

**AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT**

1. CONTRACT ID CODE  
U

PAGE OF PAGES  
1 2

2. AMENDMENT/MODIFICATION NO.  
49

3. EFFECTIVE DATE  
01-Apr-2015

4. REQUISITION/PURCHASE REQ. NO.  
1300486244

5. PROJECT NO. (If applicable)  
N/A

6. ISSUED BY CODE

N00167

7. ADMINISTERED BY (If other than Item 6) CODE

S0701A

NSWC, CARDEROCK DIVISION, MARYLAND  
9500 MacArthur Blvd  
West Bethesda MD 20817  
donna.stride@navy.mil 301-227-5749

DCMA HARTFORD  
130 DARLIN STREET  
EAST HARTFORD CT 06108-3234

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State, and Zip Code)

Applied Physical Sciences  
2 State Street, Suite 300  
New London CT 06320

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

[X]

10A. MODIFICATION OF CONTRACT/ORDER NO.

N00178-04-D-4014-FD01

10B. DATED (SEE ITEM 13)

30-Sep-2010

CAGE CODE  
1ZG32

FACILITY CODE

**11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS**

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers  is extended,  is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning one (1) copy of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

SEE SECTION G

**13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.**

(*)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
<input type="checkbox"/>	
<input type="checkbox"/>	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.)SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
<input type="checkbox"/>	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
<input checked="" type="checkbox"/>	D. OTHER (Specify type of modification and authority) Unilateral modification in accordance with FAR 52.232-22 'Limitation of Funds'

E. IMPORTANT: Contractor  is not,  is required to sign this document and return \_\_\_ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

SEE PAGE 2

15A. NAME AND TITLE OF SIGNER (Type or print)

16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)

Kathleen C Bonturi, Contracting Officer

15B. CONTRACTOR/OFFEROR

15C. DATE SIGNED

16B. UNITED STATES OF AMERICA

16C. DATE SIGNED

(Signature of person authorized to sign)

BY /s/Kathleen C Bonturi

(Signature of Contracting Officer)

01-Apr-2015

NSN 7540-01-152-8070

PREVIOUS EDITION UNUSABLE

30-105

STANDARD FORM 30 (Rev. 10-83)

Prescribed by GSA  
FAR (48 CFR) 53.243

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## GENERAL INFORMATION

The purpose of this modification is to add an increment of funding in the amount of \$25,000,000.

Accordingly, said Task Order is modified as follows:

1) The total amount of funds obligated to the task is hereby increased from \$17,662,465.00 by \$25,000.00 to \$17,687,465.00. The total remaining unfunded balance is \$27,881,967.00.

2) Sections B and G are revised to add the following:

CLIN/SLIN	Type Of Fund	From (\$)	By (\$)	To (\$)
700005	RDT&E	0.00	24,000.00	24,000.00
900005	RDT&E	0.00	1,000.00	1,000.00

3) The total value of the order is hereby increased from \$45,569,432.00 by \$0.00 to \$45,569,432.00.

4) Section G Clause entitled "SEA 5252.232-9104 ALLOTMENT OF FUNDS (May 1993)" has been revised as follows:

ESTIMATED ITEM(S)	ALLOTTED TO COST	ALLOTTED TO FEE	PERIOD OF PERFORMANCE
7000	\$ 947,861.00	\$ 75,639.00	Through 29 September 2015
9000	\$ 461,500.00	N/A	Through 29 September 2015

5) The Accounting and Appropriation Data added to Section G is as follows:

MOD 49

700005 130048624400001 24000.00  
 LLA :  
 EB 97X4930 NH1C 253 77777 0 050120 2F 000000 A00002784708

900005 130048624400002 1000.00  
 LLA :  
 EB 97X4930 NH1C 253 77777 0 050120 2F 000000 A00002784708

MOD 49 Funding 25000.00  
 Cumulative Funding 17687465.00

6) The end of period of performance remains unchanged at 29 September 2015, as last extended by Modification 48.

7) The contractor is not authorized to begin performance with the work associated in TI-67 until the Contracting Officer and the Contracting Officers Representative have received a fully signed copy of the TI from the contractor.

A conformed copy of this Task Order is attached to this modification for informational purposes only.

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## SECTION B SUPPLIES OR SERVICES AND PRICES

CLIN - SUPPLIES OR SERVICES

For Cost Type Items:

Item	PSC	Supplies/Services	Qty	Unit	Est. Cost	Fixed Fee	CPFF
4000	AD24	Engineering services for for ship signature control and signature mitigation (Fund Type - TBD)	1.0	LO	\$17,835,607.00	\$1,422,730.00	\$19,258,337.00
400001	AD24	Funding in the amount of \$142,500 for TI-1 (RDT&E)					
400002	AD24	Funding in the amount of \$50,000 for TI #2 (RDT&E)					
400003	AD24	Funding in the amount of \$10,000 for TI #3 (RDT&E)					
400004	AD24	Funding in the amount of \$138,000 for TI #5 (O&MN,N)					
400005	AD24	Funding in the amount of \$18,500 for TI #4 (SCN)					
400006	AD24	Funding in the amount of \$94,000 for TI #6 (SCN)					
400007	AD24	Funding in the amount of \$59,000 for TI #7 (RDT&E)					
400008	AD24	Funding in the amount of \$96,900 for TI #8 (RDT&E)					
400009	AD24	Funding in the amount of \$85,000 for TI #10 (RDT&E)					
400010	AD24	Funding in the amount of \$36,000 for TI #11 (RDT&E)					
400011	AD24	Funding in the amount of \$566,800 for TI #9 (SCN)					
400012	AD24	Funding in the amount of \$116,300 for TI #8B (RDT&E)					
400013	AD24	Funding in the amount of \$220,000 for TI #12 (RDT&E)					
400014	AD24	Funding in the amount of \$65,000 for TI #13 (RDT&E)					
400015	AD24	Funding in the amount of \$25,000 for TI #14 (SCN)					
400016	AD24	Funding in the amount of \$115,000 for TI #15 (RDT&E)					
400017	AD24	Funding in the amount of \$25,000 for TI #16 (SCN)					

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Item	PSC	Supplies/Services	Qty	Unit	Est. Cost	Fixed Fee	CPFF
400018	AD24	Funding in the amount of \$130,000 for TI #19 (SCN)					
400019	AD24	Funding in the amount of \$50,000 for TI #18 (RDT&E)					
400020	AD24	Funding in the amount of \$25,000 for TI # 17 (RDT&E)					
400021	AD24	Funding in the amount of \$336,300 for TI #21 (RDT&E)					
400022	AD24	Funding in the amount of \$165,000 TI #20 (WCF)					
400023	AD24	Funding in the amount of \$180,000 TI #22 (O&MN,N)					
400024	AD24	Funding in the amount of \$50,000 TI #22 (O&MN,N)					
400025	AD24	Funding in the amount of \$15,000 TI #24 (RDT&E)					
400026	AD24	Funding in the amount of \$25,000 TI #24 (RDT&E)					
400027	AD24	Funding in the amount of \$30,000 TI #23 (RDT&E)					
400028	AD24	Funding in the amount of \$200,000 TI #23 (RDT&E)					
400029	AD24	Funding in the amount of \$100,000 TI #23 (SCN)					
400030	AD24	Incremental Funding in the amount of \$50,000 TI #17 (RDT&E)					
400031	AD24	Incremental funding in the amount of \$25,000 TI #25 (RDT&E)					
400032	AD24	Incremental funding in the amount of \$20,000 TI #26 (O&MN,N)					
400033	AD24	Incremental funding in the amount of \$160,000 TI #27 (O&MN,N)					
400034	AD24	Incremental funding in the amount of \$156,000 TI #18 Rev A (RDT&E)					
400035	AD24	Incremental funding in the amount of \$52,574 TI #15 Rev A (RDT&E)					
400036	AD24	Incremental funding in the amount of \$84,000 TI #25 (RDT&E)					
400037	AD24	Incremental funding in the amount of \$455,000 TI #19 Rev A (RDT&E)					
400038	AD24	Incremental funding in the amount of \$154,000 TI #27 Rev A (O&MN,N)					

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Item	PSC	Supplies/Services	Qty	Unit	Est. Cost	Fixed Fee	CPFF
400039	AD24	Incremental funding in the amount of \$35,000 TI #29 (O&MN,N)					
400040	AD24	Incremental funding in the amount of \$75,000 TI #26 Rev A (O&MN,N)					
400041	AD24	Incremental funding in the amount of \$67,000 TI #28 (RDT&E)					
400042	AD24	Incremental funding in the amount of \$10,000 TI #30 (RDT&E)					
4100	AD24	Option Year 1 Engineering services for for ship signature control and signature mitigation (Fund Type - TBD)	1.0	LO	\$2,517,497.00	\$200,825.00	\$2,718,322.00
410001	AD24	Incremental funding in the amount of \$274,000 for TI 25 Rev B (RDT&E)					
410002	AD24	Incremental funding in the amount of \$75,000 for TI 31 (O&MN,N)					
410003	AD24	Incremental funding in the amount of \$195,000 for TI 32 (RDT&E)					
410004	AD24	Incremental funding in the amount of \$200,000 for TI 33 (RDT&E)					
410005	AD24	Incremental funding in the amount of \$70,000 for TI 34 (RDT&E)					
410006	AD24	Incremental funding in the amount of \$80,000 for TI 31A (O&MN,N)					
410008	AD24	Incremental funding in the amount of \$88,052 for TI 38 (RDT&E)					
410009	AD24	Incremental funding in the amount of \$209,270 for TI 35 (SCN)					
410010	AD24	Incremental funding in the amount of \$380,000 for TI 36 (SCN)					
410011	AD24	Incremental funding in the amount of \$60,000 for TI 31B (O&MN,N)					
410012	AD24	Incremental funding in the amount of \$145,000 for TI 28A (RDT&E)					
410013	AD24	Incremental funding in the amount of \$40,000 for TI 34A (RDT&E)					
410014	AD24	Incremental funding in the amount of \$190,000 for TI 33A (RDT&E)					
410015	AD24	Incremental funding in the amount of \$300,000 for TI 37 (RDT&E)					
410016	AD24	Incremental funding in the amount of \$50,000 for TI 39 (RDT&E)					

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Item	PSC	Supplies/Services	Qty	Unit	Est. Cost	Fixed Fee	CPFF
410017	AD24	Incremental funding in the amount of \$80,000 for TI 40 (RDT&E)					
410018	AD24	Incremental funding in the amount of 282,000 for TI-31C (O&MN,N)					
4200	AD24	Option Year 2 Engineering services for for ship signature control and signature mitigation (Fund Type - TBD)	1.0	LO	\$6,058,945.00	\$483,325.00	\$6,542,270.00
420001	AD24	Incremental funding in the amount of \$410,000 for TI 41 (RDT&E)					
420002	AD24	Incremental funding in the amount of \$275,000 for TI 43 (RDT&E)					
420003	AD24	Incremental funding in the amount of \$200,000 for TI 40A (RDT&E)					
420004	AD24	Incremental funding in the amount of \$192,000 for TI 35A (SCN)					
420005	AD24	Incremental funding in the amount of \$40,000 for TI 44 (RDT&E)					
420006	AD24	Incremental funding in the amount of \$50,000 for TI 32A (RDT&E)					
420007	AD24	Incremental funding in the amount of \$100,000 for TI 28B (RDT&E)					
420008	AD24	Incremental funding in the amount of \$10,000 for TI 42 (RDT&E)					
420009	AD24	Incremental funding in the amount of \$545,000 for TI 36A (SCN)					
420010	AD24	Incremental funding in the amount of \$100,000 for TI 45 (RDT&E)					
420011	AD24	Incremental funding in the amount of \$45,000 for TI 39A (RDT&E)					
420012	AD24	Incremental funding in the amount of \$600,000 for TI 49 (RDT&E)					
420013	AD24	Incremental funding in the amount of \$120,000 for TI 39B (RDT&E)					
420014	AD24	Incremental funding in the amount of \$135,000 for TI 47 (RDT&E)					
420015	AD24	Incremental funding in the amount of \$190,000 for TI 48 (RDT&E)					
420016	AD24	Incremental funding in the amount of \$450,000 for TI 50 (RDT&E)					
420017	AD24	Incremental funding in the amount of \$69,000 for TI 52 (RDT&E)					

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Item	PSC	Supplies/Services	Qty	Unit	Est. Cost	Fixed Fee	CPFF
420018	AD24	Incremental funding in the amount of \$90,000 for TI 51 (RDT&E)					
420019	AD24	Incremental funding in the amount of \$105,000 for TI 53 (RDT&E)					
420020	AD24	Incremental funding in the amount of \$196,500 for TI 54 (RDT&E)					
420021	AD24	Incremental funding in the amount of \$275,000 for TI 55 (SCN)					
420022	AD24	Incremental funding in the amount of \$700,000 for TI 56 (SCN)					
420023	AD24	Incremental funding in the amount of \$919,770 for TI 49A (RDT&E)					
420024	AD24	Incremental funding in the amount of \$125,000 for TI 47A (RDT&E)					
420025	AD24	Incremental funding in the amount of \$135,000 for TI 48A (RDT&E)					
420026	AD24	Incremental funding in the amount of \$50,000 for TI 54A (RDT&E)					
420027	AD24	Incremental funding in the amount of \$115,000 for TI 57 (RDT&E)					
420028	AD24	Incremental funding in the amount of \$70,000 for TI 58 (RDT&E)					
420029	AD24	Incremental funding in the amount of \$48,000 for TI 60 (RDT&E)					
420030	AD24	Incremental funding in the amount of \$182,000 for TI 61 (RDT&E)					

For ODC Items:

Item	PSC	Supplies/Services	Qty	Unit	Est. Cost
6000	AD24	Other Direct Costs (material, travel, miscellaneous including applicable indirect costs) - Non-fee bearing (Fund Type - TBD)	1.0	LO	\$262,656.00
600001	AD24	Funding in the amount of \$7,500 for TI-1 (RDT&E)			
600002	AD24	Funding in the amount of \$2,000 for TI-5 (O&MN,N)			
600003	AD24	Funding in the amount of \$1,500 for TI-4 (SCN)			
600004	AD24	Funding in the amount of \$6,000 for TI-6 (SCN)			
600005	AD24	Funding in the amount of \$4,900 for TI-7 (RDT&E)			
600006	AD24	Funding in the amount of \$3,100 for TI-8 (RDT&E)			
600007	AD24	Funding in the amount of \$5,000 for TI-10 (RDT&E)			
600008	AD24	Funding in the amount of \$4,000 for TI-11 (RDT&E)			

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Item	PSC	Supplies/Services	Qty	Unit	Est. Cost
600009	AD24	Funding in the amount of \$18,200 for TI-9 (SCN)			
600010	AD24	Funding in the amount of \$3,700 for TI-8B (RDT&E)			
600011	AD24	Funding in the amount of \$15,000 for TI-12 (RDT&E)			
600012	AD24	Funding in the amount of \$10,000 for TI-13 (RDT&E)			
600013	AD24	Funding in the amount of \$3,000 for TI-14 (SCN)			
600014	AD24	Funding in the amount of \$5,000 for TI-15 (RDT&E)			
600015	AD24	Funding in the amount of \$400 for TI-16 (SCN)			
600016	AD24	Funding in the amount of \$8,700 for TI-21 (RDT&E)			
600017	AD24	Funding in the amount of \$15,000 for TI-20 (WCF)			
600018	AD24	Incremental funding in the amount of \$10,000 TI #27 (O&MN,N)			
600019	AD24	Incremental funding in the amount of \$75,000 TI #18 Rev A (RDT&E)			
600020	AD24	Incremental funding in the amount of \$1,656 TI #15 Rev A (RDT&E)			
600021	AD24	Incremental funding in the amount of \$16,000 TI #25 (RDT&E)			
600022	AD24	Incremental funding in the amount of \$20,000 TI #19 Rev A (RDT&E)			
600023	AD24	Incremental funding in the amount of \$21,000 TI #27 Rev A (O&MN,N)			
600024	AD24	Incremental funding in the amount of \$3,000 TI #29 (O&MN,N)			
600025	AD24	Incremental funding in the amount of \$3,000 TI #28 (RDT&E)			
6100	AD24	Option Year 1 Other Direct Costs (material, travel, miscellaneous including applicable indirect costs) - Non-fee bearing (Fund Type - TBD)	1.0	LO	\$707,613.00
610001	AD24	Incremental funding in the amount of \$26,000 for TI 25 Rev B (RDT&E)			
610002	AD24	Incremental funding in the amount of \$5,000 for TI 32 (RDT&E)			
610003	AD24	Incremental funding in the amount of \$5,000 for TI 34 (RDT&E)			
610004	AD24	Incremental funding in the amount of \$5,583 for TI 38 (RDT&E)			
610005	AD24	Funds in the amount of \$20,000 for TI 36 (SCN)			
610006	AD24	Funds in the amount of \$6,030 for TI 35 (SCN)			
610007	AD24	Incremental funding in the amount of \$5,000 for TI 28A (RDT&E)			
610008	AD24	Incremental funding in the amount of \$585,000 for TI 37 (RDT&E)			
610009	AD24	Incremental funding in the amount of \$5,000 for TI 39 (RDT&E)			
610010	AD24	Incremental funding in the amount of \$25,000 for TI 33B (RDT&E)			
610011	AD24	Incremental funding in the amount of \$20,000 for TI 40 (RDT&E)			
6200	AD24	Option Year 2 Other Direct Costs (material, travel, miscellaneous including applicable indirect costs) - Non-fee	1.0	LO	\$1,458,730.00



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Item	PSC	Supplies/Services	Qty	Unit	Est. Cost
		bearing (Fund Type - TBD)			
620001	AD24	Incremental funding in the amount of \$40,000 for TI 41 (RDT&E)			
620002	AD24	Incremental funding in the amount of \$350,000 for TI 49 (RDT&E)			
620003	AD24	Incremental funding in the amount of \$40,000 for TI 47 (RDT&E)			
620004	AD24	Incremental funding in the amount of \$20,000 for TI 48 (RDT&E)			
620005	AD24	Incremental funding in the amount of \$35,000 for TI 50 (RDT&E)			
620006	AD24	Incremental funding in the amount of \$18,500 for TI 54 (RDT&E)			
620007	AD24	Incremental funding in the amount of \$2,000 for TI 55 (SCN)			
620008	AD24	Incremental funding in the amount of \$60,000 for TI 56 (SCN)			
620009	AD24	Incremental funding in the amount of \$798,230 for TI 49A (RDT&E)			
620010	AD24	Incremental funding in the amount of \$50,000 for TI 47A (RDT&E)			
620011	AD24	Incremental funding in the amount of \$15,000 for TI 48A (RDT&E)			
620012	AD24	Incremental funding in the amount of \$10,000 for TI 57 (RDT&E)			
620013	AD24	Incremental funding in the amount of \$2,000 for TI 60 (RDT&E)			
620014	AD24	Incremental funding in the amount of \$18,000 for TI 61 (RDT&E)			

For Cost Type Items:

Item	PSC	Supplies/Services	Qty	Unit	Est. Cost	Fixed Fee	CPFF
7000	AD24	Engineering services for for ship signature control and signature mitigation (Fund Type - TBD)	1.0	LO	\$11,505,900.00	\$918,103.00	\$12,424,003.00
700001	AD24	Funding in the amount of \$64,000 for TI-#62 (RDT&E)					
700002	AD24	Funding in the amount of \$558,000 for TI-#64 (RDT&E)					
700003	AD24	Funding in the amount of \$195,500 for TI-#65 (RDT&E)					
700004	AD24	Funding in the amount of \$182,000 for TI-#66 (RDT&E)					
700005	AD24	Funding in the amount of \$24,000 for TI-#67 (RDT&E)					

For ODC Items:

Item	PSC	Supplies/Services	Qty	Unit	Est. Cost
9000	AD24	Other Direct Costs (material, travel, miscellaneous including applicable indirect costs) - Non-fee bearing (Fund Type - TBD)	1.0	LO	\$2,197,501.00

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Item	PSC	Supplies/Services	Qty	Unit	Est. Cost
900001	AD24	Funding in the amount of \$6,000 for TI-#62 (RDT&E)			
900002	AD24	Funding in the amount of \$417,000 for TI-#64 (RDT&E)			
900003	AD24	Funding in the amount of \$19,500 for TI-#65 (RDT&E)			
900004	AD24	Funding in the amount of \$18,000 for TI-#66 (RDT&E)			
900005	AD24	Funding in the amount of \$1,000 for TI-#67 (RDT&E)			

The fee percentage applied to CLINs 4000, 4100, and 4200 is 7.98%

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## SECTION C DESCRIPTIONS AND SPECIFICATIONS

### SECTION C DESCRIPTIONS AND SPECIFICATIONS

#### Ship Signature Control and Signature Mitigation

#### STATEMENT OF WORK

This is a performance-based statement of work. The efforts performed hereunder will be evaluated in accordance with the performance standards / acceptable quality levels described in the attached Performance Evaluation Table and the evaluation methods described in provision CAR H09.

#### 1.0 BACKGROUND

Department 70, Ship Signatures Department, of the Naval Surface Warfare Center, Carderock Division (NSWCCD) investigates signatures from Navy surface and subsurface platforms over a wide frequency spectrum ranging from very high frequencies to very low frequencies. These signatures are the result of physical processes produced from the platform itself, the platforms physical presence, or from energy scattered by a platform from sources external to a platform. For example, a magnetic signature may arise from the mere presence of a platform in a magnetic field within a geographic region. Examples of self generated signatures include infrared emissions, radiated sound caused by internal machinery within and vibrations induced on a platform hull due to external fluid flow. Examples of scattered signatures are found in radar and active sonar sensing.

The above noted signature types as well as other platform signatures have been analyzed and evaluated utilizing innovative collections of predictive methods that incorporate representations of physical models of sufficient fidelity to characterize observed signatures. Measurements have likewise been made to understand observed platform signatures. As new technologies have been developed to detect platform signatures, additional mitigation signature technologies are required to improve stealth and platform survivability. Further, as new missions are defined for Navy platforms, the impact of design changes on platform signatures and on operational requirements are considered necessary. Further, signature evaluation methodologies and technology developments are needed to assist in new platform acquisitions. To support Navy requirements pertaining to platform signature control for existing designs, design modifications, and new designs/acquisitions, a wide range of technical backgrounds and personnel experience levels are vital to support programs under the purview of NSWCCD Department 70 Ship Signatures Department.

To further these objectives, Department 70 has established or has access to data archives of ship signatures that could be applicable to verify numerical predictions that characterize signatures of models of Navy platforms. In those instances where data is not available, test facilities may be available to the contractor, under the supervision and approval of the Navy, to acquire needed ship signature characteristics upon approval of Government program managers and test facilities managers. Additionally, resources for research and development (R&D) include resident

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Government staff of engineering, scientific, technical and administrative personnel along with additional NSWCCD support at test measurement facilities or ranges.

## 2.0 PURPOSE

The objective of the technical efforts described in this Statement of Work (SOW) is to identify engineering analysis and test support to assist the Naval Surface Warfare Center Carderock Division (NSWCCD) Department 70 with engineering services to include but is not limited to theoretical development, numerical modeling and software code development, testing and data analysis and documentation. Work may be accomplished by teams consisting of Government and Contractor personnel.

## 3.0 REQUIREMENTS

The contractor shall perform the following tasks under the direction and guidance of NSWCCD Department 70 Signature Department. The contractor efforts shall contribute to the NSWCCD achieving mission goals and to assure that surface ships, submarines and other navy vehicles have signature characteristics, which will ensure their operational superiority over other navies. The contractor shall contribute as directed to support the conduct of R&D for underwater acoustics and non-acoustics signatures and the establishment of signature requirements. The contractor shall assist in research and testing relating to hydro acoustics, structural acoustics, mechanical vibrations, target strength, radar cross section, infrared and electro-optical, magnetics, advanced signal processing, measurement technology, model testing and full-scale trials. The contractor shall evaluate advanced technologies, define and assess specific technology issues/initiatives and approaches, provide assistance to document recommendations and implementations to realize acoustic/non-acoustic signature and survivability technology potentials and achieve technical, schedule and cost goals.

### 3.1 Platform Signature Modeling Support

The contractor shall provide engineering and technical support relating to predicting the signature characteristics of submarines, surface ships and watercraft for acoustic, infrared, electro-optical, radar, magnetic and other signatures. These predictions may require deriving theoretical models and the subsequent development of algorithms implementing these models. Engineering support shall include the application of existing Navy approved numerical models and methods to predict signatures. Not to be excluded are considerations for developing computer aided design (CAD) or similar representations of platforms that can be incorporated into multi-frequency predictive approaches/software.

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### 3.2 Large-Scale Testing and Trial Support

The contractor shall provide engineering and technical support covering activities central to testing operations on any vehicle, model, test platform, including autonomous submarines, static or buoyant vehicles, watercraft or any other equipment and support platforms employed in the utilization of the vehicles or models for technology demonstrations, R&D tests, systems/component evaluation, and fleet support. Further, this support includes full scale testing of platform types to investigate configurations not available in scaled models. This support includes developing engineering alteration designs, test plans, procedures for measurements, reports and other research and development data, such as signal analysis obtained during testing and other related evolutions.

### 3.3 Ship Signatures Reduction R&D

The contractor shall provide engineering and technical support for signature reduction and control in the areas of propulsors, propulsion systems, machinery, auxiliary systems, special treatments, airborne and structure borne noise coupling and control, flow generated noise, target strength, electromagnetics, active control, electromagnetic interference, IR(infra red)/optical, magnetic and RCS (radar cross section) signatures. The contractor shall assist in the development, planning, execution, and analysis of tests for these various signature types. Further, the contractor shall assist in formulating and developing new concepts for sensing, data acquisition, sensor prototypes, analysis methodologies including waveform designs and implementing these concepts into algorithms that produce clearly identifiable signature features which assist understanding of physical processes producing observed signature characteristics. From the understanding of the cause of a signature type, approaches shall be formulated to reduce signature levels such that the detection or classification of a platform signature improves survivability and/or expands mission options.

The contractor shall provide engineering and technical support to control and/or mitigate signatures produced by transient events. These efforts shall address but are not limited to weapons performance and preparation, onboard machinery operations, pumps, personnel deployments and aircraft operations. The contractor shall assist in the development, planning, execution, and analysis of tests for these transient signatures and development of structure and component designs that minimize initiation of transient events. Further, the contractor shall assist in formulating and developing analysis methodologies into algorithms that produce clearly identifiable signature features which assist understanding of physical processes producing observed signature characteristics. From the understanding of the cause of a signature type, approaches shall be formulated to reduce signature levels such that the detection or classification of a platform signature or mission improves survivability and/or expands mission alternatives.

### 3.4 Ship Signatures Design and Engineering

The contractor shall provide engineering and technical support for the design and installation of signature control features required for existing and future platforms for the hull, mechanical,

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electrical and combat systems to support a specific Navy risk reduction objective. The contractor shall utilize a combination of Navy accepted analytical tools, numerical software and empirical data to assess the signature performance of candidate signature control treatments and systems, and provide designs and integration approaches to optimize whole platform performance pertaining to signature control, cost impact, weight effect and platform stability. The contractor shall assist the Navy in estimating signature characteristics, platform features and performance trade-off studies to evaluate the potential incorporation of signature control approaches into the Navy's acoustic, top-side, magnetic, IR (infrared) and RCS (radar cross section) and EM (electromagnetic) platform architectures for new platform designs as well as retrofits. The contractor shall assist the Navy in analyses to assess signature contributions of platform systems and compare predicted signature characteristics against established signature budgets and signature goals to determine the level of signature mitigation required to meet those goals.

The contractor shall assist in the development of platform specifications for signature requirements and budgets. The contractor shall provide engineering and technical support to Navy Design/Build Teams for the development, review and disposition of acoustic, RCS, IR, magnetic and EM signatures, processes and analyses pertaining to existing and future platform construction and Noise Reduction Programs (NRP). The contractor shall assist the Navy in the development and management of signature budgets and performance models in each signature area throughout the design process, updating predicted signature performance as a design matures.

The contractor shall develop and evaluate signature control alternatives appropriate to a given signature mitigation type, including component isolation devices, advanced raft isolation systems, advanced materials, piping system noise control features and signature control materials. The contractor shall utilize specific Navy approved tools and analytical approaches to develop the signature predictions in support of those evaluations. The contractor shall review and evaluate the performance of candidate signature controls to achieve the signature mitigation objectives, addressing transmission loss, absorption, performance at depth and temperature and frequency range. Further, the contractor shall assess the impact of integration issues including shock survivability, vibration, physical arrangements, and weight and buoyancy requirements against ship specifications. The contractor shall document developed solutions that best meet competing signature mitigation approaches.

The contractor shall assist in the development of platform specifications to define system signature requirements and signature budgets. The contractor shall provide engineering and technical support to Navy Design/Build Teams for the development, review and disposition of acoustic, RCS, IR, magnetic and EM signatures, processes and analyses pertaining to existing and future platform construction and signature reduction programs. The contractor shall assist in the development and management of signature budget and performance models in each signature area throughout the design process, updating predicted performance as a design matures.

The contractor shall assist in the evaluation of alternative platform propulsion system and onboard control designs associated with an all electric platform. The contractor shall provide engineering and technical support necessary to develop powering requirements conducive to reduced signature

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levels, conversion of hydraulic to electromagnetic actuators and reducing electric motor imperfections that produce acoustic signatures. The contractor shall assist the Navy in the development and management of signature budgets and performance models for each potential signature area throughout the design process, updating predicted performance as a design matures.

### 3.5 Fleet Support

The contractor shall provide engineering and technical support for assessing airborne and structureborne noise and mechanical vibrations of completed platforms related to HVAC, fans, pumps, auxiliary and primary propulsion systems and the associated shafting, bearings, gearing and thrust blocks. Further, the contractor shall provide engineering and technical support for assessing radar signatures, electro optic characteristics and magnetic signatures, eddy currents and stray fields. The contractor shall provide measurement plans and sensor configurations necessary and analyses methodologies to identify significant noise and/or vibration sources that produce excesses of sound levels per platform hearing habitability specifications or vibration levels during all platform operations given in platform specifications as well as evaluate underwater electromagnetic and topside electromagnetic signatures. The contractor shall review and evaluate noise and vibration candidate mitigation strategies to achieve platform objectives stated in specifications for platforms of interest. If treatments are considered for mitigation, transmission loss, absorption, performance at temperature and frequency range shall be provided by the contractor as well as consideration of cost and weight. Further, the contractor shall assess the impact of implementation issues including environmental survivability, volume, attachment method and physical arrangements requirements against platform specifications. The contractor shall document developed solutions that best meet competing noise and vibration mitigation approaches.

The contractor shall utilize a combination of Navy-accepted analytical tools, numerical software and empirical data to assess the performance of candidate control treatments and systems, and provide designs and integration approaches to optimize whole platform performance pertaining to noise and vibration control, cost impact, weight effect and platform stability. The contractor shall assist the Navy in signature estimates, designs and performance trade-off studies to the Navy for further assessment and potential incorporation into the Navy's NRP (noise reduction program) for new platform designs. The contractor shall conduct analyses to assess noise and vibration contributions of platform systems and compare predicted noise and vibration characteristics against established compartment noise categories and vibration goals to determine the level of mitigation required to meet those goals.

### 4.0 DELIVERABLES

The following listed tasks shall be accomplished to provide deliverables that support established Department 70 project schedules.

4.1 Deliver a report for a specified signature including the issues to be addressed and approach to candidate solutions. Review and analyze operational signature control issues/goals and conduct analytical research involving the application of theory through computational and physical

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modeling to evaluate causes of observed signatures. The developed models and methods should account for dynamics of platform operations. Verify, update and extend control and evaluation of acoustic/non-acoustic signature source and mechanism theory for conventional and new ship/system design concepts. Identify limitations and frequency regime of applicability of theory.

4.2 Deliver a measurement/test plan to characterize a specified signature that leads to better understanding of its cause and its location on/in a platform. Develop/evaluate experimental plans to further quantify and characterize signatures that exceed operational platform goals. Plan, conduct, evaluate and document small model, large model and full-scale test results. Develop and demonstrate novel experiment techniques that can distinguish spatial locations on platforms which contribute most to observed signatures. For radiated acoustic signatures, assess primary energy paths, structure or fluid borne, associated with on-board systems and prioritize their significance on observed signature levels.

4.3 Provide test plans to accumulate electromagnetic signatures for identified or predicted level overages for a specified platform. Advance/appraise experimental plans to further quantify and characterize topside and underwater electromagnetic signatures that exceed operational platform goals. Plan, conduct, evaluate and document small model, large model and full-scale test results. Develop and demonstrate novel experiment techniques that can distinguish spatial locations, geometries and material properties on platforms which contribute most to observed signatures. For electromagnetic signatures, assess primary physical processes that produce signatures that exceed present operational performance and future signature objectives and prioritize their significance on observed signature levels.

4.4 Provide a report and a briefing that addresses signature excess of a government specified Navy platform/class. Review potential naval vessel radiated, platform, sonar self-noise, and non-acoustic signature reduction technologies. Review and evaluate hydro acoustic, structural acoustic, magnetic, infrared signature, survivability and related technology transition alternatives. Conduct technology maturity, risk, practicality, transition feasibility and related assessments and develop recommendations. Develop and document technical and programmatic approaches for signature reduction technology development and exploitation. Provide technical support to the Navy to preparatory to prepare plan of action and milestones (POA&M) and program planning support documentation including test plans, test and evaluation master plans (TEMP), and individual task management plans (ITMPs).

4.5 Deliver a briefing of signature reduction approaches for a Government specified signature issue and distinguish risks and mitigation solution approach. Provide a report on recommendations and research plans. Review signature reduction technology ship design applications, tradeoffs and ship impacts. Conduct design concept maturity, risk, cost and related assessments for identified platforms. Prepare and document design concept development recommendations. Prepare design component development plans, and R&D planning documentation.

4.6 Provide a report that evaluates survivability of a specified platform related to a designated



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signature of interest to the Navy and include a plan to understand the signature characteristics which impact survivability. Review and analyze program hydro acoustic, structural acoustic, magnetic, RCS, IR/Optical and survivability performance goals. Define and document technical objectives to support performance goal achievement. Identify and organize multi-disciplinary technical efforts to accomplish the necessary design support products including specifications, drawings and data sheets. Analyze platform design milestones and define design input needs. Conduct schedule, cost, risk and related technical assessments of the major elements impacting design success. Develop documentation, which identifies and documents controlling interactions among participating design component elements.

4.7 Develop a report on flow induced noise, expected noise levels and validation of predictions with measurements for a platform specified by the Navy. Review, predict and evaluate flow generated noise using physics based theoretical models for narrow and broadband signatures. Newly developed numerical models to account for turbulent boundary layers (TBL) adjacent to structural discontinuities and propulsion structures are to be validated with observed signatures. Assess numerical models developed for limitations and applicability to current platform designs and future propulsor system configurations and/or hull shapes.

4.8 Provide program/project management reports to the Navy including but not limited to reviews and evaluations of signature development support project technical developments and progress. Conduct schedule, cost, risk and technical assessments. Develop and document technical and programmatic recommendations to support achievement of program goals. Develop program periodic and annual progress reports and management support documentation including MS Project, PERT cost/schedule and ITMP. Develop and provide Future Year Development Plan (FYDP) inputs in RDT&E, SCN, O&MN and OPN planning formats. Develop, maintain and update project support databases and documentation.

4.9 Analyze acoustic/non-acoustic signature reduction and survivability program technical, performance, cost, schedule, design and related issues. Develop analysis assessments, recommendations and support documentation. Develop program support documentation including POA&Ms, memoranda of agreement/understanding (MOA/MOU), Test and Evaluation (T&E) plans, FYDP inputs, and program technical, schedule and financial issue reports.

4.10 Review potential acoustic/non-acoustic signature reduction experimental, research and creation of computational tool technology applications and provide documented software and manuals to the Navy. Conduct technology maturity, risk, transition feasibility and related assessments pertaining to these numerical approaches. Develop and document integrated approaches for computational tool development and validation.

4.11 Prepare POA&M, program planning, briefings, progress reports, and related management support documentation. Review and evaluate materials or approaches for potential application to signature and survivability improvement. Review and evaluate technology transition alternatives. Conduct technology maturity, risk, practicality, transition feasibility and related assessments and develop recommendations. Develop and document technical and programmatic approaches for technology development and exploitation.

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4.12 Develop, compile and assess data and documentation pertaining to the specification, acquisition and application of active and passive materials for signature reduction and survivability performance, cost, and life cycle reliability improvement in conventional and new concept naval vehicles, systems and military devices. Prepare installation support and training documentation for material applications. Analyze material fabrication techniques and alternatives and develop recommendations for increasing effectiveness and reducing cost. Provide material fabrication, installation and training support. Prepare acquisition specifications and design documentation.

4.13 Develop integrated propulsor program technical plans that review and analyze conventional and new concept propulsor signatures and other defined propulsor performance goals in a report. Define and document technical objectives to support performance goal achievement. Identify, organize and document multi-disciplinary technical efforts to accomplish the necessary propulsor design support products. Conduct schedule, cost, risk and related technical assessments of the major elements impacting performance success. Identify and document controlling interactions among contributing design elements. Prepare POA&Ms and program management support documentation including POA&Ms, memoranda of agreement/understanding (MOA/MOU), T&E plans, FYDP inputs, and program technical, schedule and financial issue reports.

4.14 Compile, organize and document propulsor design guidance support information. Develop and recommend documentation formats for translating design guidance information into parameters that can be utilized in propulsor hydrodynamic, structural and acoustic design. Develop and document propulsor acoustic design guidance documentation including procedures and specifications.

4.15 Provide a report that: 1) Reviews potential propulsor signature reduction design support computational tool technology applications; 2) Conduct technology maturity, risk, transition feasibility and related assessments; 3) Develop and document integrated approaches for computational tool development and validation.

4.16 Develop, document and demonstrate signal and data processing algorithms and procedures for defining signature's temporal, spectral and spatial characteristics and behavior. Perform engineering and data analyses in support of signature measurement and test activities. Participate in measurement and support system development and documentation. Perform data acquisition, verification and validation. Prepare test data packages from model and full-scale tests in the established formats. Provide recommendations in memoranda for test and evaluation (T&E) system performance improvement and operating cost reduction.

4.17 Report on operational, cost, technical and O&M risks and tradeoff assessments between viable signature control features. Provide engineering and technical support for the design and installation of signature control features for current and future platforms.

4.18 Develop, provide and present documentation to support achievement of naval mission support project goals and objectives. Perform analyses and reviews in support of definition, establishment, evaluation and implementation of new signature/survivability initiatives to

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support achievement of operational mission requirements and needs. Provide documentation to support project acquisitions. Design, fabricate and demonstrate equipment to support RDT&E and system operations.

4.19 Develop and document approaches for design guidance and platform integration of noise control technologies. Perform research and development of noise reduction and control technologies for alternative machinery and auxiliary systems quieting, advanced treatments to mitigate airborne noise, airborne noise coupling, structure borne noise and flow generated noise. Develop analytical and physical modeling tools that investigate new concepts and modifications to existing concepts, to validate analytical models and to study signature interaction and tradeoff effects and report by document on the findings.

4.20 Document the performance verification, validation and accreditation of the signature prediction tools and models developed to evaluate platform signatures. Assess the limitations and implications of developed signature simulation tools and define the theoretical approach of the physics-based processes of the model. Evaluate and assess predictive tools to complement an integrated design process using standard personal computer systems and software or Navy available supercomputing sites and software. Maintain configuration management to ensure consistent model history.

4.21 Prepare test data packages from model and platform tests in the established formats. Assess signature contributions of platform systems to be compared against established signature budgets for total ship signature goals to determine the level of signature mitigation required to meet those goals. Design, develop and evaluate the signature control options appropriate for the frequency regime, source localization and source characteristics. Integrate material models into signature prediction tools to estimate mitigation effectiveness and design. Plan and implement measurement approaches to validate control signature levels. Participate in measurement, data acquisition system development and documentation.

## 5.0 SECURITY REQUIREMENTS

The contractor shall have a security clearance in accordance with the DD Form 254 provided as an attachment.

## 6.0 PERSONNEL REQUIREMENTS

The estimated level of effort for the performance of this task order is based on the following labor category and hours per year:

<u>Key Personnel</u>	<u>Hours Per Year</u>	<u>Resumes Required</u>
Senior Scientist (Acoustics)	4,000	2
Senior Scientist (Hydroacoustics)	4,000	2
Senior Scientist (Radar)	2,000	1
Senior Scientist (Magnetics)	2,000	1

Senior Scientist (Infrared/Optics)	2,000	1
Senior Analyst (Acoustics)	4,000	2
Senior Analyst (Hydroacoustics)	4,000	2
Senior Analyst (Radar)	2,000	1
Senior Analyst (Magnetics)	2,000	1
Senior Analyst (Infrared/Optics)	2,000	1
Senior Engineer (Acoustics)	4,000	2
Senior Engineer (Hydroacoustics)	4,000	2
Senior Engineer (Radar)	2,000	1
Senior Engineer (Magnetics)	2,000	1
Senior Engineer (Infrared/Optics)	2,000	1
Senior Program Manager	<u>2,000</u>	<u>1</u>
Subtotal	44,000 per year	22
<u>Non-Key Personnel</u>	<u>Hours Per Year</u>	<u>Resumes Required</u>
Analyst	6,000	N/A
Engineer	4,000	N/A
Technical Specialist	<u>4,000</u>	<u>N/A</u>
Subtotal	<u>14,000 per year</u>	<u>N/A</u>
Total	58,000 per year	22

## KEY PERSONNEL

### 6.1 SENIOR SCIENTIST (Acoustics)

The Senior Scientist (Acoustics) should have a Masters degree (PhD desired) in Physics or Mathematics and at least fifteen (15) years related professional experience which should include ten (10) years experience pertaining to Navy platform signature mitigation research, modeling, testing, platform design and evaluation. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

- (1) Initiating and accomplishing pioneering scientific research in the area of ship acoustic signature sources and mechanisms. Developing scientific advancement to the body of technical knowledge on Navy platform acoustic signature sources, mechanisms, their behavior and cause.
- (2) Developing and accomplishing nationally and internationally recognized ship acoustic signature research projects leading to major technology breakthroughs in acoustic signature control and reduction. Developing and demonstrating new ship acoustic signature characteristics and the relationship of these signatures to physics mechanisms.
- (3) Organizing multi-functional research projects at the 6.2 through 6.6 RTD&E levels. Developing new technology for supporting submarine radiated-, platform- and sonar self-noise and target strength signature reduction.

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- (4) Organizing of multi-functional research projects at the 6.2 through 6.6 RDT&E levels. Developing new technology for surface ship radiated-noise, airborne noise, fluidborne noise or structureborne noise reduction.
- (5) Nationally and internationally recognized expertise in target strength, radiated noise and structural acoustics of ships and submarines. Pioneering research on the effects of platform structures on acoustic scattering, source localization and mechanical energy flow in structures for acoustic frequency bands of Navy interest.
- (6) Demonstrated familiarity with Navy accepted methods to predict sound levels external to a platform including but not limited to finite element method (FEM), boundary element method (BEM), statistical energy analysis (SEA), Darby modeling or designer noise for submarines or submersibles.
- (7) Development of advanced techniques for the quantitative measurement and characterization of structural acoustics and vibration signature parameters and their interrelationships, e.g.; coupling factors and frequency response functions, including transients.
- (8) Development of physical model and computational facilities to predict acoustic signatures, target strength, airborne noise, structureborne noise or fluidborne noise for the evaluation of ship hull, appendages, propulsor, propulsor plant/structural interactions and related structural components.
- (9) Identifying, reviewing, evaluating and documenting that include but are not limited to potential platform radiated, sonar self-noise, target strength (TS), airborne noise and propulsor signature reduction technology alternatives.
- (10) Reviewing and documenting of technology applications for platform signature computational tools in the areas of hull, appendage, top-side, internal structures and propulsor components.
- (11) Designing, developing, evaluating and reviewing methods or materials that can be applied to or incorporated into Navy platforms to control acoustic signatures or airborne noise.
- (12) Designing, fabricating and testing including but not limited to acoustic treatments, dampings and blankets that increase transmission loss, absorb energy or reflect incident acoustic fields.

## 6.2 SENIOR SCIENTIST (Hydroacoustics)

The Senior Scientist (Hydroacoustics) should have a Masters degree (PhD desired) in Physics or Mathematics and at least fifteen (15) years related professional experience with ten (10) years experience pertaining to Navy platform hydroacoustic signature mitigation research, modeling, testing, platform design and evaluation. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

- (1) Initiating and accomplishing pioneering scientific research including but not limited to

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hydrodynamic flow, fluid turbulence impinging on naval structures, fluid flow in pipes or ducts and forces produced by fluid gradients, fluid flow defects interacting with propulsion system components or turbulent flow ingestion for propulsor systems. Developing scientific advancement to the body of technical knowledge on acoustic signatures or structural vibrations caused by fluid flow interactions with a platform, appendages or propulsion systems.

(2) Developing and accomplishing nationally and internationally recognized ship acoustic signature research projects leading to major technology breakthroughs in acoustic signature control and reduction related to fluid structure interactions. Developing analytic methods and physics based model to predict broadband flow noise from complex, treated or untreated plate structures driven by equilibrium or non-equilibrium turbulent boundary layers (TBL). Implementing provisions within new or existing analytic methods to include the effects on flow noise from rapidly distorting TBL over complex structural discontinuities, including roughness.

(3) Organizing multi-functional research projects at the 6.2 through 6.6 RDT&E levels in hydroacoustics. Developing new technology for reducing the unsteady forces acting on the platform structures related adjacent fluid flows that demonstrate improvements of the risk/benefit of new technology implementations for expected operational maneuvers. Improvements must demonstrate their effect on radiated acoustic noise and the association of unsteady forces with the structural response and re-radiation. applicable to future surface ship and submarine designs.

(4) Developing tests plans to acquire data, data reduction/analyses, data interpretation and comparing results obtained from measurements with predicted results for signatures attributed to the interaction of fluid flow and structures. Verifying and validating hydroacoustic prediction tools that evaluate performance predictions for future surface ship and submarine designs.

(5) Nationally and internationally recognized expertise the field of hydrodynamic flow interactions with marine and/or naval structures to assess the steady and unsteady forces acting on structures (including hulls, rudders, appendages, propulsors, etc.) under consideration. Modeling efforts shall also assess 1) the fluid pressures and velocities in the vicinity of structures, and 2) the design and expected operational performance of structures, including hydroacoustic and non-acoustic hydrodynamic signatures, 3) flow perturbations resulting from maneuvers and the associated signatures, and 4) sea keeping and localized flow analyses to assess the impact on acoustic and non-acoustic ship signatures, propulsor noise, cavitation, appendage cavitation, flow noise and unsteady platform response. In addition, apply optimization methods to identify and assess modifications to hull and appendage design to minimize potential signature impacts.

(6) Demonstrating familiarity with Navy accepted numerical tools that provide computational efficiency and physical resolution including but not limited to the Reynolds-Averaged Navier Stokes (RANS), Large-Eddy Simulation (LES) and Direct Numerical Simulation (DNS) leading to predictions of sound levels external to a Navy platform.

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(7) Demonstrating familiarity with Navy accepted methods to predict sound levels due to fluid flows for air and/or water, cavitating flows, multi-phase flows, flows with free-boundaries and unsteady wake flows and hydraulic actuators as they relate to acoustic signatures.

(8) Developing advanced techniques for the quantitative measurement and characterization of structural acoustics and vibration signatures characterizing airborne, structureborne and external noise fields and their interrelationships with fluid flow interactions on a surface ship or submarine platforms, ducts, appendages and components of the propulsion system, e.g., waterjet.

(9) Developing physical models and computational system configurations to predict acoustic signatures. These models shall assess 1) the fluid pressures and velocities in the vicinity of structures, and 2) the design and expected operational performance of structures attributed to hydroacoustic phenomena for surface and submarine platform hulls, appendages, propulsor, ducts, piping and other structural components.

(10) Identifying, reviewing, evaluating and documenting potential hydrodynamic platform acoustic radiation, structureborne or airborne noise and propulsor or signature reduction technology alternatives.

(11) Designing, developing, evaluating and reviewing methods or materials that can be applied to or included in Navy platforms to control acoustic signatures and/or airborne noise due to hydrodynamic flows.

(12) Designing, fabricating and testing including but not limited to hydroacoustic grooming, dampings and fairings that reduce drag, wake or mitigate acoustic responses from fluid-structure interactions.

### 6.3 SENIOR SCIENTIST (Radar)

The Senior Scientist (Radar) should have a Masters degree (PhD desired) in Physics or Mathematics and at least fifteen (15) years related professional experience with ten (10) years experience pertaining to Navy platform signature characterization, mitigation research, modeling, testing, platform design and evaluation for radar frequencies. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

(1) Nationally and internationally recognized expertise in radar cross-sections of Navy platforms, radar measurements and radar mitigation materials. Pioneering research to include but not limited to the effects of top-side structures shapes and/or materials and configurations and ocean roughness on radar scattering characteristics for Navy radar frequency bands of interest.

(2) Initiating and accomplishing pioneering scientific research including but not limited to radar mitigation treatments, effects of platform design (shapes, configurations, material composition), radar echo information extraction, physics model development and effects of radar target background on target delectability and classification.

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(3) Developing and accomplishing nationally and internationally recognized ship radar signature research projects leading to major technology breakthroughs in radar signature control and reduction. Developing analytic methods and physics based models to predict radar signatures from complex, treated or untreated platform structures.

(4) Organizing multi-functional research projects at the 6.2 through 6.6 RDT&E levels in predicting, measuring and analyzing radar signatures. Developing new technology for reducing the radar echo levels from platform structures that demonstrate improvements of the risk/benefit of new technology implementations. Improvements shall be demonstrated on their effectiveness on radar levels and beam patterns associated with the structural response for future surface ship and submarine designs.

(5) Developing tests plans to acquire data, data reduction/analyses, data interpretation and comparing results obtained from measurements with predicted results for radar signatures within radar bands of Navy interest. Verifying and validating radar prediction tools used to evaluate performance predictions for future surface ship and submarine designs.

(6) Demonstrating application and formulating of modeling efforts to assess 1) measurement systems used to characterize radar scattering from Navy platforms through waveform grooming and subsequent signal analysis, and 2) the design and expected operational performance of surface ships and submarines for weapons frequencies. In addition, apply optimization methods to identify and assess modifications to hull and appendage design or placement to minimize potential signature impacts.

(7) Demonstrating familiarity with Navy accepted numerical tools that provide computational efficiency and physical resolution including but not limited to Radar Target Signature (RTS) and method of moments leading to predictions of radar cross-sections of Navy platforms.

(8) Developing physical models and computational system configurations to predict radar cross-sections. These models shall assess surface treatments, surface shapes and base platform materials. Further, assess platform designs and expected operational performance of structures attributed to appendages, hulls, antenna, cavities and deck-house components.

(9) Identifying, reviewing, evaluating and documenting radar signature reduction technology alternatives.

(10) Designing, developing, evaluating and reviewing methods or materials that can be applied to or included in Navy platforms to control radar signatures.

(11) Designing, fabricating and testing including but not limited to radar treatments, composites and blankets that reduce radar reflections or absorb energy

#### 6.4 SENIOR SCIENTIST (Underwater Magnetic Fields)

The Senior Scientist (Underwater Magnetic Fields) should have a Masters degree (PhD desired) in Physics or Mathematics and at least fifteen (15) years related professional experience with ten



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(10) years experience pertaining to Navy platform signature mitigation research, modeling, testing, influence platform design, mines and detection/sensor techniques for underwater magnetic signatures. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

(1) Initiating and accomplishing pioneering scientific research including but not limited to degaussing, active control, inverse modeling, induced forces from magnetic fields related to component imperfections in electric motors and mine sensitivities as related to platform magnetic field signatures. Developing scientific advancement to the body of technical knowledge on underwater magnetic field signature mitigation, material developments pertaining to magnetic fields from platform systems and/or structural elements, magnetic field sources and their characterization and the interaction of mechanical forces produced by the interactions of magnetic fields in motors that produce acoustic noise and/or mechanical vibration.

(2) Developing and accomplishing nationally and internationally recognized ship magnetic signature research projects leading to major technology breakthroughs in magnetic signature control and reduction related to AC or residual associated fields. Developing analytic methods and physics based models to predict magnetic far and near fields from AC or residual magnetizations from complex, treated or untreated structures driven by equilibrium or non-equilibrium processes.

(3) Organizing multi-functional research projects at the 6.2 through 6.6 RDT&E levels in underwater magnetic signatures. Developing new technology for underwater magnetic signature reduction through active and passive methods that demonstrate improvements of the risk/benefit of new technology implementations for expected operational maneuvers. Improvements shall demonstrate their effect on the total platform magnetic signature of future surface ship and submarine designs.

(4) Developing tests plans to acquire data, data reduction/analyses, data interpretation and comparing results obtained from measurements with predicted results for magnetic signatures attributed to own platform sources and/or perturbations of geomagnetic fields. Verifying and validating magnetic field prediction tools that evaluate performance predictions for future surface ship and submarine designs.

(5) Nationally and internationally recognized expertise in modeling underwater magnetic signatures of marine and/or naval structures. Modeling efforts shall also assess 1) potential magnetic sources and their relationship to structural materials and structural configurations, and 2) the design and expected operational performance that include but are not limited to power control systems for electric motors and house keeping power systems, 3) geomagnetic field perturbations resulting from platform maneuvers, and 4) survivability risks pertaining to magnetic ship signatures. In addition, applying optimization methods to identify and assess modifications to hull, appendage and power system designs and their placements to minimize potential signature impacts.

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(6) Demonstrating application and use of 2D/3D finite element, boundary element and finite difference software that provide computational efficiency and physical resolution including but not limited to predictions of underwater magnetic signatures from Navy platforms.

(7) Developing advanced techniques and sensors for the quantitative measurement and characterization of magnetic field signatures produced by induced currents, power circuits, electric motors or developed or residual magnetization. Developing onboard magnetic field sensing and monitoring systems.

(8) Developing physics based models and computational system configurations to predict underwater magnetic signatures. These models shall assess the influence of designs and expected operational performance of platforms for surface and submarine platform hulls, appendages, propulsion systems and other structural components.

(9) Identifying, reviewing, evaluating and documenting of potential underwater magnetic signatures risks and tradeoffs for signature reduction technology alternatives.

(10) Designing, developing, evaluating and reviewing methods or materials that can be applied to or included in Navy platforms to control underwater magnetic signatures.

#### 6.5 SENIOR SCIENTIST (Infrared/Optics)

The Senior Scientist (Infrared/Optics) should have a Masters degree (PhD desired) in Physics or Mathematics and at least fifteen (15) years related professional experience with ten (10) years experience pertaining to Navy platform infrared/optical signature mitigation research, modeling, testing, platform design and risk assessments. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

(1) Nationally and internationally recognized expertise in infrared (IR) and/or optical signatures of Navy platforms. Pioneering research in understanding the effects IR/optically induced signature dependence on frequency, polarization, emissivity, geometric platform features and physical bases of IR/optical source distributions or scatters.

(2) Developing and accomplishing nationally and internationally recognized ship magnetic signature research projects leading to major technology breakthroughs in IR/optical signature control and reduction related to passive sources. Developing analytic methods and physics based models to predict IR/optical emissions from complex, treated or untreated structures driven by equilibrium or non-equilibrium processes.

(3) Organizing multi-functional research projects at the 6.2 through 6.6 RDT&E levels in IR/optical signatures from Navy platforms. Developing new technology for IR/optical signature reduction through methods that demonstrate improvements of the risk/benefit of new technology implementations for expected operational maneuvers. Improvements shall demonstrate their effect on the total platform IR/optical signature of future surface ship and submarine designs.

(4) Developing tests plans to acquire data, data reduction/analyses, data interpretation and

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comparing results obtained from measurements with predicted results for IR/optical signatures attributed to a platform. Verifying and validating IR/optical field prediction tools that evaluate performance predictions for future surface ship and submarine designs.

(5) Nationally and internationally recognized expertise in IR/optical signature modeling of marine and/or naval structures. Modeling efforts shall assess 1) internal and external thermal sources and their distributions and their relationship to structural materials and structural configurations, and 2) the design and expected operational performance that include but are not limited to power plant and exhaust heating as well as solar and influences of the ocean and 3) survivability risks pertaining to IR/optical ship signatures. In addition, apply optimization methods to identify and assess modifications to hull, appendage and power system designs and their placement to minimize potential signature impacts.

(6) Demonstrating familiarity with Navy accepted numerical tools that provide computational efficiency and physical resolution including but not limited to ShipIR, Multi-Service Electro-optics Signature (MUSES) and Direct Numerical Simulation (DNS) leading to predictions of spectral distributions, levels and radiation patterns.

(7) Developing advanced techniques and sensors for the quantitative measurement and characterization of IR/optical signatures characterizing the interrelationships between diffuse and specular natures of deck structures of surface ship and submarine platforms, appendages, communication domes and antennas.

(8) Developing physical models and computational system configurations to predict IR/optical signatures of Navy platforms. These models shall assess 1) the design during expected operational performance of structures for surface and submarine platform hulls, appendages, ducts and other structural components.

(9) Identifying, reviewing, evaluating and documenting of potential IR/optical platform signature reduction technology alternatives.

(10) Designing, developing, evaluating and reviewing methods or materials that can be applied to or included in Navy platforms to control IR/optical radiations.

(11) Designing, fabricating and testing including but not limited to infrared/optic treatments, paints, composites and blankets that reduce infrared/optic reflections or absorb energy

## 6.6 SENIOR ANALYST (Acoustics)

The Senior Analyst (Acoustics) should have a Masters degree (PhD desired) in Engineering, Physics or Mathematics and at least fifteen (15) years related professional experience with ten (10) years experience pertaining to Navy platform signature mitigation analysis, processing testing data, numerical code development and statistical methods applied to measurement data. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

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(1) Analysis including but not limited to advanced submarine acoustic silencing; surface ship fluidborne, airborne, structureborne and transient noise reduction; signal processing and data analyses encompassing radiated noise, sonar self-noise, target strength (TS), propulsor noise; and full-scale and large- and small- platform model acoustic facility experiments data reduction, data analysis code development including statistical evaluations of data quality and accuracy of extracted information; interpretation and assessments of findings.

(2) Formulating, assessing and documenting submarine or surface ship signature reduction technologies based upon extracted metrics (consider the five specialties individually) from available or acquired data sets. Designing T&E approaches that emphasize measurement systems and measurement configurations that accentuate appraising signature characteristics of defined interest.

(3) Formulating, assessing and documenting ship component design/modification technical tradeoff analyses and signature performance assessments. Developing ITMPs, and integrated data acquisition plans separately among the five signature areas of interest.

(4) Assessing and documenting submarine and surface ship signature measurement technical progress.

(5) Reviewing, evaluating and documenting submarine and surface ship signature reduction design concepts, technology applications, tradeoffs and ship-design impacts as determined from acquired data.

(6) Defining, reviewing, evaluating and documenting treatment alternatives or approaches to mitigate or control signatures. Defining, assessing and documenting platform performance ship design impact issues.

(7) Developing, reviewing and documenting submarine or surface ship acoustic signature reduction technology integration technical approaches.

(8) Developing and documenting position papers on Navy platform signature control. Identifying integrated plans to address multi-signature measurement issues.

#### 6.7 SENIOR ANALYST (Hydroacoustics)

The Senior Analyst (Hydroacoustics) should have a Masters degree (PhD desired) in Engineering, Physics or Mathematics and at least fifteen (15) years related professional experience with ten (10) years experience pertaining to Navy platform signature mitigation analysis, processing testing data, numerical code development and statistical methods applied to measurement data. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

(1) Analysis including but not limited to flow turbulence, flow ingestion into propulsor, fluid flow in ducts, fluid flow in piping and pump systems, fluid-structure interactions that produce acoustic airborne and/or fluidborne noise as well as flow induced mechanical excitations of

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platform structures. Experience should also be described to illustrate experience in analyzing hydraulic systems. Development of signal processing code and data analyses encompassing radiated noise, sonar self-noise, target propulsor-fluid noise; and full-scale, large-scale and small-scale platform model acoustic facility experiments, data reduction, data analysis code development including statistical evaluations of data quality and accuracy of extracted information; interpretation and assessments of findings.

(2) Formulating, assessing and documenting submarine or surface ship signature reduction technologies based upon extracted metrics (consider the five specialties individually) from available or acquired data sets. Designing T&E approaches that emphasize measurement systems and measurement configurations that accentuate appraising signature characteristics of defined interest.

(3) Formulating, assessing and documenting ship component design/modification technical tradeoff analyses and signature performance assessments. Developing ITMPs, and integrated data acquisition plans separately among the five signature areas of interest.

(4) Assessing and documenting submarine and surface ship signature measurement technical progress.

(5) Reviewing, evaluating and documenting submarine and surface ship signature reduction design concepts, technology applications, tradeoffs and ship-design impacts as determined from acquired data.

(6) Defining, reviewing, evaluating and documenting treatment alternatives or approaches to mitigate or control signatures. Defining, assessing and documenting platform performance ship design impact issues.

(7) Developing, reviewing and documenting submarine or surface ship acoustic signature reduction technology integration technical approaches.

(8) Developing and documenting position papers on Navy platform signature control. Identifying integrated plans to address multi-signature measurement issues.

## 6.8 SENIOR ANALYST (Radar)

The Senior Analyst (Radar) should have a Masters degree (PhD desired) in Engineering, Physics or Mathematics and at least fifteen (15) years related professional experience with ten (10) years experience pertaining to Navy platform signature mitigation analysis, processing testing data, numerical code development and statistical methods applied to measurement data. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

(1) Analysis including but not limited to Navy platform radar signature mitigation; transmitted waveform development, assessing the influence of top-side components, materials and shapes, implementation of statistical confidence and accuracy measures of data sets, image processing applications to enhance contrast and image profiles and contours and presentation and graphics

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of extracted platform characteristics for both global and localized features. Additionally, collecting, sampling and logging of radar signatures on ranges for full-scale and large-scale and small-scale platform models employing both stationary and moving acquisition systems. Further describe, performing data reduction, data analysis code development including statistical evaluations of data quality and accuracy of extracted information; interpretation and assessments of findings.

(2) Formulating, assessing and documenting submarine or surface ship signature reduction technologies based upon extracted metrics (consider the five specialties individually) from available or acquired data sets. Designing T&E approaches that emphasize measurement systems and measurement configurations that accentuate appraising signature characteristics of defined interest.

(3) Formulating, assessing and documenting ship component design/modification technical tradeoff analyses and signature performance assessments. Developing ITMPs, and integrated data acquisition plans separately among the five signature areas of interest.

(4) Assessing and documenting submarine and surface ship signature measurement technical progress.

(5) Reviewing, evaluating and documenting submarine and surface ship signature reduction design concepts, technology applications, tradeoffs and ship-design impacts as determined from acquired data.

(6) Defining, reviewing, evaluating and documenting treatment alternatives or approaches to mitigate or control signatures. Defining, assessing and documenting platform performance ship design impact issues.

(7) Developing, reviewing and documenting submarine or surface ship acoustic signature reduction technology integration technical approaches.

(8) Developing and documenting position papers on Navy platform signature control. Identifying integrated plans to address multi-signature measurement issues.

#### 6.9 SENIOR ANALYST (Underwater Magnetic Signatures)

The Senior Analyst (Underwater Magnetic Signatures) should have a Masters degree (PhD desired) in Engineering, Physics or Mathematics and at least fifteen (15) years related professional experience with ten (10) years experience pertaining to Navy platform signature mitigation analysis, processing testing data, numerical code development and statistical methods applied to measurement data. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

(1) Analysis including but not limited to Navy platform underwater magnetic signature mitigation, materials, shapes and power densities, geomagnetic perturbations due to platform

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presence, own platform monitoring and implementation of statistical confidence and accuracy measures of data sets, and presentation and graphics of extracted platform characteristics for both global and localized features, including electric motors. Additionally, collecting, sampling and logging of underwater magnetic signatures on ranges for full-scale and large-scale and small-scale platform models employing both stationary and moving acquisition systems. Further describe performing data reduction, data analysis code development including statistical evaluations of data quality and accuracy of extracted information; interpretation and assessments of findings.

(2) Formulating, assessing and documenting submarine or surface ship signature reduction technologies based upon extracted metrics (consider the five specialties individually) from available or acquired data sets. Designing T&E approaches that emphasize measurement systems and measurement configurations that accentuate appraising signature characteristics of defined interest.

(3) Formulating, assessing and documenting ship component design/modification technical tradeoff analyses and signature performance assessments. Developing ITMPs, and integrated data acquisition plans separately among the five signature areas of interest.

(4) Assessing and documenting submarine and surface ship signature measurement technical progress.

(5) Reviewing, evaluating and documenting submarine and surface ship signature reduction design concepts, technology applications, tradeoffs and ship-design impacts as determined from acquired data.

(6) Defining, reviewing, evaluating and documenting treatment alternatives or approaches to mitigate or control signatures. Defining, assessing and documenting platform performance ship design impact issues.

(7) Developing, reviewing and documenting submarine or surface ship acoustic signature reduction technology integration technical approaches.

(8) Developing and documenting position papers on Navy platform signature control. Identifying integrated plans to address multi-signature measurement issues.

#### 6.10 SENIOR ANALYST (Infrared/Optics)

The Senior Analyst (Infrared/Optics) should have a Masters degree (PhD desired) in Engineering, Physics or Mathematics and at least fifteen (15) years related professional experience with ten (10) years experience pertaining to Navy platform signature mitigation analysis, processing testing data, numerical code development and statistical methods applied to measurement data. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

(1) Analysis including but not limited to Navy platform infrared/optical signature mitigation,

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assessing the influence polarization, platform surface roughness, materials and shapes, implementation of statistical confidence and accuracy measures of data sets, image processing applications to enhance contrast and image profiles and contours and presentation and graphics of extracted platform characteristics for both global and localized features. Additionally, collecting, sampling and logging of infrared/optical signatures on ranges for full-scale and large-scale and small-scale platform models employing both stationary and moving acquisition systems and the influence of environmental factors. Further describe, performing data reduction, data analysis code development including statistical evaluations of data quality and accuracy of extracted information; interpretation and assessments of findings.

(2) Formulating, assessing and documenting submarine or surface ship signature reduction technologies based upon extracted metrics (consider the five specialties individually) from available or acquired data sets. Designing T&E approaches that emphasize measurement systems and measurement configurations that accentuate appraising signature characteristics of defined interest.

(3) Formulating, assessing and documenting ship component design/modification technical tradeoff analyses and signature performance assessments. Developing ITMPs, and integrated data acquisition plans separately among the five signature areas of interest.

(4) Assessing and documenting submarine and surface ship signature measurement technical progress.

(5) Reviewing, evaluating and documenting submarine and surface ship signature reduction design concepts, technology applications, tradeoffs and ship-design impacts as determined from acquired data.

(6) Defining, reviewing, evaluating and documenting treatment alternatives or approaches to mitigate or control signatures. Defining, assessing and documenting platform performance ship design impact issues.

(7) Developing, reviewing and documenting submarine or surface ship acoustic signature reduction technology integration technical approaches.

(8) Developing and documenting position papers on Navy platform signature control. Identifying integrated plans to address multi-signature measurement issues.

#### 6.11 SENIOR ENGINEER (Acoustic)

The Senior Engineer (Acoustic) should have a Masters degree in Engineering, Applied Engineering or Physics and at least fifteen (15) years related professional experience with ten (10) years experience years pertaining to Navy platform signature mitigation analysis, data acquisition system design, array or antenna design and test design. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

(1) Organizing test agendas and analyzing measurement system design and measurement system



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component integration commensurate with but not limited to signal processing methods, data acquisition parameters including sampling requirements, signal conditioning, dynamic range, provisions to minimize the influence of background noise, allowance for transducer positioning, sensitivity and stability within a measurement environment, and measurement system computer control. Measurements may address submarine acoustic signature silencing, surface ship fluidborne, airborne, structureborne and transient noise reduction, transducer calibration, analyses encompassing radiated noise, sonar self-noise, target strength (TS), propulsor noise, transients and full-scale and large- and small- platform model measurements conducted at prescribed acoustic facilities, littoral or open ocean ranges. Experience must be described in the resume pertaining to sensor development, array construction and powering approaches. Experiences listed must also address measurement and auxiliary system fabrication, maintenance and repair.

(2) Formulating, planning and conducting signature engineering research projects; formulating multi-disciplinary project technical approaches and organizing multi-element resources; conducting, and evaluating the results of model and full-scale tests; and developing component design documentation.

(3) Conducting measurement performance requirement analyses; developing system hardware and software specifications; performing hardware and assessment of measurement on software design for data acquisition, control and communications components; conducting system evaluations; and providing design documentation.

(4) Formulating, reviewing and documenting technology applications for submarine or surface ship signatures related to hull, appendages, platform internal structures and systems and propulsor components.

(5) Developing, reviewing and documenting platform signature reduction technology development technical approaches.

(6) Assessing and documenting Navy platform signature characteristics. Preparing R&D program technical progress.

(7) Developing measurement systems, sensors or measurement methods to quantify platform signature control R&D and their influence platform design programs.

(8) Conducting, assessing and documenting the test methods for RDT&E 6.2, 6.3 and 6.4 Navy platform signature-related small-and large-model experiments and full-scale tests.

(9) Reviewing, assessing and documenting technical and program approaches for model-scale measurement facility integration. Developing POA&M and integrated multi-year program plans.

(10) Assessing and documenting measurement instrumentation ship-impact issues.

(11) Assessing signature measurement technology maturity, technical and cost risks for supporting retrofit and new platform designs.

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## 6.12 SENIOR ENGINEER (Magnetic)

The Senior Engineer (Magnetic) should have a Masters degree in Engineering, Applied Engineering or Physics and at least fifteen (15) years related professional experience with ten (10) years experience years pertaining to Navy platform signature mitigation analysis, data acquisition system design, array or antenna design and test design. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

- (1) Organizing test agendas and analyzing measurement system design including but not limited to Navy platform underwater magnetic signature mitigation, materials, shapes and power densities, geomagnetic perturbations due to platform presence, own platform monitoring and implementation of statistical confidence and accuracy implication of measurement approaches for both global and localized features, including electric motors. Additionally, collecting, sampling and logging of underwater magnetic signatures on ranges for full-scale and large-scale and small-scale platform models employing both stationary and moving acquisition systems. Experience must also be listed for leading and participating in platform demagnetization.
- (2) Formulating, planning and conducting signature engineering research projects; formulating multi-disciplinary project technical approaches and organizing multi-element resources; conducting, and evaluating the results of model and full-scale tests; and developing component design documentation.
- (3) Conducting measurement performance requirement analyses; developing system hardware and software specifications; performing hardware and assessment of measurement on software design for data acquisition, control and communications components; conducting system evaluations; and providing design documentation.
- (4) Formulating, reviewing and documenting technology applications for submarine or surface ship signatures related to hull, appendages, platform internal structures and systems and propulsor components.
- (5) Developing, reviewing and documenting platform signature reduction technology development technical approaches.
- (6) Assessing and documenting Navy platform signature characteristics. Preparing R&D program technical progress.
- (7) Developing measurement systems, sensors or measurement methods to quantify platform signature control R&D and their influence platform design programs.
- (8) Conducting, assessing and documenting the test methods for RDT&E 6.2, 6.3 and 6.4 Navy platform signature-related small-and large-model experiments and full-scale tests.
- (9) Reviewing, assessing and documenting technical and program approaches for model-scale measurement facility integration. Developing POA&M and integrated multi-year program plans.

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(10) Assessing and documenting measurement instrumentation ship-impact issues.

(11) Assessing signature measurement technology maturity, technical and cost risks for supporting retrofit and new platform designs.

### 6.13 SENIOR ENGINEER (Radar)

The Senior Engineer (Radar) should have a Masters degree in Engineering, Applied Engineering or Physics and at least fifteen (15) years related professional experience with ten (10) years experience years pertaining to Navy platform signature mitigation analysis, data acquisition system design, array or antenna design and test design. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

(1) Organizing test agendas and analyzing measurement system design including but not limited to Navy platform radar signature mitigation; transmitted waveform development, assessing the influence of top-side components, materials and shapes, implementation of statistical confidence and accuracy measures of data sets, image processing applications to enhance contrast and image profiles and contours and presentation and graphics of extracted platform characteristics for both global and localized features. Additionally, collecting, sampling and logging of radar signatures on ranges for full-scale and large-scale and small-scale platform models employing both stationary and moving acquisition systems. Further describe experiences performing data reduction, data analysis code development including statistical evaluations of data quality and accuracy of extracted information; interpretation and assessments of findings. Experiences listed must also address measurement and auxiliary system design, fabrication, maintenance and repair.

(2) Formulating, planning and conducting signature engineering research projects; formulating multi-disciplinary project technical approaches and organizing multi-element resources; conducting, and evaluating the results of model and full-scale tests; and developing component design documentation.

(3) Conducting measurement performance requirement analyses; developing system hardware and software specifications; performing hardware and assessment of measurement on software design for data acquisition, control and communications components; conducting system evaluations; and providing design documentation.

(4) Formulating, reviewing and documenting technology applications for submarine or surface ship signatures related to hull, appendages, platform internal structures and systems and propulsor components.

(5) Developing, reviewing and documenting platform signature reduction technology development technical approaches.

(6) Assessing and documenting Navy platform signature characteristics. Preparing R&D program technical progress.

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- (7) Developing measurement systems, sensors or measurement methods to quantify platform signature control R&D and their influence platform design programs.
- (8) Conducting, assessing and documenting the test methods for RDT&E 6.2, 6.3 and 6.4 Navy platform signature-related small-and large-model experiments and full-scale tests.
- (9) Reviewing, assessing and documenting technical and program approaches for model-scale measurement facility integration. Developing POA&M and integrated multi-year program plans.
- (10) Assessing and documenting measurement instrumentation ship-impact issues.
- (11) Assessing signature measurement technology maturity, technical and cost risks for supporting retrofit and new platform designs.

#### 6.14 SENIOR ENGINEER (Hydroacoustic)

The Senior Engineer (Hydroacoustic) should have a Masters degree in Engineering, Applied Engineering or Physics and at least fifteen (15) years related professional experience with ten (10) years experience years pertaining to Navy platform signature mitigation analysis, data acquisition system design, array or antenna design and test design. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

- (1) Organizing test agendas and analyzing measurement system design including but not limited to flow turbulence, flow ingestion into propulsor, fluid flow in ducts, fluid flow in piping and pump systems, fluid-structure interactions that produce acoustic airborne and/or fluidborne noise as well as flow induced mechanical excitations of platform structures. Experience should also be described to illustrate experience in analyzing hydraulic actuator systems. Development of measurement systems should include arrangements, sensor development, data acquisition control software and sensor installations for full-scale, medium-scale and small-scale platforms as well as experience with measurements in flow tunnels ,e.g.; NAVSEA LCC facility. Examples illustrating consideration for measurement limitations, accuracies and statistical evaluations of quantity measured. Experiences listed must also address measurement and auxiliary system fabrication, maintenance and repair.
- (2) Formulating, planning and conducting signature engineering research projects; formulating multi-disciplinary project technical approaches and organizing multi-element resources; conducting, and evaluating the results of model and full-scale tests; and developing component design documentation.
- (3) Conducting measurement performance requirement analyses; developing system hardware and software specifications; performing hardware and assessment of measurement on software design for data acquisition, control and communications components; conducting system evaluations; and providing design documentation.
- (4) Formulating, reviewing and documenting technology applications for submarine or surface

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ship signatures related to hull, appendages, platform internal structures and systems and propulsor components.

(5) Developing, reviewing and documenting platform signature reduction technology development technical approaches.

(6) Assessing and documenting Navy platform signature characteristics. Preparing R&D program technical progress.

(7) Developing measurement systems, sensors or measurement methods to quantify platform signature control R&D and their influence platform design programs.

(8) Conducting, assessing and documenting the test methods for RDT&E 6.2, 6.3 and 6.4 Navy platform signature-related small-and large-model experiments and full-scale tests.

(9) Reviewing, assessing and documenting technical and program approaches for model-scale measurement facility integration. Developing POA&M and integrated multi-year program plans.

(10) Assessing and documenting measurement instrumentation ship-impact issues.

(11) Assessing signature measurement technology maturity, technical and cost risks for supporting retrofit and new platform designs.

#### 6.15 SENIOR ENGINEER (Infrared/Optic)

The Senior Engineer (Infrared/Optics) should have a Masters degree in Engineering, Applied Engineering or Physics and at least fifteen (15) years related professional experience with ten (10) years experience years pertaining to Navy platform signature mitigation analysis, data acquisition system design, array or antenna design and test design. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

(1) Organizing test agendas and analyzing measurement system design including but not limited to Navy platform infrared/optical signature mitigation/characterization, materials, shapes and background variability. Also listed must include analyses of the statistical confidence and accuracy implication of measurement approaches for both global and localized features. Describe the influence of polarization, platform surface roughness, materials and shapes, implementation of statistical confidence and accuracy measures of data sets, image processing applications to enhance contrast and image profiles and contours. Further describe the impact of measurement approach on data acquisition and statistical implications of data quality and accuracy of extracted information and ultimately on interpretation and assessments of findings.

(2) Formulating, planning and conducting signature engineering research projects; formulating multi-disciplinary project technical approaches and organizing multi-element resources; conducting, and evaluating the results of model and full-scale tests; and developing component design documentation.

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(3) Conducting measurement performance requirement analyses; developing system hardware and software specifications; performing hardware and assessment of measurement on software design for data acquisition, control and communications components; conducting system evaluations; and providing design documentation.

(4) Formulating, reviewing and documenting technology applications for submarine or surface ship signatures related to hull, appendages, platform internal structures and systems and propulsor components.

(5) Developing, reviewing and documenting platform signature reduction technology development technical approaches.

(6) Assessing and documenting Navy platform signature characteristics. Preparing R&D program technical progress.

(7) Developing measurement systems, sensors or measurement methods to quantify platform signature control R&D and their influence platform design programs.

(8) Conducting, assessing and documenting the test methods for RDT&E 6.2, 6.3 and 6.4 Navy platform signature-related small-and large-model experiments and full-scale tests.

(9) Reviewing, assessing and documenting technical and program approaches for model-scale measurement facility integration. Developing POA&M and integrated multi-year program plans.

(10) Assessing and documenting measurement instrumentation ship-impact issues.

(11) Assessing signature measurement technology maturity, technical and cost risks for supporting retrofit and new platform designs.

#### 6.16 SENIOR PROGRAM/PROJECT MANAGER

The Senior Program/Project Manager should have a bachelor's degree in Engineering, Physics, Mathematics or Science and at least fifteen (15) years related professional experience with ten (10) years experience involvement with Navy platform acoustic or magnetic or radar or infrared/optics or hydroacoustic signature mitigation and/or control. The ten (10) years experience should also include a listing of documents published by the proposed individual to verify that the individual is capable of performing the required tasking below:

(1) Documenting multi-organization, multi-disciplinary POA&Ms, ITMPs, MOA/MOUs, program issue reports, and integrated multi-year program plans.

(2) Developing and documenting Microsoft Project-type management support documentation for multi-disciplinary signature R&D projects.

(3) Preparing integrated multi-task progress reports and revised multi-year program plans.

(4) Defining, reviewing, evaluating and documenting ship signature full-scale or scale-model test schedule and cost issues so that program schedule goals and costs are met. Developing

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multi-year cost estimates, support plans and cost-tracking management information system.

(5) Tracking and documenting platform signature test facility and/or assess availability and cost issues for characterizing Navy platform signatures.

(6) Providing and reporting program cost accounting, spending rate and task progress.

#### NON-KEY PERSONNEL

##### 6.17 ANALYST

The Analyst shall have a Bachelors degree in Engineering, Physics, Mathematics or Science with at least seven (7) years related professional experience with three (3) years involvement with Navy RDT&E. The individual shall be capable of performing the required tasking below:

(1) Reviewing, assessing and documenting Navy platform acoustic or magnetic or radar or infrared/optics or hydroacoustic signature reduction technology.

(2) Reviewing, assessing and documenting platform component design/modification technical tradeoff analyses and performance assessments.

(3) Assessing and documenting submarine acoustic or magnetic or radar or infrared/optics or hydroacoustic signature R&D program technical progress.

(4) Reviewing, evaluating and documenting platform acoustic or magnetic or radar or infrared/optics or hydroacoustic signature reduction design concepts.

(5) Conducting platform design and performance analysis; assist small- and large-model test data reduction approaches and analysis code development.

(6) Formulating platform model and full-scale acoustic or magnetic or radar or infrared/optics or hydroacoustic signature evaluations; performing data analysis and preparing signature reports.

(7) Reviewing, evaluating and documenting potential Navy platform signature reduction technologies and technology transition alternatives for the six (6) areas listed above.

(8) Developing, reviewing and documenting submarine or surface ship acoustic or magnetic or radar or infrared/optics or hydroacoustics signature reduction technology integration technical approaches.

##### 6.18 SCIENTIST

The Scientist shall have a Bachelors degree in Engineering, Physics, Mathematics or Science with at least seven (7) years Navy program-related experience with three (3) years experience in Navy platform RDT&E program signature mitigation and/or control in one of the six (6) topic areas listed below. The individual shall be capable of performing the required tasking below:

(1) Reviewing and documenting Navy platform signature reduction technology development technical approaches.

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- (2) Reviewing, evaluating and documenting full-scale or large-scale model platform designs and the relationship of the designs with physics phenomena causing signature excesses.
- (3) Assessing and documenting Navy platform multi-disciplinary signature R&D program technical progress.
- (4) Developing treatments and/or approaches to mitigate and/or control Navy platform signatures and assess platform designs relevant to program goals.
- (5) Reviewing and documenting Navy platform signature reduction technology integration.
- (6) Experience in Navy platform in the design of platform and technical and program issue analysis covering platform signature characteristics for small-scale, medium-scale, large-scale or full-scale platform models and the implications on system operational and tactical operations.

#### 6.19 ENGINEER

The Engineer shall have a Bachelors degree in Engineering, Mathematics or Science and seven (7) years professional experience. The individual shall capable of performing the required tasking below:

- (1) Navy RDT&E project support, including but not limited to measurement design, test system fabrication and system implementation.
- (2) Technical data compilation, organization and analysis.
- (3) Project support documentation preparation.
- (4) Technical analysis including but not limited to data logging, equipment maintenance and measurement system operations.

#### 6.20 TECHNICAL SPECIALIST

The Technical Specialist shall have formal technical training and seven (7) years professional experience related to ship signature/survivability technical support; or, an associate, or higher, degree in a field related to project technical support. The individual shall capable of performing the required tasking below:

- (1) Signature/survivability project technical support.
- (2) Data compilation, organization and analysis.
- (3) Information compilation and documentation.



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## SECTION D PACKAGING AND MARKING

Packing and Marking shall be in accordance with Section D of the base contract.

Contracting Officer Representative (COR)  
Ronald Hughes Code 7200  
9500 MacArthur Blvd  
West Bethesda, MD 20817-5700  
ronald.g.hughes@navy.mil  
301-227-5248

### HQ D-2-0008 MARKING OF REPORTS (NAVSEA) (SEP 1990)

All reports delivered by the Contractor to the Government under this contract shall prominently show on the cover of the report:

- (1) name and business address of the Contractor
- (2) contract number
- (3) task order number
- (4) sponsor: \_\_\_\_\_  
(Name of Individual Sponsor)

\_\_\_\_\_  
(Name of Requiring Activity)

\_\_\_\_\_  
(City and State)

All deliverables shall be packaged and marked IAW Best Commercial Practice.

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## **SECTION E INSPECTION AND ACCEPTANCE**

Inspection and Acceptance shall be performed at a destination by the Government.

DODAAC: N00167  
Contracting Officer Representative (COR)  
Ronald Hughes Code 7200  
9500 MacArthur Blvd  
West Bethesda, MD 20817-5700  
ronald.g.hughes@navy.mil  
301-227-5248

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## SECTION F DELIVERABLES OR PERFORMANCE

The periods of performance for the following Items are as follows:

4000	8/1/2010 - 9/29/2013
4100	9/30/2012 - 9/29/2013
4200	9/30/2013 - 3/29/2015
6000	8/1/2010 - 9/29/2013
6100	9/30/2012 - 9/29/2013
6200	9/30/2013 - 3/29/2015
7000	3/29/2015 - 9/29/2015
9000	3/29/2015 - 9/29/2015

### CLIN - DELIVERIES OR PERFORMANCE

52.211-8 TIME OF DELIVERY (JUN 1997)

(a) The Government requires delivery to be made according to the following schedule:

<u>ITEM NO.</u>	<u>QUANTITY</u>	<u>WITHIN DAYS AFTER DATE OF TASK ORDER</u>
4000 & 6000	ALL	Through 29 September 2013
4100 & 6100	ALL	29 September 2012 through 29 September 2013
4200 & 6200	ALL	From the date of the modification that exercises the option through 29 March 2015

### DELIVERY INFORMATION

FOB: Destination

DODAAC: N00167  
Contracting Officer Representative (COR)  
Ronald Hughes Code 7200  
9500 MacArthur Blvd  
West Bethesda, MD 20817-5700  
ronald.g.hughes@navy.mil  
301-227-5248

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## SECTION G CONTRACT ADMINISTRATION DATA

### G17S TOM APPOINTMENT (AUG 2005)

(a) The Contracting Officer hereby appoints the following individual as the Contracting Officer Representative (COR) for this task order:

Contracting Officer Representative (COR)  
 Ronald Hughes Code 7200  
 9500 MacArthur Blvd  
 West Bethesda, MD 20817-5700  
 ronald.g.hughes@navy.mil  
 301-227-5248

### DdI-G-21 TYPES OF ORDERS UNDER INDEFINITE DELIVERY TYPE CONTRACTS

This Task Order shall be issued on a Cost-Plus-Fixed-Fee (Term) basis.

### CAR-G11 INVOICE INSTRUCTIONS (DEC 2007) (NSWCCD)

(a) In accordance with the clause of this contract entitled "ELECTRONIC SUBMISSION OF PAYMENT REQUESTS" (DFARS 252.232-7003), the Naval Surface Warfare Center, Carderock Division (NSWCCD) will utilize the DoD Wide Area Workflow Receipt and Acceptance (WAWF) system to accept supplies/services delivered under this contract. This web-based system located at <https://wawf.eb.mil> provides the technology for government contractors and authorized Department of Defense (DoD) personnel to generate, capture and process receipt and payment-related documentation in a paperless environment. Invoices for supplies/services rendered under this contract shall be submitted electronically through WAWF. Submission of hard copy DD250/invoices may no longer be accepted for payment.

(b) It is recommended that the person in your company designated as the Central Contractor Registration (CCR) Electronic Business (EB) Point of Contact and anyone responsible for the submission of invoices, use the online training system for WAWF at <http://wawftraining.com>. The Vendor, Group Administrator (GAM), and sections marked with an asterisk in the training system should be reviewed. Vendor Quick Reference Guides also are available at <http://acquisition.navy.mil/navyaos/content/view/full/3521/>. The most useful guides are "Getting Started for Vendors" and "WAWF Vendor Guide".

(c) The designated CCR EB point of contact is responsible for activating the company's CAGE code on WAWF by calling 1-866-618-5988. Once the company is activated, the CCR EB point of contact will self-register under the company's CAGE code on WAWF and follow the instructions for a group administrator. After the company is set-up on WAWF, any additional persons responsible for submitting invoices must self-register under the company's CAGE code at <https://wawf.eb.mil>.

(d) The contractor shall use the following document types, DODAAC codes and inspection and acceptance locations when submitting invoices in WAWF:

Type of Document (*contracting officer check all that apply*)

<input type="checkbox"/>	Invoice (FFP Supply & Service)
<input type="checkbox"/>	Invoice and Receiving Report Combo (FFP Supply)
<input type="checkbox"/>	Invoice as 2-in-1 (FFP Service Only)
<input checked="" type="checkbox"/>	Cost Voucher (Cost Reimbursable, T&M , LH, or FPI)
<input type="checkbox"/>	Receiving Report (FFP, DD250 Only)

DODAAC Codes and Inspection and Acceptance Locations (*contracting officer complete appropriate*)

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information as applicable)

Issue DODAAC	<u>N00167</u>
Admin DODAAC	<u>S0701A</u>
Pay Office DODAAC	<u>HQ0337</u>
Service Approver DODAAC	<u>N00167</u>
DCAA Auditor DODAAC	<u>HAA661</u>

Attachments created in any Microsoft Office product may be attached to the WAWF invoice, e.g., backup documentation, timesheets, etc. Maximum limit for size of each file is 2 megabytes. Maximum limit for size of files per invoice is 5 megabytes.

(e) Before closing out of an invoice session in WAWF, but after submitting the document(s), you will be prompted to send additional email notifications. Click on “Send More Email Notification” and add the acceptor/receiver email addresses noted below in the first email address block, and add any other additional email addresses desired in the following blocks. This additional notification to the government is important to ensure that the acceptor/receiver is aware that the invoice documents have been submitted into WAWF.

Send Additional Email Notification To:
<a href="mailto:ronald.g.hughes@navy.mil">ronald.g.hughes@navy.mil</a>

(f) The contractor shall submit invoices/cost vouchers for payment per contract terms and the government shall process invoices/cost vouchers for payment per contract terms. Contractors approved by DCAA for direct billing will submit cost vouchers directly to DFAS via WAWF. Final voucher submission will be approved by the ACO.

(g) The WAWF system has not yet been implemented on some Navy programs; therefore, upon written concurrence from the cognizant Procuring Contracting Officer, the Contractor is authorized to use DFAS WinS for electronic end to end invoicing until the functionality of WinS has been incorporated into WAWF.

(h) If you have any questions regarding WAWF, please contact the WAWF helpdesk at the above 1-866 number or the NSWCCD WAWF Point of Contact (POC) Christian Taye; [christian.t.taye@navy.mil](mailto:christian.t.taye@navy.mil); 301-227-1910 or the alternate POC Richard Ford; [richard.a.ford@navy.mil](mailto:richard.a.ford@navy.mil); 301-227-1116.

(End of Clause)

#### SEA 5252.216-9122 LEVEL OF EFFORT (DEC 2000)

(a) The Contractor agrees to provide the total level of effort specified in the next sentence in performance of the work described in Sections B and C of this contract. The total level of effort for the performance of this contract shall be 164,540 total man-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.

(b) Of the total man-hours of direct labor set forth above, it is estimated that \_0\_(to be identified at the task order level) man-hours are uncompensated effort.

Uncompensated effort is defined as hours provided by personnel in excess of 40 hours per week without additional compensation for such excess work. All other effort is defined as compensated effort. If no effort is indicated in the first sentence of this paragraph, uncompensated effort performed by the Contractor shall not be counted in fulfillment of the level of effort obligations under this contract.

(c) Effort performed in fulfilling the total level of effort obligations specified above shall only include effort performed in direct support of this contract and shall not include time and effort expended on such things as (local travel to and from an employee's usual work location), uncompensated effort while on travel status, truncated lunch periods, work (actual or inferred) at an employee's residence or other non-work locations (except as provided in paragraph (j) below), or other time and effort which does not have a specific and direct contribution to the tasks described in Sections B and C.

(d) The level of effort for this contract shall be expended at an average rate of approximately 1,115 hours per week. It is understood and agreed that the rate of man-hours per month may fluctuate in pursuit of the technical objective,

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provided such fluctuation does not result in the use of the total man-hours of effort prior to the expiration of the term hereof, except as provided in the following paragraph.

(e) If, during the term hereof, the Contractor finds it necessary to accelerate the expenditure of direct labor to such an extent that the total man hours of effort specified above 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 fee together with an offer, setting forth a proposed level of effort, cost breakdown, and proposed 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.

(f) The Contracting Officer may, by written order, direct the Contractor to accelerate the expenditure of direct labor such that the total man 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.

(g) If the total level of effort specified in paragraph (a) above is not provided by the Contractor during the period of this contract, the Contracting Officer, at its sole discretion, shall either (i) reduce the fee of this contract as follows:

Fee Reduction = Fee((Required LOE minus Expended LOE)divided by Required LOE))

or (ii) subject to the provisions of the clause of this contract entitled "LIMITATION OF COST" (FAR 52.232-20) or "LIMITATION OF COST (FACILITIES)" (FAR 52.232-21), as applicable, require the Contractor to continue to perform the work until the total number of man hours of direct labor specified in paragraph (a) above shall have been expended, at no increase in the fee of this contract.

(h) The Contractor shall provide and maintain an accounting system, acceptable to the Administrative Contracting Officer and the Defense Contract Audit Agency (DCAA), which collects costs incurred and effort (compensated and uncompensated, if any) provided in fulfillment of the level of effort obligations of this contract. The Contractor shall indicate on each invoice the total level of effort claimed during the period covered by the invoice, separately identifying compensated effort and uncompensated effort, if any.

(i) Within 45 days after completion of the work under each separately identified period of performance hereunder, the Contractor shall submit the following information in writing to the Contracting Officer with copies to the cognizant Contract Administration Office and to the DCAA office to which vouchers are submitted: (1) the total number of man hours of direct labor expended during the applicable period; (2) a breakdown of this total showing the number of man hours expended in each direct labor classification and associated direct and indirect costs; (3) a breakdown of other costs incurred; and (4) the Contractor's estimate of the total allowable cost incurred under the contract for the period. Within 45 days after completion of the work under the contract, the Contractor shall submit, in addition, in the case of a cost overrun; (5) the amount by which the estimated cost of this contract may be reduced to recover excess funds and, in the case of an overrun in hours specified as the total level of effort; and (6) a calculation of the appropriate fee reduction in accordance with this clause. All submissions shall include subcontractor information.

(j) Notwithstanding any of the provisions in the above paragraphs, the Contractor may furnish man hours up to five percent in excess of the total man 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 fee is required.

(End of Clause)

SEA 5252.232-9104 ALLOTMENT OF FUNDS (MAY 1993)

(a) This contract is incrementally funded with respect to both cost and fee. The amount(s) presently available and allotted to this contract for payment of fee for incrementally funded contract line item number/contract subline item number (CLIN/SLIN), subject to the clause entitled "FIXED FEE" (FAR 52.216-8) or "INCENTIVE FEE" (FAR

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52.216-10), as appropriate, is specified below. The amount(s) presently available and allotted to this contract for payment of cost for incrementally funded CLINs/SLINs is set forth below. As provided in the clause of this contract entitled "LIMITATION OF FUNDS" (FAR 52.232-22), the CLINs/SLINs covered thereby, and the period of performance for which it is estimated the allotted amount(s) will cover are as follows:

ESTIMATED ITEM(S)	ALLOTTED TO COST	ALLOTTED TO FEE	PERIOD OF PERFORMANCE
4000	\$4,179,469.00	\$333,405.00	Through 29 September 2013
6000	\$ 262,656.00	N/A	Through 29 September 2013
4100	\$2,517,497.00	\$200,825.00	Through 29 September 2013
6100	\$ 707,613.00	N/A	Through 29 September 2013
4200	\$ 6,058,945.00	\$483,325.00	Through 29 March 2015
6200	\$1,458,730.00	N/A	Through 29 March 2015
7000	\$ 947,861.00	\$ 75,639.00	Through 29 September 2015
9000	\$ 461,500.00	N/A	Through 29 September 2015

(b) The parties contemplate that the Government will allot additional amounts to this contract from time to time for the incrementally funded CLINs/SLINs by unilateral contract modification, and any such modification shall state separately the amount(s) allotted for cost, the amount(s) allotted for fee, the CLINs/SLINs covered thereby, and the period of performance which the amount(s) are expected to cover.

(c) CLINs/SLINs are fully funded and performance under these CLINs/SLINs is subject to the clause of this contract entitled "LIMITATION OF COST" (FAR 52.232-20) or "LIMITATION OF COST (FACILITIES)" (FAR 52.232-21), as applicable.

(d) The Contractor shall segregate costs for the performance of incrementally funded CLINs/SLINs from the cost of performance of fully funded CLINs/SLINs.

(End of Clause)

Accounting Data

SLINID	PR Number	Amount
400001	01810099	142500.00
LLA :		
AA 97X4930 NH1C 000 77777 0 000167 2F 000000 101508078291		
600001	01810099	7500.00
LLA :		
AA 97X4930 NH1C 000 77777 0 000167 2F 000000 101508078291		

BASE Funding 150000.00  
Cumulative Funding 150000.00

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400002 03280209 50000.00  
 LLA :  
 AB 1701319 H4RJ 253 SASUB 0 068342 2D 010240 F32200000010  
 Standard Number: N0002411WX10412

400003 03280224 10000.00  
 LLA :  
 AB 1701319 H4RJ 253 SASUB 0 068342 2D 010240 F32200000010  
 Standard Number: N0002411WX10412

MOD 01 Funding 60000.00  
 Cumulative Funding 210000.00

MOD 02

400004 03496435 138000.00  
 LLA :  
 AC 1711804 8B5B 252 VU021 0 050120 2D 000000 A00000623322  
 Standard Number: N0002411RX00719/AA

400005 03547328 18500.00  
 LLA :  
 AD 97X4930 NH1C 000 77777 0 000167 2F 000000 111915214008

600002 03496435 2000.00  
 LLA :  
 AC 1711804 8B5B 252 VU021 0 050120 2D 000000 A00000623322  
 Standard Number: N0002411RX00719/AA

600003 03547328 1500.00  
 LLA :  
 AD 97X4930 NH1C 000 77777 0 000167 2F 000000 111915214008

MOD 02 Funding 160000.00  
 Cumulative Funding 370000.00

MOD 03

400006 10245821 94000.00  
 LLA :  
 AE 97X4930 NH1C 000 77777 0 000167 2F 000000 111915214418

600004 10245821 6000.00  
 LLA :  
 AE 97X4930 NH1C 000 77777 0 000167 2F 000000 111915214418

MOD 03 Funding 100000.00  
 Cumulative Funding 470000.00

MOD 04

400007 10215565 59000.00  
 LLA :  
 AF 97X4930 NH1C 000 77777 0 000167 2F 000000 111707291160

600005 10215565 4900.00  
 LLA :  
 AF 97X4930 NH1C 000 77777 0 000167 2F 000000 111707291160

MOD 04 Funding 63900.00  
 Cumulative Funding 533900.00

MOD 05

400008 10390645 96900.00  
 LLA :  
 AG 97X4930 NH1C 000 77777 0 000167 2F 000000 111722002510



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400009 10400902 85000.00  
 LLA :  
 AH 97X4930 NH1C 000 77777 0 000167 2F 000000 111707291420

400010 10474081 36000.00  
 LLA :  
 AJ 97X4930 NH1C 000 77777 0 000167 2F 000000 111707292094

600006 10390645 3100.00  
 LLA :  
 AG 97X4930 NH1C 000 77777 0 000167 2F 000000 111722002510

600007 10400902 5000.00  
 LLA :  
 AH 97X4930 NH1C 000 77777 0 000167 2F 000000 111707291420

600008 10474081 4000.00  
 LLA :  
 AJ 97X4930 NH1C 000 77777 0 000167 2F 000000 111707292094

MOD 05 Funding 230000.00  
 Cumulative Funding 763900.00

MOD 06

400011 10617833 566800.00  
 LLA :  
 AK 1761811 H232 253 WAWRH 0 068342 2D 000000 200795000000 N0002406WX20734/AC  
 Standard Number: N0002406WX20734/AC

400012 10679704 116300.00  
 LLA :  
 AL 1711319 H5YT 255 SB450 0 050120 2D 000000 A00000674378 N0002411RX01284/AA PR#1400  
 182342  
 Standard Number: N0002411RX01284/AA PR#1400182342

400013 10628487 220000.00  
 LLA :  
 AM 97X4930 NH1C 000 77777 0 000167 2F 000000 111707291294

600009 10617833 18200.00  
 LLA :  
 AK 1761811 H232 253 WAWRH 0 068342 2D 000000 200795000000 N0002406WX20734/AC  
 Standard Number: N0002406WX20734/AC

600010 10679704 3700.00  
 LLA :  
 AL 1711319 H5YT 255 SB450 0 050120 2D 000000 A00000674378 N0002411RX01284/AA PR#1400  
 182342  
 Standard Number: N0002411RX01284/AA PR#1400182342

600011 10628487 15000.00  
 LLA :  
 AM 97X4930 NH1C 000 77777 0 000167 2F 000000 111707291294

MOD 06 Funding 940000.00  
 Cumulative Funding 1703900.00

MOD 07

400014 10804679 65000.00  
 LLA :  
 AN 97X4930 NH1C 000 77777 0 000167 2F 000000 111707281804

600012 10804679 10000.00  
 LLA :  
 AN 97X4930 NH1C 000 77777 0 000167 2F 000000 111707281804

MOD 07 Funding 75000.00

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Cumulative Funding 1778900.00

MOD 08

400015 10886830 25000.00  
 LLA :  
 AP 97X4930 NH1C 000 77777 0 000167 2F 000000 111915214607

600013 10886830 3000.00  
 LLA :  
 AP 97X4930 NH1C 000 77777 0 000167 2F 000000 111915214607

MOD 08 Funding 28000.00  
 Cumulative Funding 1806900.00

MOD 09

400016 11105045 115000.00  
 LLA :  
 AQ 1711319 84RX 255 V5T00 0 050120 2D 000000 A00000713183  
 Standard Number: N0002411RX01630/AA

600014 11105045 5000.00  
 LLA :  
 AQ 1711319 84RX 255 V5T00 0 050120 2D 000000 A00000713183  
 Standard Number: N0002411RX01630/AA

MOD 09 Funding 120000.00  
 Cumulative Funding 1926900.00

MOD 10

400017 11578781 25000.00  
 LLA :  
 AR 97X4930 NH1C 000 77777 0 000167 2F 000000 111913240801

600015 11578781 400.00  
 LLA :  
 AR 97X4930 NH1C 000 77777 0 000167 2F 000000 111913240801

MOD 10 Funding 25400.00  
 Cumulative Funding 1952300.00

MOD 11

400018 11901382 130000.00  
 LLA :  
 AK 1761811 H232 253 WAWRH 0 068342 2D 000000 200795000000 N0002406WX20734/AC  
 Standard Number: N0002406WX20734/AC

400019 11921489 50000.00  
 LLA :  
 AM 97X4930 NH1C 000 77777 0 000167 2F 000000 111707291294

400020 11921516 25000.00  
 LLA :  
 AM 97X4930 NH1C 000 77777 0 000167 2F 000000 111707291294

MOD 11 Funding 205000.00  
 Cumulative Funding 2157300.00

MOD 12

400021 12217418 336300.00  
 LLA :  
 AS 97X4930 NH1C 000 77777 0 000167 2F 000000 111508039720

400022 12249412 165000.00

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LLA :  
AT 97X4930 NH1D 000 77777 0 061331 2F 000000 31T01110ARMY  
Standard Number: N6133111RX00071/AA

600016 12217418 8700.00

LLA :  
AS 97X4930 NH1C 000 77777 0 000167 2F 000000 111508039720

600017 12249412 15000.00

LLA :  
AT 97X4930 NH1D 000 77777 0 061331 2F 000000 31T01110ARMY  
Standard Number: N6133111RX00071/AA

MOD 12 Funding 525000.00  
Cumulative Funding 2682300.00

MOD 13

400023 12293011 180000.00

LLA :  
AU 97X4930 NH1C 000 77777 0 000167 2F 000000 111730811401

400024 12293056 50000.00

LLA :  
AV 97X4930 NH1C 000 77777 0 000167 2F 000000 111730811801

MOD 13 Funding 230000.00  
Cumulative Funding 2912300.00

MOD 14

400025 12365733 15000.00

LLA :  
AW 97X4930 NH1C 000 77777 0 000167 2F 000000 111750231340

400026 12365741 25000.00

LLA :  
AX 97X4930 NH1C 000 77777 0 000167 2F 000000 111707291040

400027 12375926 30000.00

LLA :  
AY 1711319 H4RJ 255 SB397 0 050120 2D 000000 A00000652920  
Standard Number: N0002411RX01016/AA PR#1400178822

400028 12375931 200000.00

LLA :  
AY 1711319 H4RJ 255 SB397 0 050120 2D 000000 A00000652920  
Standard Number: N0002411RX01016/AA PR#1400178822

400029 12375935 100000.00

LLA :  
AZ 1711611 8560 252 SB450 0 050120 2D 000000 A00000820656  
Standard Number: N0002411RX02663/AA PR#1400206424

MOD 14 Funding 370000.00  
Cumulative Funding 3282300.00

MOD 15

400030 1300244965 50000.00

LLA :  
BA 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001021768  
Standard Number: N0002412WX03526/AA

MOD 15 Funding 50000.00  
Cumulative Funding 3332300.00

MOD 16

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400031 1300249385 25000.00  
 LLA :  
 BB 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001054017  
 Standard Number: N0002412WX03526/AA

MOD 16 Funding 25000.00  
 Cumulative Funding 3357300.00

MOD 17

400032 1300253450 20000.00  
 LLA :  
 BC 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001082263

MOD 17 Funding 20000.00  
 Cumulative Funding 3377300.00

MOD 18

400033 1300253594 160000.00  
 LLA :  
 BD 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001083592

400034 1300261058 156000.00  
 LLA :  
 BE 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001135108

600018 1300253594 10000.00  
 LLA :  
 BD 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001083592

600019 1300261058 75000.00  
 LLA :  
 BE 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001135108

MOD 18 Funding 401000.00  
 Cumulative Funding 3778300.00

MOD 19

400035 1300260945 52574.00  
 LLA :  
 BF 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001134518

600020 1300260945 1656.00  
 LLA :  
 BF 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001134518

MOD 19 Funding 54230.00  
 Cumulative Funding 3832530.00

MOD 20

400036 1300273298 84000.00  
 LLA :  
 BG 97X4930 NH1C 251 77777 0 050120 2F 000000 A00001218248

600021 1300273298 16000.00  
 LLA :  
 BG 97X4930 NH1C 251 77777 0 050120 2F 000000 A00001218248

MOD 20 Funding 100000.00  
 Cumulative Funding 3932530.00

MOD 21

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400037 1300276954 455000.00  
 LLA :  
 BH 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001242646

400038 1300274744 154000.00  
 LLA :  
 BJ 1721804 8B5B 252 VU021 0 050120 2D 000000 A00001227096

600022 1300276954 20000.00  
 LLA :  
 BH 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001242646

600023 1300274744 21000.00  
 LLA :  
 BJ 1721804 8B5B 252 VU021 0 050120 2D 000000 A00001227096

MOD 21 Funding 650000.00  
 Cumulative Funding 4582530.00

MOD 22

400039 1300278745 35000.00  
 LLA :  
 BK 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001253732

400040 1300280580 75000.00  
 LLA :  
 BL 1721804 8B5B 252 VU021 0 050120 2D 000000 A00001266329

600024 1300278745 3000.00  
 LLA :  
 BK 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001253732

MOD 22 Funding 113000.00  
 Cumulative Funding 4695530.00

MOD 23

400041 1300273021 67000.00  
 LLA :  
 BM 1721319 H4RJ 255 SB397 0 050120 2D 000000 A10001216108

400042 1300286742 10000.00  
 LLA :  
 BN 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001298954

600025 1300273021 3000.00  
 LLA :  
 BP 1721319 H4RJ 252 SB397 0 050120 2D 000000 A10001216108

MOD 23 Funding 80000.00  
 Cumulative Funding 4775530.00

MOD 24

410001 1300289894 274000.00  
 LLA :  
 BQ 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001313859

610001 1300289894 26000.00  
 LLA :  
 BQ 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001313859

MOD 24 Funding 300000.00  
 Cumulative Funding 5075530.00

MOD 25 Funding 0.00  
 Cumulative Funding 5075530.00

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MOD 26

410002 1300306989 75000.00  
 LLA :  
 BR 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001421381

MOD 26 Funding 75000.00  
 Cumulative Funding 5150530.00

MOD 27

410003 1300308671 195000.00  
 LLA :  
 BS 1721319 H4RJ 253 SB397 0 050120 2D 000000 C30001435862

610002 1300308671 5000.00  
 LLA :  
 BS 1721319 H4RJ 252 SB397 0 050120 2D 000000 C30001435862

MOD 27 Funding 200000.00  
 Cumulative Funding 5350530.00

MOD 28

410004 1300311423 200000.00  
 LLA :  
 BT 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001462398

410005 1300311424 70000.00  
 LLA :  
 BU 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001462453

610003 1300311424 5000.00  
 LLA :  
 BV 97X4930 NH1C 252 77777 0 050120 2F 000000 A00001462453

MOD 28 Funding 275000.00  
 Cumulative Funding 5625530.00

MOD 29

410006 1300327741 80000.00  
 LLA :  
 BW 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001566656

410008 1300331959 88052.00  
 LLA :  
 BY 97X4930 NH1C 253 77777 0 050120 2F 000000 A10001594440

610004 1300331959 5583.00  
 LLA :  
 BY 97X4930 NH1C 253 77777 0 050120 2F 000000 A10001594440

MOD 29 Funding 173635.00  
 Cumulative Funding 5799165.00

MOD 30

410009 1300327097 209270.00  
 LLA :  
 BX 1721611 H232 252 SB450 0 050120 2D 000000 A10001564064

410010 1300327098 380000.00  
 LLA :  
 BZ 1721611 H232 252 SB450 0 050120 2D 000000 A10001564067

610005 1300327098 20000.00

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LLA :  
BZ 1721611 H232 252 SB450 0 050120 2D 000000 A10001564067

610006 1300327097 6030.00

LLA :  
BX 1721611 H232 252 SB450 0 050120 2D 000000 A10001564064

MOD 30 Funding 615300.00  
Cumulative Funding 6414465.00

MOD 31

410011 1300333266 60000.00

LLA :  
CA 97X4930 NH1C 253 77777 0 050120 2F 000000 A00001605777

410012 1300340718 145000.00

LLA :  
CB 97X4930 NH1C 253 77777 0 050120 2F 000000 A00001657646

410013 1300340993 40000.00

LLA :  
CC 97X4930 NH1C 253 77777 0 050120 2F 000000 A00001659484

410014 1300344621 190000.00

LLA :  
CD 97X4930 NH1C 253 77777 0 050120 2F 000000 A00001684320

610007 1300340718 5000.00

LLA :  
CE 97X4930 NH1C 252 77777 0 050120 2F 000000 A00001657646

MOD 31 Funding 440000.00  
Cumulative Funding 6854465.00

MOD 32

410015 1300329012 300000.00

LLA :  
CF 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001575327

610008 1300329012 585000.00

LLA :  
CF 97X4930 NH1C 255 77777 0 050120 2F 000000 A00001575327

MOD 32 Funding 885000.00  
Cumulative Funding 7739465.00

MOD 33

410016 1300349518 50000.00

LLA :  
CG 97X4930 NH1C 253 77777 0 050120 2F 000000 A00001722338

610009 1300349518 5000.00

LLA :  
CH 97X4930 NH1C 252 77777 0 050120 2F 000000 A10001722338

MOD 33 Funding 55000.00  
Cumulative Funding 7794465.00

MOD 34

410017 1300357306 80000.00

LLA :  
CJ 97X4930 NH1C 253 77777 0 050120 2F 000000 A00001776096

410018 1300363396 282000.00

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LLA :  
CM 97X4930 NH1C 253 77777 0 050120 2F 000000 A00001812490

610010 1300360575 25000.00

LLA :  
CK 97X4930 NH1C 252 77777 0 050120 2F 000000 A00001795951

610011 1300357306 20000.00

LLA :  
CL 97X4930 NH1C 252 77777 0 050120 2F 000000 A00001776096

MOD 34 Funding 407000.00  
Cumulative Funding 8201465.00

MOD 35

420001 1300360654 410000.00

LLA :  
CN 97X4930 NH1C 253 77777 0 050120 2F 000000 A00001795930

620001 1300360654 40000.00

LLA :  
CP 97X4930 NH1C 252 77777 0 050120 2F 000000 A00001795930

MOD 35 Funding 450000.00  
Cumulative Funding 8651465.00

MOD 36

420002 130038758500001 275000.00

LLA :  
CQ 97X4930 NH1C 253 77777 0 050120 2F 000000 A00002003704

420003 130038647100001 200000.00

LLA :  
CR 1731319 H4RJ 252 SB397 0 050120 2D 000000 A00001990892

420004 130038593400001 192000.00

LLA :  
CS 1731611 H232 251 SB450 0 050120 2D 000000 A00001986104

420005 130038654200001 40000.00

LLA :  
CT 1731319 H4RJ 252 SB397 0 050120 2D 000000 A00001991329

420006 130038726800001 50000.00

LLA :  
CU 1731319 H4RJ 251 SB397 0 050120 2D 000000 A00002000706

420007 130038723900001 100000.00

LLA :  
CV 1731319 H4RJ 251 SB397 0 050120 2D 000000 A00002001253

420008 130038650500001 10000.00

LLA :  
CW 1731319 H4RJ 252 SB397 0 050120 2D 000000 A00001991608

420009 130038647200001 545000.00

LLA :  
CX 1731611 H232 252 SB450 0 050120 2D 000000 A00001990893

MOD 36 Funding 1412000.00  
Cumulative Funding 10063465.00

MOD 37

420010 130039977800001 100000.00

LLA :  
CY 1731319 H4RJ 253 SB397 0 050120 2D 000000 A00002095316



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420011 130040366400001 45000.00  
 LLA :  
 CZ 97X4930 NH1C 253 77777 0 050120 2F 000000 A00002129057

MOD 37 Funding 145000.00  
 Cumulative Funding 10208465.00

MOD 38

420012 130041141300001 600000.00  
 LLA :  
 DA 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002188332

620002 130041141300002 350000.00  
 LLA :  
 DA 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002188332

MOD 38 Funding 950000.00  
 Cumulative Funding 11158465.00

MOD 39

420013 130041088100001 120000.00  
 LLA :  
 DB 97X4930 NH1C 252 77777 0 050120 2F 000000 A00002185051

420014 130040856800003 135000.00  
 LLA :  
 DC 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002169127

420015 130041089200001 190000.00  
 LLA :  
 DD 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002184970

620003 130040856800004 40000.00  
 LLA :  
 DC 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002169127

620004 130041089200002 20000.00  
 LLA :  
 DD 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002184970

MOD 39 Funding 505000.00  
 Cumulative Funding 11663465.00

MOD 40

420016 130041528700001 450000.00  
 LLA :  
 DE 1741319 84RJ 252 V73R0 0 050120 2D 000000 A00002216393

420017 130041733600001 69000.00  
 LLA :  
 DF 2142040 0000 U4 2014 0 8 8140 6 33461D S700 25GY L5 1JLK NA 22079 0000873 022079

620005 130041528700002 35000.00  
 LLA :  
 DE 1741319 84RJ 252 V73R0 0 050120 2D 000000 A00002216393

MOD 40 Funding 554000.00  
 Cumulative Funding 12217465.00

MOD 41

420018 130041507400001 90000.00  
 LLA :  
 DG 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002214558

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420019 130042307800001 105000.00  
 LLA :  
 DH 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002277877

420020 130042910000001 196500.00  
 LLA :  
 DJ 97X4930 NH1C 253 77777 0 050120 2F 000000 A00002317674

620006 130042910000002 18500.00  
 LLA :  
 DK 97X4930 NH1C 253 77777 0 050120 2F 000000 A10002317674

MOD 41 Funding 410000.00  
 Cumulative Funding 12627465.00

MOD 42 Funding 0.00  
 Cumulative Funding 12627465.00

MOD 43

420021 130043925000001 275000.00  
 LLA :  
 DL 1741611 H232 252 SB450 0 050120 2D 000000 A00002392071

420022 130043925700001 700000.00  
 LLA :  
 DM 1741611 H232 252 SB450 0 050120 2D 000000 A00002392140

420023 130043569200001 919770.00  
 LLA :  
 DN 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002364195

620007 130043925000002 2000.00  
 LLA :  
 DL 1741611 H232 252 SB450 0 050120 2D 000000 A00002392071

620008 130043925700002 60000.00  
 LLA :  
 DM 1741611 H232 252 SB450 0 050120 2D 000000 A00002392140

620009 130043569200002 798230.00  
 LLA :  
 DN 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002364195

MOD 43 Funding 2755000.00  
 Cumulative Funding 15382465.00

MOD 44

420024 130044449800001 125000.00  
 LLA :  
 DP 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002425063

420025 130044467800001 135000.00  
 LLA :  
 DQ 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002425023

420026 130044560400001 50000.00  
 LLA :  
 DR 97X4930 NH1C 252 77777 0 050120 2F 000000 A00002432180

420027 130044469100001 115000.00  
 LLA :  
 DS 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002425278

420028 130044460600001 70000.00  
 LLA :  
 DT 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002424949

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620010 130044449800002 50000.00  
 LLA :  
 DP 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002425063

620011 130044467800002 15000.00  
 LLA :  
 DQ 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002425023

620012 130044469100002 10000.00  
 LLA :  
 DS 1741319 H4RJ 252 SB397 0 050120 2D 000000 A00002425278

MOD 44 Funding 570000.00  
 Cumulative Funding 15952465.00

MOD 45 Funding 0.00  
 Cumulative Funding 15952465.00

MOD 46

420029 130046206300001 48000.00  
 LLA :  
 DU 97X4930 NH1C 252 77777 0 050120 2F 000000 A00002590715

620013 130046206300002 2000.00  
 LLA :  
 DV 97X4930 NH1C 253 77777 0 050120 2F 000000 A00002590715

MOD 46 Funding 50000.00  
 Cumulative Funding 16002465.00

MOD 47

420030 130046538200001 182000.00  
 LLA :  
 DW 1751319 H4RL 255 SB397 0 050120 2D 000000 A00002619975

620014 130046538200002 18000.00  
 LLA :  
 DW 1751319 H4RL 255 SB397 0 050120 2D 000000 A00002619975

MOD 47 Funding 200000.00  
 Cumulative Funding 16202465.00

MOD 48

700001 130047701500001 64000.00  
 LLA :  
 EA 1751319 H4RL 255 SB397 0 050120 2D 000000 A00002717169

700002 130047709600001 558000.00  
 LLA :  
 DX 1751319 H4RL 255 SB397 0 050120 2D 000000 A00002717700

700003 130047709700001 195500.00  
 LLA :  
 DY 1751319 H4RL 255 SB397 0 050120 2D 000000 A00002717701

700004 130047709800001 182000.00  
 LLA :  
 DZ 1751319 H4RL 255 SB397 0 050120 2D 000000 A00002717722

900001 130047701500002 6000.00  
 LLA :  
 EA 1751319 H4RL 255 SB397 0 050120 2D 000000 A00002717169

900002 130047709600002 417000.00  
 LLA :  
 DX 1751319 H4RL 255 SB397 0 050120 2D 000000 A00002717700

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900003 130047709700002 19500.00  
 LLA :  
 DY 1751319 H4RL 255 SB397 0 050120 2D 000000 A00002717701

900004 130047709800002 18000.00  
 LLA :  
 DZ 1751319 H4RL 255 SB397 0 050120 2D 000000 A00002717722

MOD 48 Funding 1460000.00  
 Cumulative Funding 17662465.00

MOD 49

700005 130048624400001 24000.00  
 LLA :  
 EB 97X4930 NH1C 253 77777 0 050120 2F 000000 A00002784708

900005 130048624400002 1000.00  
 LLA :  
 EB 97X4930 NH1C 253 77777 0 050120 2F 000000 A00002784708

MOD 49 Funding 25000.00  
 Cumulative Funding 17687465.00

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## SECTION H SPECIAL CONTRACT REQUIREMENTS

### NOTIFICATION CONCERNING DETERMINATION OF SMALL BUSINESS SIZE STATUS

For the purposes of FAR clauses 52.219-6, NOTICE OF TOTAL SMALL BUSINESS SET-ASIDE, 52.219-3, NOTICE OF TOTAL HUBZONE SET-ASIDE, 52.219-18, NOTIFICATION OF COMPETITION LIMITED TO ELIGIBLE 8(A) CONCERNS, and 52.219-27 NOTICE OF TOTAL SERVICE-DISABLED VETERAN-OWNED SMALL BUSINESS SET-ASIDE, the determination of whether a small business concern is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the size standards in this solicitation, and further, meets the definition of a HUBZone small business concern, a small business concern certified by the SBA for participation in the SBAs 8(a) program, or a service disabled veteran-owned small business concern, as applicable, shall be based on the status of said concern at the time of award of the SeaPort-e MACs and as further determined in accordance with Special Contract Requirement H-19.

#### 52.219-6 NOTICE OF TOTAL SMALL BUSINESS SET-ASIDE (JUNE 2003)

- (a) Definition. "Small business concern" as used in this clause, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the size standards in this solicitation.
- (b) General. (1) Offers are solicited only from small business concerns. Offers received from concerns that are not small business concerns shall be considered nonresponsive and will be rejected. (2) Any award resulting from this solicitation will be made to a small business concern.
- (c) Agreement. A small business concern submitting an offer in its own name shall furnish, in performing the contract, only end items manufactured or produced by small business concerns in the United States or its outlying areas. If this procurement is processed under simplified acquisition procedures and the total amount of this contract does not exceed \$25,000, a small business concern may furnish the product of any domestic firm. This paragraph does not apply to construction or service contracts.

#### HQ C-2-0037 ORGANIZATIONAL CONFLICT OF INTEREST (NAVSEA) (JUL 2000)

- (a) "Organizational Conflict of Interest" means that because of other activities or relationships with other persons, a person is unable or potentially unable to render impartial assistance or advice to the Government, or the person's objectivity in performing the contract work is or might be otherwise impaired, or a person has an unfair competitive advantage. "Person" as used herein includes Corporations, Partnerships, Joint Ventures, and other business enterprises.
- (b) The Contractor warrants that to the best of its knowledge and belief, and except as otherwise set forth in the contract, the Contractor does not have any organizational conflict of interest(s) as defined in paragraph (a).
- (c) It is recognized that the effort to be performed by the Contractor under this contract may create a potential organizational conflict of interest on the instant contract or on a future acquisition. In order to avoid this potential conflict of interest, and at the same time to avoid prejudicing the best interest of the Government, the right of the Contractor to participate in future procurement of equipment and/or services that are the subject of any work under this contract shall be limited as described below in accordance with the requirements of FAR 9.5.
- (d) (1) The Contractor agrees that it shall not release, disclose, or use in any way that would permit or result in disclosure to any party outside the Government any information provided to the Contractor by the Government during or as a result of performance of this contract. Such information includes, but is not limited to, information submitted to the Government on a confidential basis by other persons. Further, the prohibition against release of Government provided information extends to cover such information whether or not in its original form, e.g., where the information has been included in Contractor generated work or where it is discernible from materials incorporating or based upon such information. This prohibition shall not expire after a given period of time.

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(2) The Contractor agrees that it shall not release, disclose, or use in any way that would permit or result in disclosure to any party outside the Government any information generated or derived during or as a result of performance of this contract. This prohibition shall expire after a period of three years after completion of performance of this contract.

(3) The prohibitions contained in subparagraphs (d)(1) and (d)(2) shall apply with equal force to any affiliate of the Contractor, any subcontractor, consultant, or employee of the Contractor, any joint venture involving the Contractor, any entity into or with which it may merge or affiliate, or any successor or assign of the Contractor. The terms of paragraph (f) of this Special Contract Requirement relating to notification shall apply to any release of information in contravention of this paragraph (d).

(e) The Contractor further agrees that, during the performance of this contract and for a period of three years after completion of performance of this contract, the Contractor, any affiliate of the Contractor, any subcontractor, consultant, or employee of the Contractor, any joint venture involving the Contractor, any entity into or with which it may subsequently merge or affiliate, or any other successor or assign of the Contractor, shall not furnish to the United States Government, either as a prime contractor or as a subcontractor, or as a consultant to a prime contractor or subcontractor, any system, component or services, which is the subject of the work to be performed under this contract. This exclusion does not apply to any recompetition for those systems, components or services furnished pursuant to this contract. As provided in FAR 9.505-2, if the Government procures the system, component, or services on the basis of work statements growing out of the effort performed under this contract, from a source other than the contractor, subcontractor, affiliate, or assign of either, during the course of performance of this contract or before the three year period following completion of this contract has lapsed, the Contractor may, with the authorization of the cognizant Contracting Officer, participate in a subsequent procurement for the same system, component, or service. In other words, the Contractor may be authorized to compete for procurement(s) for systems, components or services subsequent to an intervening procurement.

(f) The Contractor agrees that, if after award, it discovers an actual or potential organizational conflict of interest, it shall make immediate and full disclosure in writing to the Contracting Officer. The notification shall include a description of the actual or potential organizational conflict of interest, a description of the action which the Contractor has taken or proposes to take to avoid, mitigate, or neutralize the conflict, and any other relevant information that would assist the Contracting Officer in making a determination on this matter. Notwithstanding this notification, the Government may terminate the contract for the convenience of the Government if determined to be in the best interest of the Government.

(g) Notwithstanding paragraph (f) above, if the Contractor was aware, or should have been aware, of an organizational conflict of interest prior to the award of this contract or becomes, or should become, aware of an organizational conflict of interest after award of this contract and does not make an immediate and full disclosure in writing to the Contracting Officer, the Government may terminate this contract for default.

(h) If the Contractor takes any action prohibited by this requirement or fails to take action required by this requirement, the Government may terminate this contract for default.

(i) The Contracting Officer's decision as to the existence or nonexistence of an actual or potential organizational conflict of interest shall be final.

(j) Nothing in this requirement is intended to prohibit or preclude the Contractor from marketing or selling to the United States Government its product lines in existence on the effective date of this contract; nor, shall this requirement preclude the Contractor from participating in any research and development or delivering any design development model or prototype of any such equipment. Additionally, sale of catalog or standard commercial items are exempt from this requirement.

(k) The Contractor shall promptly notify the Contracting Officer, in writing, if it has been tasked to evaluate or advise the Government concerning its own products or activities or those of a competitor in order to ensure proper safeguards exist to guarantee objectivity and to protect the Government's interest.

(l) The Contractor shall include this requirement in subcontracts of any tier which involve access to information or situations/conditions covered by the preceding paragraphs, substituting "subcontractor" for "contractor" where appropriate.

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(m) The rights and remedies described herein shall not be exclusive and are in addition to other rights and remedies provided by law or elsewhere included in this contract.

(n) Compliance with this requirement is a material requirement of this contract.

(End of Clause)

CAR-H09 Performance-Based Acquisition Evaluation Procedures for a SeaPort e Task Order (MAR 2006)  
(NSWCCD)

(a) Introduction: The contractor's performance on this task order will be evaluated by the Government, in accordance with this task order clause. The first evaluation will cover the period ending twelve months after the date of task order award with successive evaluations being performed for each twelve-month period thereafter until the contractor completes performance under the task order. Based on the evaluation results, the PCO will assign an overall performance rating in accordance with paragraph (b) of this clause. The purpose of the evaluation is to determine remedies that may be invoked due to "Unsatisfactory" performance. If the PCO assigns an "Unsatisfactory" performance rating for the period evaluated, the PCO may take unilateral action, in accordance with clause 52.246-5 entitled "Inspection of Services-Cost Reimbursement", dated Apr 1984, in Section E of the base contract, to provide for a fee reduction covering the performance period evaluated. This clause provides the basis for evaluation of the contractor's performance and for determining if the fee amount should be reduced due to "Unsatisfactory" performance.

(b) Performance Ratings: The Government will evaluate the contractor's performance of the Statement of Work under the task order for each twelve month period of performance, using the measurable performance standards set forth in the Performance Requirements Summary Table in the SOW, or elsewhere in the task order, and the PCO will assign one of the following ratings:

- (1) Excellent
- (2) Very Good
- (3) Satisfactory
- (4) Unsatisfactory

The standards associated with these ratings are given in the following Table 1.

Table 1: Overall Performance Ratings

For The Evaluation Period

Overall Performance Rating	Standard
Excellent	"Excellent" ratings for all performance evaluation criteria.
Very Good	A combination of "Excellent" and "Satisfactory" ratings determined by the PCO to exceed Satisfactory" overall.
Satisfactory	A minimum of "Satisfactory" ratings for all performance evaluation criteria.
Unsatisfactory	A rating of "Unsatisfactory" for one or more performance evaluation criteria.

(c) Evaluation Objective: The purpose of the evaluation and the inclusion of a remedy to the Government for unsatisfactory contractor performance under this task order is to ensure that the Government receives at least "Satisfactory" overall performance.

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(d) Performance Evaluation Criteria: The contractor's performance will be evaluated on an annual basis using the criteria and standards provided for each task objective in the Performance Requirements Summary Table, and considering the criterion in Tables 2 through 4 of this task order clause.

(e) Organization: The performance evaluation organization consists of the Procuring Contracting Officer (PCO), who will serve as the Evaluation Official, and the Task Order Manager (ToM).

(1) ToM: The ToM will provide ongoing performance monitoring, evaluate task performance based on the task order Performance Requirements Summary, prepare the evaluation report, including a recommended overall performance rating, and submit the report to the PCO for final decision within thirty days after the end of the evaluation period. The ToM will maintain the written records of the contractor's performance so that a fair and accurate evaluation is made.

(2) Procuring Contracting Officer (PCO): The PCO is responsible for properly administering the performance evaluation process, maintaining the official performance evaluation file, and making the decision about the overall performance rating and whether to reduce the fee if performance is rated as unsatisfactory.

(f) Evaluation Schedule: Each performance evaluation will cover the previous twelve months of performance. The Government will evaluate all work under the task order performed by the contractor during the twelve-month period. Following each evaluation period, the PCO (or Contract Specialist if so designated by the PCO) and the ToM will hold a meeting with the contractor's Senior Technical Representative to review performance under the task order during the previous twelve months, including overall trends, specific problem areas, if any, and their resolution. Other Government and contractor personnel may also participate as deemed appropriate.

(g) Contractor's Self-Evaluation: The contractor may also submit a Self-Evaluation Report for consideration. The report must include an overall performance rating for the task order, covering the evaluation period, and may include whatever information the contractor deems relevant to support that rating. The report shall not exceed two (2) pages in length.

(h) Performance Evaluation: The PCO will make the decision on the overall performance rating for the work performed under the task order within thirty days after receipt of the evaluation report from the ToM. The decision will be based upon the ToM's recommendations, the contractor's comments, including any Self-Evaluation Report, and any other information deemed relevant by the PCO. The PCO shall resolve disagreements between the ToM's recommendations and the contractor's comments/report regarding the evaluation. The PCO will provide a copy of the evaluation report, including the overall rating, to the contractor within five working days after completion of the evaluation.

(i) Contractor's Review of the Evaluation Report: Contractors shall be given a minimum of 15 calendar days to submit comments, rebut statements, or provide additional information. The PCO shall consider the contractor's submission and respond as appropriate. Although the PCO will consider the contractor's comments, rebuttals, or additional information, the PCO may, or may not, change the overall rating. The decision to change the rating based on contractor input at this stage is solely at the discretion of the PCO.

(j) This performance evaluation does not replace any other requirement for evaluating contractor performance that may be required by the base contract, such as a Contractor Performance Assessment Reporting System (CPARS) report, or a Task Order Performance Evaluation (TOPE).

TABLE 2: TASK PERFORMANCE EVALUATION CRITERIA AND STANDARDS

Criterion	UNSATISFACTORY	SATISFACTORY	EXCELLENT
Task Performance	Work product fails to meet Acceptable Quality Levels (AQLs) defined in Performance Requirements Summary Table (see SOW or elsewhere in the Task Order).	Work product routinely meets Acceptable Quality Levels (AQLs) defined in Performance Requirements Summary Table (see SOW or elsewhere in the Task Order).	Work product frequently exceeds Acceptable Quality Levels (AQLs) defined in Performance Requirements Summary Table (see SOW or elsewhere in the Task Order).



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Staffing	Contractor provides marginally qualified or unqualified personnel. Lapses in coverage occur regularly.	Contractor provides qualified personnel. Lapses in coverage may occasionally occur and are managed per individual task order policy.	Contractor provides highly qualified personnel. Contractor reassigns personnel to ensure proper coverage. Actual lapses in coverage occur very rarely, if ever, and are managed per individual task order policy. Contractor ensures staff training remains current.
Timeliness	Contractor frequently misses deadlines, schedules, or is slow to respond to government requests or is non-responsive to government requests.	Contractor routinely meets deadlines, schedules, and responds quickly to government requests.	Contractor always meets deadlines, schedules, and responds immediately to government requests.
Customer Satisfaction	Fails to meet customer expectations	Meets customer expectations.	Exceeds customer expectations.

TABLE 3: CONTRACT MANAGEMENT PERFORMANCE EVALUATION CRITERIA AND STANDARDS

CRITERION	UNSATISFACTORY	SATISFACTORY	EXCELLENT
Problem Resolution	Problems are unresolved, repetitive, or take excessive government effort to resolve.	Problems are resolved quickly with minimal government involvement.	Problems are non-existent or the contractor takes corrective action without government involvement.
Responsiveness	Contractor's management is unresponsive to government requests and concerns.	Contractor's management is responsive to government requests and concerns.	Contractor's management takes proactive approach in dealing with government representatives and anticipates Government concerns.
Communications	Contractor often fails to communicate with government in an effective and timely manner.	Contractor routinely communicates with government in an effective and timely manner.	Contractor takes a proactive approach such that communications are almost always clear, effective, and timely.

TABLE 4: COST EFFICIENCY PERFORMANCE EVALUATION CRITERIA AND STANDARDS

CRITERION	UNSATISFACTORY	SATISFACTORY	EXCELLENT
Cost Management	Contractor routinely fails to complete the effort within the originally agreed to estimated cost, i.e. cost overruns frequently occur.	Contractor routinely completes the effort within the originally agreed to estimated cost. Contractor provides measures for controlling all costs at estimated costs. Funds and resources are generally	Reductions in direct costs to the Government below contract estimated costs are noteworthy. Contractor provides detailed cost analysis and recommendations to Government for resolution of problems

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		used in a cost-effective manner. No major resource management problems are apparent.	identified. Funds and resources are optimally used to provide the maximum benefit for the funds and resources available. Documented savings are apparent.
Cost Reporting	Reports are generally late, inaccurate incomplete or unclear.	Reports are timely, accurate, complete and clearly written. Problems and/or trends are addressed, and an analysis is also submitted.	Reports are clear, accurate, and pro-active. Problems and/or trends are addressed thoroughly, and the contractor's recommendations and/or corrective plans are implemented and effective.

#### CAR H11 – CONTRACTOR PERSONNEL SECURITY REQUIREMENTS (JUL 2009)

In accordance with SECNAV M-5510.30 Chapters 5 and 6, all Contractor personnel that require access to Department of Navy (DON) information systems and/or work on-site are designated Non-Critical Sensitive/IT-II positions, which require an open investigation or favorable adjudicated National Agency Check (NACLC) by the Industrial Security Clearance Office (DISCO). Investigations should be completed using the SF- 85 Form and the SF-87 finger print card. An interim clearance can be granted by the company Security Officer and recorded in the Joint Personnel Adjudication System (JPAS). An open investigation or favorable adjudication is required prior to issuance of a Common Access Card (CAC) card or a badge providing access to NSWCCD sites and buildings. If an unfavorable adjudication is determined by DISCO all access will terminated.

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## SECTION I CONTRACT CLAUSES

### 52.217-9 Option to Extend the Term of the Contract (Mar 2000)

(a) The Government may extend the term of this contract by written notice to the Contractor before the end of the period of performance; provided that the Government gives the Contractor a preliminary written notice of its intent to extend at least 30 days before the contract expires. The preliminary notice does not commit the Government to an extension.

(b) If the Government exercises this option, the extended contract shall be considered to include this option clause.

(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed four years.

(End of Clause)

### 52.222-2 PAYMENT FOR OVERTIME PREMIUMS (JUL 1990)

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

(End of Clause)

### CAR-I18 TECHNICAL INSTRUCTIONS (DEC 2001)

#### (1) Directions to the Contractor

(a) Performance of the work hereunder may be subject to written technical instructions signed by the Task Order Manager. As used herein, technical instructions are defined to include the following:

(1) Directions to the Contractor that suggest pursuit of certain lines of inquiry, shift work emphasis, fill in details or otherwise serve to accomplish the statement of work.

(2) Guidelines to the Contractor that assist in the interpretation of drawings, specifications or technical portions of work description.

(b) Technical instructions must be within the general scope of work stated in the task order. Technical instructions may not be used to :

(1) assign additional work under the task order;

(2) direct a change as defined in the "Changes" clause of the base contract;

(3) increase or decrease the contract price or estimated amount (including fee), as applicable,

the level of effort, or the time required for task order performance; or

(4) change any of the terms, conditions or specifications of the task order.

(c) If, in the opinion of the Contractor, any technical instruction calls for effort outside the scope of the task order or is inconsistent with this requirement, the Contractor shall notify the Contracting Officer in writing within ten (10) working days after the receipt of any such instruction. The Contractor shall not proceed with the work affected by the technical instruction unless and until the Contracting Officer notifies the Contractor that the technical instruction is within the scope of this task order.

(d) Nothing in the paragraph (c) of this clause shall be construed to excuse the Contractor from performing that portion of the task order statement of work which is not affected by the disputed technical instruction.

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(End of Clause)

#### 252.239-7000 PROTECTION AGAINST COMPROMISING EMANATIONS (JUN 2004)

(a) The Contractor shall provide or use only information technology, as specified by the Government, that has been accredited to meet the appropriate information assurance requirements of—

(1) The National Security Agency National TEMPEST Standards (NACSEM No. 5100 or NACSEM No. 5100A, Compromising Emanations Laboratory Test Standard, Electromagnetics (U)); or

(2) Other standards specified by this contract, including the date through which the required accreditation is current or valid for the contract.

(b) Upon request of the Contracting Officer, the Contractor shall provide documentation supporting the accreditation.

(c) The Government may, as part of its inspection and acceptance, conduct additional tests to ensure that information technology delivered under this contract satisfies the information assurance standards specified. The Government may conduct additional tests—

(1) At the installation site or contractor's facility; and

(2) Notwithstanding the existence of valid accreditations of information technology prior to the award of this contract.

(d) Unless otherwise provided in this contract under the Warranty of Supplies or Warranty of Systems and Equipment clause, the Contractor shall correct or replace accepted information technology found to be deficient within 1 year after proper installations.

(1) The correction or replacement shall be at no cost to the Government.

(2) Should a modification to the delivered information technology be made by the Contractor, the 1-year period applies to the modification upon its proper installation.

(3) This paragraph (d) applies regardless of f.o.b. point or the point of acceptance of the deficient information technology.

(End of clause)

#### 252.239-7001 INFORMATION ASSURANCE CONTRACTOR TRAINING AND CERTIFICATION (JAN 2008)

(a) The Contractor shall ensure that personnel accessing information systems have the proper and current information assurance certification to perform information assurance functions in accordance with DoD 8570.01-M, Information Assurance Workforce Improvement Program. The Contractor shall meet the applicable information assurance certification requirements, including—

(1) DoD-approved information assurance workforce certifications appropriate for each category and level as listed in the current version of DoD 8570.01-M; and

(2) Appropriate operating system certification for information assurance technical positions as required by DoD 8570.01-M.

(b) Upon request by the Government, the Contractor shall provide documentation supporting the information assurance certification status of personnel performing information assurance functions.

(c) Contractor personnel who do not have proper and current certifications shall be denied access to DoD information systems for the purpose of performing information assurance functions.

(End of clause)

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## **SECTION J LIST OF ATTACHMENTS**

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Performance Evaluation Criteria