

DEPARTMENT OF THE ARMY
DoD 23.4 Small Business Innovation Research (SBIR)
Annual Broad Agency Announcement (BAA)
Component-Specific Proposal Instructions
Release 8

March 14, 2023: Topics issued for pre-release

March 30, 2023: Army begins accepting proposals via DSIP

April 18, 2023: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

May 2, 2023: Deadline for receipt of proposals no later than 12:00 p.m. ET

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

CONTACT INFORMATION

Direct Specific questions pertaining to the administration of the Department of the Army SBIR Program and proposal preparation instructions to the Point of Contact identified in the Topic announcement. General questions can be directed to the following:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil

Website: <https://www.armysbir.army.mil/>

Mailing Address:

Army Applied SBIR Office 2530 Crystal Dr; Ste 11192
Arlington, VA 22202

RESPONSIVENESS AND TIMELINESS

All proposals will be evaluated and judged on a competitive basis. Proposals will only be evaluated in response to an active, corresponding Army topic. Proposals will be initially screened to determine responsiveness and timeliness. Proposals passing this initial screening will be technically evaluated by engineers or scientists to determine the most promising technical and scientific approaches. Assessment of responsiveness may continue during technical evaluation and after selection. If at any point the proposal is deemed untimely, unresponsive, ineligible, or non-responsible, the proposal will be rejected / the contract action will be cancelled.

Interested firms shall follow the DoD Program BAA instructions as well as the Army's component-specific proposal instructions herein, when preparing and submitting proposals. The DoD 23.4 SBIR Program BAA can be found here: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>.

SYSTEM FOR AWARD MANAGEMENT (SAM)

Interested firms are required to be registered in SAM (www.sam.gov) before submitting a proposal and shall continue to be registered until time of award, during performance, and through final payment of any contract.

PHASE I PROPOSAL INSTRUCTIONS

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers (also referred to herein as “offeror(s)”) are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Proposal Coversheet (Volume 1)

The proposal coversheet must follow the instructions and requirements provided in the DoD SBIR Program BAA.

The offeror shall certify that to the best of its knowledge and belief, its eligibility information under the SBIR Program is accurate, complete, and current as of the date of the offer.

Technical Volume (Volume 2)

The technical volume proposal is not to exceed 5 word document pages and must follow the formatting requirements provided in the DoD SBIR Program BAA. A commercialization plan must also accompany the technical volume proposal and must be 8 slides. The required content to include within these slides are described in Appendix D. The commercialization plan must be converted from slides to pdf and attached to the end of the technical volume proposal, resulting in one pdf file to be uploaded to DSIP as Volume 2. The commercialization plan does not count towards the technical volume 5-page limit. Any proposals submitted without a commercialization plan or in a format other than that provided in these Component Instructions and by the BAA will be deemed unresponsive and will not be reviewed.

Content of the Technical Volume

The Technical Volume shall contain three key sections – technical approach, team qualifications and commercialization section. The technical approach section shall contain details on how the proposer is going to solve the problem. It shall detail key elements of the firm’s approach, any risks, relevant past work and how success is measured. The team qualifications section shall highlight the key personnel working on the project, and the resources that will be brought to bear on solving the problem. The commercialization plan shall include:

- **Company information**: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- **Customer and Competition**: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- **Market**: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- **Intellectual Property**: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- **Financing**: Plans for securing necessary non-SBIR funding.
- **Assistance and mentoring**: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State

assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

The Cost Volume must follow all instructions and requirements provided in the DoD SBIR Program BAA. Supplemental requirements are as follows:

The Phase I Base amount must not exceed \$250,000 for a 6-month period of performance. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3. Awards for these topics will be in the form of a firm fixed price contract.

Please review the updated Percentage of Work (POW) calculation details included in section 5.3 of the DoD Program BAA. Army Applied SBIR will occasionally accept deviations from the POW requirements with written approval from the Funding Agreement officer.

For pricing purposes, offerors shall assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. Substantiating documentation guidance is as follows:

- **LABOR:**
 - List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
 - Explain the basis of proposed labor hours, including required tasks, and substantiating documentation for the costs (e.g. payroll reports). Volume 5, Supporting Documents, may be used if additional space is needed.
- **MATERIAL/TOOLING/EQUIPMENT:**
 - Explain the basis of proposed material and equipment costs. This support should include a consolidated priced summary of individual material and equipment quantities and substantiating documentation for the costs (e.g. vendor quotes, invoice prices, competitive bids, etc.). If your choice isn't the lowest cost available, explain the decision to choose one item or supplier over another. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Ensure all materials are American-made to the maximum extent practicable.

Offerors who propose to use a foreign-made product in its technology may be required to find an American-made equivalent.

- While special tooling and test equipment and material cost may be included, it will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Component Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component, unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.
- TRAVEL:
 - Explain the basis of proposed travel, including to/from locations, number of trips, number of travelers per trip, and number of days/nights per trip. Include substantiating documentation for the costs (e.g. screenshots of flight cost comparison, rental car quotes, etc.). NOTE: Virtual meetings shall be utilized to the maximum extent practicable. Volume 5, Supporting Documents, may be used if additional space is needed.
- SUBCONTRACTS: A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the prime contractor (awardee) calling for supplies or services for the performance of the contract.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc.
 - Explain the basis of proposed subcontract costs. Include documented support of the offeror's price analyses and degree of competition of all subcontractor proposals. All subcontractor costs and consultant costs, such as labor, travel, equipment, materials, must be detailed at the same level as prime contractor costs. Provide detailed substantiation of subcontractor costs in your cost proposal. Volume 5, Supporting Documents, may be used if additional space is needed.
 - Certify that the following requirements are met: For Phase I, the offeror must perform a minimum of two-thirds of the research and/or analytical effort. One third may be subcontracted to another firm or research organization/facility. The percentage of work is measured by both direct and indirect costs.
 - Offerors shall not propose to subcontract to the issuing agency, to any other Federal Government agency, or to other units of the Federal Government, except Federal Laboratories in rare circumstances. As defined in 15 U.S.C. 3703, Federal Laboratory means any laboratory, any federally funded research and development center, or any center established under 15 U.S.C. 3705 and 3707 that is owned, leased, or otherwise used by a Federal Agency

and funded by the Federal Government, whether operated by the Government or by a contractor.

- Offerors shall not propose to subcontract to any prohibited sources. Proposals identifying a subcontractor/vendor arrangement with a prohibited source may be rejected.
 - Offerors shall ensure subcontracting arrangements are with United States Small Businesses to the maximum extent practicable. Offerors proposing a subcontractor arrangement with other than a United States Small Business (such as, a large business, foreign firm, foreign government, educational institution, unit of Federal Government, etc.) may be required to submit further explanation.
- **INDIRECT COSTS:**
 - Explain the basis of the proposed indirect expense rates including overhead, general and administrative, material handling, and fringe benefits.
 - If a Defense Contract Audit Agency (DCAA) Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected, failure to include the documentation with your proposal may delay contract award, as the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs. It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Failure or refusal to provide documentation may result in cancellation of the contract action.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified immediately above and in the DoD Program BAA. All other documents submitted will be disregarded.

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers interested in submitting a DP2 proposal in response to these topics must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. 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 proposer and/or the Principal Investigator.

The Army will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

Format of Technical Volume (Volume 2)

The Technical Volume must include two parts, the Feasibility Documentation and the Technical Proposal.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

The length of the Feasibility Documentation is not to exceed 5 pages and the length of the Technical Proposal is not to exceed 10 pages. A commercialization plan must also accompany the technical proposal and should be no more than 8 slides. Any proposals submitted in a different format, or exceed the page count limits will not be reviewed.

Number all pages of your proposal consecutively. Font size should not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Content of the Feasibility Documentation (Volume 2a)

The content of the Feasibility Documentation Proposers should substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. 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 proposer and/or the Principal Investigator.

Content of the Technical Proposal (Volume 2b)

The content of the Technical Volume should address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The commercialization plan should include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.
- Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- Financing: Plans for securing necessary non-SBIR funding.
- Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

Unless otherwise noted in the topic, the Army will accept Direct to Phase II proposals for a cost up to \$1,800,000 for an 18-month period of performance. Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

Cost Breakdown Guidance:

- List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
- Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the Army; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the Army.
- Cost for travel funds must be justified and related to the needs of the project.
- Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required, nor will it be an evaluation factor in the consideration of a proposal.
- All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

If a DCAA Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army will accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified in the topic instructions. All other submissions will be disregarded.

PHASE II PROPOSAL INSTRUCTIONS

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process. Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in its Army SBIR proposal and must demonstrate that the vendor is uniquely postured to provide the specific technical and business services required. TABA funding will be denied if the offeror fails to include the cost and detailed explanation in its proposal.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is as follows:

- Phase I Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$6,500 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$6,500 in contract obligation (in addition to the base SBIR award amount) per project per year.
- Phase II Firms:
 - Army-Preferred Vendor: If approved, the contractor may receive up to \$50,000 worth of assistance services per project per year (in addition to the base SBIR award amount).
 - Firm-Selected Vendor: If approved, the contractor may receive up to \$50,000 in contract obligation (in addition to the base SBIR award amount) per project per year.

EVALUATION AND SELECTION

The Army will conduct an evaluation of each responsive, timely, eligible proposal in accordance with the evaluation criteria listed in the DoD Program BAA. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria and to select the source (or sources)

whose offer meets the Government's technical, policy, and programmatic goals.

As previously stated herein, timeliness, responsiveness, and eligibility will be assessed upon initial screening, during evaluation, and after selection. Proposals that do not comply with the instructions and requirements detailed in this document, the DoD Program BAA, or the corresponding Topic posting (including the research objective(s)), will be considered ineligible, nonresponsive, untimely, or non-conforming and therefore will not be evaluated or considered for award.

Using the evaluation criteria, the Government will evaluate each responsive, timely, eligible proposal in its entirety. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Selected proposals are those determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the DoD Program BAA, the component-specific instructions herein, the corresponding Topic posting, and availability of funding.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the Topic. The notification will be sent to the Corporate Official listed on the proposal cover sheet from the Army SBIR Program Office mailbox. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

Proposers must not regard the notification email (selection decision notice) as an authorization to commit or expend funds. After the Army SBIR Office has recommended a proposal for award, a Government Contracting Officer may contact the proposer in order to discuss and request additional information required for award. This may include representations and certifications, certified or other than certified cost data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. Proposers must not regard these communications as an authorization to commit or expend funds. Unless a Government Contracting Officer signs the award document (i.e. contract), no obligations to provide funding are made. The Government may reject the proposal or cancel the contract action at any time.

If signed by the Government Contracting Officer, the award document is the official and authorizing instrument (i.e. contract). The anticipated period of performance start date will be determined at time of award. The Contracting Officer will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

PROTESTS

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.


As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award shall be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@mail.mil

Mailing Address:

Army Applied SBIR Office
2530 Crystal Dr; Ste 11192
Arlington, VA 22202

Appendix A Phase I Evaluation Criteria


Applied SBIR Phase I Proposal Review v2-0-3 Evaluation Criteria Defined		
		DEFINITION
INTRODUCTION	weight 5%	Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this.
POTENTIAL FOR ARMY IMPACT	OPERATIONAL IMPACT	At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions?
	weight 25%	POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army.
TECHNICAL FEASIBILITY	SCIENTIFIC FEASIBILITY	Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles.
	ENABLING TECHNOLOGIES	Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army fielded) underlying technologies and techniques helps to lower technical risk.
	ALTERNATIVE TECHNICAL APPROACHES	From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win?
	weight 25%	TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks.
TRANSITION	ARMY TRANSITION PATHWAY	Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award.
	weight 20%	SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance.
FIRM CASH FLOW	FIRM SURVIVAL RISK	SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel.
	OTHER PEOPLE'S MONEY	Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program.
	weight 10%	FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program.
TEAM ABILITY	weight 10%	Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company?
SUBMISSION QUALITY	QUALITY OF PROSE	Prove you write clearly. Prove you argue convincingly.
	weight 5%	DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility.

Appendix B Direct to Phase II Evaluation Criteria

Applied SBIR D2P2 Proposal Review v2-0-4 Evaluation Criteria Defined		DEFINITION
INTRODUCTION	weight 2%	Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this.
POTENTIAL FOR ARMY IMPACT	weight 20%	<p>OPERATIONAL IMPACT At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions?</p> <p>POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army.</p>
TECHNICAL FEASIBILITY	weight 30%	<p>SCIENTIFIC FEASIBILITY Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles.</p> <p>ENABLING TECHNOLOGIES Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk.</p> <p>ALTERNATIVE TECHNICAL APPROACHES From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win?</p> <p>TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks.</p>
TRANSITION	weight 20%	<p>ARMY TRANSITION PATHWAY Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award.</p> <p>SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance.</p>
FIRM CASH FLOW	weight 15%	<p>FIRM SURVIVAL RISK SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel.</p> <p>OTHER PEOPLE'S MONEY Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program.</p> <p>FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program.</p>
TEAM ABILITY	weight 10%	Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company?
SUBMISSION QUALITY	weight 3%	<p>QUALITY OF PROSE Prove you write clearly. Prove you argue convincingly.</p> <p>DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility.</p>



Appendix C Phase II Evaluation Criteria

Applied SBIR Phase II Proposal Review v2-0-3 Evaluation Criteria Defined		
		DEFINITION
INTRODUCTION	weight 2%	Write a clear, concise description of what your innovation does or will do, and where you are in your evolution. Make clear its intended impact on the Army. Evaluators should "get it" after reading this.
POTENTIAL FOR ARMY IMPACT	OPERATIONAL IMPACT	At the scale of a single Army end-user, argue that their jobs or lives will be significantly improved if your solution is adopted. What is the impact of your solution for a soldier/Army civilian vs. today's solutions?
	weight 20%	POTENTIAL SCALE OF IMPACT Here, we're looking for an idea of how broad the impact you described above could be. Look into the future to a time when your solution is both technically mature and actively in use by Army personnel. Describe the scale and scope of your impact within the context of the Army.
TECHNICAL FEASIBILITY	SCIENTIFIC FEASIBILITY	Is the science behind the solution sound? Convince readers who don't have deep expertise in your field that your innovation is built atop sound scientific and engineering principles.
		ENABLING TECHNOLOGIES Point to the foundational technologies that you rely on to deliver your solution. Do the required enabling technologies introduce added risk? Using proven (and ideally Army-fielded) underlying technologies and techniques helps to lower technical risk.
		ALTERNATIVE TECHNICAL APPROACHES From a technologist's perspective, why is your proposed solution the best choice for the Army? Refute the alternative engineering approaches others are using. Why does your technology win?
	weight 25%	TECHNICAL RISK MITIGATION No matter your current technology readiness level, technical risks remain. Identify those risks. Present a credible plan to tackle those risks.
TRANSITION	ARMY TRANSITION PATHWAY	Planning for success, what's next for you after this SBIR award? Describe the next type of deal you aim to make with the Army, e.g. a CRADA, a different SBIR contract, a CSO, etc. Briefly outline your current plan to unlock that next opportunity and/or share the biggest risks you see post this SBIR award.
	weight 25%	SBIR MILESTONE SCHEDULE Please share with us a thoughtful execution plan. Strike a balance between giving us a sense of the detailed thinking behind the scenes and the need for your contracting officer to manage a reasonably small number of milestones during your period of performance.
FIRM CASH FLOW	FIRM SURVIVAL RISK	SBIR funds are meant to fuel growth rather than stave off a firm's impending financial failure. Demonstrate that your company will survive financially as a going concern through the early stages of a Phase III contract, sometimes referred to as "transitioning" into use by Army personnel.
	OTHER PEOPLE'S MONEY	Make the case that non-Army and/or non-DoD dollars will continue to fund improvements to your solution from which the Army will benefit in the future. Companies who cannot demonstrate non-Army and/or non-DoD funding sources for future solution enhancements are less attractive to the Applied SBIR program.
	weight 20%	FINANCIAL PROFIT POTENTIAL Through the Applied SBIR program, the Army wants to take advantage of the speed and scalability of dual-use companies. Make your best case that your product is or will be profitable. If you have more than one product, please focus your argument on the product / solution presented for this SBIR program.
TEAM ABILITY	weight 5%	Prove your team has executed well as a group. Please draw clear distinctions between private sector, DoD and civilian government work. What milestones have you accomplished as a group in this company?
SUBMISSION QUALITY	QUALITY OF PROSE	Prove you write clearly. Prove you argue convincingly.
	weight 2%	DATA QUALITY & ATTRIBUTION Support your arguments with relevant, properly attributed data to enhance your credibility.

Appendix D

Commercialization Plan Template

General Instructions/Guidance:

1. The slide deck must be 8 slides total, per Component Instructions, and follow the formatting contained in the template. Font size shall be no smaller than 10-point font.
2. Slides should display the slide number in bottom right corner
3. All text (including tables, charts, plots, axes labels, legends, captions) must be readable without zooming and understandable without voice-over
4. For plots and charts:
 - a. Include title/bullet describing importance of plot/chart, and/or data (be specific)
 - b. Axes must be meaningfully labeled (to be understandable by non-experts) and include scale
5. Avoid jargon; define technical terms
6. Convert from slide format to a PDF file for submission to DSIP alongside the technical volume proposal
7. To insert images, capture a screenshot of the image and paste it into the slide. Please do not drag-drop a file into the presentation or use the Insert Pictures menu function.
8. Use PowerPoint's "Compress Pictures" feature to reduce file size
 - a. Select 96ppi resolution
 - b. Uncheck "For this picture only"
9. Replace the boilerplate footer below with distribution markings as appropriate
10. Do not put any company logos (Twitter, Reddit, GitHub, etc) on your slides

To be considered valid proposals, Commercialization Plan submissions must follow the number and content of each slide as contained in the attached template.

Appendix D
Commercialization Plan Template cont.

Firm Name

SBIR Project Title

Principal Investigator Name / Title
Key (or other relevant) Personnel, and
Subcontractors

.....
Insert Topic Number
Insert Proposal Number

Distribution markings as appropriate for your organization

BLUF: Bottom Line Up Front

- **BLUF:**
 - 1. Company information and background** : Core competencies, significant sales, previous funding, commercialization successes.
 - 2. Customer and Competition** : Clear description of key technology objectives, current competition, and advantages.
 - 3. Market:** Plan to obtain market share.
 - 4. Intellectual Property:** Patent status, technology lead, trade secrets or other demonstration of a plan to protect the company's technical advantage.
 - 5. Financing/Revenue:** Plans for securing necessary non -SBIR funding.
 - 6. Assistance and mentoring** : Plans for securing needed technical or business assistance.

Distribution markings as appropriate for your organization

Appendix D

Commercialization Plan Template cont.

Company Information and Background

- Core competencies and areas of specialization.
- Products with significant sales.
- Concise history of previous Federal and non -Federal funding/investments.
- Regulatory experience (if applicable).
- Past commercialization successes.
- Past failure and how you overcame .

Distribution markings as appropriate for your organization

3

Customer & Competition

- Description of key technology objectives.
- Current competition and/or alternative solutions.
- Advantages of company's offer compared to competing products or services.
- Hurdles to acceptance of the proposed innovation.
- Description of possible areas where your technology may be utilized or is under utilized.

Distribution markings as appropriate for your organization

4

Appendix D Commercialization Plan Template cont.

Market

- Analysis of market size and 1 and 5 year forecasted market share.
- Explanation of milestones and target dates of plan to obtain that market share.
- What experience do you have with marketing to this target market?
- What commercialization strategy appears to be the best for bringing this product to the target market?
- What experience do you have with bring products to market – either through this company or through other companies with which you have worked.
- Does the company currently market, manufacture, or license technology? Describe what you do.

Intellectual Property

- Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporary competitive advantage .
- Describe how you will protect the intellectual property that enables commercialization of its products while keeping competitors at bay. Note any actions you may consider to attain at least a temporary competitive advantage. Also consider your company's prior record in this area. Comment on your company's strategy to build a sustainable business through protection of intellectual property.

Appendix D Commercialization Plan Template cont.

Financing

- Plan for securing non-SBIR, private or government funding necessary to enter low rate of production of anticipated technical solution.
- Describe your revenue stream generation to include but not limited to:
 - Manufacture and direct sales
 - Sales through value added resellers or other distributors
 - Joint venture

Distribution markings as appropriate for your organization

7

Assistance & Mentoring

- Plans for securing needed technical or business assistance through mentoring, partnering, or arrangements with government sponsored (e.g., SBIR funded Discretionary Technical and Business Assistance (TABAs), State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., Small Business Development Center (SBDC) or Small Business Technical Development Center (SBTDC)), commercial accelerators, DOD Prime Contractors, SBA Mentor - Protégé program, Procurement Technical Assistance Center (PTAC) or other assistance provider.

Distribution markings as appropriate for your organization

8

Army SBIR 23.4 Topic Index
Release 8

A234-011	Conformable Hydrogen Storage
A234-012	Hydrogen Generator

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Renewable Energy Generation and Storage; Biotechnology

OBJECTIVE: The goal of this topic is to develop conformable hydrogen storage vessels that can store hydrogen at 700 bar (10,000 psi). Furthermore, the purpose is also to develop an on-demand hydrogen generation system that can be used to quickly refuel a vehicle in situations where its main fuel tank is empty.

DESCRIPTION: As the Army moves towards electrifying its vehicle fleet, storing enough energy onboard vehicles to match or exceed their current performance is a challenge. While batteries have made great strides in recent decades, they remain heavy and cumbersome. A potential solution for heavy vehicles is hydrogen fuel cells. Fuel cells can provide the benefits of electrification (silent mobility, silent watch, export power, high torque on demand, etc.) while maintaining current vehicle range and allowing for refueling in the same amount of time as liquid fuels. One drawback of hydrogen fuel cells is storage of the hydrogen itself. Current solutions are bulky composite overwrapped pressure vessels (COPVs) that take up significant space. A potential solution is conformable tanks that can be designed to fit unusually shaped space claims, allowing for more energy to be stored in containers, on vehicles, or in other energy storage use cases. This technology has been developed and validated to 350 bar (5,000 psi) applications, but further work is required to meet the goal of 700 bar operating pressures. Evaluation of these tanks under military ballistic testing also revealed some potential areas of improvement for this technology. It is important to develop this technology as it will enable high energy density storage that can be refilled as quickly as current liquid fuels while enabling electrification technologies and reducing thermal and acoustic footprints for energy generation systems.

Note: Hydrogen generators that utilize aluminum alloy and water are like an extra fuel tank, but less volatile. Aluminum powder can be safely handled and stored as a solid material, unlike liquid fuel. Several recent advances in the technology allow for the material to be manufactured at scale from scrap aluminum, providing a large source of energy in an inexpensive manner (1, 2). Compared to domestically sourcing lithium for battery production (and in order to meet future energy needs), this technology provides significant energy density without requiring rare earth metals, while at the same time needing significantly less infrastructure be developed. When exposed to water, the alloys produce hydrogen rapidly and at pressure, allowing a vehicle to be fueled quickly while providing enough energy to travel back to safety or a refueling point. The system can be designed with safety at the forefront, incorporating pressure relief devices and intrinsically safe controls.

PHASE I: It is important to note that this is a Direct to Phase II topic. To justify a Direct to Phase 2, the company should provide data showing a tank system made up of multiple segments (more than one) capable of 350 bar operations. At minimum, there should be data demonstrating the system can comply with proof testing and burst testing outlined in CSA/ANSI HG 2.

PHASE II: Design a hydrogen generation system that can be man-portable while providing a meaningful range for vehicles in the case that fuel is depleted. Manage the thermal performance of the system, reducing both the exterior touch temperature to safe levels and overall thermal signature. Fabricate and demonstrate such a system. Demonstrate aluminum alloy production capable of supporting the manufacturing of several systems. Testing requirements for this technology is described in CSA/ANSI HG 2. Specific testing areas of interest are proof testing (verifying that the vessel can hold the required pressure), burst testing (determining at which pressure the vessel loses its structural integrity), permeation

rate (the rate at which hydrogen passes through the walls of the vessel), filling speed and temperature gradients, cut testing (determining if the vessel can survive contact with sharp edges), and ballistic testing.

PHASE III DUAL USE APPLICATIONS: There is a multitude of industries that would benefit from improved hydrogen storage, with new use cases, like P2G tech, that will rely on hydrogen storage technology for operation. Efficient hydrogen storage will become a necessity as various industries, including transportation, metal refining, and chemical manufacturing, increase their hydrogen usage. The proposed technology has potential use within the Army Small Business Innovation Research Program as well as other Army Research Centers and acquisition programs.

KEYWORDS: Hydrogen; Storage; fuel; battlespace; tank; refuel point; electrification

REFERENCES:

1. Lithium Ion Battery, Clean Energy Institute, <https://www.cei.washington.edu/education/science-of-solar/battery-technology/>
2. Physical Hydrogen Storage, <https://www.energy.gov/eere/fuelcells/physical-hydrogen-storage>
3. Conformable Hydrogen Pressure Vessel, <https://www.osti.gov/servlets/purl/1459184>
4. Innovative pressurized hydrogen storage for integrated vehicle structures using composites,
5. <https://www.compositesworld.com/news/innovative-pressurized-hydrogen-storage-for-integrated-vehicle-structures-using-composites>
6. Materials challenges to enable hydrogen deployment at scale by 2050, https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=0CCYQw7AJahcKEwjg37GFo_f7AhUAAAAAHQAAAAAQAw&url=https%3A%2F%2Fwww.royce.ac.uk%2Fcontent%2Fuploads%2F2021%2F06%2FRoyce-Hydrogen-Conformable-Tanks-Summary.pdf&psig=AOvVaw1WyXFqJZkfpV3vNpk4zMmc&ust=1671044241186277

TPOC-1: Benjamin Paczkowski

Email: benjamin.v.paczkowski.civ@army.mil

OUSD (R&E) CRITICAL TECHNOLOGY AREA(S): Renewable Energy Generation and Storage; Biotechnology

OBJECTIVE: The purpose of this topic is to develop an on-demand hydrogen generation system that can be used to quickly refuel a vehicle in situations where its main fuel tank is empty. The end user for this system would be fuel cell system operators. In the event a fuel cell system depletes the main fuel tank and battery power (assuming a hybrid fuel cell/battery electric architecture), this system can be used to provide hydrogen to the fuel tank (or directly to the fuel cell) to allow the system to provide power and return to safety. The system would be sized to be portable while providing enough energy to travel back to base, similar to how jerrycans are currently used.

DESCRIPTION: As the Army moves towards more electrified platforms, new challenges arise, such as running out of fuel or energy while executing a mission. Current vehicles can be refueled quickly from a jerrycan, allowing them to travel to the refueling point. Fully electrified platforms are not as easily refueled on the side of the road, which puts both Soldiers and materiel in danger. As the Army explores electrification technologies, preparing for situations such as this are important to keep both Soldiers safe and protect next generation platforms. Hydrogen fuel cells are a potential electrification technology that can provide near-silent power and mobility for military vehicles while providing high torque with inherently scalable power and energy, capable of providing range beyond that of purely battery-powered electric vehicles. Hydrogen can also be refueled more quickly than batteries can charge, providing an opportunity to solve the problem of a fuel-depleted vehicle on a mission. Several technologies exist that can provide hydrogen on-demand from solid materials that can be easily and safely transported and stored. One such technology of interest is aluminum alloys that react with water to provide hydrogen.

Note: Hydrogen generators that utilize aluminum alloy and water are like an extra fuel tank, but less volatile. Aluminum powder can be safely handled and stored as a solid material, unlike liquid fuel. Several recent advances in the technology allow for the material to be manufactured at scale from scrap aluminum, providing a large source of energy in an inexpensive manner (1, 2). Compared to domestically sourcing lithium for battery production (and in order to meet future energy needs), this technology provides significant energy density without requiring rare earth metals, while at the same time needing significantly less infrastructure be developed. When exposed to water, the alloys produce hydrogen rapidly and at pressure, allowing a vehicle to be fueled quickly while providing enough energy to travel back to safety or a refueling point. The system can be designed with safety at the forefront, incorporating pressure relief devices and intrinsically safe controls.

PHASE I: It is important to note that this is a Direct to Phase II topic. To justify a Direct to Phase 2, This Direct to Phase 2 effort should have data demonstrating the operation of an aluminum-water hydrogen generation system. The data should show the flow rate of hydrogen from the system, pressure during operation, temperature of the system, the amount of aluminum and water used, and control over the reaction (data showing a controlled stop/start cycle of the reaction). The proposal should also demonstrate the hydrogen from the reaction is pure enough to operate a fuel cell by either providing performance data from a fuel cell connected to the system or analysis of the hydrogen purity.

PHASE II: Design a hydrogen generation system that can be man-portable while providing a meaningful range for vehicles in the case that fuel is depleted. Manage the thermal performance of the system, reducing both the exterior touch temperature to safe levels and overall thermal signature. Fabricate and demonstrate such a system. Demonstrate aluminum alloy production capable of supporting the manufacturing of several systems. Testing required for this technology would include measuring the flow

rate of hydrogen from the system, demonstrating that the system can operate at the designated pressure, maintaining a safe external touch temperature, and effectively removing heat from the reaction.

PHASE III DUAL USE APPLICATIONS: There is high dual-use potential for hydrogen fuel cells, as users across industries continue to adopt this technology, especially in vehicles and industrial power. The high CAGR indicated rapid, significant projected growth across all sectors. Popular use cases for fuel cells in general include power generation for electric individual and mass transportation vehicles, industrial processes, data centers, and utilities, as well as residential heating. Hydrogen fuel cells can be used to build stacks, which can allow for modular power systems that can adapt to energy requirements based on the use case. The proposed technology has potential use within the Army Small Business Innovation Research Program as well as other Army Research Centers and acquisition programs.

KEYWORDS: Hydrogen; Storage; fuel; battlespace; tank; refuel point; electrification; generator; generation system; power supply

REFERENCES:

1. Using aluminum and water to make clean hydrogen fuel—when and where it’s needed, <https://energy.mit.edu/news/using-aluminum-and-water-to-make-clean-hydrogen-fuel-when-and-where-its-needed/>
2. Nanogalvanic Aluminum Powder For Hydrogen Generation, <https://www.arl.army.mil/wp-content/uploads/2019/11/AlNanogalvanicPowder-Marketing-Sheet.pdf>
3. The production of hydrogen as an alternative energy carrier from aluminium waste, <https://energysustainsoc.biomedcentral.com/articles/10.1186/s13705-017-0110-7>

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