

Request for Information (RFI): Echo
IARPA-RFI-16-08

The Intelligence Advanced Research Projects Activity (IARPA) is seeking information on technologies to characterize containers with unknown contents. This request for information (RFI) is issued solely for information gathering and planning purposes; this RFI does not constitute a formal solicitation for proposals. The following sections of this announcement contain details of the scope of technical efforts of interest, along with instructions for the submission of responses.

Background & Scope

In the course of duty, government personnel encounter unconventional containers potentially filled with chemical, biological, or explosive materials and precursors. These containers must be characterized to ensure the safety of personnel and others in the vicinity. IARPA is seeking innovative concepts for a reliable, man portable system that can quickly characterize the contents of a containment vessel. The technical solution should be able to accomplish diagnostic tasks without penetrating the integrity of the container but physical contact with the outside of the container is permissible. The solution should maintain a high degree of threat identification accuracy (i.e. level of confidence associated with the match/non-match of physical signatures from distinct observations) while attempting to reduce Size, Weight and Power (SWAP), as well as complexity associated with handling the equipment. In addition, while a self-contained system is preferable, a system that uses radio-frequency (RF) communications links to connect to remote processors would be considered as well.

Responses to this RFI should answer any or all of the following questions:

1. What are the existing methods for assessment of the substance within a container whose contents are unknown? The responses should be written to address containers within the size range of 1 liter to 500 liters, made of variable materials (metal, plastic etc.) and conditions to include containers that are aged, pitted and dented, of varying wall thickness (1-25 mm) and vessels that are multi-layered.
2. What approaches are currently available to determine if container content is gaseous and/or under pressure in the absence of inspection ports? If the contents are under pressure, what is the ability to determine the ratio of internal pressure to ambient atmospheric pressure?
3. What capabilities exist to determine if the contents are solely gaseous, liquid under gas, solid under gas, or liquid and solid under gas to include acoustic, laser vibrometry and ionizing radiation technologies? What are the technical deficiencies and shortcomings of these approaches? What is the corresponding SWAP for these capabilities?
4. What technologies are available for characterizing a liquid in a container as related to chemical class and to what degree of associated specificity and sensitivity? What are the technical deficiencies and shortcomings of these approaches?
5. What technologies are available for assessing the specific heat or latent heat of the unknown substance within a container?
6. Can these methods be installed on a lightweight, man-portable platform? Would the system have to operate remotely from a fixed location?

7. What RF methods could be used to connect an acoustic signal processor, ionizing radiation detector, or laser vibrometer with a man-portable assessment system with little or no latency?
8. What are appropriate test and evaluation approaches to measure system performance against several types of containers and unknown internal substances in various phases? What is the accuracy of these methods and related limitations?

The responses to this RFI may be used to support a one-day workshop on container characterization. An expected result for such a workshop is the identification of promising areas for research investment.

Preparation Instructions to Respondents

IARPA requests that respondents submit ideas related to this topic for use by the Government in formulating a potential program. IARPA requests that submittals answer questions concisely, briefly and clearly describe the potential approach or concept, outline critical technical issues/obstacles, describe how the approach may address those issues/obstacles and comment on the expected performance and robustness of the proposed approach. If appropriate, respondents may also choose to provide a non-proprietary rough order of magnitude (ROM) estimate regarding what such approaches might require in terms of funding and other resources for one or more years. This announcement contains all of the information required to submit a response. No additional forms, kits, or other materials are needed.

IARPA appreciates responses from all capable and qualified sources from within and outside of the US. Because IARPA is interested in an integrated approach, responses from teams with complementary areas of expertise are encouraged.

Responses have the following formatting requirements:

1. A one page cover sheet that identifies the title, organization(s), respondent's technical and administrative points of contact - including names, addresses, phone and fax numbers, and email addresses of all co-authors, and clearly indicating its association with RFI-16-08;
2. A substantive, focused, one-half page executive summary;
3. A description (limited to 5 pages in minimum 12 point Times New Roman font, appropriate for single-sided, single-spaced 8.5 by 11 inch paper, with 1-inch margins) of the technical challenges, answers to RFI questions, and suggested approach(es);
4. A list of citations (any significant claims or reports of success must be accompanied by citations);
5. Optionally, up to 3 overview briefing charts graphically depicting the key technical ideas only, no cost or corporate capabilities.

Submission Instructions to Respondents:

Responses to this RFI are due no later than 4:00 p.m., Eastern Time, on 19 October 2016. All submissions must be electronically submitted to dni-iarpa-rfi-16-08@iarpa.gov as a PDF document. Inquiries to this RFI must be submitted to dni-iarpa-rfi-16-08@iarpa.gov. Do not send questions with proprietary content. No telephone inquiries will be accepted.

Disclaimers and Important Notes:

This is an RFI issued solely for information and planning purposes and does not constitute a solicitation. Respondents are advised that IARPA is under no obligation to acknowledge receipt of the information received, or provide feedback to respondents with respect to any information submitted under this RFI.

Responses to this notice are not offers and cannot be accepted by the Government to form a binding contract. Respondents are solely responsible for all expenses associated with responding to this RFI. IARPA will not provide reimbursement for costs incurred in responding to this RFI. It is the respondent's responsibility to ensure that the submitted material has been approved for public release by the information owner.

The Government does not intend to award a contract on the basis of this RFI or to otherwise pay for the information solicited, nor is the Government obligated to issue a solicitation based on responses received. Neither proprietary nor classified concepts or information should be included in the submittal. Input on technical aspects of the responses may be solicited by IARPA from non-Government consultants/experts who are bound by appropriate non-disclosure requirements.

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