

**U.S. ARMY RESEARCH OFFICE**  
**BROAD AGENCY ANNOUNCEMENT**

**W911NF-09-R-0001**



**Development of Quantum Computing Algorithms**

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This publication constitutes a Broad Agency Announcement (BAA) and sets forth basic research areas of interest in the theoretical development of quantum computing algorithms. This BAA is issued under the provisions of Federal Acquisition Regulation (FAR) 6.102(d)(2) and Department of Defense Grant and Agreement Regulations (DODGARS) 22.315. Awards based on responses to this BAA are considered to be the result of full and open competition.

**OVERVIEW INFORMATION:**

**Agency Name:** U.S. Army Research Office, Physics Division, P.O. Box 12211, Research Triangle Park, NC 27709-2211

**Issuing Acquisition Office:** U.S. Army RDECOM Acquisition Center, RTP Contracting Division, P.O. Box 12211, Research Triangle Park, NC 27709-2211

**Research Opportunity Title:** Development of Quantum Computing Algorithms

**Announcement Type and Date:** Initial Announcement – October 2008

**Research Opportunity Number:** W911NF-09-R-0001

**Catalog of Federal Domestic Assistance (CFDA) Number and Title:** 12.431 – Basic Scientific Research

**Response Dates:**

**White Papers:** 4:00 PM Standard Time on Tuesday, 25 November 2008.

**Proposals:** 4:00 PM Standard Time on Tuesday, 27 January 2009. See Section IV, B for additional information.

**I. AGENCY CONTACTS:**

**Technical POC:**

Dr. T.R. Govindan

ARO Physics Division

(919) 549-4236, e-mail: [tr.govindan@us.army.mil](mailto:tr.govindan@us.army.mil)

**Questions of a business nature are to be directed to Ms. Alma Frye at email address: [alma.frye@us.army.mil](mailto:alma.frye@us.army.mil) with the BAA number W911NF-09-R-0001 in the subject line of the email.**

Comments or questions submitted should be concise and to the point, eliminating any unnecessary verbiage. In addition, the relevant part and paragraph of the Broad Agency Announcement (BAA) should be referenced.

## II. RESEARCH OPPORTUNITY DESCRIPTION:

The U.S. Army Research Office (ARO) together with the National Security Agency (NSA) is soliciting proposals to: (1) develop new quantum computing algorithms for hard computational problems; (2) characterize the efficiency of candidate quantum algorithms; and (3) develop insights into the power of quantum computation and consider issues of quantum complexity and computability.

Proposals for research in quantum algorithms should primarily be to devise specific quantum algorithms to solve mathematically and computationally hard problems from such diverse fields as algebra, number theory, geometry, analysis, optimization, graph theory, differential equations, combinatorics, topology, logic, and simulation. Quantum algorithms that are developed should focus on constructive solutions for specific tasks and on general methodologies for expressing and analyzing algorithms tailored to specific problems. Complexity analyses such as upper and lower bounds on algorithms relative to specific models of quantum computation are also encouraged.

Investigators should presuppose the existence of a fully functional quantum computer and consider what algorithmic tasks are particularly well suited to such a machine. A necessary component of this research will be to compare the efficiency of the quantum algorithm to the best existing classical algorithm for the same problem.

To characterize the efficiency of candidate quantum algorithms, metrics must be developed to quantify the performance of quantum algorithms relative to their classical analogs. The problems to which they are being applied must have well-defined inputs, and well-defined outputs, along with a well-defined statement of what exactly is being computed. A full accounting of all computational resources must be made including such things as numbers of qubits, numbers of quantum gates, amount of memory being used, amounts of classical pre-computation and post-computation, probability of success, and number of times the algorithm must be run. Worst-case analyses of the algorithms are preferable to average case analyses, but if average case analysis is to be used in an efficiency measure, the distribution of all cases must be made explicit as well as the placement of average cases within this distribution. In addition, proposals that study the algorithmic limitations of fully functional quantum computers will be considered as long as similar performance metrics are specified and quantified.

Although Quantum Algorithm (QA) proposals may impose general architectural constraints, (e.g. nearest neighbor only gates) for implementing algorithms, they should otherwise concentrate on developing the algorithm. QA proposals should assiduously avoid tying algorithms to specific types of qubits.

### **III. AWARD INFORMATION:**

Awards made under this BAA may be in the form of contracts or grants and are subject to the availability of appropriations. Multi-year projects must have clear goals for each year. Funding for subsequent years will be contingent upon satisfactory performance and the availability of funds.

Multiple, one to three year awards are anticipated. The maximum total of any award is five (5) years. Most proposals will request less than \$200K per year. Larger proposals that combine the efforts of multiple investigators from multiple institutions will be considered if a strong and compelling case is made for such a combined effort, rather than multiple smaller efforts.

### **IV. ELIGIBILITY INFORMATION:**

#### **A. Eligible Applicants:**

Proposals may be submitted by degree-granting universities (foreign and domestic), nonprofit organizations, or industrial concerns (large and small businesses).

Proposals are encouraged from Historically Black Colleges and Universities (as determined by the Secretary of Education to meet requirements of Title III of the Higher Education Act of 1965, as amended (20 U.S.C. §1061) and from Minority Institutions defined as institutions whose enrollment of a single minority or a combination of minorities exceeds 50 percent of the total enrollment. [20 U.S.C. § 1067k(3) and 20 U.S.C. § 2323(a)(1)(C)]. However, no funds are specifically allocated for HBCU/MI participation.

#### **B. Cost Sharing or Matching:**

There is no required cost sharing, matching, or cost participation to be eligible under this BAA.

#### **C. Other:**

Federal laboratories, Federally Funded Research and Development Centers, and academic institutions that are federal government organizations (e.g., Naval Postgraduate School) may submit to the federal program for support, but are not eligible to receive funding awarded through this BAA. These organizations are encouraged to contact [mrcurri@nsa.gov](mailto:mrcurri@nsa.gov) for information on how to submit to the internal research program.

## V. APPLICATION AND SUBMISSION INFORMATION

This BAA may be accessed from the FedBizOpps, Grants.gov and the ARO website <http://www.arl.army.mil/www/default.cfm?Action=6&Page=8>. Amendments to this BAA will be posted to these websites when they occur. Interested parties are encouraged to periodically check these websites for updates and amendments.

The following information is for those wishing to respond to the BAA:

### A. Application Process:

The application process is in two stages as follows:

**Stage 1 White Papers** – Prospective proposers are strongly encouraged to submit White Papers. The purpose of requesting White Papers is to minimize the labor and cost associated with the production of detailed proposals that have very little chance of being selected for funding. Based on assessment of the White Papers, feedback will be provided to the offerors to encourage or discourage submission of full proposals. Regardless of the Government response to a White Paper, offerors may submit a full proposal.

NOTE: If an offeror is discouraged from providing a full proposal after the Stage 1 review of White Papers, the offeror should understand that the proposed research has such a negligible chance of being funded as to be considered a poor use of resources to submit a full proposal. In the case that the proposal is not a good fit to this BAA, an offeror may be encouraged to submit their proposal to a separate agency.

**Stage 2 Full Proposals** –After Stage I reviews are completed, offerors should submit full proposals in accordance with the requirements set forth in this BAA. See Section V.C.3.

NOTE: All proposals submitted under the terms and conditions cited in this BAA will be reviewed regardless of the feedback provided on a White Paper submission(s). If offerors have not submitted White Papers under Stage I of the BAA, offerors may submit Full proposals for consideration for funding. Full proposals must be submitted in order for the offeror to receive consideration for funding.

## **B. Format and Content of White Papers/Proposals:**

White Paper Format and Content:

1. White Papers must be submitted electronically to [whitepapers@arl.army.mil](mailto:whitepapers@arl.army.mil) in the following format:
  - Single MSWord formatted file as an email attachment
  - Page Size: 8 ½ x 11 inches
  - Margins – 1 inch
  - Spacing – double
  - Font – No smaller than Times New Roman, 12 point
  - Number of Pages – no more than ten (10) single-sided pages. White Papers exceeding the page limit may not be evaluated.
  
2. White Papers must contain the following:
  - Title page. The title page should be labeled “Proposal White Paper” and should include the BAA number, proposed title, Principal Investigator (PI) with telephone number and email address, and an executive summary. (Not to exceed one page.)
  - Expected expenditures and justifications. (Not to exceed one page.)
  - Curriculum vitae sketches. (Not to exceed one page.)
  - Technical portion including all references and figures. Introduce the problem to be addressed, briefly survey related work, identify key obstacles, outline the proposed solution and well-defined objective, outline the yearly research plan with milestones, and state the impact if successful. (Not to exceed seven pages.)

## **C. Grants.gov Submission Mechanism (applies to all offerors):**

Registration in Grants.gov must be accomplished prior to submitting applications through Grants.gov.

### **C.1. Registration Requirements for Grants.gov (applies to all offerors):**

There are several one-time actions your organization must complete in order to submit applications through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, register with Grants.gov and obtain approval for an Authorized Organization Representative (AOR) to submit applications on behalf of the organization). Go to [http://www.Grants.gov/applicants/get\\_registered.jsp](http://www.Grants.gov/applicants/get_registered.jsp) for further information. Use the Grants.gov Organization Registration Checklist, which may be accessed at <http://www.Grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process.

**Questions:**

Questions relating to the registration process, system requirements, how an application form works, or the submittal process should be directed to Grants.gov at 1-800-518-4726 or [support@grants.gov](mailto:support@grants.gov).

**VERY IMPORTANT:** In order to view, complete, and submit an application package, you may need to download the appropriate software packages. Go to [http://www.Grants.gov/applicants/apply\\_for\\_grants.jsp](http://www.Grants.gov/applicants/apply_for_grants.jsp) for further information.

**C.2. Application through the Grants.gov portal:**

(a) **SF 424 (R&R) (Mandatory)** - The SF 424 (R&R) form is to be used as the cover page for all proposals. Authorized Organization Representative (AOR) usernames and passwords serve as “electronic signatures” when your organization submits applications through Grants.gov. By using the SF 424 (R&R), proposers are providing the certification required by 32 CFR Part 28 regarding lobbying as contained in Section VII. B2. The Application for Federal Assistance form, SF 424 (R&R), must be fully completed. Block 11, “Descriptive Title of Applicant’s Project,” must reference the research being addressed in the effort.

(b) You **MUST** open and complete the form entitled Application for Federal Assistance, SF 424 (R&R) first, as this form will automatically populate data fields in other forms. If you encounter any problems, contact customer support at 1-800-518-4726 or at [support@grants.gov](mailto:support@grants.gov). If you forget your user name or password, follow the instructions provided in the Credential Provider tutorial. Tutorials may be printed by right-clicking on the tutorial and selecting “Print.”

**NOTE:** Prospective awardees must complete several steps in order to participate in the Grants.gov application process. *Starting early is extremely important* as it may take several weeks to complete the processes necessary to submit an application through the Grants.gov APPLY portal.

**C.3. Proposal Format and Content:**

All full proposals must be submitted electronically through Grants.gov in the format given below. Nonconforming proposals may be rejected without review.

**Application Forms:**

Specific forms are required for submission of a proposal. The forms are contained in the Application Package available through the Grants.gov application process. To access these materials, go to <http://www.Grants.gov>, select “Apply for Grants,” and then select “Download Application Package.” Under Grants.gov, utilize the “pop-up” instructions on the form. To activate the instructions, turn on the “Help Mode” in Grants.gov. (The “Help Mode”

is turned on by the icon with the pointer and question mark. This is located at the top of the form). Enter the CFDA for Basic Research (12.431), and the funding opportunity number **W911NF-09-R-0001**.

Offerors must complete the mandatory forms and any optional forms (e.g., SF-LLL Disclosure of Lobbying Activities) in accordance with the instructions on the forms and the additional instructions below. The required fields should be completed in accordance with the “pop-up” instructions on the forms. To activate the instructions, turn on the “Help Mode” (icon with the pointer and question mark at the top of the form).

The following formatting rules apply for the file attachments:

Paper size when printed – 8.5 x 11 inch paper

Margins – 1 inch

Spacing – single

Font – No smaller than Times New Roman, 12 point

**FORM: SF 424 (R&R) (Mandatory):**

Complete this form first to populate data in other forms. Authorized Organization Representative (AOR) usernames and passwords serve as “electronic signatures” when your organization submits applications through Grants.gov. By using the SF 424 (R&R), offerors are providing the certification required by 32 CFR Part 28 regarding lobbying as contained in Section VII. B2. Use SF 424 R&R. **NOTE:** In Block 8, select “Other” and specify whether the type of award selected is a contract or a grant.

**NOTE:** Lead Reviewer to Receive the Proposal – Input the ARO Program Manager data in the field right of Block #2 “Application Identifier” as follows: “Dr. TR Govindan”

**FORM: Research & Related Senior/Key Person Profile (Mandatory):**

Biographical sketches including relevant publications are required where indicated after the profile for the Principal Investigator and key Co-investigators. To attach biographical sketches, click “Add Attachment.”

Statements of current and pending support for the Principal Investigator and Co-investigators listed in the proposal are required where indicated after the profiles for the Principal Investigator and key Co-investigators. The statements should include the project title and brief description, name of the organization or agency funding the work or requested to perform the work, award amount or dollar value, period of performance, and breakdown of the time required of the principal investigator and other senior personnel. To attach current and pending support, click “Add Attachment.”

**FORM: Research & Related Other Project Information (Mandatory):**  
Complete questions 1 through 5 and attach files. The files must comply with the following instructions.

**i. Project Summary/Abstract (Field 6 on the form):**

The project summary/abstract should be a concise description of the proposed research **(200 words or less)**.

**ii. Project Narrative (Field 7)/Technical and Management Portion:**

This portion will comply with the following content at Times New Roman, 12 point. Offerors should not feel compelled to use the entire page allotment. All pages should be numbered consecutively. (Not to exceed **thirty (30) pages.**)

Introduce the problem to be addressed, survey related work, identify key obstacles, outline the proposed solution and well-defined objective, detail the yearly research plan with milestones, and analyze the impact if successful.

**iii. Bibliography & References Cited (Field 8) (no page limitations):**

Include an appropriate bibliography and list of literature citations. To attach a bibliography, click “Add Attachment.”

**iv. Facilities and Other Resources (Field 9) (no page limitations):**

Describe facilities available for performing the proposed research and any additional facilities or equipment that the organization proposes to acquire at its own expense. To attach facilities information, click “Add Attachment.”

**v. Equipment (Field 10) (no page limitations):**

Provide a rationale for each item of equipment requested in the budget and how this equipment will contribute to the infrastructure building goals of the proposal. To attach equipment information, click “Add Attachment.”

**vi. Other Attachments (Field 11) (no page limitations):**

Attach ARO Form 52A, Protection of Proprietary Information During Evaluation, and After Award/Statement of Disclosure Preference. This form may be accessed at <http://www.aro.army.mil/forms/forms2.htm> under “Forms-Broad Agency /Announcements (BAA),” completed and saved as an Adobe PDF. To attach ARO Form 52A, click “Add Attachments.”

**FORMS: RESEARCH & RELATED Senior/Key Person Profile and RESEARCH & RELATED PERSONAL DATA, Personnel Portion** (Not to exceed five (5) pages, *excluding* letters of agreement from subcontractors.):

Describe the qualifications of the principal investigator and other key researchers involved in the project, along with the amount of effort to be expended by each person during each year, and include brief biographies for each. For all proposals, one individual should be the designated principal investigator for purposes of technical responsibility and contact.

Include letters of agreement from all subcontractors indicating their commitment and ability to perform the requested work. These letters should be signed on the offerors's letterhead. Letters should be no more than a single page each, and should contain no critical technical information related to the proposal. The proposal's technical content will be judged solely on the material within the Technical Management Portion.

**FORM: RESEARCH & RELATED Senior/Key Person Profile, State of Current and Pending Support Portion:** (Not to exceed two pages.)

A statement of current and pending support must be included for each investigator listed in the proposal. Use the ARO Current and Pending Support form located at:

<http://www.arl.army.mil/www/default.cfm?Action=29&Page=218#baaforms> to submit this information. This statement requires that each investigator specify all grants and contracts through which he or she is currently receiving or may potentially receive financial support.

**FORM: Disclosure of Lobbying Activities (Standard Form LLL) (Optional):**

If applicable, this form must be completed. This form is applicable if any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the application for a grant under this BAA.

**FORM: Research & Related Budget (Mandatory):**

Complete Sections A through J and attach a budget justification in Section K. The budget justification should provide additional data (not included in Sections A through J) by element of cost, sufficient to meet the guidance provided below and ensure meaningful evaluation. The budget justification at Section K should also include the cost sharing or matching plan specified below if applicable.

The budget must include the period-of-performance, a total estimated cost of the project, and the amount and source of project funding (i.e., funds requested from the Federal Government, any funds provided under current grants or contracts with the Federal Government, and non-federal funds to be provided as cost sharing or matching). The estimated project costs must be shown in total as well as broken down for each year of the program to show the cost elements. Use a separate Research & Related Budget form for each year. The Research & Related Budget-Cumulative Budget form will reflect the total costs. The following additional guidance is provided:

**i. Salary Costs:**

For all employees/labor categories, indicate the amount of time being charged to the proposed project (e.g., number of months) and show resulting costs based on current or projected salary and fringe benefits.

**ii. Equipment:**

Describe any equipment to be acquired and the basis of cost estimates. Costs should be based on recent quotations from manufacturers or distributors.

**iii. Travel:**

Estimate the required amount of travel and state its relationship to the research. List the proposed destinations and basis of cost estimates. Awardees should budget accordingly for an annual review meeting under this BAA. Participation by the PI and key research personnel is mandatory.

**iv. Participant/Trainee Support Costs:**

Estimate tuition/fees/health insurance for students.

**v. Other Direct Costs:**

**(a) Materials and Supplies:**

Estimate costs of materials and supplies. List types of materials needed and costs. Provide basis for cost estimates.

**(b) Publication Costs:**

Estimate the costs of publishing and reporting research results.

**(c) Consultant Services:**

State the planned daily consultant fee and travel expenses, the nature of the consulting effort, and the reason consultants are required to complete the effort.

**(d) Subaward Costs (Other Attachment (Field 11 on the form))**

Support the estimate of subaward work by indicating the specific items or portion of the work to be subawarded, type of subaward anticipated, name of subawardee, and a detailed budget for each. For subaward budgets, use the Research & Related Budget form. Under Budget Type, select "Subaward/Consortium." (Subaward cost will be provided with the same amount of detail as that provided by the Prime.)

**(e) Equipment Rental/User Fees:**

Estimate anticipated direct costs such as rental for computers or other equipment and facility usage fees. Unusual or expensive items should be fully justified.

**(f) Other:**

Add in other proposed direct costs (such as communications) under Other Direct Costs on the Research & Related budget form.

**vi. Indirect Costs (Overhead, General and Administrative, and Other):** Provide the most recent rates, dates of negotiations, the base(s) and period to which the rates apply, and a statement identifying whether the proposed rates are provisional or fixed. If the rates have been negotiated by a Government agency, state when and by which agency. Include a copy of any current indirect rate agreement or provide a URL if this document is available from the Internet.

**vii. Total Direct and Indirect Costs:**

Give the total costs, year by year, and the cost for the entire proposed grant period.

**viii. Cost Sharing or Matching Plans (if applicable):**

Construct a table showing the cost sharing or matching share committed to your proposal in the following categories: State, institutional, and private sector. In each category, show the amount and nature of the planned expenditure share (e.g., State appropriation, equipment, faculty release time for research, etc.). A signed statement of commitment regarding the cost sharing or matching funds described above should be obtained from the appropriate State, institutional, and/or private sector officials. **The cost sharing or matching plan should be included in the budget justification at Section K.**

**NOTE:** To attach the budget justification at Section K, click “Add Attachment.”

Failure to provide the requested information or exceed page limits may render the proposal non-responsive, and the proposal may not be evaluated.

Separate attachments, such as institutional brochures or reprints, cannot be considered.

#### **D. Submission Dates and Times:**

##### **D.1. White Papers:**

White Papers must be submitted electronically via e-mail to [Whitepapers@arl.army.mil](mailto:Whitepapers@arl.army.mil) and received at the Army Research Office by **4:00 PM Standard Time on Tuesday, 25 November 2008**. The email subject line should contain the following: **W911NF-09-R-0001 White Paper**. White Papers received after the deadline will not be reviewed. Feedback on the White Papers will be e-mailed directly to the proposed principal investigators by **Friday, 19 December 2008**.

##### **D.2. Proposals:**

Proposals transmitted to be considered for award must be received by Grants.gov no later than **4:00 PM Eastern Standard Time on Tuesday, 27 January 2009**.

#### **E. Late Submission and Withdrawal of Proposals:**

Offerors are responsible for submitting electronic proposals so as to reach Grants.gov by the time specified in this BAA. If the electronic proposal is received by Grants.gov after the exact time and date specified for receipt of offers it will be considered “late” and will not be considered for review. Acceptable evidence to establish the time of receipt by Grants.gov includes documentary evidence of receipt maintained by Grants.gov.

If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the solicitation, and urgent Government requirements preclude amendment of the solicitation closing date, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

Proposals may be withdrawn at any time before award by written notice or by email. Notice of withdrawal shall be sent to the Contract Specialist identified in Section I of this BAA. Withdrawals are effective upon receipt of notice by the Contract Specialist.

## **VI. PROPOSAL REVIEW INFORMATION:**

### **A. Criteria:**

A.1. Proposals submitted in response to this BAA will be evaluated primarily on the following criteria, both of equal weight:

1. Scientific and technical merits of the proposed research; and
2. Potential contribution of the research, if successful, to significantly extend the potential applications base of quantum computing.

A.2 Other evaluation criteria, of lesser importance, but weighted equal to each other include:

1. Experience and qualifications of the principal investigator, other key research personnel, and the institution sponsoring the proposal; and
2. The realism and reasonableness of cost.

**NOTE:** Cost sharing will not be considered in the evaluation.

### **B. Review and Selection Process:**

The proposal selection process will be conducted based upon a technical peer review according to the evaluation criteria specified in Section VI.A. Each proposal will be evaluated based on the merit and relevance of the specific proposal as it relates to the development of quantum algorithms rather than against other proposals for research in the same general area.

## **VII. AWARD ADMINISTRATION INFORMATION:**

### **A. Award Notices:**

Notification of selection of proposals will be e-mailed by ARO to successful offerors on or about **Tuesday, 3 March 2009**. Unsuccessful offerors will be notified shortly thereafter.

The notification e-mail must not be regarded as an authorization to commit or expend funds. The Government is not obligated to provide any funding until a Government Grants/Contracting Officer signs the grant or contract award document.

Offerors whose proposals are recommended for negotiation of award will be contacted by a Contract/Grant Specialist to discuss additional information required for award. This may include representations and certifications, revised budgets or budget explanations, certificate of current cost or pricing data, subcontracting plan for small businesses, and other information as applicable to the proposed award. The award start date will be determined at this time. A contract or grant document signed by the Government Contracting/Grants Officer is the authorizing award document.

## **B. Administrative and National Policy Requirements:**

### **B.1. Central Contractor Registration (CCR):**

Successful offerors must be registered in the Federal Government CCR database prior to award of a grant or contract. By submission of an offer resulting from this BAA, the offeror acknowledges the requirement that a prospective contractor/grantee must be registered in the CCR database prior to award, during performance, and through final payment of any agreement resulting from this BAA. The CCR may be accessed at <http://www.ccr.gov>. Assistance with registration is available by phone at 1-888-227-2423.

### **B.2. Certification Required for Grant Awards:**

The certification at Appendix A to 32 CFR Part 28 regarding lobbying is the only certification required at the time of proposal submission for a grant award. The certification is as follows:

“By signing and submitting a proposal that may result in the award of a grant exceeding \$100,000.00, the prospective awardee is certifying, to the best of his or her knowledge and belief, that:

(a) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(b) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.

(c) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, and subgrants, and contracts under grants, and loans, or cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty or not less than \$10,000 and not more than \$100,000.00 for each such failure.”

### B.3. Certifications Required for Contract Awards:

Certifications and representations shall be completed by successful offerors prior to award. Department of Defense FAR Supplement (DFARS) Online Representations and Certifications Application (ORCA) are at website <http://orca.bpn.gov>.

### B.4. Export Control:

a. Contractors shall comply with all U.S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, in the performance of this contract. In the absence of available license exemptions/exceptions, the Contractor shall be responsible for obtaining the appropriate licenses or other approvals, if required, for exports of (including deemed exports) hardware, technical data, and software, or for the provision of technical assistance.

b. The Contractor shall be responsible for obtaining export licenses, if required, before utilizing foreign persons in the performance of this contract, including instances where the work is to be performed on-site at any Government installation (whether in or outside the United States), where the foreign person will have access to export-controlled technologies, including technical data or software.

c. The Contractor shall be responsible for all regulatory record keeping requirements associated with the use of licenses and license exemptions/exceptions.

d. The Contractor shall be responsible for ensuring that the provisions of this clause (and any required DFARS clause) apply to its subcontractors as applicable or required.

**C. Reporting Requirements:**

Additional reports including number and types will be specified in the award document, but will include as a minimum monthly financial status reports. The reports shall be prepared and submitted in accordance with the procedures contained in the award document and mutually agreed upon before award. Reports and briefing material will also be required as appropriate to document progress in accomplishing program metrics. A final report that summarizes the project and tasks will be required at the conclusion of the performance period for the award

**D. Security:**

Proposals must not include any information that has been identified as classified national security information under authorities established in Executive Order 12958, Classified National Security Information.