility to construct the proposed system and operational performance in the full combat environment (e.g. temperature, humidity and atmospheric pressure as defined in MIL-STD 810).
- Defined and developed a concept through the point of a model or limited prototype.
- Identified, designed, constructed and tested a concept model.
- Performed a final production cost analysis

FEASIBILITY DOCUMENTATION: Offerors interested in participating in Direct to Phase II must include in their response to this topic Phase I feasibility documentation that substantiates the scientific and technical merit and Phase I feasibility described in Phase I above has been met (i.e. the small business must have performed Phase I-type research and development related to the topic, but from non-SBIR funding sources) and describe the potential commercialization applications. The documentation provided must validate that the proposer has completed development of technology as stated in Phase I above. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the offeror and/or the principal investigator (PI).

Read and follow all of the DON SBIR 16.3 Direct to Phase II solicitation Instructions. Phase I Proposals will NOT be accepted for this solicitation.

PHASE II: The small business will perform Phase II efforts in accordance with the Phase II contract and the Phase II statement of work. Initial tasks include the production of prototype hardware based on approved designs. Continue design modification and optimization based on performance and Marine feedback. Produce final hardware, complete acoustic characterization testing and finalize hardware design for certification and qualification for deployment to the extent of available funding. Deliver a minimum of 25 small, 200 medium, and 25 large ear plugs for further testing and qualification purposes.

Phase II Option, if awarded: Perform small run of Next Generation Hearing Protection Earplugs. Provide a minimum of 1,500 production sample-pairs of protective devices (150 small, 1,200 medium, 150 large) utilizing the developed production methods for field user trials. Complete Acoustic Characterization of Next Generation Hearing Protection Earplugs Perform a final refinement of the design based on the results of the field trials and lab testing.

Non-hardware deliverables include a copy of the final hardware design, a final Report containing all test results and a Marketing Plan.

PHASE III DUAL USE APPLICATIONS: Support the continued modification and qualification of improved devices as necessary. Perform materials manufacturing development for production and scale-up. Refine the process for manufacturing the products to insure consistency and alignment with performance requirements and price points. The expected outcome is a product with a manufacturability maturity level of MRL7 or better to include preliminary production samples and a commercial production plan with detailed cost information for end items. Develop Data package for DLA cataloging. Private Sector Commercial Potential: In addition to aiding our Marines and other Warfighters, the technology has significant application in a variety of commercial settings. For example, workers in heavy industry are exposed to damaging impact noise. If the workers wear conventional hearing protection they are deprived of the ability to hear normal sounds such as the back-up warning on a forklift. Law enforcement officers and other first responders who often work in loud environments will benefit from the protection afforded by hearing protection technology while being able to hear their colleagues. Finally, there are a variety of consumer uses for Hearing protection, ranging from the homeowner operating a gas-powered leaf-blower to the do-it-yourself enthusiast who uses power tools. The USMC identifies four markets: (1) the military; (2) law enforcement and first responders; (3) industry; and (4) consumers. USMC market research estimates that the industrial hearing protection market alone exceeds \$300 million in the United States and \$800 million globally.

REFERENCES:

1. Department of Veterans Affairs. Hearing Impairment, Independent Study Course, March 2002. http://www.publichealth.va.gov/docs/vhi/hearing_impairment.pdf
2. Henderson, D., & Hamernik, R. (1995). Biologic Bases of Noise-induced Hearing Loss. *Occupational Medicine: State of the Art Reviews*, 10(3), 513-34.
3. C.J. Moore, *An Introduction to the Psychology of Hearing*, 4th ed., London: Academic Press, 1997.
4. Berger, E. (2002). Hearing Protector Performance: How They Work and What Goes Wrong in the Real World. *EARLog*.
5. McLeary 2008. [GAO Report, GAO-11-114].
6. Hood, O. SPC., 5th Mobile Public Affairs Detachment, "Hearing Loss No. 1 Diagnosis for U.S. Soldiers in Afghanistan". *Hearing Health Magazine*, December 29, 2009.
7. ANSI S12.42-2008 Methods for the Measurement of Insertion Loss of Hearing Protection Devices in Continuous or Impulsive Noise Using Microphone-in-Real-Ear or Acoustic Test Fixture Procedures.

KEYWORDS: Hearing, Noise, Steady-State, Impulse, Non-Linear, Passive, Communication capability, Protection, Hearing protection, blast injury, tinnitus

Questions may also be submitted through DoD SBIR/STTR SITIS website.

N163-D02 TITLE: Direct to Phase II – Supply Chain Risk Analysis Management Solution (SCRAMS)

TECHNOLOGY AREA(S): Information Systems

ACQUISITION PROGRAM: Nuclear Command, Control, and Communications Navy (NC3) Modernized Hybrid Solution; ACAT III program

OBJECTIVE: Develop an automated process and software tool to identify specific suppliers and associated Information and Communications Technology (ICT) components based on inputs, cues and user-determined parameters. The software tool will need to provide the capability to complete a federated search of available government and internet web-based data and databases, facilitate data discovery, and perform anomaly detection and have analytical capabilities to recognize risks (based on user-determined indicators), be scalable, and provide formatting for export into Microsoft Office products.

DESCRIPTION: The existing process to identify a specific supplier suspected of providing counterfeit, gray market or sub-standard ICT components, is through basic electronic searches of local contract management related folders and files, followed by extensive paper file-folder reviews. If the supplier is not a Prime (a sub-contractor or a sub to a sub or sub to a Lead System Integrator), the problem set becomes more complex with no additional electronic search capability. The necessary data is collected and loaded into at least one database over the course of the contracting process but is not readily discoverable nor accessible. Even if the data were technically accessible, currently it would only be to a very small select few due to limitations of roles and data management structure within a database.

The software tool would need to be innovative enough to help map the commercial supply chain, conduct analysis of and parse out supplier levels (Tiers) and detect and document supplier relationships across Tiers. It would require access across the data management restrictions, but would be tailored to pull only particular fields relevant to the Supply Chain Risk Management (SCRM) problem set, providing a more automated, efficient and effective method to meet the need of data discovery. The implementation of the software tool would be that it works in parallel with Enterprise Resource Planning (ERP) systems, monitoring transactions and feeding them back through the software tool for analysis, through a Service Oriented Architecture (SOA), most likely a Simple Object Access Protocol (SOAP) web service, and allowing for easy user accessibility. Such a tool could be implemented and success measured in stages. Each stage adding function and capability as requirements are fully met and potentially new ones added. The tool could start with a single Navy Systems Command and be eventually broadened to the entire Department of the Navy (DoN). This effort would provide a critical capability that would significantly contribute to the DON's ability to respond to threats from the supply chain and potentially avoid them as well.

PHASE I: For a Direct to Phase II topic, the government expects that the small business would have accomplished the following in a Phase I-type effort. Have developed a concept for a workable Supply Chain Risk Analysis Management software (SCRAMS) prototype or design to address at a minimum the basic requirements of the stated objective above. The below actions would be required in order to successfully accomplish Phase I:

- Determination of data types and sets necessary in order to accomplish objective.
- Determine if existing electronic tools or tool-sets can be used or leveraged in order to meet stated objective.
- Determine if the objective is technically feasible, given restraints of data access or availability, among other factors.
- Complete a concept of operations and business rules.
- Tested using existing mock data.
- Structure an approach to implementation of tool(s), including scenario-based implementation and observation using modeling.
- Complete design of tool(s) and validation of analysis.

FEASIBILITY DOCUMENTATION: Offerors interested in participating in Direct to Phase II must include in their response to this topic Phase I feasibility documentation that substantiates the scientific and technical merit and Phase I feasibility described in Phase I above has been met (i.e. the small business must have performed Phase I-type research and development related to the topic, but from non-SBIR funding sources) and describe the potential commercialization applications. The documentation provided must validate that the proposer has completed development of technology as stated in Phase I above. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the offeror and/or the principal investigator (PI).

Read and follow all of the DON SBIR 16.3 Direct to Phase II solicitation Instructions. Phase I Proposals will NOT be accepted for this solicitation.

PHASE II: The Supply Chain Risk Analysis Management software tool(s) will be fully developed and implemented using data provided by the Government, tested, and an analysis of the results provided to the Government. Phase II actions are as follows:

- Implementation and analysis of the Phase I-type effort modeling using 'real' data provided by the Government
- Simulation of the tool(s) demonstrating their utility and function
- Analysis of simulations that validates applicability to the SCRM problem set with regard to the stated objective of this SBIR.
- Completion of a prototype that is fully functional and meets the requirements as stated in the Phase II Statement of Work.

PHASE III DUAL USE APPLICATIONS: The Supply Chain Risk Analysis Management software tool(s) will be transitioned from a PEO C4I based effort to the rest of the PEOs under SPAWAR SYSCOM cognizance, then to the other SYSCOMs within the DoN. Ultimately the tool(s) can be transitioned for use within the rest of the DoD, and be made available to Industry. Industry that supports the DoD has the same clear and present danger from threats within the supply chain as DoD in that it is relying on the global supply chain. Phase III expected actions are as follows:

- Integrate tool(s) into all PEO C4I supply chain data processes (N-ERP or others)
 - Test tool(s) based on refined requirements from Phase I and II
 - Test and complete analysis of tool(s) and determine requirements for transition to commercialization
 - Fully integrate tool(s) into business processes for supply chains of Programs of Record within PEO C4I
 - Expand tool for use throughout DoN and DoD
- Private Sector Commercial Potential:** This tool could be used in any commercial setting where complex supply chain requirements exist and system configuration, funds availability, equipment upgrade/replacement schedules are complicating factors (e.g. utilities, transportation, communication/broadcasting and IT systems and manufacturing industries).

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KEYWORDS: Supply Chain Risk Management; SCRM; Program Protection; Anti-Counterfeit; Counterfeit; Grey Market; N-ERP; NC3; Nova

Questions may also be submitted through DoD SBIR/STTR SITIS website.