AWARD/CONTRACT

1 THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 350)	Rating	Page 1 of Pages 23

2 CONTRACT (Proc. Inst. Ident.) NO.	3 EFFECTIVE DATE	4. REQUISITION/PURCHASE REQUEST PROJECT NO.
D10PC20008	09/10/2010	SZ100617

5. ISSUED BY CODE	6 ADMINISTERED BY (If other than Item 5) CODE
DOI - NBC, Ft. Huachuca AZ NBC Acquisition Services Directorate Sierra Vista Branch P.O. Box 12924 Fort Huachuca, AZ 85670-2924	

7 NAME AND ADDRESS OF CONTRACTOR (No., street, city, county, State and ZIP Code)	8 DELIVERY FOB Origin ✓ Other (See below)
SCIENCE APPLICATIONS INTERNATI 1710 SAIC DR MCLEAN, VA 22102-3703	9 DISCOUNT FOR PROMPT PAYMENT 10 days % 20 days % 30 days % 0 days %
CODE • FACILITY CODE	10 SUBMIT INVOICES (4 copies unless otherwise specified) TO THE ADDRESS SHOWN IN ITEM 12

11 SHIP TO/MARK FOR CODE DARPA	12 PAYMENT WILL BE MADE BY CODE D2730
Joseph Olive DARPA 3701 N. Fairfax Drive Arlington, VA 22203-1714	Dept of the Interior - National Business Center National Business Center - Denver Fiscal Support Section - D2730-FH 7301 W. Mansfield Denver, CO 80235-2230

13. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION:
☐ 10 U.S.C. 2304(c) ( ) ☐ 41 U.S.C. 253(c) ( )

14 ACCOUNTING AND APPROPRIATION DATA
2010 - - WH - 6941 - - 255D - - WHDRP - - - Z99700 - - 1A - - - -

15A. ITEM NO	15B SUPPLIES/SERVICES	15C QUANTITY	15D UNIT	15E UNIT PRICE	15F AMOUNT
	SEE LINE ITEM DETAIL				

15G TOTAL AMOUNT OF CONTRACT 311,215.00

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X	B	SUPPLIES OR SERVICES AND PRICES/COSTS	2-3	PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACH			
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CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE

17. ✓ CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return 1 copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as attached or incorporated by reference herein. (Attachments are listed herein.)

18. AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____ including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award consummates the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.

19A. NAME AND TITLE OF SIGNER (Type or print)	20A. NAME OF CONTRACTING OFFICER
Karen L. Burgess, Deputy Operations Contracts Manager	Lisa A. Mattocks
19B. NAME OF CONTRACTOR By Karen L Burgess (Signature of person authorized to sign)	19C. DATE SIGNED 9/10/10
20B. UNITED STATES OF AMERICA By Lisa A Mattocks (Signature of Contracting Officer)	20C. DATE SIGNED 9/11/2010

Total Funding: $311,215.00

FYs	Fund	Budget Org	Sub	Object Class	Sub	Program	Cost Org	Sub	Proj/Job No.	Sub	Reporting Category
2010	WH	6941		255D		WHDRP			Z99700		1A

Division **Closed FYs** **Cancelled Fund**

Line Item Number	Description	CLIN Ref	Delivery Date (Start Date to End Date)	Quantity	Unit of Issue	Unit Price	Total Cost (Includes Discounts)
0001	Research and Development Services	0001		1.00	LO	$311,215.000	$ 311,215.00

(09/10/2010 to 02/28/2012)

The contractor shall furnish the necessary personnel, materials, facilities, and nonpersonal services to perform the research and development in accordance with the contractor's technical and management proposal entitled, "Robust Automatic Transcription of Speech (RATS) Technical Area 3, Evaluation", submitted on February 12, 2010 and cost proposal #F00455.A.2311.010.000 dated March 29, 2010 submitted in response to the Defense Advanced Research Project Agency/Information Processing Techniques Office (DARPA/IPTO) Broad Agency Announcement (BAA) 10-34, and reports as identified in Section J.

The Contract Data Requirements List (CDRLS) are not separately priced.

Estimated Cost: $ 1,478,853.00
Fixed Fee: $ 118,032.00
Cost-Plus-Fixed-Fee (CPFF): $1,596,885.00

Ref Req No: SZ100617

Funding Information:

2010 - - WH - 6941 - - 255D - - WHDRP - - - Z99700 - - 1A - -
- -
$311,215.00

Total Cost: $311,215.00

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SECTION C -- DESCRIPTIONS AND SPECIFICATIONS

C.1 DELIVERABLES

The deliverables for this effort are as follows:

Six (6) weeks before each phase conclusion, all Development Teams are expected to submit to the Government the following deliverables:

-All software and supporting documentation developed in the program
-An integrated system to be evaluated at the site of the Evaluation team.
-For Phase 2 and Phase 3, a fully functioning, military user-friendly software suite including an intuitive, easy to use graphic user interface. Systems must be field trainable for new languages, speakers and key words.
-A written final report of their activities and accomplishments.

Data Team
Collected, annotated data will be delivered to the Government and furnished to the Development Teams and the Evaluation team as GFI per the schedule outlined herein.

Evaluation Team
Within two (2) wekks preceding each phase conclusion, the Evaluation Team is expected to submit to the Government the following deliverables:

-All test datasets and supporting information, including ground truth annotations.
-Evaluations of all Development Team results
-All software and supporting documentation developed in the program.
-A written final report of its activites and accomplishments, a comparative summary of Development Team results, and the Evaluation Team's conclusions regarding the results of the Development Teams and the program.

C.2 DESCRIPTIONS AND SPECIFICATIONS

The contractor shall furnish the necessary personnel, materials, facilities, and nonpersonal services to perform the research and development in accordance with the contractor's technical and management proposal entitled, "Robust Automatic Transcription of Speech (RATS) Technical Area 3, Evaluation", submitted on February 12, 2010 and cost proposal dated March 29, 2010 submitted in response to the Defense Advanced Research Project Agency/Information Processing Techniques Office (DARPA/IPTO) Broad Agency Announcement (BAA) 10-34, and reports as identified in Section J.

SECTION D -- PACKAGING AND MARKING

D.1 MARKING

Shipping documents, containers, correspondence and packages shall be marked with the following information:

Contract Number: D10PC20008
ARPA Order Numbers: Z997/00
Proposal Title: "Robust Automatic Transcription of Speech (RATS) Technical Area 3"

D.2 PACKAGING

All deliverables called for shall be packed and shipped in accordance with the Contractor's standard commercial practices in a manner that shall afford adequate protection against physical and environmental deterioration and damage during shipment.
(END OF SECTION D)

SECTION E -- INSPECTION AND ACCEPTANCE

E.1 52.252-02 CLAUSES INCORPORATED BY REFERENCE

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

http://farsite.hill.af.mil/

Clause	Title	Date
52.246-08	Inspection of Research and Development--Cost Reimbursement	May 2001

E.2 REVIEW AND OVERSIGHT

Review and oversight of research and development services will be made by the DARPA Program Manager (PM) identified in Section G. DARPA PM will inform Government Contracting Officer's Representative identified in Section G, if research and development services do not conform to contract requirements.
(END OF SECTION E)

SECTION F -- DELIVERIES OR PERFORMANCE

F.1 52.252-02 CLAUSES INCORPORATED BY REFERENCE

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

http://farsite.hill.af.mil/

Clause	Title	Date
52.242-15 Alt I	Stop-Work Order (Aug 1989) Alternate I	April 1984
52.247-34	F.O.B. Destination	November 1991

F.2 DELIVERY OF DATA

The data to be delivered with the reports shall be delivered in accordance with the instructions provided as identified in Section C.

F.3 PERIOD OF PERFORMANCE

The contract period of performance will be as follows:

Period of Performance
September 10, 2010 through February 28, 2014

SECTION G -- CONTRACT ADMINISTRATION DATA

G.1 DARPA PROGRAM MANAGER

The DARPA Program Manager (PM) for this contract is:

Joseph Olive
DARPA/IPTO
3701 North Fairfax Drive
Arlington, VA 22203-1714

Phone: (571) 218-4920
Fax: (703) 807-4953
E-Mail: Jospeh.Olive@Darpa.mil

G.2 CONTRACTING OFFICER'S REPRESENTATIVE (COR)

Contracting Officer's Representative (COR) responsibilities will be performed by:

Department of Interior/National Business Center
Acquisition Services Directorate
Sierra Vista Branch
Post Office Box 12924
Fort Huachuca, Arizona 85670-2924

POC: Lawrence H. Carter
Phone: (520) 533-1213
Fax: (520) 538-3761
E-Mail: Lawrence_H_Carter@nbc.gov

Building Location and Zip Code for Overnight Deliveries:
Augur and Adair Streets, Bldg #22208 (2nd Floor)
Zip Code: 85613-6000

G.3 GOVERNMENT CONTRACT ADMINISTRATOR

Administration of the contract, except for COR responsibilities, shall be performed by:

POC: Yvonne Edwards
Phone: (520) 533-0055
Fax: (520) 538-3761
E-Mail: Yvonne_M_Edwards@nbc.gov

Mailing Address:

U.S. Department of the Interior
National Business Center
Acquisition Services Directorate
Sierra Vista Branch
Post Office Box 12924
Fort Huachuca, AZ 85670-2924

Commercial Address:

U.S. Department of the Interior
National Business Center
Acquisition Services Directorate
Sierra Vista Branch
Augur and Adair Streets, Bldg #22208 (2nd Floor)
Fort Huachuca, AZ 85613-6000

G.4 CONTRACT ADMINISTRATION DATA

Contractor's office, which will supervise and administer the resulting contract, is as follows:

Science Applications International Corporation (SAIC)
4001 Fairfax Drive, Suite 700
Arlington, VA 22203

Karen L. Burgess
Deputy Operation Contracts Manager
Science Applications International Corporation (SAIC)
Technology and Advanced Systems Business Unit (TASBU)
(843) 971-2890 - Office Phone / Facsimile
(571) 839-2446 - Blackberry
karen.lee.burgess@saic.com

G.5 PAYMENT OFFICE

Payment will be made by the following office:

U.S. Dept of the Interior
Office of the Secretary
National Business Center - Denver
Fiscal Support Section - D2730-FH
7301 W. Mansfield Avenue
Denver, Co 80235-2230

E-Mail: Ft_Huachuca_Pay_NBCDENVER@NBC.GOV

G.6 INCREMENTAL FUNDING

Of the total price of CLIN 0001 the sum of $311,215.00 is presently available for payment and allotted to this contract. It is anticipated from time to time additional funds will be allotted to this contract until the total price of these items is allotted. It is contemplated that funds presently allotted to this contract will cover the work to be performed, as limited by the provision of (b) below, until 31 January 2011.

b. For purposes of the Limitation of Funds Clause, Section I, 52.232-22, this provision will be the "Schedule". Accordingly, the contractor is working at his own risk if funds are expended beyond those currently allotted to this contract at any given time.
(END OF SECTION G)

G.7 CONTRACT PAYMENTS

VOUCHER SUBMISSION FOR COST AND FEE (Fee may be combined with cost invoice):

A. The contractor shall submit an original and one copy of interim invoices, excluding the final invoice, to the Contracting Officer's Representative (COR) and one copy to the Government Contract Administrator identified in Section G. The Contracting Officer's Representative (COR) shall certify the accepted proper invoice and submit to the payment office indentified in Section G within 5 days of receipt.

B. Final Invoice. The original of the final invoice must be forwarded to the Cognizant DCAA Office. The Cognizant DCAA Office will submit the reviewed final invoice to the Government Contract Administrator identified in Section G no later than twenty (20) working days from receipt. The Government Contract Administrator will approve and submit the approved final invoice to the payment office identified in Section G.

C. For payment of fee, the contractor will invoice for fee at 8% per invoice not to exceed $121,488.00 of this contract.

D. Proper invoices for this contract will be submitted on at least a monthly basis in accordance with FAR Clause 52.216-7, Allowable Cost and Payment (Dec 2002), not more often than once every two (2) weeks.

E. All requests for payment shall be submitted in accordance with FAR Clause 52.232-25, Alt 1, Prompt Payment (Feb 2002).

G.8 DEFENSE CONTRACT AUDIT AGENCY (DCAA) OFFICE

The DCAA office for this contract is:

Defense Contract Audit Agency (DCAA)
SAIC Suboffice
10260 Campus Point Drive
Mailstop A-1-C
San Diego, CA 92121

For Audit Assistance:

Phone: (858) 826-7409
Fax: (858) 826-7698
EMail: dcaa-fao4171@dcaa.mil

SECTION H -- SPECIAL CONTRACT REQUIREMENTS

H.1 NOTIFICATION UNDER A COST REIMBURSEMENT CONTRACT

a. To facilitate administration of the contract and the several provisions and clauses associated with cost/performance administration, including "Limitation of Funds," etc., the Contractor agrees to give timely notification to the Contracting Officer at any time he has reason to believe the total cost to the Government for the performance of this contract will be greater or less than the estimated cost set forth in the contract.

b. As part of such notification, the Contractor shall provide a revised cost estimate for accomplishing the specified work including a detailed statement of costs incurred, a detailed estimate of cost to complete, and an analysis, accompanied with an explanation, for the projected variance from estimated cost at completion. In the case of a projected increase, such analysis and explanation must include a description of action(s) taken or projected by the contractor in attempting to eliminate or mitigate the increase while discharging the management role of assuring performance within cost.

c. It is agreed by the parties that the notification contemplated above is to be accomplished only by separate written correspondence directed to the Contracting Officer and that no other form or "notification" (e.g. mention in any type of monthly progress or status report) will effect compliance. Further, notification to any individual other than the Administrative Contracting Officer shall not constitute compliance with this requirement

H.2 SUBCONTRACTING PLAN

SAIC Individual Subcontracting Plan, signed and dated 2 September 2010 and Master Subcontracting Plan dated 23 December, 2008, as submitted to and approved by the Contracting Officer in accordance with FAR 52.219-09 is herein attached at Section J and applicable to this contract.

H.3 AWARD MADE ON BEHALF OF A DOD AGENCY

This contract is issued by the Department of Interior/National Business Center (DOI/NBC), Aquisition Services Directorate, Sierra Vista Branch on behalf of a Department of Defense (DoD) Agency-Defense Advanced Research Projects Agency (DARPA).

H.4 KEY PERSONNEL REQUIREMENTS

Certain skilled/experienced professional and/or technical personnel are essential for successful contractor accomplishment of the work to be performed under this contract. These are defined as "key personnel" and listed:

Prime Contractor's Name: Richard LaValley - Principal Investigator

The contractor agrees key personnel shall not be removed from the contract work or be replaced without compliance with the following:

a. If one or more of the key personnel for whatever reason becomes, or is expected to become, unavailable for work under this contract for a continuous period exceeding 30-calendar days, or is expected to devote substantially less effort to the work than indicated in the proposal as initially anticipated, the contractor shall promptly notify the Government Contract Administrator

identified in Section G. Upon concurrence of the Contracting Officer or authorized representative, the contractor shall promptly replace such personnel with personnel of at least equal ability and qualifications.

b. All requests for approval of substitutions hereunder must be in writing and provide a detailed explanation of the circumstances necessitating the proposed substitution(s). They must contain a complete resume for the proposed substitute, and any other information requested by the Contracting Officer to approve or disapprove the proposed substitution. The Contracting Officer or duly authorized representative will evaluate such requests and promptly notify the contractor of the approval or disapproval thereof, in writing.

H.5 NOTICE OF INCORPORATION OF SECTION K

The following section of the solicitation will not be distributed with the contract; however, this section is incorporated by reference and forms a part of the resultant contract as though furnished in full text therewith::

Section K - Representations, Certifications and Other Statements of Offerors dated 29 July 2010.
Online Representations and Certifications Application (ORCA).

H.6 EQUIPMENT CLAUSE

The Contractor shall report any purchase of property, plant or equipment whose unit cost exceeds $100,000 to the DARPA Comptroller and the Contracting Officer. DoD FMR 7000.14R, Vol. 4, Chapter 6 and Federal Financial Accounting Standards No. 6 Accounting for Property, Plant and Equipment, applies.

H.7 NO-COST SETTLEMENT

When in the best interest of the Government and Contractor, a no-cost settlement may upon mutual agreement of the parties be executed in lieu of a termination due to the immature stage and uncertainties involved in contract performance in research and development efforts. In a no-cost settlement, all costs reimbursable, not previously paid, for the performance of the contract to the date of the termination are allowable; however, the costs for anticipatory profits or consequential damages resulting from the termination of this contract (or any subcontract) to include: Accounting, legal, clerical and other expenses necessary for the preparation of settlement proposals and supporting data shall be excluded from the settlement proposal submitted by the contractor. The rights and remedies of the Government in this clause are in addition to any other rights and remedies provided by law under this contract.

H.8 PERMITS, TAXES, LICENSES, ORDINANCES AND REGULATIONS

The Contractor shall, at its own expense, obtain all necessary permits, give all notices, pay all license fees and taxes, comply with all Federal, State, Municipal, County and local Board of Health ordinances, rules and regulations applicable to the business carried on under this contract, and be responsible for all applicable State Sales and Use Taxes.

H.9 PUBLICATION

PUBLIC RELEASE OR DISSEMINATION OF INFORMATION

(a) There shall be no dissemination or publication, except within and between the Contractor and any subcontractors, of information developed under this contract or contained in the reports to be furnished pursuant to this contract without prior written concurrence of the COR. All scientific and technical reports will be issued with a classification of Distribution Statement C. In consideration of the nonprofit institutions of higher education who will be subcontractors under this contract, papers resulting from unclassified contracted

fundamental research (as defined by DoD Instruction Number 5230.27) are exempt from prepublication controls and the requirement for prior written concurrence of the COR.

(b) When submitting material for written approval for open publication, the Contractor/Awardee must submit a request for public release to the DARPA Technical Information Office (TIO) and include the following information: 1) Document Information: document title, document author, short plain-language description of technology discussed in the material (approx. 30 words), number of pages (or minutes of video) and document type (briefing, report, abstract, article, or paper); 2) Event Information: event type (conference, principle investigator meeting, article or paper), event date, desired date for DARPA's approval; 3) DARPA Sponsor: DARPA Program Manager, DARPA office, and contract number; and 4) Contractor/Awardee's Information: POC name, e-mail and phone. Allow four weeks for processing; due dates under four weeks require a justification. Unusual electronic file formats may require additional processing time. Requests can be sent either via e-mail to tio@darpa.mil or via 3701 North Fairfax Drive, Arlington VA 22203-1714, telephone (571) 218-4235. Refer to www.darpa.mil/tio for information about DARPA's public release process.

H.10 TRAVEL AND PER DIEM

Travel and per diem costs claimed shall be in accordance with those rates/amounts allowed by the Joint Travel Regulation (JTR) in effect at the time travel is actually performed. There may be occasions where the contractor travels to high cost areas and is unable to remain in accordance with the Joint Travel Regulation. If required, the contractor will justify those costs to the Contracting Officer prior to performing the travel. The contractor agrees to use the most economical method of travel available. All travel other than what was proposed will have prior approval of the Contracting Officer's Representative as identified in Section G. This provision also applies to all subcontractors other than educational institutions performing travel in support of this contract. Universities will be reimbursed IAW their internal travel policies pursuant to OMB Circular A-21. Foreign travel requires 90 days approval by the Contracting Officer Representative.

H.11 ASSERTION OF DATA RIGHTS

The Contractor has asserted restrictions on the Government's use, release and disclosure of technical data and computer software. The technical data and computer software assertions are attached at Section J.

H.12 REPORTING REQUIREMENTS

a. QUARTERLY RESEARCH AND DEVELOPMENT (R&D) TECHNICAL STATUS REPORT

Description: The Quarterly R&D Technical Status Report provides a means to capture a comprehensive assessment of project goals, progress, and status. The report provides a section for programmatic data, technical progress, project plans, and issues and concerns. The report shall be formatted in accordance with the report template provided at Attachment 2.

Submission Requirements:

--Frequency: Quarterly.
--Reporting Period: Report on performance during previous quarterly.
--Due Date: Submit within fifteen (15) calendar days after the end of the previous quarter. Post-award initial submission will be submitted within 30 calendar days of award.

b. QUARTERLY FINANCIAL STATUS REPORT

Description: The Quarterly Financial Status Report provides a means to capture a comprehensive assessment of expenditures. The report provides a section for incurred expenses and invoices submitted, both for the period and for the total cumulative effort which maintains a running balance of the funds remaining. Burn rates are easy to identify as all the pertinent information is side-by-side and easy to compare. The report shall be formatted in accordance with the report template provided at Attachment 2.

Submission Requirements:

--Frequency: Quarterly
--Reporting Period: Report on performance during previous quarterly.
--Due Date: Submit within fifteen (15) calendar days after the end of the previous quarter. Post-award initial submission will be submitted within 30 calendar days of award.

c. FINAL TECHNICAL REPORT

Description: The Final Technical Report describes and disseminates to the analytical, scientific and technical community the precise nature and results of analytical studies, research development, test and evaluation (RDT&E) on an assigned task(s). The Scientific and Technical Report may be definitive for the subject presented, exploratory in nature, or an evaluation of critical subsystem or of technical problems. The document content shall be clearly written, describe accomplishments and other facts adequately with no technical errors and be acceptable for release. There is no prescribed format. If the Final Technical Report is marked unclassified, unlimited distribution, it should be accompanied by a letter certifying that it has been cleared for public release and/or sale; to include release and/or sale to foreign nationals.

d. DISTRIBUTION OF REPORTS

All reports listed above shall be submitted according to Section J, Exhibit 1 of the contract.

The Final Report must be electronically submitted to the Program Manager (PM) as identified in Section G. The PM is responsible for reviewing and redacting any information prior to submitting Final Report to the Defense Technical Information Center (DTIC), DTIC-BCS, 8725 John J. Kingman Road, Suite 0944, Fort Belvoir, VA 22060-6218. The PM shall send an electronic copy to the Government Contract Administrator as identified in Section G, when the final report is sent to the DTIC.

SECTION I -- CONTRACT CLAUSES

I.1 52.252-02 CLAUSES INCORPORATED BY REFERENCE

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

http://farsite.hill.af.mil/

Clause	Title	Date
52.202-01	Definitions	July 2004
52.203-03	Gratuities	April 1984
52.203-05	Covenant Against Contingent Fees	April 1984
52.203-06	Restrictions On Subcontractor Sales To The Government	September 2006
52.203-07	Anti-Kickback Procedures	July 1995
52.203-08	Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity	January 1997
52.203-10	Price Or Fee Adjustment For Illegal Or Improper Activity	January 1997
52.203-12	Limitation on Payments to Influence Certain Federal Transactions	September 2007
52.204-04	Printed or Copied Double-Sided on Recycled Paper.	August 2000
52.204-07	Central Contractor Registration	April 2008
52.209-06	Protecting the Government's Interest When Subcontracting with Contractors Debarred, Suspended, or Proposed for Debarment	September 2006
52.215-02	Audit and Records--Negotiation	March 2009
52.215-08	Order of Precedence--Uniform Contract Format	October 1997
52.215-10	Price Reduction for Defective Cost or Pricing Data	October 1997
52.215-11	Price Reduction for Defective Cost or Pricing Data--Modifications	October 1997
52.215-12	Subcontractor Cost or Pricing Data	October 1997
52.215-13	Subcontractor Cost or Pricing Data--Modifications	October 1997
52.215-15	Pension Adjustments and Asset Reversions	October 2004
52.215-16	Facilities Capital Cost of Money	June 2003
52.215-18	Reversion or Adjustment of Plans for Postretirement Benefits (PRB) Other than Pensions	July 2005
52.215-21	Requirements for Cost or Pricing Data or Information Other Than Cost or Pricing Data--Modifications	October 1997
52.215-23	Limitations on Pass-Through Charges.	October 2009
52.216-07	Allowable Cost and Payment	December 2002
52.216-08	Fixed Fee	March 1997
52.219-08	Utilization of Small Business Concerns	May 2004
52.219-09	Small Business Subcontracting Plan	April 2008
52.219-16	Liquidated Damages-Subcontracting Plan	January 1999
52.219-28	Post-Award Small Business Program Representation	April 2009
52.222-03	Convict Labor	June 2003
52.222-21	Prohibition of Segregated Facilities	February 1999
52.222-26	Equal Opportunity	March 2007
52.222-35	Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans	September 2006
52.222-36	Affirmative Action For Workers with Disabilities	June 1998
52.222-37	Employment Reports on Special Disabled Veterans, Veterans of	September 2006

	the Vietnam Era, and Other Eligible Veterans	
52.222-50	Combating Trafficking in Persons	February 2009
52.223-06	Drug Free Workplace	May 2001
52.223-14	Toxic Chemical Release Reporting	August 2003
52.225-13	Restrictions on Certain Foreign Purchases	June 2008
52.227-01 Alt I	Authorization And Consent (Jul 1995) - Alternate I	April 1984
52.227-02	Notice And Assistance Regarding Patent And Copy Infringement	December 2007
52.227-11	Patent Rights--Ownership by the Contractor	December 2007
52.228-07	Insurance--Liability To Third Persons	March 1996
52.230-02	Cost Accounting Standards	October 2008
52.230-06	Administration of Cost Accounting Standards	March 2008
52.232-09	Limitation on Withholding of Payments.	April 1984
52.232-17	Interest	October 2008
52.232-22	Limitation of Funds	April 1984
52.232-23	Assignment Of Claims	January 1986
52.232-25 Alt I	Prompt Payment (Oct 2003) Alternate I	February 2002
52.232-33	Payment by Electronic Funds Transfer-Central Contractor Registration	October 2003
52.233-01 Alt I	Disputes (Jul 2002) - Alternate I	December 1991
52.233-03 Alt I	Protest After Award (Aug 1996) - Alternate I	June 1985
52.233-04	Applicable Law for Breach of Contract Claim	October 2004
52.242-01	Notice of Intent to Disallow Costs	April 1984
52.242-03	Penalties for Unallowable Costs	May 2001
52.242-04	Certification of Final Indirect Costs	January 1997
52.242-13	Bankruptcy	July 1995
52.243-02 Alt V	Changes--Cost-Reimbursement (Aug 1987) -Alternate V	April 1984
52.243-07	Notification Of Changes	April 1984
52.244-05	Competition In Subcontracting	December 1996
52.244-06	Subcontracts for Commercial Items	April 2010
52.245-01	Government Property	June 2007
52.245-09	Use And Charges	June 2007
52.246-23	Limitation Of Liability	February 1997
52.246-25	Limitation of Liability--Services	February 1997
52.249-06	Termination (Cost-Reimbursement)	May 2004
52.249-14	Excusable Delays	April 1984
52.253-01	Computer Generated Forms	January 1991

I.2 52.244-02 SUBCONTRACTS JUNE 2007

(a) Definitions. As used in this clause--

"Approved purchasing system" means a Contractor's purchasing system that has been reviewed and approved in accordance with Part 44 of the Federal Acquisition Regulation (FAR).

"Consent to subcontract" means the Contracting Officer's written consent for the Contractor to enter into a particular subcontract.

"Subcontract" means any contract, as defined in FAR Subpart 2.1, entered into by a subcontractor to furnish supplies or services for performance of the prime contract or a subcontract. It includes, but is not limited to, purchase orders, and changes and modifications to purchase orders.

(b) When this clause is included in a fixed-price type contract, consent to subcontract is required only on unpriced

contract actions (including unpriced modifications or unpriced delivery orders), and only if required in accordance with paragraph (c) or (d) of this clause.

(c) If the Contractor does not have an approved purchasing system, consent to subcontract is required for any subcontract that--

(1) Is of the cost-reimbursement, time-and-materials, or labor-hour type; or

(2) Is fixed-price and exceeds--

(i) For a contract awarded by the Department of Defense, the Coast Guard, or the National Aeronautics and Space Administration, the greater of the simplified acquisition threshold or 5 percent of the total estimated cost of the contract; or

(ii) For a contract awarded by a civilian agency other than the Coast Guard and the National Aeronautics and Space Administration, either the simplified acquisition threshold or 5 percent of the total estimated cost of the contract.

(d) If the Contractor has an approved purchasing system, the Contractor nevertheless shall obtain the Contracting Officer's written consent before placing the following subcontracts:

N/A

(e)(1) The Contractor shall notify the Contracting Officer reasonably in advance of placing any subcontract or modification thereof for which consent is required under paragraph (b), (c), or (d) of this clause, including the following information:

(i) A description of the supplies or services to be subcontracted.

(ii) Identification of the type of subcontract to be used.

(iii) Identification of the proposed subcontractor.

(iv) The proposed subcontract price.

(v) The subcontractor's current, complete, and accurate cost or pricing data and Certificate of Current Cost or Pricing Data, if required by other contract provisions.

(vi) The subcontractor's Disclosure Statement or Certificate relating to Cost Accounting Standards when such data are required by other provisions of this contract.

(vii) A negotiation memorandum reflecting--

(A) The principal elements of the subcontract price negotiations;

(B) The most significant considerations controlling establishment of initial or revised prices;

(C) The reason cost or pricing data were or were not required;

(D) The extent, if any, to which the Contractor did not rely on the subcontractor's cost or pricing data in determining the price objective and in negotiating the final price;

(E) The extent to which it was recognized in the negotiation that the subcontractor's cost or pricing data were not accurate, complete, or current; the action taken by the Contractor and the subcontractor; and the effect of any such defective data on the total price negotiated;

(F) The reasons for any significant difference between the Contractor's price objective and the price negotiated; and

(G) A complete explanation of the incentive fee or profit plan when incentives are used. The explanation shall identify each critical performance element, management decisions used to quantify each incentive element, reasons for the

incentives, and a summary of all trade-off possibilities considered.

(2) The Contractor is not required to notify the Contracting Officer in advance of entering into any subcontract for which consent is not required under paragraph (b), (c), or (d) of this clause.

(f) Unless the consent or approval specifically provides otherwise, neither consent by the Contracting Officer to any subcontract nor approval of the Contractor's purchasing system shall constitute a determination--

(1) Of the acceptability of any subcontract terms or conditions;

(2) Of the allowability of any cost under this contract; or

(3) To relieve the Contractor of any responsibility for performing this contract.

(g) No subcontract or modification thereof placed under this contract shall provide for payment on a cost-plus-a-percentage-of-cost basis, and any fee payable under cost-reimbursement type subcontracts shall not exceed the fee limitations in FAR 15.404-4(c)(4)(i).

(h) The Contractor shall give the Contracting Officer immediate written notice of any action or suit filed and prompt notice of any claim made against the Contractor by any subcontractor or vendor that, in the opinion of the Contractor, may result in litigation related in any way to this contract, with respect to which the Contractor may be entitled to reimbursement from the Government.

(i) The Government reserves the right to review the Contractor's purchasing system as set forth in FAR Subpart 44.3.

(j) Paragraphs (c) and (e) of this clause do not apply to the following subcontracts, which were evaluated during negotiations:

N/A

(End of clause)
(END OF SECTION I)

I.3 52.215-19 NOTIFICATION OF OWNERSHIP CHANGES OCTOBER 1997

(a) The Contractor shall make the following notifications in writing:

(1) When the Contractor becomes aware that a change in its ownership has occurred, or is certain to occur, that could result in changes in the valuation of its capitalized assets in the accounting records, the Contractor shall notify the Administrative Contracting Officer (ACO) within 30 days.

(2) The Contractor shall also notify the ACO within 30 days whenever changes to asset valuations or any other cost changes have occurred or are certain to occur as a result of a change in ownership.

(b) The Contractor shall--

(1) Maintain current, accurate, and complete inventory records of assets and their costs;

(2) Provide the ACO or designated representative ready access to the records upon request;

(3) Ensure that all individual and grouped assets, their capitalized values, accumulated depreciation or amortization, and remaining useful lives are identified accurately before and after each of the Contractor's ownership changes; and

(4) Retain and continue to maintain depreciation and amortization schedules based on the asset records maintained before each Contractor ownership change.

(c) The Contractor shall include the substance of this clause in all subcontracts under this contract that meet the applicability requirement of FAR 15.408(k).

I.4 52.222-02 PAYMENT FOR OVERTIME PREMIUMS JULY 1990

(a) The use of overtime is authorized under this contract if the overtime premium does not exceed * 0 or the overtime premium is paid for work --

(1) Necessary to cope with emergencies such as those resulting from accidents, natural disasters, breakdowns of production equipment, or occasional production bottlenecks of a sporadic nature;

(2) By indirect-labor employees such as those performing duties in connection with administration, protection, transportation, maintenance, standby plant protection, operation of utilities, or accounting;

(3) To perform tests, industrial processes, laboratory procedures, loading or unloading of transportation conveyances, and operations in flight or afloat that are continuous in nature and cannot reasonably be interrupted or completed otherwise; or

(4) That will result in lower overall costs to the Government.

(b) Any request for estimated overtime premiums that exceeds the amount specified above shall include all estimated overtime for contract completion and shall--

(1) Identify the work unit; e.g., department or section in which the requested overtime will be used, together with present workload, staffing, and other data of the affected unit sufficient to permit the Contracting Officer to evaluate the necessity for the overtime;

(2) Demonstrate the effect that denial of the request will have on the contract delivery or performance schedule;

(3) Identify the extent to which approval of overtime would affect the performance or payments in connection with other Government contracts, together with identification of each affected contract; and

(4) Provide reasons why the required work cannot be performed by using multishift operations or by employing additional personnel.

* Insert either "zero" or the dollar amount agreed to during negotiations. The inserted figure does not apply to the exceptions in subparagraph (a)(1) through (a)(4) of the clause.

I.5 52.252-02 CLAUSES INCORPORATED BY REFERENCE FEBRUARY 1998

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

http://www.arnet.gov/far/

I.6 52.252-06 AUTHORIZED DEVIATIONS IN CLAUSES APRIL 1984

(a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.

(b) The use in this solicitation or contract of any U.S. Department of the Interior Acquisition Regulation Supplement (DIARS) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

I.7 DEFENSE FEDERAL ACQUISITION REGULATION SUPPLEMENT

DEFENSE FEDERAL ACQUISITION REGULATION SUPPLEMENT (DFARS)

Incorporate By Reference: The below referenced DFARS clauses are applicable, will be incorporated in, and will form a part of the resultant contract as though furnished in full text herewith:

252.201-7000	Contracting Officer's Representative (Dec 1991)
252.203-7001	Prohibition on Persons Convicted of Fraud or Other Defense-Contract-Related Felonies (Dec 2008)
252.203-7002	Requirement to Inform Employees of Whisleblower Reghts (Jan 2009)
252.204-7000	Disclosure of Information (Dec 1991)
252.204-7003	Control of Government Personnel Work Product (Apr 1992)
252.204-7004	Alternate A, Central Contractor Registration (Sep 2007)
252.205-7000	Provision of Information to Cooperative Agreement Holders (Dec 1991)
252.209-7004	Subcontracting with Firms That Are Owned or Controlled by the Government of a Terrorist Country (Dec 2006)
252.215-7002	Cost Estimating System Requirements (Dec 2006)
252.225-7002	Qualifying Country Sources as Subcontractors (Apr 2003)
252.225-7012	Preference for Certain Domestic Commodities (Dec 2008)
252.227-7013	Rights in Technical Data--Noncommercial Items (Nov 1995)
252.227-7014 (June 1995)	Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation.
252.227-7015	Technical Data - Commercial Items (Nov 1995)
252.227-7016	Rights in Bid or Proposal Information (June 1995)
252.227-7017	Identification and assertion of use, release, or disclosure restrictions (Jun 1995)
252.227-7019	Validation of Asserted Restrictions--Computer Software (June 1995)
252.227-7025	Limitations on the Use or Disclosure of Government Furnished Information Marked with Restrictive Legends (June 1995)
252.227-7026	Deferred Delivery of Technical Data or Computer Software (Apr 1988)
252.227-7027	Deferred Ordering of Technical Data or Computer Software (Apr 1988)
252.227-7030	Technical Data - Withholding of Payments (Mar 2000)
252.227-7037	Validation of Restrictive Markings on Technical Data (Sep 1999)
252.227-7039	Patents - Reporting of Subject Inventions (Apr 1990)
252.231-7000	Supplemental Cost Principles (Dec 1991)
252.235-7011	Final Scientific or Technical Report (Nov 2004)
252.243-7002	Requests for Equitable Adjustment (Mar 1998)

NOTE: Full text versions may be accessed electronically at this/these address(es):

http://farsite.hill.af.mil/

Incorporate in Full Text: The below DFARS clause is applicable, will be incorporated in, and will form a part of the resultant contract:

252.235-7010 Acknowledgement of Support and Disclaimer (May 1995)

(a) The Contractor shall include an acknowledgment of the Government's support in the publication of any material based on or developed under this contract, stated in the following terms: This material is based upon work supported by the Defense Advanced Research Projects Agency (DARPA) under Contract No. N10PC20008.

(b) All material, except scientific articles or papers published in scientific journals, must, in addition to any notices or disclaimers by the Contractor, also contain the following disclaimer: Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Defense Advanced Research Projects Agency (DARPA); or its Contracting Agent, the U.S. Department of the Interior, National Business Center, Acquisition & Property Management Division, Southwest Branch.

I.8 1452.203-70 RESTRICTION ON ENDORSEMENTS JULY 1996

1452.203-70 RESTRICTION ON ENDORSEMENTS -
DEPARTMENT OF THE INTERIOR (JUL 1996)

The Contractor shall not refer to contracts awarded by the Department of the Interior in commercial advertising, as defined in FAR 31.205-1, in a manner which states or implies that the product or service provided is approved or endorsed by the Government, or is considered by the Government to be superior to other products or services. This restriction is intended to avoid the appearance of preference by the Government toward any product or service. The Contractor may request the Contracting Officer to make a determination as to the propriety of promotional material.

(End of clause)

I.9 1452.204-70 RELEASE OF CLAIMS JULY 1996

1452.204-70 RELEASE OF CLAIMS -- DEPARTMENT OF THE INTERIOR (JUL 1996)

After completion of work and prior to final payment, the Contractor shall furnish the Contracting Officer with a release of claims against the United States relating to this contract. The Release of Claims form (DI-137) shall be used for this purpose. The form provides for exception of specified claims from operation of the release.

(End of clause)

I.10 1452.215-70 EXAMINATION OF RECORDS BY DOI APRIL 1984

1452.215-70 EXAMINATION OF RECORDS BY THE DEPARTMENT OF THE INTERIOR (APR 1984)

For purposes of the Examination of Records by the Comptroller General clause of this contract (FAR 52.215-1), the Secretary of the Interior, the Inspector General, and their duly authorized representative(s) from the Department of the Interior shall have the same access and examination rights as the Comptroller General of the United States.

(End of clause)

I.11 1452.228-7 INSURANCE - LIABILITY TO THIRD PERSON APRIL 1984

1452.228-7 Insurance - Liability to Third Persons

(a) As prescribed in 1428.311-2, the clause at FAR 52.228-7, Insurance - Liability to Third Persons, shall be modified before insertion into solicitations and contracts by (1) changing the title of the clause to read:
"INSURANCE - LIABILITY TO THIRD PERSONS (APR 1984) (DEVIATIONS)";

and (2) changing the first sentence in subparagraph (c)(2) of the clause to read:

"For certain liabilities (and expenses incidental to such liabilities) to third persons not compensated by insurance or otherwise but subject to the 'Limitation of Cost' or 'Limitation of Funds' clause of this contract."
(b) As prescribed in FAR 52.103(a) and 52.107(f), the clause at FAR 52.252-6, Authorized Deviations in Clauses, shall be inserted into solicitations and contracts containing the clause in paragraph (a) of this section.

I.12 1452.237-70 INFORMATION COLLECTION - DOI JULY 1996

1452.237-70 INFORMATION COLLECTION -- DEPARTMENT OF THE INTERIOR (JUL 1996)

If performance of this contract requires the contractor to collect information on identical items from ten or more public respondents, no action shall be taken or funds expended in the solicitation or collection of such information until the contractor has received from the Contracting Officer written notification that approval has been obtained from the Office of Management and Budget (OMB) pursuant to the Paperwork Reduction Act of 1980. The Contractor agrees to provide all information requested by the Contracting Officer which is necessary to obtain approval from OMB.

(End of clause)

SECTION J -- LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

J.1 ATTACHMENTS

Attachment 1 - Assertion of Data Rights
Attachment 2 - Master Subcontracting Plan
Attachment 3 - Individual Subcontracting Plan
Attachment 4- DD Form 1423-1 Contract Data Requirements List

J.2 EXHIBITS

Exhibit A - Progress, Status and Management Report/Monthly Progress Report, 3 pages.

(END OF SECTION J)

APPENDIX A

Data Rights Assertions

In compliance with DFARS 252.227-7017 Identification and Assertions of Use, Release, or Disclosure Restrictions (June 1995), SAIC either owns or possesses appropriate licensing rights to all other intellectual property that will be utilized under our proposal for the DARPA program. SAIC provides the following technical data or software rights assertions.

Figure 3.7-1 provides noncommercial technical data, and **figure 3.7-2** lists noncommercial computer software with less than unlimited rights.

In addition, SAIC hereby provides notification that any software created during the life of any resultant contract will be delivered with unlimited rights. Should any of these assertions change, SAIC will inform the Contracting Officer and provide the justification for the restricted rights before delivering the software in question.

Technical Data or Computer Software to Be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restriction
None	None	None	N/A

Figure 3.7-1. Noncommercial Technical Data

During performance of this contract, SAIC intends to modify its Evaluation Framework software that was developed previously under government Contract No. FA8750-09-C-0184 for the DARPA Machine Reading program. In accordance with the data rights clauses of that contract, the government has unlimited rights in the software. Please note that the software does contain commercial third party code subject to various terms and conditions, which are identified in the table below.

Technical Data or Computer Software to Be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restriction	Link to License Terms
Sun Java 1.6	Developed at private expense	Open-source license rights(SUN Binary Code License)	SUN Microsystems	http://java.sun.com/javase/6/ jre-6u14-license.txt
HP Jena 2.6.0	Developed at private expense	Open-source license rights	Hewlett Packard	http://jena.sourceforge.net/ license.html
ARQ	Developed at private expense	Open-source license rights	Hewlett Packard	http://jena.sourceforge.net/ ARQ/license.html
ICU 3.4	Developed at private expense	Open-source license rights	IBM	http://source.icu-project.org/ repos/icu/icu/trunk/license.html
IRI	Developed at private expense	Open-source license rights	Hewlett Packard	http://jena.sourceforge.net/iri/ license.html
xercesImpl.jar	Developed at private expense	Open-source license rights	Apache Foundation	http://www.apache.org/licenses/ LICENSE-2.0
Xml-apis.jar	Developed at private expense	Open-source license rights	Apache Foundation	http://www.apache.org/licenses/ LICENSE-2.0
Apache Ant	Developed at private expense	Open-source license rights	Apache Foundation	http://ant.apache.org/license.html

Figure 3.7-2. Commercial Computer Software with Less Than Unlimited Rights

Technical Data or Computer Software to Be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restriction	Link to License Terms
NIST Sphere (audio file headers)	Developed at private expense	Open-source license rights	NIST	http://www.itl.nist.gov/iad/mig// tools/sphere_26atarZ.htm
Shorten (decompression)	Developed at private expense	Open-source license rights	Softsound Ltd	http://www.etree.org/shncom.html
SoX (conversion utilities)	Developed at private expense	Open-source license rights		http://sox.sourceforge.net/

Figure 3.7-2. Commercial Computer Software With Less Than Unlimited Rights *(continued)*

Date 29 July 2010

Printed Name and Title Beverly C. Davey, Contract Mgr.

Signature Beverly C Davey

Progress, Status and Management Report

Period Covered by the Report

Date of Report:

Project Title: Robust Automatic Transcription of Speech (RATS)
Contract Number: D10PC20008
Total Dollar Value: $ 13,047,478.00,596,885.00
Program Manager: Joseph Olive

Submitted by:

[Name]
[Address]

Telephone:
Fax:
Email:

Security Classification – Unclassified

Distribution List and Addresses

One report to:

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Arlington, VA 22203-1714
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One report to:

Roy Peters/COR
Science & Technology Specialist
DOI/NBC
Acquisition Services Directorate
P.O. Box 192924
Fort Huachuca, AZ 85670-2924
E-mail: Roy_L_Peters@nbc.gov

Technical Information – Financial Management

1. **Technical Progress / Monthly Expenditure Report (Please provide cumulative spending graph).**

Figure 1. Example Graph

Please provide Phase 1 schedule of tasks and events for this quarter, with financial expenditures broken down by task.

Task 1 – (Task Description): $
Task 2 – (Task Description): $
Task 3 – (Task Description): $

Total expenditures for the quarter - $

Actual Cost versus Planned Costs

	Current Month's Cost* ($)	Inception to Date ($)	Phase 1 Cost ($)
Plan			
Actual			
Difference			

* Current month is (DATE) through (DATE).

2. **Technical Progress / Highlights - Observations**

3. **Results or Problems and Solutions**

4. **Significant Accomplishments Anticipated During Next Reporting Period**

5. **Publications relevant to this effort**

6. **Meetings and Events (Please include meetings with subcontractors)**

7. **Publications Changes to the Contract Organization**

SAIC
From Science to Solutions

Small/Small Disadvantaged/Women-Owned/HUBZone/HBCU/MI/ Veteran-Owned/Service Disabled Veteran-Owned Businesses Individual Subcontracting Plan

Including
Approved Master Subcontracting Plan Effective
01 January 2009 through 31 December 2011

SAIC DUNS Number 054781240 CAGE 52302 for ISR/SSR Reporting
SAIC SOLICITATION DUNS Number: 833063105 CAGE 5UTE1

Subcontracting Goals For
Prime Contract/Solicitation No.: DARPA BAA 10-34
SAIC Bid and Proposal No.: F00455.A.2311.010.000

Prepared By:

John Meanley — September 2, 2010
Senior Subcontracts Administrator

By:

Michael Tuffley — September 2, 2010
Deputy BU Procurement Director

Approved By:

September 2, 2010
James Cantor — Date
Deputy Business Unit Manager

Approval Concurrence:

9/2/2010
Rochelle Love — Date
Small Business Compliance Manager

SPECIFIC SUBCONTRACTING PLAN
BASED ON FAR 52.219-9 REQUIREMENTS

CONTENTS

SECTION	DESCRIPTION
I.	Subcontracting Goals [(d)(1), (d)(2) & (d)(7)]
II.	Proposed Distribution and Description of Subcontract Awards [(d)(3)]
III	** Efforts to Subcontract with Small Disadvantaged Business (SDB) Concerns
IV.	Method Used to Develop Goals [(d)(4)]
V	Indirect and Overhead Costs [(d)(6)]
VI	Method of Identification/Solicitation [(d)(5)]

NOTE: Requirements of FAR 52.219-9(d)((8), (d)(9), (d)(10), and (d)(11) are contained in the approved SAIC Master Subcontracting Plan; which is incorporated herein.

[ ] References Specifically Identifies FAR 52.219-9 Requirements
** Specifically Identifies DFAR 219.705-4

I. SUBCONTRACTING GOALS

A. Prime Contract/Solicitation Number: F00455.A.2311.010.000 / DARPA BAA 10-34

SAIC Group: Intelligence. Security and Technology Services Group (Shea)
DUNS: 833063105 CAGE 5UTE1

Proposal Title: Robust Automatic Transcription of Speech (RATS), Technical Area 3. Evaluation ("RATS")

Program Summary: The goal of the RATS program is to create technology capable of accurately determining speech activity regions, detecting key words, identifying language and speaker in highly degraded, weak and/or noisy communication channels. RATS test and training data will be collected under both controlled and uncontrolled field conditions.

B. Individual Subcontract Plan Administrator:

Name:	John Meanley		
Employee No:	115582	Title:	Sr. Subcontracts Administrator
Address:	10260 Campus Point Drive San Diego. CA 92121-1578		
Telephone No.:	858-826-5472	Location No.	0001 – Campus Point SD
Group No.:	25	Division No.	2

Group or BU Procurement Manager Name: Douglas Weiss
Group or BU Procurement Manager Employee No: 54438

C. Contract Representative:

Name:	Karen Lee Burgess		
Employee No:	95610	Title:	Dep Ops Contracts Mgr
Address:	1710 SAIC Drive, McLean, VA 22102		
Telephone No.:	843-971-2890	Location No.:	15
Group No.:	25	Division No.:	2
Group Manager Name:	Jane Gabriel		

D. Corporate Small Business Development Programs Small Business Liaison Officer:

Name:	Rochelle Lowe
Title:	Small Business Compliance Manager
Address:	10260 Campus Pt. Drive San Diego, CA 92121
Telephone:	(858) 826-7406
Fax:	(858) 826-2693

Duties of SBLO detailed in Master Subcontracting Plan and include those detailed in FAR 52.219-8 and 52.219-9.

F. Subcontracting Goal Summary

Period of Performance:

Base	Option	Option 2
15-Aug-10	15-Feb-12	15-Feb-13
14-Feb-12	14-Feb-13	14-Feb-14

The percentages contained in Table A represent the goals for the contract upon initial award.

	Distribution of Subcontracts	Amount	Percentage of Subcontracted Dollars
1	Total Dollars to be Subcontracted	24,143.0	100%
2a	Large Business	4,400.0	18.2%
2b(1)	Total Small Business	19,743.0	81.8%
2b(2)	Small Disadvantaged	19,743.0	81.8%
2b(3)	Small Woman-Owned	19,743.0	81.8%
2b(4)	HBCU/MI	0.0	0.0%
2b(5)	HUBZone	19,743.0	81.8%
2b(6)	Small Veteran-Owned	0.0	0.0%
2b(7)	Small Service Disabled Veteran-Owned	0.0	0.0%

TABLE A -- Goals Expressed as Percentage of Total Planned Subcontracting

The SAIC program manager plans to purchase certain computer equipment for this program. This equipment, which includes four Dell PowerEdge T610 tower chassis configured for program requirements, may be purchased from Blue Tech, Inc., a HUBZone, Small Disadvantaged, Woman-Owned business. In this plan, an additional amount, noted in Table A, is budgeted for miscellaneous supplies and materials with assumed large business status. Based on this approach, this plan allocates over 80% to SDB, WOSB and HUBZone business.

II. PROPOSED DISTRIBUTION AND DESCRIPTION OF SUBCONTRACT AWARDS

Science Applications International Corporation is committed to providing opportunities for small businesses to compete for subcontract awards. This commitment has proven effective with actual direct awards of 53.0% to Small Businesses overall with 9.8% going to Small Disadvantaged Businesses and 9.6% going to Women Owned businesses in Government Fiscal Year 2009.

The principal supplies and/or services to be subcontracted under this contract are:

- Dell PowerEdge T610 tower chassis and peripherals

	Type of Award													
Identify Service / Product	NAICS (which describes service/ product being acquired from vendor)	Full & Open Competition Source Item	Limited Competition	Single Source	Restricted Disadvantaged Competition	Small Business	SDB	WOSB	HBCU/MI	Large Business	HUBZone	VOSB	SDVOSB	ANC/Indian Tribal-owned
Computers & Peripherals	423430		X				X	X			X			

III EFFORTS TO SUBCONTRACT WITH SMALL DISADVANTAGED BUSINESS (SDB) CONCERNS

This Individual Subcontracting Plan was prepared with consideration given to positive goals for SDB participation. This included reviewing subcontracting requirements for possible opportunities for Historically Black Colleges and Universities or Minority Institutions.

Describe anticipated product or services to be provided by SDB, technical assistance to be provided, and/or restricted competition with SDB or HBCU/MI: IT equipment, including four Dell PowerEdge T610 tower chassis configured for program requirements, will be purchased from a firm whose status is HUBZone, Small Disadvantaged and Woman-Owned business. The proposed purchase orders represent over 80% of the entire subcontracted effort.

IV. METHOD USED TO DEVELOP GOALS

A. Proposed subcontracting goals as identified in Section I, F. Subcontracting Goal Summary was developed by a joint pre-proposal review of the solicitation statement of work and performance requirements. The joint review involved program, technical and procurement personnel including, the Corporate Small Business Liaison Officer, Business Unit Manager, Contract Representative, and the identified Individual Subcontract Plan Administrator.

B. Criteria considered in the review process included:
   1. Review of the solicitation statement of work.
   2. Identification of the requirement for goods and services.
   3. Identification of the potential to subcontract for goods and services.
   4. Make - Buy Analysis.
   5. Identification of potential suppliers.
   6. Categorization of source requirements based on single source, limited competition and open competition as provided by the marketplace or could potentially be developed.

V. INDIRECT AND OVERHEAD CHARGES

Indirect and overhead charges are not included in this subcontracting plan.

VI. METHOD OF IDENTIFICATION /SOLICITATION

The development of goals as described in Section IV resulted in the identification of potential/proposed subcontracting opportunities. The review process identified provided a categorization of items available from single sources, limited competition and full and open competition. Some single source items are available from "only qualified sources" as determined from previous programs of a similar nature.

Items available for limited or open competition provide the opportunity to subcontract to small businesses. These prospective sources were identified through the mechanisms identified in Section III(c) of the Master Subcontracting Plan.

cc: Rochelle Lowe
File

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

The public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Services and Communications Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. **Please do not return your form to the above organization. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.**

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0001	A	TDP ____ TM ____ OTHER ____

D. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR
	D10PC20008	Science Applications International

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A001	Scientific and Technical Reports	

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-MISC-81612	Section J.2, D10PC20008	

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
See Blk 16	C	See Block 16	See Block 16

8. APP CODE	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
A	See Block 16	See Block 16

16 REMARKS

See pages 2-3

14. DISTRIBUTION			
a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
DARPA PM via			
TFIMS			
COR via Email			
15. TOTAL →	0	0	0

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
Maria Elemia	08/12/2010	Lisa Mattocks	08/12/2010

DD FORM 1423-1, FEB 2001 PREVIOUS EDITION MAY BE USED. Page 1 of 4 Pages

Exhibit A

CONTRACT DATA REQUIREMENTS LIST

(1 Data Item)

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0001	A	TDP _____ TM _____ OTHER _____

D. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR
	D10PC20008	Science Applications International

16. REMARKS *(Continued)*

INSTRUCTIONS FOR COMPLETING DD FORM 1423

(See DoD 5010.12-M for detailed instructions.)

FOR GOVERNMENT PERSONNEL

Item A. Self-explanatory.

Item B. Self-explanatory.

Item C. Mark (X) appropriate category: TDP - Technical Data Package; TM - Technical Manual; Other - other category of data, such as "Provisioning,""Configuration Management," etc.

Item D. Enter name of system/item being acquired that data will support.

Item E. Self-explanatory (to be filled in after contract award).

Item F. Self-explanatory (to be filled in after contract award).

Item G. Signature of preparer of CDRL.

Item H. Date CDRL was prepared.

Item I. Signature of CDRL approval authority.

Item J. Date CDRL was approved.

Item 1. See DoD FAR Supplement Subpart 4.71 for proper numbering.

Item 2. Enter title as it appears on data acquisition document cited in Item 4.

Item 3. Enter subtitle of data item for further definition of data item (optional entry).

Item 4. Enter Data Item Description (DID) number, military specification number, or military standard number listed in DoD 5010.12-L (AMSDL), or one-time DID number, that defines data content and format requirements.

Item 5. Enter reference to tasking in contract that generates requirement for the data item (e.g., Statement of Work paragraph number).

Item 6. Enter technical office responsible for ensuring adequacy of the data item.

Item 7. Specify requirement for inspection/acceptance of the data item by the Government.

Item 8. Specify requirement for approval of a draft before preparation of the final data item.

Item 9. For technical data, specify requirement for contractor to mark the appropriate distribution statement on the data (ref. DoDD 5230.24).

Item 10. Specify number of times data items are to be delivered.

Item 11. Specify as-of date of data item, when applicable.

Item 12. Specify when first submittal is required.

Item 13. Specify when subsequent submittals are required, when applicable.

Item 14. Enter addressees and number of draft/final copies to be delivered to each addressee. Explain reproducible copies in Item 16.

Item 15. Enter total number of draft/final copies to be delivered.

Item 16. Use for additional/clarifying information for Items 1 through 15. Examples are: Tailoring of documents cited in Item 4; Clarification of submittal dates in Items 12 and 13; Explanation of reproducible copies in Item 14.; Desired medium for delivery of the data item.

FOR THE CONTRACTOR

Item 17. Specify appropriate price group from one of the following groups of effort in developing estimated prices for each data item listed on the DD Form 1423.

a. Group I. Definition - Data which is not otherwise essential to the contractor's performance of the primary contracted effort (production, development, testing, and administration) but which is required by DD Form 1423.

Estimated Price - Costs to be included under Group I are those applicable to preparing and assembling the data item in conformance with Government requirements, and the administration and other expenses related to reproducing and delivering such data items to the Government.

b. Group II. Definition - Data which is essential to the performance of the primary contracted effort but the contractor is required to perform additional work to conform to Government requirements with regard to depth of content, format, frequency of submittal, preparation, control, or quality of the data item.

Estimated Price - Costs to be included under Group II are those incurred over and above the cost of the essential data item without conforming to Government requirements, and the administrative and other expenses related to reproducing and delivering such data item to the Government.

c. Group III. Definition - Data which the contractor must develop for his internal use in performance of the primary contracted effort and does not require any substantial change to conform to Government requirements with regard to depth of content, format, frequency of submittal, preparation, control, and quality of the data item.

Estimated Price - Costs to be included under Group III are the administrative and other expenses related to reproducing and delivering such data item to the Government.

d. Group IV. Definition - Data which is developed by the contractor as part of his normal operating procedures and his effort in supplying these data to the Government is minimal.

Estimated Price - Group IV items should normally be shown on the DD Form 1423 at no cost.

Item 18. For each data item, enter an amount equal to that portion of the total price which is estimated to be attributable to the production or development for the Government of that item of data. These estimated data prices shall be developed only from those costs which will be incurred as a direct result of the requirement to supply the data, over and above those costs which would otherwise be incurred in performance of the contract if no data were required. The estimated data prices shall not include any amount for rights in data. The Government's right to use the data shall be governed by the pertinent provisions of the contract.

CLIN 0001 **RESEARCH AND DEVELOPMENT PROJECT SUMMARY**

--CONTINUATION PAGE--

16. REMARKS.

- REPORTING PERIOD TERMINOLOGY
  - QUARTERLY REPORTING PERIODS:
    - JUL-SEP: COVERS PERFORMANCE FROM 1 JULY - 30 SEPTEMBER
    - OCT-DEC: COVERS PERFORMANCE FROM 1 OCTOBER - 31 DECEMBER
    - JAN-MAR: COVERS PERFORMANCE FROM 1 JANUARY - 31 MARCH
    - APR-JUN: COVERS PERFORMANCE FROM 1 APRIL - 30 JUNE

- ELECTRONIC SUBMISSION. THE CONTRACTOR SHALL ACCESS THE DARPA EXTRANET REPORTING PAGE https://www.tlims.darpa.mil AND ELECTRONICALLY SUBMIT ALL REQUIRED REPORTING INFORMATION ACCORDING TO ALL SPECIFICATIONS BELOW.

- POST-AWARD INITIAL SUBMISSION REQUIREMENT: SUBMIT WITHIN 30 CALENDAR DAYS OF AWARD ALL DATA ITEMS IN 1. PROJECT INFORMATION.

- MINIMAL INITIAL REPORT: **IF AWARD OCCURS WITHIN 30 CALENDAR DAYS OF END OF QUARTERLY REPORTING PERIOD** SUBMIT DATA ITEMS 2.6 ISSUES OR CONCERNS AND 3.2 PROJECT PLANS, ONLY, IN FIRST REPORT. DUE DATE FOR MINIMAL FIRST REPORT IS WITHIN 15 CALENDAR DAYS OF END OF QUARTERLY REPORTING PERIOD THAT INCLUDES AWARD DATE.

- GENERAL QUARTERLY SUBMISSION REQUIREMENTS
  - FREQUENCY: BLOCK 10. INPUT FOUR (4) TIMES YEARLY, ONCE FOR EACH OF THE QUARTERLY REPORTING PERIODS CITED ABOVE, FOR DURATION OF CONTRACT.
  - REPORTING PERIOD: BLOCK 11. REPORT ON PERFORMANCE DURING THE MOST RECENT QUARTERLY REPORTING PERIOD.
  - DUE DATE: BLOCK 12 AND BLOCK 13. SUBMIT WITHIN FIFTEEN (15) CALENDAR DAYS AFTER THE END OF MOST RECENT QUARTERLY REPORTING PERIOD, BEGINNING WITH REPORTING PERIOD APR-JUN, DUE DATE IS JULY 15 FOR INITIAL REPORT, I.E.
    - FOR REPORTING PERIOD JUL-SEP, DUE DATE IS OCTOBER 15
    - FOR REPORTING PERIOD OCT-DEC, DUE DATE IS JANUARY 15
    - FOR REPORTING PERIOD JAN-MAR, DUE DATE IS APRIL 15
    - FOR REPORTING PERIOD APR-JUN, DUE DATE IS JULY 15

- QUARTERLY CONTENT REQUIREMENTS
  - IF CURRENT SUBMISSION IS FINAL SUBMISSION FOR THIS CDRL ITEM INCLUDE ALL PARAGRAPHS OF REFERENCED DATA ITEM DESCRIPTION (DID), ELSE
    - FOR THE APR-JUN QUARTERLY REPORT, INCLUDE ALL PARAGRAPHS OF REFERENCED DID
      FOR 3.2.1. PLANNED ACTIVITIES, IN ADDITION TO REPORTING PLANNED ACTIVITIES FOR NEXT QUARTER, INCLUDE A TOP-LEVEL BULLET LIST OF PLANNED ACTIVITIES FOR TIME PERIOD BEGINNING 1 OCTOBER OF CURRENT YEAR AND ENDING 31 DECEMBER OF NEXT YEAR.
    - FOR ALL OTHER QUARTERLY REPORTS, INCLUDE ALL PARAGRAPHS OF THE REFERENCED DID **EXCEPT** FOR DID PARAGRAPH 1.2 PROGRAMMATIC INFORMATION (AND ALL SUB-ELEMENTS OF 1.2)

- GENERAL MONTHLY SUBMISSION REQUIREMENTS
  - FREQUENCY: BLOCK 10. INPUT TWELVE (12) TIMES YEARLY FOR DURATION OF CONTRACT.
  - REPORTING PERIOD: BLOCK 11. REPORT ON PERFORMANCE DURING PREVIOUS MONTH.
  - DUE DATE: BLOCK 12 AND BLOCK 13. SUBMIT WITHIN FIFTEEN (15) CALENDAR DAYS AFTER END OF PREVIOUS MONTH.

- MONTHLY CONTENT REQUIREMENTS
  - FOR DURATION OF CONTRACT, SUBMIT REFERENCED DID ITEMS 2.1 INCURRED EXPENSES THIS PERIOD, AS LUMP SUM TOTAL ONLY.

- CONCURRENT SUBMISSION REQUIREMENTS
  - FOR DURATION OF CONTRACT SUBMIT 2.2 INVOICES THIS PERIOD, AS INVOICES ARE SUBMITTED FOR PAYMENT. PERIOD IN 2.2 DENOTES TIME SINCE LAST SUBMISSION OF INVOICE(S).

- FORMAT
  - GENERAL FORMAT INSTRUCTIONS: COMPLY WITH ALL INSTRUCTIONS DELINEATED ON THE DARPA EXTRANET REPORTING PAGE.

  - SPECIAL FORMAT INSTRUCTIONS: SUBMIT 3.1.7, PUBLICATIONS THIS PERIOD, IN ADOBE ACROBAT (PDF) FILE FORMAT. SUBMIT 1.2.2.4, SCHEDULE GRAPHIC IN EITHER POWERPOINT (PPT), JPG, TIFF, OR PDF FILE FORMAT. SUBMIT 1.2.2.7, QUAD-CHART, IN MICROSOFT POWERPOINT (PPT) FILE FORMAT.

- INPUT OF PROPRIETARY INFORMATION:
  - PROPRIETARY INFORMATION MAY BE ENTERED ONLY FOR THE FOLLOWING ITEMS AND ONLY IN THOSE AREAS DESIGNATED FOR SUCH INPUT ON THE DARPA EXTRANET REPORTING PAGE
    - 1.2.2.3 DETAILED DESCRIPTION OF TECHNICAL APPROACH AND COMPARISON WITH CURRENT TECHNOLOGY
    - 3.1.2 TECHNICAL ACCOMPLISHMENTS THIS PERIOD
    - 3.2.1 PLANNED ACTIVITIES

- CLASSIFICATION: THE ENTIRE REPORT SHALL BE UNCLASSIFIED.

- INCLUDE THIS R&D PROJECT SUMMARY ON THE FINAL DD FORM 250.

DATA ITEM DESCRIPTION

Title: RESEARCH AND DEVELOPMENT (R&D) PROJECT SUMMARY

Number: DI-MISC-81612A **Approval Date: 20031215**

AMSC Number: D7442 **Limitation:**

DTIC Applicable: N/A **GIDEP Applicable: N/A**

Preparing Activity: OSD-SO

Applicable Forms: N/A

Use, Relationships:

The R&D Project Summary reports key project administrative, programmatic, technical and financial data. The R&D Project Summary includes administrative and funding information, research objectives, innovative approaches, accomplishments, plans, technology transitions, technology transfers, and issues. The technical and financial information contained in the R&D Project Summary enables comprehensive assessment of project goals, progress and status. This Data Item Description (DID) contains format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract statement of work (SOW).

Requirements:

1. Project Information.

1.1. Administrative Information.

1.1.1. Subcontractors. Verify each subcontractor.

1.1.2. Performing Organization Contacts.

1.1.2.1. Principal Investigator(s) Contact. Verify the name, organization, business address, business phone, business fax, and e-mail address of each principal investigator.

1.1.2.2. Administrative Contact. Verify the name, organization, business address, business phone, business fax, and e-mail address of the administrative point of contact.

1.1.2.3. Financial Data Contact. Verify the name, organization, business address, business phone, business fax, and e-mail address of the contact for financial data.

1.1.2.4. Programmatic/Technical Reporter Contact. If the Principal Investigator is not the reporter of the programmatic/technical data verify the name, organization, business address, business phone, business fax, and e-mail address of the programmatic/technical reporter point of contact.

1.2. Programmatic Information.

1.2.1. Project Uniform Resource Locator (URL). Provide the project URL.

1.2.2. Project Description.

1.2.2.1. Research Objectives.

1.2.2.2. Problem Description. Provide a concise description of the problem area addressed by this research project.

1. Research Goals. Identify specific research goals of this project. Identify and quantify expected performance improvements from this research. Identify new capabilities enabled by this research. Identify and discuss salient features and capabilities of developmental hardware and software prototypes.

2. Expected Impact. Describe the expected impact of the research project, if successful, to the problem area.

1.2.2.3. Technical Approach.

3. Detailed Description of Technical Approach. Provide a detailed description of the technical approach that will be used in this project to achieve the research goals. Specifically identify and discuss innovative aspects of the technical approach.

4. Comparison with Current Technology. Describe state-of-the-art approaches and the limitations within the context of the problem area addressed by this research.

1.2.2.4. Schedule and Milestones.

5. Schedule Graphic. Provide a graphic representation of the project schedule including detail down to the individual task effort level. Show all project milestones. Use absolute time designations for all dates.

6. Detailed Individual Task Descriptions. Provide detailed task descriptions for each individual task in the schedule graphic.

1.2.2.5. Deliverables Description. List and provide a detailed description for each planned deliverable. Specify receiving organization(s) and expected delivery dates for each deliverable.

1.2.2.6. Technology Transition and Technology Transfer Targets and Plans. Discuss plans for technology transition and transfer. Identify specific military and commercial organizations for technology transition or transfer. Specify anticipated dates for transition or transfer.

1.2.2.7. Quad Chart. Provide a Quad Chart as one (1) landscape-oriented page divided into four (4) quadrants and suitable for use in briefings using the following format:

Project Title	
GRAPHIC: A visually compelling graphic that conveys the key technological idea(s) or the expected impact of the research.	**NEW IDEAS:** List at least 3 new technical ideas embodied by the research.
IMPACT: At least 3 quantitative statements discussing how this research can revolutionize an area of importance to the Department of Defense	**SCHEDULE:** At least 2 scheduled events or project milestones per year, depicted on a horizontal timeline with at least Quarter resolution (3 month increments) starting with the Quarter that contains the project start and ending with the Quarter that contains the scheduled project end. Quarters begin on 1 October, 1 January, 1 April, and 1 July. Use absolute time designations for all dates.

2. Funding Report.

2.1. Incurred Expenses this Period. Specify the expenses incurred during this reporting period (direct and indirect costs on the awardee's accounting system including labor, overhead, G&A, equipment purchases, travel, material, and any subcontract charges known by the prime).

2.2. Invoices this Period. Specify the invoice date, number, and amount of each invoice submitted during this reporting.

2.3. Date Incurred Expenses will equal Obligated Funding. Specify the anticipated dates that incurred expenses will equal 75% and 100% of the obligated funding, respectively.

2.4. Planned Incurred Expenses. Specify the total expenses planned to be incurred for each of the next three (3) quarters.

2.5. Projected Funding Increment. Specify the funding increment required for the period beginning with "Date Incurred Expenses will equal 100% of Obligated Funding" and ending with 31 December of the next calendar year. If contract ends prior to 31 December of the next calendar year, specify the funding increment required up to the contract end date. Obligated funding increments are additions to currently available funds, not additions to the total contract value.

2.6. Issues or Concerns. Summarize any funding, technical, programmatic and other issues or concerns as well as recommended actions for Government consideration. Indicate if an anticipated funding increment has not been received.

3. Technical Report.

3.1. Project Progress.

3.1.1. Progress Against Planned Objectives. Update the status of the specific objectives identified in the last reporting period as "Specific Objectives for Next Period". For each objective, indicate if the objective was or was not accomplished. For each objective not accomplished, detail the current status of the objective.

3.1.2. Technical Accomplishments this Period. Describe the technical accomplishments made during this reporting period.

3.1.3. Improvements to Prototypes this Period. Provide a detailed, quantitative description of significant new features, capabilities and performance enhancements to hardware and software prototypes made during this period.

3.1.4. Significant Changes to Technical Approach to Date. Identify and provide a detailed description of and rationale for significant changes to the technical approach since the start of the research project.

3.1.5. Deliverables this Period. Report the deliverables (excluding Technology Transition and Transfer covered under 3.1.6.) submitted during this reporting period. List the Deliverable Name, Type of Deliverable (e.g. hardware or software item, demonstration, milestone, design study or other documentation), and Date of Submission. List the Contract Line or Data Item Number (CLIN or DIN), when applicable. Specify the name, organization, business phone, fax number, and e-mail address of a point of contact for the organization(s) that received the deliverable.

3.1.6. Technology Transition and Transfer this Period.

3.1.6.1. Technology Transition and Transfer Description. List and describe the features and performance capabilities for each technology transitioned or transferred this period.

3.1.6.2. Technology Transition and Transfer List. For each technology transitioned or transferred this period, identify the specific military, commercial, or other transition or transfer organization(s) and the application context.

3.1.6.3. Technology Transition and Transfer Contacts. For each technology transitioned or transferred this period, specify the name, organization, business address, business phone, business fax, and e-mail address of a cognizant point of contact for the organization(s) that received the transitioned or transferred technology.

3.1.7. Publications this Period. Provide an electronic copy of each publication sponsored fully or in part by this contract during the reporting period. For each publication, specify the:

(1) Title
(2) Author(s)
(3) Publication date
(4) Publication venue (e.g. journal, conference or magazine name)
(5) Publication keywords

3.1.8. Meetings and Presentations this Period. List all meetings (conferences, workshops, demonstrations, and other coordination meetings) participated in during the reporting period that were sponsored fully or in part by this contract. For each meeting, specify the:

(1) Meeting Name
(2) Meeting Purpose
(3) Meeting Start and End Dates
(4) Meeting Location (place and name of facility)
(5) Meeting Attendees from this project
(6) Presentations Made

3.1.9. Issues or Concerns. Summarize any funding, technical, programmatic, or other issues or concerns as well as recommended actions for Government consideration. Indicate if an anticipated funding increment has not been received.

3.2. Project Plans.

3.2.1. Planned Activities. Describe the planned activities for the next reporting period. Discuss the risks and payoffs corresponding to the planned activities. Include a discussion of planned experiments, demonstrations, presentations, and technical papers.

3.2.2. Specific Objectives for Next Period. Report the significant technical and programmatic objectives planned to be completed during the next reporting period. These are dynamic objectives driven by the progress of the project and not necessarily long-term milestones. Report specific and measurable objectives, rather than simple declarations of continued or sustained effort. For each objective, provide:

(1) Objective Name

1. ADMINISTRATIVE

1.1 Confirmation Sheet/Cover Sheet

VOLUME 1—TECHNICAL PROPOSAL

BROAD AGENCY ANNOUNCEMENT (BAA) 10-34

"ROBUST AUTOMATIC TRANSCRIPTION OF SPEECH"

TECHNICAL AREA 3, EVALUATION

Technical Point of Contact
Mr. Richard LaValley
4001 Fairfax Drive, Suite 700
Arlington, VA 22203
(703) 267-3123 – Voice
(703) 312-6029 – Fax
Richard.W.LaValley@saic.com - Email

Administrative Point of Contact
Ms. Katherine Nguyen
4001 Fairfax Drive, Suite 250
Arlington, VA 22203
(703) 907-5343 – Voice
(703) 465-0316 – Fax
katherine.p.nguyen@saic.com- Email

Total Cost Proposed	**$1,596,885**
Base (18 months)	$758,247
Option 1 (12 months)	$482,362
Option 2 (12 months)	356,276
Contractor Reference Number:	F00455.A.2311.010.000
Large Business	

This proposal or quotation includes data that shall not be disclosed outside the government and shall not be duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate this proposal or quotation. If, however, a contract is awarded to this offeror or quoter as a result of or in connection with the submission of these data, the government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to these restrictions are contained on all pages of this proposal. In addition, the information contained herein may include technical data, the export of which is restricted by the U.S. Arms Export Control Act (AECA) (Title 22, U.S.C. Sec 2751, et seq.) or the Export Administration Act of 1979, as amended (Title 50, U.S.C., App. 2401, et seq.).

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Source Selection Information – See FAR 2.101 and 3.104 Use or disclosure of information contained on this sheet is subject to the restrictions on the title page of this proposal or quotation.

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Source Selection Information – See FAR 2.101 and 3.104 Use or disclosure of information contained on this sheet is subject to the restrictions on the title page of this proposal or quotation.

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2.1 Innovative Claims for Proposed Research

As the Robust Automatic Transcription of Speech (RATS) Program's Evaluator, SAIC will design, execute and support an evaluation process that encourages maximum innovation in RATS technologies. We seek to maximize overall program effectiveness and minimize risk. Our proposal builds on the BAA's evaluation plan with a set of technology experimentation and evaluation insights that are tailored to drive innovation throughout the RATS Development, Data Collection, and Evaluation technical areas. These insights are described in **figure 2.1-1**.

2.1.1 Problem Description

The BAA describes the broad requirements for Rapid Automated Transcription of Speech (RATS) Program Technical Area 3 as a series of phased evaluations of speech transcription technologies that progress from unclassified to classified environments over the course of the program. The essential problem for the Evaluation Team is to design and implement an evaluation process and framework that integrates research algorithms with classified and unclassified data to measure progress toward validating the program claims and to do so in a way that enhances the research progress that is the central goal of the program.

2.1.2 Research Goals

The goals of the evaluation team are to create the materials, specifications, and processes necessary to foster advances in RATS research and to measure these advances clearly in unclassified and classified environments. The Evaluation Team must achieve the following technical and evaluation goals:

- Extend the BAA's broad evaluation plan into a detailed specification document that provides clear guidance to algorithm developers and facilitates their research progress while ensuring effective measurement of that progress against program metrics.
- Develop a flexible evaluation framework that provides continuous testing services for advances in RATS technologies while delivering objective evaluation tests and results.
- Support the Data Collection team in developing data sets and test/training partitions that allow effective evaluation across multiple dimensions while emphasizing relevance to transition partners and DOD missions.
- Support potential transition of RATS technologies more broadly to DOD and the IC.

2.1.3 Expected Impact

The Evaluation Team's clearest impact will be enabling DARPA to measure progress in RATS technology. This is achieved by implementing a fair, valid, replicable, insightful, and accurate evaluation methodology and process that can shift smoothly from unclassified to classified environments. Equally important will be the value of evaluation to algorithm developers, who will be able to measure their own research progress against program metrics continuously within the evaluation framework and will receive detailed results from end of phase tests that will reveal strengths and weaknesses of their algorithmic approaches.

A more subtle, but perhaps more important, impact of the Evaluation Team's work is to support eventual transition of RATS technologies to operational users across DOD and the IC. During Phases 2 and 3, algorithm developers will be delivering fully functioning, field-trainable software systems for evaluation. SAIC will structure evaluation tasks to maximize relevance to operational users and will perform classified evaluations that demonstrate performance on operational data. As desired by the government, SAIC will also develop a process for mapping from current Measures of Performance (MOPs) – the official program metrics – to the Measures of Effectiveness (MOEs) that will serve as the basis for transition planning. Finally, SAIC's access to a wide audience of potential RATS technology experiment and transition partners across the DOD and the IC will provide crucial exposure for RATS technologies and allow for demonstrations and field tests that could increase Technical Readiness Levels (TRLs) and create new transition opportunities.

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Innovation	Features	Benefits
1. Comprehensive alignment of evaluation methodology, expertise, and automated software tools for the assessment of speech technology	Leverage best practices and existing framework of previous IC and DoD evaluations to provide customized RATS solution	Independent, repeatable process consistent with best practices in speech technology evaluation – focused 100% on supporting the research process
2. Evaluation framework shared with research teams supporting continuous measurement of progress	Evaluation framework software provided to teams early in phase 1 by leveraging existing software framework with updates tailored to RATS program needs	Consistent measurement during research and evaluation – seamlessly integrating the evaluation into each phase of the research
3. Understanding of cross-IC and DoD missions used to tailor operationally relevant scenario-based evaluations for speech analysis technology	Expertise in experimental design for IC and DoD evaluations supported by automated tools and data handling	High relevance of resulting performance measures to potential operational users will increase opportunities for transition of RATS technologies.
4. Collaborate with data collection performer on collection design, annotation, and test/training partition	Specific recommendations to Technical Area 2 performer for audio segmentation and events for LID, SID, and KWS, leveraging knowledge gained in prior IC/DoD audio technology evaluations	Measurable and consistent performance reporting with high confidence levels
5. Multi-dimensional results reporting to algorithm developers to identify areas of high and low performance in multiple dimensions	Data characterized for training and testing in a consistent manner with that anticipated for evaluation	Effective and comprehensive evaluation measurement in support of research objectives and processes
6. Experimental design captures information required to estimate (and provides limited measurement of) end to end performance	Separate trials for technology and overall performance across individual and combinations of technologies	Better alignment with program objectives, enabling rapid progression from measures of performance (MOP) to measures of effectiveness (MOE) in support of possible transitions
7. In-depth dimensional performance analysis using comprehensive experimental designs	Breakdown by dimensions such as noise level/source, gender, number of speakers, and closed/open sets for speaker and language identification	Insight into comparative performance and possible tradeoffs analyses for development teams across different parts of the problem space
8. Streamlined, low-risk process for shifting evaluation from unclassified to classified environment	Leverage process used for 150+ successful classified evaluations of unclassified tools	Minimize risks of security, integration, and performance problems that plague classified evaluations of research algorithms
9. Consistent annotation of classified data sets with unclassified data	Train cleared target language linguists to perform unclassified annotation using technical area 2 methodology and data prior to annotation of classified data and test inter-rater agreement	Maximize consistency between unclassified and classified data sets to ensure comparability of evaluation results
10. Test system trainability on unknown speaker and keyword set in preparation for classified evaluation	Sequester technical area 2 products for targeted speakers and keywords during the data partitioning task and use these to evaluate performance after training	Smooth transition to classified data where targets cannot be revealed to algorithm developers.
11. Evaluation methodology and experience that supports transition to DoD and IC customers	Leverage experience transitioning research products, including speech analysis tools, to operational users	Alignment of research goals and evaluation results with DoD/IC transition processes to the Technology Readiness Level desired by DARPA
12. Unique understanding of a broad set of DoD and IC customers, missions, and data	Leverage metrics development and experimental design experience from Programs such as Research and Development Experimental Collaboration (RDEC) program	Operationally relevant scenarios and access to potential transition partners, allowing for mapping of MOPs to MOEs for more efficient transition of RATS technology

Figure 2.1-1. SAIC proposes a comprehensive set of innovations that will promote research progress in RATS and ensure fair and comprehensive evaluation.

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2.2 Proposal Road Map

SAIC's approach to Technical Area 3 (Evaluation) for the DARPA Robust Automatic Transcription of Speech (RATS) Program is based on applying and adapting best practices developed over previous IPTO and Intelligence Community (IC) evaluations. This approach combines methodology—a collaborative specification process based on a comprehensive experimental design, targeted refinement of metrics, and a streamlined process for moving to classified environments—with a scenario-driven approach to the selection and partition of data and an open evaluation framework that provides continuous testing to researchers and multi-level reporting of results to DARPA. SAIC's team—including PI Richard La Valley, Dr. William Hardy, Dr. Henry Goldberg and consultant Professor Paul Cohen—brings together experts in metrics and experimental design, speech analysis technology, and statistics with extensive knowledge of the operational missions that RATS technology is intended to address. **Figure 2.2-1** illustrates the SAIC approach and its relationship to performers in Technical Areas 1 and 2 while providing a roadmap of the sections of the proposal that address each area.

Figure 2.2-2 provides a detailed roadmap to all major elements of the SAIC proposal.

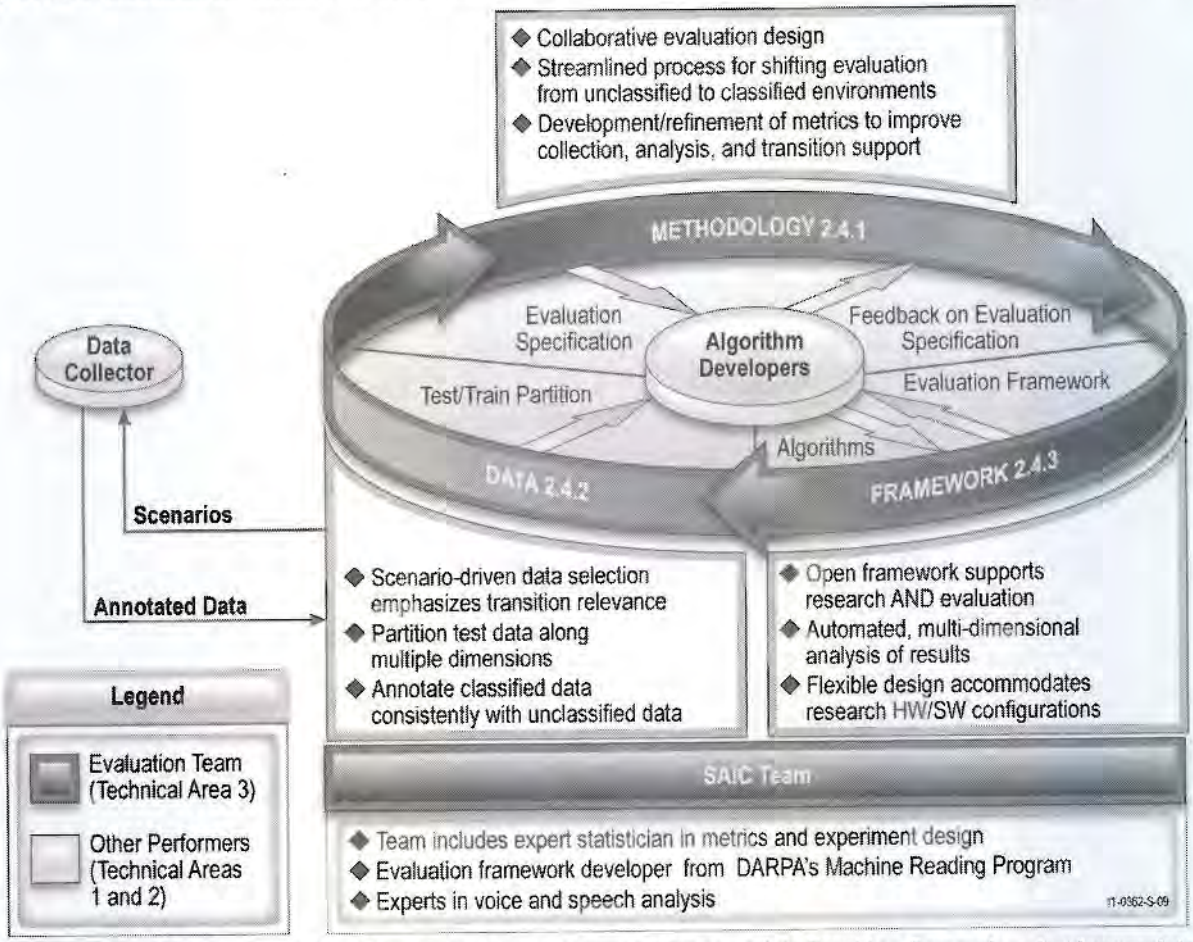

Figure 2.2-1. SAIC's Approach Combines Methodology, Data, and Framework to Provide a Comprehensive Approach to RATS Evaluation. *SAIC's approach includes extensive interaction with both algorithm developers (Technical Area 1) and data collection (Technical Area 2), assuring a collaborative approach that accelerates research progress while effectively measuring that progress. Section references point to sections of the proposal that highlight each area.*

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Topic	Synopsis	Page #
Main Goals of Proposed Research (Evaluation)	◆ Create an evaluation specification and methodology that defines a fair and comprehensive approach to measuring and evaluating research progress against RATS goals	2.4-1
	◆ Perform comprehensive evaluation of speech analysis algorithms that shifts smoothly from unclassified environments to classified environments and data in Phases 2 and 3	2.4-1, 2.4-5
	◆ Develop an Evaluation Framework that provides continuous testing during development and layered performance measurement during evaluation	2.4-4
	◆ Partition data sets to support evaluation of performance in realistic operational scenarios and across multiple relevant dimensions (noise level, # speakers, etc.) to emphasize transition relevance of research and support estimation of MOEs from MOPs	2.4-6 2.4-1, 2.4-2, 2.4-4
Tangible Benefits to End Users	◆ Provide clear, comprehensive evaluation results to DARPA that support programmatic decisions	2.4-2, 2.4-4
	◆ Maximize research progress for algorithm developers by tailoring evaluation specifications, offering flexible evaluation schedules to accommodate rapid technology advances, and providing detailed evaluation results	2.4-4
	◆ Direct research toward areas of relevance to potential operational users and transition partners through realistic, scenario-based evaluations	2.4-4
	◆ Provide opportunities for exposure of RATS technologies to potential users and transition partners	2.4-4
Critical Technical Barriers	◆ Difficulty in integrating with research hardware and software platforms rapidly prior to limited end of phase evaluation period	2.4-4, 2.4-7
	◆ Lack of methods to generalize measures of performance (MOPs) into measures of effectiveness (MOEs) that directly impact operational users	2.4-4
	◆ Measurement of performance within required confidence levels to support comparison to phase-specific goals	2.4-7
	◆ Refinement of metrics to address technical limitations in annotator performance	2.4-2
	◆ Challenge in annotating classified speech data consistently with unclassified annotations to ensure utility of resulting classified evaluation results	2.4-5
Main Elements of Technical Approach	◆ Provide experienced team combining experts in metrics and experimental design, speech technology, and statistics	2.4-6, 2.9-1
	◆ Leverage existing evaluation artifacts (specifications and software) from similar programs to maximize effectiveness and minimize risk and cost to the government	2.4-1, 2.4-5
	◆ Collaborate with RATS algorithm developers in design of evaluation specification	2.4-1
	◆ Develop Evaluation Framework that provides robust, automated testing of algorithm performance on all RATS metrics across multiple dimensions	2.4-1
	◆ Incentivize continuous integration by providing Evaluation Framework to algorithm developers, providing continuous testing to facilitate research progress	2.4-4
	◆ Define operational scenarios based on understanding of real IC and DOD missions that emphasize envisioned RATS CONOPS	2.4-6
	◆ Partner with Technical Area 2 team to assure that data collection and resulting partition support planned evaluation protocol and scenarios	2.4-6
Basis of Confidence	◆ Extensive record of successful evaluations for IPTO, the IC, and DOD	2.4-5, 2.4-6, 2.9-1
	◆ Detailed knowledge of state of the art approaches for measuring speech analysis technologies	2.4-6
	◆ Cleared staff and facilities to support evaluations at the TS/SCI level	2.4-5
	◆ Successful previous evaluation of speech transcription technology leading to formal transition to operational environment	2.4-5, 2.4-6, 2.9-1, 2.10-6
Nature and Description of End Results	◆ Thorough evaluation of research progress against defined, phase-specific goals for all RATS metrics	2.4-10
	◆ Multi-level analysis that provides detailed breakdown of algorithm performance across multiple dimensions, identifying strengths, weaknesses, and opportunities for research progress	2.4-1-2.4.4

Figure 2.2-2. Detailed Roadmap to All Major Elements of the SAIC Proposal

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Topic	Synopsis	Page #
Nature and Description of End Results (Continued)	◆ Projected MOEs based on MOPs and operational scenarios to support possible transition	2.4-4
	◆ Extensive evaluation framework for speech technology that can be distributed to the wider research community at the discretion of DARPA	2.4-4
Cost and Schedule	◆ Phase 1: 18 months - $717K ◆ Phase 2: 12 months - $487K ◆ Phase 3: 12 months - $392K	2.11-1-2.11-3
Plans and Capability to Accomplish Technology Transition	◆ Develop a framework to support both standard and non-standard interfaces	2.4-7
	◆ Include detailed specifications documentation	2.4-1
	◆ Establish a mirrored testbed for unclassified and classified evaluations to assure that the algorithms can operate effectively in both environments	2.4-5, 2.2-3, 2.10-5
	◆ Develop realistic operational scenarios that can be used to estimate MOEs for potential transition partners	2.4-1,2.4-3, 2.4-4
	◆ Leverage experience from previous successful transitions of speech analysis technology into the IC	2.4-5

Figure 2.2-2. Detailed Roadmap to All Major Elements of the SAIC Proposal (continued)

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2.3 Reserved

Note: The outline instructions included in DARPA-BAA-10-34 as Amended on 16 March 2010 did not include Section 2.3. This section is reserved to align with the BAA outline instructions.

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2.4 Technical Approach

Summary. SAIC's approach to the evaluation task for RATS focuses on applying and adapting best practices developed in previous NIST, IPTO and IC evaluations of speech analysis and other language technologies. SAIC will leverage our extensive experience implementing a research framework and evaluation process that supports research progress, provides fair and objective evaluation, transitions seamlessly from unclassified to classified environments, and maximizes relevance to possible transition partners in the DOD and IC communities. SAIC will utilize its experience and knowledge of likely operational scenarios motivating the RATS performance tasks, as well as its extensive experience transitioning tools into DOD and the Intelligence Community (IC), to focus evaluation on problems of likely interest and to support DARPA in transitioning RATS technologies to operational users.

2.4.1 Methodology

2.4.1.1 Evaluation Specification

A key element to successful evaluation of research programs is clear communication of evaluation methodologies and protocols as early as possible, allowing researchers to focus their efforts and providing the opportunity to recommend improvements that minimize impacts on research and improve the utility and accuracy of performance data collection.

The SAIC Team will develop and publish a draft of the Evaluation Specification Document describing data, tasks, test protocols, and metrics during the first six months of Phase 1. Research teams will be able to provide feedback on a variety of issues that will be incorporated (as appropriate and approved by the government) into a series of releases that are consistent with each phase. This collaborative approach will lead to a comprehensive and fair evaluation specification that will serve as the basis for successful evaluations of RATS.

2.4.1.2 Experimental Design

The method proposed to evaluate RATS technologies at the end of each phase has two distinct approaches. The first approach will be the calculation of the measures of performance as outlined over a set of audio files as outlined by the BAA as well as the calculation over each audio instance within the audio file. The second method proposed uses analysis of variance tests to investigate the performance sensitivity over different dimensions of interest to DARPA's customers. Note that both analyses will be generated from the same testing process, allowing more in-depth analysis with minimal additional effort or cost.

Technical Area 1 systems will be presented with a series of trials which will be geared to evaluate the performance of a selected technology (SAD, LID, SID or KWS). Each trial will consist of a series of audio files that will be scored on whether the condition of interest (Speech, Language, Speaker, Key Word) was present (yes or no) along with certainty of that call.

The measures of performance (MOPs) outlined in the RATS BAA will be calculated for each event within the audio file, as well as cumulatively over the events within the file and overall for the audio files.

Based on our understanding of the overall population of possible events and making the assumption that voice activity will comprise of at least 75% of the activity in the audio provided by the Task 2 team, we have computed the total sample size needed for 95% confidence estimates to be at least 800 events. The training and evaluation data split provided in the BAA provides more than enough of a population of 3 second events necessary for each evaluation phase and will be sufficient to provide estimates of the true performance of the particular algorithm with 95% level of confidence.

SAIC proposes an experimental design approach to evaluate each technology and investigate the performance over multiple dimensions as in **figure 2.4-1**. Experiments will be run on various combinations of these dimensions and the results will be analyzed and examined for statistical differences (**figure 2.4-2**).

In order to obtain a sufficiently large number of samples for variance analysis to achieve a 95% level of confidence, each Technical Area 1 system will be evaluated on a set of audio files which fit the characteristics of the experimental

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Technology	Dimension of Interest
SAD	Level of SNR, Noise with and without Music, Gender
LID	# of Languages, Open and Closed Sets of Languages, Gender, Type of Speaker (Native, Non-Native)
SID	# of Speakers, Level of SNR, Open and Closed Sets of Speakers, Gender, Type of Speaker (Native, Non-Native)
KWS	# of Words, Level of SNR, Open and Closed Sets of Words

Figure 2.4-1. Possible Experimental Design Dimensions

design as outlined; the measures of performance (MOPs) will be calculated, and analyzed and reported. Since each of the set of audio files within one of the cells will have been collected by the same Technical Area 2 performer under similar conditions, it is anticipated that the results should provide a good basis for decision making by DARPA at the end of each phase.

2.4.1.2.1 Annotation, Trials, and Analysis. In order to be able to compare RATS to previous testing such as NIST's Rich Transcription (RT), Language Recognition Evaluation (LRE), and Spoken Term Detection (STD) programs, SAIC proposes a similar approach for the RATS evaluation and the handling of the data.

2.4.1.2.1.1 Annotation. A key assumption for this evaluation is the level of annotation of the audio files from the Technical Area 2 team. It is assumed that each segment will be annotated whether speech is present or not. When speech is present, the annotation will provide which language and speaker are being used for the segment as well as whether a key word is spoken during the segment. This will be the basis for scoring the performance of the systems provided by Technical Area 1 development teams.

2.4.1.2.1.2 Trials. SAIC proposes presenting the Technical Area 1 development system with a set of audio files which will be as the basis for the performance evaluation for the four RATS technologies. The RATS BAA defines the segmentation for SAD, LID, SID and KWS as 3 seconds. Each instance of voice will be segmented and scored. This should allow for direct comparisons to previous NIST and industry technology evaluations which use 3 second, 30 second, and 45 second segmentation. Technical Area 1 development systems will be asked to make a decision specific to the evaluated RATS technology (SAD, LID, SID and KWS) for each segment and provide a level of confidence on its decision such that more positive scores indicate greater confidence. MOPs will be calculated on each annotated voice activity and cumulatively over all activities.

2.4.1.2.2 Analysis & Reporting. The three performance measures defined by the BAA will be calculated at the voice activity level cumulatively over each activity within the entire audio file and overall for the entire audio file. SAIC will calculate overall performance achieved for each technology separately, which will be the basis for reporting the performance of the various technologies to DARPA and Technical Area 1 teams as defined by the BAA for each phase. Each MOP will be tested against the desired performance level as outlined in the RATS BAA for each phase at a 95 % level of confidence and reported to DARPA. The results of the analysis of variance will be analyzed using non-parametric statistical techniques such as Friedman's test at the 95% level of confidence.

2.4.1.3 Metrics

2.4.1.3.1 SAD. Speech Activity Detection is a key technology which has been worked on for many years. The major difficulty of the speech detection task in RATS is the variability of the speech and background noise patterns. The noise and voice inconsistency often leads to inaccurate detection of the speech endpoints, by cutting phonemes or passing non-speech events to the speech processing system such as Language Identification detection (LID), Speaker Identification detection (SID) and Key Word Spotting (KWS) when used in the end-to-end configuration envisioned in the BAA.

An important problem in the evaluation of SAD technology is the absence of an accurate

S/N ratio	0–5 dB				5–10 dB			
Gender	M	F	M	F	M	F	M	F
Environment Noise	Music	Music	No Music	No Music	Music	Music	No Music	No Music

Figure 2.4-2. Proposed Experimental Design for RATS

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method of checking the correctness of a speech detection algorithm, or for comparing two or more candidate methods. The location of the speech endpoints in the presence of high-level noise becomes a complex task even for experienced phoneticians. The commonly used manual method consists of a rough approximation, followed by a more precise endpoint location with acoustical and visual assistance. The BAA specifies that the Technical Area 2 team collect and annotate audio files which will be annotated at each 200 ms segment of the audio. This represents a significant research challenge as the current state of the art of manual or semi-automatic annotation of speech segments is at the 500 ms level. This challenge has a significant impact on the development of the experimental design for evaluating the algorithms developed by Technical Area 1 teams for RATS. SAIC proposes to work with the Technical Area 2 team to determine the level of segmentation that will be delivered and adapt the evaluation design as required if the BAA level of segmentation is not realized.

Previous Evaluations of SAD technologies typically were evaluated over various dimensions of interest but very few have the SNR level specified in the BAA. The RATS BAA specifically asks for the data to be collected in environments where the signal to noise ratio (SNR) is less that 10 dB. SAIC believes that it is important to also measure the effect of the noise over previously investigated dimensions such as gender and type of noise. The experimental design proposed will allow for an understanding of the possible interactions of these dimensions and the overall performance.

2.4.1.3.2 LID. Language identification detection is the process of determining if a language is spoken in voice stream and determining which language is spoken from a set of given languages. The techniques typically used in LID algorithms are based one or a combination of the acoustic or acoustic-phonotactic or lexical or prosodic information.

Some of the known problems with past LID evaluations occur in testing across genders, similar languages, collection environments, and in selecting language when non-native speakers are in the audio. Previous evaluations have also experimented with both open and closed sets of languages. Previous Evaluations of LID technologies typically have not been at SNR level specified in the BAA.

As was proposed for SAD, SAIC believes that it is important to also measure the effect of the noise on LID over previously investigated dimensions such as gender and type of noise. The experimental design proposed will allow for an understanding of the possible interactions of these dimensions and the overall performance of the LID algorithms and allow more accurate estimation of effectiveness in operational environments and scenarios.

2.4.1.3.3 SID. Speaker identification detection is the procedure of capturing and processing a speech signal and automatically recognizing the speaker. The dominant technique used in speaker identification is based on the use of Mel Frequency Cepstral Coefficients (MFCC) extracted from the power spectrum as representation of the vocal track and GMM for modeling and classification.

There are many factors or dimensions when considering SID evaluation. These include speech quality, speech modality, speech duration, and speaker population. The presence of background noise severely degrades the performance of speaker identification detection algorithms.

As was proposed for SAD and LID, SAIC believes that it is important to also measure the effect of the noise on SID over previously investigated dimensions such as gender and type of noise. The experimental design proposed will allow for an understanding of the possible interactions of these dimensions and the overall performance of the SID algorithms.

2.4.1.3.4 KWS. Keyword (or word) spotting refers to a proper detecting of any occurrence of a limited number of keywords that would most likely express the intent of a speaker, rather than attempting to recognize every word in an utterance. A critical issue in keyword spotting is the modeling of the non-keyword portions.

As was proposed for SAD, LID and SID, SAIC believes that it is important to also meas-

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ure the effect of the noise on KWS over previously investigated dimensions such as gender and type of noise. The experimental design proposed will allow for an understanding of the possible interactions of these dimensions and the overall performance of the KWS algorithms.

2.4.1.3.5 MOPs vs. MOEs. The RATS program seeks to develop technologies in which there will be significant interest among possible transition partners. To facilitate the transition process, SAIC proposes to supplement the Measures of Performance (MOPs) that are the fundamental metrics of the program with Measures of Effectiveness (MOEs) that will more clearly demonstrate the potential of RATS technologies in operational environments. Complete, end-to-end measurement of MOEs is out of scope for Technical Area 3, so SAIC proposes a low-risk and low-cost alternative in which we will combine relevant MOP results with specific operational scenarios to estimate MOEs. Such estimates will be based on clear assumptions about missions and resources and will include confidences levels of predicted performance that will allow potential transition partners to understand the likely impact of RATS technologies.

An example scenario could be based on the HPCP intercept described in Section 2.4.2.1. The full scenario would include a number of operationally relevant factors such as the number of hours of traffic recorded per day, the number of linguists available, the rate of translation of raw audio, and the performance of linguists on large audio streams (which can be estimated from the data collection task). It would include a mission—for example detection of a series of targeted individuals and keywords relevant to a counter-IED mission. These scenarios would align with those used during evaluation, so that data and results would be directly applicable.

Overall MOE performance would be calculated based on the end-to-end relevant MOPs. The overall MOPs would in turn be estimated by joint probabilities, with limited end-to-end testing to validate the assumptions. For example, the end-to-end probability of detecting speech and speaker can be expressed as:

$$P(SID \cap SAD) = P(SAD) * P(SID \mid SAD)$$

Where P(SID) and P(SAD) are the probabilities of correctly identifying speaker and speech, respectively, for a given audio sample. We can estimate P(SID | SAD) from the measured results on P(SID), but this estimate will be inaccurate. By doing limited end-to-end testing, we can provide both a more accurate performance estimate and a confidence interval around that estimate. Certain tipping-and-queuing scenarios would require correct identification of speech, language, and speaker, introducing additional challenges to the overall performance estimates that should be addressed through limited end-to-end testing.

From estimates of end-to-end MOPs, MOEs of operational interest such as % reduction in translator effort/unit of audio and % of total targets correctly identified can be estimated from simple workflow models and scenario parameters. Similar approaches have been demonstrated successfully in RDEC and other related IC programs to estimate mission impacts from performance measures.

2.4.1.4 Conducting Evaluations

2.4.1.4.1 Phase 1 Evaluation. The Evaluation team proposes a flexible design for Phase 1 evaluation that will adapt to the progress achieved by algorithm designers, in the event their systems are not fully implemented by the BAA schedule ("6 weeks before the end of each phase"). This flexible approach, along with our planned early implementation of the Evaluation Framework and Evaluation Specification, will prepare us to execute phase 1 evaluations at any time after month 12, allowing algorithm developers capable of meeting phase milestones early to be tested whenever they are ready. Previous integration with the Evaluation Framework (section 2.4.3), and successful completion of dry run evaluations, will be used to increase the likelihood that the end of phase integration will proceed smoothly, and support from our integration team will be provided to deal with any unanticipated challenges during this critical period. SAIC will confirm successful integration by running a limited set of tests, automatically verifying results against developer-reported results on a subset of the

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training data and hand-verification of results on a limited subset of evaluation data.

The evaluation itself will consist of a series of runs based on our experimental design (section 2.4.1.2).Using the results from each run, SAIC's evaluation framework will automatically compute both overall and cross-dimensional results for the program metrics, including ROC/DET curves and confidence intervals. These detailed results will serve as the basis for our analysis and results reporting. As part of the automated analysis, SAIC will create confusion matrices for languages, speakers, and keywords that will help identify strengths and weaknesses of different algorithmic approaches and identify opportunities for improvement in phase 2 and beyond.

SAIC will conduct separate tests of LID and KWS using data from speakers that were not part of the training set. We will either include or exclude these results from aggregate measures of LID and KWS performance based on guidance from DARPA. Results from these open set tests will allow us to determine the dependence of LID and SID performance on previous exposure to specific speakers—a critical consideration in future classified testing as well as potential operational use.

2.4.1.4.2 Phase 2 and 3 Unclassified Evaluation. The Evaluation team will conduct the Phase 2 and Phase 3 unclassified evaluations at the same unclassified laboratory facility used in Phase 1 testing. Algorithm developers will be expected to train SAIC evaluators on the use of their systems, especially in the areas of training on speakers, and entry of keyword lists, no later than eight weeks prior to the end of phase 2 in order to prepare for testing on classified data.. We anticipate a 2-day training period per system, though more or less may be necessary depending on the degree of familiarity gained during Phase 1 and the number of changes since those tests. SAIC will repeat the testing conducted in previous phases with new data not previously encountered by Technical Area 1 systems. In addition to testing SAD, LID, SID, and KWS as in Phase 1, SAIC will train algorithms to recognize new speakers and keywords and evaluate performance on SID and KWS in such scenarios. This will determine the "trainability" of algorithms—critical for understanding results from classified evaluations where speakers and keywords cannot have been part of the training data.

2.4.1.4.3 Process for Shifting from Unclassified to Classified Evaluation. During Phases 2 and 3, SAIC will conduct classified testing using the same methodology for evaluation as the unclassified testing, executing testing in a sensitive compartmented information facility (SCIF) using classified data provided by the government and previously annotated by SAIC translators (see section 2.4.2.4 for details on annotation).

SAIC has extensive experience in shifting evaluations from unclassified to classified environments. During the RDEC program, SAIC conducted evaluations of over 40 different technologies that moved from unclassified to classified environments and data. We have developed a streamlined process to facilitate the transition—a process we propose to leverage on RATS.

Our process is based on the right combination of staff, policies, and control of the environment. For smooth transitions, it is critical to have all key staff members fully cleared and able to work on the high as well as the low side, as we do. This eliminates potential down time for training that can be very costly in classified environments. Policies must be in place to satisfy all security requirements so that there are no disruptions due to security violations or other problems. Most importantly, the unclassified environment must mirror the classified environment as closely as possible, minimizing the risk of unexpected integration problems inside the SCIF. The Evaluation Team will ensure consistency of the environment by using a single configuration of the Evaluation Framework in both unclassified and classified environments. The Evaluation Framework will reside on paired high-end server systems, one for the high-volume Speech Activity Detection (SAD) metric, while the second server system will focus on the smaller data-sets associated with Language Identification (LID), Speaker Identification (SID), and Key Word Spotting (KWS) testing. There will be separate but identically configured pairs for unclassified and classified testing. The

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configuration of these systems will include removable hard-drives in order to support multiple possible operating systems (e.g. Linux and Windows) and transfer of pre-loaded software into classified environments. If algorithm developers' solutions include hardware, their systems will connect to the Evaluation Framework servers through a LAN connection.

SAIC has a wide variety of SCIF spaces available for use in RATS evaluations. We have specifically identified our own classified laboratory facility at the 4001 North Fairfax Drive, Arlington VA (CAGE Code 0PSG0) as the preferred location for RATS due to its proximity to DARPA, our familiarity with the security protocols and procedures, and the availability of storage space for RATS equipment and data. However, in case of difficulties establishing a Co-Utilization Agreement (CUA) with the current certifying authority for this SCIF (Air Force Research Laboratory), SAIC has identified multiple potential backup sites. Further details on our security approach are described in our draft security plan in Appendix B.

2.4.2 Data

Equally critical to evaluation methodology is the proper treatment and handling of data. SAIC will work closely with the Data Collection team to assure that collection and annotation protocols support planned research and evaluation goals while maximizing the operational relevance of RATS technical progress.

2.4.2.1 Scenario-driven evaluation design

SAIC believes the most effective way to focus evaluation is to develop a set of operationally relevant scenarios based on notional concepts of operations (CONOPS), using these scenarios as the basis for the selection of evaluation data, performance tasks, and subsequent analysis. SAIC will develop several scenarios at the start of Phase 1, drawing on a broad set of experts with experience in the operational use of speech analysis technology within DOD and the IC from across the company. The completed scenarios will be presented to DARPA, and based on their recommendation scenarios will be selected for use.

SAIC will work closely with the Data Collection team during their design process to communicate these primary scenarios and encourage them to tailor the collection design to emphasize the scenarios. One potential issue is that it may not be possible for the Data Collection team to collect all data in a manner consistent with the scenarios. In this case, SAIC will recommend that the test data of the test/training partition include sufficient relevant data to support scenario-based testing and analysis. SAIC will further recommend that a subset of the training data with similar characteristics to the test partition be created and labeled for the algorithm developers, allowing them the opportunity to learn specific and interesting characteristics of the scenario-based data while using the remainder of the training data for overall task learning and as background material.

Figure 2.4-3 illustrates potential operationally relevant scenarios and some of the considerations for data collection related to their use.

2.4.2.2 Data Partitioning

The Evaluation Team proposes that it work closely with the Technical Area 2 team to characterize all of the data produced and ensure that the training data characterization is similar to the evaluation data. This should allow for consistent evaluation to be conducted during devel-

Scenario	Network Characteristics	Length	# Languages / Speakers	Noise Sources / Recording considerations
High power cordless phone intercept	Full duplex, analog	Variable, short	1–2 / 2 - 4	Interference, variable signal, background voice, background noise
Cell phone intercept	Full duplex, digital	Variable, short	1–2 / 2 - 4	Interference, variable signal, background voice, background noise (including vehicle)
Radio intercept	Half duplex, analog	Variable, short	1–2 / 1 - 6	Interference, variable signal, background voice, background noise (including vehicle)
Covert microphone	Simplex	Variable, long	1–5 / 2–20	Varying distance from recording, background voice, background noise
Radio broadcast monitoring	Simplex, analog	Regular, long	1 / 1	Interference, interruptions

Figure 2.4-3. Potential Operationally-Relevant Scenarios

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opment by the Technical Area 1 teams and during independent evaluation by the Technical Area 3 team. This characterization will include but is not limited to the dimensions outlined in section 2.4.1.2. The Evaluation Team will use this characterization of the audio to create evaluation audio files that have certain characteristics to support the factorial experimental design. This process will allow the Evaluation Team to provide a comprehensive set of performance and the analysis of variance testing on the Technical Area 1 systems and provide DARPA with criteria for decision making at the end of each phase.

SAIC proposes that the Technical Area 2 team isolate a set of data that Technical Area 1 team will not have access prior to Phase 2 evaluation. In addition to the planned 10% of data for evaluation, this data will include all data from one of the 15 languages, all data from small set of speakers, and a set of keywords not provided for training to the Technical Area 1 teams. This will allow the Evaluation Team to conduct measurement on the time and skills needed for independent analysts to train Technical Area 1 algorithms in language, speaker and key words. This experience will also enable the Evaluation Team to conduct rehearsals for the evaluation of the classified audio where it is anticipated none of the speakers and key words will be previously available to the Technical Area 1 or Technical Area 2 teams.

2.4.2.3 Annotating Classified Data Consistently with Unclassified Data

A critical aspect of successful classified evaluation is the availability of classified data that is annotated in a manner consistent with that of the unclassified data used for algorithm development. Without such consistent annotation, it will be impossible to generate evaluation results that can effectively demonstrate and measure the capabilities of RATS technologies.

SAIC has identified trained, cleared linguists available to annotate the classified data sets. To achieve consistency with the unclassified data, SAIC proposes to have these linguists perform limited annotation of unclassified data using the tools and processes of the Technical Area 2 performer. SAIC recommends limited testing of inter-rater consistency of our annotators with those of the Technical Area 2 performer to identify any potential biases or other issues with their annotations. After producing limited amounts of unclassified training data, SAIC's annotators will work in our classified facilities to annotate the classified data in preparation for Phase 2 and 3 evaluations.

2.4.3 Evaluation Framework

The Evaluation Framework was initially developed under the DARPA Machine Reading program. SAIC proposes to re-use the code base already developed as the core of the RATS Evaluation Framework. The framework provides basic capabilities common to many evaluation tasks such as serving test data, scoring, recording results and generating reports. On top of the core services, RATS specific components such as a custom scoring engine, appropriate GUIs and reporting will be built.

The framework has a component based architecture which supports development of customized data retrieval and scoring engine modules. For RATS the scoring engine will be modified to score results using the relevant metrics by comparing system output to ground truth and the data retrieval modules will be customized to serve the audio samples for each test. The Visualization component will be used by evaluators to aid analysis and reporting and by researchers during the training phase to gauge system progress.

2.4.3.1 Concept of Operations for an Evaluation

Evaluations will occur using the RATS evaluation platform. The evaluation platform is a SOA solution providing test data sets, scoring, metric calculation, results logging and visualization as detailed in **figure 2.4.3.1-1**.

The RATS Evaluation Framework exposes several interfaces with which RATS systems will be required to interact during the evaluation, including audio sample retrieval and metric scoring. All interfaces are available over both SOAP and REST protocols to allow the widest possible range of clients to connect and make use of the framework. XML Schemas defining request and response formats will be provided early in the first phase to allow system developers ample time to integrate with the framework.

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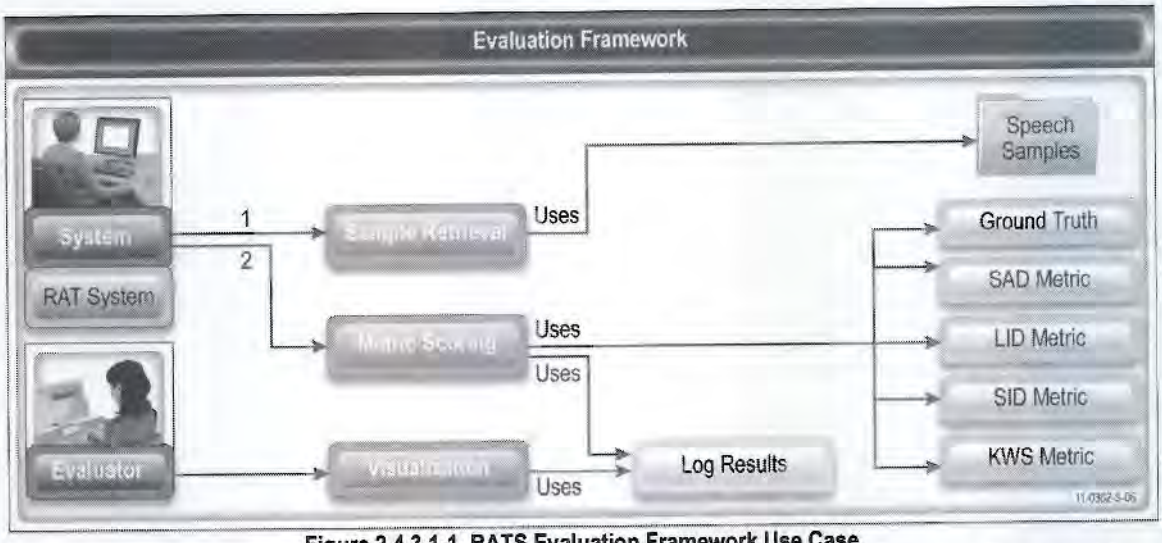

Figure 2.4.3.1-1. RATS Evaluation Framework Use Case

Evaluation begins with the system under test (SUT) making connection with the evaluation platform via an HTTP request to retrieve a test plan. The evaluation platform will reply with a set of URIs used to retrieve audio sample files for that test along with speaker sets for SID and a set of keywords for KWS.

The SUT will process the samples included in the test manifest, generating a result matrix for each task which it will submit to the scoring engine. A scoring report will be generated and returned to the SUT.

Once scoring is complete a results log is generated and stored in a database of results. The visualization component uses the results log to provide a GUI (**figure 2.4.3.1-2**) for navigating a system's performance over an audio sample. The GUI allows any user running the platform, evaluator or researcher, to view performance over arbitrary segments of the test sample including all metrics and a graphical representation of P_{miss} and P_{fa} over each speech event.

2.4.3.2 Evaluation Framework Architecture

The evaluation system components interact with each other and the system under test (SUT) to execute, record, and score evaluations of unclassified or classified audio data (**figure 2.4.3.2-2**).

Evaluation System GUI. When results are provided by the system under test, the Progress Display functionality will show the audio being processed, the results of the algorithm processing, ground truth value and incremental scoring. The Results Display functionality provides an interface for reports summarizing scoring of algorithm results across multiple tests, types of tests, algorithm team, and historical results.

Audio File Server. Control of test execution is managed through this component, in response to requests from the system under test. Data will be supplied to system under test as URIs to the files containing the samples in the test. Files supplied for test will be in the same format as those supplied as training data at the beginning of the phase. This component responds to requests from the system under test to control test execution, for example, requests for the next test to be initiated. Once the system has processed all data in the test it can then send its complete result set to the scoring engine for processing.

Scoring Engine. The scoring engine is activated by a call from the system under test when it has completed processing the samples provided by the audio file server. The SUT will send with the request a matrix for each test metric with results by segment, along with time stamps indicating start and end of processing time. This will support testing of latency requirements described within the FAQs for RATS. The engine will calculate the results of each metric over the sample set by comparing system results to annotated ground truth, then save results into a database which is used by the progress display GUI.

Data Preparation. SAIC will develop several tools for processing the data sets supplied by the Data

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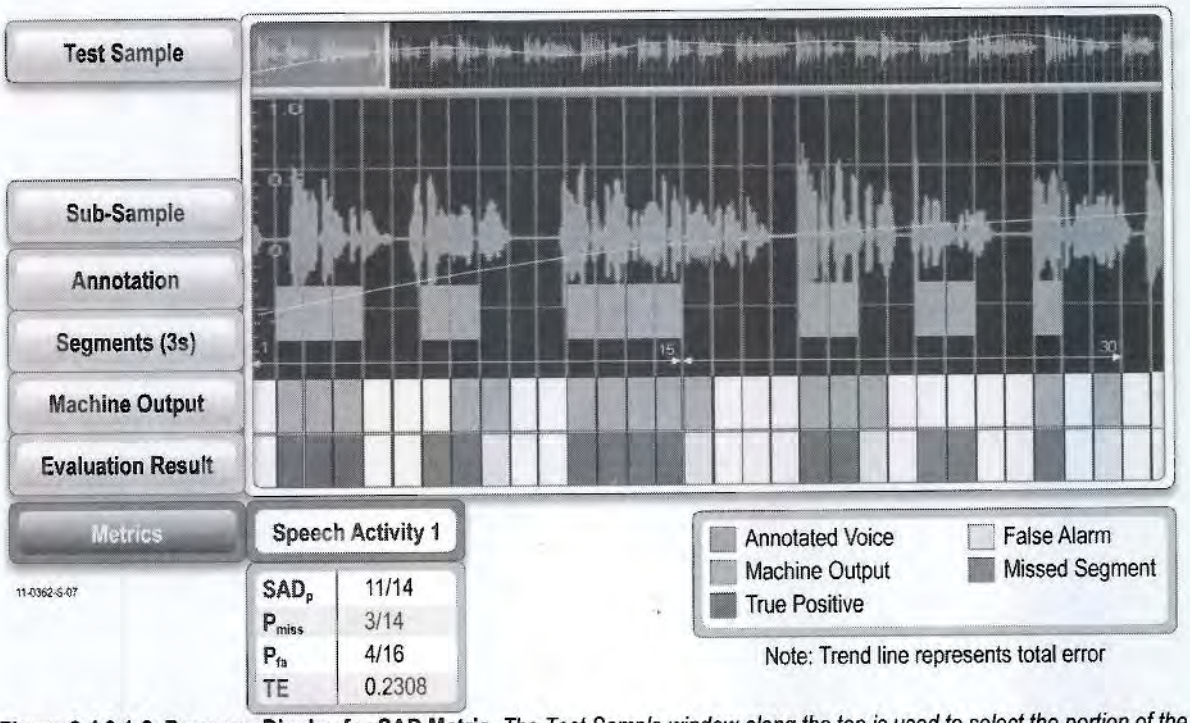

Figure 2.4.3.1-2. Progress Display for SAD Metric. *The Test Sample window along the top is used to select the portion of the sample to be viewed. Note that all metrics can be selected by a user for display on a similar GUI*

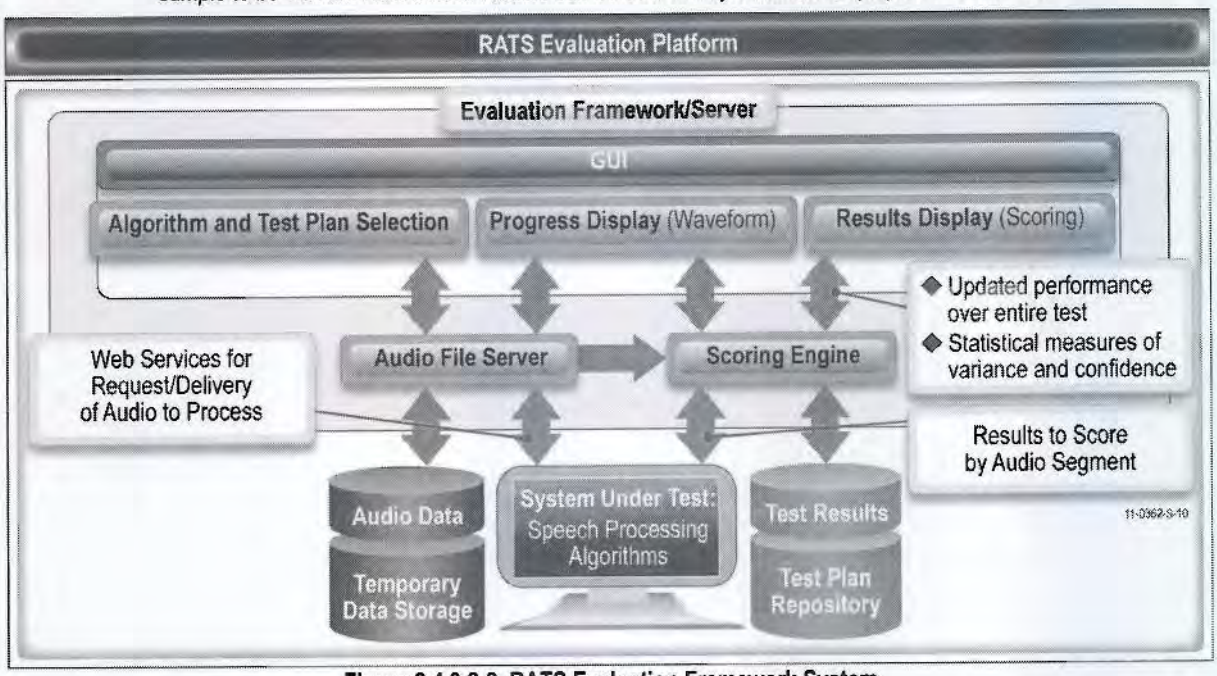

Figure 2.4.3.2-2. RATS Evaluation Framework System

team. These include Test Plan Generation tools to simplify preparation of evaluation test plans and relevant sample sets, audio file conversion tools for preparation of the data for ingestion by the system under test, and ground truth extraction and for determining and building a database of the characteristics of the datasets.

2.4.3.3 Component Development Plan

SAIC brings an existing evaluation framework code base to RATS Evaluation system devel-

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opment representing approximately 55% of the capability needed to support the program (**figure 2.4.3.3-1**). This framework already supports a highly automated, loosely coupled, services-based model for providing evaluation data to a set of heterogeneous systems under test. We plan to extend this framework to handle large audio data sets, score the results of speech processing, and provide the graphical display of results.

Figure 2.4.3.3-1. Approximate Percent Completion of the RATS Evaluation Framework

These components will interact to allow the evaluation user to select a test scenario and test data set, execute the test, observe progress during execution, and then report trends and comparisons between algorithms. Required to support these capabilities is integration with third-party code libraries developed for the various audio file representation formats that may be needed by the speech processing algorithms.

The first components to be extended will be the Test Plan Selection GUI and the Audio File Server. The Audio File Server is anticipated to be required to support audio header and data file processing supporting functions as described in **figure 2.4.3.3-2**.

Next will be implementation of the interface for the SUTs to report results to the evaluation system. These results will be scored on an ongoing basis by the Scoring Engine and displayed by the GUI as the Progress Display. Results will be stored and maintained in a database by the Evaluation system both during and after test plan execution, to allow for interruptions and restart of tests by the SUTs. This capability to stop and restart test execution from intermediate steps is made necessary by the quantity of audio data needed to provide statistically significant scoring results, and by the necessarily limited evaluation timeframe at the end of each phase. The final results will be accessible through a Results Display, a tabular presentation comparing algorithm performance against prior evaluations, or against other algorithm result.

Compression / Decompression	
Header Extraction	Formats including NIST SPHERE with self-describing file header specifying number of samples, the sampling rate, the number of channels, and the kind of sample encoding, as well as whether the speech data are compressed or not
Decompression	Utilities for lossless compression /decompression, ratios up to 2:1 on 16-bit audio files
Manipulation and Extraction	
Selection Extraction	Manipulate SPHERE files (compress or uncompress using shorten, read or modify header contents, remove the header, extract portions from waveform files, de-multiplex two-channel files, etc).
Selection of Sampling Rate, Channels	Single or dual channel, 16-bit PCM or 8-bit mu-law, any sampling rate. Options for controlling output include conversion of mu-law data to PCM, selecting one channel from a two-channel input file.
Waveform, Sample Rate Conversion	Provide alternative file formats (AU, AIFF, and more) and changes in sampling rate, etc.

Figure 2.4.3.3-2. Table of Audio Data Processing Algorithms to be Implemented

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2.5 Comparison with Current Technology

The RATS program intends to advance the state of the art in speech analysis technology in three distinct areas: performance in noisy environments, individual performance levels for detection, language and speaker identification, and keyword detection, and overall end-to-end system performance. Achieving the RATS BAA performance metrics will represent a significant advancement in the state of the art for each of these technologies, particularly within a noisy environment. The resulting high performance, end-to-end system would allow DARPA's customers to seriously consider utilization of speech analysis technology for tipping and cueing in intelligence analysis. If that performance can be expressed within the language of MOEs relevant to the operational community for the RATS program can have a significant impact on the overall effectiveness of many collection and analysis efforts.

The evaluation approach proposed by SAIC builds on previous evaluations in Speech Detection. RATS Technologies (SAD, LID, SID and KWS) have been evaluated in various forms for the past 50 years. Some of the earliest advancements in voice activity compression and voice activity detection occurred in telephony and was spearheaded by Bell Labs[1]. Evaluation of these technologies in the US continued at Texas Instruments (TI) in 1981 and since 1984 have been spearheaded by NIST[2] in its Rich Transcription[3] (RT) Speech Activity Detection[4] (SAD) series, Language Recognition Evaluation[5] (LRE) series, Speaker Recognition Evaluation[6] (SRE) series and Spoken Term Recognition[7] (STR) series. The Computer Sciences Laboratory for Mechanics and Engineering Sciences[8] (LIMSI) in its project CHIL – "Computers in the Human Interaction Loop" has included both SAD and SID technologies in its CLEAR 06 and 07 Workshops.

NIST's Rich Transcription (RT) evaluation series promotes and gauges advances in the state-of-the-art in several automatic speech recognition technologies including SAD. NIST began working in the area of Automatic Speech Recognition (ASR) in 1984, before DARPA's Speech Recognition program, with the development of quantitative measures of performance for ASR. NIST published its first benchmark tests in the Proceedings of the Speech Recognition Workshop sponsored by DARPA in February 1986. In 2003, NIST implemented the first tests in the DARPA Effective, Affordable, and Reusable Speech-to-text (EARS) Program. The goal of this DARPA Program is "Rich Transcription" – providing not just a text stream, but a rich transcript that includes metadata - as the output of an ASR system. The focus of the EARS efforts are on both Broadcast News and Conversational Telephone-based Speech (CTS), for English, Chinese, and Arabic

The latest SAD efforts at NIST was conducted in 2005 and 2006 Spring Meeting Recognition efforts. The evaluation techniques for SAD in this most recent series include the same performance measures as defined the RATS BAA as well as detection cost functions defined as a weighted sum of the False Alarm and Missed probabilities. The method for analysis has been predominantly through ROC curves and DET curves. The CHIL efforts in SAD were largely in support of the NIST RT effort and used the same evaluation metrics as NIST as well as Mismatch Rate (MR), Speech Detection Error Rate (SDER), and Non-Speech Detection Error Rate (NDER). Audio Segmentation for SAD has been addressed differently over the years but most recently appears to be in the sub second level of granularity and consistent with the segmentation proposed in the RATS BAA. The metrics and segmentation in this proposal are consistent with the NIST past SAD evaluation efforts but build and extend those efforts to emphasize measurements of interest to potential operational users. The proposed experiment design will provide DARPA with a better understanding of the interaction effects which may exist between gender, type of noise and level of noise in detecting speech activity.

NIST's Language Recognition Evaluation (LRE) series was established to baseline the performance capability of language recognition of

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conversational telephone speech. It started in 1996 and has been ongoing to the present starting in 2003. The NIST LRE task is defined as given a segment of speech and a language of interest to be detected (i.e., a target language), to decide whether that target language was in fact spoken in the given segment (yes or no), based on an automated analysis of the data contained in the segment. This is essentially the same task as outlined in the LID portion of BAA. The latest evaluation metrics in LRE are the same as outlined in the RATS BAA and they include detection cost functions defined as a weighted sum of the False Alarm and Missed probabilities for LID. The predominant analysis approach for LRE has been both ROC and DET curves like SAD. Speech Segmentation has been addressed by looking at different durations of test conditions of 3, 10 and 30 seconds. The metrics and segmentation in this proposal are consistent with the NIST efforts in LID as well as providing DARPA with a look at the interactions between the dimensions of interest. The proposed evaluation framework in this proposal allows the flexibility of building paired language, open set, and closed set testing of LID based on operationally relevant scenarios using the segments produced for RATS.

SID has been addressed by NIST in its' Speaker Recognition Evaluation (SRE) series, which was started in 1997 and has run continuously since. The goal of the SRE series is to contribute to the direction of research efforts and the calibration of technical capabilities of text independent speaker recognition. In the 2010 Evaluation plan for SRE, NIST defines the performance metrics in a manner similar to the RATS BAA and also includes the detection cost function similar to the one defined for SAD and LID. The CHIL efforts in SID were largely in support of the NIST RT effort and used the same evaluation metrics as NIST as well as Mismatch Rate (MR), Speech Detection Error Rate (SDER), and Non-Speech Detection Error Rate (NDER). The SAIC approach investigates the interactions between the dimensions as well the mix and matching of various speakers supported by the evaluation framework, allowing for realistic operational simulations.

KWS is addressed by NIST in its' 2006 Spoken Term Detection (STD) project. This project is an open evaluation series of technologies that search vast, heterogeneous audio archives for occurrences of spoken terms in three languages: Arabic, English, and Mandarin. The evaluation used three different audio sources: Conversational Telephone Speech, Broadcast News and Conference Room Meetings.

In this evaluation, basic detection of performance was characterized using detection error tradeoff (DET) curves of miss probability (P_{Miss}) versus false alarm probability (P_{FA}). In this evaluation plan, they provided a unique definition of trials as a function of the amount of speech in the audio file. As in the other technologies, NIST defined two overall system detection performance metrics (Occurrence and Term) as a cost function of the False Alarm and Missed probabilities. These cost functions were used to discriminate the performance for spurious detection and term specific performance. This proposal provides consistent metrics with prior work as well as diagnostic analysis of the experiment design for improved performance.

SAIC's experience with both the Intelligence Community and DOD customers will allow us to estimate Measures of Effectiveness that will be vital for future transition opportunities and the overall success of the RATS program.

1 G. R. Doddington and T. B. Schalk, "Speech recognition: turning theory into practice", IEEE Spectrum, Vol. 18, #9, pp.26-32, Sept. 1981.

2 D. S. Pallett, "Performance Assessment of Automatic Speech Recognizers", Journal of Research of the National Bureau of Standards, Vol. 90, #5, Sept. – Oct. 1985.

3 National Institute of Standards and Technology, NIST Rich Transcription Evaluations. WWW-site, http://www.itl.nist.gov/iad/mig/tests/rt/

4 National Institute of Standards and Technology, NIST Language Recognition Evaluations. WWW-site, http://www.itl.nist.gov/iad/mig//tests/lre/

5 National Institute of Standards and Technology, NIST Speaker Recognition Evaluations. WWW-site, http://www.itl.nist.gov/iad/mig/tests/sre/

6 National Institute of Standards and Technology, NIST Speaker Recognition Evaluations. WWW-site, http://www.itl.nist.gov/iad/mig/tests/sre/

7 National Institute of Standards and Technology, NIST Spoke Term Recognition Evaluations. WWW-site, http://www.itl.nist.gov/iad/mig//tests/std/

8 Laboratoire d'Informatique pour la Mécanique et les Sciences de l'Ingénieur, Spoken Language Processing Group, WWW site, http://www.limsi.fr/Recherche/TLP/bibsearch.cgi?keyword=speaker

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2.6 Statement of Work

The goal of RATS Technical Area 3 is to construct an evaluation framework to measure the performance of the algorithms developed in Technical Area 1 against DARPA-defined metrics.

SAIC will leverage our existing DARPA Machine Reading Program evaluation framework and materials to provide a high quality, efficient solution that supports research progress and fair, comprehensive, accurate evaluation. The SAIC evaluation team will work collaboratively with the Technical Area 1 and 2 teams to define a research environment and develop the evaluation framework to facilitate the independent execution of evaluations. Our integrated approach with the Technical Area 2 data collection task assures smooth integration of data sources into evaluation framework/execution.

The program statement of work is organized into three phases, with Phase 1 as the base task and Phases 2 and 3 as options. The SAIC Evaluation Team will design and apply an evaluation process that measures the progress of the Technical Area 1 Development Teams during each phase of the program.

Scope

This statement of work lists the tasks identified for the Evaluation Team in Phase 1, with tasks for Option Phases 2 and 3, where appropriate. We further describe the implementation of these tasks in the Technical Approach (Section 2.4), and the Work Breakdown Structure (WBS) with milestones and duration of these tasks in Section 2.8. We describe management tasks in the Project Management and Interaction Plan (Section 2.10).

SAIC is the primary organization responsible for each task defined for Technical Area 3, Evaluation. Our consultant, Dr. Paul Cohen, is a subject matter expert on the design and execution of evaluations and will provide an independent peer review on the evaluation activities described herein.

During each phase, SAIC provides the algorithm developers with the evaluation framework. This approach allows the developers and/or SAIC to support informal test runs to identify progress and issues during the algorithm development stage and allows the SAIC evaluation team to refine evaluation methodology and metrics.

At the conclusion of each phase, SAIC will perform evaluation of each Technical Area 1 system using a data set that has been sequestered from Technical Area 1 teams. The evaluation methods will be the same in each phase, scenario-focused data supplied by the Technical Area 2 Team to represent real-world operational scenarios. SAIC will develop several potential scenarios at the start of Phase 1 and work with DARPA to determine the final set for use in the evaluation activities. As described in Section 2.4, we propose a flexible approach that will adapt the Phase 1 evaluation to the progress achieved by algorithm designers.

During Phase 1, we anticipate initial delivery of data from the Technical Area 2 performer during month 6 and drops at regular intervals until the final evaluation period commences. In addition, starting at the end of Phase 2, the SAIC Evaluation Team will perform secondary evaluations using classified "real world" data provided as Government Furnished Information (GFI). The proposed SAIC personnel and facilities are cleared to the SCI level. Our extensive Intelligence Community (IC)/Classified experience assures relevance and assists DARPA with providing access to required facilities and personnel to conduct evaluations.

2.6.1 Develop Evaluation Specification Document

The development of the Evaluation Specification Document is defined below. **Figure 2.6-1** identifies the task by WBS reference 1.1.1, the dependencies and exit criteria and definition of task deliverables.

Objective. To define the evaluation environment including processes and procedures and assure test integrity, fidelity, and interoperability.

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Task	Task	Task Duration	Depends On	Exit Criteria (product, event, milestone)	Deliverable
1.1.1	Develop Evaluation Specification	6 Months	Contract award	Initial draft, reviews and updates as required. Final Document delivered	Draft Evaluation Specification Document Final Evaluation Specification Document

Figure 2.6-1. Develop Evaluation Specification Document

Approach. The Evaluation Team will consult with the Technical Area 1 and 2 Teams as it develops the Evaluation Specification Document. Specifics of the implementation of each evaluation will be defined including data, tasks, test protocols, and metrology. The specification document includes the evaluation methodology and identifies the data and graphical presentation format to be used to measure and display algorithmic performance and interface standards. SAIC will publish initial specifications and planning products for comment and review by the Technical Area 1 and 2 Teams with final review and approval of the Evaluation Specification Document from the DARPA PM. We will refine and publish the specification and metrics, as necessary. For Phases 2 and 3, we will update, review, and publish the Evaluation Specification Document to reflect the goals for the specific phase, revised metrics and lessons learned from previous phases.

Benefit of SAIC's Approach. Collaboration with the Technical Area 1 and 2 Teams and timely publication and updates will assure system interoperability in the final test environment.

Definition of Task Deliverables. Evaluation Specification Document

The evaluation specification document will describe the data, tasks, test protocols, metrology and interface requirements associated with evaluations. The document will include a description of the data and graphical presentation format to be used to measure and display algorithmic performance.

2.6.2 Develop Evaluation Framework

The Evaluation Framework development activity includes design and development of the evaluation framework and development of customized interfaces as described in Section 2.4.1. **Figure 2.6-2** identifies the task by WBS reference 1.2, the dependencies and exit criteria and definition of task deliverables.

Objective. Provide a flexible evaluation framework.

Approach. SAIC will work closely with the algorithm developers to develop an evaluation framework that supports algorithm developers in evaluating their own research progress, allowing efficient utilization of our code base across all program performers and minimizing the risk of integration challenges at end of phase evaluations. The evaluation framework is delivered at Month 6 to support development activities and can be refined to accommodate unique interfaces and changes up through month 11 of Phase 1. Additional capabilities and features can be added in Option Phases 2 and 3 as required.

SAIC will develop an evaluation framework, consulting with the Technical Areas 1 and 2 as we enhance the framework to accommodate additional languages and capabilities anticipated in Phases 2 and 3. We will refine the Evaluation Specification Document, as necessary, to finalize the description of the evaluation framework. For Phases 2 and 3, we will update, review, and publish the Evaluation Specification Document monthly to reflect changes as required.

Benefit of SAIC's Approach. The proposed evaluation framework can be leveraged to support research development and determine progress throughout all phases of the program and facilitate a realistic final evaluation conducted over the largest possible set of evaluation data.

Definition of Task Deliverables. Evaluation Framework (Version Release #).

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Task	Task	Task Duration	Depends On	Exit Criteria (product, event, milestone)	Deliverable
1.2.1	Design Evaluation Framework	2 Months	Decomposition of BAA Requirements and Collaboration with Technical Area Teams	Design Baseline complete	
1.2.2, 1.2.3	Develop and Deliver Evaluation Framework	4 Months	Framework Design	Framework available for Development Teams	Framework Version (Release #)
1.2.4	Customize Framework Interfaces	1 Month	Requirement to accommodate unique system interfaces	Customize d interfaces	
1.2.5	Refine Framework to accommodate required changes requested by developers in Technical Area 1	1 Month	New Requirements identified by the development team	Framework revision	
1.2.6	Configure Phase 1 Test bed	3 Days	Configure lab environment to facilitate testing	Test bed configured	Configuration Drawing included in *Evaluation Specification Document*

Figure 2.6-2. Develop Evaluation Framework

2.6.3 Evaluation Test Design

Evaluation Test Design activities include development of scenarios for data collection, collaboration with the Data Collection Team to plan and review data collection requirements; characterization and partition of test data and formal evaluation data. This approach ensures that data collection and data partitioning are aligned with program goals and planned evaluation protocols. **Figure 2.6-3** identifies the task by WBS reference 1.3, the dependencies and exit criteria and definition of task deliverables.

2.6.3.1 Develop Scenarios

Objective. Establish a context for data collection.

Approach. SAIC will develop a set of potential scenarios at the start of Phase 1, drawing on a broad set of experts with experience in the operational use of speech analysis technology within DOD and the IC from across the company. The draft scenarios will be presented to DARPA, and based on their recommendation primary scenarios will be finalized for use in the evaluations.

Benefit of SAIC's Approach. SAIC will utilize its experience and knowledge of likely operational scenarios motivating the RATS performance tasks to focus evaluation on problems of likely interest and to support DARPA in transitioning RATS technologies to operational users

Definition of Task Deliverables. The final set of selected scenarios will be included in the Evaluation Specification Document.

2.6.3.2 Collaborate with Data Collection Team [WBS 1.3.2, 1.3.3]

Objective. Establish the requirements for data deliverables

Approach. A Data Collection Planning meeting and periodic reviews will be held with the Data Collection Team to establish the requirements for data deliverables.

Benefit of SAIC's Approach. Establishing the collection and tagging specifications early in the program will assure that end of phase evaluation and Phase 2 and 3 classified evaluations are efficient and effective. An initial data drop and periodic deliveries will facilitate our ability to measure progress and refine the test specification and environment.

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Task	Task	Task Duration	Depends On	Exit Criteria (product, event, milestone)	Deliverable
1.3.1	Develop Scenarios	1 month	Start date	Operational Scenarios	Test Artifacts (Final Report)
1.3.2, 1.3.3	Collaborate with Data Collection Team	2 Face-to-face Meetings, 1 day each	Specifications, Operational Scenarios	Collection Requirements	
1.3.4, 1.3.5	Receive drops, Characterize Data, Partition Test and Evaluation Data	Intervals over an 8 month period starting at Month 6 in Phase 1	Receipt of annotated data (incremental deliveries starting in Month 6	Test data segmented from evaluation data. Data characterized.	

Figure 2.6-3. Split Test and Evaluation Data

Definition of task deliverables. The schedule and requirements for the Data Deliverables will be included in the Evaluation Specification Document.

2.6.3.3 Partition Test and Evaluation Data

The Partition Test and Evaluation Data activity includes receipt and verification of data and partition of test data and formal evaluation data.

Objective. Ensure that the partition of data between training and test sets supports scenario-based evaluation while being normalized across important dimensions.

Approach. SAIC will work closely with the Data Collection team, ensuring that the division of data between training and test sets is normalized across important dimensions while sequestering limited data on certain dimensions (speakers, keywords) to supports evaluation of the trainability of research algorithms.

Benefit of SAIC's Approach. This approach ensures that data collection and data partitioning are aligned with program goals and planned evaluation protocols.

Definition of task deliverables. All data artifacts used in the evaluations will be submitted with The Final Report

2.6.4 Conduct Evaluations

Evaluations are performed during each phase. **Figure 2.6-4** identifies the Phase 1 tasks by WBS reference 1.4, the dependencies and exit criteria and definition of task deliverables. **Figure 2.6-5** identifies the additional tasks necessary to conduct Classified Evaluations in Option Phases 2 and 3.

2.6.4.1 Perform (Unclassified) Evaluation

Objective. To assess progress, analyze performance and draw conclusions and recommendations.

Approach. SAIC will perform a final evaluation on each Technical Area 1 System at the end of each phase. The final version of an integrated system is delivered to the SAIC evaluation team as GFI 6 weeks before the end of the phase but 8 weeks is preferable to accommodate required training. The system will be baselined upon receipt "as delivered" through the Configuration Management Process. The SAIC Evaluation Team will work directly with each Algorithm Development Team to perform integration and training prior to final evaluations as required. A preliminary delivery of the system will allow for training before the final system delivery is required. It is expected that the Algorithm Developer Teams will assign resources to support the final training and integration activities. The SAIC Evaluation Team will evaluate the system in accordance with the methodology and technical framework documented in the Evaluation Specification Document and prepare a Final Evaluation Report at the completion of the test event.

Benefit of SAIC's Approach. Training and communication with the development team will promote a solid understanding of the algorithm before the evaluation tests are initiated.

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Task	Task	Task Duration	Depends On	Exit Criteria (product, event, milestone)	Deliverable
1.4.1	Perform Phase (n) (Unclassified) Evaluation	40 days	Final Systems are required 6 weeks before end-of-phase. Reports are due 2 weeks before end of Phase.	Final Evaluation Reports complete	Evaluation Reports
1.4.1.1 1.4.1.2	Receive preliminary and final systems for training	0 Days	Technical Area 1 systems delivered as GFI	Configuration Item number assigned (CM process)	
1.4.1.3	Integrate research algorithms with data and test framework, train system	15 days	Receipt of GFI (Technical Team 1 Systems)	System ready to test	
1.4.1.4	Evaluate Integrated Systems	19 days	Integration and training schedule	Test Complete	
1.4.1.5	Analyze Results and Prepare Report	6 days	Completion of evaluation	Results documented	
1.4.1.6	Deliver Report(s)	0 days	BAA Requirement (2 weeks before end of phase)	Report delivered	

Figure 2.6-4. Conduct Evaluations

Task	Task	Task Duration	Depends On	Exit Criteria (product, event, milestone)	Deliverable
1.4.2	Perform Classified Evaluations (N/A for Phase 1)	55 days	Authorization to perform Classified Test	Option Phases 2 and 3 Classified Evaluation Reports Complete	Classified Evaluation Report
1.4.2.1	Perform Security Planning and Documentation	7 days	Required Security documentation received from Technical Area 1 Teams	Security Plan complete	Security Plan
1.4.2.2	Transition equipment from Low to High	3 days	Approved configuration and receipt of classified data	Classified Test Range	N/A
1.4.2.3	Perform Security Audit	1 day	Government Security Compliance Testing Complete	Approval to conduct classified test	N/A
1.4.2.4	Annotate Data	1 month	GFI of Classified Data	Annotated Test Data	Classified Test Report /Test Artifacts
1.4.2.5	Train Systems	12 days	Receipt of systems	Systems ready to Test	N/A
1.4.2.6	Execute tests	18 days	Systems Ready, Data Ready	Test Results	Test Report
1.4.2.7 1.4.2.8	Analyze results and prepare report	12 days	Test Completion	Final Evaluation Report	Classified Test Report
1.4.2.9	Perform Security Sanitization Activities	1 day	Test Completion	Sanitized Lab	N/A

Figure 2.6-5. Conduct Classified Evaluations (Option Phases 2 and 3)

Definition of Task Deliverables. Final Evaluation Report.

The Final Evaluation Report documents progress, results, conclusions and recommendations from the evaluation activities. System

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2.7 Intellectual Property

In compliance with DFARS 252.227-7017 Identification and Assertions of Use, Release, or Disclosure Restrictions (June 1995), SAIC provides the following technical data or software rights assertions, including those of our proposed subcontractors.

2.7.1 Noncommercial Technical Data and Software Rights

Figure 2.7-1 indicates that noncommercial technical data with less than unlimited rights is not proposed for use on this contract. In addition, SAIC hereby provides notification that any software created during the life of any resultant contract will be delivered with unlimited rights. Should any of these assertions change, SAIC will inform the Contracting Officer and provide the justification for the restricted rights before delivering the software in question.

During performance of this contract, SAIC intends to modify its Evaluation Framework software that was developed previously under government contract for the DARPA Machine Reading program. In accordance with the data rights clauses of that contract, the government has unlimited rights in the software. Please note that the software does contain commercial third party code subject to various terms and conditions, which are identified in **figure 2.7-2** below.

Technical Data or Computer Software to Be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restriction
None	None	None	N/A

Figure 2.7-1. Noncommercial Technical Data

Technical Data or Computer Software to Be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restriction	Link to License Terms
Sun Java 1.6	Developed at private expense	Open-source license rights(SUN Binary Code License)	SUN Microsystems	http://java.sun.com/javase/6/jre-6u14-license.txt
HP Jena 2.6.0	Developed at private expense	Open-source license rights	Hewlett Packard	http://jena.sourceforge.net/license.html
ARQ	Developed at private expense	Open-source license rights	Hewlett Packard	http://jena.sourceforge.net/ARQ/license.html
ICU 3.4	Developed at private expense	Open-source license rights	IBM	http://source.icu-project.org/repos/icu/icu/trunk/license.html
IRI	Developed at private expense	Open-source license rights	Hewlett Packard	http://jena.sourceforge.net/iri/license.html
xercesImpl.jar	Developed at private expense	Open-source license rights	Apache Foundation	http://www.apache.org/licenses/LICENSE-2.0
Xml-apis.jar	Developed at private expense	Open-source license rights	Apache Foundation	http://www.apache.org/licenses/LICENSE-2.0
Apache Ant	Developed at private expense	Open-source license rights	Apache Foundation	http://ant.apache.org/license.html
NIST Sphere (audio file headers)	Developed at private expense	Open-source license rights	NIST	http://www.itl.nist.gov/iad/mig//tools/sphere_26atarZ.htm
Shorten(decompression)	Developed at private expense	Open-source license rights	Softsound Ltd	http://www.etree.org/shncom.html
SoX(conversion utilities)	Developed at private expense	Open-source license rights		http://sox.sourceforge.net/

Figure 2.7-2. Commercial Computer Software with Less Than Unlimited Rights

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2.9 Personnel, Qualifications, and Commitments

2.9.1 Personnel and Commitments

Richard La Valley is selected as the Principal Investigator (PI) of the SAIC RATS Evaluation Team for his experience in designing and executing evaluations for advanced technology programs and analysis of tools in classified environments. Mr. La Valley is proposed as key personnel on this program. He will be supported by Matthew Reardon, as Program Manager (PM) to ensure continuous adherence to schedule and budget in addition to supporting test and evaluation activities as required. Dr. Paul Cohen, Dr. William Hardy, and Dr. Henry Goldberg who are subject matter experts with significant technical expertise in the areas of language transcription technology will support Mr. La Valley as required to develop specifications and analyze test results. Dr. Goldberg and the RATS Evaluation Framework software engineer, Jonathan Herr, bring significant expertise on the development and implementation of the proposed evaluation framework and methodology from the DARPA Machine Reading Program. In addition to the evaluation subject matter experts, we will enlist the services of SAIC linguists specializing in Arabic and Farsi as required to collaborate with the Data Collection Team and help to establish specifications for data annotation. This collaboration in Phase 1 will facilitate the annotation process and use of the annotation tool on classified GFI during the classified test portions of Phases 2 and 3.

Figure 2.9-1 summarizes the hours and percentage of time proposed for the PI Richard LaValley, the named key personnel. Mr. La Valley will devote 50% of his time to the evaluation tasks across all phases. He is an expert statistician in metrics and experimental design with extensive experience in the design and execution of unclassified and classified evaluations. Non-key personnel who will support Mr. La Valley include a PM, Mathew Reardon, who has extensive program management experience within the IC, DOD, and the telecommunications industry. Dr. William Hardy, an expert in voice and speech analysis and metrics, will serve as a subject matter expert on speech transcription technology. Dr. Henry Goldberg, the PI on DARPA's Machine Reading Program, will contribute his expertise in evaluation of speech recognition systems. Jonathan Herr, who created the evaluation framework for the Machine Reading Program, will develop the RATS Evaluation Framework and interfaces leveraging the framework developed for the Machine Reading. Dr. Paul Cohen from the University of Arizona will serve as a consulting subject matter expert to develop the Evaluation Specification Document, refine metrics, assist in data partitioning, and analyze evaluation test results. The SAIC linguists will support collaboration with Technical Area 2 teams and the classified data annotation in Phases 2 and 3. Detailed breakdown of hours are provided in the Cost Proposal (Volume 2).

Concise summaries of SAIC key and significant supporting personnel are included in the resumes section that follows.

Key Individual	Project	Pending or Current	Phase 1	Phase 2	Phase 3
Richard LaValley (PI) SAIC	RATS Tech Area 3	Proposed	1504 hours (54%)	976 hours (52%)	836 hours (45%)

Figure 2.9-1. Mr. La Valley, Experienced in Evaluating New Technologies, will Lead the RATS Evaluation Program to Ensure Successful Conduct of Evaluations

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Mathew Reardon **Program Manager**

Summary of Qualifications

- Has 10+ years of experience as a professional analyst and strategic planner across multiple disciplines.
- Has 10+ years of project and business management experience.
- Has extensive experience in operations research and analysis across the military and telecommunications domains.
- 18 years of experience as a Naval Officer (active and reserve components).

Education

- Master of Science (with Distinction), Systems Management, Naval Postgraduate School, Monterey, CA, 1997.
- Bachelor of Science, Ocean Engineering, U.S. Naval Academy, Annapolis, MD, 1991.

Clearance: TS/SCI

Work In Related Research Areas and Previous Accomplishments

Science Applications International Corporation, Director of Strategic Plans *10/2008–Present*

- Manages IC Collaboration and Technology Evaluation & Experimentation cells across the IC established under the umbrella of IARPA's Research & Development Experimental Collaboration (RDEC) program.
- Manages Joint Capability Technology Demonstration support project in support of USD (AT&L).

AOL, LLC., Vice President, Planning & Partner Management, Dulles, VA *08/2001–06/2008*

- Led strategy and planning for AOL's Access Division, managed operations across global contact center network and marketing partnerships with network of Retail and OEM providers.
- Led teams responsible for developing the strategy, partner management, and optimized channel mix and operations of co-marketing partnerships with nationwide network of DSL, FiOS, and Cable providers. Managed sales and marketing strategy, program implementation, and operations across global call center network.
- Managed teams responsible for forecasting, operations and marketing analysis, strategic & operational planning, and workforce management.

Military Sealift Command, Director of OIF/OEF Contingency Plans, Washington, DC *03/2003–01/2004*

- Mobilized reservist in support of Operation Iraqi Freedom/Operation Enduring Freedom, planned and scheduled the sealift movement of over 30 million square feet of combat and support cargo with a surge fleet of 120 government and commercial ships.

Chief of Naval Operations, MPN Strength Planner & Program Analyst, Washington, DC *07/1997–08/2001*

- Developed and executed personnel models resulting in tactical and strategic plans (recruiting, training, retention, and advancement) and MilPers appropriation programming for Navy's enlisted workforce and over 100 specialty skills. Served as Chief of Naval Operations representative to Military Operations Research Society working groups

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William C. Hardy, Ph. D. — Subject Matter Expert

Summary of Qualifications

- Has more than forty years' experience as an operations analyst specializing in decision support based on acquisition, organization, interpretation, and analysis of relevant data to produce credible, scientifically defensible answers to questions posed by decision-makers.
- 13 years in conduct of analyses for military communications and command and control systems, 13 years in analysis of commercial telephony, 6 years dedicated to evaluation and development of modeling aids for intelligence analysts.
- Analytical efforts for commercial telephony focused on the problem of measurement and evaluation of quality of telephone services, with emphasis on the measurement and evaluation of user perception of the quality of telephonic speech. Work in this area resulted in innovations in test technology and measurement and analysis of acoustic speech waveforms that earned more than 23 US patents.

Education

- Ph.D in Mathematics, University of New Mexico, Albuquerque, NM, 1970.

Clearance: TS/SCI

Work in Related Research Areas and Previous Accomplishments

Science Applications International Corporation, Senior Metrics Analyst and Technical Fellow — *3/2004–Present*

- Responsible for developing measures, test and protocols for evaluation of effectiveness and utility of automated tools for intelligence analysts, such as group detection algorithms, machine text translators, and document retrieval facilities.
- Developed and applied ad hoc, rapid prototypes of numerous data handling and analysis algorithms; innovations in automatic pattern recognition for knowledge discovery; innovative techniques for analyzing scalability of network analysis algorithms.

MCI/WorldCom, Executive Staff Analyst for Measures and Analysis — *1/1989–6/2003*

- Responsible for development of data acquisition and analysis tools for measuring and evaluating quality of commercial telephone services.
- Designed and successfully exploited the Service Attribute Test, which provides a viable test platform for collection of data from which to determine relationships between system manifestations of system performance problems and user assessment of call quality.
- Designed, and directed development of MCIs Telephone Quality Measurement System (TQMS) and Voice Quality Evaluation System (VQES), which create capabilities for automated data collection of telephonic voice samples and analysis of the captured waveforms to predict user perception of quality.
- Earned the following TQMS/VQES-related patents that exploit or are based on innovations in speech detection and speech waveform analysis directly related to this effort:

5,748,876 System and Method for Testing Acoustic Modems with Semantically-Encoded Waveforms	6,556,677 Single-Ended Echo Cancellation System and Method	6,246,978 Method and System for Measurement of Signal Fidelity from Samples of Telephonic Voice Signals	7,085,230 Method and System for Evaluating the Quality of Packet-Switched Voice Signals
6,115,465 System and Method for Modifying Voice Signals to Avoid Triggering Tone Detectors	6,564,181 Method and System for Measurement of Speech Distortion from Samples of Telephonic Voice Signals	6,370,120 Method for Predicting Perceived Quality of a Packet-Switched Telephone Connection	7,099,282 Determining the Effects of New Types of Impairments on Perceived Quality of a Voice Service
6,130,943 Method and Apparatus for Suppressing Echo in Telephony	6,985,559 Method and Apparatus for Estimating Quality in a Telephonic Voice Connection	6,553,061 Method and Apparatus for Detecting a Waveform	7,154,855 Method and System for Determining Dropped Frame Rates over a Packet-Switched Transport

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Henry G. Goldberg, Ph.D — Subject Matter Expert

Summary of Qualifications

- Has experience in the design and execution of evaluations for technologies developed under the DARPA Machine Reading Program. Creates the materials, specifications, and processes necessary to maximize advances in machine reading research and to measure these advances clearly.
- Has 17 years of experience in research, design, construction, and operation of knowledge-based systems for detection and discovery of financial crimes, fraud, and other behaviors of interest to intelligence, law enforcement, and regulation for government and the private sector.
- Has experience evaluating AI methods and systems, especially speech recognition and NLP.
- Has knowledge-based systems engineering expertise in the application of data mining and knowledge discovery, and exploitation of temporal and network patterns in large databases.
- Authored and co-authored 20 articles and publications in speech recognition systems, evaluation of pattern recognition performance in AI systems, link analysis, and innovative applications of AI involving natural language processing, temporal pattern recognition, and link analysis.

Education

- Ph.D., Computer Science (AI), Carnegie-Mellon University, 1975
- B.S., Mathematics, Massachusetts Institute of Technology, 1968.

Clearance: Top Secret

Work in Related Research Areas and Previous Accomplishments

Science Applications International Corporation, Chief Scientist and Engineer — *1/2009–Present*

- Serves as PI of the Evaluation Team under the DARPA Machine Reading Program, whose goal is to make information from natural language corpora available to reasoning systems. The Evaluation Team's mission is to prepare materials, design and execute evaluations, and coordinate common technologies among the 3 performing teams.
- Leads experiments and metrics development for intelligent systems evaluations, especially in the areas of natural language, knowledge representation and reasoning, and machine learning.

FINRA (formerly NASD), Rockville, Md., Systems and Knowledge Engineer, Securities Regulation — *10/1996–12/2008*

Special Projects, Business Solutions Department — *9/2007–12/2008*

- As principal technical officer studying alternatives for migration of installed base of detection scenarios, provided consultation and review of technology strategies to meet the challenge of increased volumes, multiple sources of market data, and migration to new hardware platforms.
- Evaluated systems for text mining as part of the NASD Sonar system as senior knowledge engineer and KDD specialist.

Director, KDD Team, Market Regulation Department — *6/2001–9/2007*

- Directed a team of knowledge engineers and programmers engaged in maintenance and ongoing new development of regulatory surveillance programs, patterns and data mining solutions.

Senior KDD Specialist, NASD Technology — *10/1996–6/2001*

- Innovative knowledge-based systems for fraud and violation detection in financial markets.

U.S. Treasury, Financial Crimes Enforcement Network, Vienna, Va., Senior Research Computer Scientist — *7/1991–10/1996*

- KDD and knowledge-based technology for detection of financial crimes and money laundering.

U.S. Courts, Federal Judicial Center, Washington, D.C. — *7/1977–7/1991*

- Application of advanced information processing to court administration.

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Computer Science Department, Carnegie-Mellon University, Pittsburgh, PA *9/1968–7/1977*

- Ph.D dissertation: Segmentation and Labeling of Speech, a Comparative Performance Evaluation
- Developed the signal-to-symbol level components of CMU's Hearsay II speech understanding system, supported by DARPA's SUS program in the 1970's.

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Jonathan Herr — Software Engineer

Summary of Qualifications

- Has 10 years experience working on all aspects of the full software development life cycle across a variety of communities.
- Has 7 years of experience with Java programming language including work on SOA architectures, J2EE solutions, and a variety of client and server libraries.
- Developed the common evaluation framework used by the DARPA Machine Reading program

Education

- MS, Computer Science, The Johns Hopkins University, 2007
- BBA, Computer Information Systems, James Madison University, 1999

Clearance: TS/SCI with Full Scope Polygraph—Active

Work in Related Research Areas and Previous Accomplishments

Science Applications International Corporation, Senior Software Engineer — *5/2008–Present*

- Leads software development efforts which support evaluation of intelligent systems.
- Supports experimentation by building test harnesses which measure system performance.
- Supports classified projects with Java development and secure communications protocols such as mutually authenticated SSL transactions.

Lockheed Martin Corporation, Software Engineer — *5/1999–5/2008*

- Led design and development of a layer for communication between .Net and Java applications using Windows Communications Foundation and C# in Microsoft .Net 3.0.
- Designed and developed a reporting tool for a 24 hour operations center which displayed live views of incoming data over the web using AJAX and a SOA architecture.
- Developed ETL component of a large data warehousing project involving terabytes of data being loaded into a MS SQL Server farm.

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2.10 Project Management and Interaction Plan

2.10.1 Team Composition

The composition of the SAIC team addresses both the scientific design of evaluations that provide meaningful results, and the engineering needed to build the supporting tools and processes. Prior experience has shown that SAIC, as the evaluator, is the natural facilitator for and has successfully created a common understanding among and between the algorithm teams, as well as with the data collection effort. Our organization reflects this by identifying leads for the critical infrastructure portions of the overall program task, as described in **figure 2.10-1**. SAIC's Principle Investigator (PI) Rich LaValley, supported by an experienced team, will provide the leadership and technical skills needed to execute all parts of the proposed evaluation task. Matt Reardon, Program Manager (PM), will support the program execution and collaboration across Technical Area 1 and 2 performers. SAIC has also arranged to place Dr. Paul Cohen under a consulting agreement to provide expert technical guidance on the conduct of the evaluation.

The Data Preparation activity is called out to address the need for communication and coordination with the team selected to perform the Data Collection task, ensuring the right distribution and composition of the speech samples provided for training and evaluation by the algorithm development teams. This activity will be heaviest in the initial 6 months of the program.

Under the Experimentation activity, analysts experienced in the real-world applications for large collections of speech data will design experiment-based evaluations that produce useful results. Experiment design will guide data set design, evaluation scenario planning, and analysis and presentation of results to the government for both the unclassified and classified evaluations. The focus on scientific, statistically valid, measurable metrics and experimentation supported by automated tools and processes for analysis, feedback, and recommendations will provide the government with the best value from our evaluation team.

The Framework Development resources proposed for this effort will define the requirements and implement the systems to execute evaluations over the large set of audio data collected, over several different speech processing systems, and operating within both an unclassified and classified environment. Engineers experienced with the DARPA Machine Reading evaluation software framework are proposed for this effort, to leverage the existing software assets as extended to meet the anticipated needs of the algorithm development systems. These

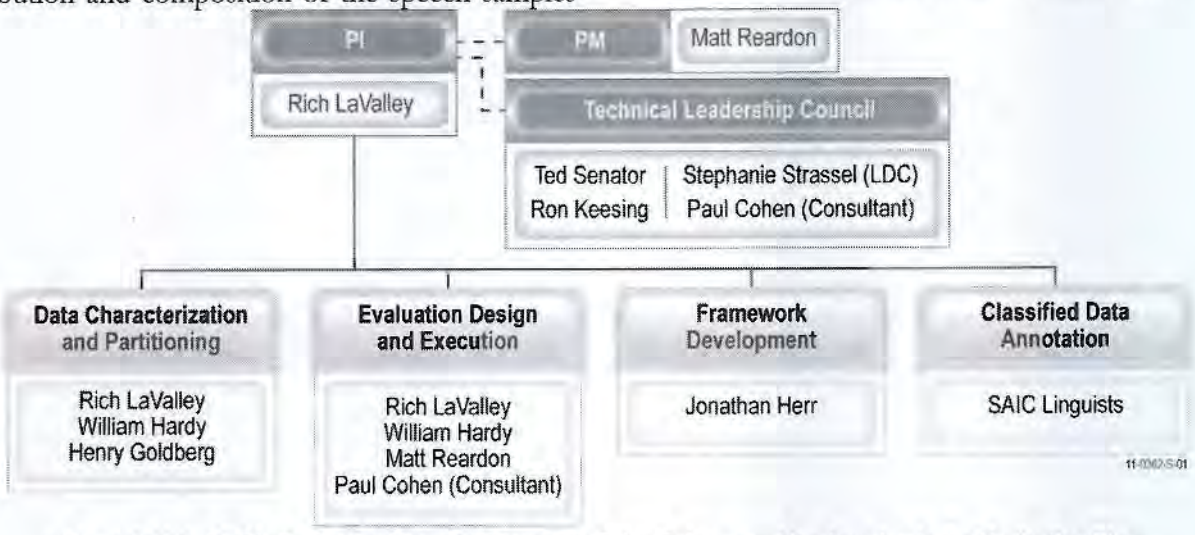

Figure 2.10-1. SAIC's Evaluation Team Collaborate to Bring Science and Engineering to the Evaluation Plan

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resources are expected to be utilized in a phased approach to development - heavier in the first 6 months of each yearly phase, preparing the evaluation system to interact with the newest technological advances of the speech processing systems under development, then active at each interim evaluation point to provide feedback and revise code.

The Classified Data Annotation activity will be lead by SAIC linguists, applying common annotation data annotation tools and processes utilized by the Technical Area 2 performer. Level of effort is estimated based on the size of the anticipated data set.

Further, the PM and PI will be supported by a Technical Leadership Council (TLC) consisting of Ted Senator and Ron Keesing from SAIC, and Dr. Paul Cohen from the University of Arizona and Stephanie Strassel from the University of Pennsylvania's Linguistic Data Center. Each TLC member will be a regular contributor to the program and will review all major technical issues and consult on the design of the evaluation plan at no additional cost to the government.

2.10.2 Communication Plan

Coordination with the algorithm development teams will occur throughout the program as an integral activity. This coordination will be accomplished through a collaborative process to specify interface specifications and supported system configurations between the evaluation platform and speech processing systems. Documents describing the current understanding and specifications will be distributed electronically, reviewed and revised collaboratively, and maintained in the evaluation program repository available to all RATS program teams. This repository, described in detail below, will be populated during the initial 6 months of the program to contain the latest released version of the evaluation platform software and training data for use in testing by the algorithm teams. Early validation of compliance with the agreed-upon specifications will be ensured by the requirement on the speech processing systems to use the code repository to maintain the latest code release for integration testing by the evaluation team. This process will result in a set of interim evaluations providing feedback to the algorithm teams and progress reports to the government.

Communication through electronic and telephonic means is anticipated to provide the appropriate opportunities to discuss progress and challenges between the evaluation and algorithm development teams without the necessity for travel outside of the D.C. Metro area. Collaboration with the Data Collection team selected by the government, on the other hand, is anticipated to require monthly in-person meetings during the initial 6-month collection period. These meetings would be used to review the type and mix of training and evaluation data in the context of the scenarios under development, to ensure coordinated data sets and test planning.

SAIC recognizes that there will be significant interest from the scientific community in the RATS program. To this end, SAIC intends to submit summaries of our evaluation design techniques and key learnings for publication in targeted research journals.

2.10.2.1 Evaluation Repository

An Evaluation Repository will be deployed early in the program for communication among the Evaluation Team as a place to track progress on evaluation tasks, post documentation, and share evaluation framework code among members. Once built and tested by the evaluation team, access will be provided to other program participants, including researchers, data team members, and DARPA.

The repository will take the form of a MediaWiki server to which all program participants will be granted read/write access. It will provide several key functions SAIC has found to lead to improved communication between the evaluation team, researchers and DARPA. A document repository allows participants to retrieve evaluation documentation, such as program plans, testing protocols and evaluation framework software documentation, while also

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providing a mechanism for sharing feedback on them. A subversion code repository provides access to the RATS Evaluation Framework and a bug tracking database allows researchers to create bug tickets and track the progress of fixes as issues are discovered and fixed throughout the program. In addition to providing feedback on software and documentation all participants can use the wiki itself to create articles of interest to members of the program. The wiki format's ease of editing and creating new articles fosters community within the program and turns the wiki into a hub around which all program activity can be tracked.

At the request of the government, SAIC will offer this program-wide collaboration site based on a similar wiki approach at little or no additional cost. SAIC is also willing to support program-wide mailing lists. These services have been provided on the Machine Reading Program, forming the basis for cross-program and cross-performer interactions and collaboration.

2.10.3 Classified Data Management

Evaluations using classified data will be conducted at the SAIC facility within the appropriately protected environment, with information security oversight and security procedures. SAIC will provide the cleared personnel and resources to manage and execute the evaluations. Analysis, planning, and presentation of the results to the government will occur within the same SAIC facilities. Algorithm teams that include cleared personnel can be invited to outbriefs on evaluation results at the government's discretion.

2.10.4 Program Management Progress Metrics

Our program management team will use SAIC's in-place project management methodology to ensure that we complete all tasks on time and on budget and that deliverables meet or exceed program requirements. We will monitor each task weekly on an integrated project schedule, allowing early identification of potential problems. We will track project resources by task and update them biweekly. Project management and the TLC will review all deliverables to ensure quality and compliance with requirements.

SAIC has defined interim measures of progress on the evaluation methodology, data preparation, and evaluation framework tasks as shown in **figure 2.10-2**.

Evaluation Task and Metric	Description
Evaluation Methodology	
Percent completion of the evaluation specification (phase 1)	#actual scenarios/#planned
Number of Development Team systems evaluated, by phase evaluation	#unclassified, #classified evaluations
Percent completion of testing by number of partitioned data sets, by phase evaluation	#data sets results returned/#data sets total
Percent completion of testing by total data set audio time in minutes, by phase evaluation	#minutes in data sets results returned/#minutes in data sets total
Ratio of elapsed processing time to audio data set length, averaged over all tests within phase evaluation	(results returned timestamp – test initiation timestamp)/#minutes in data set
Data Preparation	
Amount of audio data examined and annotated, compared to the amount of audio data available (phase 2 classified data annotation task)	#minutes annotated/#minutes in data set
Number and type of annotations by type, classification per time unit, by phase	[#keywords, #speech events, # speakers, #languages]/minute of audio in collection
% completion of data sets partitions available for testing, by type, size, annotation density, by phase	#partitioned data sets complete/#planned
Evaluation Framework	
Percent completion of planned framework revisions (phase 1 task)	#revisions complete/#planned
Number, type, and length of data sets ready and accessible to be used by a system under test through the framework, by phase	#partitioned data sets available/#created
Number of systems that have been installed and successfully undergone integration testing with the framework, by phase	#teams passed testing with framework/#teams total

Figure 2.10-2. Progress Metrics for Evaluation Tasks

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For the evaluation methodology, the percent completion of the evaluation specification will indicate the extent to which the team is on schedule to initiate the data preparation and development team evaluation activities. During execution of the end of phase evaluations, metrics will be maintained that show progress toward completing testing across all development teams, and amount of time required to complete each set of test protocols, in first the unclassified and then the classified environment. These include the number of Technical Area 1 Team systems evaluated, percent completion of testing by number of partitioned data sets, and by total data set audio time in minutes, for both the unclassified and classified environments. Time required to complete testing will be reported as the ratio of elapsed processing time to audio data set length measured from test initiation to processing result report completion. As the processing is expected to approach "real-time", this ratio should be close to one, and the overhead for test initiation and closeout will be low as a result of using our automated evaluation framework.

Progress on the data preparation task will be measured for both the annotation and the partitioning activities. Progress on the classified annotation task will be measured as the amount of audio data examined and annotated in minutes, compared to the amount of audio data available. The number and type of annotations by time unit (minutes of audio data) will be tracked to show progress in developing the sample size needed (the number and density of keywords for KWS, for example), for both the unclassified data received from the Technical Area 2 performer as well as the classified data. Partitioning of the audio data into sets with the correct sample size and distribution will be tracked as a percent completion of data sets partitions available for testing, by type, size, and annotation density.

Metrics for the evaluation framework will include both measures of progress in extending the underlying source code and availability of data sets and Technical Area 1 Team systems for use in performing an evaluation at any time. Progress on the framework development to support the RATS program will be tracked as percent completion of planned framework revisions. Availability of partitioned data sets will be tracked by the number, type, and length of data sets ready and accessible to be used by a system under test through the framework. Availability of the Technical Area 1 Team systems for evaluation will be reported as the number of systems that have been installed and successfully undergone integration testing with the framework, and are therefore ready for performing an evaluation in either the unclassified or classified environment.

2.10.5 Potential Schedule Risk and Risk Mitigation Strategies

For programs such as RATS, which push technology boundaries and pose potential integration challenges, SAIC uses a proactive risk management process. **Figure 2.10-3** identifies potential program risks and SAIC's mitigating strategies.

We will conduct monthly risk assessments to determine when we need to enlist other resources, which may include team-wide, off-bench, in-house expertise. We will create an advisory group that includes senior scientists to conduct regular reviews of progress, future plans, and existing obstacles. We will promptly advise the Defense Advanced Research Projects Agency (DARPA)/Information Processing Technology Office (IPTO) program manager about any risks that potentially affect on-time performance.

2.10.6 Plans and Capability to Accomplish Technology Transition

SAIC recognizes that there is a strong demand within the operational community for the capabilities to be developed in RATS and that one of the goals of the program is to identify and foster transition opportunities. SAIC's technical approach to RATS evaluation will provide a solid foundation, emphasizing the relevance of

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Risk	Risk Level	Impact	Mitigation
Inability to integrate research algorithms with data and test framework in time to conduct end of phase evaluations	Medium	Medium	Develop test framework that can be used by developers for continuous testing during development, incentivizing continuous integration Provide evaluation framework to performers for on-going integration testing with evaluation system and a representative set of test data
Inability to execute research algorithms on classified systems	Low	High	Leverage proven process for shift from unclassified -> classified evaluation established over the course of 40+ previous experiences Test on unclassified, mirrored configuration of classified system prior to moving testing in classified environment
Serious degradation of research algorithms performance in classified environments	Medium	Medium	Test critical aspects of performance – such as trainability on new speakers, keywords, and languages – prior to transition to classified environments
Difficulty constructing the evaluation framework	Low	Medium	Leverage existing MR Evaluation Framework Use full team's proven evaluation infrastructure expertise and SAIC's extensive system engineering experience to meet initial and evolving requirements

Figure 2.10-3. Risk Analysis Table

RATS technology trough scenario-based evaluations and the calculations of MOEs based on MOPs.

In addition, SAIC's broad and deep reach across the intelligence community gives us many opportunities to expose potential customers to RATS technologies for demonstrations and experimentation. Our recommended approach to transition is based on extensive experience supporting previous technology transitions – including speech analysis technology – into the IC. We believe that this experience, which cannot be discussed within an unclassified proposal, makes us uniquely qualified to support RATS transition. We can provide references to the appropriate contacts within the government upon request.

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2.11 Cost Summary

2.11.1 Introduction

SAIC recognizes that the costs associated with each phase of our proposed approach are significantly higher than those described in DARPA BAA 10-34 Amendment 3/ RATS_FAQs_23Mar10.pdf posted on FED-BIZOPS.gov. Our proposed costs are based on our extensive experience on evaluation tasks of similar size, scope, and complexity and are tailored to accomplish key RATS objectives. We believe our higher costs are justified by the following factors, which we view as essential to achieving thorough, effective evaluation of RATS technologies while providing crucial information that will be needed by possible transition partners:

- Evaluation framework that is shared with algorithm developers and supports continuous testing during development, maximizing program resources by developing shared resource across multiple teams while minimizing risk of integration problems.
- Experimental design and analysis that breaks down performance across multiple dimensions, identifying strengths, weaknesses, challenges, and opportunities for different RATS technologies.
- Scenario-based data collection and evaluation, emphasizing operationally relevant technology development.
- Streamlined process for moving from unclassified to classified environments during Phases 2 and 3.
- Method for annotating classified data that is consistent with unclassified data.
- Estimation of Measures of Effectiveness (MOEs) from Measures of Performance (MOPs) and limited end-to-end testing, allowing potential transition partners to assess the impacts of RATS technologies within the framework needed to justify their investment.

In the case that DARPA feels one or more of these areas are less important, we are prepared to work with the government to select and separate individual tasks where possible, revising our pro-posed approach and costs.

2.11.2 Total Cost Summary by Phase

Figure 2.11-1 presents the Total Cost Summary by Task in Phase 1 and Option Phases 2 and 3.

SAIC Proposal No: F00455.A.2311.010.000
Proposal Title: Robust Automatic Transcription of Speech (RATS) Technical Area 3 - Evaluation
Task Title: 2.11 Cost Summary - Task & Phase
Offeror: SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
Period of Performance: 15 August 2010 - 14 February 2013

2.11 Cost Summary - Task & Phase

Program Tasks		Base Period Phase 1 Cost	%	Option Period 1 Phase 2 Cost	%	Option Period 2 Phase 1 Cost	%
WBS 1.1	Develop Evaluation Specification Document	$137,759	19%				
WBS 1.2	Develop Evaluation Test Framework	$136,112	19%				
WBS 1.3	Evaluation Test Design	$164,721	23%				
WBS 1.4	Conduct Phase 1 Evaluations	$175,463	24%				
WBS 1.5	Management Task	$103,132	14%				
WBS 2.1	Refine Evaluation Specification Document			$55,409	11%		
WBS 2.2	Refine Evaluation Framework			$54,881	11%		
WBS 2.3	Evaluation Test Design			$101,093	21%		
WBS 2.4	Conduct Phase 2 Evaluations			$212,049	44%		
WBS 2.5	Management Task			$63,819	13%		
WBS 3.1	Refine Evaluation Specification Document					$50,654	13%
WBS 3.2	Evaluation Test Design					$69,200	18%
WBS 3.3	Refine Evaluation Test Framework					$35,983	9%
WBS 3.4	Conduct Phase 3 Evaluations					$171,141	44%
WBS 3.5	Management Task					$65,467	17%
Total		**$717,187**	**100%**	**$487,251**	**100%**	**$392,446**	**100%**

Figure 2.11-1. Total Cost Summary by Task

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2.11.2 Major Tasks and Subtasks by Month

Figure 2.11-2 presents the major tasks and sub-tasks by month.

Note: Second level WBS task and sub-task elements provided only. Greater level of WBS cost detail can be provided upon request. See Section 2.8 for the activities included under each task and sub-task.

SAIC Proposal No:	F00455.A.2311.010.000
Proposal Title:	Robust Automatic Transcription of Speech (RATS) Technical Area 3 - Evaluation
Task Title:	2.11 Cost Summary - Task & Month
Offeror:	SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
Period of Performance:	15 August 2010 - 14 February 2013

2.11 Cost Summary - Task & Month

Program Tasks		Fiscal Year 2010 Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	FY-10 Total
WBS 1.1	Develop Evaluation Specification Document											$37,491	$35,448	$72,938
WBS 1.2	Develop Evaluation Test Framework											$19,923	$19,923	$39,846
WBS 1.3	Evaluation Test Design											$8,605	$8,605	$17,210
WBS 1.4	Conduct Phase 1 Evaluations													
WBS 1.5	Management Task											$9,049	$7,643	$16,692
WBS 2.1	Refine Evaluation Specification Document													
WBS 2.2	Refine Evaluation Framework													
WBS 2.3	Evaluation Test Design													
WBS 2.4	Conduct Phase 2 Evaluations													
WBS 2.5	Management Task													
WBS 3.1	Refine Evaluation Specification Document													
WBS 3.2	Evaluation Test Design													
WBS 3.3	Refine Evaluation Test Framework													
WBS 3.4	Conduct Phase 3 Evaluations													
WBS 3.5	Management Task													
Total		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$75,067	$71,618	$146,686

Program Tasks		Fiscal Year 2011 Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	FY-11 Total
WBS 1.1	Develop Evaluation Specification Document	$28,546	$12,092	$12,092	$12,092									$64,821
WBS 1.2	Develop Evaluation Test Framework	$19,923	$17,741	$11,828	$11,828	$23,119	$1,478	$1,478	$1,478	$1,478	$1,478	$1,478	$1,478	$94,788
WBS 1.3	Evaluation Test Design	$15,506	$15,506	$15,506	$8,605	$20,757	$20,757	$16,455	$8,605	$8,605	$8,605	$8,605		$147,511
WBS 1.4	Conduct Phase 1 Evaluations													
WBS 1.5	Management Task	$5,336	$5,118	$5,336	$5,118	$6,741	$5,118	$5,336	$5,118	$5,336	$5,118	$6,741	$5,118	$65,533
WBS 2.1	Refine Evaluation Specification Document													
WBS 2.2	Refine Evaluation Framework													
WBS 2.3	Evaluation Test Design													
WBS 2.4	Conduct Phase 2 Evaluations													
WBS 2.5	Management Task													
WBS 3.1	Refine Evaluation Specification Document													
WBS 3.2	Evaluation Test Design													
WBS 3.3	Refine Evaluation Test Framework													
WBS 3.4	Conduct Phase 3 Evaluations													
WBS 3.5	Management Task													
Total		$69,311	$50,457	$44,761	$37,642	$50,617	$27,353	$23,269	$15,201	$15,419	$15,201	$16,825	$6,596	$372,653

Program Tasks		Fiscal Year 2012 Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	FY-12 Total
WBS 1.1	Develop Evaluation Specification Document													
WBS 1.2	Develop Evaluation Test Framework	$1,478												$1,478
WBS 1.3	Evaluation Test Design													
WBS 1.4	Conduct Phase 1 Evaluations		$41,129	$67,167	$67,167									$175,463
WBS 1.5	Management Task	$5,336	$5,118	$5,336	$5,118									$20,907
WBS 2.1	Refine Evaluation Specification Document					$25,934	$16,990	$12,485						$55,409
WBS 2.2	Refine Evaluation Framework						$14,465	$14,465	$12,213	$6,106	$4,580	$1,527	$1,527	$54,881
WBS 2.3	Evaluation Test Design					$8,885	$15,786	$15,786	$16,928	$21,432	$13,390	$8,885		$101,093
WBS 2.4	Conduct Phase 2 Evaluations								$13,242	$14,973	$14,973	$7,487		$50,675
WBS 2.5	Management Task					$6,240	$4,834	$4,834	$4,834	$4,834	$4,834	$6,240	$4,834	$41,487
WBS 3.1	Refine Evaluation Specification Document													
WBS 3.2	Evaluation Test Design													
WBS 3.3	Refine Evaluation Test Framework													
WBS 3.4	Conduct Phase 3 Evaluations													
WBS 3.5	Management Task													
Total		$6,814	$46,247	$72,503	$72,285	$41,059	$52,076	$47,571	$47,217	$47,346	$37,777	$24,138	$6,361	$501,395

Figure 2.11-2. Major Tasks and Sub-Tasks by Month

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SAIC Proposal No:	F00455.A.2311.010.000
Proposal Title:	Robust Automatic Transcription of Speech (RATS) Technical Area 3 - Evaluation
Task Title:	2.11 Cost Summary - Task & Month
Offeror:	SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
Period of Performance:	15 August 2010 - 14 February 2013

Program Tasks		Fiscal Year 2013 Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	FY-13 Total
WBS 1.1	Develop Evaluation Specification Document													
WBS 1.2	Develop Evaluation Test Framework													
WBS 1.3	Evaluation Test Design													
WBS 1.4	Conduct Phase 1 Evaluations													
WBS 1.5	Management Task													
WBS 2.1	Refine Evaluation Specification Document													
WBS 2.2	Refine Evaluation Framework													
WBS 2.3	Evaluation Test Design													
WBS 2.4	Conduct Phase 2 Evaluations		$40,668	$60,353	$60,353									$161,373
WBS 2.5	Management Task	$4,834	$4,834	$6,332	$6,332									$22,332
WBS 3.1	Refine Evaluation Specification Document					$25,237	$14,444	$10,974						$50,654
WBS 3.2	Evaluation Test Design					$4,563	$11,464	$11,464	$12,822	$16,292	$8,032	$4,563		$69,200
WBS 3.3	Refine Evaluation Test Framework						$8,584	$8,584	$6,271	$6,271	$3,763	$1,254	$1,254	$35,983
WBS 3.4	Conduct Phase 3 Evaluations												$7,689	$7,689
WBS 3.5	Management Task					$6,371	$4,965	$4,965	$4,965	$4,965	$4,965	$6,371	$4,965	$42,532
Total		$4,834	$45,502	$66,685	$66,685	$36,170	$39,457	$35,987	$24,059	$27,529	$16,760	$12,187	$13,908	$389,763

Program Tasks		Fiscal Year 2014 Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	FY-14 Total
WBS 1.1	Develop Evaluation Specification Document													
WBS 1.2	Develop Evaluation Test Framework													
WBS 1.3	Evaluation Test Design													
WBS 1.4	Conduct Phase 1 Evaluations													
WBS 1.5	Management Task													
WBS 2.1	Refine Evaluation Specification Document													
WBS 2.2	Refine Evaluation Framework													
WBS 2.3	Evaluation Test Design													
WBS 2.4	Conduct Phase 2 Evaluations													
WBS 2.5	Management Task													
WBS 3.1	Refine Evaluation Specification Document													
WBS 3.2	Evaluation Test Design													
WBS 3.3	Refine Evaluation Test Framework													
WBS 3.4	Conduct Phase 3 Evaluations	$7,689	$35,495	$60,135	$60,135									$163,453
WBS 3.5	Management Task	$4,965	$4,965	$6,503	$6,503									$22,936
Total		$12,654	$40,460	$66,637	$66,637	$0	$0	$0	$0	$0	$0	$0	$0	$186,388

Figure 2.11-2. Major Tasks and Sub-Tasks by Month (continued)

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2.12 Organizational Conflict of Interest Affirmations and Disclosure

In accordance with the instructions in BAA 10-34, Section III.A.1 and Section IVB 2.12, "Organizational Conflict of Interest Affirmations and Disclosure," SAIC affirms that SAIC and our proposed consultant are not currently providing SETA support.

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2.13 Human Use

None. Human use is not a factor in this proposal. Should the need arise in the future, SAIC will comply with the federal regulations for human subject protection, DoD 32 CFR 219, *Protection of Human Subjects* and DoD Directive 3216.02, *Protection of Human Subjects and Adherence to Ethical Standards in DoD-Supported Research.* As required, SAIC will provide documentation of a current Assurance of Compliance with Federal regulations for human subject protection and evidence of or a plan for review by an Institutional Review Board (IRB).

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2.14 Animal Use

None. Animal use is not a factor in this proposal.

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2.15 Statement of Unique Capability Provided by Government or Government funded Team Member

The SAIC Team does not propose to include any government team member as part of this effort. However, SAIC is willing to work with any government agency or entity designated by DARPA to participate in the RATS program.

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2.16 Government or Government-Funded Team Member Eligibility

Not eligible.

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APPENDIX A. GLOSSARY

Term or Acronym	Definition
BAA	Broad Agency Announcement
COTS	Commercial off-the-shelf
DARPA	Defense Advanced Research Projects Agency
DoD	Department of Defense
DSRS	Domain-Specific Reasoning System
EARS	Effective, Affordable, Reusable Speech-to-Text
English Text	Text (including automatically transcribed speech) that was originally in English or that was translated into English
GUI	Graphical User Interface
HVI	High Value Individual
IC	Intelligence Community
IPTO	Information Processing Techniques Office
Knowledge Base	Structured information extracted from text
KWS	Key Word Spotting
LCD	Linguistics Data Consortium
LCTL	Less Commonly Taught Languages
LID	Language Identification
LDC	Linguistic Data Consortium
Metric	A numerical measure of performance
MOE	Measure of Effectiveness
MOP	Measure of Performance
NIST	National Institute of Standards and Technology
NLP	Natural Language Processing
PE	Performance Evaluation
Pfa	Probability of a false alarm
PI	Principal Investigator
Pmiss	Probability of a missed detection
SAD	Speech Activity Detection
SID	Speaker Identification
Source Language	Language in which the speech or text originated
Speech	Audio signal (digital waveform)
Team	Prime contractor plus 0 or more subcontractors
Text	Ordinary text (in machine readable form) or automatically transcribed speech
T-FIMS	Technical-Financial Information Management System
Total Error (TE)	TE = 2 (PmissPfa)/(Pmiss + Pfa)
TRL	Technical Readiness Level
TS/SCI	Top Secret/secret compartmented information
User Interface	Software by which users and algorithms interact

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APPENDIX B. SECURITY PLAN

This Security Plan presents our approach to supporting the security organization, personnel security, physical security, information security, and operations security requirements of the RATS Program. Our approach will establish a balance between the risk of losing information resources and the inconvenience and cost of security measures. Our goal is to fulfill the overall security objectives of federal statutes and RATS policies and directives, while tailoring specific procedures to meet the needs of the RATS Program to prevent the impeding of scientific and administrative research.

SAIC is cleared by the Department of Defense (DoD) for access to classified information through Top Secret and we have more than 142 SAIC facilities cleared under the National Industrial Security Program (NISP) located in important regional centers throughout the United States. SAIC facilities have been recipients of 28 James S. Cogswell Awards from DoD in recognition of our "Outstanding Industrial Security Program." The DoD has approved SAIC for access to Sensitive Compartmented Information (SCI), Communications Security (COMSEC), Critical Nuclear Weapons Design Information (CNWDI), Restricted Data (RD), North Atlantic Treaty Organization (NATO), and other special access authorizations.

B.1 Approach to Performing Evaluation on Classified Data For RATS Phase 2 and 3

Facility. For this effort, SAIC has selected the building Quincy Street Station, located at 4001 North Fairfax Drive, Arlington, Va. (CAGE Code: 0PSG0). The Air Force Research Laboratory (AFRL) has accredited this facility at the Top Secret level, with areas ranging from Secret to Top Secret for the establishment of our RATS PMO. This building offers SAIC and RATS the best combination of cost, location, and amenities. SAIC selected this building for the RATS contract because it is secured through physical and administrative security mechanisms and a 24/7 guard force onsite to protect the contents and people in the facility. The AFRL is the certifying authority for the Sensitive Compartmented Information Facility (SCIF) located at the Quincy Street Station. In order for SAIC to receive authorization to use this facility, a Co-Utilization Agreement (CUA) must be in effect between the sponsor of the RATS Program (i.e. DARPA) and AFRL.

Co-Utilization Agreement. The introduction of the evaluation platform into the classified laboratory facility at the 4001 North Fairfax Drive, Arlington VA location requires the strict adherence to a set number of processes. The Air Force Research Laboratory (AFRL) is the certifying authority of the classified laboratory and a Co-Utilization Agreement (CUA) is required prior to the initiation of the classified evaluation process. SAIC will facilitate the establishment of this agreement between the AFRL and DARPA.

System Security Authorization Agreement. Since the evaluation platform will involve Automated Information Systems (AIS), the appropriate Designated Accreditation Authority (DAA) must accredit these systems prior to introducing them into the classified laboratory. A System Security Authorization Agreement (SSAA) will facilitate the certification and accreditation process of the evaluation platform. Once the Evaluation Team has identified the required systems, they will add them to the SSAA and provide them to the certifying authority (i.e. AFRL). The SSAA will document the required security information to support systems certification and accreditation by describing the AIS and providing details surrounding its operation in a secure environment. The scope of the SSAA is to provide a detailed understanding of the AIS concerning security configuration, internal and external connectivity, security countermeasures, threats and vulnerabilities, security administration, and physical layout of the secure environment.

Evaluation Platform. While it is preferred that the Technical Teams furnish their evaluation

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systems in software format (i.e. removable media) only, the teams may also furnish equipment as long as the introduced hardware is certified and accredited according to the instructions detailed by the DAA. Furthermore, SAIC will facilitate prior coordination with AFRL to ensure that the Technical Teams introduce this equipment at the earliest stage possible for inclusion into the CUA and SSAA.

Storage of Classified Material. The removable hard-drives and all removable media (e.g. CD-ROMs) provided by the Technical Teams will be permanently stored in the classified laboratory facility at the 4001 North Fairfax Drive, Arlington VA location. SAIC will arrange for additional classified storage containers prior to the initiation of Phase 2 of the DARPA RATS project as needed.

Removal of Evaluation System. At the conclusion of the evaluation, the classified material may be removed from the classified facility as specified by the DAA and the Information System Security Manager.

B.2 Security Organization and Management

For the RATS Program we have designated a facility security officer (FSO) who will also act as the facility manager. The FSO is responsible for directly supporting the security program, including processing security clearances, submitting comprehensive standard operating procedures (SOPs), and implementing the Information Technology Security Plan to control all classified data, equipment, and security training. The FSO has unlimited and complete support and access throughout the life of the RATS Program to two key SAIC business unit individuals: our principal investigator Rich LaValley and our director of security Mr. Bill Tremble, as shown in **figure B.2-1**.

Personnel Security Practices and Procedures, Including Employee Screening Procedures. The SAIC Team meets the RATS Program requirements for processing employees, subcontractors, and consultants for personnel clearances. The SAIC Team will send all completed personnel security-background investigation package to the SAIC security office for tracking and transmission to the DSS. The SAIC Team includes cleared personnel who are currently working on programs that require clearances at the Secret level or higher, and who are available to begin work on Day One of contract award. SAIC policy includes the requirement for each employee with access to attend a series of security awareness briefings to provide them with an understanding of the RATS Program, the role of security on the program, their role relative to security, and our methods and techniques for safeguarding classified information.

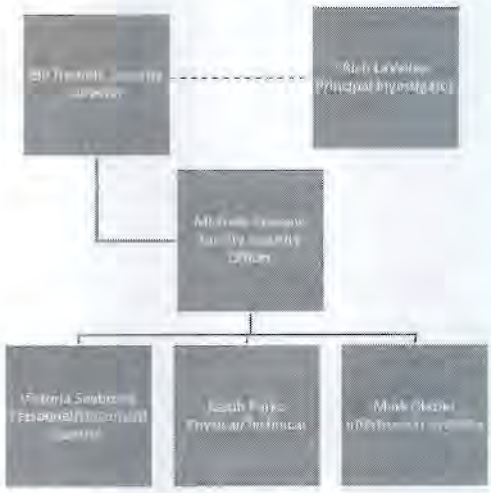

Figure B.2-1 Security Organization Chart

B.3 Physical Security Procedures to Protect Classified Data

SAIC will provide physical security for the RATS facility and its subcontractors in accordance with the NISPOM requirements for safeguarding classified material. The safeguards include construction features, access control systems, badging systems, alarms, telephones, and storage facilities. SAIC corporate security, as well as the appropriate government authorities, will inspect each facility on a regular basis to ensure regulatory compliance. Although any of the safeguards alone can only delay attempts to gain unauthorized access to classified information, our combination of safeguards presents a layered, formidable barrier against physical

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penetration or inadvertent disclosure of controlled areas. Our physical security safeguard requirements for the Restricted Areas and Closed Areas in which the RATS Program contract activities will take place meet or exceed the physical security construction and administrative requirements established in NISPOM for all Closed Area facilities. To deter and detect unauthorized introduction or removal of classified or sensitive information from the facility, the SAIC Team maintains a formal system that includes random inspection of the personal effects of all persons who enter or exit the facility. The SAIC security office will conduct these inspections at irregular intervals and schedule them so as not to interfere with facility operations. The SAIC security office will prominently display a sign notifying all employees and visitors of this procedure at the primary point of entry.

Procedures for Controlling and Handling Classified/NOFORN Materials. Our extensive experience with other government agencies will serve as the base for all procedures related to controlling, handling, or accessing government data or other classified resources for the RATS Program. The SAIC Team understands that all classified and sensitive RATS work products, including documentation, materials, media, and manuals, become the property of RATS. The SAIC Team will ensure that all materials created, maintained, stored, and transported will do so in a manner that affords protection from unauthorized disclosure. The SAIC Team will handle all data in accordance with established security policies and procedures.

Our security procedures begin with receipt of classified or sensitive data and continue through final turnover of the data. The SAIC Team will track all classified material entering or leaving our facility using our security information management system Access Commander. SAIC currently use this system on other federal contracts and will provide it at no direct cost to the RATS program.

In addition, the SAIC Team ensures that all sensitive material (including data printouts and other hard copy materials, software documentation, operating manuals, and handbooks) is stored in a secure location when not in use.

All deliverables that contain classified materials that the SAIC Team will send out of the facility will be prepared for transmission using secure communications, hand-carry, or the following procedure: enclose the inner envelope of classification level and ensure sufficient durability and strength to protect the material during transit and mark the outer envelope with the official address provided.

All material released, originated, or reproduced in performing contractual obligations remains the property of the RATS sponsor organization. On completion of each RATS task, the FSO seeks disposition guidance from the contracting officer and the security representative. As required, the FSO prepares a request to retain materials required to fulfill contractual obligations, or, if needed, to perform another RATS task. To prevent unauthorized access or compromise of classified information entrusted to the SAIC facility, the SAIC Team will establish controls for material that is in use and provide approved GSA Class 6 Security Containers or Class 5 Security Containers. SAIC reminds all employees to ensure that non-cleared individuals cannot overhear their classified and sensitive conversations. The SAIC Team will ensure the protection and security of employees operating within open or closed areas via the layout of office furniture and the proper use of screens for computer systems.

Limitations on Employees Concerning Reproduction, Transmission, or Disclosure of Data. The SAIC Team will keep the reproduction of classified deliverable or non-deliverable documents to an absolute minimum, consistent with contractual and operational requirements. The FSO is also responsible for ensuring that only authorized employees carry out reproduction of classified material. Before these employees reproduce any documents, the FSO or security staff will review the documents and determine whether reproducing them is in the best interest of RATS; if not, reproduction of any kind is not authorized.

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The FSO also ensures proper recording and accountability of the material after reproduction. We strictly control production and dissemination of these materials. After-hours reproduction is discouraged and must be coordinated with the security staff. If operational requirements dictate such activity, the FSO - in conjunction with the SAIC Team - will establish specific arrangements and procedures on a case-by-case basis.

Procedures for the Destruction of Classified Information. The FSO and security staff member are the only individuals authorized to destroy classified material. The security team will only destroy material with the consent of the program manager and only when the SAIC Team no longer need the material.

B.4 Information Security

Information security addresses the control and monitoring of data used by computer applications and systems. SAIC has developed a DSS-approved System Security Plan (SSP) that defines the procedures for controlling, handling, and accessing government data and other information system resources. This plan follows NISPOM Chapter 8 and other best practice processes. The SSP describes the system and provides details surrounding its operation in a secure environment. The SSP includes detailed descriptions of the system with regard to security configuration, internal and external connectivity, security countermeasures, threats and vulnerabilities, security administration, and physical layout. **Figure B.4-1** depicts how the RATS Program and other governing documents correlate with our SAIC management SOP and SSP. This correlation coincides with our approach to tailoring our processes and procedures to accommodate RATS policies and regulations.

The SAIC Team adheres to all information security procedures while processing information in the facility. SAIC enforces security standards that prohibit the use of non-contract–related software on computers used to support this contract. If any non-contract–related software is found on computers supporting this contract, we will investigate the reasons for using the software and bring all computer systems into compliance. Before permitting access to any computing system, SAIC conducts user training and warns system users about restrictions with sign-on warning banners. The SAIC Team gives clear and unequivocal notice to computer users that, by signing on to the system they are expressly consenting to such monitoring. In addition, system administrators monitor computer users in the course of routine system maintenance.

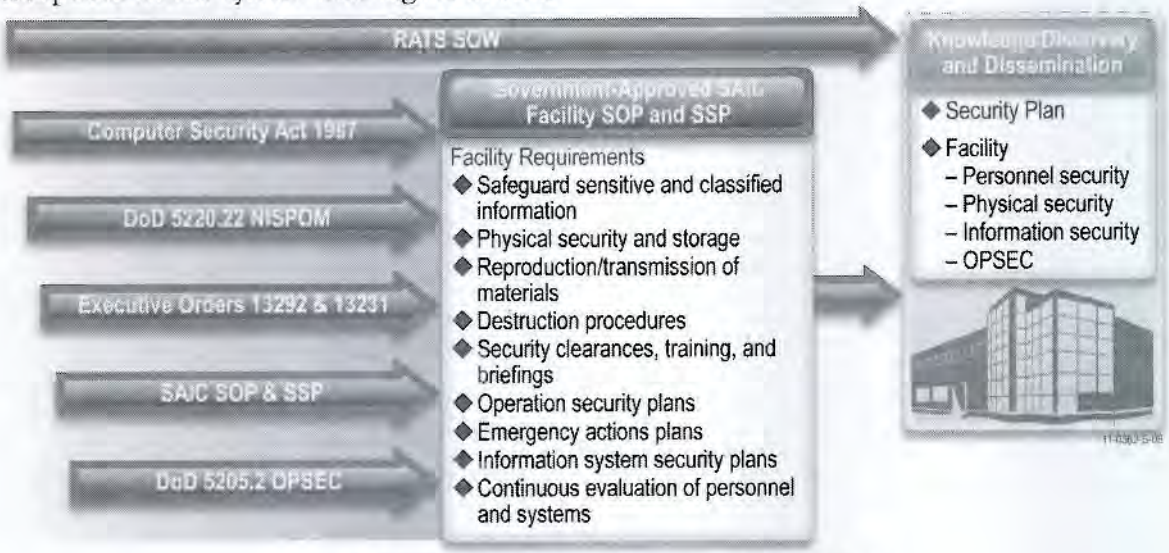

Figure B.4-1. Correlation of SAIC Management SOP and SSP

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In addition to the data, the SAIC will secure the operating systems and software used in support of the RATS Program. The SAIC Team applies controls to protect assets from unauthorized or fraudulent use, manipulation, or destruction as required in the areas of auditing, recording, investigating, and archiving. The SAIC Team will also implement security controls for fraudulent or inadvertent occasions; features that guarantee system integrity and prevent unauthorized use of system interfaces; controlled access to the software programs stored in the system; safeguards to protect operational status and subsequent restart integrity during and after a system shutdown. In addition to these security controls, the SAIC will also ensure complete and current documentation that enables us to construct audit trails and implement software features that lock out a terminal not used for a specified period. The SAIC Team will also develop procedural safeguards, such as periodic evaluation of system vulnerabilities, separation of duties, and complete rules for operation; and maintenance processes to validate operating systems before implementation.

In addition to these security measures, SAIC will also implement 256-bit Advanced Encryption Standard (AES) hardware-based encryption on all removable hard drives used during the evaluation process.

As an integral part of our information security process, SAIC automatically backs up data in case of a disaster. SAIC's approach provides integrity and availability through a comprehensive set of requirements and standards for day-to-day protection of data, systems, and software.

Data Backup Procedures. The SAIC Team uses full and incremental backups to meet a variety of requirements. The SAIC Team will combine full and incremental backups in several ways as solutions to meet specific recovery and business continuity challenges. In a full backup, data is stored on tape or another transportable media in a secure, protected environment. In an incremental backup, all data that has changed since the last full, differential, or incremental backup are stored. The SAIC team will keep incremental backups close to the data center to facilitate restoration in the event of a catastrophic failure.

The SAIC team will back up data every night during non-peak hours. The SAIC Team will maintain incremental backup tapes for four weeks and monthly full backup archive tapes for six months. In addition, as per current operating procedures, SAIC will maintain the last monthly full backup archive for six years or the life of the contract. This scheme provides chronological restoration capability in the event of a disaster or for investigative purposes. Note that SAIC can only restore individual files if they were present on the system during previous a backup operation.

B.5 Operations Security

Operations security (OPSEC) applies to all members of the RATS Program who generate or handle critical program information (CPI) as well as all other sensitive information. We will protect mission-sensitive information, including core mission components such as operational information; maintain classification levels from Unclassified, For Official Use Only (FOUO), and Classified Confidential and Secret; and protect CPI as well as all other sensitive information by analyzing friendly actions attendant to military operations. By developing countermeasures, we not only protect information but also eliminate and minimize indicators.

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ATTACHMENT 1. SECURE FACILITY DOCUMENTATION

DEFENSE SECURITY SERVICE
OPERATIONS CENTER - COLUMBUS
P.O. BOX 2499
COLUMBUS, OHIO 43216-5006

May 11, 1999

CAGE: 0PSG0

Science Applications International Corporation
Technology Research Group
Attn: Facility Security Officer
4001 N Fairfax Dr., Suite 410
Arlington, VA 22203

Dear Sir or Madam:

Reference is made to our earlier correspondence regarding the eligibility of your facility for a Department of Defense security clearance. I am pleased to advise that the necessary processing has been completed and a security clearance at the TOP SECRET level is hereby granted your facility.

The fact that your organization has qualified for and has been granted a facility clearance may not be used for advertising nor promotional purposes, nor may this letter be reproduced in any form except for the necessary records of your organization.

The Defense Security Service is vitally interested in assisting you in the development of a sound security posture. We will conduct periodic reviews of your security program to aid you in maintaining proper security safeguards and are available at any time for guidance or assistance.

Sincerely,

JOHN W. FAULKNER
Director

copy: ODCKS

DSS FL 381-R

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APPENDAGE TO DEPARTMENT OF DEFENSE SECURITY AGREEMENT

Form Approved
OMB No. 0704-0194
Expires Sep 30, 2007

The public reporting burden for this collection of information is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0194), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION. RETURN COMPLETED FORM TO YOUR RESPECTIVE COGNIZANT SECURITY OFFICE.

It is further agreed, on this 10th day of December 2007, by and between the United States of America through the Defense Security Service, acting for the Department of Defense, hereinafter called the Government, and Science Applications International Corporation which has entered into the Security Agreement to which this appendix is made a part that the branches and/or facilities listed below, owned and/or operated by said contractor are included in and covered by the provisions of the said Security Agreement, and Certificate Pertaining to Foreign Interests, Standard Form 328

NAME OF PLANT OR FACILITY	NUMBER AND STREET ADDRESS	CITY AND STATE
Science Applications International Corporation (CAGE: 0PSG0)	4001 North Fairfax Drive, Suite 475	Arlington, VA 22203

THE UNITED STATES OF AMERICA	CONTRACTOR *(Typed Name)*
BY *(Signature of Government Representative)* Nancy de la Garza Field Office Chief	Science Applications International Corporation BY *(Signature of Authorized Contractor Representative)* George S. Hall
AUTHORIZED REPRESENTATIVE OF THE GOVERNMENT *(Type Name of Government Agency)* Defense Security Service (S41SD) 11770 Bernardo Plaza Court, Suite 450 San Diego, CA 92128-2420	TITLE *(of Authorized Contractor Representative)* George S. Hall, Corporate Security Corporate Industrial Security Manager ADDRESS 10260 Campus Point Drive San Diego, CA 92121

DD FORM 441-1, OCT 2004 PREVIOUS EDITION IS OBSOLETE.

DEPARTMENT OF DEFENSE

SECURITY- AGREEMENT

FORM APPROVED: OMB NO. 0704-0194 EXP. DATE: MAR 31 1987

THIS DEPARTMENT OF DEFENSE SECURITY AGREEMENT (hereinafter called the Agreement), entered into this 5th day of January 1987, by and between the UNITED STATES OF AMERICA, through the Defense Investigative Service acting for the Department of Defense and other governmental User Agencies (hereinafter called the Government), and

(i) a corporation organized and existing under the laws of the state of Delaware SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

(ii) [illegible]

(iii) [illegible]

with its principal office and place of business at 10260 Campus Point Drive in the city of San Diego, state of California (hereinafter called the Contractor)

WITNESSETH THAT:

WHEREAS, the Government has in the past purchased or may in the future purchase from the Contractor supplies or services, which are required and necessary to the national security of the United States; or may invite bids or request quotations on proposed contracts for the purchase of supplies or services, which are required and necessary to the national security of the United States; and

WHEREAS, it is essential that certain security measures be taken by the Contractor prior to and after being accorded access to classified information; and

WHEREAS, the parties desire to define and set forth the precautions and specific safeguards to be taken by the Contractor and the Government in order to preserve and maintain the security of the United States through the prevention of improper disclosure of classified information, sabotage, or any other acts detrimental to the security of the United States;

NOW, THEREFORE, in consideration of the foregoing and of the mutual promises herein contained, the parties hereto agree as follows.

Section I - SECURITY CONTROLS

(A) The Contractor agrees to provide and maintain a system of security controls within the organization in accordance with the requirements of the Department of Defense "Industrial Security Manual for Safeguarding Classified Information" (hereinafter called the Manual) attached hereto and made a part of this Agreement, subject, however, (i) to any revisions of the Manual required by the demands of national security as determined by the Government, notice of which shall be furnished to the Contractor, and (ii) to mutual agreements entered into by the parties in order to adapt the Manual to the Contractor's business and necessary procedures thereunder. In order to place in effect such security controls, the Contractor further agrees to prepare Standard Practice Procedures for internal use, such procedures to be consistent with the Manual. In the event of any inconsistency between the Manual, as revised, and the Contractor's Standard Practice Procedures, the Manual shall control.

(B) The Government agrees that it shall indicate, when necessary, by security classification (TOP SECRET, SECRET, or CONFIDENTIAL) the degree of importance to the national security of information pertaining to supplies, services, and other matters to be furnished by the Contractor to the Government, or by the Government to the Contractor, and the Government shall give written notice of such security classification to the Contractor and of any subsequent changes thereof; provided, however, that matters requiring security classification will be assigned the least restricted security classification consistent with proper safeguarding of the matter concerned, since over-classification causes unnecessary operational delays and depreciates the importance of correctly classified matter. Further, the Government agrees that when Atomic Energy information is involved it will, when necessary, indicate by a marking additional to the classification marking that the information is "RESTRICTED DATA." The "Department of Defense Contract Security Classification Specification" (DD Form 254) is the basic document by which classification, regrading, and declassification specifications are documented and conveyed to the Contractor.

(C) The Government agrees, on written application, to grant personnel security clearances to eligible employees of the Contractor who require access to information classified TOP SECRET, SECRET, or CONFIDENTIAL.

(D) The Contractor agrees to determine that any subcontractor, subbidder, individual, or organization proposed for the furnishing of supplies or services, which will involve access to classified information, has been granted an appropriate Department of Defense facility security clearance, which is still in effect prior to according access to such classified information.

Section II - INSPECTION

Designated representatives of the Government responsible for inspection pertaining to industrial plant security shall have the right to inspect, at reasonable intervals, the procedures, methods, and facilities utilized by the Contractor in complying with the requirements of the terms and conditions of the Manual. Should the Government, through its authorized representative, determine that the Contractor's security methods, procedures, or facilities do not comply with such requirements, it shall submit a written report to the Contractor advising of the deficiencies.

Section III - MODIFICATION

Modification of this Agreement may be made only by written agreement of the parties hereto. The Manual may be modified in accordance with section I of this Agreement.

DD FORM 34 JAN 441 Previous editions of this form are obsolete.

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Section IV - TERMINATION

This Agreement shall remain in effect until terminated through the giving of 30 days' written notice to the other party of the intention to terminate; provided, however, notwithstanding any such termination, the terms and conditions of this Agreement shall continue in effect so long as the Contractor possesses classified information.

Section V - PRIOR SECURITY AGREEMENTS

As of the date hereof, this Agreement replaces and supersedes any and all prior security or secrecy agreements, understandings, and representations, with respect to the subject matter included herein, entered into between the Contractor and the Government; provided, that the term "security or secrecy agreements, understandings, and representations" shall not include agreements, understandings, and representations contained in contracts for the furnishing of supplies or services to the Government, which were previously entered into between the Contractor and the Government.

Section VI - SECURITY COSTS

This Agreement does not obligate Government funds, and the Government shall not be liable for any costs or claims of the Contractor arising out of this Agreement or instructions issued hereunder. It is recognized, however, that the parties may provide in other written contracts for security costs, which may be properly chargeable thereto.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year written above:

THE UNITED STATES OF AMERICA

By _____
JOHN E. FOSTER
Director, Industrial Security

(Authorized Representative of the Government)

_____
(Corporate Seal)

By _____

J. R. Beyster

WITNESS

_____

_____

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
(Firm)

Chairman of the Board, President and Chief Executive Officer
(Title)

10260 Campus Point Drive
San Diego, CA 92121
(Address)

NOTE: In case of a corporation, witnesses not required, but the certificate must be completed. Type or print names under all signatures.

NOTE: *The Contractor, if a corporation, should cause the following certificate to be executed under its corporate seal, provided that the same officer shall not execute both the Agreement and the Certificate.*

CERTIFICATE

I, J. D. Heipt, certify that I am the Corporate Secretary of the corporation named as Contractor herein; that J. R. Beyster, who signed this agreement on behalf of the Contractor, was then Chairman of the Board, President and Chief Executive Officer of said corporation; that said agreement was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
OCTOBER 21 1980
RELEASE

(Corporate Seal)

_____
J. D. Heipt (Signature)

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ATTACHMENT 2. FOCI

CERTIFICATE PERTAINING TO FOREIGN INTERESTS
(Type or print all answers)

Form Approved OMB No. 0704-0194 Expires Sep 30, 2007

The public reporting burden for this collection of information is estimated to average 70 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Services and Communications Directorate (0704-0194). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION. RETURN COMPLETED FORM TO YOUR RESPECTIVE COGNIZANT SECURITY OFFICE.

PENALTY NOTICE

Failure to answer all questions or any misrepresentation (by omission or concealment, or by misleading, false or partial answers) may serve as a basis for denial of clearance for access to classified information. In addition, Title 18, United States Code 1001, makes it a criminal offense, punishable by a maximum of five (5) years imprisonment, $15,000 fine or both, knowingly to make a false statement or representation to any Department or Agency of the United States, as to any matter within the jurisdiction of any Department or Agency of the United States. This includes any statement made herein which is knowingly incorrect, incomplete or misleading in any important particular.

PROVISIONS

1. This report is authorized by the Secretary of Defense, as Executive Agent for the National Industrial Security Program, pursuant to Executive Order 12829. While you are not required to respond, your eligibility for a facility security clearance cannot be determined if you do not complete this form. The retention of a facility security clearance is contingent upon your compliance with the requirements of DoD 5220.22-M for submission of a revised form as appropriate.

2. When this report is submitted in confidence and is so marked, applicable exemptions to the Freedom of Information Act will be invoked to withhold it from public disclosure.

3. Complete all questions on this form. Mark "Yes" or "No" for each question. If your answer is "Yes" furnish in full the complete information under "Remarks."

QUESTIONS AND ANSWERS

	YES	NO
1. *(Answer 1a. or 1b.)* a. *(For entities which issue stock)*: Do any foreign person(s), directly or indirectly, own or have beneficial ownership of 5 percent or more of the outstanding shares of any class of your organization's equity securities?		X
b. *(For entities which do not issue stock)*: Has any foreign person directly or indirectly subscribed 5 percent or more of your organization's total capital commitment?		X
2. Does your organization directly, or indirectly through your subsidiaries and/or affiliates, own 10 percent or more of any foreign interest?	X	
3. Do any non-U.S. citizens serve as members of your organization's board of directors (or similar governing body), officers, executive personnel, general partners, regents, trustees or senior management officials?		X
4. Does any foreign person(s) have the power, direct or indirect, to control the election, appointment, or tenure of members of your organization's board of directors (or similar governing body) or other management positions of your organization, or have the power to control or cause the direction of other decisions or activities of your organization?		X
5. Does your organization have any contracts, agreements, understandings, or arrangements with a foreign person(s)?	X	
6. Does your organization, whether as borrower, surety, guarantor or otherwise have any indebtedness, liabilities or obligations to a foreign person(s)?	X	
7. During your last fiscal year, did your organization derive: a. 5 percent or more of its total revenues or net income from any single foreign person?		X
b. In the aggregate 30 percent or more of its revenues or net income from foreign persons?		X
8. Is 10 percent or more of any class of your organization's voting securities held in "nominee" shares, in "street names" or in some other method which does not identify the beneficial owner?		X
9. Do any of the members of your organization's board of directors (or similar governing body), officers, executive personnel, general partners, regents, trustees or senior management officials hold any positions with, or serve as consultants for, any foreign person(s)?	X	
10. Is there any other factor(s) that indicates or demonstrates a capability on the part of foreign persons to control or influence the operations or management of your organization?		X

STANDARD FORM 328 (Revised 7/2004) PREVIOUS EDITION IS OBSOLETE.

REMARKS *(Attach additional sheets, if necessary, for a full detailed statement.)*

See attached remarks.

CERTIFICATION

I CERTIFY that the entries made by me above are true, complete, and correct to the best of my knowledge and belief and are made in good faith.

WITNESSES:

Paula D. McMullen

23 March 2005
(Date Certified)

By _____
(Signature of Authorized Contractor Representative)

Science Applications International Corporation
(Typed Name of Contractor)

Senior Vice President, General Counsel and Secretary
(Title of Authorized Contractor Representative)

10260 CampusPoint Drive, San Diego, CA 92121
(Address)

NOTE: In case of a corporation, a witness is not required but the certificate below must be completed. Type or print names under all signatures.

NOTE: Contractor, if a corporation, should cause the following certificate to be executed under its corporate seal, provided that the same officer shall not execute both the Agreement and the Certificate.

CERTIFICATE

I, Dr. John H. Warner, certify that I am the Chief Administrative Officer of the corporation named as Contractor herein; that Douglas E. Scott who signed this certificate on behalf of the Contractor, was then General Counsel and Secretary of said corporation; that said certificate was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION DELAWARE MAR 21 1990
(Corporate Seal)

John H. Warner Jr.
(Signature and Date)

STANDARD FORM 328 (BACK) (Revised 7/2004)

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ALTERNATE CERTIFICATE PERTAINING TO FOREIGN INTEREST (SF 328)

A comprehensive Certificate Pertaining to Foreign Interest (Standard Form 328) need not be completed because of a Foreign Ownership, Control or Influence (FOCI) favorable adjudication determination made on 19 July 2005 by the:

Department of Defense
Defense Security Service
Attn: Ms. Nancy de la Garza
Industrial Security Field Office (S41SD)
11770 Bernardo Plaza Court, Suite 450
San Diego, California 92128-2128
Telephone: 858-674-4311

Company Name, Address and CAGE Code:

Science Applications International Corporation
10260 Campus Point Drive
San Diego, California 92121

CAGE Code: 53293

I hereby certify the above information to be complete, current and accurate.

James P. Linn

Date: 3/31/06

James P. Linn
Vice President and Director of Corporate Security
Voice: 703-676-5704 Cell: 703-969-0444
E-Mail: james.p.linn@saic.com

Science Applications International Corporation
1710 SAIC Drive, P.O. Box 1303 McLean, Virginia 22102