SOLICITATION, OFFER AND AWARD	1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 350) ▶	RATING	PAGE OF
		D0-C9	1 of 54 PAGES

2. CONTRACT NO.	3. SOLICITATION NO.	4. TYPE OF SOLICITATION	5. DATE ISSUED	6. REQUISITION/PURCHASE NO.
	N00173-00-R-KK04	☐ SEALED BID (IFB) ☒ NEGOTIATED (RFP)	19 JUL 00	

7. ISSUED BY	CODE	8. ADDRESS OFFER TO *(If other than Item 7)*
CONTRACTING OFFICER NAVAL RESEARCH LABORATORY ATTN: CODE 3220.KK WASHINGTON DC 20375-5326		

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

SOLICITATION

9. Sealed offers in original and 2 copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository located in Building 222, Room 115 until 1600 *(Hour)* local time 21 Aug 2000 *(Date)*

CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-10. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL: ▶	A. NAME	B. TELEPHONE NO. *(Include area code) (NO COLLECT CALLS)*
	KEVIN M. KING	202 - 767-1495

11. TABLE OF CONTENTS

(✓)	SEC.	DESCRIPTION	PAGE(S)	(✓)	SEC.	DESCRIPTION	PAGE(S)
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OFFER *(Must be fully completed by offeror)*

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within _____ calendar days *(60 calendar days unless a different period is inserted by the offeror)* from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT *(See Section I, Clause No. 52-232-8)* ▶	10 CALENDAR DAYS %	20 CALENDAR DAYS %	30 CALENDAR DAYS %	CALENDAR DAYS %

14. ACKNOWLEDGMENT OF AMENDMENTS *(The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated:*	AMENDMENT NO.	DATE	AMENDMENT NO.	DATE

15A. NAME AND ADDRESS OF OFFEROR	CODE	FACILITY	16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*

15B. TELEPHONE NO. *(Include area code)*	15C. ☐ CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE.	17. SIGNATURE	18. OFFER DATE

AWARD *(To be completed by Government)*

19. ACCEPTED AS TO ITEMS NUMBERED	20. AMOUNT	21. ACCOUNTING AND APPROPRIATION

22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION:

☐ 10 U.S.C. 2304(c) ( ) ☐ 41 U.S.C. 253(c) ( )

23. SUBMIT INVOICES TO ADDRESS SHOWN IN *(4 copies unless otherwise specified)* ▶ ITEM

24. ADMINISTERED BY *(If other than Item 7)*	CODE	25. PAYMENT WILL BE MADE BY	CODE

26. NAME OF CONTRACTING OFFICER *(Type or print)*	27. UNITED STATES OF AMERICA *(Signature of Contracting Officer)*	28. AWARD DATE

IMPORTANT - Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.

PART I - THE SCHEDULE
SECTION B
SUPPLIES OR SERVICES AND PRICES/COSTS

B-1 SUPPLIES/SERVICES AND COSTS

ITEM NUMBER	SUPPLIES/SERVICES	ESTIMATED COST	FIXED FEE	ESTIMATED COST PLUS FIXED FEE
BASE PERIOD - YEAR 1				
	Task 1			
0001	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 1, entitled " Fire Research"	$	$	$
0002	Data in accordance with Exhibit A (DD 1423)	* NSP	* NSP	* NSP
	Task 2			
0003	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 2, entitled " Service Life, Affordability, Maintainability and Safety of the Fleet"	$	$	$
0004	Data in accordance with Exhibit B (DD 1423)	* NSP	* NSP	* NSP

Task 3

0005	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 3, entitled " Synthesis and Characterization of Advanced Chemical Materials Destined for Use in Navy Systems and Other Chemical Material Research"	$	$	$
0006	Data in accordance with Exhibit C (DD 1423)	* NSP	* NSP	* NSP

Task 4

0007	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 4, entitled " Development and Characterization of New Polymeric Materials for Naval Systems"	$	$	$
0008	Data in accordance with Exhibit D (DD 1423)	* NSP	* NSP	* NSP

Task 5

0009	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 5, entitled " Study of Propulsion Fuels and Other Fuels"	$	$	$
0010	Data in accordance with Exhibit E (DD 1423)	* NSP	* NSP	* NSP

Task 6

0011	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1,	$	$	$

	Task 6, entitled " Research and Development of Analytical Techniques Used in the Combustion of Fuels, Propellants, Pyrophorics and Explosives"			
0012	Data in accordance with Exhibit F (DD 1423)	* NSP	* NSP	* NSP
	Task 7			
0013	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 7, entitled " Development and Evaluation of New Analytical Technologies"	$	$	$
0014	Data in accordance with Exhibit G (DD 1423)	* NSP	* NSP	* NSP
	Task 8			
0015	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 8, entitled " Computer Hardware and Software Support"	$	$	$
0016	Data in accordance with Exhibit H (DD 1423)	* NSP	* NSP	* NSP
TOTAL EST. COST PLUS FIXED FEE	(Base Period – Year 1)	$	$	$
OPTION 1 –YEAR 2				
	Task 1			
0017	The Contractor shall provide research as described in the Statement	$	$	$

	of Work, Attachment No. 1, Task 1, entitled " Fire Research"			
0018	Data in accordance with Exhibit A (DD 1423)	* NSP	* NSP	* NSP
	Task 2			
0019	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 2, entitled " Service Life, Affordability, Maintainability and Safety of the Fleet"	$	$	$
0020	Data in accordance with Exhibit B (DD 1423)	* NSP	* NSP	* NSP
	Task 3			
0021	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 3, entitled " Synthesis and Characterization of Advanced Chemical Materials Destined for Use in Navy Systems and Other Chemical Material Research"	$	$	$
0022	Data in accordance with Exhibit C (DD 1423)	* NSP	* NSP	* NSP
	Task 4			
0023	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 4, entitled " Development and Characterization of New Polymeric Materials for Naval Systems"	$	$	$
0024	Data in accordance with Exhibit D (DD 1423)	* NSP	* NSP	* NSP

Task 5

0025	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 5, entitled " Study of Propulsion Fuels and Other Fuels"	$	$	$
0026	Data in accordance with Exhibit E (DD 1423)	* NSP	* NSP	* NSP

Task 6

0027	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 6, entitled " Research and Development of Analytical Techniques Used in the Combustion of Fuels, Propellants, Pyrophorics and Explosives"	$	$	$
0028	Data in accordance with Exhibit F (DD 1423)	* NSP	* NSP	* NSP

Task 7

0029	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 7, entitled " Development and Evaluation of New Analytical Technologies"	$	$	$
0030	Data in accordance with Exhibit G (DD 1423)	* NSP	* NSP	* NSP

Task 8

0031	The Contractor shall	$	$	$

	provide research as described in the Statement of Work, Attachment No. 1, Task 8, entitled " Computer Hardware and Software Support"			
0032	Data in accordance with Exhibit H (DD 1423)	* NSP	* NSP	* NSP
TOTAL EST. COST PLUS FIXED FEE (Option 1 – Year 2)		$	$	$
OPTION 2 – YEAR 3				
	Task 1			
0033	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 1, entitled " Fire Research"	$	$	$
0034	Data in accordance with Exhibit A (DD 1423)	* NSP	* NSP	* NSP
	Task 2			
0035	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 2, entitled " Service Life, Affordability, Maintainability and Safety of the Fleet"	$	$	$
0036	Data in accordance with Exhibit B (DD 1423)	* NSP	* NSP	* NSP
	Task 3			
0037	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 3, entitled " Synthesis and	$	$	$

	Characterization of Advanced Chemical Materials Destined for Use in Navy Systems and Other Chemical Material Research"			
0038	Data in accordance with Exhibit C (DD 1423)	* NSP	* NSP	* NSP
	Task 4			
0039	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 4, entitled " Development and Characterization of New Polymeric Materials for Naval Systems"	$	$	$
0040	Data in accordance with Exhibit D (DD 1423)	* NSP	* NSP	* NSP
	Task 5			
0041	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 5, entitled " Study of Propulsion Fuels and Other Fuels"	$	$	$
0042	Data in accordance with Exhibit E (DD 1423)	* NSP	* NSP	* NSP
	Task 6			
0043	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 6, entitled " Research and Development of Analytical Techniques Used in the Combustion of Fuels, Propellants, Pyrophorics and Explosives"	$	$	$
0044	Data in accordance with Exhibit F (DD 1423)	* NSP	* NSP	* NSP

	Task 7			
0045	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 7, entitled " Development and Evaluation of New Analytical Technologies"	$	$	$
0046	Data in accordance with Exhibit G (DD 1423)	* NSP	* NSP	* NSP
	Task 8			
0047	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 8, entitled " Computer Hardware and Software Support"	$	$	$
0048	Data in accordance with Exhibit H (DD 1423)	* NSP	* NSP	* NSP
TOTAL EST. COST PLUS FIXED FEE (Option 2 – Year 3)		$	$	$
OPTION 3 – YEAR 4				
	Task 1			
0049	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 1, entitled " Fire Research"	$	$	$
0050	Data in accordance with Exhibit A (DD 1423)	* NSP	* NSP	* NSP

Task 2

0051	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 2, entitled " Service Life, Affordability, Maintainability and Safety of the Fleet"	$	$	$
0052	Data in accordance with Exhibit B (DD 1423)	* NSP	* NSP	* NSP

Task 3

0053	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 3, entitled " Synthesis and Characterization of Advanced Chemical Materials Destined for Use in Navy Systems and Other Chemical Material Research"	$	$	$
0054	Data in accordance with Exhibit C (DD 1423)	* NSP	* NSP	* NSP

Task 4

0055	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 4, entitled " Development and Characterization of New Polymeric Materials for Naval Systems"	$	$	$
0056	Data in accordance with Exhibit D (DD 1423)	* NSP	* NSP	* NSP

Task 5

0057	The Contractor shall provide research as described in the Statement	$	$	$

	of Work, Attachment No. 1, Task 5, entitled " Study of Propulsion Fuels and Other Fuels"			
0058	Data in accordance with Exhibit E (DD 1423)	* NSP	* NSP	* NSP
	Task 6			
0059	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 6, entitled " Research and Development of Analytical Techniques Used in the Combustion of Fuels, Propellants, Pyrophorics and Explosives"	$	$	$
0060	Data in accordance with Exhibit F (DD 1423)	* NSP	* NSP	* NSP
	Task 7			
0061	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 7, entitled " Development and Evaluation of New Analytical Technologies"	$	$	$
0062	Data in accordance with Exhibit G (DD 1423)	* NSP	* NSP	* NSP
	Task 8			
0063	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1,	$	$	$

	Task 8, entitled " Computer Hardware and Software Support"			
0064	Data in accordance with Exhibit H (DD 1423)	* NSP	* NSP	* NSP
TOTAL EST. COST PLUS FIXED FEE (Option 3 – Year 4)		$	$	$
OPTION 4 – YEAR 5				
	Task 1			
0065	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 1, entitled " Fire Research"	$	$	$
0066	Data in accordance with Exhibit A (DD 1423)	* NSP	* NSP	* NSP
	Task 2			
0067	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 2, entitled " Service Life, Affordability, Maintainability and Safety of the Fleet"	$	$	$
0068	Data in accordance with Exhibit B (DD 1423)	* NSP	* NSP	* NSP
	Task 3			
0069	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 3, entitled " Synthesis and Characterization of Advanced Chemical Materials Destined for Use in Navy Systems and Other	$	$	$

Chemical Material Research"

0070	Data in accordance with Exhibit C (DD 1423)	* NSP	* NSP	* NSP
	Task 4			
0071	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 4, entitled " Development and Characterization of New Polymeric Materials for Naval Systems"	$	$	$
0072	Data in accordance with Exhibit D (DD 1423)	* NSP	* NSP	* NSP
	Task 5			
0073	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 5, entitled " Study of Propulsion Fuels and Other Fuels"	$	$	$
0074	Data in accordance with Exhibit E (DD 1423)	* NSP	* NSP	* NSP
	Task 6			
0075	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 6, entitled " Research and Development of Analytical Techniques Used in the Combustion of Fuels, Propellants, Pyrophorics and Explosives"	$	$	$
0076	Data in accordance with Exhibit F (DD 1423)	* NSP	* NSP	* NSP

	Task 7			
0077	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 7, entitled " Development and Evaluation of New Analytical Technologies"	$	$	$
0078	Data in accordance with Exhibit G (DD 1423)	* NSP	* NSP	* NSP
	Task 8			
0079	The Contractor shall provide research as described in the Statement of Work, Attachment No. 1, Task 8, entitled " Computer Hardware and Software Support"	$	$	$
0080	Data in accordance with Exhibit H (DD 1423)	* NSP	* NSP	* NSP
TOTAL EST. COST PLUS FIXED FEE (Option 4 – Year 5)		$	$	$

- *Not Separately Priced*
- *Note: Award may be made on a task by task basis, or in the aggregate, whichever basis is most advantageous to the Government. See Section L-13.*

SECTION C
DESCRIPTION/SPECIFICATIONS/STATEMENT OF WORK

C-1 STATEMENT OF WORK

The work and services to be performed hereunder shall be subject to the requirements and standards contained in Attachment (1), Statement of Work, with Exhibits A,B, C, D, E, F, G, and H, Contract Data Requirements List, and all other Attachments cited in Section J, which are incorporated by reference into Section C.

C-2 REQUIREMENTS FOR ON-SITE CONTRACTORS

For those portions of the work under this contract performed at any NRL site, the contractor shall comply with the Requirements for On-Site Contractors dated 11 April 2000 which are hereby incorporated by reference. The full text is available at http://heron.nrl.navy.mil/contracts/home.htm.

C-3 SUBCONTRACTING PLAN

Subcontracting Plan dated is hereby incorporated by reference.
*(*this provision will be included and completed at time of award, if applicable)*

SECTION D
PACKAGING AND MARKING

D-1 PACKAGING AND MARKING

Preservation, packaging, packing and marking of all deliverable contract line items must conform to normal commercial packing standards to assure safe delivery at destination.

SECTION E
INSPECTION AND ACCEPTANCE

E-1 INSPECTION AND ACCEPTANCE CLAUSES INCORPORATED BY REFERENCE

FAR CLAUSE		TITLE
52.246-9	-	Inspection Of Research And Development (Short Form) (APR 1984)

DFARS CLAUSE		TITLE
252.246-7000	-	Material Inspection And Receiving Report (DEC 1991)

E-2 INSPECTION AND ACCEPTANCE

Inspection and acceptance of the final delivery will be accomplished by the Technical Manager (TM) or Contracting Officer Representative (COR) designated in Section G of this contract. Inspection and acceptance will be performed at the Naval Research Laboratory, Washington DC 20375-5320.

SECTION F
DELIVERIES OR PERFORMANCE

F-1 DELIVERIES OR PERFORMANCE CLAUSES INCORPORATED BY REFERENCE:

FAR CLAUSE		TITLE
52.242-15	-	Stop-Work Order (AUG 1989) - Alternate I (APR 1984)
52.247-34	-	F.O.B. Destination (NOV 1991)

F-2 PERIOD AND PLACE OF PERFORMANCE

(a) The term of this contract is from date of contract award through one year thereafter. In the event that any of the option items are exercised, the term shall commence on the effective date stated in the modification which exercises the option through one year thereafter.

(b) The principal place of performance of this contract shall be at the Naval Research Laboratory, Washington, D.C., unless specified otherwise at time of award. Prospective offerors should note, however, that portions of some tasks are performed at locations other than the Naval Research Laboratory. These locations are more specifically identified in Section L and in the Statement of Work.

(c) All deliverables required by this contract shall be shipped FOB Destination, Naval Research Laboratory, Washington, D.C. 20375-5320, consigned to:

Contracting Officer's Representative
*
Naval Research Laboratory
Contract Number: *
Building: *
Code: *
4555 Overlook Avenue, SW
Washington, D.C. 20375-5320

*(* To be completed at time of award)*

SECTION G
CONTRACT ADMINISTRATION DATA

G-1 PROCURING OFFICE REPRESENTATIVE

In order to expedite administration of the contract, the Administrative Contracting Officer (ACO) will direct inquiries to the appropriate office listed below. Please do not direct routine inquiries to the person listed in Item 20A on Standard Form 26.

Contract Matters- *

Security Matters- *

Safety Matters- *

Patent Matters- *

Release of Data- *

The ACO will forward invention disclosures and reports directly to the Associate Counsel for Patents, Code 1008.2, Naval Research Laboratory, Washington DC 20375-5320. The Associate Counsel for Patents will return the reports along with a recommendation to the Administrative Contracting Officer. The Associate Counsel for Patents will represent the Contracting Officer with regard to invention reporting matters arising under this contract.

*(* To be completed at time of award)*

G-2 CONTRACTING OFFICER'S REPRESENTATIVE (COR) - FUNCTIONS AND LIMITATIONS

* is hereby designated the cognizant COR who will represent the Contracting Officer in the administration of technical details within the scope of this contract and inspection and acceptance. The COR is not otherwise authorized to make any representations or commitments of any kind on behalf of the Contracting Officer or the Government. The COR does not have the authority to alter the Contractor's obligations or change the specifications in the contract. If, as a result of technical discussions, it is desirable to alter contract obligations or statements of work, a modification must be issued in writing and signed by the Contracting Officer. The COR is responsible for reviewing the bills and charges submitted by the Contractor and informing the ACO of areas where exceptions are to be taken.

*(* To be completed at time of award)*

G-3 TECHNICAL DIRECTION MEMORANDUM (TDM)

(a) For the purposes of this clause, technical direction includes the following:
  (1) Direction to the Contractor which shifts work emphasis between work areas or tasks, requires pursuit of certain lines of inquiry, fills in details or otherwise describes work which will accomplish the objectives described in the statement of work;
  (2) Guidelines to the Contractor which assist in interpretation of drawings, specifications or technical portions of work description.

(b) Technical instructions must be within the scope of work stated in the contract. Technical instructions may not be used to:
  (1) Assign additional work under the contract:
  (2) Direct a change as defined in the contract clause entitled "Changes";
  (3) Increase or decrease the estimated contract cost, the fixed fee, or the time required for contract performance; or
  (4) Change any of the terms, conditions or specifications of the contract

(c) The TDM shall be written by the Contracting Officer's Representative (COR), with the original

given to the Contractor and a copy retained in the CORs file. Technical direction may be issued orally only in emergency situations. If technical direction is issued orally, a TDM must follow within two (2) working days from the date of the oral direction. Amendments, corrections, or changes to TDMs shall also be in written format and shall include all the information set forth in paragraph (e) below.

(d) A TDM shall be considered issued when the Government deposits it in the mail, or if transmitted by other means, when it is physically delivered to the contractor.

(e) TDMs shall include, but not be limited to, the following information:

(1) Date of TDM,
(2) Contract Number,
(3) Reference to the relevant portion or item in the Statement of Work,
(4) The specific technical direction or clarification, and
(5) The signature of the COR.

(f) CORs shall retain all files containing TDMs for a period of two (2) years after the final contract completion date.

(g) The only individual authorized in any way to amend or modify any of the terms of this contract shall be the Contracting Officer. When, in the opinion of the Contractor, any technical direction calls for effort outside the scope of the contract or inconsistent with this special provision, the Contractor shall notify the Contracting Officer in writing within ten (10) working days after its receipt.

G-4 SUBCONTRACTORS/CONSULTANTS

(a) Advance notification or requests for consent pursuant to the contract clause entitled "Subcontracts" (FAR 52.244-2) shall be directed to the cognizant administrative contracting officer (ACO).

(b) The following subcontractors/consultants have been identified in the Contractor's proposal as necessary for performance of this contract:

Subcontractor/Consultant Name	Estimated Cost

(Paragraph (b) will be included and filled in at time of award if subcontractor/consultants are proposed by the successful offeror)

G-5 NAPS 5252.232-9001 - SUBMISSION OF INVOICES (COST-REIMBURSEMENT, TIME-AND-MATERIALS, LABOR-HOUR, OR FIXED PRICE INCENTIVE (JUL 1992)

(a) "Invoice" as used in this clause includes contractor requests for interim payments using public vouchers (SF 1034) but does not include contractor requests for progress payments under fixed price incentive contracts.

(b) The Contractor shall submit invoices and any necessary supporting documentation, in an original and 4 copies, to the contract auditor at the following address:

(To be completed at time of award)

unless delivery orders are applicable, in which case invoices will be segregated by individual order and submitted to the address specified in the order. In addition, an information copy shall be

submitted to [See Section G for designated COR]. Following verification, the contract auditor will forward the invoice to the designated payment office for payment in the amount determined to be owing, in accordance with the applicable payment (and fee) clause(s) of this contract.
(c) Invoices requesting interim payments shall be submitted no more than once every two weeks, unless another time period is specified in the Payments clause of this contract. For indefinite delivery type contracts, interim payment invoices shall be submitted no more than once every two weeks for each delivery orders. There shall be a lapse of no more than 30 calendar days between performance and submission of an interim payment invoice.
(d) In addition to the information identified in the Prompt Payment clause herein, each invoice shall contain the following information, as applicable:

(1) Contract line item number (CLIN)
(2) Subline item number (SLIN)
(3) Accounting Classification Reference Number(ACRN)
(4) Payment terms
(5) Procuring activity
(6) Date supplies provided or services performed
(7) Costs incurred and allowable under the contract
(8) Vessel (e.g., ship, submarine or other craft) or system for which supply/service is provided

(e) A DD Form 250, "Material Inspection and Receiving Report",
** is required with each invoice submittal.
__X__ is required only with the final invoice.
** is not required.
(f) A Certificate of Performance
** shall be provided with each invoice submittal.
__X__ is not required.
(g) The Contractor's final invoice shall be identified as such, and shall list all other invoices (if any) previously tendered under this contract.
(h) Cost of performance shall be segregated, accumulated and invoiced to the appropriate ACRN categories to the extent possible. When such segregation of costs by ACRN is not possible for invoices submitted with CLIN/SLINS with more than one ACRN, an allocation ratio shall be established in the same ratio as the obligations cited in the accounting data so that costs are allocated on a proportional basis.

G-6 INCREMENTAL FUNDING

Pursuant to the Limitation of Funds clause (FAR 52.232-22), the total amount allotted to this contract is $* and it is estimated that this amount is sufficient for contract performance through * .
*(*this provision will be included and completed at time of award, if applicable)*

G-7 PAYMENT INSTRUCTIONS FOR MULTIPLE ACCOUNTING CLASSIFICATION CITATIONS (COST-REIMBURSEMENT)

The purpose of these instructions is to permit the paying office to charge the accounting classification citations in the contract in a manner that reflects the performance of the contract. These instructions do not create any obligation on the part of the Government or the contractor nor do they in any way alter any obligation created by any other provision of the contract. Invoices should be paid from available ACRNs in the following order:

(a) ACRNs cited on the contractor's invoice.
(b) On a proportional basis from any ACRNs assigned to funds which will cancel at the end of the current fiscal year.
(c) The ACRN assigned to the following line of accounting:
97X4930.NH4A 000 77777 0 000173 2F 000000 N00173Z45000.
(d) If funds appropriated in more than one fiscal year are allotted to the contract, the ACRN assigned to the oldest allotment of funds.
(e) On a proportional basis from all ACRNs assigned to allotments of funds appropriated in a single fiscal year.

SECTION H
SPECIAL CONTRACT REQUIREMENTS

H-1 TYPE OF CONTRACT

This is a *

*(*To be completed at time of award)*

H-2 ONR 5252.237-9705 - KEY PERSONNEL (DEC 88)

(a) The Contractor agrees to assign to the contract tasks those persons whose resumes were submitted with its proposal and who are necessary to fulfill the requirements of the contract as "key personnel". No substitutions may be made except in accordance with this clause.
(b) The Contractor understands that during the first ninety (90) days of the contract performance period, no personnel substitutions will be permitted unless these substitutions are unavoidable because of the incumbent's sudden illness, death or termination of employment. In any of these events, the Contractor shall promptly notify the Contracting Officer and provide the information described in paragraph (c) below. After the initial ninety (90) day period the Contractor must submit to the Contracting Officer all proposed substitutions, in writing, at least fifteen (15) days in advance (thirty (30) days if security clearance must be obtained) of any proposed substitution and provide the information required by paragraph (c) below.
(c) Any request for substitution must include a detailed explanation of the circumstances necessitating the proposed substitution, a resume for the proposed substitute, and any other information requested by the Contracting Officer. Any proposed substitute must have qualifications equal to or superior to the qualifications of the incumbent. The Contracting Officer or his/her authorized representative will evaluate such requests and promptly notify the Contractor of his/her approval or disapproval thereof.
(d) In the event that any of the identified key personnel cease to perform under the contract and the substitute is disapproved, the contract may be immediately terminated in accordance with the Termination clause of the contract.
The following are identified as key personnel: *

*Note: The anticipated key labor categories are shown by an asterisk in Attachment No. 3. Offerors are put on notice that individuals proposed for these labor categories will be considered to be offered as key personnel for the purposes of this clause. The actual names of the individuals proposed and accepted by the Government as key personnel will be completed at time of award.

H-3 ONR 5252.216-9706 - LEVEL OF EFFORT (DEC 88)

(a) The Contractor agrees to provide the total level of effort specified in the next sentence in performance of the work described in this contract. The total level of effort for performance of this contract shall be * total hours of direct labor, including subcontractor direct labor for those subcontractors specifically identified in the Contractor's proposal as having hours included in the proposed level of effort. A breakdown of labor categories and hours is set forth in paragraph (k) below.

(b) The level of effort for this contract shall be expended at an average rate of * hours per month. It is understood and agreed that the rate of hours per month may fluctuate in pursuit of the technical objective, provided such fluctuation does not result in the use of the total hours of effort prior to the expiration of the term of the contract.

(c) The Contractor is required to notify the Contracting Officer when any of the following situations occur, or are anticipated to occur: If during any three consecutive months the monthly average is exceeded by 25% or, if at any time it is forecast that during the last three months of the contract less than 50% of the monthly average will be used during any given month; or, when 85% of the total level of effort has been expended.

(d) If, during the term of the contract, the Contractor finds it necessary to accelerate the expenditure of direct labor to such an extent that the total hours of effort specified would be used prior to the expiration of the term, the Contractor shall notify the Contracting Officer in writing, setting forth the acceleration required, the probable benefits which would result, and an offer to undertake the acceleration at no increase in the estimated cost or fixed fee together with an offer setting forth a proposed level of effort, cost breakdown, and proposed fixed fee for continuation of the work until expiration of the term hereof. The offer shall provide that the work proposed will be subject to the terms and conditions of this contract and any additions or changes required by then current law, regulations, or directives, and that the offer, with a written notice of acceptance by the Contracting Officer, shall constitute a binding contract. The Contractor shall not accelerate any effort until receipt of such written approval by the Contracting Officer. Any agreement to accelerate will be formalized by contract modification.

(e) The Contracting Officer may, by written order, direct the Contractor to accelerate the expenditure of direct labor such that the total hours of effort specified in paragraph (a) above would be used prior to the expiration of the term. This order shall specify the acceleration required and the resulting revised term. The Contractor shall acknowledge this order within five days of receipt.

(f) If the total level of effort specified in paragraph (a) above is not provided by the Contractor during the term of this contract, the Contracting Officer shall either (i) reduce the fixed fee of this contract as follows:

$$\text{Fee Reduction} = \text{Fixed Fee} \times \frac{(\text{Required LOE Hours} - \text{Expended LOE Hours})}{\text{Required LOE Hours}}$$

or (ii) subject to the provisions of the clause of this contract entitled "Limitation of Cost," require the Contractor to continue to perform the work until the total number of hours of direct labor specified in paragraph (a) shall have been expended, at no increase in the fixed fee of this contract.

(g) In the event the government fails to fully fund the contract in a timely manner, the term of the contract may be extended accordingly with no change to cost or fee. If the government fails to fully fund the contract, the fee will be adjusted in direct proportion to that effort which was performed.

(h) Notwithstanding any of the provisions in the above paragraphs, the Contractor may furnish

hours up to five percent in excess of the total hours specified in paragraph (a) above, provided that the additional effort is furnished within the term hereof, and provided further that no increase in the estimated cost or fixed fee is required, and no adjustment in the fixed fee shall be made provided that the Contractor has delivered at least 95% of the level of effort required in paragraph (a) above.
(i) It is understood that the mix of labor categories provided by the Contractor under the contract, as well as the distribution of effort among those categories, may vary considerably from the initial mix and distribution of effort which was estimated by the government or proposed by the Contractor.
(j) Nothing herein shall be construed to alter or waive any of the rights or obligations of either party pursuant to the Clause entitled "Limitation of Costs" or "Limitation of Funds," either of which clauses as incorporated herein applies to this contract.
(k) The anticipated breakdown by labor category of the total level of effort is as follows: *

Labor Category	Hours

- Paragraphs (a) and (k) will be completed at time of award. For RFP purposes, offerors should refer to Section L-14, entitled "Anticipated Distribution of Direct Labor Hours by Labor Categories."

*(*To be completed at time of award)*

H-4 ONR 5252.235-9714 - REPORT PREPARATION (FEB 97)

Scientific or technical reports prepared by the Contractor and deliverable under the terms of this contract will be prepared in accordance with format requirements contained in ANSI/NISO Z39.18-1995, "Scientific and Technical Reports: Elements, Organization, and Design. "[NOTE: ANSI Z39.18 may be obtained from NISO Press Fulfillment Center, P. O. Box 338, Oxon Hill, MD. 20750-0338.Telephone 1-800-282-6476]

H-5 ON-SITE USE OF GOVERNMENT PROPERTY

It is anticipated that Government property will be used by the contractor's personnel in the performance of that portion of the contract performed on-site at the U.S. Naval Research Laboratory (NRL) including any of its field sites. Such use will be on a rent free basis and all such property shall be considered to remain in the possession and control of the NRL for property responsibility and accountability purposes.

H-6 YEAR 2000 COMPLIANT INFORMATION TECHNOLOGY

This requirement applies to information technology (IT) that processes date-related information. All such IT delivered under this contract shall be Year 2000 compliant as defined at FAR 39.002.

H-7 REPRESENTATIONS AND CERTIFICATIONS

The Contractor's completed Representations, Certifications, and Other Statements of Offerors or Respondents is incorporated herein by reference in any resultant award.

H-8 OPTION TO EXTEND TERM

This contract shall be renewable at the unilateral option of the Government by the Contracting Officer's notice of renewal to the Contractor within the existing term of the contract.

PART II - CONTRACT CLAUSES
SECTION I
CONTRACT CLAUSES

I-1 52.252-2 - CLAUSES INCORPORATED BY REFERENCE (FEB 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
http://heron.nrl.navy.mil/contracts/home.htm

a. FEDERAL ACQUISITION REGULATION CLAUSES

FAR CLAUSE		TITLE
52.202-1	-	Definitions (OCT 1995)
52.203-3	-	Gratuities (APR 1984)
52.203-5	-	Covenant Against Contingent Fees (APR 1984)
52.203-6	-	Restrictions On Subcontractor Sales To The Government (JUL 1995)
52.203-7	-	Anti-Kickback Procedures (JUL 1995)
52-203-8	-	Cancellation, Rescission, And Recovery Of Funds For Illegal Or Improper Activity (JAN 1997)
52.203-10	-	Price Or Fee Adjustment For Illegal Or Improper Activity (JAN 1997)
52.203-12	-	Limitation On Payments To Influence Certain Federal Transactions (JUN 1997)
52.204-2	-	Security Requirements (AUG 1996)
52.204-4	-	Printing/Copying Double-Sided On Recycled Paper (JUN 1996)
52.209-6	-	Protecting The Government's Interest When Subcontracting With Contractors Debarred, Suspended, Or Proposed For Debarment (JUL 1995)
52.211-15	-	Defense Priority and Allocation Requirements (SEP 1990)
52.215-2	-	Audit And Records-Negotiation (JUNE 1999)
52.215-8	-	Order of Precedence - Uniform Contract Format (OCT 1997)
52.215-10	-	Price Reduction for Defective Cost or Pricing Data (OCT 1997)
52.215-11	-	Price Reduction for Defective Cost or Pricing Data - Modifications (OCT 1997)
52.215-12	-	Subcontractor Cost or Pricing Data (OCT 1997)
52.215-13	-	Subcontractor Cost or Pricing Data Modifications (OCT 1997)
52.215-14	-	Integrity of Unit Prices (OCT 1997)

52.215-15 - Pension Adjustments And Asset Reversions (DEC 1998)
52.215-17 - Waiver of Facilities Capital Cost of Money (OCT 1997)
(will be included if the successful offeror does not propose facilities capital cost of money)
52.215-18 - Reversion or Adjustment of Plans for Post-retirement Benefits (PRB) Other than Pensions (OCT 1997)
52.215-19 - Notification of Ownership Changes (OCT 1997)
52.215-21 - Requirements for Cost or Pricing Data or Information Other Than Cost or Pricing Data -Modifications (OCT 1997)
52.216-7 - Allowable Cost And Payment (MAR 2000)
52.216-8 - Fixed-Fee (MAR 1997)
52.219-4 - Notice of Price Evaluation Preference For HUBZone Small Business Concerns (JAN 1999) ☐ Offeror elects to waive the evaluation preference.
52.219-8 - Utilization Of Small Business Concerns (OCT 1999)
52.219-9 - Small Business Subcontracting Plan (OCT 1999) - Alternate II (JAN 1999)
52.219-16 - Liquidated Damages-Subcontracting Plan (JAN 1999)
52.219-25 - Small Disadvantaged Business Participation Program-Disadvantaged Status And Reporting (OCT 1999)
52.222-1 - Notice To The Government Of Labor Disputes (FEB 1997)
52.222-2 - Payment For Overtime Premiums (JUL 1990) -The Use Of Overtime Is Authorized Under This Contract If The Overtime Premium Does Not Exceed "0"
52.222-3 - Convict Labor (AUG 1996)
52.222-21 - Prohibition of Segregated Facilities (FEB 1999)
52.222-26 - Equal Opportunity (FEB 1999)
52.222-35 - Affirmative Action For Disabled Veterans And Veterans Of The Vietnam Era (APR 1998)
52.222-36 - Affirmative Action For Workers With Disabilities (JUN 1998)
52.222-37 - Employment Reports On Disabled Veterans And Veterans Of The Vietnam Era (APR 1998)
52.223-3 - Hazardous Material Identification And Material Safety Data (JAN 1997)
52.223-5 - Pollution Prevention and Right-To-Know Information (APR 1998)
52.223-6 - Drug-Free Workplace (JAN 1997)
52.223-14 - Toxic Chemical Release Reporting (OCT 1996)
52.225-13 - Restrictions On Certain Foreign Purchases (JUL 2000)
52.226-1 - Utilization Of Indian Organizations And Indian-Owned Economic Enterprises (JUN 2000)
52.227-1 - Authorization And Consent (JUL 1995)- Alternate I (APR 1984)
52.227-2 - Notice And Assistance Regarding Patent And Copyright Infringement (AUG 1996)
52.227-10 - Filing of Patent Application- Classified Subject Matter (APR 1984)
52.227-11 - Patent Rights - Retention By The Contractor (Short Form) (JUN 1997)
(will be included if the successful offeror is a small business or a non-profit organization)
52.227-12 - Patent Rights - Retention By The Contractor (Long Form) (JAN 1997)
(will be included if the successful offeror is not a small business or a non-profit organization)
52.228-7 - Insurance - Liability To Third Persons (MAR 1996)

52.230-2 - Cost Accounting Standards (APR 1998)
52.232-9 - Limitation On Withholding Of Payments (APR 1984)
52.232-17 - Interest (JUN 1996)
52.232-18 - Availability Of Funds (APR 1984)
52.232-20 - Limitation Of Cost (APR 1984) *(Applicable when the contract or task order is fully funded)*
52.232-22 - Limitation Of Funds (APR 1984) *(Applicable when the contract or task order is not fully funded)*
52.232-23 - Assignment Of Claims (JAN 1986) Alternate I (APR 1984)
52.232-25 - Prompt Payment (JUN 1997)
52.232-33 - Payment By Electronic Funds Transfer-Central Contractor Registration (MAY 1999)
52.233-1 - Disputes (DEC 1998) - Alternate I (DEC 1991)
52.233-3 - Protest After Award (AUG 1996) - Alternate I (JUN 1985)
52.236-7 - Permits and Responsibilities (NOV 1991)
52.237-2 - Protection Of Government Buildings, Equipment And Vegetation (APR 1984)
52.237-3 - Continuity Of Services (JAN 1991)
52.237-10 - Identification of Uncompensated Overtime (OCT 1997)
52.242-1 - Notice Of Intent To Disallow Costs (APR 1984)
52.242-3 - Penalties For Unallowable Costs (OCT 1995)
52.242-4 - Certification of Final Indirect Costs (JAN 1997)
52.242-13 - Bankruptcy (JUL 1995)
52.243-2 - Changes - Cost-Reimbursement (AUG 1987) - Alternate V (APR 1984)
52.243-6 - Change Order Accounting (APR 1984)
52.243-7 - Notification Of Changes (APR 1984)fill in 30
52.244-2 - Subcontracts (AUG 1998) - Alternate I (AUG 1998)
52.244-5 - Competition In Subcontracting (DEC 1996)
52.244-6 - Subcontracts for Commercial Items and Commercial Components (OCT 1998)
52.245-5 - Government Property (Cost-Reimbursement, Time-And-Material, Or Labor-Hour Contracts) (JAN 1986) (DEVIATION)
52.245-18 - Special Test Equipment (FEB 1993)
52.245-19 - Government Property Furnished "As-Is" (APR 1984)
52.246-23 - Limitation Of Liability (FEB 1997)
52.246-25 - Limitation Of Liability - Services (FEB 1997)
52.247-1 - Commercial Bill Of Lading Notations (APR 1984)
52.247-63 - Preference For U. S. Flag Carriers (JAN 1997)
52.249-6 - Termination (Cost-Reimbursement) (SEP 1996)
52.249-14 - Excusable Delays (APR 1984)
52.252-6 - Authorized Deviations in Clauses (APR 1984)(fill in Defense Federal Acquisition Regulation Supplement (48 CFR Chapter 2))
52.253-1 - Computer Generated Forms (JAN 1991)

b. DEPARTMENT OF DEFENSE FEDERAL ACQUISITION REGULATION CLAUSES

DFARS CLAUSE TITLE
252.201-7000 - Contracting Officer's Representative (DEC 1991)
252.203-7001 - Prohibition On Persons Convicted Of Fraud Or Other Defense Contract Related

Felonies (MAR 1999)
252.203-7002 - Display Of DoD Hotline Poster (DEC 1991)
252.204-7000 - Disclosure Of Information (DEC 1991)
252.204-7003 - Control Of Government Personnel Work Product (APR 1992)
252.204-7004 - Required Central Contractor Registration (MAR 2000)
252.204-7005 - Oral Attestation Of Security Responsibilities (AUG 1999)
252.205-7000 - Provision Of Information To Cooperative Agreement Holders (DEC 1991)
252.209-7000 - Acquisition From Subcontractors Subject To On-Site Inspection Under The Intermediate-Range Nuclear Forces (INF) Treaty (NOV 1995)
252.209-7004 - Subcontracting With Firms That Are Owned Or Controlled By The Government Of A Terrorist Country (MAR 1998)
252.215-7000 - Pricing Adjustments (DEC 1991)
252.215-7002 - Cost Estimating System Requirements (OCT 1998)
252.219-7003 - Small Business And Small Disadvantaged Business Subcontracting Plan (DoD Contracts) (APR 1996)
252.223-7004 - Drug-Free Work Force (SEP 1988)
252.223-7006 - Prohibition On Storage And Disposal Of Toxic And Hazardous Materials (APR 1993)
252.225-7001 - Buy American Act And Balance Of Payments Program (MAR 1998)
252.225-7002 - Qualifying Country Sources As Subcontractors (DEC 1991)
252.225-7012 - Preference For Certain Domestic Commodities (MAY 1999)
252.225-7026 - Reporting Of Contract Performance Outside The United States (JUN 2000)
252.225-7031 - Secondary Arab Boycott Of Israel (JUN 1992)
252.225-7043 - Antiterrorism/Force Protection Policy For Defense Contractors Outside The United States (JUN 1998) (fill in : Naval Criminal Investigative Service (NCIS), Code 24, telephone, DSN 228-9113 or commercial (202)433-9113)
252.227-7001 - Release Of Past Infringement (AUG 1984)
252.227-7013 - Rights In Technical Data -- Noncommercial Items (NOV 1995)
252.227-7014 - Rights In Noncommercial Computer Software And Noncommercial Computer Software Documentation (JUN 1995)
252.227-7016 - Rights In Bids or Proposal Information (JUN 1995)
252.227-7019 - Validation Of Asserted Restrictions--Computer Software (JUN 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 Payment (MAR 2000)
252.227-7034 - Patents--Subcontracts (APR 1984)
252.227-7036 - Declaration Of Technical Data Conformity (JAN 1997)
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)
252.235-7010 - Acknowledgment of Support and Disclaimer (MAY 1995)
252.235-7011 - Final Scientific Or Technical Report (SEP 1999)
252.242-7000 - Post Award Conference (DEC 1991)
252.242-7004 - Material Management And Accounting System (SEP 1996)
252.243-7002 - Requests for Equitable Adjustment (MAR 1998)
252.244-7000 - Subcontracts For Commercial Items And Commercial Components (DOD

Contracts) (MAR 2000)
252.245-7001 - Reports of Government Property (MAY 1994)
252.247-7023 - Transportation Of Supplies By Sea (MAR 2000)
252.247-7024 - Notification Of Transportation Of Supplies By Sea (MAR 2000)
(will be included if the successful offeror made a negative response to the inquiry at DFARS 252.247-7022)

I-2 FAR 52.223-11 - OZONE-DEPLETING SUBSTANCES (JUN 1996)

(a) Definitions.

"Ozone-depleting substance", as used in this clause, means any substance designated as Class I by the Environmental Protection Agency (EPA) (40 CFR Part 82), including but not limited to chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform; or any substance designated as Class II by EPA (40 CFR Part 82), including but not limited to hydrochlorofluorocarbons.

(b) The Contractor shall label products which contain or are manufactured with ozone-depleting substances in the manner and to the extent required by 42 U.S.C. 7671j (b), (c), and (d) and 40 CFR Part 82, Subpart E, as follows:

"WARNING: Contains (or manufactured with, if applicable)_____*_____, a substance(s) which harm(s) public health and environment by destroying ozone in the upper atmosphere."

* The Contractor shall insert the name of the substance(s).

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

J-1 Attachment (1) - Statement Of Work – 79 Pages, With Exhibits A, B, C,D, E, F, G, and H, DD Form 1423, Contract Data Requirements List, 16 pages.

J-2 Attachment (2) - DD Form 254, Contract Security Classification Specification, Ser 029-00, 26 JUN 00 – 2 pages

J-3 Attachment (3) – Personnel Qualifications, 7 pages.

J-4 Attachment (4) – Contract Safety Requirements – 1 page.

J-5 Attachment (5) – Accounting and Appropriation Data- 1 page. *

(To be included at time of award)*

PART IV - REPRESENTATIONS AND INSTRUCTIONS
SECTION - K
REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS OR RESPONDENTS

K-1 Representations, Certifications, and Other Statements of Offerors or Respondents

Each Offeror must submit a completed Representations, Certifications, and Other Statements Of Offerors or Respondents with its proposal which is available electronically in full text at http://heron.nrl.navy.mil/contracts/reps&certs.htm

K-2 FILL IN FOR FAR 52.219-1 - SMALL BUSINESS PROGRAM REPRESENTATIONS (MAY 1999)

The fill in information is as follows:

The standard industrial classification (SIC) code for this acquisition is 8731.
The small business size standard is 500 employees.

SECTION L
INSTRUCTIONS CONDITIONS AND NOTICES TO OFFERORS OR RESPONDENTS

L-1 52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions 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. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

http://www.arnet.gov/far
http://heron.nrl.navy.mil/contracts/home.htm

FAR CLAUSE		TITLE
52.204-6	-	Data Universal Numbering System (DUNS) Number (JUNE 1999)
52.214-34	-	Submission Of Offers In The English Language (APR 1991)
52.214-35	-	Submission Of Offers In U.S. Currency (APR 1991)
52.215-1	-	Instructions to Offerors- Competitive Acquisition (FEB 2000)
52.215-16	-	Facilities Capital Cost Of Money (OCT 1997)
52.219-24	-	Small Disadvantaged Business Participation Program - Targets (JAN 1999)
52.222-24	-	Preaward On-Site Equal Opportunity Compliance Evaluation (FEB 1999)

52.237-1 - Site Visit (APR 1984)
52.252-5 - Authorized Deviations in Provisions (APR 1984)

L-2 FAR 52.211-14 - NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (SEP 1990)

Any contract awarded as a result of this solicitation will be a ☐ DX rated order; ☒ DO rated order certified for national use under the Defense Priorities and Allocations system (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation.

L-3 FAR 52.215-20 REQUIREMENTS FOR COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA (OCT 1997)

(a) *Exceptions from cost or pricing data.* (1) In lieu of submitting cost or pricing data, offerors may submit a written request for exception by submitting the information described in the following subparagraphs. The Contracting Officer may require additional supporting information, but only to the extent necessary to determine whether an exception should be granted, and whether the price is fair and reasonable.

(i) *Identification of the law or regulation establishing the price offered.* If the price is controlled under law by periodic rulings, reviews, or similar actions of a governmental body, attach a copy of the controlling document, unless it was previously submitted to the contracting office.

(ii) *Commercial item exception.* For a commercial item exception, the offeror shall submit, at a minimum, information on prices at which the same item or similar items have previously been sold in the commercial market that is adequate for evaluating the reasonableness of the price for this acquisition. Such information may include--

(A) For catalog items, a copy of or identification of the catalog and its date, or the appropriate pages for the offered items, or a statement that the catalog is on file in the buying office to which the proposal is being submitted. Provide a copy or describe current discount policies and price lists (published or unpublished), e.g., wholesale, original equipment manufacturer, or reseller. Also explain the basis of each offered price and its relationship to the established catalog price, including how the proposed price relates to the price of recent sales in quantities similar to the proposed quantities.

(B) For market priced items, the source and date or period of the market quotation or other basis for market price, the base amount, and applicable discounts. In addition, describe the nature of the market.

(C) For items included on an active Federal Supply Service Multiple Award Schedule contract, proof that an exception has been granted for the schedule item.

(2) The offeror grants the Contracting Officer or an authorized representative the right to examine, at any time before award, books, records, documents, or other directly pertinent records to verify any request for an exception under this provision, and the reasonableness of price. For items priced using catalog or market prices, or law or regulation, access does not extend to cost or profit information or other data relevant solely to the offeror's determination of the prices to be offered in the catalog or marketplace.

(b) *Requirements for cost or pricing data.* If the offeror is not granted an exception from the requirement to submit cost or pricing data, the following applies:

(1) The offeror shall prepare and submit cost or pricing data and supporting attachments in accordance with Table 15-2 of FAR 15.408.

(2) As soon as practicable after agreement on price, but before contract award (except for unpriced actions such as letter contracts), the offeror shall submit a Certificate of Current Cost or

Pricing Data, as prescribed in FAR 15.406-2.

L-4 FAR 52.216-1 - TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a Cost Plus Fixed Fee Term type contract resulting from this solicitation.

L-5 FAR 52.233-2 - SERVICE OF PROTEST (AUG 1996)

(a) Protests, as defined in Section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO) shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from the Control Desk, Code 3200, Bldg. 222, Rm. 115, Naval Research Laboratory, 4555 Overlook Ave., S.W., Washington DC 20375-5326.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

L-6 DFARS 252.227-7017 - IDENTIFICATION AND ASSERTION OF USE, RELEASE, OR DISCLOSURE RESTRICTIONS (JUN 1995)

(a) The terms used in this provision are defined in following clause or clauses contained in this solicitation--
  (1) If a successful offeror will be required to deliver technical data, the Rights in Technical Data--Noncommercial Items clause, or, if this solicitation contemplates a contract under the Small Business Innovative Research Program, the Rights in Noncommercial Technical Data and Computer Software--Small Business Innovative Research (SBIR) Program clause.
  (2) If a successful offeror will not be required to deliver technical data, the Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation clause, or, if this solicitation contemplates a contract under the Small Business Innovative Research Program, the Rights in Noncommercial Technical Data and Computer Software--Small Business Innovative Research (SBIR) Program clause.

(b) The identification and assertion requirements in this provision apply only to technical data, including computer software documents, or computer software to be delivered with other than unlimited rights. For contracts to be awarded under the Small Business Innovative Research Program, the notification requirements do not apply to technical data or computer software that will be generated under the resulting contract. Notification and identification is not required for restrictions based solely on copyright.

(c) Offers submitted in response to this solicitation shall identify, to the extent known at the time an offer is submitted to the Government, the technical data or computer software that the Offeror, its subcontractors or suppliers, or potential subcontractors or suppliers, assert should be furnished to the Government with restrictions on use, release, or disclosure.

(d) The Offeror's assertions, including the assertions of its subcontractors or suppliers or potential subcontractors or suppliers shall be submitted as an attachment to its offer in the following format, dated and signed by an official authorized to contractually obligate the Offeror: Identification and Assertion of Restrictions on the Government's Use, Release, or Disclosure of

Technical Data or Computer Software.
The Offeror asserts for itself, or the persons identified below, that the Government's rights to use, release, or disclose the following technical data or computer software should be restricted:

Technical Data or Computer Software to be Furnished With Restrictions*	Basis for Assertion**	Asserted Rights Category***	Name of Person Asserting Restrictions****
(LIST)*****.	(LIST)	(LIST)	(LIST)

* For technical data (other than computer software documentation) pertaining to items, components, or processes developed at private expense, identify both the deliverable technical data and each such items, component, or process. For computer software or computer software documentation identify the software or documentation.

** Generally, development at private expense, either exclusively or partially, is the only basis for asserting restrictions. For technical data, other than computer software documentation, development refers to development of the item, component, or process to which the data pertain. The Government's rights in computer software documentation generally may not be restricted. For computer software, development refers to the software. Indicate whether development was accomplished exclusively or partially at private expense. If development was not accomplished at private expense, or for computer software documentation, enter the specific basis for asserting restrictions.

*** Enter asserted rights category (e.g., government purpose license rights from a prior contract, rights in SBIR data generated under another contract, limited, restricted, or government purpose rights under this or a prior contract, or specially negotiated licenses).

**** Corporation, individual, or other person, as appropriate.

***** Enter "none" when all data or software will be submitted without restrictions.

Date _____

Printed Name and Title _____

_____

Signature _____

(End of identification and assertion)

(e) An offeror's failure to submit, complete, or sign the notification and identification required by paragraph (d) of this provision with its offer may render the offer ineligible for award.

(f) If the Offeror is awarded a contract, the assertions identified in paragraph (d) of this provision shall be listed in an attachment to that contract. Upon request by the Contracting Officer, the Offeror shall provide sufficient information to enable the Contracting Officer to evaluate any listed assertion.

L-7 DFARS 252.227-7028 - TECHNICAL DATA OR COMPUTER SOFTWARE PREVIOUSLY DELIVERED TO THE GOVERNMENT (JUN 1995)

The Offeror shall attach to its offer an identification of all documents or other media incorporating technical data or computer software it intends to deliver under this contract with other than unlimited rights that are identical or substantially similar to documents or other media that the Offeror has produced for, delivered to, or is obligated to deliver to the Government under any contract or subcontract. The attachment shall identify - -

(a) The contract number under which the data or software were produced;
(b) The contract number under which, and the name and address of the organization to whom, the data or software were most recently delivered or will be delivered; and
(c) Any limitations on the Government's rights to use or disclose the data or software, including, when applicable, identification of the earliest date the limitations expire.

L-8 GOVERNMENT-FURNISHED PROPERTY

No material, labor, or facilities will be furnished by the Government unless provided for in the solicitation.

L-9 INQUIRIES CONCERNING THE RFP

Any questions concerning the RFP must be submitted in writing to the Contracting Officer at the location noted in blocks 7 and 9 of the Standard Form 33, "Solicitation, Offer and Award," no less than fifteen (15) days before closing. The Government will not consider questions received after this date. Offerors are cautioned against directing any questions concerning this RFP to technical personnel at the Naval Research Laboratory.

L-10 INSTRUCTIONS FOR SUBMISSION AND INFORMATION REQUIRED TO EVALUATE PROPOSALS

(1) Information for the technical/management proposal shall be placed in Volume I and be completely separate from the business proposal (Volume II).

(2) Proposal Identification/Mailing - The proposal should be packaged for delivery so as to permit safe and timely arrival at destination. The proposal package should be sent to the address shown in Block 7 of the RFP face page and marked:

Solicitation No. N00173-00-R-KK04
Closing Date:
(As specified in Block 9, RFP face page)
Attn: Code 3220.KK

(3) Proposal Format and Length - No attempt is made to restrict the proposal format and style. However, the proposal should be written and organized so as to be compatible with the RFP, the Statement of Work, company's organization and accounting structure, and proposed cost estimate. Offerors are encouraged to use recycled paper and maximize the use of double sided copying when preparing responses to solicitations.

L-11 VOLUME I - TECHNICAL/MANAGEMENT PROPOSAL

REQUIRED COPIES: 1 ORIGINAL AND 7 COPIES .

(1) Include a matrix indicating proposed labor hours by skill category required to perform the statement of work. A breakdown which clearly relates the hours proposed to the labor categories stated in Attachment No. 3 should be provided. This matrix shall not contain labor rates or any other indication of price.

(2) The following information is required for evaluation of your technical/management proposal:

(a) The proposal should describe the technical approaches involved to support the various tasks of the Statement of Work and provide any supporting materials needed to support the proposed approach. The proposal should clearly state which aspects of the proposed approach have been demonstrated and which are unproven. If the proposed approach is justified by prior analysis or design studies, the details of those studies should be presented in the proposal. If any additional studies are required or suggested, the details of these studies should be included in the proposal. The overall technical analysis process which led to the offeror's proposed approach should be described. If a test and evaluation program is proposed which will support the intent of the Statement of Work, it should be clearly and concisely described.

(b) The proposal should list all prior work which is relevant to the proposed effort. This listing should include a narrative description of current or prior contracts or subcontracts which are substantially similar to this effort. This listing should state the relationship between the prior work and the current proposal, including the contract number, contract title, the name of the contracting agency or company. The proposal should contain a brief explanation of the work performed under the contract and the extent or degree to which the contract objectives were met. The proposal should include the identification of the sponsors of prior work and provide points of contact. The proposal should indicate whether the people and facilities involved in the prior contracts are available for this effort.

(c) The proposal should clearly state the qualifications of all of the personnel proposed for this project. Offerors should list the key personnel (for the prime contractor and for any proposed subcontractors or consultants) by function, including their education level, relevant experience and the amount of time each individual will contribute to the project. The proposal must clearly show the availability of sufficient personnel, who have sufficient experience levels to adequately address the requirements of the task for which they were proposed. The proposal should explain what manpower resources will routinely be committed to the project and what additional resources are available on a contingency basis, including subcontractors, in the event that technical problems arise during the project. As a minimum, the proposal should include concise resumes of proposed key personnel. These resumes should clearly indicate the labor

category (which corresponds to Attachment No. 3), education level, and relevant experience for each person proposed. If any prospective employees are proposed as contingent hires, the proposal should include signed letters of commitment from the individuals proposed.

(d) The proposal must identify facilities which the offeror proposes to use for this project . This information should be provided for both the prime contractor and for any subcontractor facilities proposed. Concise descriptions of the research facilities at which the work proposed will be performed should be provided. The location and ownership of each facility should be described. The proposal should state whether the facilities proposed possess the required systems necessary to complete the effort proposed.

(e) The proposal must clearly state the proposed management structure. The narrative should include an organizational chart indicating the chain of command and the person(s) responsible for each function. A single individual must be identified as being responsible for a given task(s). The management plan must include a mechanism for maintaining accountability for all activities. The management plan shall present a proposed program schedule, identify areas of schedule risk and propose methods for minimizing each risk area. The management plan should indicate a proposed work schedule, which also indicates the critical path items. The management plan should address operating procedures, quality assurance and control, inventory, safety, reporting, and financial control. A functional description of the management organization should be provided. The management plan should identify any proposed subcontractors and provide a mechanism for the oversight of subcontractor performance.

PAST PERFORMANCE INFORMATION

(a) Offerors shall submit the following information as part of their proposal. (Offerors are encouraged to submit the information prior to other parts of the proposal to assist the government in reducing the length of the evaluation period.) List the last 3 contracts or subcontracts completed during the past 3 years for services similar in nature to this requirement. Include in the 3 any current contracts or subcontracts for similar services that were awarded at least one year prior to the date of this solicitation. Offerors that have no similar previous or current contracts should provide the requested information for proposed subcontractors that will perform major or critical aspects of the requirement or for the proposed project manager or key personnel responsible for major or critical aspects of the requirement.

1. Name of contracting organization.
2. Contract number
3. Contract type
4. Total contract value
5. Description of the contract work
6. Contracting officer and telephone number
7. Contracting officer's representative, program manager, or similar official and

telephone number
(b) Offerors shall contact the contracting organizations identified pursuant to paragraph (a) as soon as possible and request them to send past performance information on the identified contracts to the address in Block 7 of the face page of this solicitation. The past performance report which is available electronically in full text at http://heron.nrl.navy.mil/contracts/home.htm is to be provided to the contracting organization for this purpose. If the contracting organization has already collected past performance information on the contract pursuant to FAR Subpart 42.15, the format used to collect the information may be used instead of the past performance report.
(c) Offerors may include in their proposals specific information relating to problems encountered in performing the identified contracts and any corrective actions by the offeror. Offerors should not provide general information on their performance on the identified contracts as this will be obtained from the contracting organizations.

L-12 VOLUME II - BUSINESS PROPOSAL

REQUIRED COPIES: 1 ORIGINAL AND 7 COPIES

(1) COST PROPOSAL

The offeror shall submit a business proposal that includes a cost proposal with supporting information for each cost element consistent with offeror's cost accounting system. The supporting breakdown should include such elements as materials, direct labor, indirect cost, and other costs such as travel. The offeror shall provide exhibits as necessary to substantiate the cost elements. Should any rates be used in the proposal which are not DCAA approved, the offeror shall provide complete documentation and the rationale for their use at time of proposal submission. However, offerors are advised to use actual labor rates of proposed personnel as the basis of estimating labor costs when practicable.

(2) SMALL BUSINESS PARTICIPATION

(a) In addition to complying with the clause at FAR 52.219-9, Small Business Subcontracting Plan (Jan 1999) with its Alternate II, proposals must include information to permit evaluation of the extent of participation of small businesses and historical black colleges or universities and minority institutions in performance of the contract. Participation to be identified may be in the form of a joint venture, teaming arrangement, or subcontract. Small business concerns that are not required by FAR 52.219-9 to submit a subcontracting plan must indicate the extent to which proposed joint ventures, teaming arrangements, or subcontracts are with historically black colleges or universities and minority institutions. Information provided should include the extent of participation of such firms in terms of the value of the total acquisition and the complexity and variety of the work such firms are to perform.

(b) Proposals must also include information to permit evaluation of the extent of participation of small disadvantaged business concerns in performance of the contract. See the provision at FAR 52.219-24, Small Disadvantaged Business Participation Program--Targets (Jan 1999), and the clause at 52.219-25, Small Disadvantaged Business Participation Program--Disadvantaged Status and Reporting (Jan 1999). Any targets will be incorporated into and become part of any resulting

contract. Information provided should include the extent of participation of such firms in terms of the value of the total acquisition and the complexity and variety of the work such firms are to perform.

L-13 MULTIPLE AWARDS

The Contracting Officer may make multiple awards resulting from this solicitation.

L-14 ANTICIPATED DISTRIBUTION OF DIRECT LABOR HOURS BY LABOR CATEGORIES

The following is the anticipated distribution of labor hours by labor category by task for the anticipated level of effort. This distribution shall be used by prospective offerors in preparing their cost proposal. If the offeror uses labor category terminology that is different from that which is stated in this provision, the offeror shall provide a matrix clearly relating their proposed labor categories to those stated in this provision.

SOW TASK

TASK 1 - FIRE RESEARCH

	YR 1 HRS	YR 2 HRS	YR 3 HRS	YR 4 HRS	YR 5 HRS	TOTAL HOURS
Labor Category and Loc. Of Work						
*Senior Fire Protection Engineer						
NRL – D.C.	1200	1200	1200	1200	1200	6000
NRL - Chesapeake Bay Detachment	600	600	600	600	600	3000
TOTAL	1800	1800	1800	1800	1800	9000
*Fire Protection Engineer						
NRL – Chesapeake Bay Detachment	1800	1800	1800	1800	1800	9000
TOTAL	1800	1800	1800	1800	1800	9000
*Senior Analytical Chemist						
NRL – Chesapeake Bay Detachment	1800	1800	1800	1800	1800	9000
TOTAL	1800	1800	1800	1800	1800	9000

Analytical Chemist						
NRL-Chesapeake Bay Detachment	1800	1800	1800	1800	1800	9000
TOTAL	1800	1800	1800	1800	1800	9000
Scientist / Engineer						
NRL – DC	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000
Human Resources Specialist						
Contractor Facility	100	100	100	100	100	500
TOTAL	100	100	100	100	100	500
Engineer						
NRL – ex-USS Shadwell, Mobile, AL	5400	5400	5400	5400	5400	27000
TOTAL	5400	5400	5400	5400	5400	27000
Engineer						
NRL- Chesapeake Bay Detachment	500	500	500	500	500	2500
NRL- DC	1300	1300	1300	1300	1300	6500
TOTAL	1800	1800	1800	1800	1800	9000
Business Assistant						
NRL- ex-USS Shadwell, Mobile, AL	1800	1800	1800	1800	1800	9000
TOTAL	1800	1800	1800	1800	1800	9000
Mechanic						
NRL– ex-USS Shadwell, Mobile, AL	3600	3600	3600	3600	3600	18000
TOTAL	3600	3600	3600	3600	3600	18000
Labor Support						
NRL – ex-USS Shadwell, Mobile, AL	9000	9000	9000	9000	9000	45000

TOTAL	9000	9000	9000	9000	9000	45000

*** Designates Key Personnel**

TASK 2 – SERVICE LIFE, AFFORDABILITY, MAINTAINABILITY AND SAFETY OF THE FLEET

	YR 1 HRS	**YR 2 HRS**	**YR 3 HRS**	**YR 4 HRS**	**YR 5 HRS**	**TOTAL HOURS**
Labor Category and Loc. Of Work						
*Senior Engineer – Corrosion Control System, Cathodic Protection						
NRL – Key West	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000
*Senior Engineer- Corrosion						
NRL – DC	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000
*Senior Scientist – Environmental Effects						
NRL – DC	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000
Senior Scientist – Corrosion/Cathodic Protection						
NRL—DC	1000	1000	1000	1000	1000	5000
TOTAL	1000	1000	1000	1000	1000	5000
Senior Scientist/ Engineer – Coating/Corrosion						
NRL – DC	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000
Senior Scientist/Engineer – Prototype/System Design						
Contractor Facility	2300	2300	2300	2300	2300	11500
TOTAL	2300	2300	2300	2300	2300	11500

*Engineer – Materials						
NRL- Key West	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000
Engineer – Mechanical						
NRL - DC	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000
Engineer/Scientist – General						
Norfolk, VA	2000	2000	2000	2000	2000	10000
NRL – Key West	4000	4000	4000	4000	4000	20000
NRL—DC	2300	2000	2000	2000	2000	10300
TOTAL	8300	8000	8000	8000	8000	40300
Laboratory Technician						
NRL – DC	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000

*** Designates Key Personnel**

TASK 3 – SYNTHESIS AND CHARACTERIZATION OF ADVANCED CHEMICAL MATERIALS DESTINED FOR USE IN NAVY SYSTEMS AND OTHER CHEMICAL MATERIAL RESEARCH

Labor Category and Location	YR 1 HRS	YR 2 HRS	YR 3 HRS	YR 4 HRS	YR 5 HRS	TOTAL HOURS
*Senior Research Physical Scientist/Engineer						
NRL –DC	1800	1800	1800	1800	1800	9000
Contractor Facility	1800	1800	1800	1800	1800	9000
TOTAL	3600	3600	3600	3600	3600	18000

*Research Materials Scientist /Engineer

NRL—DC	0	1800	1800	1800	1800	7200
Contractor Facility	1800	1800	1800	1800	1800	9000
TOTAL	1800	3600	3600	3600	3600	16200

Research Scientist or Engineer

Contractor Facility	1800	1800	1800	1800	1800	9000
TOTAL	1800	1800	1800	1800	1800	9000

Synthetic Chemist

NRL –DC	1800	1800	1800	1800	1800	9000
TOTAL	1800	1800	1800	1800	1800	9000

***Designates Key Personnel**

TASK 4 – DEVELOPMENT AND CHARACTERIZATION OF NEW POLYMERIC MATERIALS FOR NAVAL SYSTEMS

Labor Category and Location	YR 1 HRS	YR 2 HRS	YR 3 HRS	YR 4 HRS	YR 5 HRS	TOTAL HOURS
Physicist						
NRL –DC	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000
*Senior Program Analyst						
Contractor Facility	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000
Program Analyst						
Contractor Facility	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000

Synchrotron Technician						
Brookhaven National Laboratory – NY	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000

***Designates Key Personnel**

TASK 5 – STUDY OF PROPULSION FUELS AND OTHER FUELS

Labor Category and Location	YR 1 HRS	YR 2 HRS	YR 3 HRS	YR 4 HRS	YR 5 HRS	TOTAL HOURS
*PhD – Chemist						
NRL—DC	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000
*MS—Chemist						
NRL—DC	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000
*BS—Chemist						
NAWC-Patuxent River, MD	10000	10000	10000	10000	10000	50000
TOTAL	10000	10000	10000	10000	10000	50000

***Designates Key Personnel**

TASK 6 – RESEARCH AND DEVELOPMENT OF ANALYTICAL TECHNIQUES USED IN THE COMBUSTION OF FUELS, PROPELLANTS, PYROPHORICS, AND EXPLOSIVES

Labor Category and Location	YR 1 HRS	YR 2 HRS	YR 3 HRS	YR 4 HRS	YR 5 HRS	TOTAL HOURS
*Chemist						
NRL – DC	9500	9500	9500	9500	9500	47500

Biochemist						
NRL-DC	1900	1900	1900	1900	1900	9500
Engineer						
NRL-DC	1900	1900	1900	1900	1900	9500
Biologist						
NRL- DC	3800	3800	3800	3800	3800	19000
*Microbiologist						
NRL – DC	3800	3800	3800	3800	3800	19000
Molecular Biologist						
NRL – DC	3800	3800	3800	3800	3800	19000
TOTAL	24700	24700	24700	24700	24700	123500

*** Designates Key Personnel**

TASK 7 – DEVELOPMENT AND EVALUATION OF NEW ANALYTICAL TECHNOLOGIES

Labor Category and Location	YR 1 HRS	YR 2 HRS	YR 3 HRS	YR 4 HRS	YR 5 HRS	TOTAL HOURS
*Chemist						
NRL – DC	2000	2000	2000	2000	2000	10000
TOTAL	2000	2000	2000	2000	2000	10000

***Designates Key Personnel**

TASK 8 -- COMPUTER HARDWARE AND SOFTWARE SUPPORT

Labor Category and Location	YR 1 HRS	YR 2 HRS	YR 3 HRS	YR 4 HRS	YR 5 HRS	TOTAL HOURS
*Computer Hardware/Software Tech.						

NRL- DC	1800	1800	1800	1800	1800	9000

Computer Consultants

Note: No minimum personnel qualifications are stated for this labor category since it is not known in advance what type of computer consultants may be required. Offerors should price their proposals with the expectation that the following number of hours will be required:

NRL – DC	900	900	900	900	900	4500
TOTAL	2700	2700	2700	2700	2700	13500

*** Designates Key Personnel**

L-15 ANTICIPATED TRAVEL REQUIREMENTS

All destinations are from the Naval Research Laboratory, Washington, D.C. unless otherwise noted. Offerors should use the following estimate of travel in preparing their proposals:

Task	Year	No. of Trips	No. of People	No. of Days	Destination
1	1	1	2	5	Southwest U.S.
1	2	1	3	5	Southwest U.S.
1	3	1	3	5	Southwest U.S.
1	4	1	4	5	Southwest U.S.
1	5	1	4	5	Southwest U.S.
1	1	1	2	4	Northeastern U. S.
1	2	1	2	4	Northeastern U. S.
1	3	1	2	4	Northeastern U. S.
1	4	1	2	4	Northeastern U. S.
1	5	1	2	4	Northeastern U. S.
1	1	1	1	4	East Coast, U.S.
1	2	1	1	4	East Coast, U.S.
1	3	1	1	4	Gulf Coast, U.S.
1	4	1	1	4	West Coast, U.S.
1	5	1	1	4	West Coast, U.S.
1	1	1	1	6	Europe
1	2	1	1	6	Europe
1	3	1	1	6	Europe
1	4	1	1	6	Europe
1	5	1	1	6	Europe
1	1	1	2	2	Universities, East Coast
1	2	1	2	2	Universities, East Coast
1	3	1	2	2	Universities, East Coast
1	4	1	2	2	Universities, East Coast
1	5	1	2	2	Universities, East Coast
1	1	3	2	6	Chesapeake Bay Detachment
1	2	3	2	6	Chesapeake Bay Detachment
1	3	3	2	6	Chesapeake Bay Detachment
1	4	3	2	6	Chesapeake Bay Detachment
1	5	3	2	6	Chesapeake Bay Detachment
1	1	10	1	3	Mobile, AL
1	2	10	1	3	Mobile, AL
1	3	10	1	3	Mobile, AL
1	4	10	1	3	Mobile, AL
1	5	10	1	3	Mobile, AL
1	1	3	1	3	Washington, D.C. (from Mobile, AL)
1	2	3	1	3	Washington, D.C. (from Mobile, AL)
1	3	3	1	3	Washington, D.C. (from Mobile, AL)
1	4	3	1	3	Washington, D.C. (from Mobile, AL)

1	5	3	1	3	Washington, D.C. (from Mobile, AL)
Task	**Year**	**No. of Trips**	**No. of People**	**No. of Days**	**Destination**
2	1	8	2	5	Key West, FL
2	1	3	2	5	San Diego, CA
2	1	5	2	5	Washington, DC (from Key West)
2	1	4	1	5	Norfolk, VA
2	1	4	1	5	Norfolk, VA (from Key West)
2	1	2	1	5	San Francisco, CA
2	1	2	1	5	Grotton, CT
2	1	2	1	4	Portsmouth, NH
2	1	2	1	4	Seattle, WA
2	1	2	2	5	Pearl Harbor, HI
2	1	2	1	2	Vancouver, Canada
2	2	8	2	5	Key West, FL
2	2	3	2	5	San Diego, CA
2	2	5	2	5	Washington, DC (from Key West)
2	2	4	1	5	Norfolk, VA
2	2	4	1	5	Norfolk, VA (from Key West)
2	2	2	1	5	San Francisco, CA
2	2	2	1	5	Grotton, CT
2	2	2	1	4	Portsmouth, NH
2	2	2	1	4	Seattle, WA
2	2	2	2	5	Pearl Harbor, HI
2	2	2	1	2	Vancouver, Canada
2	3	8	2	5	Key West, FL
2	3	3	2	5	San Diego, CA
2	3	5	2	5	Washington, DC (from Key West)
2	3	4	1	5	Norfolk, VA
2	3	4	1	5	Norfolk, VA (from Key West)
2	3	2	1	5	San Francisco, CA
2	3	2	1	5	Grotton, CT
2	3	2	1	4	Portsmouth, NH
2	3	2	1	4	Seattle, WA
2	3	2	2	5	Pearl Harbor, HI
2	3	2	1	2	Vancouver, Canada
2	4	8	2	5	Key West, FL
2	4	3	2	5	San Diego, CA
2	4	5	2	5	Washington, DC (from Key West)
2	4	4	1	5	Norfolk, VA
2	4	4	1	5	Norfolk, VA (from Key West)
2	4	2	1	5	San Francisco, CA
2	4	2	1	5	Grotton, CT
2	4	2	1	4	Portsmouth, NH
2	4	2	1	4	Seattle, WA
2	4	2	2	5	Pearl Harbor, HI

Task	Year	No. of Trips	No. of People	No. of Days	Destination
2	4	2	1	2	Vancouver, Canada
2	5	8	2	5	Key West, FL
2	5	3	2	5	San Diego, CA
2	5	5	2	5	Washington, DC (from Key West)
2	5	4	1	5	Norfolk, VA
2	5	4	1	5	Norfolk, VA (from Key West)
2	5	2	1	5	San Francisco, CA
2	5	2	1	5	Grotton, CT
2	5	2	1	4	Portsmouth, NH
2	5	2	1	4	Seattle, WA
2	5	2	2	5	Pearl Harbor, HI
2	5	2	1	2	Vancouver, Canada
3	1	1	1	5	Chicago, IL
3	1	1	2	14	Jacksonville, FL
3	1	1	1	2	Indianapolis, IN
3	1	1	1	5	Seattle, WA
3	1	1	1	5	Austin, TX
3	1	1	1	5	Boston, MA
3	1	1	1	2	San Diego, CA
3	2	1	1	5	Chicago, IL
3	2	1	2	4	Orlando, FL
3	2	1	2	2	Mayport, FL
3	3	1	1	5	Chicago, IL
3	3	1	2	2	Jacksonville, FL
3	3	1	1	2	Jacksonville, FL
3	4	1	1	5	Chicago, IL
3	4	1	1	5	Jacksonville, FL
3	5	1	1	5	Chicago, IL
4	1	1	1	5	West Coast
4	2	1	1	5	West Coast
4	3	1	1	5	West Coast
4	4	1	1	5	West Coast
4	5	1	1	5	West Coast
4	1	2	1	2	Jacksonville, FL
4	1	2	2	2	Jacksonville, FL
4	1	4	1	2	Crane, IN
4	1	4	2	2	Philadelphia, PA
4	2	2	1	2	Jacksonville, FL
4	2	2	2	2	Jacksonville, FL
4	2	4	1	2	Crane, IN
4	2	4	2	2	Philadelphia, PA
4	3	2	1	2	Jacksonville, FL

4	3	2	2	2	Jacksonville, FL
4	3	4	1	2	Crane, IN
4	3	4	2	2	Philadelphia, PA
4	4	2	1	2	Jacksonville, FL
4	4	2	2	2	Jacksonville, FL
4	4	4	1	2	Crane, IN
4	4	4	2	2	Philadelphia, PA
4	5	2	1	2	Jacksonville, FL
4	5	2	2	2	Jacksonville, FL
4	5	4	1	2	Crane, IN
4	5	4	2	2	Philadelphia, PA
4	1	4	1	1	Washington, D.C. (from Brookhaven, NY)
4	2	4	1	1	Washington, D.C. (from Brookhaven, NY)
4	3	4	1	1	Washington, D.C. (from Brookhaven, NY)
4	4	4	1	1	Washington, D.C. (from Brookhaven, NY)
4	5	4	1	1	Washington, D.C. (from Brookhaven, NY)
5	1	7	3	3	Patuxent River, MD
5	1	1	3	5	Vienna, Austria
5	2	7	3	3	Patuxent River, MD
5	2	2	3	3	San Diego, CA
5	3	7	3	3	Patuxent River, MD
5	3	2	3	3	Norfolk, VA
5	4	7	3	3	Patuxent River, MD
5	4	2	3	3	Tampa, FL
5	5	7	3	3	Patuxent River, MD
5	5	2	3	3	San Antonio, TX
6	1	3	7	7	Charleston, S.C.
6	1	3	7	7	San Diego, CA
6	1	3	7	7	Philadelphia, PA
6	1	3	7	7	Pearl Harbor, HI
6	2	3	7	7	Charleston, SC
6	2	3	7	7	San Diego, CA
6	2	3	7	7	Philadelphia, PA
6	2	3	7	7	Pearl Harbor, HI
6	3	3	7	7	Charleston, SC
6	3	3	7	7	San Diego, CA
6	3	3	7	7	Philadelphia, PA
6	3	3	7	7	Pearl Harbor, HI
6	4	3	7	7	Charleston, SC
6	4	3	7	7	San Diego, CA
6	4	3	7	7	Philadelphia, PA

6	4	3	7	7	Pearl Harbor, HI
6	5	3	7	7	Charleston, SC
6	5	3	7	7	San Diego, CA
6	5	3	7	7	Philadelphia, PA
6	5	3	7	7	Pearl Harbor, HI
7	1	1	1	5	West Coast
7	2	1	1	5	West Coast
7	3	1	1	5	West Coast
7	4	1	1	5	West Coast
7	5	1	1	5	West Coast
8		NONE			

L-16 MATERIALS ESTIMATE

For the purpose of preparing their proposals, offerors should utilize the following estimates per year for material requirements. Offerors should note that these are direct costs and that they should add any applicable indirect costs.

Task	Year	Amount
TASK 1		
1	1	$1,195,000
1	2	$1,197,000
1	3	$1,199,000
1	4	$1,202,000
1	5	$1,205,000
Total – Task 1		$5,998,000
TASK 2		
2	1	$1,680,000
2	2	$1,747,200
2	3	$1,817,088
2	4	$1,889,772
2	5	$1,965,362

Materials for Task 1 will consist of various supplies and special items. The cost estimate is as follows:

Material requirements for Task 2 may include such items as solvents, paints, biofouling and/or scaling control chemicals, piping and valves, metal stock for corrosion/coating studies, specialty machining/fabrication tools, ISO containers, data logging and analysis instrumentation, pumps, computer hardware and software, and other miscellaneous items. The cost estimate is as follows:

Total – Task 2	$9,099,422

TASK 3

Material requirements for Task 3 may include such items as computer hardware and software, software licenses, computer training, batteries, cables, screws, washers, rings, lumber, oil, power supplies, and other miscellaneous items. The cost estimate is as follows:

3	1	$10,000
3	2	$25,000
3	3	$30,000
3	4	$25,000
3	5	$20,000
Total – Task 3		$110,000

TASK 4

Material requirements for Task 4 may include computer hardware, software, printers, electronics, RF test equipment, office supplies and other miscellaneous items. The cost estimate is as follows:

4	1	$17,000
4	2	$19,500
4	3	$18,000
4	4	$20,500
4	5	$19,000
Total – Task 4		$94,000

TASK 5

Material requirements for Task 5 may include such items as solvents, chemicals, glassware, syringes, conductance cells, electrometers and other miscellaneous items. The cost estimate is as follows:

5	1	$35,000
5	2	$38,500
5	3	$42,500
5	4	$46,500
5	5	$51,000
Total – Task 5		$213,500

TASK 6

Material requirements for Task 6 includes such items as laboratory chemicals, minor equipment, and disposables. The cost estimate is:

6	1	$150,000
6	2	$160,000
6	3	$170,000
6	4	$180,000
6	5	$180,000
Total – Task 6		$840,000

TASK 7

Material requirements for Task 7 may include computer hardware, software, electronics, RF test equipment and other miscellaneous items. The cost estimate is as follows:

7	1	$ 5,000
7	2	$ 5,000
7	3	$ 5,000
7	4	$ 5,000
7	5	$ 5,000
Total – Task 7		$25,000

Task 8

Material requirements for Task 8 may consist of computer hardware, software, modems, and other miscellaneous items which may be needed to support this task. The cost estimate is as follows:

8	1	$ 8,000
8	2	$8,000
8	3	$8,000
8	4	$8,000
8	5	$8,000
Total – Task 8		$40,000

L-17 SUBCONTRACTS/CONSULTANTS

For the purpose of preparing their proposals, offerors should utilize the following estimates per year for subcontracting/consulting requirements. These estimates are based on historical data and/or estimates of future needs available to the Government. It is anticipated that these subcontracts/consultants will be in addition to the anticipated level of effort stated in Clause L-14 above. Offerors should note that this is an estimate of the amount of subcontracting/consultants which may be required. Offerors should note that these are direct costs and that they should add any applicable indirect costs. Estimates of subcontracting/consultant requirements are provided

below for Tasks 1,2, 3, and 6. No subcontracting/consultants are anticipated for Tasks 4,5,7, or 8.

Task	**Year**	**Amount**
TASK 1		
Subcontracting activity will consist of engineering design, on- site modifications, suppressant agent handling, and labor support. The cost estimate is as follows:		
1	1	$152,000
1	2	$157,000
1	3	$162,000
1	4	$167,000
1	5	$171,000
TOTAL TASK 1		$809,000
TASK 2		
It is anticipated that subcontracting will be necessary to obtain services in corrosion control mechanisms for surface ship maintenance including rust stain resistant and wear resistant coatings. Subcontracts may also be used in the development of innovative methods and advanced materials to control or eliminate corrosion. Additional subcontracting is anticipated in cathodic protection (anode) development/evaluation and biofouling and scalant control process development/evaluation. The estimated cost for this is as follows:		
2	1	$1,000,000
2	2	$1,040,000
2	3	$1,081,600
2	4	$1,124,864
2	5	$1,169,859
TOTAL TASK 2		$5,416,323
TASK 3		
It is anticipated that subcontracting will be necessary to obtain the services of a metallurgist. The estimated cost for this is as follows:		
3	1	$15,000
3	2	$30,000
3	3	$30,000
3	4	$ 0
3	5	$ 0
TOTAL TASK 3		$75,000

TASK 6

It is anticipated that Task 6 may require that some subcontracting be done for the purpose of chemical analysis. The estimated cost for this is as follows:

6	1	$ 35,000
6	2	$ 35,000
6	3	$ 35,000
4	4	$ 35,000
6	5	$ 35,000
TOTAL TASK 6		$ 175,000

SECTION M
EVALUATION FACTORS FOR AWARD

M-1 EVALUATION

Award will be made to that offeror whose proposal is determined to be the best value to the Government, proposed cost and other factors considered. The Government reserves the right to make award to other than the low offeror. Although technical considerations are more important than the cost factor, the closer the technical scores of the various proposals are to one another, the more important the business considerations become.

M-2 EVALUATION FACTORS FOR AWARD

Proposals will be evaluated in accordance with the following criteria. The technical factor is more important than the cost factor. Technical subfactors are listed in descending order of importance.

M-2-1. TECHNICAL/MANAGEMENT

(1) TECHNICAL APPROACH

Note: The subfactors listed under technical approach are all considered to be equal in value.

Proposals will be evaluated on the degree to which the proposal demonstrates that the offeror has a clear understanding of the purposes and objectives of the Statement of Work and of the technical problems inherent in those objectives. Areas to be evaluated include: 1) whether the proposal adequately describes the technical approaches involved in support of the various tasks in the Statement of Work, 2) whether the supporting materials in the proposal clearly support the proposed approach, 3) the extent to which it is clear which aspects of the proposed approach have been demonstrated and which are unproved 4) the extent to which the proposed approach is justified by

prior analysis or design studies and whether the details of those prior studies are included in the proposal 5) whether or not additional studies are required or suggested and the extent to which the details of the required or proposed studies are presented in the proposal 6) the extent to which the overall technical analysis process, which led to the offeror's proposed approach is adequately described, and 7) the extent to which the proposal provides a clear, concise description of any test and evaluation program proposed to support the intent of the Statement of Work.

(2) PERSONNEL QUALIFICATIONS

The proposals will be evaluated on the extent to which the offeror has proposed personnel in accordance with the personnel qualifications listed in Attachment No. 3, including their education level, relevant experience, and the amount of time each person proposed will contribute to the project. The proposals will also be evaluated on the extent to which it shows the availability of sufficient personnel who have sufficient experience levels to adequately address the requirements of the Statement of Work. The manpower resources that will routinely be committed to the project and what additional resources are available on a contingency basis will also be evaluated.

(3) CORPORATE EXPERIENCE

The proposals will be evaluated on the extent to which it indicates that the offeror has previous contracts or subcontracts which are substantially similar to this effort. This evaluation will be based on narrative descriptions which provide brief explanations of the work performed under the prior contracts and which indicate the extent to which the contract objectives are met. The extent to which the people and facilities involved in the prior contracts are available for work on this effort will also be considered.

(4) MANAGEMENT PLAN

The proposals will be evaluated on the proposed management plan for the project. This plan must include a mechanism for maintaining accountability of all activities, and a proposed program schedule, including areas of schedule risk and methods for minimizing each risk area.

(5) FACILITIES

The proposals will be evaluated on the facilities which are proposed for this project, including any proposed use of subcontractor facilities. The facilities proposed will also be evaluated on the basis of whether they possess the systems required for this effort.

(6) PAST PERFORMANCE

Past performance will be evaluated on the basis of the quality of the work performed, timeliness of performance, cost control, and business relations. The evaluation will be based on the information provided pursuant to Section L and other sources if available. Offerors that have no relevant

performance history or for which past performance information is not available will not be evaluated favorably or unfavorably on past performance. The government may begin proposal evaluation prior to receipt of past performance information. If, after completion of proposal evaluation except evaluation of past performance, the contracting officer determines that evaluation of past performance will not affect the outcome of competitive selection, the contracting officer may waive its evaluation in accordance with FAR 15.304(c)(3)(iii).

M-2-2 COST TO THE GOVERNMENT

Proposed estimated cost to the Government. The Government may adjust the proposed cost for purposes of evaluation based upon an evaluation of cost realism. Cost Realism means that the costs in an offeror's proposal are realistic for the work to be performed; reflect a clear understanding of the requirements; and are consistent with the various elements of the offeror's technical proposal. The cost realism evaluation includes an analysis of the adequacy of the hours, labor mix, and other direct costs to perform the work as proposed in the technical proposal as well as the proposed labor and indirect rates. It also includes evaluation of the likelihood that the risks inherent in the offeror's technical approach will result in higher actual costs than anticipated.

M-2-3 SMALL BUSINESS PARTICIPATION

(a) The extent of participation of small businesses and historically black colleges or universities and minority institutions in performance of the contract will be evaluated on the basis of the proposed extent of participation of such firms in terms of the value of the total acquisition and the complexity and variety of the work such firms are to perform.
(b) The extent of participation of small disadvantaged business concerns in performance of the contract will be evaluated on the basis of the proposed extent of participation of such firms in terms of the value of the total acquisition and the complexity and variety of the work such firms are to perform.

M-3 FAR 52.217-5 - EVALUATION OF OPTIONS (JUL 1990)

Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. Evaluation of options will not obligate the Government to exercise the option(s).

Solicitation N00173-00-R-KK04
Attachment No. 1

STATEMENT OF WORK

Contractor Support For Various Branches of NRL's Chemistry Division

The Naval Research Laboratory (NRL) has a requirement for contractor support for various branches of its Chemistry Division. Major topics of research are 1) Fire Research 2) Improving Service Life, Affordability, Maintainability and Safety of the Fleet 3) Synthesis and Characterization of Advanced Chemical Materials Destined for Use in Navy Systems and Other Chemical Material Research 4) Development and Characterization of New Polymeric Materials for Naval Systems 5) The Study of Propulsion Fuels and Other Fuels 6) Research and Development of Analytical Techniques Used in the Combustion of Fuels, Propellants, Pyrophorics, and Explosives 7) Development of New Technologies and 8) Computer Hardware and Software Support. Fire research will include studies of combustion and the development of fire models, research to develop a replacement for halon as a firefighting agent, fire suppression system modeling and engineering, statistical research in support of shipboard combustion research tests, and shipboard fire scaling to test potential new ship designs and equipment. Research to improve service life, affordability, maintainability, and safety of the fleet includes research into corrosion issues, cathodic protection, anode investigations, research on fouling and antifouling, research on protective coatings and composites, materials testing, characterization, and analysis,

system prototyping and evaluation on ships, and general program support. Synthesis and characterization of advanced chemical materials destined for use in Navy systems and other chemical materials research includes research to improve the reliability of sonar dome rubber windows and sonar rubber domes, research of advanced nondestructive examination techniques for sonar domes, research of new materials systems or designs for sonar windows and domes, materials synthesis for nanotechnology, and research and characterization of advanced materials for use in naval systems. Research into the development and characterization of new polymeric materials for naval systems includes formulation, evaluation, testing and applications development of fluoropolymer materials and coatings, studies on the interactions between polymeric materials and high energy laser and microwave radiation, development of magnetic resonance methods for detection of explosives, technical support for sonar rubber domes and sonar dome rubber windows, development and evaluation of new analytical technologies, and development and application of X-ray characterization methods. The study of propulsion fuels and other fuels includes research into the performance of Navy fuels as a function of compositional and physical properties, and research into fuel chemistry in support of naval air engineering programs. Research and development of analytical techniques used in the combustion of fuels, propellants, pyrophorics and explosives includes the analysis and control of airborne chemicals, chemical analysis and chemical sensor development, and site characterization and remediation of contaminated soils, groundwater, and river sediments. Development of new technologies will include research in magnetic

resonance methods for Nuclear Magnetic Resonance (NMR), imaging of solid materials, the use of NMR for assessing polymers and polymer blends, and the use of these techniques for the detection of explosives and other concealed materials. Computer hardware and software support involves installation and maintenance of local area networks, development, installation and maintenance of software, on-call support, and specialized backup support. The Contractor shall perform the following tasks as required by NRL:

TASK 1 – Fire Research

INTRODUCTION

The Naval Research Laboratory (NRL) conducts basic and applied R&D programs aimed at the solution of current and future Navy problems in the fields of combustion, fire extinguishment, fire research, damage control and atmospheric hazards. This research is performed by the Naval Technology Center for Safety and Survivability. This center has several sections. The Combustion Dynamics Section studies the mechanisms of flame reactions and fire behavior, and examines inhibition systems and fire extinguishment, with emphasis on exploring and developing fire protection systems and strategies to replace Navy halon fire suppression systems. The Combustion Modeling and Scaling Section develops fire models and scaling parameters, evaluates fire behavior and toxic hazards from materials exposed to fires, defines the properties of fire extinguishment, develops fire detection systems and integrates these into damage control concepts. The Shipboard Fire Scaling Section investigates new concepts, agents, equipment and techniques for fire protection on

surface ships, submarines, aircraft and shore facilities. This includes new approaches to developing fire extinguishment and means for applying them, developing means to "see" through smoke, eliminating electrostatic hazards in fuel systems, and developing fire extinguishing systems. It is also involved in developing doctrine and tactics with final proof of concept being accomplished with fleet personnel.

In summary, these NRL programs require contractor support which is highly technical, diverse and responsive. Individual task areas are described below. These tasks may involve supporting one or more sections of the Naval Technology Center for Safety and Survivability. The individual tasks areas are as follows:

1.1 COMBUSTION AND MODELING

1.1.2 BACKGROUND

National and international standards have mandated that current environmentally damaging firefighting agents containing halogen atoms be replaced with alternatives with comparable efficiency but which are less harmful to the environment. Current agents being investigated either still maintain some of their chemical action by incorporating halogen atoms in their structure and hence maintain their Ozone Depleting Potential (ODP); are reactive and yield low ODP, yet represent some level of toxicity; or are inefficient and generate large quantities of toxic and corrosive acids in firefighting usage.

One promising non-chemical acting alternative to the environmentally damaging agents is water mist. Much of the past experimental research on this agent has

concentrated on large-scale demonstrations showing that water mist does indeed work in simulated high risk shipboard compartments, both in open (surface ship) and in closed (submarine) compartments. It is important, however, to understand the mechanism by which water mist is so effective in efficiently suppressing combustion.

1.1.3 SCOPE

The contractor shall perform the tasks as required by NRL according to the technical requirements set forth below. Additional tasks related to the cited technical requirements and within the scope of the SOW may be identified during the period of performance. Such additional tasks will be identified as specific written technical direction.

1.1.4 TASK DESCRIPTION

(a) The contractor shall develop fire models that demonstrate the behavior of fire in semi- and completely confined spaces and be able to correlate these models with small, intermediate, and large scale fire data.

(b) The contractor shall evaluate extinguishing systems performance and its effect on fires in semi-and completely confined spaces, including the effects of reduced oxygen concentration.

(c) The contractor shall use his extensive knowledge of sensors and analytical equipment for detecting fire, smoke and toxic gases to correlate these types of data to fire model predictions.

(d) The contractor shall have knowledge of analytical techniques necessary to determine the mechanism(s) of interaction of flame and water mist systems that result in extinguishment.

(e) The contractor shall determine mechanisms for the extinguishment of fires with water mist based on (a), (b), (c), and (d) above.

(f) The contractor shall determine the effectiveness of water mist on various classes of fuels based on (a), (b), (c), and (d) above.

1.2 HALON REPLACEMENT

1.2.1 BACKGROUND

The need is to develop an improved understanding of fire suppression to allow design and evaluation of fire protection systems. The goal is driven by the need of the Navy to eliminate the dependence on the currently employed halon based systems.

DOD has decided to not install halon on any newly designed facility or platform, and will try to eliminate existing ones as maintaining protection allows.

1.2.2 SCOPE

The contractor shall perform the tasks as required by NRL according to the technical requirements set forth below. Additional tasks related to the cited technical requirements and within the scope of the SOW may be identified during the period of performance. Such additional tasks will be identified as specific written technical direction.

1.2.3 TASK DESCRIPTION

(a) The contractor shall develop test plans and execute fire protection system tests for Navy fire threat scenarios, based on fire protection engineering.

(b) The contractor shall incorporate analytical capability into the laboratory evaluation/validation of optical techniques for study of aerosol diagnostics and behavior.

(c) The contractor shall incorporate analytical capability into the experimental test facilities as appropriate for test monitoring and fire and suppression parameter understanding.

(d) The contractor shall analyze results from fire tests to advise on acceptable and optimum fire suppression systems, as well as to suggest improved fire protection approaches.

1.3.0 FIRE SUPPRESSION SYSTEM MODELING AND ENGINEERING

1.3.1 BACKGROUND

A variety of novel fluids are envisioned as replacement agents for the halon currently employed by the Navy as a fire suppression agent. The range of values of physical properties mandates a thorough evaluation of their flow properties to properly design and optimize agent delivery and distribution systems. This entails determining agent property model construction and validation, designing and evaluating shipboard and test systems. Engineering input is also required for firefighting and damage control planning and doctrine development, including automation.

1.3.2 SCOPE

The contractor shall perform the tasks as required by NRL according to the technical requirements set forth below. Additional tasks related to the cited technical requirements and within the scope of the SOW may be identified during the period of performance. Such additional tasks will be identified as specific written technical direction.

1.3.3 TASK DESCRIPTION

(a) The contractor shall obtain information on the thermodynamic and physical properties of candidate suppression agents.

(b) The contractor shall develop (or modify as appropriate) fluid flow models for predicting discharge system characteristics.

(c) The contractor shall design discharge systems and participate in their test and evaluation.

(d) The contractor shall provide engineering input on agent discharge systems and hardware and other aspects of combustion testing as appropriate.

(e) The contractor shall provide engineering input on firefighting and damage control evaluation and doctrine development, including automation of sensor input and system response.

1.4.0 STATISTICAL RESEARCH IN SUPPORT OF SHIPBOARD COMBUSTION RESEARCH TESTS

1.4.1 BACKGROUND

Full-scale shipboard fire tests involve many complex and interacting variables. Very large data sets result from a matrix of different experiments. Statistical design of test programs and interpretation and validation of results can greatly enhance research efficiency.

1.4.2 SCOPE

The contractor shall perform the tasks as required by NRL according to the technical requirements set forth below. Additional tasks related to the cited technical requirements and within the scope of the SOW may be identified during the period of performance. Such additional tasks will be identified as specific written technical direction.

1.4.3 TASK DESCRIPTION

(a) The contractor shall develop efficient and appropriate statistical methods for application to technical problems associated with large scale testing.

(b) The contractor shall, using information supplied on test variables, range of tests to be performed and information desired, evaluate and comment on test plans, including suggesting modifications to improve the quality of data that can be obtained, based on statistical methods.

(c) The contractor shall analyze data obtained from large scale testing to provide statistically valid evaluations of how the various factors affect the test results.

1.5.0 SHIPBOARD FIRE SCALING

1.5.1 BACKGROUND

NRL has custody of a full scale damage/control research ship, the Ex USS SHADWELL. This facility is in constant need of alterations to accommodate various proposed ship class damage conduct innovations. For some integrated experiments, the SHADWELL must accommodate over 100 people while furnishing the research facility to conduct the experiments.

1.5.2 SCOPE

The contractor shall perform the tasks as required by NRL according to the technical requirements set forth below. Additional tasks related to the cited technical requirements and within the scope of the SOW may be identified during the period of performance. Such additional tasks will be identified as specific written technical direction.

1.5.3 TASK DESCRIPTION

(a) The contractor shall aid in designing, modifying and maintaining unique aspects of the ex-USS SHADWELL as a research testbed for proof of concept of new ship design and equipment.

(b) The contractor shall define and transition technical expertise about damage control into Navy operations, doctrines and tactics.

(c) The contractor shall provide materials needed to maintain and modify the platform.

(d) The contractor shall formulate and determine the services needed to maintain the facility.

(e) The contractor shall furnish expertise for automation, hull, mechanical, and electrical ship hardware and analytical instrumentation to measure the same.

1.6 Reports and Data

The contractor shall submit a monthly financial report, quarterly technical reports, a brief annual report, and a brief final report in accordance with the Contract Data Requirements List (Exhibit A – DD Form 1423).

TASK 2 – Service Life, Affordability, Maintainability and Safety of the Fleet

INTRODUCTION

The Navy is working to improve performance service life, affordability, maintainability, and safety while reducing life-cycle costs and manning requirements. The Chemistry Division of the Naval Research Laboratory is significantly involved in assisting the Navy in its endeavors in supporting research, development and engineering efforts for improving these areas.

2.1.0 BACKGROUND

One aspect of these efforts involves corrosion control. The Navy expends millions of dollars each year repairing items destroyed by corrosion. One approach to addressing this requirement is through the development of innovative methods and advanced materials to control or eliminate corrosion. This includes, but is not limited to, the use of composite materials or new/novel coating systems.

Another direction for addressing corrosion control being implemented by the Navy is cathodic protection. Cathodic protection is used to prevent seawater corrosion in ship hulls and ballast tanks. Currently, anodes are the method used

to provide cathodic protection. The service life of anodes is expected to be two years, however, the reality is that they may not work, work sporadically, or work for a fraction of the anticipated life. The plan is to extend the life of the anodes. Even a short life extension or a method for determining which anodes will fail would have a significant impact on the operating costs associated with the Fleet.

To further assist the Navy in enhancing the service life, maintainability, etc. of the Fleet, the Chemistry Division is also involved in investigations & evaluation efforts in biofouling control as its relates to both the exterior (hulls, etc.) and interior (auxiliary systems) areas of ships & submarines. These efforts include laboratory piping loop and shipboard engineering prototype studies regarding the effectiveness of biofouling control chemicals for heat exchangers, condensers and cooling systems, as well as the certification of the chemical based on the interaction between the qualified ship/sub materials and the introduced biofoulant.

The Chemistry Division's technical requirements within this Task Area are described in the following Subtasks, which focus on, but are not limited to:

Providing research & engineering support for the shipboard application, implementation, documentation of surface preparation procedures, coating application, and installation for advanced and prototype marine coatings and corrosion reduction strategies;

Providing corrosion engineering to resolve high-value material-maintenance issues related to Navy ship operations.

Providing research & engineering in the development and understanding of cathodic protection (CP) systems.

2.2.0 TECHNICAL REQUIREMENTS

2.2.1 CORROSION ISSUES/CATHODIC PROTECTION

2.2.1.1 The contractor shall develop efficient test research methodologies toward determining the crevice corrosion mechanism in high strength active-passive metals, particularly nickel based alloys. The contractor shall design experiments and test cells to be used in both controlled laboratory bench research and in natural seawater exposure studies. The research shall be conducted to evaluate such variables including, but not limited to, temperature, ennoblization, crevice geometry, biofilms, heat treatments, crevice solution chemistry, and metallurgical and compositional variations. The contractor shall identify and evaluate countermeasures to mitigate existing crevice corrosion problems.

2.2.1.2 The contractor shall conduct research to study the degradation effects of materials when exposed to natural seawater with and without cathodic protection. The contractor will use both DC and AC electrochemical evaluation techniques and long term exposure coupons to predict the corrosion rate of the materials and to predict the corrosion resistance and galvanic relationships of these materials in a natural seawater environment. The contractor will use, but not be limited to, Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), and Electron Diffraction X-Ray (EDX), instrumentation to perform microstructural/microscopic analysis on the materials after exposure. This will lead to the development of theoretical models on corrosion mechanism of these materials.

2.2.1.3 The contractor shall use physical scale modeling (PSM) techniques to design and evaluate the impressed current cathodic protection (ICCP) systems of seawater structures and Navy platforms in accordance with Naval Sea Systems Command design criteria. This will require the construction of subscale plastic or metal models, which incorporate both scaled metallic components and cathodic protection systems. In conjunction with the PSM ICCP modeling, the contractor shall construct a sensor that will measure the electric fields produced as a function of both the ICCP system use and the galvanic nature of the structure. The contractor shall run calibration tests on the sensor system and correlate the data gathered against theoretically derived data. Analysis may

require the use of sophisticated hardware/software and the development of appropriate subsystems.

2.2.1.4 The contractor shall conduct research and provide engineering expertise in the area of materials evaluation and corrosion control for seawater applications. This work encompasses a broad area including basic laboratory chemical and electrochemical analysis, prototype engineering/fabrication, and computerized data analysis. Specifically, the contractor shall: assist in design and fabrication of both electrochemical and visual sensor systems to measure coatings degradation and cathodic protection levels in ballast tanks and ship hulls, install prototype sensor systems, develop an analysis package for ranking the state of preservation of the tanks coating system, and design interim cathodic protection systems for tanks found to be under protected. The contractor shall assist in evaluating and identifying wireless technology for use with the sensor systems. The contractor shall conduct all necessary laboratory experimentation by using physical models to verify the sensor systems and analysis regimes. The contractor shall be involved in the development of advance solid state logging systems designed specifically for measuring corrosion potential and sacrificial anode current output in ballast tanks and on ship hulls.

2.2.1.5 The contractor shall conduct product-form testing for systems used on naval platforms. This testing will include, but not limited to, testing of equipment,

components, sensors and associated hardware. The contractor shall construct the necessary platforms, similar to the life-cycle environment in which the component will be exposed, for testing of these components in a natural seawater environment. The contractor shall identify and evaluate equipment and testing methodologies that can used to pinpoint failures in ICCP components without requiring dry-docking of the vessel.

2.2.1.6 The contractor shall be required to construct, upgrade, and monitor many large-scale test structures to support of a wide variety of corrosion testing. This may include construction of large tanks and buildings to house the delicate instrumentation needed for the corrosion research. The contractor shall construct and maintain seawater piping loops, pumps and exposure troughs for the testing of metals under flowing and quiescent conditions. This will require tri-weekly measurement and documentation of seawater physio-chemical parameters. The contractor will instrument a 700 foot seawater pier to be used for the evaluation of sacrificial anode efficiency. The contractor will construct and maintain full-scale heat exchangers for the testing of new coating systems and bio fouling controlling chemicals. The contractor shall setup and maintain a xenon Weatherometer and environmental chambers for controlling of atmospheric variables when conducting controlled corrosion and coatings research.

2.2.1.7 The contractor shall conduct research to determine the effect of current density, fouling accumulation, pH, solution dynamics, microstructure and long term exposure on the current capacity/efficiency of aluminum or zinc anodes. This work may require the fabrication or casting of new anode compositions and work relating to the qualification of aluminum anodes under military specification. The contractor shall perform microstructural analyses using, but not limited to, SEM, TEM, EDX instrumentation and shall also perform electrochemical evaluations relating to anode efficiency. Testing may relate to both long-term and short term laboratory evaluation as well as field trials.

2.2.1.8 The contractor shall conduct a wide range of experiments evaluating the effects of cathodic protection on the strength of materials. This will require expertise in the use of mechanical testing machines including, but not limited to, slow–strain rate, step-load and pure bend testing apparatuses. Conducting these experiments will require experience with LabView applications, fabrication of electrochemical test cells that allow continuous once through natural seawater flow as well as use of multiple potentiostats/galvanostat systems.

2.2.2 FOULING

2.2.2.1 The contractor shall evaluate the interactions between materials and newly introduced chemicals and materials. This will include, but not be limited to, the effects of waste effluent streams on piping and container materials,

and the selection of appropriate materials for various marine pollution control device (MPCD) systems.

2.2.2.2 The contractor shall examine the effect of ship seawater system antifouling systems/technologies on materials. The use of current and proposed systems/technologies, including chlorination, copper dosing, other injectable biocides, piping interior coatings, modified cathodic protection, and pulsed electric/acoustic power, shall be evaluated for their effects on materials and resistance to corrosion. These techniques shall be evaluated in NRLKW and/or contractor designed and constructed piping flow loops. In addition, the contractor shall consider the environmental impact of these antifouling systems and other emergent technologies, such as dechlorination and ultrafiltration, by conducting engineering studies, conducting environmental testing with appropriate aquatic organisms, and developing novel in-situ monitoring methodologies to ensure environmental compliance of antifouling systems.

2.2.3 COATINGS/COMPOSITES

2.2.3.1 The contractor shall perform all necessary tasks relating to testing antifouling and corrosion preventative coatings (including paints) used on shipboard. This includes but is not limited to substrate surface preparation,

coating application, and coating testing for effectiveness and durability under service conditions.

2.2.3.2 The contractor shall conduct Ship surveys by Type Commander (TYCOM)/Squadron to determine number and size of deck grates and ventilation screens per ship and to development a replacement logistics plan using composites to reduce corrosion. Once the surveys are completed, the contractor shall provide copies of Letter Reports detailing numbers and sizes of grates and screens and a recommended logistics plan in accordance with DD Form 1423 (Exhibit B).

2.2.3.3 The contractor shall conduct an industry survey of available composite components (e.g. handrails and life-rails) for possible Fleet implementation and determine their applicability for possible ship installation and demonstration. Upon completion of the survey, the contractor shall provide copies of a Letter Report detailing the ability of the surveyed items to meet Navy requirements such as shock, impact, and aging in accordance with DD Form 1423 (Exhibit B). The Report should identify commercial systems that are available and which could meet all requirements.

2.2.3.4 The contractor shall perform a study of coating applications (e.g. improved non-skid coatings) when new and after aging. Upon completion of

the study, the contractor shall provide copies of a Letter Report detailing coating applications' performance and aging characteristics in accordance with DD Form 1423 (Exhibit B).

2.2.3.5 The contractor shall support the inspection and evaluation of open/closed loop ultra-high pressure water-jet (hydro-blast) systems demonstrated at various Naval Shipyards for coating removal and maintenance. Upon completion, the contractor shall provide copies of a Letter Report detailing results of the demonstrations in accordance with DD Form 1423 (Exhibit B).

2.2.3.6 The contractor shall provide engineering oversight of ship demonstration/installation projects of composite components--such as vent screens installed in place of metal screens, ladders, ducting, handrail connectors, louvers, ready service lockers, cable hangers, handrails and life-rails—designed to reduce corrosion. Upon completion, the contractor shall provide copies of a Letter Report detailing installation techniques, lessons learned and proposed installation procedures applicable to other ships in accordance with DD Form 1423 (Exhibit B).

2.2.3.7 The contractor shall provide on-site field services to apply and monitor the application of approved coatings for evaluation, from initial surface cleaning and preparation to final acceptance inspections.

2.2.3.8 The contractor shall provide on-site field services to apply and monitor the application of approved marine coatings for superstructure and freeboard areas and all interior spaces, from initial surface cleaning and preparation to final curing and acceptance inspections.

2.2.3.9 The contractor shall provide program support to identify and track coated areas and to document the effectiveness of the coating and application methods for all designated DOD vehicles, vessels, and systems. The contractor shall identify any deficiencies or process improvements that should be implemented and advise the NRL COR (Contracting Officer's Representative) about them.

2.2.3.10 The contractor shall provide program support to plan and track treated equipment and document the effectiveness, return on investment, and manpower offset that the treatment provides.

2.2.3.11 The contractor shall implement "state of the art" prototype surface preparation methods in conjunction with coatings that may increase bond effectiveness, longevity, and the rate of production or improve environmental regulation compliance compared to currently utilized technology in conjunction with the following program areas: well deck overhead coatings,

freeboard and anti-stain coatings; high durability; wear resistant coatings, bilge coatings and non-skid coatings.

2.2.3.12 As required, the contractor shall apply prototype, "state of the art" systems to protect substrates in vessel, vehicle and systems applications and at field sites.

2.2.3.13 The contractor shall execute "state of the art" production methods for repair efforts to increase effectiveness, longevity, the rate of production and to improve environmental regulation compliance compared to currently utilized technology, including hydro blast technologies.

2.2.3.14 The contractor shall utilize "state of the art" production methods, and other available equipment and facilities, for evaluation purposes, to complete repair tasking, coating application, and component fabrication.

2.2.3.15 The contractor shall utilize approved industrial methods of repair/coating removal including hydro-blast technologies/disposal to achieve enhanced effectiveness and efficiency.

2.2.3.16 The contractor shall implement advanced corrosion control products and demonstrate advanced techniques including corrosion control

application procedures and quality control methods in well deck overheads, bilges, freeboard areas and decking.

2.2.3.17 The contractor shall execute methods of coating removal /disposal in support of studies for effectiveness (such as hydro-blasting or stripping selected layers from a multiple layer coating system), efficiency (such as contaminant removal from waste water by scrubbing apparatus), rate of coating removal, operational safety to personnel, and the effect on environment.

2.2.3.18 The contractor shall demonstrate prototype systems and "state of the art" engineering and coating technologies, including plural component application systems, for enhanced compliance with current and projected regulations on volatile organic compounds (VOC 's) and liquid and solid wastes, including heavy metals.

2.2.3.19 The contractor shall apply candidate advanced corrosion control surface coatings or implement other surface protection and material technologies, such as composite systems, in support of studies for cost effectiveness, operational effectiveness, effective life and environmental impact.

2.2.3.20 The contractor shall assist in training Navy and joint service maintenance personnel to achieve the required qualifications for tool and equipment operations, repair operations and coating applications for the purpose of evaluating these approaches/systems as possible Fleet corrosion control methods.

2.2.3.21 The contractor shall comply with current regulations on volatile organic compounds (VOC' s) and liquid and solid wastes. The contractor shall investigate, catalogue, and implement coating technologies which may be applicable to joint service vessels, vehicles, and weapons systems.

2.2.3.22 The contractor shall provide documentation, which defines tooling and support requirements, and costs, to the Naval Research Laboratory for various initiatives and efforts associated with the coating subtasks.

2.2.3.23 The contractor shall document various performance objectives established in conjunction with NRL regarding coating related initiatives.

2.2.3.24 The contractor shall create quality assurance criteria for approval and record implementation data.

2.2.3.25 The contractor shall submit Management and Technical Support Documentation for the following items:

a. The contractor shall assist NRL in developing specifications for the application of advanced coatings on vehicles, vessels, internal spaces, external components and structures.
b. The contractor shall provide written recommendations for coating and application process improvements for consideration by the Naval Research Laboratory.
c. The contractor shall provide written reports, configuration change documentation, automated data exchange, database maintenance, photographic archives, and WEB access to DOD and Navy performance, and cost and reference data on advanced and prototype composite material components, installed at the direction of the Naval Research Laboratory.
d. The contractor shall provide post-application reports detailing application processes, in-process reviews accomplished, and a final application assessment on each application and technical support project undertaken.

2.2.3.26 The contractor shall manage and implement the development of new anti-fouling coating technologies to satisfy the Uniform National Discharge Standards (UNDS) goal of reducing copper emissions from Navy ship hulls. This support shall include coordination of all aspects of the program including vendor participation, facilitating regulatory approval,

developing testing protocol, overseeing testing, and participating in various technical and trade association committees in conjunction with NRL.

2.2.3.27 The contractor shall identify and review candidate wear resistant coating systems. Further, the contractor shall provide laboratory verification of candidate wear resistant coating performance. The results from the laboratory testing will be used by NRL to identify appropriate systems to be tested aboard USN ships.

2.2.3.28 The contractor shall assist in the identification and review of Low Solar Absorption (LSA)/rust stain resistant shipboard camouflage coatings. The review process will include laboratory verification of performance.

2.2.3.29 The contractor shall develop a Tank Inspector's Guide to provide inspectors with the necessary guidance information. The contractor shall develop, provide a draft for review, produce and distribute the Tank Inspector's Guide in accordance with DD Form 1423 (Exhibit B). The guide will provide inspectors with a visual reference for condition-based assessments of tank coatings. Information from American Bureau of Shipping (ABS), regulators, and Planning and Engineering for Repairs and Alterations – Carrier (PERA CV) will be leveraged for development purposes. Specifically, the guide is to be used in conjunction with solvent free, edge retentive coating installations on USN ships.

2.2.3.30 The contractor shall determine the impact of hydro-blasting versus conventional abrasive blasting as an alternative for surface preparation for long term coating system performance and corrosion control. The contractor shall provide engineering input to issues such as the impact of flash rusting on long-term coating performance, the economics of hydro-blasting versus abrasive blasting for installation of Navy corrosion control systems, suitability of hydro-blasting for use on non-skid surfaces, identifying required Uniform Industrial Process Instructions (UIPI) improvements required to incorporate technology advances, environmental regulations, visual standards, and OSHA (Occupational Safety and Health Act) issues. The contractor shall also provide a technical review of a shipboard hydro-blasting demonstration, and provide any required documentation in accordance with DD Form 1423 (Exhibit B).

2.2.3.31 The contractor shall investigate improved coefficient of friction evaluation of new non-skid coatings, including enhanced data analysis using the standard test method with a modified sled. The contractor shall assess other non-skid performance parameters (such as durability, fading, chalking, wearing, loss of slip resistance, etc.), comment on a commercial item description for new non-skid coatings, and comment on new coating chemistries.

2.2.4 MATERIALS TESTING & ANALYSIS

2.2.4.1 The contractor shall conduct research in the destructive and non-destructive testing of a broad range of metallic and non-metallic materials. Specific tasks include: failure analysis and fractography using both light and electron microscopes; materials characterization through the use of x-ray fluorescence spectrometers, energy dispersive x-ray spectrometers and the scanning Auger microprobe; microstructural analysis of materials by polishing, etching and sectioning; and destructive materials testing via monotonic, cyclic and impact loading in tensile, compressive or flexural modes. The contractor shall: perform appropriate tests on metals, polymers and organic matrix composites in accordance with American Society for Testing and Materials (ASTM) and Suppliers of Advanced Composite Materials Association (SACMA) specifications; develop innovative test methods to solve problems not addressed by standard tests; and develop and conduct non-destructive materials evaluation using ultrasonic, x-ray, and other technologies.

2.2.4.2 The contractor shall perform other characterizations as required for some materials. This shall include, but not be limited to, determinations of specific heat, coefficients of thermal expansion, electrical conductivity,

vibrational dampening, and indentation hardness. In addition, the contractor shall, as required, investigate materials uses pertaining to the measurement and reduction of magnetic signatures of materials, structures, and vessels.

2.2.4.3 The contractor shall evaluate fracture mechanics applicability to ceramic and metal alloys using the facilities at NRL. In addition, the contractor shall determine the deformation and fracture characteristics of these materials under similar service conditions, and conduct experimental and analytical studies (e.g. using dislocation dynamics and diffusion kinetics of the behavior of high temperature materials under monotonic and cyclic loads). The contractor shall evaluate damage mechanisms using electron microscopy and computer simulation techniques. In environmental-assisted fracture, the contractor will address effects related to stress corrosion, corrosion fatigue, hydrogen effects, and strain rate.

2.2.4.4 The contractor shall develop new or modify existing methodologies for non-destructive evaluation (NDE) or non-destructive inspection (NDI). The contractor will use these, as well as standard methods, as appropriate, for the evaluation or inspection of metals, ceramics, composites, and other organic and inorganic materials to analyze the condition of components.

2.2.5 SYSTEM PROTOTYPING/SHIP EVALUATION

2.2.5.1 The contractor shall provide test planning and development of test plans. Test plans will be formulated for laboratory testing or shipboard testing to meet government-defined objectives. The test plans will include clearly defined objectives, background, approach, procedure, specifications for data collection, and figures and tables as determined necessary.

2.2.5.2 The contractor shall support test execution aboard ships and submarines, at NRL, at contractor owned facilities, at designated contractor operated facilities, or at other government facilities. The contractor shall include data collection, analysis and interpretation. Theoretical calculations will be performed to estimate test results and evaluate test system performance. The contractor shall gather data by observation or by it being recorded on laboratory equipment. Analysis of the collected data will be completed by engineering personnel and/or with commercially available software. The data will be interpreted to provide trends or the best answers to the original test objectives, and documented in technical reports and/or briefings.

2.2.5.3 The contractor shall develop control systems for the operation of prototype and shipboard systems. This work will include, but not be limited to,

selecting and integrating sensors to maintain system parameters; recording and processing data; programming computer control systems; and selecting and integrating control system hardware.

2.2.5.4 The Contractor shall provide the technical personnel and facilities to design and fabricate test equipment, test articles, prototype equipment units, Engineering Development Models (EDM 's) and upgrades to existing EDM 's, and prototype/pre-production units of equipment for eventual installation aboard ship. The contractor shall complete engineering drawings, shop drawings, and process and instrumentation drawings. The effort may also include modifications to commercial off-the-shelf equipment, for installation and use aboard ship.

2.2.5.5 The contractor shall provide support for installation, trouble shooting, repair, maintenance and removal of engineering prototype equipment on ships and submarines including debriefs to NRL and/or ships' representatives to report status of equipment problems/repairs. The contractor shall also perform and document failure analysis of shipboard component assemblies to determine cause and effect to assist the Fleet with resolution of the equipment failures. The effort will include ship checks and functional checks to diagnose catastrophic failures, transport of component assemblies to/from the Fleet and assisting the Fleet with installation and/or repair of the equipment.

2.2.5.6 The contractor shall support the development of software for the development and management of databases, the design of automated data collection and processing systems; and the design and fabrication of control systems, (including programmable logic controls). The contractor shall also provide statistical analysis support.

2.2.5.7 The Contractor shall provide support to training programs that demonstrate correct operation and maintenance of all types of shipboard prototype equipment. Training will be conducted on site, aboard ship or through interactive courseware.

2.2.6 GENERAL PROGRAM SUPPORT

2.2.6.1 The contractor shall assist NRL in arranging, organizing, coordinating, scheduling, and facilitating working group meetings, seminars, symposia, program reviews and other programmatic meetings at Contractor spaces or other commercial facilities. The contractor shall provide, as needed, technical support which shall include, but not be limited to: responses to interrogatories; the preparation and presentation of point papers and other briefings; and the preparation of fact sheets and other documentation related to the technical research conducted under this effort.

2.2.6.2 The contractor shall provide, as needed, attendance by its staff to off-site locations including, but not limited to: professional society meetings; technical review meetings and workshops; and planning and coordination meetings. The intent here is to enhance the near- and far-term performance of the aforementioned subtasking. When unusual field conditions require it, the contractor shall provide appropriate garments and equipment to work under extreme weather or hazardous environments.

2.3 Reports and Data

The Contractor shall submit reports and data in accordance with the Contracts Data Requirements List (DD Form 1423)(Exhibit B).

TASK 3 – Synthesis and Characterization of Advanced Chemical Materials Destined for Use in Navy Systems and Other Chemical Material Research

3.1.0 INTRODUCTION

The Materials Chemistry Branch (Code 6120) is responsible for the synthesis and characterization of advanced chemical materials destined for use in Navy systems. The Branch also examines chemical materials in Fleet service to identify and propose solutions to problems resulting from deficiencies in such materials. The scope of the Branch's effort covers a variety of advanced material concepts, from new chemicals for use as precursors in the synthesis of new polymers and chemical vapor deposition (CVD) coatings to modification of existing materials to enhance properties such as strength, biodegradability and environmental safety. The Branch has assumed a leadership role in developing state of the art compounds which can lead to significant technological advances for Fleet use. Our research continues to produce materials and processes for polymers for lightweight composite structural elements, environmentally safe hull coatings and specialty chemicals for a variety of unique Navy needs. The branch also supplies the System Commands with technical support for development and improved maintenance of Navy systems. Because of the diverse nature of the materials field, the Branch mission is necessarily broad.

Examples of the technical contract activities required in pursuit of individual branch projects are given below.

3.2. SCOPE OF WORK

3.2.1 The Materials Chemistry Branch requires contractor technical activities to pursue applied research projects and to assist the transition of discoveries which arise from basic research programs to products suitable for use in the Fleet and in shore activities of the Navy. This contract is designed to provide research in the following four areas of interest to the Branch.

3.3.1 Reliability improvement of Sonar Dome Rubber Windows (SDRW' s) and Sonar Rubber Domes (SRD' s)

3.3.2 Advanced Nondestructive Examination Techniques for Sonar Domes

3.3.3 Advanced Materials for SDRW' s and SRD' s

3.3.4 Materials Synthesis for Nanotechnology

Security requirements

The Sonar Dome tasks often require access by contractor personnel to Naval facilities such as Naval Stations, shipyards and ships. Therefore, personnel proposed by the Contractor must have, or be able to get, a security clearance at Secret level.

3.3. SPECIFIC CONTRACT REQUIREMENTS

3.3.1 RELIABILITY IMPROVEMENT OF SONAR DOME RUBBER WINDOWS AND SONAR RUBBER DOMES

On practically all of its sonar-equipped vessels the Navy currently uses rubber/steel-cord laminated structures known as Sonar Dome Rubber Windows (SDRWs) or Sonar Rubber Domes (SRDs) to protect the sonar transducers. These structures are located either at the bow (SDRW) or on the keel (SRD) of the ship. While general performance of the current domes is good, there are cases when sea water can penetrate the laminate structure, causing corrosion fatigue of the steel cords which eventually leads to failure. This has serious ramifications if the failure occurs during service at sea. For this reason the Navy, with the assistance of NRL, has set up non-destructive examination (NDE) procedures. NRL is tasked to evaluate NDE results, recommend action, develop and maintain data bases for historical analysis and statistical predictions, maintain a developmental web site where the database information may be formatted, updated and transferred to a web site maintained by a NAVSEA operation, conduct analyses of failed domes, postulate failure mechanisms and suggest changes or improvements in manufacturing procedures and design to overcome real problems or to prevent potential ones.

(a) The Contractor shall perform interpretation, immediate analysis, and assessment of radiographs of Sonar Dome Rubber Windows (SDRW' s)

and Sonar Rubber Domes (SRD' s) received from radiographic inspection contractors. This task shall receive priority status, and the Contractor shall assure that qualified staff are on hand for performing it. The Contractor shall report the results to the NRL task manager, and others designated by NRL, and shall take, or facilitate, action necessary to return ships to service.

(b) In special cases of urgency to the Navy, the Contractor shall provide the NDE interpretation, as described in (a), on-site at shipyards or at other Navy installations and report as above.

(c) The Contractor shall prepare reports of the analysis of these radiographic inspections, as well as those from inspections of repairs and of newly manufactured domes, verify unusual construction features with the manufacturer, and prepare periodic summary inspection reports.

(d) The Contractor shall develop radiograph interpretation procedures, standards and/or specifications for radiographs, (including density, sensitivity and coverage requirements) and shall suggest changes in procedures as experience allows.

(e) The Contractor shall develop and maintain SDRW/SRD data bases. These data bases shall include information on cord damage, lines of

compressed radial cords, subtly deflected longitudinal cords, and any additional information useful in analysis of damage growth and prediction of service life as required by NRL for life cycle monitoring. Also included in the data base shall be other information related to dome installation and history of ship's dome experience. SDRW and SRD data base management shall include treating radiographic files to preserve images for 10 year storage, maintaining files of radiographs and reports, providing data for statistical analysis of failures, and updating the computerized data bases.

(f) The Contractor shall maintain a developmental web site where the database information may be formatted, updated and transferred to a web site maintained by a NAVSEA organization for real time internet access by ship and Fleet program personnel.

(g) The Contractor shall conduct failure analyses of damaged SDRW' s/ SRD' s selected by NRL and compare the results to radiographic data. The Contractor shall propose damage mechanisms, conduct tests to verify such proposals, and determine the means to correct problems.

(h) The Contractor shall investigate new methods to enhance radiographic images to detect voids and corrosion, and to improve radiographic evaluation of SDRW' s/ SRD' s.

3.3.2 Advanced Nondestructive Examination Techniques for Sonar Domes

The recent rapid advancements in technology, resulting in new instrumentation, better means for data reduction, and enhanced interpretation techniques, are revolutionizing the field of nondestructive examination. This task involves monitoring these advancements and evaluating their application to inspection of SDRW' s and SRD' s with the goal of making inspections more reliable, more efficient, or less costly. The task requires not only an extensive knowledge of the SDRW and SRD structures and the damage mechanisms responsible for failure, but also the ability to understand the scientific foundations of a wide variety of NDE techniques, interpret their application, and engineer approaches to fit the needs of the Navy inspection program. The new composite sandwich domes in development are a different structure, not amenable to radiographic inspection. Work is required to define most probable failure mechanisms for these domes and to develop nondestructive inspection technique(s) to reliably detect the resulting damage.

(a) The Contractor shall work with NRL and NAVSEA to develop procedures to make the x-ray backscatter tomography (XBT) inspection procedure for SRD' s a viable alternative for use in the Fleet.

(b) The Contractor shall constantly monitor the NDE field, through reviewing the NDE literature and attending NDE symposia, watching for new techniques or improvements in older ones, which may be of value to

the Navy for inspection of SDRW' s and SRD' s. The Contractor shall arrange for evaluations of any particularly promising NDE technique, and report on the desirability of initiating work to further explore the technique's potential.

(c) The Contractor shall investigate potential damage mechanisms in the developmental composite sandwich sonar domes to identify those which will adversely affect sonar performance or lead to physical failure of the domes. The Contractor shall evaluate current (ultrasonics, microwave) NDE techniques as well as new techniques to detect such damage in these composite domes.

3.3.3 Advanced Materials for SDRW and SRD

The Navy often receives proposals for new material systems and designs for sonar domes to replace the current materials and designs. Research in this task focuses on means to evaluate these proposes new systems and designs, to suggest changes in approach, to establish adequate testing procedures, and to assist in performing such tests. The task requires an extensive knowledge of sonar dome response to environmental and physical forces, and of documented procedures of mechanical and chemical testing of advanced materials and the ability to design, construct and carry out test procedures of relevant value.

(a) The Contractor shall assist NRL with the evaluation of proposals for new SDRW/SRD materials and/or designs, to determine the reasonableness of proceeding with any particular approach.

(b) The Contractor shall provide support for testing new sonar dome materials and/or designs in accordance with accepted industry and Navy procedures, working with NRL, NAVSEA and other interested parties to generate a consensus for the testing approach and the interpretation of results.

3.3.4 MATERIALS SYNTHESIS FOR NANOTECHNOLOGY

The construction of nanoscale electronic and magnetic devices is a new and critical area of miniaturization technology. Successful developments in this area will have substantial impact in any application involving computers, surveillance, sensors, etc. The contractor shall develop procedures/processes for the synthesis of metal nanoclusters with well defined sizes and size distribution, the assembly and interconnection of them in regular arrays with nanoscale precision and the hydridization of such constructions with state of the art e-beam microlithography.

(a) The contractor shall develop and conduct synthesis and methods for the preparation of metal clusters with controlled sizes and size distribution, and

obtain necessary characterization of the surface composition and size. These materials will be utilized in chemical self assembly operations and will be made available to other workers at NRL.

(b) The contractor shall develop methodologies for chemical self assembly of the metal nanoclusters onto various surfaces and lithographic devices for collaborative scientific study and technical evaluation.

(c) The contractor shall design and synthesize, if necessary, organic tethering agents necessary for the self assembly chemistry.

3.3.5 REPORTS AND DATA

The contractor shall provide reports and data in accordance with the Contract Data Requirements List, Exhibit C (DD Form 1423).

TASK 4 – Development and Characterization of New Polymeric Materials For Naval Systems

4.1. INTRODUCTION

The Materials Chemistry Branch (Code 6120) and the Surface Physics Branch (Code 6170) of the Naval Research Laboratory (NRL) are responsible for the development and characterization of new materials of interest to the Navy.

The Materials Chemistry Branch (Code 6120) is responsible for the development and characterization of new polymeric materials destined for use in Naval systems. Part of the Branch's responsibility is to examine materials and systems already in service to identify opportunities to improve performance by correcting deficiencies in them. The Branch is also responsible for the development and evaluation of new materials technologies and analytical technologies of potential interest to the Navy. The Branch has assumed a leadership role in developing state-of-the-art compounds and analytical techniques that are required for the continual search for significant technological advances for fleet use.

The Surface Physics Branch (Code 6170) uses x-ray analytical techniques for characterization of a wide variety of materials with diverse requirements and varied physical form. The characterization methods use both synchrotron and conventional x-ray sources together with a variety of x-ray detection and interaction methods.

These Branches have extremely broad missions, encompassing development and testing of such diverse materials as composites, coatings, caulks, adhesives, sealants, elastomers, plastics, thin magnetic films, contaminated soils and sediments, semiconductors and ferroelectrics. Additionally, development of new analytical technologies and program management support are within the mission. The Branches require highly technical contractor support in the individual task areas described below.

4.2. SCOPE OF WORK

This Statement of Work (SOW) identifies three specific areas of interest. These areas are as follows:

(a) Technical Support for Sonar Rubber Domes and Sonar Dome Rubber Windows.

(b) Development and Evaluation of New Analytical Technologies.

(c) Development and Application of X-ray Characterization Methods.

4.3. SPECIFIC CONTRACT REQUIREMENTS

4.3.1 The following list of experimental research and development requirements is typical of the projects to be undertaken:

4.3.1.1 Technical Support for Sonar Rubber Domes and Sonar Dome Rubber Windows

For a number of years NRL has developed and maintained various computer data bases for the Sonar Dome Program Office to use in managing programs for Sonar Rubber Domes (SRD' s) and Sonar Dome Rubber Windows (SDRW' s), and has provided technical evaluations and recommendations for long and short term requirements. The objective of this task is to provide engineering support for the development and maintenance of program planning and implementation to support new construction of CG47 and DDG51 class ships and operational activities of all surface ASW (Anti-Submarine Warfare) ships equipped with SRD' s and SDRW' s.

The contractor shall:

(a) Provide assistance to the Sonar Dome Program Office in identifying hardware, software, and reporting requirements necessary to fulfill its short and long range missions in supporting new construction and operational ships;

(b) Identify and analyze existing and emerging material and manufacturing technologies, and determine how such technologies might be used to satisfy the requirements of the Sonar Dome Program Office in identifying and solving problems regarding reliability, maintainability, environmental, and safety issues;

(c) Provide hardware, cost analyses, pricing histories, and new technology impacts to assist the Sonar Dome Program Office in developing resource requirements and program phasing;

(d) Evaluate historical data and provide recommendations for tracking and monitoring the configuration management for new construction;

(e) Develop automated resource planning tools to monitor, track, and predict hardware, manpower, and emerging technology requirements; and

(f) Visit field sites and attend program reviews and technical briefings to gather information needed to execute contract responsibilities.

4.3.1.2 Development and Evaluation of New Analytical Technologies

The Materials Chemistry Branch has an interest in advanced analytical methods for assessing materials of interest to the Navy and the US Government. The Branch has pioneered magnetic resonance methods for NMR (Nuclear Magnetic Resonance), imaging of solid materials and for examining materials outside the NMR coil and outside the NMR magnet. Other novel analytical techniques include the use of xenon, proton, and carbon-13 solid state NMR for assessing miscibility and morphology of polymers and polymer blends. A further interest is the use of advanced magnetic resonance techniques for the detection of explosives, narcotics, and other concealed materials.

The contractor shall:

(a) Devise strategies to detect important explosives and narcotics by magnetic resonance methods, including nuclear quadrupole resonance;

(b) Examine these strategies for application to land mine detection and to scanning of baggage (airline), personnel, mail, packages, and cargo containers;

(c) Construct apparatus, or modify existing apparatus, as necessary;

(d) Design, test, and document prototype apparatus for detection of narcotics and explosives;

(e) Participate in field trials of such apparatus; and

(f) Communicate results to sponsors and, as appropriate, to the scientific community.

4.3.1.2.1 Security Requirements For Tasks 4.3.1.1 and 4.3.1.2

These tasks require access by the Contractor to Naval and Navy contractor facilities for which security clearances may be required. Specific requirements are noted in the DD Form 254, Attachment No. 2 and the Personnel Qualifications, Attachment No. 3.

4.3.1.3 Development and Application of X-ray Characterization Methods

The Surface Physics Branch uses x-ray methods for characterization of a wide variety of materials of interest to the Navy. NRL maintains both laboratory capabilities at its main site and synchrotron radiation capabilities at the National Synchrotron Light Source (NSLS) at Brookhaven National Laboratory (BNL). Unique components of the facility at Brookhaven National Laboratory include a compact, modular, mirror bending and positioning system used for both mirrors on the hard x-ray beamline, and an ultra-high vacuum (UHV) compatible fixed-exit, double-crystal monochromator. X-ray diffraction, x-ray fluorescence, and x-ray absorption spectroscopy are used to analyze polymers, ceramics, metal alloys, thin films, and a variety of other materials.

The contractor shall:

(a) Maintain the NRL synchrotron facilities at the NSLS, and make improvements as required by NRL, including design and construction of custom instrumentation and providing assistance to users;

(b) Design, construct, test, document, and operate unique x-ray fluorescence sensors for Navy applications;

(c) Analyze x-ray fluorescence and x-ray absorption spectra; and

(d) Design, code, test, and document software for data collection, data analysis, and simulation of x-ray transport.

4.4.0 Deliverables

The contractor shall provide monthly status of funds reports, quarterly progress reports, and annual technical reports. The contractor shall provide a final report at the conclusion of the contract. The contractor shall provide reports and data in accordance with the Contract Data Requirements List (DD Form 1423)(Exhibit D).

TASK 5 – Study of Propulsion Fuels and Other Fuels

INTRODUCTION

The Naval Research Laboratory (NRL) conducts basic and applied R&D programs aimed at the solution of current and future Navy problems for, existing Navy propulsion fuels and new fuels from alternate sources. The Fuels Section studies composition/property/ performance relationships for current and future Navy mobility fuels (non nuclear). Key fuel performance topics include storage, handling and combustion with emphasis on safety and reliability in peacetime and on availability and performance in wartime.

These NRL programs require contractor support which is highly technical, diverse and responsive. Individual task areas are described below.

SCOPE

The contractor shall perform the tasks as required by NRL according to the technical requirements set forth below. Additional tasks related to the cited technical requirements and within the scope of the SOW may be identified during the period of performance. Such additional tasks will be identified as specific written technical direction.

5.1.0 PERFORMANCE OF NAVY FUELS AS A FUNCTION OF COMPOSITIONAL AND PHYSICAL PROPERTIES

5.1.1 BACKGROUND

The performance behavior of Navy fuels in ships and aircraft in a global arena pose unique requirements and problems. Relating the composition and properties of Navy jet and diesel fuels used for mobility to their performance in this arena is of major importance given our worldwide procurement, distribution and use system. The use of such correlations can exert tremendous cost savings to the Navy in terms of lower cost testing, preventing problems in the

fuel handling system and in engines and in quickly diagnosing and suggesting solutions to fuel related field problems.

Topics of on-going interest include storage stability, thermal stability, combustion, flammability, filterability, water shedding, microbiological contamination, electrostatic charge generation and lubricity. These interests arise from distinct Naval requirements and needs and work is needed in these areas to more precisely define the effect of fuel properties on these performance criteria of concern to the Navy. This task will be performed at the Naval Research Laboratory, Washington, D.C.

5.1.2 TASK DESCRIPTION

(a) The contractor shall use available and developing analytical techniques to determine necessary compositional data for the fuels supplied by NRL.

(b) The contractor shall develop and utilize various bench scale measurement devices to measure the laboratory scale data for the fuels of (a) above.

(c) The contractor shall use the information in (a) and (b) to develop useful correlations which may be extendable to engine performance data.

(d) The contractor shall work to develop or improve existing bench scale tests which measure the critical performance properties of flash point, filtration/filterability, coalescence, microbial growth, lubricity, electrostatic charging, and thermal stability.

(e) The contractor shall measure compositional fuel properties which might play a role in governing the performance properties specified in (d) above. The fuels shall be supplied by NRL.

(f) The contractor shall develop composition/prepaid correlations using the data from (d) and (e) above.

5.2.0 FUEL CHEMISTRY IN SUPPORT OF NAVAL AIR ENGINEERING PROGRAMS

5.2.1 BACKGROUND

Chemical and physical property analysis must be provided on a continual basis in support of ongoing Navy air engineering programs which employ test fuels in both intermediate and large scale devices/components. This analysis may involve unique testing or development of alternative analytical and test devices for more routine use. This task will be performed at the Patuxent Naval Air Station, Patuxent, MD.

5.2.2 SCOPE

(a) The contractor shall provide chemical compositional analysis, and property information for experimental and test fuels as supplied by the Naval Research Laboratory (NRL) in support of on-going Naval air engineering programs.

The contractor shall develop new analytical methods and devices to determine the possibility of new correlations between fuel composition and properties.

5.2.3 Reports and Data

The contractor shall provide reports and data as specified in the Contract Data Requirements List (DD Form 1423)(Exhibit E).

TASK 6 – RESEARCH AND DEVELOPMENT OF ANALYTICAL TECHNIQUES USED IN THE COMBUSTION OF FUELS, PROPELLANTS, PYROPHORICS AND EXPLOSIVES

6.1.0 INTRODUCTION

The Naval Research Laboratory (NRL) is responsible for a wide range of research efforts involving the combustion of fuels, propellants, pyrophorics and explosives. Additionally, NRL conducts research in the development of analytical and diagnostic techniques associated with these and other materials, and

analyzes and evaluates their performance. Development of analytical, diagnostic and characterization techniques extends also to chemical species associated with ship and submarine operations, ship wastes and accidental releases, and waste streams generated as a result of military activities. Both intrusive and non-intrusive sensing capabilities are also developed for environmental applications requiring site characterization for biochemicals and other toxic/hazardous materials such as polycyclic aromatic hydrocarbons (PAH' s) and heavy metals in anticipation of required remediation. Under the Arctic Military Environmental Program, NRL develops, evaluates, and deploys technologies to support decommissions, activities of Russian Nuclear Submarines and treating and handling shipboard waste streams.

6.2.0 SCOPE

These research efforts require the expertise of skilled, technically qualified contractor scientists and engineers to carry out these studies. The range of skills required include: laser expertise, optical spectroscopies, mass spectrometry, reaction kinetics and mechanisms, modern instrumental analytical technique development and applications, biological and microbiological analysis capabilities, advanced chemical sensor development, computer modeling and graphics, software development, sophisticated data reduction and analysis, generation of briefings and reports, and hardware design and system engineering experience.

The R&D requirements include tasks that vary considerably in their scope and in the complexity of the deliverable products. However, the tasks are interrelated in that they support the central mission of NRL and must be coordinated with each other.

Specific categories of personnel to perform work shall consist of those direct labor classifications proposed by the contractor which are included in the resultant contract. The required personnel qualifications and level of security clearances to perform individual tasks are defined with each task description.

6.3.0 TASK DESCRIPTIONS

The task areas associated with this procurement are described below. The technical requirements, the source of the materials and equipment required to support the work and the contract deliverables are described for each task.

6.3.1 ANALYSIS AND CONTROL OF AIRBORNE CHEMICALS AND WASTE GENERATED FROM MILITARY ACTIVITIES

6.3.1.1 Background

The Navy R&D community is currently addressing important environmental problems. Among these is the phase-out of chlorofluorocarbons (CFC's) which is currently underway, in accordance with the Montreal Protocol. CFC's, both in the fleet and ashore, are being replaced with "environmentally

friendly" hydrofluorocarbon (HFC) chemicals. This change is of particular importance in the fleet, where refrigeration and atmosphere control equipment are designed to handle relatively inert CFC's, rather than their more reactive HFC replacement chemicals. Changes in submarine operating parameters of the air handling equipment responsible for removing CO, H_2, and hydrocarbons from the atmosphere may affect the ultimate level of hydrocarbons and many other chemicals in the submarine atmosphere. These effects must be understood.

There has long been a need to document and characterize the atmospheric composition, specifically contaminant levels of submarine air. The Naval Research Laboratory is involved in efforts to identify and develop new techniques for characterizing trace submarine atmospheric contaminants, and to use available and new techniques to characterize volatile organic compounds. This effort will provide important baseline information which will be used to characterize the performance of atmosphere control equipment, as well as to serve as the beginning of a Navy database for submarine atmosphere compositions. This database will also contain the associated medical and health issues of interest to the crew.

Techniques and capabilities developed specifically for atmospheric analysis and control in the fleet will have widespread applications ashore and in the civilian community. The use of new refrigerants and replacement chemicals

for halon fire fighting chemicals creates a need to evaluate the interactions of these species with local workplace and community environments and with the atmosphere. Long term, NRL must be concerned with secondary effects associated with these chemicals and their reactive products as ozone depleting substances and as green house gases.

6.3.1.2 Scope

The contractor shall conduct an on-site research program for NRL according to the technical requirements set forth below.

6.3.1.3 Technical Requirements

(1) The contractor, using standard analytical methods and techniques, shall characterize trace organic components from submarine atmospheres. Typical studies involve collecting whole air samples and sampling air over adsorbent materials such as Tenax and Carbotrap. Sampling media employing reactive substrates shall also be used in the characterization of compounds such as aldehydes and ketones. Standard methods for analysis of these samples include thermal desorption/cryogenic trapping combined with gas chromatography and various hybrid mass spectrometry techniques. Other analytical approaches that will be employed include extraction, followed by liquid chromatography analysis

with UV detection, and gas chromatography with flame ionization detection. The contractor shall make modifications to these techniques and shall develop new techniques where necessary. Commercial instrumentation will be provided by the Government or acquired by the contractor for the government as directed by the COR. The contractor shall evaluate analytical protocols and techniques for accuracy, precision, applicability and performance over time. These techniques will be used to characterize submarine air samples for the CFC replacement program, and will also be employed in the characterization of other materials and processes related to submarine atmosphere control, as necessary.

(2) The contractor shall investigate and develop new technologies that will be used in obtaining information about trace organic levels of airborne chemicals aboard submarines. These technologies will require remote auto-sampling devices for collecting air samples using adsorbent materials, passive sampling devices such as badges, and solid-phase extraction materials. Such sampling technologies will be employed in analyses based on gas chromatography/mass spectrometry. Additional sensors based on spectroscopic and electrochemical techniques shall be developed, if required.

(3) The contractor shall analyze the results of atmospheric chemical measurements made on operational submarines. This information shall be used to create a database of background submarine atmospheric chemical components. This information can be used for evaluation of atmospheres

following accidents and unexpected events on board. Additionally, this information will be used, in conjunction with Naval medical programs to evaluate health effects. The contractor shall compile and analyze data, prepare reports and briefings on results, as required. As directed by the COR, the contractor shall organize and support meetings, workshops and conferences to disseminate this information. These meetings shall be conducted by Government personnel.

(4) The contractor shall perform gas phase chemical reaction studies to determine the environmental impact of the use of replacement refrigerants and their reactive products on machinery, instrumentation, electronics and personnel in ship and submarine environments. New fire fighting chemicals, to replace halons, will be qualified in the near future. Their fire suppression efficiency, relatively low toxicity and benign affect on the atmosphere must be documented. However, NRL will very likely have little detailed knowledge about their fire suppression chemistry, and their interaction with electronic equipment, machinery or submarine life support equipment. As directed, the contractor shall undertake laboratory chemical studies to investigate these issues. Gas phase and controlled combustion studies shall be conducted to determine the reaction products and their production mechanisms of replacement fire fighting chemicals as they interact with combustion systems, including both developed fires, smoldering combustion and fires being extinguished by suppression agents.

(5) The contractor shall support the development, evaluation or deployment of technologies to address waste streams generated from military activities, including low level radioactive solid waste resulting from the decommissioning of Russian nuclear submarines and oily gray and black water waste from military vessels.

(6) Techniques and technologies developed in this effort will be tested at field sites, including aboard ships and submarines, as specified by the COR to evaluate their performance. The contractor shall design test protocols, support field studies, evaluate results and draft reports describing performance.

6.3.1.4 Work Site

Major portions of this task will be performed on site, using NRL facilities on a non-interfering basis. Additional facilities needed to support the effort will be provided either by the contractor or the government at the discretion of the COR, subject to the conditions and scope of the contract. It may be necessary to conduct studies on board underway submarines. Contractor staff must be qualified, in accordance with Personnel Qualifications, Attachment (3), to conduct these studies.

6.3.1.5 Deliverables

The contractor shall provide a monthly status of funds report, periodic progress reports (quarterly, or as required by the COR) and a final report upon completion of this task as described in DD Form 1423, (Exhibit "F"). Prototype equipment, if developed as part of this task, will be a deliverable. Any developed prototype equipment will be provided with full documentation, including, manuals, hardware and drawings, schematics and documented software as such is developed. (The level of drawings, schematics, etc. will be specified by the COR on a case by case basis). Detailed test procedures associated with analytical tests, documented analytical protocols, and test procedures, as specified by the COR, are deliverables.

6.3.1.6 Security Requirements

As this effort may require contractor personnel to have access to shipboard environments, as well as classified information pertaining to shipboard systems and engineering, the security classification for this task shall be at the SECRET level.

6.3.2 CHEMICAL ANALYSIS AND CHEMICAL SENSOR DEVELOPMENT

6.3.2.1 Background

Naval vessels are facing ever-increasing restrictions to operations at sea, in shallow water environments, and even at dock. Control of both solid and liquid

wastes are subject to a myriad of complex, and often conflicting, requirements. The holding capacity of tanks for both gray and black water wastes are inadequate for legal operation in many scenarios and technologies are not available for timely volume reduction of these wastes. New techniques are required for treating both solid and liquid wastes onboard the surface fleet to allow unrestricted operation and access to all friendly ports. An immediate requirement is the ability to analyze the contents of the liquid waste streams (gray water, black water and bilge water) in the field. The Naval Research Laboratory is involved in efforts to develop new sensors and portable instrumentation that will be useful in the analysis of waste water streams from Navy ships. This involves monitors based on conventional instrumentation such as mass spectrometers, as well as emerging techniques such as sensor array technologies based on surface acoustic wave and other chemical sensor devices. Conventional analytical techniques are also used to characterize these waste streams so that new sensor systems can be compared with approved protocols.

The Naval Research Laboratory is also involved in efforts directed toward the characterization of effluents from new solid waste disposal technologies. For example, the disposal of waste using plasma arc thermal destruction techniques is an emerging technology of interest to the Navy. An understanding of the trace organic compounds present in the effluent stream of such a reactor is critical to the eventual application of such technologies. Standard air sampling and

analysis techniques, sensors and instrument-based monitors all can play a role in the characterization of such effluent streams. Such techniques can also be useful to characterize effluents from a variety of processes, including pollution and atmosphere control equipment.

6.3.2.2 Scope

The contractor shall conduct an on-site research program for NRL according to the technical requirements set forth below.

6.3.2.3 Technical Requirements

The contractor shall conduct a laboratory research program primarily on-site at NRL and provide specified analytical expertise, including but not limited to:

(1) The contractor shall employ standard techniques and modifications of standard techniques to characterize water from shipboard waste streams. These techniques include purge and trap/gas chromatography analysis. Other methods, including solid phase extraction and solid phase microextraction, will be investigated. The precision, accuracy and long-term reliability of these techniques must be considered. After suitable development and evaluation, these techniques will be employed in the characterization of unknown samples.

This data will be used for comparison with data obtained from other types of sensors.

(2) The contractor shall explore and develop new technologies to be used in the characterization of water from shipboard waste streams. These techniques will ultimately form the basis of potential shipboard monitors for waste water streams and will include membrane introduction mass spectrometry, sensor arrays based on surface acoustic wave devices or electrochemical cells, and immunoassay techniques. Investigations of the precision, accuracy and long-term reliability will be used to compare these portable sensors to the results from more conventional techniques.

(3) The contractor shall evaluate available technologies and develop new sensors and monitoring capabilities suitable for monitoring effluents from shipboard solid waste treatment facilities. Techniques currently under development include bioreactors, supercritical reactors, and arc and plasma assisted solid waste combustors. These treatment processes produce a range of liquid, solid and gas phase waste effluents. Process control monitors and effluent and stack monitors are required for solid waste reactor systems. The contractor shall use standard air sampling and analysis methodology to characterize trace atmospheric constituents in the effluents of these reactors. Sampling and analysis methodologies include the collection of whole air and adsorbent tube samples followed by thermal desorption/gas chromatography/mass spectrometry

for the characterization of trace atmospheric constituents. Methods will also be employed for the characterization of semi-volatile components such as polycyclic aromatic hydrocarbons (PAH' s). These methods include the collection of large volume samples over filter and collection media, followed by extraction and analysis by gas chromatography, liquid chromatography and gas chromatography/mass spectrometry.

(4) Techniques developed in this effort will be tested at field sites, including aboard ships and submarines, as specified by the Government to evaluate their performance. The contractor shall design and support field test protocols. The contractor shall compile and analyze data, prepare reports and briefings on results, as directed. As required, the contractor shall organize and provide support for meetings, workshops and conferences to disseminate this information. These meetings shall be conducted by Government personnel.

(5) The contractor shall evaluate and use available sampling and analysis capabilities to characterize solid, liquid and gas samples from sites of Navy environmental interest. These analyses will include methods based on standard EPA protocols for the analysis of water, solid waste and air. The methods used will principally employ gas chromatography with flame ionization and electron capture detection, gas chromatography/mass spectrometry and liquid chromatography. Samples may include soil, sediment and water samples from environmental sites of interest. Principal targets of analysis include volatile and

semi-volatile organic compounds including benzene, toluene, ethyl-benzene and xylene (BTEX' s) and PAH'S.

6.3.2.4 Work Site

Major portions of this task will be performed on site at NRL using NRL facilities on a non-interfering basis. Additional facilities needed to support the effort will be provided either by the contractor or the government at the discretion of the COR, subject to the conditions and scope of the contract.

6.3.2.5 Deliverables

The contractor shall provide a monthly status of funds report, periodic progress reports (quarterly, or as required by the COR) and a final report upon completion of this task in accordance with the Contract Data Requirements List, (DD Form 1423) (Exhibit F). Prototype equipment, if developed as part of this task, will be a deliverable. Any developed prototype equipment will be provided with full documentation, including, manuals, hardware and drawings, schematics and documented software as such are developed. (The level of drawings, schematics, etc. will be specified by the COR on a case by case basis). Detailed test procedures associated with analytical tests, documented analytical protocols, and test procedures, as specified by the COR, are deliverables.

6.3.2.6 Security Requirements

As this effort may require contractor personnel to have access to shipboard environments, as well as classified information pertaining to shipboard systems and engineering, the security classification for this task shall be at the SECRET level.

6.3.3 SITE CHARACTERIZATION AND REMEDIATION OF CONTAMINATED SOILS, GROUNDWATER AND RIVER SEDIMENTS

6.3.3.1 Background

Soils and Groundwater. The scope and magnitude of groundwater contamination by fossil fuels (i.e., gasoline, jet fuel, diesel fuel, and creosote) and chlorinated solvents (i.e.,Trichloroethylene (TCE)) is large. Given the potential adverse effects on the environment and human health associated with this contamination, remedial actions are being required at an ever-increasing number of sites. However, to use conventional remediation technologies to achieve current cleanup goals for known DOD and DOE sites has been estimated to cost between $750 billion and $1.5 trillion US dollars. Since these resources do not exist, there is a dire need to transition innovative, cost-saving remediation technologies to the conventional category. To do this in a responsible manner will require rigorous evaluation of multiple applications, with in situ bioremediation representing one such innovative technology. In situ bioremediation applications are being recommended out of practical and economic necessity. Effective use of these technologies has frequently been calculated to cost less than 10% of the more conventional approaches such as pump-and-treat.

Despite this potential for huge cost savings, the wide-scale use of in situ bioremediation systems has been limited by a general uncertainty or skepticism of the technology's true performance. In many cases, such skepticism is understandable and justified because there is a dearth of scientifically valid field demonstrations of the technology's efficacy. The absence of well-documented examples of successful in situ bioremediation projects limits the use of this technology.

Sediments. Industrial, military and urban activities have impacted both marine and freshwater sediments. Contaminant inputs of untreated sewage from combined sewer outfalls, surface runoff from agricultural areas and storm drains, and the groundwater seepage of chemical contaminants have all contributed to deterioration of the watershed. These anthropogenic inputs have affected the ecology of rivers by reducing biological diversity, reducing oxygen levels, and diminishing natural resources. The Naval Research Laboratory is involved in efforts to determine point and non-point sources of contamination, measure impact of contaminants to the river ecosystem and develop strategies to manage watershed restoration.

Ecosystem dynamics involve complex transfer and cycling of metabolites though various levels of the food chain. The contaminant degradation rate is controlled by the many environmental factors that influence natural carbon and nutrient fluxes through natural microbial assemblages. Typical site investigations

focus on parent compound surveys and flask biotreatability studies and fail to determine factors that control contaminant cycling as an integrated component of an ecosystem and thus, subsequent metabolism as an integrated component of an ecosystem. As a result, subsequent remediation strategies often do not achieve cleanup goals and can even lead to unintended or adverse environmental consequences. Ecosystem level analyses of contaminant flux and transport will greatly lessen the chance that an unnecessary, or even counterproductive, remedial action will be undertaken. This approach provides a foundation to allow modeling of interactions within and between impacted ecosystems so that sampling variability is minimized.

6.3.3.2 Scope

The contractor shall conduct research and development for NRL according to the technical requirements set forth below:

6.3.3.3 Technical Requirements

The contractor shall conduct a research and development program and provide specified R&D support, including but not limited to the areas associated with this task as enumerated below. The majority of the effort will be accomplished in the field sites and at NRL facilities, as directed by the COR.

Access to field sites may require appropriate training, personal protective gear, and HAZWOPR certification.

(1) The contractor, at the direction of the COR, shall develop protocols for sampling and characterization of organic and inorganic contaminants in sediment, groundwater, and surface soil samples from a variety of field sites using standard methods and techniques. Contaminants include hydrocarbons, PAHS, chlorinated solvents, and heavy metals.

(2) The contractor shall conduct groundwater assessments, including measurements of ground water flow, contaminant movement and contaminant degradation. Groundwater conductivity measurements shall be carried out using standard geoprobe techniques.

(3) The contractor shall assist in river studies that characterize sedimentation rates contaminant transport, and chemical risk assessment.

(4) The contractor shall investigate and develop new techniques for assessing intrinsic bioremediation and engineering-enhanced bioremediation in terrestrial and aquatic waters and sediments. The contractor shall implement these techniques in field studies, as directed by the COR. The data generated in field studies by the contractor shall be shared with and integrated into a coordinated research effort between NRL employees, academia and other

contractors. Proprietary techniques developed in the task are protected as set forth in other clauses in the contract.

(5) The use of innovating and emerging technologies to manage shipboard and decommission waste shall be employed where appropriate and directed by the COR. The contractor shall participate in the Arctic Military Environmental Cooperation (AMEC) for implementing and evaluating innovative and emerging technologies. These include technologies involving oil water separators, filtration and monitoring systems, and solid waste volume reduction.

(6) The contractor shall organize meetings, workshops and conferences in support of the Arctic Military Environmental Cooperation (AMEC) program and other related projects at the NRL, as directed by the COR. These meetings will be conducted by Government personnel.

6.3.3.4 Work Site

The major portion of this task will be performed at field sites and NRL facilities. Certain materials and components will be supplied by the Government. Tests, demonstrations and surveys, as directed by the COR, will be carried out at government sites, federal and industrial facilities.

6.3.3.5 Deliverables

The contractor shall provide a monthly status of funds report, bi-annual technical reports, periodic written progress reports (as required by the COR), oral briefings and progress reports (as requested by the contractor or COR), and a final report describing the site characterization and technology demonstrations at the completion of the Task in accordance with the Contract Data Requirements List, (DD Form 1423)(Exhibit F).

6.3.3.6 Security Requirements

No classified areas or access to classified information is anticipated for this task. The security classification for this task shall be at the UNCLASSIFIED level.

6.4 REPORTS AND DATA

Reports and Data as mentioned in the above task descriptions shall be provided as well as any items that are required in the Contract Data Requirements List (DD Form 1423)(Exhibit F).

TASK 7 -- DEVELOPMENT AND EVALUATION OF NEW ANALYTICAL TECHNOLOGIES

7.0 Introduction

The Materials Chemistry Branch has an interest in advanced analytical methods for assessing materials of interest to the Navy and the US Government. The Branch has pioneered magnetic resonance methods for NMR (Nuclear Magnetic

Resonance), imaging of solid materials and for examining materials outside the NMR coil and outside the NMR magnet. Other novel analytical techniques include the use of xenon, proton, and carbon-13 solid state NMR for assessing miscibility and morphology of polymers and polymer blends.

7.1 SCOPE

The contractor shall:

(a) Develop magnetic resonance techniques for the study and evaluation of materials that may be useful in Naval and DOD applications.

(b) Collaborate with NRL and outside researchers in the study and characterization of materials of interest.

(c) Communicate with sponsors and with the scientific community through oral presentations and publications.

7.2 REPORTS AND DATA

The Contractor shall prepare reports and data in accordance with the Contract Data Requirements List, (DD Form 1423), (Exhibit G).

TASK 8 – COMPUTER HARDWARE AND SOFTWARE SUPPORT

8.1.0 INTRODUCTION

This task provides hardware and software support to the Chemistry Division technical and administrative staff for data management and other purposes. The Contractor shall provide the personnel, materials,

equipment and facilities (except those furnished by the Government) necessary to accomplish the following tasks:

8.2 Local Area Network Support

The Contractor shall install and maintain Local Area Networks (LANs) in support of data acquisition, data analysis, and database management within the Chemistry Division.

8.3 Software Development and Support

The Contractor shall develop, install and maintain scientific and database software in support of the operations within the Chemistry Division.

8.4 On Call Support

The Contractor shall maintain and provide "on-call" support to the computer and network equipment of both technical and administrative personnel within the Chemistry Division as necessary.
Such "on call" services shall be coordinated with the NRL COR.

8.5 Backup Support

The Contractor shall provide specialized backup support to address highly specialized hardware and software requirements.

8.6 Reports and Data

The Contractor shall provide monthly reports of costs and hours of support as indicated in the Contract Data Requirements List (DD

Form 1423)(Exhibit H). This report shall indicate to which Chemistry Division Branch/Section or administrative unit support was provided.

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO. 0002
B. EXHIBIT A
C. CATEGORY: TDP ____ TM-____ OTHER F

D. SYSTEM / ITEM
E. CONTRACT / PR NO. N00173-
F. CONTRACTOR

1. DATA ITEM NO. A001
2. TITLE OF DATA ITEM Contractor On-Site Labor Report
3. SUBTITLE

17. PRICE GROUP

18. ESTIMATED

4. AUTHORITY *(Data Acquisition Document No.)* N/A
5. CONTRACT REFERENCE SOW, Para. 1.6
6. REQUIRING OFFICE NRL Code 6180

7. DD 250 REQ LT
9. DIST STATEMENT REQUIRED N/A
10. FREQUENCY MNTLY
12. DATE OF FIRST SUBMISSION 30 DAC
8. APP CODE N/A
11. AS OF DATE
13. DATE OF SUBSEQUENT SUBMISSION

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
COR	0	1	0
AO CODE 6102		1	0
15. TOTAL →			

16. REMARKS

The Contractor shall deliver the On-Site Labor Report no later than ten (10) days after the end of each reporting month. The report must include as a minimum the following data:

Reporting Period:
Contract Number (and Order Number, if applicable):
Contract Value:
Current Funding:
Amount Expended in Current Period:
Total Expended to Date:
Date Submitted:

Labor (including subcontractors) - Show employee name, number of hours, and total amount billed for contractor employees working on-site at NRL. If the contractor employees worked on multiple tasks (as defined by the COR), the numbers of hours worked on each task must be shown separately.

The breakout of these expenditures shall include both Task I as a whole, and a separate breakout for each of the subtasks, (i.e combustion and modeling, halon replacement, etc.)

In addition, the contractor shall itemize outstanding obligations/committments as well as the projected expenditure rate. The total expended to date shall be broken down by fiscal year.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

CONTRACT DATA REQUIREMENTS LIST

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0002	A	TDP _____ TM _____ OTHER _____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
Fire Research		

1. DATA ITEM NO. A002

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A002	Technical Reports	

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para. 1.6	NRL, Code 6180

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		QRTLY	105 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		90 DAC	ea. 90 days thereafter

16. REMARKS
The Contractor shall submit a report of technical accomplishments during the previous quarter.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
NRL Code 6180		1	
15. TOTAL →		1	

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

1. DATA ITEM NO. A003

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A003	Annual Reports	

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para 1.6	NRL, Code 6180

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		ANNLY	395 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		365 DAC	each year thereafter

16. REMARKS
The Contractor shall submit a brief report of technical accomplishments during the previous year.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
NRL Code 6180		1	
15. TOTAL →		1	

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

1. DATA ITEM NO. A004

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A004	Final Report	

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para 1.6	NRL, Code 6180

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		1TIME	1885 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		1825 DAC	N/A

16. REMARKS
The Contractor shall submit a brief report of technical accomplishments over the life of the contract.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
NRL Code 6180		1	
15. TOTAL →		1	

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

1. DATA ITEM NO.

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**

16. REMARKS

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
15. TOTAL →			

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0004	B	TDP _____ TM _____ OTHER F

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
Service Life of the Fleet		

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
B001	Contractor On-Site Labor Report	

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
N/A	SOW, Para. 2.3	NRL CODE 6130

7. DD 250 REQ	8. APP CODE	9. DIST STATEMENT REQUIRED	10. FREQUENCY	11. AS OF DATE	12. DATE OF FIRST SUBMISSION	13. DATE OF SUBSEQUENT SUBMISSION
LT	N/A	N/A	MNTLY		30 DAC	

14. DISTRIBUTION			
a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
COR	0	1	0
AO CODE 6102		1	0
15. TOTAL →			

16. REMARKS

The Contractor shall deliver the On-Site Labor Report no later than ten (10) days after the end of each reporting month. The report must include as a minimum the following data:

Reporting Period:
Contract Number (and Order Number, if applicable):
Contract Value:
Current Funding:
Amount Expended in Current Period:
Total Expended to Date:
Date Submitted:

Labor (including subcontractors) - Show employee name, number of hours, and total amount billed for contractor employees working on-site at NRL. If the contractor employees worked on multiple tasks (as defined by the COR), the numbers of hours worked on each task must be shown separately.

In addition, the contractor should itemize outstanding obligations/committments, as well as the projected expenditure rate.

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

CONTRACT DATA REQUIREMENTS LIST

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0004	B	TDP _____ TM- _____ OTHER _____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
Service Life of the Fleet		

1. DATA ITEM NO. B002 — 2. TITLE OF DATA ITEM: Quarterly Progress Report — 3. SUBTITLE

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Paragraph 2.3	NRL Code 6130

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		QRTLY	105 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		90 DAC	ea. 90 days thereafter

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
NRL Code 6130		1	
15. TOTAL →		1	

16. REMARKS

Summary of accomplishments, including project trips, conference attendance, problems, solutions, and plans for the next period. Significant findings shall be documented.

1. DATA ITEM NO. B003 — 2. TITLE OF DATA ITEM: Special Progress Reports — 3. SUBTITLE

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Paaragraph 2.3	NRL Code 6130

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		ASREQ	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A			

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
NRL Code 6130		1	
15. TOTAL →		1	

16. REMARKS

Report covers completion of significant portions of the task for use as a publication or as a report to a sponsor, as well as letter reports. (ref. SOW Tasks 2.2.3.2 through 2.2.3.6 and 2.2.3.29 and 2.2.3.30)

1. DATA ITEM NO. B004 — 2. TITLE OF DATA ITEM: Computer Program/Prototype System Documentation — 3. SUBTITLE

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Paragraph 2.3	NRL Code 6130

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		ASREQ	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A			

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
NRL Code 6130	1	2	
15. TOTAL →	1	2	

16. REMARKS

Report covering purpose, instructions for use and program listings for each computer program/system (and updates) or application written under the contract, and a program flow chart, system drawings, parts listing and maintenance req.

1. DATA ITEM NO. B005 — 2. TITLE OF DATA ITEM: Trip Report — 3. SUBTITLE

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para 2.3	NRL Code 6130

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		ASREQ	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A			

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
NRL Code 6130		2	
15. TOTAL →		2	

16. REMARKS

A short report showing who went where, why, what happened, and what actions are pending. Only one report per trip for all travelers concerned.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO. 0004

B. EXHIBIT B

C. CATEGORY: TDP ______ TM ______ OTHER ______

D. SYSTEM / ITEM Service Life of the Fleet

E. CONTRACT / PR NO.

F. CONTRACTOR

1. DATA ITEM NO. B006

2. TITLE OF DATA ITEM Final Report

3. SUBTITLE

17. PRICE GROUP

18. ESTIMATED

4. AUTHORITY *(Data Acquisition Document No.)*

5. CONTRACT REFERENCE SOW, Para 2.3

6. REQUIRING OFFICE NRL, Code 6130

7. DD 250 REQ DD

8. APP CODE N/A

9. DIST STATEMENT REQUIRED

10. FREQUENCY 1TIME

11. AS OF DATE 1825 DAC

12. DATE OF FIRST SUBMISSION 1885 DAC

13. DATE OF SUBSEQUENT SUBMISSION N/A

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
NRL Code 6130	1	1	
NRL Library		2	
DTIC		3	
15. TOTAL →	1	6	

16. REMARKS

G. PREPARED BY

H. DATE

I. APPROVED BY

J. DATE

DD Form 1423-1, JUN 90 *Previous editions are obsolete.* Page ______ of ______ Pages

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CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO. 0006
B. EXHIBIT C
C. CATEGORY: TDP ______ TM - ______ OTHER F

D. SYSTEM / ITEM
E. CONTRACT / PR NO.
F. CONTRACTOR

1. DATA ITEM NO. C001
2. TITLE OF DATA ITEM Contractor On-Site Labor Report
3. SUBTITLE

17. PRICE GROUP

18. ESTIMATED

4. AUTHORITY *(Data Acquisition Document No.)* N/A
5. CONTRACT REFERENCE SOW, Para.3.3.5
6. REQUIRING OFFICE NRL CODE 6120

7. DD 250 REQ LT
9. DIST STATEMENT REQUIRED N/A
10. FREQUENCY MNTLY
12. DATE OF FIRST SUBMISSION 30 DAC
8. APP CODE N/A
11. AS OF DATE
13. DATE OF SUBSEQUENT SUBMISSION

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
COR	0	1	0
AO CODE 6102		1	0
15. TOTAL →			

16. REMARKS

The Contractor shall deliver the On-Site Labor Report no later than five (5) days after the end of each reporting month. The report must include as a minimum the following data:

Reporting Period:
Contract Number (and Order Number, if applicable):
Contract Value:
Current Funding:
Amount Expended in Current Period:
Total Expended to Date:
Date Submitted:

Labor (including subcontractors) - Show employee name, number of hours, and total amount billed for contractor employees working on-site at NRL. If the contractor employees worked on multiple tasks (as defined by the COR), the numbers of hours worked on each task must be shown separately.

In addition, the contractor should itemize outstanding obligations/committments, as well as the projected expenditure rate.

G. PREPARED BY
H. DATE
I. APPROVED BY
J. DATE

CONTRACT DATA REQUIREMENTS LIST

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0006	C	TDP _____ TM- _____ OTHER _____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
Synthesis and Characterization		

Block 1

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
C002	Monthly Status of Funds Report	

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para 3.3.5	NRL, Code 6120

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		MNTHLY	45 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		45 DAC	ea. 30 days thereafter

16. REMARKS

For each task, list employee's name, current hours, hourly rate, current month wage total and cumulative wage total. Itemize travel, material and other expenses. List overhead, G & A and total billings.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
Code 6120	1		
15. TOTAL →	1		

17. PRICE GROUP

18. ESTIMATED

Block 2

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
C003	Monthly Progress Report	

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para 3.3.5	NRL Code 6120

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		MNTHLY	45 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		45 DAC	ea. 30 days thereafter

16. REMARKS

Summary of accomplishments, including project trips, conference attendance, problems, solutions, and plans for next period. Significant findings shall be reported to the COR promptly.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
Code 6120		1	
15. TOTAL →		1	

17. PRICE GROUP

18. ESTIMATED

Block 3

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
C004	Special Progress Reports	

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para 3.3.5	NRL, Code 6120

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		ASREQ	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A			

16. REMARKS

Report covers completion of significant portions of the task for use as a publication or as a report to a sponsor.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
Code 6120	1	2	
15. TOTAL →	1	2	

17. PRICE GROUP

18. ESTIMATED

Block 4

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
C005	Computer Program Documentation	

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para 3.3.5	NRL Code 6120

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		ASREQ	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A			

16. REMARKS

Report covering purpose, instructions for use, and program listings for each computer program (and updates) or application written under the contract.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
Code 6120	1	2	
15. TOTAL →	1	2	

17. PRICE GROUP

18. ESTIMATED

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

CONTRACT DATA REQUIREMENTS LIST
(2 Data Items)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0006	C	TDP _____ TM- _____ OTHER _____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
Synthesis and Characterization		

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
C006	Trip Report		18. ESTIMATED

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para. 3.3.5	NRL Code 6120

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		AS REQ	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A			

16. REMARKS

A short report showing who went where, why, what happened, and what actions are pending. Only one report per trip for all travelers concerned.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
Code 6120		2	
15. TOTAL →		2	

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
C007	Final Report		18. ESTIMATED

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para. 3.3.5	NRL Code 6120

7 DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
DD		0TIME	425 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		425 DAC	N/A

16. REMARKS

To contain technical accomplishments, procedures developed, computer program development, conclusions and recommendations for the annual period of performance.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
NRL Code 6120	1	1	
NRL Library		2	
DTIC		3	
15. TOTAL →	1	6	

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0008	D	TDP _____ TM _____ OTHER F

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
D001	Contractor On-Site Labor Report	

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
N/A	SOW, Para 4.4.0	NRL CODE 6120

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		MNTLY	30 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A	N/A		

16. REMARKS

The Contractor shall deliver the On-Site Labor Report no later than five (5) days after the end of each reporting month. The report must include as a minimum the following data:

Reporting Period:
Contract Number (and Order Number, if applicable):
Contract Value:
Current Funding:
Amount Expended in Current Period:
Total Expended to Date:
Date Submitted:

Labor (including subcontractors) - Show employee name, number of hours, and total amount billed for contractor employees working on-site at NRL. If the contractor employees worked on multiple tasks (as defined by the COR), the numbers of hours worked on each task must be shown separately.

In addition, the contractor should itemize outstanding obligations/cmmittments, as well as the projected expenditure rate.

14. DISTRIBUTION			
a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
15. TOTAL →			

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

17. PRICE GROUP
18. ESTIMATED

CONTRACT DATA REQUIREMENTS LIST

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0008	D	TDP _____ TM- _____ OTHER _____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
Development of New Materials		

Block 1

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
D002	Quarterly Technical Report	

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para. 4.4.0	NRL , CODE 6120

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		QRTLY	105 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		90 DAC	ea. 90 days thereafter

16. REMARKS

The report shall document each specific technical labor effort and achievements by project. The report shall be due not later than 5 days after the end of each quarter. Note - this applies to SOW, Para 4.3.2.1 only

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
COR		1	
15. TOTAL →		1	

17. PRICE GROUP

18. ESTIMATED

Block 2

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
D003	Annual Technical Report and Financial Summary	

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para. 4.4.0	NRL, Code 6120

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		ANNLY	380 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		365 DAC	ea. 365 days thereafter

16. REMARKS

This report shall provide a year end review highlighting major achievements by

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
COR		1	
15. TOTAL →		1	

17. PRICE GROUP

18. ESTIMATED

Block 3

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE

7. DD 250 REQ	9. DIST STATEMENT	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**

16. REMARKS

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
15. TOTAL →			

17. PRICE GROUP

18. ESTIMATED

Block 4

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE

7. DD 250 REQ	9. DIST STATEMENT	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**

16. REMARKS

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
15. TOTAL →			

17. PRICE GROUP

18. ESTIMATED

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO. 0008
B. EXHIBIT E
C. CATEGORY: TDP ______ TM ______ OTHER F

D. SYSTEM / ITEM
E. CONTRACT / PR NO.
F. CONTRACTOR

1. DATA ITEM NO. E001
2. TITLE OF DATA ITEM Contractor On-Site Labor Report
3. SUBTITLE

17. PRICE GROUP

18. ESTIMATED

4. AUTHORITY *(Data Acquisition Document No.)* N/A
5. CONTRACT REFERENCE
6. REQUIRING OFFICE NRL CODE

7. DD 250 REQ LT
8. APP CODE N/A
9. DIST STATEMENT REQUIRED N/A
10. FREQUENCY MNTLY
11. AS OF DATE
12. DATE OF FIRST SUBMISSION 30 DAC
13. DATE OF SUBSEQUENT SUBMISSION

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
CODE 6121	0	1	0
AO CODE 6102		1	0
15. TOTAL →			

16. REMARKS

The Contractor shall deliver the On-Site Labor Report no later than five (5) days after the end of each reporting month. The report must include as a minimum the following data:

Reporting Period:
Contract Number (and Order Number, if applicable):
Contract Value:
Current Funding:
Amount Expended in Current Period:
Total Expended to Date:
Date Submitted:

Labor (including subcontractors) - Show employee name, number of hours, and total amount billed for contractor employees working on-site at NRL. If the contractor employees worked on multiple tasks (as defined by the COR), the numbers of hours worked on each task must be shown separately.

In addition, the contractor should itemize outstanding obligations/committments, as well as the projected expenditure rate.

G. PREPARED BY
H. DATE
I. APPROVED BY
J. DATE

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

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 this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. 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:
0010	E	TDP ____ TM - ____ OTHER F

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
E001	Contractor On-Site Labor Report	

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
N/A		NRL CODE

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		MNTLY	30 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A	N/A		

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
CODE 6121	0	1	0
AO CODE 6102		1	0
15. TOTAL →			

16. REMARKS

The Contractor shall deliver the On-Site Labor Report no later than five (5) days after the end of each reporting month. The report must include as a minimum the following data:

Reporting Period:
Contract Number (and Order Number, if applicable):
Contract Value:
Current Funding:
Amount Expended in Current Period:
Total Expended to Date:
Date Submitted:

Labor (including subcontractors) - Show employee name, number of hours, and total amount billed for contractor employees working on-site at NRL. If the contractor employees worked on multiple tasks (as defined by the COR), the numbers of hours worked on each task must be shown separately.

In addition, the contractor should itemize outstanding obligations/committments, as well as the projected expenditure rate.

17. PRICE GROUP
18. ESTIMATED

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

CONTRACT DATA REQUIREMENTS LIST

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0010	E	TDP _____ TM- _____ OTHER _____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
Study of Propulsion Fuels		

Block 1

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
E002	Financial Status Report		18. ESTIMATED

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para. 5.2.3	NRL Code 6121

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		MTHLY	35 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		35 DAC	ea. 30 days thereafter

16. REMARKS

The contractor should provide a monthly cost report to include all labor expenses, (persons, hours worked, cost), overhead, other direct costs (materials, subcontracts) and G and A. Report should reflect both monthly and cum. amount

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
NRL Code 6102		1	
NRL Code 6121		1	
15. TOTAL →		2	

Block 2

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
E003	Progress/Accomplishment Reports		18. ESTIMATED

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para 5.2.3	NRL , Code 6121

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		QRTLY	100 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		90 DAC	ea. 90 days thereafter

16. REMARKS

The Contractor may be required to provide informal verbal and/or written Technical Progress updates.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
Code 6102		1	
Code 6121		1	
15. TOTAL →		2	

Block 3

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
E004	RAW DATA/SPECIAL PROJECT REPORTS		18. ESTIMATED

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para 5.2.3	NRL Code 6121

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		ASREQ	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A			

16. REMARKS

The Contractor shall submit all Raw Data or reports resulting from research only as required by the COR.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
Code 6121		1	
15. TOTAL →		1	

Block 4

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
E005	Final Technical Report		18. ESTIMATED

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para 5.2.3	

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		0TIME	30 days after completion
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
		contract completion	N/A

16. REMARKS

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
CODE 6121		1	
DTIC		6	
15. TOTAL →		7	

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0012	F	TDP _____ TM _____ OTHER F

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
F001	Contractor On-Site Labor Report	

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
N/A	SOW, Para. 6.3.3.5	NRL CODE 6115

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		MNTLY	30 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A	N/A		

16. REMARKS

The Contractor shall deliver the On-Site Labor Report no later than five (5) days after the end of each reporting month. The report must include as a minimum the following data:

Reporting Period:
Contract Number (and Order Number, if applicable):
Contract Value:
Current Funding:
Amount Expended in Current Period:
Total Expended to Date:
Date Submitted:

Labor (including subcontractors) - Show employee name, number of hours, and total amount billed for contractor employees working on-site at NRL. If the contractor employees worked on multiple tasks (as defined by the COR), the numbers of hours worked on each task must be shown separately.

In addition, the contractor should itemize outstanding obligations/committments, as well as the projected expenditure rate.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
Code 6115	0	1	0
AO CODE 6102		1	0
15. TOTAL →			

17. PRICE GROUP

18. ESTIMATED

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

CONTRACT DATA REQUIREMENTS LIST

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0012	F	TDP _____ TM _____ OTHER _____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
Analytical Techniques - Combustion		

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
F002	Bi-Annual Technical Reports		18. ESTIMATED TOTAL PRICE

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para. 6.3.3.5	NRL Code 6115

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		SEMIA	195 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		180 DAC	ea. 180 days thereafter

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
NRL Code 6115		1	
15. TOTAL →		1	

16. REMARKS
The Contractor shall provide a bi-annual technical report at the end of each 6 months.

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
F003	Periodic Written Progress Reports		18. ESTIMATED TOTAL PRICE

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para. 6.3.3.5	NRL Code 6115

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		ASREQ	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A			

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
NRL Code 6115		1	
15. TOTAL →		1	

16. REMARKS

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
F004	Final Report		18. ESTIMATED TOTAL PRICE

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW, Para. 6.3.3.5	NRL Code 6115

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		1TIME	425 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		425 DAC	N/A

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
NRL Code 6115		1	
DTIC		3	
15. TOTAL →		4	

16. REMARKS

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
			18. ESTIMATED TOTAL PRICE

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
15. TOTAL →			

16. REMARKS

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

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

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
Development of New Technologies	N00173-	

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
G001	Contractor On-Site Labor Report	

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
N/A		NRL CODE

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		MNTLY	30 DAC
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A	N/A		

16. REMARKS

The Contractor shall deliver the On-Site Labor Report no later than five (5) days after the end of each reporting month. The report must include as a minimum the following data:

Reporting Period:
Contract Number (and Order Number, if applicable):
Contract Value:
Current Funding:
Amount Expended in Current Period:
Total Expended to Date:
Date Submitted:

Labor (including subcontractors) - Show employee name, number of hours, and total amount billed for contractor employees working on-site at NRL. If the contractor employees worked on multiple tasks (as defined by the COR), the numbers of hours worked on each task must be shown separately.

In addition, the contractor should itemize outstanding obligations/committments, as well as the projected expenditure rate.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
COR	0	1	0
AO CODE 6102		1	0
15. TOTAL →			

17. PRICE GROUP

18. ESTIMATED

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO. 0014

B. EXHIBIT G

C. CATEGORY: TDP ____ TM ____ OTHER F

D. SYSTEM / ITEM Development of New Technologies

E. CONTRACT / PR NO. N00173-

F. CONTRACTOR

1. DATA ITEM NO. G001

2. TITLE OF DATA ITEM Contractor On-Site Labor Report

3. SUBTITLE

17. PRICE GROUP

18. ESTIMATED

4. AUTHORITY *(Data Acquisition Document No.)* N/A

5. CONTRACT REFERENCE

6. REQUIRING OFFICE NRL CODE 6120

7. DD 250 REQ LT

8. APP CODE N/A

9. DIST STATEMENT REQUIRED N/A

10. FREQUENCY MNTLY

11. AS OF DATE

12. DATE OF FIRST SUBMISSION 30 DAC

13. DATE OF SUBSEQUENT SUBMISSION

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
COR	0	1	0
AO CODE 6102		1	0
15. TOTAL			

16. REMARKS

The Contractor shall deliver the On-Site Labor Report no later than five (5) days after the end of each reporting month. The report must include as a minimum the following data:

Reporting Period:
Contract Number (and Order Number, if applicable):
Contract Value:
Current Funding:
Amount Expended in Current Period:
Total Expended to Date:
Date Submitted:

Labor (including subcontractors) - Show employee name, number of hours, and total amount billed for contractor employees working on-site at NRL. If the contractor employees worked on multiple tasks (as defined by the COR), the numbers of hours worked on each task must be shown separately.

In addition, the contractor should itemize outstanding obligations/committments, as well as the projected expenditure rate.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
0016	H	TDP _____ TM _____ OTHER F

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
H001	Contractor On-Site Labor Report	

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
N/A	SOW, Para. 8.6	NRL CODE 6101

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	N/A	MNTLY	30 DAC

8. APP CODE	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
N/A		

16. REMARKS

The Contractor shall deliver the On-Site Labor Report no later than five (5) days after the end of each reporting month. The report must include as a minimum the following data:

Reporting Period:
Contract Number (and Order Number, if applicable):
Contract Value:
Current Funding:
Amount Expended in Current Period:
Total Expended to Date:
Date Submitted:

Labor (including subcontractors) - Show employee name, number of hours, and total amount billed for contractor employees working on-site at NRL. If the contractor employees worked on multiple tasks (as defined by the COR), the numbers of hours worked on each task must be shown separately.

In addition, the contractor should itemize outstanding obligations/committments, as well as the projected expenditure rate.

This report shall indicate to which Chemistry Division Branch/Section or administrative unit support was provided.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final Reg	Final Repro
COR	0	1	0
AO CODE 6102		1	0
15. TOTAL →			

17. PRICE GROUP	
18. ESTIMATED	

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

DEPARTMENT OF DEFENSE
CONTRACT SECURITY CLASSIFICATION SPECIFICATION

(The requirements of the DoD Industrial Security Manual apply to all security aspects of this effort.)

1. CLEARANCE AND SAFEGUARDING SER: 029-00

a. FACILITY CLEARANCE REQUIRED: SECRET

b. LEVEL OF SAFEGUARDING REQUIRED: NONE

2. THIS SPECIFICATION IS FOR: *(X and complete as applicable)*

	a. PRIME CONTRACT NUMBER		
	b. SUBCONTRACT NUMBER		
X	c. SOLICITATION OR OTHER NUMBER: 61-1446-00	DUE DATE *(YYYYMMDD)*	

3. THIS SPECIFICATION IS: *(X and complete as applicable)*

X	a. ORIGINAL *(Complete date in all cases)*		DATE *(YYYYMMDD)*: 000626
	b. REVISED *(Supersedes all previous specs)*	REVISION NO.	DATE *(YYYYMMDD)*
	c. FINAL *(Complete item 5 in all cases)*		DATE *(YYYYMMDD)*

4. IS THIS A FOLLOW-ON CONTRACT? [ ] YES [X] NO. If Yes, complete the following:

Classified material received or generated _____ *(Preceding Contract Number)* is transferred to this follow-on contract.

5. IS THIS A FINAL DD FORM 254? [ ] YES [X] NO. If Yes, complete the following:

In response to the contractor's request _____, retention of the classified material is authorized for the period of _____

6. CONTRACTOR *(Include Commercial and Government Entity (CAGE) Code)*

a. NAME, ADDRESS, AND ZIP CODE	b. CAGE CODE	c. COGNIZANT SECURITY OFFICE *(Name, Address, and Zip Code)*
FOR RFP PURPOSES ONLY, NOT VALID FOR	ACTUAL CONTRACT AWARD	

7. SUBCONTRACTOR

a. NAME, ADDRESS, AND ZIP CODE	b. CAGE CODE	c. COGNIZANT SECURITY OFFICE *(Name, Address, and Zip Code)*
N/A		N/A

8. ACTUAL PERFORMANCE

a. LOCATION	b. CAGE CODE	c. COGNIZANT SECURITY OFFICE *(Name, Address, and Zip Code)*
N/A		N/A

9. GENERAL IDENTIFICATION OF THIS PROCUREMENT

Research and Development Support for various Branches of the Chemistry Division.

10. CONTRACTOR WILL REQUIRE ACCESS TO:	YES	NO	11. IN PERFORMING THIS CONTRACT, THE CONTRACTOR WILL:	YES	NO
a. COMMUNICATIONS SECURITY (COMSEC) INFORMATION		X	a. HAVE ACCESS TO CLASSIFIED INFORMATION ONLY AT ANOTHER CONTRACTOR'S FACILITY OR A GOVERNMENT ACTIVITY	X	
b. RESTRICTED DATA		X	b. RECEIVE CLASSIFIED DOCUMENTS ONLY		X
c. CRITICAL NUCLEAR WEAPON DESIGN INFORMATION		X	c. RECEIVE AND GENERATE CLASSIFIED MATERIAL		X
d. FORMERLY RESTRICTED DATA		X	d. FABRICATE, MODIFY, OR STORE CLASSIFIED HARDWARE		X
e. INTELLIGENCE INFORMATION			e. PERFORM SERVICES ONLY		X
(1) Sensitive Compartmented Information (SCI)		X	f. HAVE ACCESS TO U.S. CLASSIFIED INFORMATION OUTSIDE THE U.S., PUERTO RICO, U.S. POSSESSIONS AND TRUST TERRITORIES		X
(2) Non-SCI		X	g. BE AUTHORIZED TO USE THE SERVICES OF DEFENSE TECHNICAL INFORMATION CENTER (DTIC) OR OTHER SECONDARY DISTRIBUTION CENTER		X
f. SPECIAL ACCESS INFORMATION		X	h. REQUIRE A COMSEC ACCOUNT		X
g. NATO INFORMATION		X	i. HAVE TEMPEST REQUIREMENTS		X
h. FOREIGN GOVERNMENT INFORMATION		X	j. HAVE OPERATIONS SECURITY (OPSEC) REQUIREMENTS		X
i. LIMITED DISSEMINATION INFORMATION		X	k. BE AUTHORIZED TO USE THE DEFENSE COURIER SERVICE		X
j. FOR OFFICIAL USE ONLY INFORMATION		X	l. OTHER *(Specify)*		
k. OTHER *(Specify)*					

12. PUBLIC RELEASE. Any information *(classified or unclassified)* pertaining to this contract shall not be released for public dissemination except as provided by the Industrial Security Manual or unless it has been approved for public release by appropriate U.S. Government authority. Proposed public releases shall

[ ] Direct [X] Through *(Specify)*

Commanding Officer, Naval Research Laboratory, Washington, DC 20375-5320, Code 6101.

to the Directorate for Freedom of Information and Security Review, Office of the Assistant Secretary of Defense (Public Affairs)* for review.
*In the case of non-DoD User Agencies, requests for disclosure shall be submitted to that agency.

13. SECURITY GUIDANCE. The security classification guidance needed for this classified effort is identified below. If any difficulty is encountered in applying this guidance or if any other contributing factor indicates a need for changes in this guidance, the contractor is authorized and encouraged to provide recommended changes; to challenge the guidance or the classification assigned to any information or material furnished or generated under this contract; and to submit any questions for interpretation of this guidance to the official identified below. Pending final decision, the information involved shall be handled and protected at the highest level of classification assigned or recommended. *(Fill in as appropriate for the classified effort. Attach, or forward under*

Access to classified information is not required for the purpose of submitting a bid/proposal for this statement work. However, prior to award of contract, the successful contractor will be required to have a SECRET facility clearance, and personnel available with DoD granted personnel security clearances commensurate with level of access required for performance of contract.

14. ADDITIONAL SECURITY REQUIREMENTS. Requirements, in addition to ISM requirements, are established for this contract. [ ] Yes [X] No
(If Yes, identify the pertinent contractual clauses in the contract document itself, or provide an appropriate statement which identifies the additional requirements. Provide a copy of the requirements to the cognizant security office. Use Item 13 if additional space is needed.)

15. INSPECTIONS. Elements of this contract are outside the inspection responsibility of the cognizant security office. [ ] Yes [X] No
(If Yes, explain and identify specific areas or elements carved out and the activity responsible for inspections. Use Item 13 if additional space is needed.)

16. CERTIFICATION AND SIGNATURE. Security requirements stated herein are complete and adequate for safeguarding the classified information to be released or generated under this classified effort. All questions shall be referred to the official named below.

a. TYPED NAME OF CERTIFYING OFFICIAL	b. TITLE	c. TELEPHONE *(Include Area Code)*
TINA SMALLWOOD	Contracting Officer, Security	202-767-2240/2521

d. ADDRESS *(Include Zip Code)*
Naval Research Laboratory
4555 Overlook Ave., SW
Washington, DC 20375-5320

e. SIGNATURE
Tina Smallwood

17. REQUIRED DISTRIBUTION

X	a. CONTRACTOR
	b. SUBCONTRACTOR
X	c. COGNIZANT SECURITY OFFICE FOR PRIME AND SUBCONTRACTOR
	d. U.S. ACTIVITY RESPONSIBLE FOR OVERSEAS SECURITY ADMINISTRATION
	e. ADMINISTRATIVE CONTRACTING OFFICER
X	f. OTHERS AS NECESSARY 1221.11,6101,6102

DD FORM 254 (BACK), DEC 1999

Personnel Qualifications

Proposals will be evaluated to determine if proposed personnel meet the experience requirements stated below. The proposed employee's background, pertinent experience, and the length of time each will be working on the project will be considered. Other considerations include the education level, experience (both general and project related) and the availability of sufficient key project professional and technical contractor personnel. The minimum qualifications for the desired personnel mix are as stated below:

Task 1

***Senior Fire Protection Engineer**

Masters degree and extensive experience in designing and executing a fire protection research, test and evaluation program. This individual will serve as the Field Test Program Director.

***Fire Protection Engineer**

Masters degree and experience in designing and executing a fire protection research test and evaluation program. This individual will serve as the Associate Field Test Program Director

***Senior Analytical Chemist**

Masters degree and extensive experience in managing instrumentation applications. This will include large scale fire test sampling and instrument setup and troubleshooting. This will include GC, thermocouples, gas sampling, FTIR, and droplet sizing. This individual will serve as the Instrumentation Director.

Analytical Chemist

Bachelor's degree with significant experience with gas sampling and GC's.

Scientist/Engineer

Bachelor's degree with hands-on experience in conducting field tests.

Human Resources Specialist

Skill in evaluating part time and intermittent personnel.

Engineer

Must have a baccalaureate degree.

Business Assistant

Must have a BS in Business Administration.

Mechanic

Must have a High School Diploma.

Labor Support

No specific personnel requirements are required.

Task 2

***Senior Engineer – Corrosion Control System, Cathodic Protection**

BS degree in Engineering and a minimum of 10 yrs experience with extensive knowledge of materials selection. The individual should also have experience with the design, installation and troubleshooting of corrosion control systems, such as cathodic protection, with direct experience in developing/constructing equipment/procedures necessary to evaluate materials for U.S. Navy applications; developing specifications and standard operating procedures for corrosion control; designing corrosion control systems; and establishing procedures for supervising the installation and testing of completed corrosion control systems and evaluating and selecting materials for corrosion control purposes.

***Senior Engineer – Corrosion**

Ph.D. or a M.S. in Engineering and two or more years of experience in research related to corrosion and corrosion inhibitors of steel and other metal based materials. The individual should have direct research experience in crevice corrosion, as well as in experimental design and analysis, engineering to develop prototypes of specialty instruments and engineered systems and modeling and engineering of mechanical, thermal, chemical and electrochemical systems. This experience should include experience with software development for modeling, computerized instrumentation and control, and electronics and cabling design for field-ruggedized technologies.

***Senior Scientist - Environmental Effects**

BS in Biology with at least ten years of experience related to the effects of antifouling systems and technologies on aquatic flora and fauna. The individual should have broad technical experience with the evaluation of current and novel shipboard seawater system antifouling technologies, including the evaluation of ship system sensing methodologies and marine pollution control devices (MPCD). The individual should also have direct experience in the development and conduct of aquatic bioassay protocols, including whole effluent toxicity (WET) testing based on Navy requirements for compliance with EPA and state environmental aquatic discharge criteria. Recent experience in the development and shipboard testing of seawater system antifouling devices for use aboard Navy ships is also desired.

Senior Scientist – Corrosion/Cathodic Protection

MS with at least ten years of experience in corrosion and cathodic protection as it relates to the Statement of Work, Section 2.2.1. The individual should have extensive understanding of the theories and technologies, past and present, related to corrosion, as well as an extensive understanding of the types of research and evaluations required by the Statement of Work in the areas of corrosion and cathodic protection.

Senior Scientist/Engineer – Coating/Corrosion

MS or a BS in Engineering with at least ten years of experience in coating and corrosion research and technology. The individual should have direct experience in U.S. Navy piping and deck coatings, as well as related experience in the development of laboratory techniques for the evaluation of coating properties and test facilities for the evaluation of coatings.

Senior Scientist/Engineer – Prototype/System Design

BS in Engineering or relevant technical discipline with at least five years experience in related prototype/system design, development, and fielding directly related to areas outlined in the Statement of Work.

***Engineer – Materials**

BS in Materials Engineering with at least 2 years of practical experience with extensive knowledge in metallurgical examination, material uses, mechanical design and applications, electronics, as well as working knowledge of naval operations and procedures, with a direct understanding of corrosion principles and prevention practices. The individual should have direct experience in corrosion research, as well as familiarity with at least some of the following analytical techniques/instrumentation:

- Scanning Electron Microscopy.

- Energy Dispersive Spectroscopy.
- Wavelength Dispersive Spectroscopy.
- Scanning Tunneling Microscopy.
- Instron & MTS tensile and fatigue testers.
- Metallurgical image analysis equipment.
- NDT equipment, ultrasonic, eddy current, etc.
- Data loggers, such as Fluke, Hewlard Packard, Veriteq.
- Metallurgical test equipment

Engineer – Mechanical

BS in Mechanical Engineering with a minimum of 3 years practical experience in engineering design and evaluation, including direct experience in the development/evaluation of surface preparation tools and processes. The individual should also have direct experience in defining improved hand tools for Navy-wide, shipboard corrosion control maintenance, designing new components of prototype Non-Destructive Examination (NDE) equipment, and in developing a relational database, assessable via the internet, for data/information storage and analysis.

Engineer/Scientist – General

BS in engineering or scientific/technical discipline and at least one year of direct experience in performing research and/or engineering in corrosion, coating, biofouling control, prototype development efforts relevant to the Statement of Work.

Laboratory Technician

An associate degree in a scientific/technical discipline or equivalent training with at least two years of direct experience in making measurements, conducting tests, or carrying out procedures relevant to the Statement of Work.

Task 3

***Senior Research Physical Scientist/Engineer**

BS or equivalent experience in engineering or a physical science. Must have a minimum of five years of directly related experience. Must have a record of publications and a demonstrated ability to communicate results of research to the scientific community by means of publications and presentations or by internal reports. Must have demonstrated broad capabilities and accomplishments in materials science, chemistry, and/or engineering. Must have capability for independent work as well as experience in working with other research personnel.

***Research Materials Scientist or Engineer**

BS or equivalent experience in engineering or materials science or a physical science. Must have a minimum of five years of directly related experience. Must have a demonstrated ability to communicate results of research to the scientific community by means of publications, presentations or internal reports. Must have demonstrated broad capabilities and accomplishments in materials science. Must have capability for independent work as well as experience in working with other research personnel.

Research Scientist or Engineer

BS or equivalent experience in a physical science or an appropriate field of engineering (i.e. chemical, mechanical, or materials). Must have 3-5 years of experience or an advanced degree. Must have experience in the areas of interest outlined in the scope of work for this task. Must have experience in working with research personnel, and be capable of independent project work.

Synthetic Chemist

Must have a PhD and experience with synthetic and characterization methods used in the preparation of materials discussed in this Task. Must be capable of independent laboratory work.

Task 4

Physicist

Must have a PhD in physics, chemistry or a closely related discipline and at least 10 years of experience in magnetic resonance (NMR, NQR). Must have a record of innovation, intellectual independence, scientific leadership and publications. Directly related experience in NQR for explosives detection is highly desirable.

***Senior Program Analyst**

Must have a BS or BA degree, 5 to 10 years experience and/or an advanced degree. Must have experience in the areas outlined in the Statement of Work, paragraph 4.3.1.1. Must have knowledge of computer hardware and software used for cost analysis and pricing histories. Individual must have familiarity with the systems of military, federal and voluntary consensus specifications and standards, and with naval ships' operational schedules and requirements. Must have experience in engineering and technology assessment and be capable of working independently. Must have or be able to obtain a clearance at the Secret level.

Program Analyst

Must have a BS or BA degree and 2 to 5 years of relevant experience. Must have experience in the areas outlined in the Statement of Work, Paragraph 4.3.1.1 Must have knowledge of computer hardware and software used for cost analysis and pricing histories. Individual must have familiarity with the systems of military, federal and voluntary consensus specifications and standards, and with naval ships' operational schedules and requirements. Must have experience in engineering and technology assessment and be capable of working independently. Must have or be able to obtain a clearance at the Confidential level.

***Synchrotron Technician**

Must have at least five years experience working on synchrotron radiation beamlines and experimental apparatus. Must have a record of successful design, construction, operation and maintenance of synchrotron experimental apparatus in the energy range of 1 to 10 keV, including designing, installing, and characterizing x-ray optics such as mirrors, diffracting elements, and bent crystals and in designing, installing and characterizing new detectors for x-ray spectroscopy. Must have at least an MS degree in physics or a related discipline and some experience with data collection and analysis for x-ray absorption spectroscopy and/or x-ray diffraction, preferably with publications in peer-reviewed journals. This individual will be responsible for design, fabrication, installation, and testing of the vacuum, electronic, mechanical, and computer systems for the NRL hard x-ray beamline at the National Synchrotron Light Source at Brookhaven National Laboratory.

Task 5

***PhD – Chemist**

Must have a PhD in Chemistry and a minimum of five years of directly related work experience

***MS – Chemist**

Must have a M. S. in Chemistry and a minimum of three years of directly related work experience.

***BS – Chemist**

Must have a B.S. in Chemistry and a minimum of three years of directly related work experience.

Task 6

***Chemist**

Must have an M. S. in Chemistry and a minimum of 5 years work experience.

Biochemist

Must have a B.S. in Biochemistry.

Engineer

Must have a B. S. in Mechanical, Chemical or Environmental Engineering.

Biologist

Must have a B.S. in Biological Sciences

***Microbiologist**

Must have a M.S. in Microbiology and a minimum of 3 years work experience.

Molecular Biologist

Must have a B.S. in Biology or Microbiology and a minimum of 1 year work experience in a molecular biology laboratory.

Task 7

***Chemist**

Must have a PhD in chemistry, physics or a closely related discipline and at least 5 years of experience in magnetic resonance (NMR, NQR) and in applications to materials chemistry. Must have a record of innovation, intellectual independence, scientific leadership, and publications.

Task 8

*** Computer Hardware/ Software Technician**

Must have familiarity with resolving common hardware interface problems. Familiarity with software trouble shooting, especially as associated with new installations, is also required.

*** Designates Key Personnel**

Solicitation N00014-00-R-KK04
ATTACHMENT NO. 4

SAFETY REQUIREMENTS FOR THE CHEMISTRY DIVISION BRANCH SUPPORT SOLICITATION

Contractor operations shall be compatible with Navy operations and shall not compromise the safety and health of Navy personnel or violate Occupational Safety and Health Administration (OSHA) laws and regulations. All contractors and subcontractors must conform to the requirements of Federal, State, and local occupational safety and health laws, rules, and regulations. The contractor shall comply with the following regulations, if applicable:

A. Federal Regulations:

1. **29 Code of Federal Regulations (CFR), Part 1925, Safety and Health Standards for Federal Service Contracts. Every contractor and subcontractor shall comply with the safety and health standards published in 41 CFR Part 50-204.**

B. NAVY Regulations:

1. **OPNAVINST 5100.23E, Chapter 27, Confined Space Entry Program**
2. **Naval Ship Technical Manual, Chapter 589**

C. NRL Instructions:

1. **NRLINST 5560.2C, Temporary and Long-Term Road and Parking Closures**
2. **NRLINST 4110.1B, NRL Hazardous Material Control and Management Program**
3. **NRLINST 5100.11F, NRL Radiation Protection Manual (covers both ionizing and non-ionizing radiation)**
4. **NRLINST 5100.4B, Management of Weight Handling Equipment**

D. Other:

1. **National Fire Protection Association (NFPA) 70, National Electrical Code**
2. **NFPA 10, Portable Fire Extinguishers**