



DEPARTMENT OF HOMELAND SECURITY

Ideation and Prototype Multi-Phase Prize Competition

AGENCY: Science and Technology Directorate

ACTION: Notice

AUTHORITY: 15 U.S.C. § 3719

SUMMARY: The Department of Homeland Security (DHS) gives notice of the availability of the "Environmentally Friendly Replacement for Buoy Mooring Systems" ideation and prototype multi-phase prize competition and rules. The DHS Science and Technology Directorate (DHS S&T) Borders and Maritime Division in conjunction with the United States Coast Guard's Research and Development Center (USCG RDC) is seeking innovative technology from individuals and entities for "fixing" a navigational buoy in a waterway. The current method for mooring buoys - the use of a concrete anchor and a heavy chain - has not changed substantially in decades. The goal is to develop a buoy mooring system that would have minimal impacts on the ocean floor, especially in environmentally sensitive areas.

This prize competition consists of up to three phases, two of which are optional. Phase I: Ideation; Phase II (optional): Pilot Approach Plan and Presentation; and Phase

III (optional): Pilot Phase. The total cash prize payout for all three phases of this competition is up to \$290,000 (USD). Phase I (Ideation) consists of a cash purse of up to \$40,000 (USD) with at least one cash prize of \$10,000 (USD) and no award will be less than \$10,000 (USD). Phase I awards and amounts will be paid to the best submission(s) as solely determined by the Seeker. Contestants invited to participate in Phase II will be awarded \$5,000 (USD) each to assist in preparing and presenting their Phase II competition package. The Phase II prize competition winner will receive up to \$175,000 (USD) in milestone award payments for successful participation in Phase III as agreed to between the USCG RDC and the Phase II prize competition winner. An initial milestone payment will be determined to assist with the startup costs of the Phase III pilot. The USCG RDC reserves the right to award up to a \$50,000 (USD) award bonus for successful demonstration and completion of the Phase III Pilot Phase.

This prize competition consists of the following unique features:

- Terminology

- o Seeker: DHS S&T Borders and Maritime Division
and the United States Coast Guard Research and
Development Center
- o Solvers: Ideation Prize competition submitters
- The Solvers are not required to transfer exclusive
intellectual property rights to the Seeker. (See
Additional Information-Intellectual Property below)

DATES:

Submission Period Beginning Date: January 6, 2016

Submission Period Ending Date: All submissions must be
received electronically as indicated in this announcement
by 11:59PM Eastern Standard Time on Friday, February 12,
2016. Late submissions will not be considered. All dates
are subject to change. For more details please visit
<http://www.challenge.gov>.

ADDRESSES: Questions about this prize competition may be
e-mailed to innohelp@innocentive.com

FOR FURTHER INFORMATION CONTACT:

Prize Competition Manager: Dr. Charlotte Sullivan
Phone: 202-617-5115
Email: charlotte.sullivan@hq.dhs.gov

SUPPLEMENTARY INFORMATION: The America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Reauthorization Act of 2010 (The America COMPETES Act), Public Law 111-358, enacted January 4, 2011, authorizes Federal agencies to award prizes competitively to stimulate innovations that could advance their missions. Interested persons can find full details about the competition rules and register to participate online at <http://www.challenge.gov>. Contest rules are subject to change.

Subject of the Prize Competition: Ideas and concepts that lead to innovative technologies for "fixing" a navigational buoy in a waterway. The goal is to develop a buoy mooring system that would have minimal impacts on the ocean floor, especially in environmentally sensitive areas.

Eligibility Rules: To be eligible to win a prize under this competition, an individual or entity-

- (1) Shall have registered to participate in the competition under the rules promulgated by the Department of Homeland Security, Science and Technology Directorate and in accordance with the description provided, below, under "Registration Information;"
- (2) Shall have complied with all of the requirements under this section;
- (3) Pursuant to the America COMPETES Act of 2010, awards for this prize competition may only be given to an individual that is a citizen or legal permanent resident of the United States, or an entity that is incorporated in and whose primary place of business is in the United States, subject to verification by the Seeker before prizes are awarded. An individual or private entity must be the registered entrant to be eligible to win a prize. Further restrictions apply - see the Ideation Challenge-Specific Agreement found at the competition registration website and this Federal Register Notice for full details.
- (4) Contestants to this prize competition must: agree to be bound by the rules of the prize competition; agree that the decision of the judges for this prize

competition are final and binding; and acknowledge that their submission may be the subject of a Freedom of Information Act (FOIA) request and that they are responsible for identifying and marking all business confidential and proprietary information in their submission.

(5) Entities selected as a prize competition winner must register or be previously registered in the System for Awards Management (<http://www.sam.gov>) in order to receive a cash prize. Registration in the System for Awards Management is not a prerequisite for submitting an entry to this prize competition. Failure to register in the System for Awards Management within 30 days of notification by InnoCentive, Inc. (the government's contracted prize competition administrator) will result in a disqualification of the winning entry.

(6) Individuals selected as a prize competition winner must submit all required taxpayer identification and bank account information required to complete an electronic payment of the cash prize. Failure to provide the government required documents for electronic payment within 30 days of notification

by InnoCentive, Inc. (the government's contracted prize competition administrator) will result in a disqualification of the winning entry.

(7) Contestants to this prize competition agree, as a condition for participating in Phase III, to complete a Memorandum of Agreement or other agreement as mutually agreed to and collaborate with the Department of Homeland Security, Science and Technology Directorate and the United States Coast Guard, Research and Development Center to build and pilot their proposed solution.

(8) Contestants to this prize competition agree, as a condition for winning a cash prize, to complete and submit all required winner verification documents to InnoCentive, Inc. (the government's contracted prize competition administrator) within 30 days of notification. Failure to return all required verification documents by the date specified in the notification may be a basis for disqualification of the winning entry.

(9) Contestants participating in Phase III of this competition shall be required to obtain liability insurance or demonstrate financial responsibility in

the amount of \$1,000,000 (USD) for claims by a third party for death, bodily injury, or property damage, or loss resulting from an activity carried out in connection with their participation in this prize competition, with the Department of Homeland Security and the United States Coast Guard named as additional insured under the registered participant's insurance policy. The registered participant must also agree to indemnify the Federal Government against third party claims for damages arising or related to competition activities and the Federal Government for damage or loss to government property resulting from such activity.

(10) Contestants to this prize competition must agree and consent, as a condition for receiving a cash prize, to the use of their name, entity, city and state, likeness or image, comments, and a short synopsis of their winning solution as a part of the Department of Homeland Security's promotion of this prize competition.

(11) Contestants must own or have access at their own expense to a computer, an Internet connection, and any other electronic devices, documentation, software, or

other items that contestants may deem necessary to create and enter a submission;

(12) The following individuals (including any individuals participating as part of an entity) are not eligible regardless of whether they meet the criteria set forth above:

- (i) any individual under the age of 18;
- (ii) any individual who employs an evaluator on the Judging Panel (hereafter, referenced simply as a "Judge") or otherwise has a material business relationship or affiliation with any Judge;
- (iii) any individual who is a member of any Judge's immediate family or household;
- (iv) any individual who has been convicted of a felony;
- (v) the Seeker, Participating Organizations, and any advertising agency, contractor or other individual or organization involved with the design, production, promotion, execution, or distribution of the Contest; all employees, representatives and agents thereof; and all members of the immediate family or household of

any such individual, employee, representative, or agent;

(vi) any Federal entity or Federal employee acting within the scope of his or her employment, or as may otherwise be prohibited by Federal law (employees should consult their agency ethics officials) Note: Federal ethical conduct rules may restrict or prohibit federal employees from engaging in certain outside activities, so any federal employee not excluded under the prior paragraph seeking to participate in this competition outside the scope of employment should consult his/her agency's ethics official prior to developing a submission;

(vii) any individual or entity that used Federal facilities or relied upon significant consultation with Federal employees to develop a submission, unless the facilities and employees were made available to all Contestants participating in the Contest on an equal basis;

(viii) any individual or entity that used Federal funds to develop a submission, unless such use

is consistent with the grant award, or other applicable Federal funds awarding document. If a grantee using Federal funds enters and wins this prize competition, the prize monies will need to be treated as program income for purposes of the original grant in accordance with applicable Office of Management and Budget Circulars. Federal contractors may not use Federal funds from a contract to develop a submission for this competition; and

- (ix) Employees and contractors of the Department of Homeland Security, Science and Technology Directorate and the United States Coast Guard, Research and Development Center are ineligible to compete in this competition. Likewise, members of their immediate family (spouses, children and step-children, siblings and step-siblings, parents and step-parents), and persons living in the same household as such persons, whether or not related, are not eligible to participate in any portion of this competition. Note: The members of an individual's household include any other person

who shares the same residence as such individual for at least three (3) months out of the year.

(13) Per 15 U.S.C. 3719(h), an individual or entity shall not be deemed ineligible under these eligibility rules because the individual or entity used Federal facilities or consulted with Federal employees during a competition if the facilities and employees are made available to all individuals and entities participating in the competition on an equitable basis; and

(14) Use of Marks: Except as expressly set forth in the Participant Agreement or the competition rules, participants shall not use the names, trademarks, service marks, logos, insignias, trade dress, or any other designation of source or origin subject to legal protection, copyrighted material or similar intellectual property ("Marks") of the organizers or other prize competition partners, sponsors, or collaborators in any way without such party's prior written permission in each instance, which such party may grant or withhold in its sole and absolute discretion.

(15) An individual or entity that is determined to be on the Excluded Parties List is ineligible to receive a prize award and will not be selected as a prize competition winner.

Registration Information: To be eligible to win a prize under this competition, the Solver shall have registered to participate in the contest under the process identified on the central Federal website where government competitions are advertised (Challenge.gov). Access the <http://www.challenge.gov> website and sort by: Department of Homeland Security and then select the "Environmentally Friendly Replacement for Buoy Mooring Systems" contest. Solvers will be directed to an external website created specifically for the competition to obtain contest information, register for the contest including signing the Ideation Challenge-Specific Agreement and submit their entry. After the competition deadline, the Seeker will complete the review process for Phase I and make a decision with regards to the winning solution(s) and invitation(s) to participate in subsequent phases. All Solvers that submitted an entry for Phase I will be notified on the status of their submission; however, no evaluation of an individual submission will be provided.

Phase I Submission Requirements: This competition requires a written solution that describes a novel approach to moor buoys in environmentally sensitive ecosystems.

Background information to assist in the completion of a submission: Aspects of the mooring system which need to be considered are listed below.

- (1) The method to "fix" or "anchor" a buoy marker to a precise location on the seafloor or bottom that minimizes environmental damage.
- (2) The method that physically connects the surface marker to a precisely located "anchor" that allows for motion in a seaway due to winds, waves, tides, or other forces, while minimizing or eliminating any contact with the seafloor or adjacent vegetation.
- (3) A technique to install, inspect, remove or replace any parts of the system. Ideally, the installation should be as simple as possible, and only use a ship with a boom. (For example, methods requiring the use of drills, barges, or divers might be scored lower than other proposed solutions.)

(4) These mooring systems may be fixed or moveable, passive or active, etc., with the goal of deployment in the following operating conditions:

(i) Hull Type: 6 x 16 or 8 x 22 LFR (foam buoy);

(ii) Water Depth: 30 ft.- 50 ft.;

(iii) Bottom Type: Sand or Mud;

(iv) Current: 2 kts.-4 kts.;

(v) Wind/Seas: 0 kts./0 ft.-70 kts./14 ft.;and

(vi) Tide: < 5 ft.

(5) Additionally, proposed mooring systems should have the following properties:

(i) Ability to withstand occasional allisions by vessels and not sustain damage; and

(ii) Ability to be deployed and retrieved using existing USCG resources, specifically: 175 foot Coastal Buoy Tender (WLM; Beam: 36 ft.; Buoy Deck Area: 1335 sq. ft.; Crane: 10 ton hydraulic with a 42 ft. reach; Dynamic Positioning System; or a 225 foot Seagoing Buoy Tender (WLB; Beam: 46 ft.; Buoy Deck Area: 2875

sq. ft.; Crane: 20 ton hydraulic with a 60 ft. reach; Dynamic Positioning System.

(6) Installation areas of particular interest include the St. John River outside of Jacksonville, FL and the area around Guayanilla, Puerto Rico.

(7) Alternate mooring systems exist but each has potential drawbacks that may make them unsatisfactory as solutions to this competition. Alternatives tried by the USCG include:

(i) Articulated Beacon (a.k.a. Buoyant Beacons): The systems are expensive and cannot be deployed by USCG vessels. The massive sinker weight required to counteract the huge upward buoyant force that keeps them standing upright is heavier than the buoy tender cranes can lift. A commercial crane and barge are required to put the system in the water; and

(ii) DOR-MOR Anchor: Can only be used in areas with mud or sand bottoms. Large anchors are significantly more expensive than the equivalent concrete sinkers.

(8) Alternatives not tried by USCG include:

- (i) Subsurface Float (mid-line buoy): A subsurface float is used to raise the excess chain in order to eliminate scouring the ocean bottom, but the excess chain on the bottom provides damping/anchoring forces for the buoy. Without the bottom chain, when the water rises such as during a wave surge, the buoy would tug directly against the concrete sinker and either "walk itself" off the station, or become submerged under water;
- (ii) Synthetic Line: There are many types of synthetic lines, including those with elastomeric properties. Complications possibly include more maintenance because of plant growth, as well as natural and polypropylene lines deteriorate quickly; and
- (iii) Embedment Anchors: There are many different types with the most popular the screw pile (a.k.a. Helical) anchor. Although these have a smaller footprint than the traditional concrete sinker, because they are embedded their depth of disruption is a concern.

- (9) Solutions proposing variants of these systems must address and overcome the stated drawbacks.

Submissions to Phase I of this prize competition shall include:

- (1) Cover Page (format may be found on the competition website)
- (2) Executive Summary that provides a brief summary of the response and indicating if supporting documentation is included.
- (3) Clear discussion and description of the proposed solution, including:
 - (i) Equipment Specifications (height, weight, length, fixed or movable, power requirements, etc., for both the anchoring method and attachment method);
 - (ii) Environmental Impact (How does the proposed solution avoid directly damaging plants and corals?) Information should be provided on the mooring-seafloor contact area if any exists, including expected quantity (in cubic feet) of submerged marine life directly impacted by the

anchor alone and by any connection between the anchor and the buoy; and

(iii) Graphical depictions, engineering drawings and detailed diagrams.

(4) Implementation Plan (Method and Feasibility Criterion)

(i) Deployment, Retrieval, and Transportation requirements. (Submissions should indicate if the use of divers is necessary or other specialized equipment is required. Can USCG platforms be utilized?)

(ii) Operational Limitations. (e.g., maximum sea state, minimum or maximum depth, required bottom type, etc.)

(iii) Interest and ability to participate in USCG RDC demonstrations or their equivalents. (Submissions should include any special requirements needed to facilitate demonstration of the technology.)

(5) Cost Analysis (Cost Criterion)

- (i) Acquisition Cost (Rough Order of Magnitude (ROM) and Procurement Lead Time);
 - (ii) Service Life and Maintenance Cycle;
 - (iii) Life Cycle Cost Parameters (Development, Testing, Acquisition, Operations, Planned Maintenance/Inspection, Integrated Logistics Support, training and disposal);and
 - (iv) Developmental Cost (if required to transition existing technology to meet USCG mission requirements).
- (6) Statement on capability to participate in future prototype build phases of this prize competition. This factor will not be used in evaluating entries and will only be used to determine if the Solver has the ability to participate in the subsequent (optional) phases of the competition.

Liability and Indemnification Information: By participating in this competition, each Solver agrees to assume any and all risks and waive claims against the Federal Government and its related entities, except in the case of willful misconduct, for any injury, death, damage, or loss of property, revenue, or profits, whether direct,

indirect, or consequential, arising from participation in this competition, whether the injury, death, damage, or loss arises through negligence or otherwise. Likewise, each Solver agrees to indemnify the Federal Government against third party claims for damages arising from or related to competition activities. In order to receive a prize, a Solver will be required to complete, sign and return to the Seeker affidavit(s) of eligibility and liability release, or a similar verification document.

Payment of the Prize: Prizes awarded under this competition will be paid by the United States Coast Guard and must be received by the Solver(s) via electronic funds transfer. All Federal, state and local taxes are the sole responsibility of the winner(s). DHS and the USCG will comply with the Internal Review Service withholding and reporting requirements, where applicable. All prize payments made under this contest (Phases I-III) are the sole responsibility of the United States Coast Guard. The Department of Homeland Security, Science and Technology Directorate assumes no responsibility for prize award payments under this prize competition.

Judging Criteria: Solutions for Phase I of this prize competition will be evaluated by a judging panel using the

criteria and rating scale described below. A total of 100 points is possible for each proposed solution. Judges will individually score proposed solutions that meet the eligibility and submission criteria described in this notice. Up to 15 of the highest scored proposed solutions for Phase I will advance to consensus judging for a final score and a decision on award amount, if any.

Proposed Solution Rating System (1-10 points for each criterion):

- (1) Excellent: Solver fully addressed all elements of this criterion. (10 points)
- (2) Very Good: Solver addressed most significant elements of this criterion. (8-9 points)
- (3) Good: Solver adequately addressed some important elements of this criterion. (6-7 points)
- (4) Fair: Solver failed to address one or more critical aspects of this criterion. (4-5 Points)
- (5) Poor: The solver's approach has serious deficiencies. (1-3 points)

Scoring: Criterion Score X Weighted Importance = Total

Judging Criteria:

- (1) Criterion 1: Ability to deploy, retrieve using existing CG resources (225' Seagoing Buoy Tender, 175' Coastal Buoy Tender). (Weight - 1.1)
- (2) Criterion 2: Ability to deploy or retrieve without divers. (Weight - 1.4)
- (3) Criterion 3: Whether deployment or retrieval requires any additional equipment, not normally carried by existing CG buoy tenders. (Weight - 0.7)
- (4) Criterion 4: Expected quantity (in cubic feet) of submerged marine life and vegetation impacted by the mooring (anchor), alone. (Weight - 1.3)
- (5) Criterion 5: Expected quantity (in cubic feet) of submerged marine life and vegetation impacted by the attachment system, alone. (Weight - 1.4)
- (6) Criterion 6: Suitability to the task. (i.e., How well the system keeps the floating buoy within the watch circle radius ($[\text{attachment length}^2 - \text{water depth}]^{1/2}$) of its charted position in the conditions described above (2-4 kt current, 0-70 kt winds, 0-14 ft. seas) (Weight-1.5)
- (7) Criterion 7: How well the mooring/anchor remains on the assigned position as deployed. (Weight-1.4)

- (8) Criterion 8: Cost Analysis. (Weight-0.8)
- (9) Criterion 9: Whether anchor and attachment system is integral, modular, or multi-component. (Weight - 0.4)
- (10) Criterion 10: Non-Scored Element. The ability of the submitter to produce a prototype system.

Additional Information.

Prize Competition Optional Phases II and III.

- (1) Based on the submissions received and the solver's stated capability to build a pilot solution, DHS S&T and the USCG reserve the right to invite one or more winners to participate in optional prize competitions Phase II and III with a prize pool of up to \$250,000.
- (2) Phase II contestant(s) will be awarded \$5,000 each to assist in preparing and presenting their Phase II competition package.
- (3) A contestant invited to participate in Phase II will present a prototype design to the judges through "in-person" oral presentations which may include graphics, displays, models, and PowerPoint

presentations. Oral presentations must be accompanied by a written summary of the design, materials, and techniques to implement the solution, a specification sheet and detailed design illustration, and preliminary implementation costs. The oral presentation shall not last longer than 40 minutes, allowing 20 minutes for follow-up questions and answers. It will be up to the participant(s) to determine which aspect and method of delivery will best encompass the concept of their proposed working prototype pilot. Invited Phase II contestants will present their solutions at the United States Coast Guard, Research and Development Center located in New London, CT.

(4) Judging for Phase II will be evaluated based on the following criteria.

(i) Overall effectiveness of the proposed working prototype design: This factor examines the quality of the design and proposed materials, quantification of how well the design and materials minimize disruption of the marine environment, and quantification of design's

ability to keep the floating buoy and the mooring/anchor at assigned position.

(ii) Feasibility of Implementation: This factor examines whether the relative cost of implementation is reasonable and commensurate with the costs associated with existing aid to navigation installation, servicing and maintenance, and replenishment over a 10 year life cycle.

(iii) Quality of Presentation: This factor examines whether the information that the invited contestant presents orally is consistent with the written information the contestant provides in support of their presentation, and whether the invited contestant is actually familiar with the design, theory, and analysis they provide in the supporting, written information.

(5) Phase III. The Phase II prize competition winner will be eligible to receive up to \$175,000 in milestone award payments and will have 12 months to develop and implement their design. During this development period the prize competition winner will have access to the USCG Research and Development

Center and federal scientists and engineers as agreed to in a Memorandum of Agreement or other agreement. Milestone award payments will be made based upon mutually agreed upon deliverable milestones throughout the pilot based on the USCG accepted design. An initial milestone payment will be determined to assist with the startup costs of the pilot.

- (6) The Phase III contestant will be eligible to receive up to a \$50,000 prize payment for a successful pilot demonstration of their solution. With the approval and under the direction of the USCG RDC, deploy (or provide written deployment guidance to the Coast Guard for deployment) the prototype assembly at the location of the Coast Guard's choosing. After a series of three physical inspections, over a period of 12 months, if the system is successful in meeting the criteria for overall effectiveness (remaining at assigned position with the minimized disruption of the marine environment).

Intellectual Property:

- (1) A Solver retains all ownership in intellectual property rights, if any, in the ideas, concepts, inventions, data, and other materials submitted in the

prize competition. By entering the prize competition, each Solver agrees to grant to the United States Government, a Limited Purpose Research and Development License that is royalty free and non-exclusive for a period of four years from the date of submission. The Limited Purpose Research and Development License authorizes the United States Government to conduct research and development, or authorize others to do so on behalf of the United States Government. The Limited Purpose License does not include rights to commercialize the intellectual property in the Proposed Solution.

- (2) Each Solver warrants that he or she is the sole author and owner of any copyrightable works that the Submission comprises, that the works are wholly original with the Solver (or is an improved version of an existing work that the Solver has sufficient rights to use and improve), and that the Submission does not infringe any copyright or any other rights of any third party of which Solver is aware.

Privacy: Personal information provided by entrants (Solvers) on the nomination form through the prize competition website will be used to contact selected

finalists. Information is not collected for commercial marketing. Winners are permitted to cite that they won this competition. The names, cities, and states of selected winner or entity will be made available in promotional materials and at recognition events.

Judges and their Organization:

- (1) Danielle Elam, U.S. Coast Guard
- (2) Marion Lewandowski, U.S. Coast Guard
- (3) Alexander Balsley, U.S. Coast Guard
- (4) Wayne Danzik, U.S. Coast Guard
- (5) Robert Trainor, U.S. Coast Guard
- (6) David Merrill, U.S. Coast Guard
- (7) Gail Roderick, U.S. Coast Guard

Dr. Charlotte Sullivan of DHS Science & Technology will act as a Technical Advisor to the judging panel.

Dated: December 22, 2015.

Dr. Reginald Brothers,

Under Secretary, DHS Science and Technology Directorate.

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