

IARPA

BROAD AGENCY ANNOUNCEMENT

IARPA-BAA-09-09



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BE THE FUTURE

Circuit Analysis Tools (CAT)

Safe and Secure Operations Office

IARPA-BAA-09-09

Release Date: **September 3, 2009**

IARPA

BROAD AGENCY ANNOUNCEMENT: IARPA-BAA-09-09

Circuit Analysis Tools

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PART ONE: OVERVIEW INFORMATION

This publication constitutes a Broad Agency Announcement (BAA) and sets forth research areas of interest in the area of electronic circuit analysis tools. Awards based on responses to this BAA are considered to be the result of full and open competition.

- **Federal Agency Name** – Intelligence Advanced Research Projects Activity (IARPA), Safe and Secure Operations Office
- **Funding Opportunity Title** – Circuit Analysis Tools (CAT)
- **Announcement Type** – Initial
- **Funding Opportunity Number** – IARPA-BAA-09-09
- **Catalog of Federal Domestic Assistance Numbers (CFDA)** – 12.910 Research and Technology Development
- **Dates**
 - Proposal White Paper Due Date: Friday, **October 2, 2009**
 - White Paper Feedback: on or about Thursday, November 12, 2009
 - Proposal Due Date: Friday, **December 11, 2009**
- **Anticipated individual awards** – Multiple awards are anticipated.
- **Types of instruments that may be awarded** – Procurement contract, grant, cooperative agreement or other transaction.
- **Agency Point of contact**
 - Dr. William E. Vanderlinde
 - IARPA, Safe and Secure Operations Office
 - ATTN: IARPA-BAA-09-09
 - Office of the Director of National Intelligence
 - Intelligence Advanced Research Projects Activity
 - Washington, DC 20511
 - Fax: 301-226-9137
 - Electronic mail: dni-iarpa-baa-09-09@ugov.gov
- **Program website:** www.iarpa.gov
- **BAA Summary:** The Intelligence Advanced Research Projects Activity (IARPA), is soliciting proposals to develop tools for integrated circuit analysis at future technology nodes, specifically the 22 nm node and beyond. This includes analysis tools capable of working with advanced packages including but not limited to stacked die. These tools and techniques will address circuit edit, fault isolation, logic analysis and imaging challenges for which there are currently no solutions.
- **Questions:** IARPA will accept questions about the BAA until Tuesday, **December 1, 2009**. A consolidated Question and Answer response will be publicly posted every few days on the IARPA website www.iarpa.gov; no answers will go directly to the submitter. Questions about administrative, technical or contractual issues must be submitted to the BAA e-mail address at dni-iarpa-baa-09-09@ugov.gov. If e-mail is not available, fax questions to 301-226-9137, Attention: IARPA-BAA-09-09. All requests must include the name, e-mail address (if available) and phone number of a point of contact for the requested information. Do not send questions with proprietary content.

PART TWO: FULL TEXT OF ANNOUNCEMENT

Section 1: FUNDING OPPORTUNITY DESCRIPTION

The Intelligence Advanced Research Projects Activity (IARPA) often selects its research efforts through the Broad Agency Announcement (BAA) process. The BAA will appear first on the FedBizOpps website, <http://www.fedbizopps.gov/>, and then on the IARPA website at <http://www.iarpa.gov>. The following information is for those wishing to respond to this Program BAA.

The IARPA is seeking innovative solutions for the Circuit Analysis Tools (CAT) Program. The use of a BAA solicitation allows a wide range of innovative ideas and concepts. The CAT Program is envisioned to begin in April 2010 and end in March 2014.

The CAT program will focus on developing new fault isolation, circuit edit, logic analysis and imaging tools to meet the needs of the 22 nm technology node and beyond, and complex packages like stacked chips.

1.A. Program Overview

The semiconductor electronics industry continues to scale in accordance with Moore's law, and is currently developing the processing and design infrastructure to realize the 22 nm technology node and beyond. However, analysis tools, instrumentation, and methods have not kept pace with the need for improved analytical capability.

Numerous challenges arise in the wake of such rapid progress. Complex circuits with rapidly decreasing critical dimensions will have die-level visual and non-visual defects at the nano- and atomic-scale, which will demand increased resolution in tools that are able to analyze areas as large as 10 microns to find these defects. Increasing numbers of transistors require more levels of metal interconnect (approaching 12 by the 22 nm node), which further complicates fault isolation, circuit edit and analysis techniques. In many cases, the only access to the transistors is through the back-side of the silicon, which requires extensive sample preparation and the need to work with creative approaches from both front- and back-side to test individual transistors. In some cases it will be necessary to advance or develop entirely new techniques to address nano-scale analysis at a comparatively large working distance and through intervening materials. Advanced packaging solutions to address the problem of increasing power dissipation and integration will require new back-side and through-packaging fault isolation approaches. The test time and hence the cost will become prohibitive with the increasing density and complexity of the logic chips. The SEMATECH member companies chartered two committees, the Package and Interconnect Failure Analysis Council (PIFAC) and the Integrated Circuit Failure Analysis Council (ICFAC) to monitor and determine how advances in technology and scaling affect analysis capabilities. One of the greatest challenges among the gaps identified by the PIFAC and ICFAC is fault isolation – the attribution of an electrical fault to a precise physical location in the integrated circuit (IC) for analysis. Fault isolation is increasingly inadequate given the smaller feature sizes and more subtle defects in the complex IC physical structures. Another important challenge is improved imaging resolution of defects. Unfortunately, today's techniques such as photon emission, laser, and magnetic techniques have

limited spatial resolution. There are techniques that provide superior lateral resolution, but require destructive sample preparation (i.e. they destroy device functionality).

IARPA is interested in tools that are necessary for circuit analysis at future technology nodes, specifically, the 22 nm node and beyond. This also includes analysis tools capable of working with the advanced packaging of circuits at these advanced technology nodes including but not limited to stacked die. These tools are required to evaluate commercial products for use by the Government. IARPA is specifically interested in both global and local analysis tools and techniques that can address circuit edit, fault isolation, logic analysis and imaging challenges for which there are currently no solutions. This is analogous to the “red” boxes for technology issues in the International Technology Roadmap for Semiconductors (ITRS) annual reports, which can be found at www.itrs.net. We invite proposals to address challenges for which existing techniques have no clear evolutionary path to the 22 nm node and beyond. IARPA is looking for significant improvements in tool technology, including revolutionary tools and techniques that will enable electrical and physical measurements on future integrated circuits. We are not interested in pure metrology or materials analysis tools, which are considered to be outside the scope of this program.

This program will focus on the full analysis needs of advanced integrated circuits, which are categorized into four thrust areas: circuit edit, fault isolation, logic analysis, and fast imaging. The thrust areas are briefly detailed below along with examples of potential efforts for each. Note that the thrust areas are not listed in any particular order, and no interpretation of relative importance of the thrust areas should be made based on that order.

Circuit Edit refers to the modification of the electrical behavior of an integrated circuit through the use of precise deposition and removal techniques that can cut and/or create new connections. Current technology includes gallium focused ion beam and laser beams combined with reactive gases for etching and deposition. Possible new approaches may include but are not limited to helium ion beams, electron beams, near field optical, or atomic force microscope (AFM)-based nano-fabrication and etching.

Fault Isolation refers to localization of defects in an integrated circuit (packaged or unpackaged) to include shorts, opens, and failed transistors (either hard or soft failures). Possible new approaches may include but are not limited to improved sensitivity and spatial resolution for dynamic laser stimulation, entangled photon imaging, near-field scanning optical microscopy (NSOM), nanoprobing, magnetic current imaging, and sample preparation to enable these advances. The program is also interested in repackaging approaches for stacked chips.

Logic Analysis refers to the functional testing of a circuit (packaged or unpackaged) to include logic states and timing of individual transistors and internal nodes of an integrated circuit. Possible new approaches may include but are not limited to improved sensitivity and spatial resolution for backside laser voltage probing and time resolved photon emission, and sample preparation innovations to enable these advancements. New approaches may also include point-spread function fitting techniques such as those used in fluorescent microscopy methods such as photo-activated localization microscopy (PALM) and stochastic optical reconstruction microscopy (STORM).

Fast Imaging refers to tools capable of imaging minimum size circuit features on an entire silicon die, either a partially processed die or complete die with layers removed. Possible approaches may include but are not limited to higher brightness scanning electron systems, multi-beam scanning electron microscopes, non-scanned projected

image electron systems, ion beam imaging systems, ultra-high resolution interference optical microscopes, and multiple array AFM systems. The program is also interested in sample preparation innovations to enable these advancements.

The CAT program consists of two (2) phases. The first phase will include specific technical goals that must be achieved to proceed to the second phase. The second phase will culminate with a final set of tool and application demonstrations. The schedule and main goals of the two phases are briefly described below:

- Phase 1 (24 months) will focus on analysis tool development. The main goals of this phase are to design, model or simulate, build and demonstrate the proposed circuit analysis tool as a laboratory platform and demonstrate its capability to perform analysis on 22 nm test samples.
- Phase 2 (24 months) will focus on building and optimizing a prototype tool to further advance analysis capability to the 11 nm node¹. The goals of this phase are to optimize the performance of the proposed tool and demonstrate the tool in an analysis of an 11 nm (or equivalent) sample, for either circuit design debug or failure analysis. This may involve the application/integration of multiple circuit analysis techniques.

We provide further details of the expected tool performance in Section 1.B, and program milestones and waypoints in Section 1.C of this document.

IARPA encourages teaming; team members should complement each other by providing different technical expertise and resources. Should an offeror decide to create a team, the offeror should provide clear reasoning for the inclusion of each team member on the proposed effort. The management arrangement should foster a cohesive team and facilitate interaction for achieving the program goals.

1.B Technical Objectives and Metrics for Each Thrust

The CAT Program is divided into four thrust areas: Circuit Edit, Fault Isolation, Logic Analysis, and Fast Imaging. Technical objectives and metrics for each thrust are called out separately in Tables 1 through 4 below. We are looking for improvements that will allow us to evaluate circuits at the 11 nm node, four generations of Moore's Law ahead of the current 45 nm technology. However, the ITRS roadmap has not clearly defined transistor design beyond 22 nm and it is not expected that test chips beyond 22 nm will be available by the conclusion of this program. Therefore proposals should be designed to demonstrate the technical objective metrics on 22 nm test parts and to demonstrate scalability down to 11 nm. Demonstrating scalability to 11 nm may include showing lateral resolution sufficient for 11 nm parts. For techniques that have sensitivity dependent on operating voltage, scalability to 11 nm may be demonstrated by methods such as operating 22 nm parts at the lower voltages expected for 11 nm parts. Demonstrating circuit edit on 11 nm features is tractable since test lines can be produced (using, for example, e-beam lithography) to allow a demonstration of circuit edit. Test chips for demonstration of tool performance at the end of each phase will be developed during the program with the assistance of a Government partner, and supplied to the performers by the Government. The test chips will be developed as appropriate for the proposed technologies that are ultimately selected for funding under

¹ Note that the advancements for the Fast Imaging Tools thrust (Table 4) are focused on speed more than technology node. As such, the Phase 1 metrics are focused on image acquisition speed advancement for the current 45 nm technology node, while the Phase 2 metric includes provisions for scaling to the 22 nm node without loss of image acquisition speed.

the CAT program. These samples may be developed from an advanced technology node or may be from the current generation of commercially available parts with appropriate modifications to demonstrate viability at future generation nodes. These modifications may be made through FIB (focused ion beam) alterations to structures or e-beam deposition of additional structures on test chips. It may be possible that simple test structures will be formed that are representative of the feature sizes and/or structures expected at future technology nodes. For any test chip, the defects or features of interest will be known by the Government. Defects unknown to both the Government and performer will not be used for testing metric performance. If a performer has any need for special data related to test chips and their associated test structures, it should be clearly explained in the proposal along with the rationale and justification for the need. It is often necessary to use test chips during the development of analysis tools. Test chips to be used in development will not be supplied by the Government and should be planned and budgeted for in the proposal.

Be sure to note the level of advancement expected in Tables 1 through 4 below. Offerors must propose approaches that address the program's technical objectives and associated figures of merit for a given thrust (or sub-thrust), but offerors may propose to modify metrics depending on the proffered technical approach, as long as the reasoning for the change is fully explained. However, it is imperative that offeror-proposed metrics be sufficiently aggressive to address the program goals of the 22 nm node (Phase 1) and the 11 nm node (Phase 2) and represent a significant advancement in the capability of the technology that is proposed. Overly conservative metrics, as compared to state-of-the-art, will adversely affect a proposal's score.

In addition to the program objectives and figures of merit, it is acceptable and encouraged that offerors include additional objectives, figures of merit, and associated metrics relevant to their specific approach so that the offeror's proposed technical objectives table has sufficient quantitative details by which to measure progress. For Phase 2, a minimum of one reproducibility objective and one reliability objective, along with associated metrics is required in the offeror's technical objectives table. Note that these goals are only required in Phase 2 when the technology is moved from a laboratory demonstration platform to a prototype platform. Additional technical objectives, figures of merit and metrics should be consistent with the program thrust areas and goal to ultimately advance capability four generations of technology from the current 45 nm node to the 11 nm node. Also, some analysis technologies may already be capable of work beyond the 45 nm node and thus advances should be projected to the 11 nm node relative to current capabilities.

Several of the thrust areas include sample preparation objectives with metrics relevant to the respective thrust area. Offerors are encouraged to team with an appropriate company/institution to provide the sample preparation expertise to achieve the analysis goals. It is also acceptable for an offeror to propose against several of the sample preparation requirements across multiple thrusts.

A single proposal should not address more than one technical thrust unless there is some natural connection due to the analysis technology that is proposed, such as the aforementioned sample preparation. In the case of the fault isolation thrust, an offeror is not required to address all the sub-thrust areas (Front-side Analysis, Back-side Analysis, and Stacked Chip Analysis) listed in Table 2. If an offeror wants to propose against

more than one thrust, for which there is no natural connection, then separate proposals should be submitted.

Table 1: Technical objectives and their associated metrics for the Circuit Edit thrust on CMOS silicon chips.

Circuit Edit		Metrics		
Objective	Figure of Merit	State-of-the-art (45 nm node)	Phase 1 (22 nm node)	Phase 2 (11 nm node)
Metal Deposition	Line width	100 nm	45 nm	20 nm
	Rewire Pitch	200 nm	90 nm	40 nm
	Resistivity	400 $\mu\Omega\text{cm}$	200 $\mu\Omega\text{cm}$	80 $\mu\Omega\text{cm}$
	R_c to metal	300 Ω	150 Ω	60 Ω
Dielectric Deposition	Resistivity	$10^9 \Omega\text{cm}$	$10^{10} \Omega\text{cm}$	$10^{11} \Omega\text{cm}$
Via Milling	Placement Accuracy	75 nm	34 nm	15 nm
	Aspect Ratio	5:1	8:1	10:1
	Endpoint in metal through dielectric ^a (10% Metal 1)	30 nm	15 nm	6 nm
	Endpoint in metal through bulk Si ^a (10% Metal 1)	30 nm	15 nm	6 nm
	Endpoint in dielectric through metal ^a (10% Inter-layer dielectric)	30 nm	15 nm	6 nm
Reproducibility ^b	Fraction of working parts	90%	----	80%
Reliability ^b	Temperature range with $\geq 75\%$ reliability ^c	Room Temperature	----	25°C to 70°C

^aIn specified aspect ratio hole.

^bFor structures incorporating metal, dielectrics and vias.

^cConnections work with less than 10% degradation after 5 thermal cycles from 25°C to 70°C.

Table 2: Technical objectives and their associated metrics for the Fault Isolation thrust on CMOS silicon chips.

		Fault Isolation				
			Metrics			
		Objective	Figure of Merit	State-of-the-art (45 nm node)	Phase 1 (22 nm node)	Phase 2 (11 nm node)
Front-side Analysis Sub-Thrust	SRAM (Static Random Access Memory)	Probing		6 probes	13 probes in 1 μm^2 box	13 probes in 0.25 μm^2 box
		Beam damage ^a		< 0.05 V Threshold voltage shift	< 0.03 V Threshold voltage shift	< 0.02 V Threshold voltage shift
		Stability (time in steady contact)		15 min	15 min	15 min
		Setup time		---	---	<10 min
	General probing	Minimum set of materials to be probed		Cu, Al, W, poly	Cu, Al, W, poly, NiSi	Cu, Al, W, poly, NiSi
	Probing preparation	Front-side delayering		planar to 40 nm over 4x4 mm	planar to 10 nm over 4x4 mm	planar to 5 nm over 4x4 mm
	Reproducibility ^b		---	---	95%	
Back-side Analysis Sub-Thrust	Localization of current, signals, or physical features	Resolution ^c (lateral)		300 nm	150 nm	80 nm
		Localization Accuracy ^d		---	---	80%
	Die level back-side thinning ^e	Thickness		20 μm	10 μm	1 μm
		Flatness over 4 cm^2		5 μm	2 μm	0.5 μm
		Surface roughness		5 nm RMS	3 nm RMS	2 nm RMS
	Reproducibility ^f		---	---	95%	
Stacked Chip Analysis Sub-Thrust	Localization of current, signals, or physical features	Z (vertical)		30 μm	10 μm	< 1 μm
		X-Y (lateral ^g)		6 μm	4 μm	3 μm
		Scan time for 1 mm^2 area ^h		15 min	20 min	<30 min
		Chip Differentiation ⁱ		2 chips of different technologies	3 chips	5 chips
		Localization Accuracy ^d		---	---	80%
	Re-packaging	Stacked chip separation		None	3 chips	5 chips
		Rewiring		None	3 chips	5 chips
Reliability ^j			---	---	80%	

^aFor probing coupled with SEM imaging.

^bReproducibility means that planarity can be met or exceeded on a percentage of samples.

^cResolution refers to the ability to resolve adjacent features and not simply the ability to localize peak signals with high accuracy.

^dLocalization accuracy refers to the ability to correlate a defect through physical deprocessing results with the signature obtained from the fault isolation tool to meet or exceed the lateral and/or vertical resolution goals on a percentage of samples.

^eCircuit electrically intact.

^fReproducibility means that target thickness, flatness, and surface roughness can be met or exceeded on a percentage of samples.

^gAt 30 μm working distance.

^hAt conditions to meet vertical and lateral resolutions.

ⁱSame and different technologies (eg. 3 stacked SRAMs or stacked logic and analog devices). Each die has minimum thickness of 10 μm . Imaging should be able to differentiate current / signals on each die.

^jReliability of technique to separate devices and repackage them without losing the ability to localize the defect (i.e. device retains same or similar electrical defect signature). Metric given as a percentage of parts successfully repackaged.

Table 3: Technical objectives and their associated metrics for the Logic Analysis thrust on CMOS silicon chips.

Logic Analysis		Metrics		
Objective	Figure of Merit	State-of-the-art (65 nm node ^a)	Phase 1 (22 nm node)	Phase 2 (11 nm node)
Static and dynamic logic state mapping	Sensitivity	0.9 V	0.65 V	0.5 V
	Lateral resolution	250 nm	90 nm	45 nm
	Reproducibility ^b	---	---	90%
Sample prep	Back-side thinning	1 μm over 1 mm^2	0.3 μm over 10 μm^2	0.1 μm over 1 μm^2
	Reproducibility ^c	---	---	95%
	Reliability	---	---	100 machine cycles ^d

^aNo known results for 45 nm node.

^bAbility of technique to obtain the same results on a percentage of repeated measurements with variations in signal intensity < 10%. Each measurement needs to include sample setup.

^cReproducibility means that the back-side thinning metric can be met or exceeded on a percentage of samples.

^dNumber of samples processed before system degrades below thinning criteria.

Table 4: Technical objectives and their associated metrics for the Fast Imaging Tools thrust on CMOS silicon chips. Note that the advancements for this thrust are focused on speed more than technology node. As such, the Phase 1 metrics are focused on image acquisition speed advancement for the current 45 nm technology node, while the Phase 2 metrics includes provisions for scaling to the 22 nm node without loss of image acquisition speed.

Fast Imaging Tools (tool does not need to be a SEM)		Metrics		
Objective	Figure of Merit	State-of-the-art (45 nm node)	Phase 1 (45 nm node)	Phase 2 (22 nm node)
Image acquisition speed	Imaging time ^a	140,000 min	1,400 min (improved scan rate 100x)	1,400 min (improved scan rate 400x)
	Reproducibility ^b	---	---	90%
Die level front-side planar delayering ^c	Flatness over 1 cm ²	1 μm	1 μm	0.5 μm
	Surface roughness	5 nm RMS	3 nm RMS	2 nm RMS
	Minimum set of materials to be delayered	Al, Cu, SiO ₂	Al, Cu, SiO ₂ , low-k	Al, Cu, SiO ₂ , porous low-k
	Method	Manual	Manual	Automatic
	Reproducibility ^d	---	---	95%
	Reliability	---	---	100 machine cycles ^e

^aTo image a 1 cm² area with a pixel density of 8 pixels per line width and signal to noise ratio of 20:1. Note that in Phase 2, the improvement is through imaging smaller feature sizes, while keeping the total scan time the same. This results in an effective increase in scanning rate of 400x more than state-of-the-art.

^bImage quality (signal-to-noise and resolution) is reproducible within 10% for a percentage of measurements on the same device.

^cUnderlying circuit electrically intact.

^dReproducibility means that flatness and surface roughness can be met or exceeded on a percentage of samples.

^eNumber of samples processed before system degrades below flatness and surface roughness criteria.

1.C. Program Milestones and Metrics

The Government will use the following Program Milestones and Metrics to evaluate the effectiveness of proposed solutions in achieving the stated program objectives, and to determine whether satisfactory progress is being made to warrant continued funding of the program. These metrics are intended to bound the scope of effort, while affording maximum flexibility, creativity, and innovation in proposing solutions to the stated problem.

The CAT Program is divided into two phases. Phase 1 covers the analysis tool development, culminating in a laboratory demonstration platform, and analysis tests on IARPA supplied test chips. Phase 2 covers the prototype tool fabrication, optimization to achieve more aggressive performance objectives, and application development, culminating in a demonstration of analysis on IARPA supplied test chips. We explain the phases and their components in more detail below.

Table 5: Phase 1 – Analysis Tool Development Milestones. The analysis tool development phase contains five major milestones that must be completed to show appropriate progress for continuation through the end of the phase and for consideration for Phase 2 funding.

Development Milestone	Months after program start	Metric	Deliverable
1) Concept design and/or feasibility study	6 months	---	Report ^a
2) First design for circuit analysis tool	9 months	---	Report ^a
3) Detailed test plan	15 months	---	Report ^a
4) Laboratory demonstration platform ^b built	18 months	Operational per design plans ^c	IARPA Notification ^d
5) Demonstration of laboratory tool performance	22 months	Performance meets Phase 1 metrics ^e	Report ^f

^a Using standard reporting process detailed in 6.B.8. This is not a separate report.

^b Laboratory demonstration platform refers to a “benchtop” minimum assembly of parts (off-the-shelf components, breadboard circuits, optical table assemblies, etc) to demonstrate analysis capability for Phase 1 metrics.

^c “Operational per design plans” means that the laboratory demonstration platform is operational and ready to demonstrate analysis capability on IARPA supplied test chips.

^d This milestone is a trigger to alert IARPA that the performer is ready to receive the IARPA test structure(s) to be used for milestone 5.

^e Metrics for technical objectives provided in 1B for the appropriate thrust or sub-thrust. This includes additional metrics proposed by offeror.

^f Results presented at Program Review (see program waypoints) and incorporated in annual report as described in 6.B.8. A separate report is not due at 22 months.

Table 6: Phase 2 – Tool Optimization and Application Development Milestones. The tool optimization and application development phase contains five major milestones that must be completed to show appropriate progress for continuation through the end of the phase.

Development Milestone	Months after program start	Metric	Deliverable
6) Identification of improvement areas	27 months	---	Report ^a
7) Prototype tool ^b built	36 months	Operational and able to achieve or exceed Phase 1 metrics ^c	Report ^a
8) Application development and continued optimization for performance advances	42 months	---	Report ^a
9) Demonstration of optimized performance	46 months	Performance meets Phase 2 metrics ^d	Report ^a
10) Demonstration of reliability and reproducibility	46 months	Performance meets Phase 2 metrics ^d	Report ^a

^a Using standard reporting process detailed in 6.B.8. This is not a separate report.

^b A prototype tool should be designed and built from the ground up (leveraging proven existing platforms as appropriate) in an integrated fashion ready for post-program commercialization. As appropriate to the technical approach, the prototype tool should also include any improvements identified in milestone 6 to enable further performance advancements.

^c Metrics for technical objectives provided in 1B for the appropriate thrust or sub-thrust. This includes additional metrics proposed by offeror. For this milestone, the prototype tool should be built and able to demonstrate performance advancements that at a minimum meet the Phase 1 metrics.

^d Metrics for technical objectives provided in 1B for the appropriate thrust or sub-thrust. This includes additional metrics proposed by offeror.

Program Waypoints

In order to increase the likelihood that the above milestones will be met, several Progress Waypoints are outlined below. The intent of these waypoints is to provide a means to measure progress toward meeting the program milestones so that the Program Manager and program advisors can provide more effective guidance and assistance to performers. The Program Manager and advisors will use these waypoints to assess whether the program as a whole is on the right path or whether course correction is needed to ensure program success. Offerors are free to propose additional waypoints as they see fit.

Table 7: Circuit Analysis Tools Waypoints.

Months after Program Start*	Waypoint Description	Requirement	Intent
1-2 months	Kickoff site visits	Start-up progress: Staffing, equipment and resource readiness; approach and schedule	Mutual understanding of project plan and effective project start
7 months (Nov 2010)	Program Workshop	Attendance and Presentation	Cross-fertilization between performers; gain insights into extant approaches to analysis techniques; share results with the community
10 months	Program Review	Progress and schedule	Funding continuance**
14-15 months	Site visits	Progress and schedule	Discussion of project plan and progress follow-up from program review
19 months (Nov 2011)	Program Workshop	Attendance and Presentation	Same as previous workshop
22 months	Program Review	Phase 1 milestone (1-5) review; Progress and schedule	Funding continuance**
26-27 months	Site visits	Progress and schedule	Same as previous site visits
31 months (Nov 2012)	Program Workshop	Attendance and Presentation	Same as previous workshop
34 months	Program Review	Progress and schedule	Funding continuance**
38-39 months	Site visits	Progress and schedule	Same as previous site visits
43 months (Nov 2013)	Program Workshop	Attendance and Presentation	Same as previous workshop
46 months	Program Review	Phase 2 milestone (6-10) review and progress	Review of final project status and special session to discuss future circuit analysis needs
48 months	Program Workshop	Attendance and Presentation	Present final results to extant community

* These dates assume a Program Start in April 2010. If the start date is different, most will shift accordingly, with the exception of the program workshop which will be held in conjunction with the International Symposium on Test and Failure Analysis in November each year; however, the final workshop will be run independently and coincide with the end of the program. Participation is required for all events. Domestic travel for all events, with the exception of site visits, should be considered when preparing travel costs for the budget.

** Funding continuance is based on program priorities, performance in executing proposed plans and in achieving proposed goals (including development milestones), funds availability, and IARPA priorities. Award of option years is at the sole discretion of the Government.

SECTION 2: AWARD INFORMATION

The CAT Program is envisioned as a 4-year effort that is intended to begin April 2010. Phase 1 of the Program will last 24 months and focus on analysis tool development to demonstrate capability for the 22 nm node in a laboratory environment. Phase 2 is planned as a 24 month effort that will target tool optimization with goals to the 11 nm node and application development on a prototype tool. Costs associated with commercialization of technology are not covered under this solicitation. It is expected that external investment or company funds will be leveraged to accomplish final commercialization of the technology.

It is anticipated that resulting awards will be segregated into a Base Period of 12 months with 3 pre-priced option years of 12 months each. Funding for these option years will depend upon program priorities, performance, the availability of funding, and IARPA priorities. Funding of option years is at the sole discretion of the Government.

Potential participants in Option Years 1 through 3 will be those teams that have made significant progress in the Base Period and any prior Option Years and have correctly understood and contributed to the overarching goals of the Program. Teams that offer only minor enhancements to the current state of the art will not be invited to continue with the Program.

Multiple awards are anticipated. The amount of resources made available under this BAA will depend on the quality of the proposals received and the availability of funds.

The Government reserves the right to select for negotiation all, some, one or none of the proposals received in response to this solicitation and to make awards without discussions with offerors. The Government also reserves the right to conduct discussions if the Source Selection Authority determines them to be necessary. If the proposed effort is inherently divisible and nothing is gained from the aggregation, offerors should consider submitting it as multiple independent efforts. Additionally, IARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for negotiation for award. In the event that IARPA desires to award only portions of a proposal, negotiations may be opened with that offeror. The Government reserves the right to fund proposals in phases with options for continued work at the end of one or more of the phases.

Awards under this BAA will be made to offerors on the basis of the evaluation criteria listed in 5.A, program balance, and availability of funds. Proposals identified for negotiation may result in a procurement contract, grant, cooperative agreement, or other transaction agreement (OTA). The Government reserves the right to negotiate the type of award instrument it determines appropriate under the circumstances.

Offerors whose proposals are accepted for funding will be contacted before award to obtain additional information required for award. The Government may establish a deadline for the close of fact-finding and negotiations that allow a reasonable time for the award of a contract. Offerors that are not responsive to Government deadlines established and communicated with the request may be removed from award consideration. Offerors may also be removed from award consideration should the

parties fail to reach agreement on contract terms, conditions and cost/price within a reasonable time.

2.A. Other Transaction Agreements (OTA)

Other Transaction for Research. A legal instrument, consistent with 10 U.S.C. 2371, which may be used when the use of a contract, grant, or cooperative agreement is not feasible or appropriate for basic, applied, and advanced research projects. The research covered under another transaction shall not be duplicative of research being conducted under an existing DOD program. To the maximum extent practicable, other transactions shall provide for a 50/50 cost share between the Government and the offeror. An offeror's cost share may take the form of cash, independent research and development (IR&D), foregone intellectual property rights, equipment, or access to unique facilities, as well as others. Due to the extent of cost share, and the fact that an other transaction does not qualify as a "funding agreement" as defined at 37 CFR 401.2(a), the intellectual property provisions of an other transaction can be negotiated to provide expanded protection to an offeror's intellectual property. No fee or profit is allowed on other transactions.

SECTION 3: ELIGIBILITY INFORMATION

3.A. Eligible Applicants

All responsible sources capable of satisfying the Government's needs may submit a proposal. Historically Black Colleges and Universities (HBCUs), Small Businesses, Small Disadvantaged Businesses and Minority Institutions (MIs) are encouraged to submit proposals and join others in submitting proposals; however, no portion of this announcement will be set aside for these organizations' participation due to the impracticality of reserving discrete or severable areas for exclusive competition among these entities. Other Government Agencies, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and any other similar type of organization that has a special relationship with the Government, that gives them access to privileged and/or proprietary information or access to Government equipment or real property, are not eligible to submit proposals under this BAA or participate as team members under proposals submitted by eligible entities.

Only U.S. organizations or institutions² may prime and submit proposals to the CAT BAA. Additionally, at least twenty percent (20%) of the principals of the team (as measured by FTEs) must be from U.S. organization(s) or institution(s). Foreign participants and/or individuals may participate to the extent that such participants comply with any necessary Non-Disclosure Agreements, Security Regulations, Export Control Laws and other governing statutes applicable under the circumstances. Proposers are expected to ensure that the efforts of foreign participants do not either directly or

² "U.S. organizations or institutions" means any corporation, business association, partnership, trust, academic institution, society or any other entity or group that is incorporated or organized to do business in the United States. It specifically excludes any foreign corporation, business association, partnership, trust, academic institution, society or any other entity or group that is not incorporated or organized to do business in the United States, as well as international organizations, foreign governments and any agency or subdivision of foreign governments.

indirectly compromise the laws of the United States, nor its security interests. As such, proposers should carefully consider the roles and responsibilities of foreign participants as they pursue teaming arrangements to propose to the CAT BAA.

3.A.1. Procurement Integrity, Standards of Conduct, Ethical Considerations and Organizational Conflicts of Interest (OCI)

"Organizational conflict of interest" means that because of other activities or relationships with other persons, a person is unable or potentially unable to render impartial assistance or advice to the Government, or the person's objectivity in performing the contract work is or might be otherwise impaired, or a person has an unfair competitive advantage.

If a prospective offeror, or any of its proposed subcontractor teammates, believes that a potential conflict of interest exists or may exist (whether organizational or otherwise), the offeror should promptly raise the issue with IARPA and submit a waiver request by e-mail to the mailbox address for this BAA at dni-iarpa-baa-09-09@ugov.gov. All waiver requests must be submitted through the offeror, regardless of whether the waiver request addresses a potential OCI for the offeror or one of its subcontractor teammates. A potential conflict of interest includes but is not limited to any instance where an offeror, or any of its proposed subcontractor teammates, is providing either scientific, engineering and technical assistance (SETA) or technical consultation to IARPA. In all cases, the waiver request shall identify the contract under which the SETA or consultant support is being provided. Without a waiver from the IARPA Director, neither an offeror, nor its proposed subcontractor teammates, can simultaneously provide SETA support or technical consultation to IARPA and compete or perform as a Performer under this solicitation.

All facts relevant to the existence of the potential conflict of interest, real or perceived, should be disclosed in the waiver request. The request should also include a proposed plan to avoid, neutralize or mitigate such conflict. The offeror, or subcontractor teammate as appropriate, shall certify that all information provided is accurate and complete, and that all potential conflicts, real or perceived, have been disclosed. It is recommended that an offeror submit this request as soon as possible after release of the BAA before significant time and effort are expended in preparing a proposal. If, in the sole opinion of the Government, after full consideration of the circumstances, the conflict situation cannot be resolved, the request for waiver will be denied, and any proposal submitted by the offeror that includes the conflicted entity will be withdrawn from consideration for award.

As part of their proposal, offerors who have identified any potential conflicts of interest shall include either an approved waiver signed by the IARPA Director or a copy of their waiver request. Otherwise, offerors should certify that neither they nor their subcontractor teammates have any potential conflicts of interest, real or perceived.

If, at any time during the solicitation or award process, IARPA discovers that an offeror or subcontractor teammate has a potential conflict of interest, and no waiver request has been submitted by the offeror, IARPA reserves the right to immediately withdraw the proposal from further consideration for award.

3.B. US Academic Organizations

According to Executive Order 12333, as amended, paragraph 2.7, “Elements of the Intelligence Community are authorized to enter into contracts or arrangements for the provision of goods or services with private companies or institutions in the United States and need not reveal the sponsorship of such contracts or arrangements for authorized intelligence purposes. Contracts or arrangements with academic institutions may be undertaken only with the consent of appropriate officials of the institution.”

It is highly recommended that offerors submit with their proposal a completed and signed Academic Institution Acknowledgement Letter for each U.S. academic organization that is a part of their team, whether the academic organization is serving in the role of prime, or a subcontractor or consultant at any tier of their team. A template of the Academic Institution Acknowledgement Letter is enclosed in this BAA at Appendix A. It should be noted that the completed form must be signed by an appropriate senior official from the institution, typically the President, Chancellor, Provost, or other appropriately designated official. Note that this paperwork **must** be completed before IARPA can enter into any negotiations with any offeror when a U.S. academic organization is a part of its team.

3.C. Cost Sharing/Matching

Cost sharing is not required and is not an evaluation criterion.

3.D. Other Eligibility Criteria

3.D.1. Collaboration Efforts

Collaborative efforts and teaming arrangements among potential performers are strongly encouraged, but not required. Specific content, communications, networking and team formations are the sole responsibility of the participants.

SECTION 4: APPLICATION AND SUBMISSION INFORMATION

This notice constitutes the total BAA and contains all information required to submit a proposal. No additional forms, kits, or other materials are required.

4.A. Content and Form of Application Submission

4.A.1. White Paper and Proposal Information

The application process will have two stages as follows:

Stage 1 (White papers) - Prospective offerors are strongly encouraged to submit White papers in advance of a Full Proposal. The requesting of White papers is intended to minimize unnecessary effort in proposal preparation and review, as well as to enhance the quality of full proposals. Based on assessment of White papers, feedback will be provided to include IARPA’s interest in the proposed activity and technical and or management issues. Regardless of the Government response to a White Paper, offerors may choose to submit a full proposal. The Government will review all full proposals submitted using the published evaluation criteria and without regard to feedback resulting from the review of a White Paper.

Stage 2 (Full Proposals) – Interested offerors are required to submit full proposals in order to receive consideration for funding. All proposals submitted under the terms and conditions cited in this BAA will be reviewed regardless of the feedback on a White Paper.

Offerors are required to submit proposals by the time and date specified in section 4.C.1. in order to be considered during the initial round of selections. IARPA may evaluate proposals received after this date for a period of up to one year from the date of initial posting on FedBizOpps. Selection remains contingent on availability of funds.

The typical proposal should express a consolidated effort in support of one or more related technical concepts or ideas. Disjointed efforts should not be included in a single proposal.

Offerors should submit proposals for a Base Period of 12 months plus up to 3 possible 12-month Option Years.

The Government intends to use employees of Booz Allen Hamilton and its sub-contractor, Semitracks to provide expert advice regarding portions of the proposals submitted to the Government. Booz Allen Hamilton will also provide logistical support in carrying out the evaluation process. These personnel will have signed and be subject to the terms and conditions of non-disclosure agreements. By submission of its proposal, an offeror agrees that its proposal information may be disclosed to employees of these organizations for the limited purpose stated above. If offerors do not send notice of objection to this arrangement, the Government will assume consent to the use of contractor support personnel in assisting the review of submittal(s) under this BAA.

Only Government personnel will make evaluation and award determinations under this BAA.

All administrative correspondence and questions regarding this solicitation should be directed by e-mail to dni-iarpa-baa-09-09@ugov.gov. White papers and proposals must be mailed to the address provided in Section 4.C.2. White papers and proposals may not be submitted by hand, e-mail or fax; any such White papers or proposals received in this manner will be disregarded. See below for white paper and proposal submission instructions.

Offerors must submit two hard copies and one soft copy of their white papers and proposals: one original hard copy with original signatures; one hard copy with original or copied signatures; and 1 electronic copy (.pdf format preferred) with Volume 1, Volume 2 and any permitted, additional information on a CD-ROM. Note: white papers only require Volume 1, sections 1 & 2. Both hard copies and the CD must be clearly labeled with the following information: IARPA-BAA-09-09, the offeror's organization, the proposal title (short title recommended), and copy # of #.

4.A.2. White Paper Format

White papers are *strongly encouraged* in advance of full proposals in order to enable offerors to present a description of their idea/concept, its technical merit, and its relevance to the Program prior to submitting a full proposal. In the white paper, the

offeror should articulate the innovative concept and technology needed with respect to demonstrable metrics.

White papers should follow the same general format as described in section 4.B.1. "Format of Volume 1, Technical and Management Proposal" (see below), but include ONLY Sections 1 and 2. The cover sheet should be clearly marked "White Paper" and the total length should not exceed 10 single-sided pages, excluding cover page and official transmittal letter. All pages shall be printed on 8-1/2 by 11 inch paper with 1 inch margins, single line spacing and type not smaller than 12 point. Smaller font may be used for figures, tables and charts. The page limitation for white papers includes all figures, tables, and charts. Nonconforming white papers may be rejected without review. An official transmittal letter for the white paper is required if it is submitted in advance of the full proposal. Academic Institution Acknowledgement Letter(s) or OCI waiver/certification are not required for white paper submissions. However, offerors are strongly encouraged to submit an OCI waiver request as soon as possible. All white papers must be written in English.

4.A.3. Proposal Format

All proposals must be in the format given below. Nonconforming proposals may be rejected without review. Proposals shall consist of two volumes: "Volume 1 - Technical and Management Proposal" and "Volume 2 - Cost Proposal." All pages shall be printed on 8-1/2 by 11 inch paper with 1 inch margins, single line spacing and type not smaller than 12 point. Smaller font may be used for figures, tables and charts. The page limitation for full proposals includes all figures, tables, and charts. All pages must be numbered. Proposals will be evaluated solely on the material content requested below. Any material provided in addition to the required proposal content, such as brochures, presentations or publications are not acceptable and will be discarded without review.

4.A.4. Proposal Classification

The Government anticipates that proposals submitted under this BAA will be unclassified. In the event that an offeror chooses to submit a classified proposal or submit any documentation that may be classified, the submissions must be appropriately marked and submitted in accordance with section 6.B.1, below.

4.B. Proposal Content Specifics

Each proposal submitted in response to this BAA shall consist of the following:

Volume 1 – Technical & Management Proposal

- Section 1 – Cover Sheet & Transmittal Letter
- Section 2 – Summary of Proposal
- Section 3 – Detailed Proposal
- Section 4 – Additional Information

Volume 2 – Cost Proposal

- Section 1 – Cover Sheet
- Section 2 – Detailed Estimated Cost Breakdown

4.B.1. Volume 1, Technical and Management Proposal {Limit of 30 pages}

Volume 1, Technical and Management Proposal, may include attached references of relevant published technical papers which document the technical ideas and approach on which the proposal is based; however, these materials are not part of the formal evaluation process. A list of definitions may also be attached defining acronyms and symbols in the document. This can be helpful to the reviewers unfamiliar with some of the detailed terminology associated with a given technology. These materials are referenced by reviewers at their discretion. The submission of other supporting materials along with the proposal is strongly discouraged and will not be considered for review. Except for the cover sheet, facilities description, transmittal letter, signed Academic Institution Acknowledgement Letter(s) if required, OCI waiver/certification, commercialization plan, definitions and references, Volume 1 shall not exceed 30 pages. Any pages exceeding this limit will be removed and not considered during the evaluation process. Full proposals must be accompanied by an official transmittal letter. All full proposals must be written in English.

Section 1: Cover Sheet & Transmittal Letter

A. Cover sheet:

- (1) BAA number
- (2) Technical thrust
- (3) Lead organization submitting proposal
- (4) Type of business, selected among the following categories: "LARGE BUSINESS", "SMALL DISADVANTAGED BUSINESS", "OTHER SMALL BUSINESS", "HBCU", "MI", "OTHER EDUCATIONAL", OR "OTHER NONPROFIT"
- (5) Contractor's reference number (if any)
- (6) Other team members (if applicable) and type of business for each
- (7) Proposal title
- (8) Technical point of contact to include: title, first name, last name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available)
- (9) Administrative point of contact to include: title, first name, last name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available)
- (10) OCI waiver or certification [see Section 3.A.1.] included? Yes/No
- (10a) If no, reason for not including?
- (11) Are one or more U.S. Academic Organizations part of your team? Yes/No
- (11a) If Yes, are you including an Academic Institution Acknowledgement Statement with your proposal for each Academic Organization that is part of your team? Yes/No
- (12) Total funds requested from IARPA and the amount of cost share (if any)
- (13) Date proposal was submitted.

B. Official Transmittal Letter.

Section 2: Summary of Proposal

Section 2 shall provide an overview of the proposed work as well as introduce associated technical and management issues. This section shall contain a technical description of and technical approach to the research as well as a succinct portrayal of the uniqueness and benefits of the proposed work. It shall make the technical objectives clear and quantifiable and shall provide a project schedule with definite decision points and endpoints. Offerors must address:

- A. Executive Summary: The executive summary should briefly summarize the proposal in **two** pages or less (maintain the required document format). It should unambiguously, succinctly and quantitatively address the following questions in a matching numbered list (the questions can be restated if desired and space allows, but this is not required):
- 1) a) How does the proposed technology address the need for circuit edit, fault isolation, logic analysis or fast imaging at the 22 nm node and beyond?
 - 2) a) What are the goals of the proposed activity? b) What are the specific activities proposed to accomplish the goals?
 - 3) What is the state-of-art (quantitatively) and what (quantitatively) are the limits of current practice? Address each of the goals in 2.
 - 4) a) What's new in the proposed approach that will remove limitations in (3) and improve performance? b) By how much? c) On what grounds does the offeror / team base confidence in success?
 - 5) What has the offeror / team achieved previously and how?
 - 6) If successful, what difference will it make quantitatively?
 - 7) How much will it cost to fully complete?
 - 8) How long will it take?
 - 9) What are the key outcome metrics (final results)?
- B. Identification and Significance of the Problem and Opportunity: Provide clear detail on points 1 and 3 of the executive summary. How does the proposed technology address the need for circuit edit, fault isolation, logic analysis or fast imaging at the 22 nm node and beyond? Describe the state-of-art and limits of current practice (quantitatively). Provide any appropriate background material.
- C. Innovative Approach: Explain the approach to solving the problem and highlight what is new / innovative in the proposed approach that will remove limitations in current practice and improve performance. Describe quantitatively how much improvement is expected in the various issues to be addressed (detailed technical objectives will be captured in a later section). Explain why these improvements are significant.

This section is the centerpiece of the proposal and should succinctly describe the uniqueness and benefits of the proposed approach relative to the current state-of-art approaches. Provide direct comparison to other ongoing research and indicate quantitative advantages and disadvantages of the proposed effort, assuming the competing approaches are successful on a similar timeframe. This will require the offeror to project the relative progress of competing approaches.

- D. Feasibility of the Approach: Explain on what grounds the offeror / team bases confidence in success. Proposed approaches should be grounded on solid scientific principles. Proposals should clearly provide ample technical and quantitative justification as to why the proposed methods and approaches are feasible.

Describe what the offeror / team has previously achieved and how. Describe the offeror's accomplishments in closely related areas. Summarize evidence of experience and proficiency, including critical publications and quantitative accomplishments relevant to the proposed work.

- E. Technical Objectives: In a numbered or bulleted list, briefly explain the planned approach to advance each objective in the appropriate tables (1 through 4) from Section 1.B. Offerors must propose approaches that address the program's technical objectives and associated figures of merit for a given thrust (or sub-thrust), but offerors may propose to modify metrics depending on the proffered technical approach, as long as the reasoning for the change is fully explained. Additional technical objectives, figures of merit and metrics should be consistent with the program thrust areas and goal to ultimately advance capability four generations of technology from the current 45 nm node to the 11 nm node, with the exception of the Fast Imaging Tools thrust (see Table 4).

Provide a detailed technical objectives table in the format provided below to address all the objectives, figures of merit and metrics from the appropriate thrust (or sub-thrust) table along with any additional objectives, associated figures of merit and metrics. Add rows and split rows as necessary. Using italicized text in the row above each objective, give a very brief statement of the development area (in figure of merit column), the current approach for state-of-the-art, and the innovation planned to achieve each metric (see example in table below). Avoid excessive text; employ adequate text so that goals and metrics are clearly understandable on their own and in relation to others. Employ footnotes directly below the table for extended descriptions, if necessary.

The point of this table is to provide a clear, progressive understanding of high level goals, the associated figures of merit that will determine success of reaching those goals, the State-of-Art achieved in the community (possibly by the offeror), what the offeror / team may have already achieved (may be blank), and then how the offeror / team intends to advance those metrics quantitatively by year.

It is difficult to overstate the value of this table. It is critical to the Government's understanding of how the offeror / team will quantitatively achieve goals as well as measure success.

Example Technical Objectives Table (Years reflect the calendar year in which a given funding year ends). The example given in the table is not intended to be a plausible approach and represents only one objective. It is only intended to communicate the type of information and level of detail desired in this table.

Objective	Figure of Merit	State-of-art	Already Achieved	Phase I		Phase II	
				2011	2012	2013	2014
Metal Deposition	<i>Ion beam source advances</i>	<i>Ga ions</i>	<i>Ga ions with xxx</i>	<i>XX ions</i>	<i>Improved charged particle optics</i>		<i>XXX to advance beam YYY</i>
	Line width	100 nm	85 nm	65 nm	45 nm	---	20 nm
	Rewire Pitch	200 nm	170 nm	130 nm	90 nm	---	40 nm
	Resistivity	400 $\mu\Omega\text{cm}$	400 $\mu\Omega\text{cm}$		200 $\mu\Omega\text{cm}$		80 $\mu\Omega\text{cm}$
	R_c to metal	300 Ω	300 Ω		150 Ω		60 Ω

- F. Teaming and Key Personnel: Succinctly describe the team, unique capabilities and roles, and highlight key performers in each group or institution. Bios are not necessary in this section unless for key researchers, and no more than three lines per person should be provided.
- G. Facilities/Equipment Available for the Project: Briefly describe the facilities and equipment available and required for the project, including computational and experimental resources.
- H. Cost Proposal Summary: Prepare a budget and enter the total funds requested each year per the format of the table below. Break down by institution if applicable. The final budget with all necessary details will be submitted with the full proposal.

Example Cost Table Summary (Years reflect the Fiscal year in which a given funding year starts)

	Budget			
	2010	2011	2012	2013
Primary Institution				
Second Institution				
Third Institution				
Total:				

Section 3: Detailed Proposal Information

This section of the proposal shall provide the detailed, in-depth discussion of the proposed research plan. Specific attention must be given to addressing both the risks and payoffs of the proposed research and why it is desirable for IARPA to pursue. This part shall provide:

- A. Statement of Work (SOW) - In plain English using an outline format, clearly define the technical tasks and sub-tasks to be performed, their durations and the dependencies among them. For each task and sub-task, provide:
- A general description of the objective;
 - A detailed description of the approach to be taken, developed in an orderly progression and in enough detail to establish the feasibility of accomplishing the goals of the task;
 - Identification of the primary organization responsible for task execution (prime, sub-contractor, team member, etc.) by name;
 - The exit criteria for each task/activity, i.e., a product, event or milestone that defines its completion;
 - Definition of all deliverables (e.g., data, reports, software, etc.) to be provided to the Government in support of the proposed research tasks/activities.

At the end of this section, provide a Gantt chart, showing all the tasks and sub-tasks on the left with the performance period (in years/quarters) on the right. All milestones should be clearly labeled on the chart. Use sufficient detail to effectively communicate the work plan and provide understanding of task interdependencies, while remaining legible.

Note: The SOW should be developed so that each Phase of the program is separately defined. The SOW should not contain proprietary information. If an offeror thinks that it is necessary to include proprietary information in the SOW, such proprietary information must be clearly identified and properly marked. It is not acceptable to make the whole SOW proprietary.

- B. Data Sources: Identification and description of data sources to be utilized in pursuit of the project research goals. IARPA plans to use a test chip or chips, developed in cooperation with a Government partner, in the characterization of the research work to demonstrate progress on the project. The offeror may include other data sources, but one of the key criteria for success is a successful demonstration on the IARPA test chip.

If the offeror decides to use additional data sources, they should include integrated circuits or test chips with feature sizes and parameters equivalent to proposed circuits that will be implemented at the 22 nm feature size or smaller. Explain clearly how the data selected will be an appropriate and adequate set for exploring the research topic being proposed.

- C. Deliverables: Deliverables should be defined that show progress toward achieving the stated Program Milestones. A table should be provided that lists the deliverables and when delivery is anticipated. Each project should provide at a minimum, monthly technical reports and financial status reports, quarterly update slides in PowerPoint format and a detailed annual report (format for all document types will be specified at the start of the program). In addition, if there are any other types of deliverables, such as hardware or demonstration samples, these should be included in this table.
- D. Cost, Schedule, Milestones: Cost, schedule and milestones for the proposed research, including estimates of cost for each deliverable delineated by the primes and major sub-contractors and total cost. Where the effort consists of multiple portions that could reasonably be partitioned for purposes of funding, these should be identified as options with separate cost estimates for each. The

milestones should not include proprietary information. If an offeror thinks that it is necessary to include proprietary information in the milestones, such proprietary information must be clearly identified and properly marked. It is not acceptable to make all the milestones proprietary.

- E. Offeror's Previous Accomplishments: Discuss previous accomplishments and work in this or closely related research areas and how these will contribute to and influence the current work.
- F. Detailed Management Plan: The Management Plan should identify both the organizations and the individuals within those organizations that make up the team and delineate the expected duties, relevant capabilities and task responsibilities of team members and expected relationships among team members. Expected levels of effort (percentage time or fraction of an FTE) for all key personnel and significant contributors should be clearly noted. A description of the technical, administrative and business structure of the team and the internal communications plan should be included. Government research interfaces, and planning, scheduling, and control practices should be described. Provide a brief biography of the key personnel (including alternates, if desired) who will be involved in the research along with the amount of effort to be expended by each person during the year, the role they will play, their unique and relevant capabilities, their specific tasks, and their citizenship. Participation by key personnel and significant contributors is expected to exceed 20% of their time. A compelling explanation of any variation from this figure is required.

Explain the role of all subcontractors and what value they bring to the project. Include how interactions will be handled and detail any deliverables that are expected from/between subcontractors. Subcontractors should supply a letter of commitment and be attached to the Cost Volume.

Offerors must include a clearly defined organizational chart of all anticipated project participants and their roles in the project. If the team intends to use consultants, they must be included in the organizational chart as well. Indicate if the person will be an "individual" or "organizational" consultant (that is, will the consultant represent himself/herself or his/her organization). In both cases, the organizational affiliation should be identified. The consultant should make a written commitment to be available to the team; the commitment should be attached to the Cost Volume.

Example Organizational Chart.

Participants	Org	Citizenship	Role	Unique, Relevant Capabilities	Specific Task(s) / Contributions	Time Commitment
John Doe	ABC University	USA	PI/Key Personnel	Electrical Engineer	Semiconductor Device Modeling	25%
John Doe, Jr.	ABC University	USA	Key Personnel	Electrical Engineer	Semiconductor Optical Properties	25%
Jane Doe	ABC University	USA	Significant Contributor	And so forth...	And so forth...	50%
Jane Roe	ABC University	Germany	Contributor			25%
John Doe, III	XYZ Co.	USA	Co-PI/Key Personnel			25%
Wayne Roe	XYZ Co.	UK	Significant Contributor			40%
John Doe, IV	XYZ University	France	Consultant (Individual)			200 hours

- G. Intellectual Property Plan: Describe the proposed approach to intellectual property rights, together with supporting rationale of why this approach offers the best value to the Government. This section should include a list of technical data, computer software or computer software documentation associated with this research effort in which the Government will acquire less than unlimited rights. Should no proprietary claims be made, Government rights will be unlimited. (See also Section 6.B.3, Intellectual Property)
- H. Resource Share: Include the type of support, if any, the offeror might request from the Government, such as facilities, equipment or materials, or any such resources the offeror is willing to provide at no additional cost to the Government to support the research effort. Cost sharing is not required from offerors and is not an evaluation criterion.
- I. Current and Pending Support: List any proposals submitted or existing funding to do the same or similar work. Provide any details that are important for consideration.
- J. Facilities Description: Describe facilities available for performing the proposed research and any additional facilities or equipment that the organization proposes to acquire at its own expense. (Add as an attachment, no page limit)
- K. Commercialization Plan: Assuming success in the research and development effort, describe plans for commercializing the technology after Phase 2. Estimate the cost of commercialization and potential sources of funding that will be pursued (venture capital, internal funding, other Government funding, etc.), or provide a description of potential transition partners if the technology will be commercialized by someone else. Give examples of previous successes at commercializing technology if applicable. (Add as an attachment, 2 page limit)
- L. References: Use standard AIP or IEEE formatting. (Add as an attachment, 1 page limit)
- M. Definitions: Define all acronyms and symbols in the document. This can be helpful to the reviewers unfamiliar with some of the detailed terminology associated with a given technology. (Add as an attachment, 1 page limit)

4.B.2. Volume 2: Cost Proposal {No Page Limit}

Section 1: Cover Sheet

- (1) BAA number;
- (2) Technical thrust
- (3) Lead organization submitting proposal
- (4) Type of business, selected among the following categories: "LARGE BUSINESS", "SMALL DISADVANTAGED BUSINESS", "OTHER SMALL BUSINESS", "HBCU", "MI", "OTHER EDUCATIONAL", OR "OTHER NONPROFIT"
- (5) Contractor's reference number (if any)
- (6) Other team members (if applicable) and type of business for each
- (7) Proposal title
- (8) Technical point of contact to include: title, first name, last name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available)
- (9) Administrative point of contact to include: title, first name, last name, street address, city, state, zip code, telephone, fax (if available), and electronic mail (if available)
- (10) Award instrument requested: cost-plus-fixed-fee (CPFF), cost-contract—no fee, cost sharing contract – no fee, grant, cooperative agreement, other transaction or other type of procurement contract (specify)
- (11) Place(s) and period(s) of performance
- (12) Total proposed cost separated by basic award and option(s) (if any)
- (13) Name, address, telephone number of the offeror's Defense Contract Management Agency (DCMA) administration office or equivalent cognizant contract administration entity, if known
- (14) Name, address, telephone number of the offeror's Defense Contract Audit Agency (DCAA) audit office or equivalent cognizant contract audit entity, if known
- (15) Date proposal was prepared
- (16) DUNS number
- (17) TIN number
- (18) Cage Code
- (19) Proposal validity period [minimum of 90 days]

[NOTE: See Appendix B for Cover Sheet Template]

Section 2: Detailed Estimated Cost Breakdown

- (1) Total cost broken down by major cost items (direct labor, including labor categories; sub-contracts; materials; other direct costs, overhead charges, etc.) and further broken down by major task and phase
- (2) Major program tasks by fiscal year
- (3) An itemization of major subcontracts and equipment purchases

- (4) An itemization of any information technology (IT³) purchases
- (5) A summary of projected funding requirements by month
- (6) The source, nature and amount of any industry cost-sharing
- (7) Identification of pricing assumptions of which may require incorporation into the resulting award instrument (e.g., use of Government Furnished Property/Facilities/Information, access to Government Subject Matter Expert/s, etc.).

The prime contractor is responsible for compiling and providing all subcontractor proposals for the Procuring Contracting Officer (PCO). Subcontractor proposals should include Interdivisional Work Transfer Agreements (ITWA) or similar arrangements. Where the effort consists of multiple portions which could reasonably be partitioned for purposes of funding, these should be identified as options with separate cost estimates for each. NOTE: For IT and equipment purchases, include a letter stating why the offeror cannot provide the requested resources from its own funding.

Supporting cost and pricing information must be provided in sufficient detail to substantiate the summary cost estimates in Volume 1 above. Include a description of the method used to estimate costs and supporting documentation. Note: "cost or pricing data" shall be required if the offeror is seeking a procurement contract award of \$650,000 or greater unless the offeror requests an exception from the requirement to submit cost or pricing data. Cost or pricing are not required if the offeror proposes an award instrument other than a procurement contract (e.g., a grant, cooperative agreement, or other transaction). However, such data may be required prior to award if the offeror's proposal is selected for negotiations and the Government determines that a procurement contract is the appropriate award instrument. All proprietary subcontractor proposal documentation, prepared at the same level of detail as that required of the prime, shall be made immediately available to the Government, upon request, under separate cover (i.e., mail, electronic/email, etc.), either by the offeror or by the subcontractor organization.

All offerors requesting an other transaction agreement (OTA) must include a detailed list of payment milestones. Each such payment milestone must include the following: milestone description, exit criteria, due date, milestone payment amount (to include, if cost share is proposed, contractor and Government share amounts). It is noted that, at a minimum, such payable milestones should relate directly to accomplishment of technical milestones and metrics as defined in the offeror's proposal. Agreement type, fixed price or expenditure based, will be subject to negotiation by the Government;

³IT is defined as "any equipment, or IT is defined as "any equipment, or interconnected system(s) or subsystem(s) of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the agency. (a) For purposes of this definition, equipment is used by an agency if the equipment is used by the agency directly or is used by a contractor under a contract with the agency which – (1) Requires the use of such equipment; or (2) Requires the use, to a significant extent, of such equipment in the performance of a service or the furnishing of a product. (b) The term "information technology" includes computers, ancillary, software, firmware and similar procedures, services (including support services), and related resources. (c) The term "information technology" does not include – (1) Any equipment that is acquired by a contractor incidental to a contract; or (2) Any equipment that contains imbedded information technology that is used as an integral part of the product, but the principal function of which is not the acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information. For example, HVAC (heating, ventilation, and air conditioning) equipment, such as thermostats or temperature control devices, and medical equipment where information technology is integral to its operation, is not information technology."

however, it is noted that the Government prefers use of fixed price payable milestones to the maximum extent possible. Do not include proprietary data.

Consultant letter(s) of commitment should be attached to the Cost Volume and estimated costs should be included in the cost estimates.

4.C. Submission Details

4.C.1. Due Dates

White papers must be submitted at or before 5:00 p.m. Eastern Daylight Time on **2 October 2009**. White papers are not required for the submission of a full proposal.

Full proposals must be submitted at or before 5:00 p.m. Eastern Standard Time on **11 December 2009** in order to be considered during the initial round of selections.

4.C.2. Proposal and White Paper Delivery

The full proposal (one original hard copy with original signatures; one hard copy with original or copied signatures; and 1 electronic copy with Volume 1, Volume 2 and any permitted, additional information (.pdf format preferred) on a CD-ROM), and any white paper must be delivered to:

ODNI/IARPA
Attention: William E. Vanderlinde
Gate 5
1000 Colonial Farm Road
McLean, VA 22101

IMPORTANT: Deliveries must be made using one of the following commercial delivery services: UPS, FedEx or DHL. Failure to use one of these methods may jeopardize or delay delivery of proposals. Note that under certain “same day delivery” options, UPS, FedEx and DHL may subcontract out their services to local delivery companies. These smaller local delivery companies will not be allowed access to this address to make deliveries. For this reason and other unforeseen situations, offerors should track their submission to ensure final delivery. Deliveries by hand, e-mail or fax will not be accepted.

Offerors must ensure the timely delivery of their proposals. The mail facility closes at 5 p.m. local time; delivery cannot take place after this time until the following day. IARPA will generally acknowledge receipt of complete submissions via e-mail within 24-48 hours and assign control numbers that should be used in all further correspondence regarding white papers or proposals. To be certain of delivery, however, it is suggested that a tracking number be obtained from the carrier.

Offerors are required to submit proposals by the time and date specified in Section 4.C.1 in order to be considered during the initial round of selections. IARPA may evaluate proposals received after this date for a period up to one year from the date of initial posting on FedBizOpps. Selection remains contingent on availability of funds. Failure to comply with the submission procedures may result in the submission not being evaluated.

4.D. Funding Restrictions

Funding may not be used to pay for commercialization of technology. This program will only fund development through to a prototype system.

SECTION 5: APPLICATION REVIEW INFORMATION

5.A. Evaluation Criteria

The criteria to be used to evaluate and select proposals for this Program BAA are described in the following paragraphs. Because there is no common statement of work, each proposal will be evaluated on its own merits and its relevance to the Program goals rather than against other proposals responding to this BAA. Specifics about the evaluation criteria are provided below, in descending order of importance.

5.A.1. Overall Scientific and Technical Merit

Overall scientific and technical merit of the proposal is substantiated, including unique and innovative methods, approaches, and/or concepts. The offeror clearly articulates an understanding of the problem to be solved. The technical approach is credible, and includes a clear assessment of primary risks and a means to address them. The offeror can expect the selection process to include an assessment of the proposal against the state-of-the-art.

5.A.2. Effectiveness of Proposed Work Plan

The feasibility and likelihood that the proposed approach for satisfying the Program's milestones and metrics are explicitly described and clearly substantiated along with risk mitigation strategies for achieving stated milestones and metrics. The proposal reflects a mature and quantitative understanding of the Program milestones and metrics, and the statistical confidence with which they may be measured. The offeror may also propose additional milestones and metrics as needed. Any such milestones and metrics are clear and well-defined, with a logical connection to enabling offeror decisions and/or Government decisions. The schedule to achieve the milestones is realistic and reasonable.

The role and relationships of prime and sub-contractors is clearly delineated with all participants fully documented. Work plans demonstrate the ability to provide full Government visibility into and interaction with key technical activities and personnel; and a single point of responsibility for contract performance. Work plans must also demonstrate that key personnel have sufficient time committed to the Program to accomplish their described Program roles.

The requirement for and the anticipated use or integration of Government Furnished Property (GFP) including all equipment, facilities, information, etc., is fully described including dates when such GFP, GFE (Government Furnished Equipment), GFI (Government Furnished Information) or other similar Government-provided resources will be required.

The offeror's proposed intellectual property and data rights are consistent with the Government's need to be able to communicate Program information across Government organizations and to support transition of the Program results to Intelligence Community users at a reasonable cost.

5.A.3. Contribution and Relevance to the Program Goals

The Offeror describes how the proposed solution meets the letter and intent of the stated Program goals, and all elements within the proposal exhibit a comprehensive understanding of the problems, challenges, and goals. The offeror clearly addresses how the proposed effort will meet and progressively demonstrate progress to accomplishing the CAT program goals. The proposed approach to intellectual property rights offers the best value to the Government.

5.A.4. Relevant Experience and Expertise

The offeror's capabilities, related experience, facilities, techniques, or unique combination of these which are integral factors for achieving the proposal's objectives will be evaluated, as well as qualifications, capabilities, and experience of the proposed principal investigator, team leader, and key personnel critical in achieving the proposal objectives. Time commitments of key personnel must be sufficient for their proposed responsibilities in the effort.

5.A.5. Cost Realism

The proposed costs are reasonable and realistic for the work proposed. Estimates are "realistic" when they are neither excessive nor insufficient for the effort to be accomplished. The proposal documents all anticipated costs including those of associate, participating organizations. The proposal demonstrates that the respondent has fully analyzed budget requirements and addressed resulting cost risks. All cost-sharing and leveraging opportunities have been explored and identified. Other sponsors who have funded or are funding this offeror for the same or similar efforts are identified. The Government shall evaluate how well all cost data are traceable and reconcilable.

IARPA recognizes that undue emphasis on cost may motivate Offerors to offer low-risk ideas with minimum uncertainty and to staff the effort with junior personnel in order to be in a more competitive posture. IARPA discourages such cost strategies. Cost reduction approaches that will be received favorably include innovative management concepts that maximize direct funding for technology and limit diversion of funds into overhead.

After selection and before award, the Contracting Officer will negotiate cost/price reasonableness.

5.A.6. Commercialization Plan

The commercialization plan will be (Pass/Fail).

The commercialization plan will be evaluated based on whether the plan effectively demonstrates the offeror's capability to transition a successful prototype tool into a commercial product. This evaluation will be based on estimates of the cost of commercialization, identification of potential sources of funding that will be pursued,

description of potential transition partners if the technology will be commercialized by someone else, and examples of previous successes at commercializing technology if applicable.

The commercialization plan will be evaluated on a Pass/Fail basis. If an offeror's proposal fails to provide an adequate commercialization plan, the proposal may be rejected.

5.B. Review and Selection Process

It is the policy of IARPA to ensure impartial, equitable, comprehensive proposal evaluations and to select the source (or sources) whose offer meets the Government's technical, policy and programmatic goals. In order to provide the desired evaluation, qualified Government personnel will conduct reviews and (if necessary) convene panels of experts in the appropriate areas.

Proposals will only be evaluated against the criteria described under Section 5.A above, and will not be evaluated against other proposals since they are not submitted in accordance with a common work statement. For evaluation purposes, a proposal is the document described in "White Paper and Proposal Information", Section 4.A.1. Other supporting or background materials submitted with the proposal will be considered for the reviewer's convenience only and not considered as part of the proposal.

As noted above, the Government intends to use employees of Booz Allen Hamilton to assist in administering the evaluation of the proposals as well as Semitracks to provide expert advice regarding portions of the proposals submitted to the Government. Booz Allen Hamilton will also provide logistical support in carrying out the evaluation process. These personnel will have signed and be subject to the terms and conditions of non-disclosure agreements. By submission of its proposal, an offeror agrees that its proposal information may be disclosed to employees of these organizations for the limited purpose stated above. If you do not send notice of objection to this arrangement, the Government will assume your consent to the use of contractor support personnel in assisting the review of your submittal(s) under this BAA. Only Government personnel will make evaluations and award determinations under this BAA.

5.C. Proposal and White Paper Retention

It is the policy of IARPA to treat all proposals as competitive information and to disclose their contents only for the purpose of evaluation. Proposals and white papers will not be returned. Upon completion of the source selection process, the original of each proposal received will be retained at IARPA and all other non-required copies will be destroyed. A certification of destruction may be requested, provided that the formal request is sent to IARPA via e-mail within 5 days after notification of white paper or proposal results.

SECTION 6: AWARD ADMINISTRATION INFORMATION

6.A. Award Notices

As soon as the evaluations are complete, the offeror will be notified by the Program Manager that 1) the proposal has been selected for funding, pending contract

negotiations or 2) the proposal has not been selected for funding. The Government Contracting Officer will send similar notification to the Contracting Office/Administrative Point of Contact of the lead organization.

6.B. Administrative and National Policy Requirements

6.B.1. Security

The Government anticipates that and proposals submitted under this BAA will be unclassified. Offerors choosing to submit a classified white paper or proposal must first receive permission from the Original Classification Authority to use their information in replying to this BAA. Applicable classification guide(s) should be submitted to ensure that the white paper or proposal is protected appropriately.

Offerors choosing to submit a classified white paper or proposal are reminded that the proposal deadline remains the same regardless of whether the offeror's proposal, in whole or in part, is classified. Additional processing time may be required if all or part of a submission is classified. In the event that an offeror chooses to submit a classified white paper or proposal or submit any documentation that may be classified, the following information is applicable.

Collateral Classified Information: Use classification and marking guidance provided by previously issued security classification guides and the National Industrial Security Program Operating Manual (DoD 5220.22-M) when marking and transmitting information previously classified by another original classification authority. Classified information at the Confidential and Secret level may only be mailed via U.S. Postal Service (USPS) First Class Registered Mail or U.S. Postal Service Express Mail. All classified information will be enclosed in opaque inner and outer covers and double wrapped. The inner envelope shall be sealed and plainly marked with the assigned classification and addresses of both sender and addressee. The inner envelope shall be addressed to:

TO BE OPENED BY
IARPA Security Office
ATTN: IARPA-BAA-09-09

The outer envelope shall be sealed with no identification as to the classification of its contents and addressed to:

IARPA/CASL Building
Office of the Director of National Intelligence (ODNI)
Washington, DC 20511

Information Above Collateral Secret Level: For submissions above the Collateral Secret level, contact the IARPA Security Office at 301-226-9003/9102 for further guidance and instructions prior to transmitting information to IARPA.

Offerors must have existing and in-place prior to execution of an award, approved capabilities (personnel and facilities) to perform research and development at the classification level they propose.

Security classification guidance will not be provided at this time since IARPA is soliciting ideas only. After reviewing the incoming proposals, if a determination is made that the award instrument may result in access to classified information; a security classification guide will be issued and attached as part of the award.

6.B.2 Proprietary Data

It is the policy of IARPA to treat all proposals as competitive information, and to disclose their contents only for the purpose of evaluation.

All proposals containing proprietary data should have the cover page and each page containing proprietary data clearly marked as containing proprietary data. It is the offeror's responsibility to clearly define to the Government what is considered proprietary data.

6.B.3. Intellectual Property

6.B.3.a. Procurement Contract Offerors

6.B.3.a.1. Noncommercial Items (Technical Data and Computer Software)

Offerors responding to this BAA requesting a procurement contract to be issued under the FAR shall identify all noncommercial technical data and noncommercial computer software that it plans to generate, develop and/or deliver under any proposed award instrument in which the Government will acquire less than unlimited rights and to assert specific restrictions on those deliverables. In the event that offerors do not submit such information, the Government will assume that it automatically has "unlimited rights" to all noncommercial technical data and noncommercial computer software generated, developed, and/or delivered under any award instrument, unless it is substantiated that development of the noncommercial technical data and noncommercial computer software occurred with mixed funding. If mixed funding is anticipated in the development of noncommercial technical data and noncommercial computer software generated, developed and/or delivered under any award instrument, then offerors should identify the data and software in question as subject to Government Purpose Rights (GPR).⁴ The Government will automatically assume that any such GPR restriction is limited to a period of five (5) years, at which time the Government will acquire "unlimited rights" unless the parties agree otherwise. Offerors are advised that the Government will use this information during the source selection evaluation process to evaluate the impact of any identified restrictions and may request additional information from the offeror, as

⁴ "Government purpose rights" means the rights to use, modify, reproduce, release, perform, display, or disclose technical data and computer software within the Government without restriction; and to release or disclose technical data and computer software outside the Government and authorize persons to whom release or disclosure has been made to use, modify, reproduce, release, perform, display, or disclose that data or software for any United States Government purpose. United States Government purposes include any activity in which the United States Government is a party, including cooperative agreements with international or multi-national defense organizations, or sales or transfers by the United States Government to foreign governments or international organizations. Government purposes include competitive procurement, but do not include the rights to use, modify, reproduce, release, perform, display, or disclose technical data or computer software for commercial purposes or authorize others to do so.

may be necessary, to evaluate the offeror’s assertions. If no restrictions are intended, then the offeror should state “NONE.”

A sample list for complying with this request is as follows:

NONCOMMERCIAL ITEMS			
Technical Data, Computer Software To be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions
(LIST)	(LIST)	(LIST)	(LIST)

6.B.3.a.2. Commercial Items (Technical Data and Computer Software)

Offerors responding to this BAA requesting a procurement contract to be issued under the FAR shall identify all commercial technical data and commercial computer software that may be embedded in any noncommercial deliverables contemplated under the research effort, along with any applicable restrictions on the Government’s use of such commercial technical data and/or commercial computer software. In the event that offerors do not submit the list, the Government will assume that there are no restrictions on the Government’s use of such commercial items. The Government may use the list during the source selection evaluation process to evaluate the impact of any identified restrictions and may request additional information from the offeror, as may be necessary, to evaluate the offeror’s assertions. If no restrictions are intended, then the offeror should state “NONE.”

A sample list for complying with this request is as follows:

COMMERCIAL ITEMS			
Technical Data, Computer Software To be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions
(LIST)	(LIST)	(LIST)	(LIST)

6.B.3.a.3. Non-Procurement Contract Offerors – Noncommercial and Commercial Items (Technical Data and Computer Software)

Offerors responding to this BAA requesting a grant, cooperative agreement, technology investment agreement, or other transaction shall follow the applicable rules and regulations governing these various award instruments, but in all cases should appropriately identify any potential restrictions on the Government’s use of any Intellectual Property contemplated under those award instruments in question. This includes both Noncommercial Items and Commercial Items. Offerors may use a format similar to that described in the previous sections. The Government may use the list during the source selection evaluation process to evaluate the impact of any identified restrictions, and may request additional information from the offeror, as may be necessary, to evaluate the offeror’s assertions. If no restrictions are intended, then the offeror should state “NONE.”

6.B.3.b. All Offerors – Patents

Include documentation proving ownership of or possession of appropriate licensing

rights to all patented inventions (or inventions for which a patent application has been filed) that will be utilized under the proposal for the IARPA program. If a patent application has been filed for an invention that the proposal utilizes, but the application has not yet been made publicly available and contains proprietary information, the offeror may provide only the patent number, inventor name(s), assignee names (if any), filing date, filing date of any related provisional application, and a summary of the patent title, together with either: 1) a representation that the offeror owns the invention, or 2) proof of possession of appropriate licensing rights in the invention.

6.B.3.c. All Offerors – Intellectual Property Representations

All offerors shall provide a good faith representation that you either own or possess appropriate licensing rights to all other intellectual property that will be utilized under your proposal for the IARPA program. Additionally, offerors shall provide a short summary for each item asserted with less than unlimited rights that describes the nature of the restriction and the intended use of the intellectual property in the conduct of the proposed research.

6.B.4. Meeting and Travel Requirements

Performers are expected to assume responsibility for administration of their projects and to comply with contractual and Program requirements for reporting, attendance at Program workshops and availability for site visits.

6.B.4.a. Workshops

The CAT Program intends to hold a program-level Workshop every November for the duration of the contract. These invitation-only Workshops are expected to be held in conjunction with the International Symposium for Testing and Failure Analysis (ISTFA). The purpose of the Workshops will be to encourage cross-fertilization between program performers, strengthen collaborative relations, gain insights into extant approaches to analysis techniques, and share results with the community. For costing purposes, the offeror should expect one Workshop at the ISTFA venue (typically continental US) for each year of the contract. A final Workshop will be run independently and coincide with the end of the program.

6.B.4.b. Site Visits

Site visits by the Contracting Officer Representative and the CAT Program Management staff will take place annually starting with a kick-off site visit during the first 1 to 2 months of the program. These visits will occur at the Contractor's facility. Reports on technical progress, details of successes and issues, contributions to the Program goals and technology demonstrations will be expected at such visits.

6.B.4.c. Program Reviews

Program Reviews will be held every 12 months starting 10 months after the start of the program. Progress and schedule will be reviewed against the metrics and schedule in the awarded contract. Option year funding decisions will be made based on these reviews and other data such as monthly reports. For costing purposes, the offeror should expect one Program Review in the Washington, D.C., area for each year of the contract.

6.B.5. Publication Approval

It is anticipated that research funded under this Program will be unclassified contracted fundamental research that will not require a pre-publication review. However, there is the possibility that some research results from this Program may require a pre-publication review if it is determined that the release of such information may result in the disclosure of sensitive information. Any award resulting from such a determination may include a requirement to obtain IARPA's permission before publishing any information on the research. A determination will be made based on the proposed work and any necessary provisions will be reflected in contract negotiations.

6.B.6. Export Control

(1) The offeror 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 offeror 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.

(2) The offeror 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.

(3) The offeror shall be responsible for all regulatory record keeping requirements associated with the use of licenses and license exemptions/exceptions.

(4) The offeror shall be responsible for ensuring that the provisions of this clause apply to its sub-contractors.

(5) The offeror will certify knowledge of and intended adherence to these requirements in the representations and certifications of the contract.

6.B.7. Subcontracting

It is the policy of the Government to enable small business and small disadvantaged business concerns to be considered fairly as sub-contractors to contractors performing work or rendering services as prime contractors or sub-contractors under Government contracts and to assure that prime contractors and sub-contractors carry out this policy. Each offeror that submits a proposal that includes sub-contractors; is selected for

funding (pending negotiations); and has proposed a funding level above the maximum cited in the FAR, may be asked to submit a sub-contracting plan before award, in accordance with FAR 19.702(a) (1) and (2). The plan format is outlined in FAR 19.704.

6.B.8. Reporting

Fiscal and management responsibility are important to the CAT Program. Although the number and types of reports will be specified in the award document, all performers will, at a minimum, provide the Contracting Office, Contracting Officer Representative and the CAT Program Manager with monthly technical reports and monthly financial reports. Monthly technical reports will be brief (one page or less) while quarterly technical reports in PowerPoint format will provide detailed technical highlights and accomplishments, priorities and plans, issues and concerns; will provide evaluation results; and will detail future plans. A comprehensive annual report will be due at the end of each contract year. The reports shall be prepared and submitted in accordance with the procedures contained in the award document and mutually agreed upon before award. Financial reports will present an on-going financial profile of the project, including total project funding, funds invoiced, funds received, funds expended during the preceding month and planned expenditures over the remaining period. Additional reports and briefing material may also be required, as appropriate, to document progress in accomplishing program metrics.

Performers will prepare a final report of their work at the conclusion of the performance period of the award (even if the research may continue under a follow-on vehicle). The final report will be delivered to the Contracting Agent, Contracting Officer Representative and CAT Program Manager. The report will include:

- Problem definition
- Findings and approach
- System design and solution
- Performance accomplishments against the Program Goals and Metrics
- Possible generalization(s) and lessons learned
- Remaining challenges and anticipated path ahead

6.B.9. Central Contractor Registration (CCR)

Selected offerors not already registered in the Central Contractor Registry (CCR) may be required to register in CCR prior to any award under this BAA. Information on CCR registration is available at <http://www.ccr.gov>.

6.B.10. Representations and Certifications

Prospective offerors may be required to complete electronic representations and certifications at <http://orca.bpn.gov>. Successful offerors will be required to complete additional representations and certifications prior to award.

6.B.10.a. Certification 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, 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, subgrants, and contracts under grants, loans, and 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 of not less than \$10,000 and not more than \$100,000 for each such failure.”

6.B.10.b. Certification for Contract Awards

Certifications and representations shall be completed by successful offerors prior to award. Federal Acquisition Regulation (FAR) Online Representations and Certifications Application (ORCA) is at website <http://orca.bpn.gov>. Defense FAR Supplement and contract specific certification packages will be provided to the contractor for completion prior to award.

6.B.11. Wide Area Work Flow (WAWF)

Unless using another approved electronic invoicing system, performers will be required to submit invoices for payment directly via the Internet/WAWF at <http://wawf.eb.mil>. Registration to WAWF will be required prior to any award under this BAA.

SECTION 7: AGENCY CONTACTS

Administrative, technical or contractual questions concerning this BAA should be sent via e-mail to dni-iarpa-baa-09-09@ugov.gov. If e-mail is not available, fax questions to 301-226-9137, Attention: IARPA-BAA-09-09. All requests must include the name, email address (if available), and phone number of a point of contact for the requested information. Do not send questions with proprietary content. IARPA will accept questions about the BAA until its closing. A consolidated Question and Answer response will be periodically posted on the IARPA website (www.IARPA.gov); no answers will go directly to the submitter.

Points of Contact:

The technical POC for this effort is

Dr. William E. Vanderlinde, IARPA, Safe and Secure Operations Office
ATTN: IARPA-BAA-09-09
Office of the Director of National Intelligence
Intelligence Advanced Research Projects Activity (IARPA)
Washington, DC 20511
Fax: (301) 226-9137
E-mail: dni-iarpa-baa-09-09@ugov.gov

All emails must have the BAA number (IARPA-BAA-09-09) in the Subject Line.

APPENDIX A

Academic Institution Acknowledgement Letter Template

IARPA Broad Agency Announcement

IARPA-BAA-09-09

-- Please Place on Official Letterhead --

<insert date>

To: Mr. Thomas Kelso
Chief Acquisition Officer
ODNI/IARPA
Office of the Director of National Intelligence
Washington, D.C. 20511

Subject: Academic Institution Acknowledgement Letter

Reference: Executive Order 12333, As Amended, Para 2.7

This letter is to acknowledge that the undersigned is the responsible official of <insert name of the academic institution>, authorized to approve the contractual relationship in support of the Office of the Director of National Intelligence's Intelligence Advanced Research Projects Activity and this academic institution.

The undersigned further acknowledges that he/she is aware of the Intelligence Advanced Research Projects Activity's proposed contractual relationship with <insert name of institution> through IARPA-BAA-09-09 and is hereby approved by the undersigned official, serving as the president, vice-president, chancellor, vice-chancellor, or provost of the institution.

<Name>
<Position>

Date

Copy Furnished:
Mr. John Turnicky
Chief, ODNI Contracts
Office of the Director of National Intelligence
Washington, DC 20511

APPENDIX B

SAMPLE COVER SHEET

for

VOLUME 1: Technical/Management Details

BROAD AGENCY ANNOUNCEMENT (BAA)

Circuit Analysis Tools Program

IARPA-BAA-09-09

(1) BAA Number	
(2) Technical thrust	
(3) Lead Organization Submitting Proposal	
(4) Type of Business, Selected Among the Following Categories: "Large Business", "Small Disadvantaged Business", "Other Small Business", "HBCU", "MI", "Other Educational", or "Other Nonprofit"	
(5) Contractor's Reference Number (if any)	
(6) Other Team Members (if applicable) and Type of Business for Each	
(7) Proposal Title	
(8) Technical Point of Contact to Include: Title, First Name, Last Name, Street Address, City, State, Zip Code, Telephone, Fax (if available), Electronic Mail (if available)	
(9) Administrative Point of Contact to Include: Title, First Name, Last Name, Street Address, City, State, Zip Code, Telephone, Fax (if available), Electronic Mail (if available)	
(10) OCI Waiver or Certification [see Section 3.A.1] Included?	Yes/No
(10a) If No, reason for not including?	
(11) Are one or more U.S. Academic Organizations part of your team?	Yes/No
(11a) If Yes, are you including an Academic Institution Acknowledgement Statement with your proposal for each Academic Organization that is part of your team?	Yes/No
(12) Total Funds Requested from IARPA and the Amount of Cost Share (if any)	\$
(13) Date Proposal as Submitted.	

APPENDIX C

SAMPLE COVER SHEET

for

VOLUME 2: Cost Proposal

BROAD AGENCY ANNOUNCEMENT (BAA)

Circuit Analysis Tools Program

IARPA-BAA-09-09

(1) BAA Number	
(2) Technical thrust	
(3) Lead organization submitting proposal	
(4) Type of Business, Selected Among the Following Categories: "Large Business", "Small Disadvantaged Business", "Other Small Business", "HBCU", "MI", "Other Educational", or "Other Nonprofit"	
(5) Contractor's Reference Number (if any)	
(6) Other Team Members (if applicable) and Type of Business for Each	
(7) Proposal Title	
(8) Technical Point of Contact to Include: Title, First Name, Last Name, Street Address, City, State, Zip Code, Telephone, Fax (if available), Electronic Mail (if available)	
(9) Administrative Point of Contact to Include: Title, First Name, Last Name, Street Address, City, State, Zip Code, Telephone, Fax (if available), Electronic Mail (if available)	
(10) Award Instrument Requested: Cost-Plus-Fixed-Fee (CPFF), Cost-Contract—No Fee, Cost Sharing Contract – No Fee, Grant, Cooperative Agreement or Other Type of Procurement Contract (specify)	
(11) Place(s) and Period(s) of Performance	
(12) Total Proposed Cost Separated by Basic Award and Option(s) (if any)	
(13) Name, Address, Telephone Number of the Offeror's Defense Contract Management Agency (DCMA) Administration Office or Equivalent Cognizant Contract Administration Entity, if Known	
(14) Name, Address, Telephone Number of the Offeror's Defense Contract Audit Agency (DCAA) Audit Office or Equivalent Cognizant Contract Audit Entity, if Known	
(15) Date Proposal was Prepared	
(16) DUNS Number	
(17) TIN Number	
(18) Cage Code	
(19) Proposal Validity Period [minimum of 90 days]	