NINESIGMA

Request for Proposal

NineSigma – Connecting technology seekers with solution providers around the globe

REQUEST #RFP_2019_0025

High-sensitivity, High-speed Sensor for Detection of Hazardous Materials

RESPONSE DUE DATE: March 8, 2019

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Opportunity
Joint/contract development, licensing, product supply

Timeline
Phase 1: Evaluation of stand-alone sensor performance**:**
Within 1 year
Phase 2: Evaluation of hazardous material inspection system: Within 2 years
(Evaluation of performance of sensor connected to the sampling system)

Financials
To be discussed based on proposal

DESCRIPTION

NineSigma, representing **a large global manufacturer**, seeks **sensors capable of high-sensitivity, high-speed inspection of explosives and/or illegal drugs** in order to develop a fast-response hazardous material inspection system.

KEY SUCCESS CRITERIA

Prerequisites

- The development of a sampling system for particulate matters of explosives or drugs that are attached onto inspection targets has been completed.
  - Details of particulate matter sampling device:
    - Outline of operation: The system shoots out compressed air onto the inspection target and traps target particulate matters inside the system; the deposited particulate matters is then vaporized by heat
    - Structure: See figure on the right
- Inspection target
  - Explosives or illegal drugs collected in the particulate matter sampling device

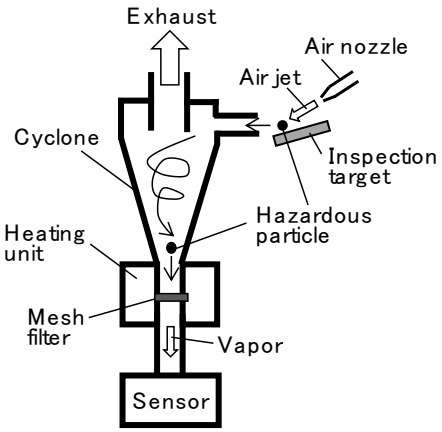

Diagram of hazardous material inspection system

Sensor technology requirements

The Client seeks sensors or technologies for the measurement of either one or both of A and B below:

A) Explosives:

- Targets and minimum limit of detection (preferably be able to handle all of the following):
  - TNT: 10 ng
  - TATP: 100 ng
  - RDX: 10 ng

B) Illegal drugs:

- Targets and minimum limit of detection:
  - Marijuana: 100 ng
  - Stimulants: 10 ng

Common requirements for A and B:

- Detection rates: 2 seconds or faster
- Size (volume): ≤0.1 m^3
- Weight: ≤60 kg
- Cost (selling price): Preferably ≤40 thousand dollars per unit

It is not necessary for all the above-listed requirements to be met at this point; proposals are welcome if there is a good chance of meeting them through another year or so of further development.

Proposer requirements

- Preferably able to provide the Client a prototype within 1 year

POSSIBLE APPROACHES

A wide range of approaches are welcome from single- or multiple-sensor unit devices to measuring instruments of different kinds. The Client expects the use of measurement principles such as the following, but is open to others:

- Infrared absorption
- Mass spectrometry
- Ion mobility spectrometry
- Chemoresistance sensor
- Fluorescence quenching detection
- Raman scattering spectroscopy

BACKGROUND

The Client is engaged in the development of high-throughput inspection systems for hazardous materials (explosives and/or illegal drugs), to be used at airports, etc. These inspection systems consist of a mechanism to collect particulate matters of explosives or drugs that are attached to inspection targets such as pieces of luggage or clothing, and a sensor to inspect the collected particulate matters. The development of a particulate matter collecting system has been completed, as has been the development of a high-speed, high-accuracy sensor for the detection mechanism. However, lower-cost sensors are needed for the development of less expensive versions of the system with priority given to the cost over the accuracy, intended for use in developing countries.

In light of the recent active research and development in sensing technologies for the purpose of terrorism and crime control, the Client sees potential in these activities that may help accelerate their own development endeavors and has therefore decided to make this RFP.

ITEMS TO BE SUBMITTED

Please include the following items in your proposal:

- Characteristics, principle, and uniqueness of the technology
- Development stage: concept level, technology currently being established, or implemented for practical use
- Current performance
  - Measuring object(s) and minimum limit of detection
  - Selectivity and accuracy of measurement
  - Responsiveness or measurement rates
  - Size and weight
  - Range of operation (e.g. temperatures, humidity)
  - Operating life
  - Cost of sensor (selling price)
  - Prototyping conditions (e.g. cost, period, contract terms)
- Current challenges and future development plans
- Past results (e.g. research papers, patents)

Please submit your proposal via NineSights, the platform of NineSigma's Open Innovation community, which allows you to manage all your proposals. Please contact the Solution Provider Help Desk phd2@ninesigma.com for assistance about registration and proposal submission.

NOTES ON RESPONSE

Proposal shall have clear points and should not include confidential information. Supplemental files may be submitted in addition to the proposal.

RESPONSE EVALUATION

The client will evaluate all responses with the following criteria.

- Overall scientific and technical merit
- Approach to proof of concept or performance
- Economic potential of concept
- Realism of the proposed plan (action items, timeline, roles, deliverables, cost estimation)
- Potential for proprietary position

- Respondents' capability and related experiences

ANTICIPATED PROJECT PROCESS

After the submission due date, the client will review all submitted proposals. NineSigma will send the review results to each proposer 6-8 weeks after the due date. The client possibly asks clarifying questions before selecting the most suitable candidates for collaboration. The client will select best candidates through evaluations. During the selection process, the client may execute NDA with selected respondents, seek further information disclosure, and discuss specific development targets or potential opportunities. The client will execute necessary agreements with the selected respondents and move to the advanced development phase. Specifics of any collaboration will be determined through consultation with the concerned parties.