

DELIVERY ORDER

FINAL

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|---|-----------------------------------|--|----------|---|------------|---|--|
| 1. CONTRACT NO. N00178-07-D-4925 | | 2. DELIVERY ORDER NO. EJP101 | | 3. EFFECTIVE DATE ORIG 09/27/2007 MOD 10/24/2007 | | 4. PURCHASE REQUEST NO. N62583-08-MR-55440 | |
| 5. ISSUED BY SPECIALTY CENTER ACQUISITIONS NAVFAC CODE RAQN0/NAVAL BASE VENTURA COUNTY 1205 MILL RD BLDG 850 PORT HUENEME CA 93043-4347 cecilia.marquez@navy.mil 805-982-2172 | | | | 6. ADMINISTERED BY DCMA VIRGINIA 10500 BATTLEVIEW PARKWAY, SUITE 200 MANASSAS VA 20109-2342 | | | |
| 7. CONTRACTOR ABSG CONSULTING INC. 1525 Wilson Blvd., Ste. 625 Arlington VA 22209 | | CODE 3RSX1 | | FACILITY | | 8. DELIVERY DATE See Section F | |
| | | | | | | 9. CLOSING DATE/TIME (hours local time – Block 5 issuing office) SET ASIDE TYPE | |
| | | | | | | 10. MAIL INVOICES TO See Section G | |
| 11. SHIP TO See Section D | | | | 12. PAYMENT WILL BE MADE BY DFAS Columbus Center, North Entitlement Operations P.O. Box 182266 Columbus OH 43218-2266 | | | |
| 13. TYPE OF ORDER | | D <input type="checkbox"/> X <input checked="" type="checkbox"/> | | This delivery order/call is issued on another Government agency or in accordance with and subject to terms and conditions of above-numbered contract. | | | |
| ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME. | | | | | | | |
| ABSG CONSULTING INC. | | | | Charles M. Mitchell | | | |
| NAME OF CONTRACTOR | | | | SIGNATURE | | TYPED NAME AND TITLE | |
| | | | | | | DATE SIGNED | |
| 14. ACCOUNTING AND APPROPRIATION DATA See Section G | | | | | | | |
| 15. ITEM NO. | 16. SCHEDULE OF SUPPLIES/SERVICES | 17. QUANTITY ORDERED/ACCEPTED* | 18. UNIT | 19. UNIT PRICE | 20. AMOUNT | | |
| See the Following Pages | | | | | | | |
| *If quantity accepted by the Government is same as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered and encircle. | | 21. UNITED STATES OF AMERICA By: Maria R Miller | | | | 10/24/2007 CONTRACTING/ORDERING OFFICER | |
| | | | | | | 22. TOTAL \$447,974.00 | |

| SECTION | DESCRIPTION | SECTION | DESCRIPTION |
|---------|---------------------------------------|---------|-------------------------------|
| B | SUPPLIES OR SERVICES AND PRICES/COSTS | H | SPECIAL CONTRACT REQUIREMENTS |
| C | DESCRIPTION/SPECS/WORK STATEMENT | I | CONTRACT CLAUSES |
| D | PACKAGING AND MARKING | J | LIST OF ATTACHMENTS |
| E | INSPECTION AND ACCEPTANCE | | |
| F | DELIVERIES OR PERFORMANCE | | |
| G | CONTRACT ADMINISTRATION DATA | | |

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GENERAL INFORMATION

MOD 01:

The purpose of this modification is to change the Payment Office address located on Block 12, page 01, of the task order as follows:

From: HQ0337
DFAS Columbus Center, North Entitlement Operations
P.O. Box 182266
Columbus, OH 43218-2266

TO: HQ0338
DFAS Columbus Center, South Entitlement Operations
P.O. Box 182264
Columbus, OH 43213

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED AS A RESULT OF THIS MODIFICATION.

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

The total value of the task order remains unchanged. The total amount of funds obligated to the task is hereby increased by \$0.00 from \$447974.00 to \$447974.00.

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SECTION B SUPPLIES OR SERVICES AND PRICES

CLIN - SUPPLIES OR SERVICES

For FFP Items:

| Item | Supplies/Services Qty | Unit | Unit Price | Total Price |
|------|---|---------|--------------|--------------|
| 2000 | Technical consulting services - Fatigue Tests for Crane Hook Certification Criteria (OTHER) | 1.0 Lot | \$447,974.00 | \$447,974.00 |

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SECTION C DESCRIPTIONS AND SPECIFICATIONS

Fatigue Tests For Crane Hook Certification Criteria

Part 1.0 INTRODUCTION

Metal fatigue failures are common and well known in welded steel structures but much less a problem in cast or forged steel structures. Two standards govern the safety of Navy crane hooks (NAVFAC P307 and MIL-HDBK-1038). Periodic, nondestructive evaluation (NDE) of crane hooks is mandated every six years by these standards. There may be 10,000 or more crane hooks that come under this inspection mandate. The expense is obviously great despite the fact that no Navy crane hook failures have been recorded, and that crane hooks are not welded structures. There is, therefore, reason to suspect that the six-year inspection interval currently mandated can be increased, perhaps even doubled to a 12-year interval, thus halving the current annual cost to the Navy for maintaining safety and reliability of its crane hooks. This proposed project will provide a technique for optimizing the crane hook inspection cycle.

Part 2.0 BACKGROUND

2.1 The only existing study conducted on fatigue and fracture of Navy crane hooks concluded after testing that the forgiving nature of the ductile steel material from which crane hooks are manufactured provides the required margin of safety against fatigue from repeated loading (Malone, 1982). Hook overloading ductile behavior results in visible deformation that warns against and avoids a sudden failure mode that typifies brittle materials. Furthermore, the stress response of a crane hook under normal loading conditions requires if a detectable crack does occur it will most likely occur in a zone of the crane hook where it is clearly visible. Any zones of the hook that require disassembly for crack inspection are unlikely to be the initial site of a detectable crack.

2.2 Approaches to fatigue analysis of unconventional steel structures have been based on fracture mechanics. However without extensive data on crane hook failures, it is difficult to propose a theory that would encompass the range of Navy applications. Therefore it is proposed that through a program of extensive fatigue testing of crane hooks, combined with model analysis, a reasonable means of predicting the fatigue life can be developed. Knowing the material of which the component is manufactured and the repeated loading to which it is subjected, a procedure will be developed to successfully predict stress life.

Part 3.0 SCOPE

Development of a prediction method that will provide rational for management of the inspection intervals for the components of weight handling crane hooks. This will require experimental fatigue testing, and modeling, incorporated within a structural reliability framework.

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Part 4.0 MANDATORY COMPLIANCE REQUIREMENTS

In keeping with the precepts of Performance Based Contracting, the contractor is directed to pursue his approach in compliance with responsible engineering practice, and the appropriate standards, such as those established by ASTM, and others. The adequacy of the compliance criteria selected by the contractor will be evaluated through the following submittals:

Performance Requirements Summary (PRS)

| Performance Objective | PWS Reference | Acceptable Quality Level (AQL) | Method of Surveillance |
|---|----------------------|---------------------------------------|-----------------------------------|
| Project Plan | 5.8.2 | REP ^A | Review ^B |
| Progress Reports | 5.8.3 | REP | Review |
| Experimental Fatigue Testing | 5.5.3 | REP | Review Site Visit ^C |
| Fatigue Life Prediction and Reliability | 5.5.5 | REP | Review |
| Final Report | 5.8.4 | REP | Review |
| Theory | 5.5.6 | REP | Review |
| Testing Procedures and Equipment | 5.6 | REP | Review |
| Conclusion | 5.9 | REP | Review |

A. Responsible Engineering Practice (REP): The quality of the reported technical effort shall be constant with responsible engineering practice associated with this work. This includes the technical approach, processes and procedures, conclusions, recommendations, documentation, precision and accuracy, and performer qualifications.

B. Review: The document will be reviewed for technical content relative to the objective of this work.

C. Site Visit: A government project engineer(s) may make one or more visits to the contractor's site.

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Part 5.0 PERFORMANCE REQUIREMENTS

5.1 To cope with the uncertainties in the material properties, the loading, and the crack growth model used, a structural reliability approach must be employed. The component's fatigue life must be treated as a random variable with a probability density function having a mean and standard deviation (Ramsamooj and Shugar 2002 a and b). The inspection interval of the component can then be managed using these parameters (Moan, 2005).

5.2 The work must define inspection sites for potential yielding in the crane hook. Fatigue testing can be conducted at the contractor's facilities. The results shall be employed to calibrate the fatigue failure model. Small scale components used must have material properties such that the fatigue model can be used to predict the fatigue life of the larger scale components.

5.3 The project is comprised of three phases: (1) Experimental fatigue testing; (2) Fatigue life prediction and reliability, and (3) Integration of the previous phase results into a recommended decision matrix relating the following three variables: (1) reliability or confidence level; (2) fatigue life; and (3) applied stress. Thus selecting any two of the foregoing variables would define the third variable.

5.4 The methodology must be set in a structural reliability framework which provides a more rational management of inspection intervals than currently used.

5.5 Required Technical Aspects.

5.5.1 The weight handling load environment for the crane hook must be defined and applied to the developed model(s).

5.5.2 Experimental Fatigue Testing. The weight handling load environment must be applied to the physical model(s) being tested. The test results will need to be transformed and compared to the analytical results. Allowable and limit stress must be compared to the test results and any analytical results.

5.5.3 Fatigue Life Prediction and Reliability. The fatigue life prediction and associated reliability shall be postulated and defended.

5.5.4 Theory. The theory and experience documented in the applicable documents (i.e. Section 7) shall be described relative to the objective and accomplishment of this work.

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5.5.5 Analysis Procedures and Tools. Any analysis procedures and tools (i.e. solution methodologies implemented in various software products) shall be identified and their role in realizing the desired objective shall be addressed. These procedures shall be analyzed to ensure the analysis results are compatible and comparable with the test results.

5.6 Testing Procedures And Equipment. The testing procedures and equipment shall be documented. This documentation includes the characteristics of the testing equipment and fixtures including limitations having possible impact on the results or interpretation of the results. These procedures including the utilized equipment shall be analyzed to ensure the test results are compatible and comparable with the analytical results.

5.7 Aggregating Methods. The approach and methods used for the life prediction and reliability results shall be documented and defended.

5.8 Documentation

5.8.1 All technical reports shall be prepared in accordance with professional engineering technical reporting standards published by professional engineering societies (e.g. American Society of Civil Engineers) or Government Technical Document Standards.

5.8.2 The project plan shall detail the work breakdown structure, technical approach (theory, testing, analysis, and investigator qualifications, and costs.

5.8.3 Progress reports shall be submitted monthly, detailing actual cost obligation, and technical progress including findings that impact the overall project objective (Part 3.0). This report is the basis for monthly fast payment authorization.

5.8.4 Final Report. Integration of the results from the testing, life and reliability results, observations, and conclusions shall be discussed with supporting graphic and tabular exhibits where appropriate. These data shall be crafted into a recommended prediction methodology including a decision matrix relating the following three variables: (1) reliability or confidence level; (2) fatigue life; and (3) applied stress. Thus by selecting any two of the foregoing variables, defines the third variable. The recommended methodology shall be defended using the presented data and applicable resources. The weight handling crane hook inspection interval shall be proposed and defended.

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5.9 Conclusion. The procedure used to arrive at the weight handling crane hook inspection interval shall be documented and defended.

Part 6.0 DELIVERABLES

The results of the first two phases referred to above shall be compiled and presented to NFESC, by way of interim reports. NFESC will review and comment on each interim submittal before the next phase continues. The last phase shall produce the final project report. A proposed project plan detailing the work breakdown structure and technical approach, investigator qualifications, and costs shall be submitted to NFESC as the selection basis. The proposed project plan shall be updated after selection and NFESC review, but before work commences. NFESC reviews will require 20 working days.

7. Applicable Documents

7.1 Department of Defense Military Handbook 1038 (1998). Weight Handling Equipment, 6 March 1998.

7.2 Malone, Percy L. (1982). Evaluation of Test Procedures for Crane Hooks, Naval Facilities Engineering Command, 200 Stovall Street, Alexandria, VA 22332.

7.3 Moan, T. (2005). Reliability-based management of inspection, maintenance and repair of offshore structures, Structure and Infrastructure Engineering, Vol. 1, No. 1, March 2005, 33-62.

7.4 NAVFAC P307 (2004). Management of Weight Handling Equipment, Naval Facilities Engineering Command, Navy Crane Center, June 2003.

7.7 Ramsamooj, D. V. and T. A. Shugar (2002 a). Prediction of fracture-based fatigue life of connectors for the mobile offshore base, Marine Structures 14 (2001) 197-214.

7.8 Ramsamooj, D. V. and T. A. Shugar (2002 b). Reliability analysis of fatigue life of the connectors-the US Mobile Offshore Base, Marine Structures 15 (2002) 233-250.

8. Period of Performance

As negotiated by both parties.

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SECTION D PACKAGING AND MARKING

In accordance with the SeaPort-e MAC contract.

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SECTION E INSPECTION AND ACCEPTANCE

Upon completion of all work and final submission of all data items, the contractor's Senior Technical Representative shall prepare and sign a Certificate of Final Acceptance memorandum, and submit it to the TOM for signature. The contractor shall include the fully signed memorandum with its final invoice.

Inspection and Acceptance shall be in accordance with Section E of the SeaPort-e Multiple Award IDIQ Basic Contract for Firm Fixed Price Task Orders. Packaging and Marking shall be in accordance with Section D of the SeaPort-e Multiple Award IDIQ Basic Contract

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SECTION F DELIVERABLES OR PERFORMANCE

CLIN - DELIVERIES OR PERFORMANCE

Refer to Section B and SOW for specific deliverables.

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SECTION G CONTRACT ADMINISTRATION DATA

5252.232-9513 INVOICING INSTRUCTIONS AND PAYMENT (WAWF INSTRUCTIONS) (MAR 2006)

(a) Invoices for goods received or services rendered under this contract shall be submitted electronically through Wide Area Work Flow – Receipt and Acceptance (WAWF):

(1) The vendor shall self-register at the web site <https://wawf.eb.mil>. Vendor training is available on the Internet at <http://www.wawftraining.com>. Additional support can be obtained by calling the NAVY WAWF Assistance Line: 1-800-559-WAWF (9293).

(2) WAWF Vendor guides "Quick Reference" are located at the following web site:
<http://www.acquisition.navy.mil/navyaos/content/view/full/3521>

(3) Select the invoice type within WAWF as specified below. Back up documentation (such as timesheets, etc.) can be included and attached to the invoice in WAWF. Attachments created in any Microsoft Office product are attachable to the invoice in WAWF. Total limit for the size of files per invoice is 5 megabytes.

(b) The following information, regarding invoice routing DODAAC's, must be entered for completion of the invoice in WAWF:

WAWF Invoice Type: Access the following web site for information on invoice types:
http://www.wawftraining.com/courses/_content_package/content_files/menuTree.html Click on Vendor, then Determine Type of Document to Create.

Issuing Office DODAAC: Enter DODAAC of the activity issuing the contract.

Admin Office DODAAC: See block 6 of Task Order front page.

Inspector DODAAC (if applicable): Enter Inspector DODAAC, or leave blank

Ship To DODAAC (for Combo), Service Acceptor DODAAC (for 2 in 1), Service Approver DODAAC (for Final Cost Voucher) (if applicable): Enter DODAAC

Acceptor DODAAC (if applicable): Enter Acceptor DODAAC **Organization that Government Acceptor Works for

Local Processing Office : N/A Leave Blank

DCAA Office DODAAC (Cost Voucher Approver – if applicable): Enter DCAA Office DODAAC

Paying Office DODAAC: See Block 12 of Task Order front page.

(c) The contractor shall submit invoices / cost vouchers for payment per contract terms. Contractors approved by DCAA for direct billing will not process vouchers through DCAA, but may submit directly to DFAS. Final voucher submission will be approved by the ACO.

(d) The Government shall process invoices / cost vouchers for payment per contract terms.

(e) For each invoice / cost voucher submitted for payment, the contractor shall also email the WAWF automated invoice notice directly to the following points of contact:

Name Email Phone Role

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G14S CONTRACTOR'S SENIOR TECHNICAL REPRESENTATIVE (AUG 2005)

Contractors: Fill-in the information required below and submit it as an attachment to your proposal. The contractor's senior technical representative, point of contact for performance under this task order is:

Name:

Title:

Mailing Address:

E-mail Address:

Telephone:

FAX:

G17S TOM APPOINTMENT (AUG 2005)

(a) The Task Order Ordering Officer hereby appoints the following individual as the Task Order Manager (TOM) for this task order:

Name: **James Forrest**

Code: OP63

Mailing Address: NAVFAC Engineering Service Center, 1100 23rd Ave., Port Hueneme, CA. 93043-4370

Telephone: (805) 982-1316

(b) The TOM is responsible for those specific functions assigned in the Task Order Administration Plan, attached.

(c) Only the Task Order Ordering Officer has the authority to modify the terms of the task order. Therefore, in no event will any understanding, agreement, modification, change order, or other matter deviating from the terms of the basic contract or this task order between the contractor and any other person be effective or binding on the Government. If, in the opinion of the contractor, an effort outside the existing scope of this task order is requested, the contractor shall promptly notify the Task Ordering Office in writing. No action shall be taken by the contractor unless the Task Order Ordering Officer, or basic contract PCO has issued a formal modification.

CONTRACTING OFFICER:

Becky Miller, (805) 982-4414, maria.miller@navy.mil

NAVFAC Southwest, SCCC, Code RAQN0/Naval Base Ventura County, 1205 Mill Rd, Bldg 850, Port Hueneme, CA. 93043-4347

CONTRACT SPECIALIST:

Cecilia Marquez, (805) 982-2172, cecilia.marquez@navy.mil

NAVFAC Southwest, SCCC, Code RAQN0/Naval Base Ventura County, 1205 Mill Rd, Bldg 850, Port Hueneme, CA.

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93043-4347

Accounting Data

| SLINID | PR Number | Amount |
|--------|-----------------|-----------|
| ----- | | |
| 2000 | N3258A07RCX0002 | 447974.00 |

LLA :
AA 1771804 KU2N 252 62470 8 068732 2D X0300Q AA001SGA0007
FUNDING FOR CLIN 2000 (FULLY FUNDED AMT)

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SECTION H SPECIAL CONTRACT REQUIREMENTS

Special contract requirements (Section H) shall be in accordance with Section H of the SeaPort-e Multiple Award basic contract.

H52S PRIOR WRITTEN PERMISSION REQUIRED TO SUBCONTRACT (FEB 2007)

None of the services required by this task order shall be subcontracted to or performed by persons other than the contractor, the contractor's employees, or those subcontractors (as listed below) which were proposed and approved in the initial offer, without the prior written approval of the Task Order Ordering Officer.

Subcontractors Manhours

H-355 CONTRACTOR IDENTIFICATION (DEC 1999)

- (a) Contractor employees must be clearly identifiable while on Government property by wearing appropriate badges.
- (b) Contractor employees are required to clearly identify themselves and the company they work for whenever making contact with Government personnel by telephone or other electronic means.

H20S INSURANCE - WORK ON A GOVERNMENT INSTALLATION

The following types of insurance are required in accordance with the clause entitled, Insurance - Work On A Government Installation (FAR 52.228-5), and shall be maintained in the minimum amounts shown:

- (1) Comprehensive General Liability: \$200,000 per person and \$500,000 per accident for bodily injury.
- (2) Automobile Insurance: \$200,000 per person and \$500,000 per accident for bodily injury and \$20,000 per accident for property damage.
- (3) Standard Workmen's Compensation and Employer's Liability Insurance (or, where maritime employment is involved, Longshoremen's and Harbor Worker's Compensation Insurance) in the minimum amount of \$100,000.

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SECTION I CONTRACT CLAUSES

In accordance with the SeaPort-e Multiple Award basic contract for a Firm Fixed Price Task Orders.

252-251-7000 Ordering From Government Supply Sources (Oct 2002)

52.219-14 LIMITATIONS OF SUBCONTRACTING (DEC 1996)

52.237-2 Protection of Government Buildings, Equipment and Vegetation (Apr 1984)

52.251-1 Government Supply Sources (Apr 1984)

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SECTION J LIST OF ATTACHMENTS