

|   |                                  |   |   |
|---|----------------------------------|---|---|
| <b>AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT</b>   |                                  | 1. CONTRACT ID CODE<br>U  | PAGE OF PAGES<br>1   2                                  |
| 2. AMENDMENT/MODIFICATION NO.<br>01   | 3. EFFECTIVE DATE<br>27-Apr-2009 | 4. REQUISITION/PURCHASE REQ. NO.<br>N62583-09-MR-59308  | 5. PROJECT NO. (If applicable)<br>N/A                   |
| 6. ISSUED BY<br>SPECIALTY CENTER ACQUISITIONS NAVFAC<br>CODE<br>RAQN0/NAVAL BASE VENTURA COUNTY 1205 MILL RD<br>BLDG 850<br>PORT HUENEME CA 93043-4347<br>cecilia.marquez@navy.mil 805-982-2172 | 3. EFFECTIVE DATE<br>N62583      | 7. ADMINISTERED BY (If other than Item 6)<br>DCMA SOUTHERN VIRGINIA<br>2000 Enterprise Parkway, Suite 200<br>Hampton VA 23666 | 5. PROJECT NO. (If applicable)<br>N/A<br>CODE<br>S5111A |

|  |  |
|--|--|
| 8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State, and Zip Code)<br>Técnico Corp<br>831 Industrial Ave.<br>Chesapeake VA 23324 | 9A. AMENDMENT OF SOLICITATION NO.                                |
|  | 9B. DATED (SEE ITEM 11)  |
|  | 10A. MODIFICATION OF CONTRACT/ORDER NO.<br>N00178-04-D-4140-EJG2 |
| CAGE CODE 0NY44  | FACILITY CODE 626112502  |
| 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)

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

|                                     |   |
|-------------------------------------|---|
| <input type="checkbox"/>            | 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 checked="" 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 type="checkbox"/>            | D. OTHER (Specify type of modification and authority)   |

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)<br>Cecilia G Marquez, Contracting Officer |                                 |
| 15B. CONTRACTOR/OFFEROR                       | 15C. DATE SIGNED | 16B. UNITED STATES OF AMERICA<br>BY /s/Cecilia G Marquez   | 16C. DATE SIGNED<br>27-Apr-2009 |
| (Signature of person authorized to sign)      |                  | (Signature of Contracting Officer)   |                                 |

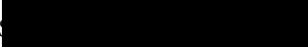
|                                  |                            |                |       |
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## **GENERAL INFORMATION**

The purpose of this modification is to extend the period of performance at no additional cost to the Government through 31 May 2009.

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 amount of funds obligated to the task is hereby increased by \$0.00 from 

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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 | CLIN 2000 -<br>PROVIDE ALL<br>SERVICES FOR<br>MK-16 CHARGING<br>STATION (OTHER) | 1.0  | Lot        |  |

Contract Type Summary for Payment Office

The proposed Task Order type will be Firm Fixed Price (FFP)

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## **SECTION C DESCRIPTIONS AND SPECIFICATIONS**

Attachment 1 – Statement of Work

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## **SECTION D PACKAGING AND MARKING**

Packaging and Marking shall be in accordance with Section D of the SeaPort-e Multiple Award Basic 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

All provisions and clauses in Section F of the basic contract apply to this task order, unless otherwise specified in this task order.

#### F.1 - CLIN – Performance Periods

The period of performance is from date of task order award through 180 days thereafter. Offerors shall provide a proposed completion schedule if different than the period of performance above as part of their technical proposal.

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## SECTION G CONTRACT ADMINISTRATION DATA

### 5252.232-9513 INVOICING AND PAYMENT (WAWF) INSTRUCTIONS (NOV 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 have their cage code activated by calling 866-618-5988. Once activated, 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 "Quick Reference" Guides 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:   | -- Select <b>2-in-1</b> for FFP Services Only.<br><br>-- Select <b>Combo</b> for Supplies, or Supplies AND FFP Services.<br><br>-- Select <b>Cost Voucher</b> for all Cost or T&M contracts or CLINs.<br><br>If none of the above apply, please call 1-800-559-WAWF (9293). |
| Issuing Office DODAAC  | N62583  |
| Admin Office DODAAC:   | Enter Admin Office DODAAC   |
| Inspector DODAAC (usually only used when Inspector & Acceptor are different people): | Enter Inspector DODAAC, or leave blank  |
| Ship To DODAAC (for Combo),  | N69218  |
| Service Acceptor DODAAC (for 2 in 1),  | N69218  |
| Service Approver DODAAC (Cost Voucher)   | N69218  |
| Local Processing Office (applicable if   |   |



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|   |  |
|---|--|
| DFAS DoDAAC begins with an "N"):                  |  |
| DCAA Office DODAAC (Used on Cost Voucher's only): | Enter DCAA Office DODAAC                       |
| Paying Office DODAAC:                             | Enter Paying Office DODAAC Located on Contract |

**(c) 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) 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                |
|-----------------|--|--------------|---------------------|
| Colin McDonald  | <a href="mailto:colin.mcdonald@navy.mil">colin.mcdonald@navy.mil</a>   | 202-433-5358 | TOM                 |
| Cecilia Marquez | <a href="mailto:cecilia.marquez@navy.mil">cecilia.marquez@navy.mil</a> | 805-982-2172 | Contract Specialist |
|                 |  |              |                     |

#### **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: **Colin McDonald**

Code: Code OF50

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Mailing Address:

Telephone: (202) 433-5358

Commercial (401)-

DSN 432-

(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](mailto:maria.miller@navy.mil)

Specialty Center Acquisitions, NAVFAC (SCAN), 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](mailto:cecilia.marquez@navy.mil)

Specialty Center Acquisitions, NAVFAC (SCAN), Code RAQN0, Naval Base Ventura County, 1205 Mill Rd, Bldg 850, Port Hueneme, CA. 93043-4347

```

Accounting Data
SLINID  PR Number      Amount
-----
2000    N6921808RC10057    [REDACTED]
LLA :
AA 97X4930 NH5A 000 77777 0 068894 2F 000000 00008RC10057
Funding for CLIN 2000 -FULLY FUNDED CLIN

```

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## SECTION H SPECIAL CONTRACT REQUIREMENTS

All provisions and clauses in Section H of the basic contract apply to this task order unless otherwise specified in the task order.

### ACCESS TO GOVERNMENT SITES

(a) Contractor personnel shall comply with all current badging and security procedures required to gain access to any government site. The contractor shall ensure that contractor personnel employed on any government site become familiar with and obey activity regulations. Contractor personnel shall not enter restricted areas unless required to do so and until cleared for such entry.

(b) All contractor equipment shall be conspicuously marked for identification. The contractor shall strictly adhere to Federal Occupational Safety and Health Agency (OSHA) Regulations, Environmental Protection Agency (EPA) Regulations, and all applicable state and local requirements.

### CONTRACTUAL AUTHORITY AND COMMUNICATIONS

(a) Except as specified in subparagraph (b) below, no order, statement, or conduct of any Government personnel who visit the contractor's facilities or in any other manner communicates with contractor personnel during the performance of this task order shall constitute a change under the Changes clause of this contract.

(b) The contractor shall not comply with any order, direction or request of government personnel unless it is issued in writing and signed by the Contracting Officer, or is pursuant to specific authority otherwise included as a part of this task order.

(c) The Contracting Officer is the only person authorized to approve changes in any of the requirements of this task order and, notwithstanding provisions contained elsewhere in this task order, the said authority remains solely the Contracting Officer's. In the event the contractor effects any change at the direction of any person other than the Contracting Officer, the change will be considered to have been made without authority and no adjustment will be made in the task order price to cover any increase in charges incurred as a result thereof.

### WORK WEEK

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(a) All or a portion of the effort under this contract will be performed on a Government installation. The normal work week shall be Monday through Friday for all straight time worked. No deviation in the normal workweek will be permitted without express advance approval in writing by the designated Ordering Officer(s) with coordination of the using departments. In the event that the contractor fails to observe the normal work week, any resulting costs incurred by the Government shall be chargeable to the contractor. Work on Center shall be performed during the normal work hours at that location unless differing hours are specified at time of task order award. For purposes of scheduling personnel, the contractor is hereby advised that the Government installation will observe all Federal Government holidays. The contractor is further advised that access to the Government installation may be restricted on these holidays.

(b) In the event any of the above holidays occur on a Saturday or Sunday, then such holiday shall be observed by the contractor in accordance with the practice as observed by the Government employees at the using activity.

(c) In the event the contractor is prevented from performance as the result of an Executive Order or an administrative leave determination applying to the using activity, such time may be charged to leave or indirect charges in accordance with company policy.

#### KEY PERSONNEL

NAVFAC 5252.237-9301 Substitutions of Key Personnel (June 1994)

The contractor shall provide complete resumes for proposed substitutions, and any additional information requested by the Contracting Officer. Proposed substitutions should have comparable qualifications to those of the persons being replaced. The Contracting Officer will notify the contractor within 15 days after receipt of all required information of the consent of substitutes. No change in fixed prices may occur as a result of key personnel substitution.

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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.

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## **SECTION J LIST OF ATTACHMENTS**

Attachment 1 - Statement of Work (SOW)

**MK - 16 CHARGING STATION**

**NAVAL DIVING AND SALVAGE TRAINING CENTER**

**PANAMA CITY, FL**

**CONTRACT SPECIFICATION**

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PART C1: GENERAL PARAGRAPHS

PART C2: OPERATION/PERFORMANCE REQUIREMENTS

PART C3: PIPING & INSTRUMENTATION (P&I) TECHNICAL  
REQUIREMENTS

C3.1 GENERAL REQUIREMENTS

PART C4: PRESSURE VESSEL FOR HUMAN OCCUPANCY (PVHO) - **N/A**

PART C5: QUALITY ASSURANCE

C5.1 GENERAL REQUIREMENTS

PART C6: TABLES & FIGURES

NOTE: THE SYMBOL "N/A" BESIDE A PARAGRAPH NUMBER INDICATES  
THAT NO SPECIFICATION IS INTENDED IN THAT PARAGRAPH.



## 1. GENERAL PARAGRAPHS

### 1.1 GENERAL:

- 1.1.1 **INTENTION:** It is the declared and acknowledged intention and meaning to procure hyperbaric facilities, as described herein, to include design, fabrication, outfitting and testing of a new MK-16 charging station, to be installed at the Naval Diving and Salvage Training Center (NDSTC), Panama City, FL. The contractor shall be responsible for all work specified herein. The charging station shall be complete and useable upon conclusion of the work.
- 1.1.2 **DESCRIPTION OF WORK:** The contractor shall provide all labor and materials for the design, procurement, fabrication, assembly, shop testing and shipping of the described MK-16 Charging Station. Further, the contractor shall prepare and submit all documents, records and manuals specified herein.
- a. Provision of the MK-16/Secumar Charging Station as described herein.
  - b. Provision of MK-16/Secumar Charging Station manuals.
  - c. Submission of the design, fabrication & test documents.
- 1.1.3 **DESCRIPTION OF FACILITIES:** The hyperbaric contractor shall provide the following work. Part C6 contains drawings and schematics of the facility:
- a. **MK-16/Secumar CHARGING STATION:** The MK-16/Secumar Charging Station shall be located in the classroom of the new Joint Aquatic Combat Diver Training Facility. The charging station shall also include a test tank.
  - b. **BOTTLE STORAGE:** The contractor shall provide for storage racks as described herein.
- 1.1.4 **GOVERNMENT FURNISHED EQUIPMENT (GFE):** None
- 1.1.5 **EXISTING CONDITIONS:** The building is currently under construction.
- 1.1.6 **LOCATION:** The system shall be installed and tested at the Naval Diving and Salvage Training Center at the Naval Support Activity (NSA), Panama City, FL.
- 1.1.7 **TIME OF DELIVERY:** The work shall begin (on the "Start Work date") 15 consecutive calendar days after the "Award Date". The contract completion date is 180 consecutive calendar days after the "Award Date". The "Award Date" is shown in Section A, block 28 of this contract. The contractor shall make no component nor material procurement until after the Preliminary Design has been submitted, unless approval is received from the Contracting Officers Technical Representative (COTR).
- 1.1.8 **NOT USED**
- 1.1.9 **"IN KIND" REPLACEMENT DEFINITION:** The in kind replacement of a component is defined as the identical component if the

identical component is still in manufacture. In the event the identical component is no longer in manufacture, the replacement component must meet all of the requirements of the original component. The requirements of the original components can usually be obtained from the original supplier/manufacturer. If "in kind" components are not available, then replacement components shall be provided upon review by the COTR to the contractor.

**1.1.10 "HYPERBARIC" TERM:** Anywhere in this specification where the term "Hyperbaric" is used, it shall be assumed (where applicable) to mean "Hyperbaric Systems".

**1.2 ADDITIONAL PARAGRAPHS:**

**1.2.1 SPECIAL PERFORMANCE REQUIREMENTS DUE TO HAZARDS TO PERSONNEL:** Attention of prospective offerors is called to the fact that this contract calls for the fabrication of life sensitive support systems. Failure to adhere to the highest standards of metallurgy, welding, oxygen cleanliness and workmanship will create severe hazards to persons working on or near these systems when they are pressurized. Failure to meet these requirements may be cause for termination for default, and in any event will be cause for Government rejection of components.

**1.2.2 CONTRACTORS TECHNICAL RESPONSIBILITY:** This specification contains technical requirements to which the contractor must adhere; however, it is the contractor's responsibility to confirm by engineering analysis that component sizes cited herein are adequate to perform the "Operational/ Performance Requirements" cited in Part C2. Typical of such items are pipe sizes, number of high pressure media storage flasks, etc. Data has been provided herein to demonstrate the conceptual feasibility of such a facility. Other technical issues that are not specified herein are at the discretion of the contractor. The contractor shall cite his intentions in these areas in the preliminary design.

**1.2.3 CONFORMANCE REQUIREMENTS:** Omissions from the drawings or specifications or the misdescription of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the contractor from performing such omitted or misdescribed details of the work but they shall be performed as if fully and correctly set forth and described in the drawings and specifications.

**1.2.4 CONTRACTOR'S SPECIFICATION CHECK:** The contractor shall check all drawings and specifications furnished him immediately upon their receipt and shall promptly notify the Government of any discrepancies. Numbers marked on drawings shall in general be followed in preference to scale measurements. Large scale drawings shall in general govern small scale drawings. The contractor shall compare all drawings and verify the data before laying out the work and will be responsible for any errors that might have been avoided thereby.

**1.2.5 CONTRACTOR'S SITE VERIFICATION CHECK:** The contract requires the interface of new material/equipment with existing equipment in the building. The contractor is responsible for on-site verification of existing conditions. The contractor is responsible for the integration of new equipment into existing spaces, and the interface of new equipment with existing systems, such as gas, electrical, water, etc. Prior to the submission of the Final Design, the contractor is responsible for visiting the site to facilitate layout of the work.

**1.2.6 STANDARD PRODUCTS:** Whenever practical, use will be made of materials and equipment that are standard catalog products of manufacturers regularly engaged in the production of such materials and equipment and shall be the manufacturer's latest standard design that complies with the specification requirements. Where two or more products of a similar type are used, they will be products of the same manufacturer. Where two or more products are of a similar type that the same manufacturer's model number can be used, all the products shall be identical. Where standard products are available which have been proven successful for hyperbaric application, they shall be used. Each major component used in this installation will be clearly marked so that the manufacturer, model, serial number, and the principal characteristics of the item can readily be determined.

**1.2.7 DOCUMENT SUBMITTAL SCHEDULE:** The following is a summary of the documents that are required to be submitted to the Government. Five copies of each document shall be submitted. Document descriptions are in Part 5, "Quality Assurance". Piecemeal submittal of documents is unacceptable; such submittals shall be returned. Submittals shall be completed and delivered no later than the dates listed below:

a. 60 Days After "Start Work Date":

1. Preliminary Design Package.
2. Quality Assurance Plan (submitted with only first appendix package).
3. Preliminary System Manual Outline (where applicable).
4. Weld Procedures, Welders Qualification and Welder Qualification Records (where applicable).
5. Functional Test Plan, Painting Plan, Hydrostatic Test Plan, Cleaning Procedures and Plan; and gas sample procedures and plan (each where applicable).

b. 30 Days Before Contract Completion Date:

1. Record Drawings.
2. 100% Contractor's Records and Documents.
3. 100% Component Database/Component Manufacturer's Design Data (CMDD).
4. Final System Manual.
5. Gas Sample Reports.
6. Functional Test Records & Reports.
7. Purchase Orders

- d. Monthly Report: Each Monthly Submittal shall be delivered no later than 10 days after the beginning of each month and shall include:
  - 1. Project Schedule.
  - 2. Component database (latest revision).
  - 3. Current Progress Report.
  - 4. Drawing Status Report

**1.2.8 HYPERBARIC FACILITY CODES AND STANDARDS:** The contractor's designs and all other work provided under this contract must assure in all instances that the finished hyperbaric facility conforms to the codes and standards listed below. Areas of conflict shall be brought to the attention of the Government. The issue of the respective code to be used for this contract is the effective code at the time of signing of the contract.

- a. NAVSEA SS521-AA-MAN-010, "U.S. Navy Diving And Manned Hyperbaric Systems Safety Certification Manual".
- b. NAVSEA 0994-LP-001-9010, "U.S. Navy Diving Manual".
- c. NAVFAC DM-39, "Hyperbaric Facilities Design Manual".
- d. NFPA 99, "Health Care Facilities".

**1.2.9 REFERENCE SOURCES:** Reference publications are cited throughout this specification. The addresses of the sponsoring organizations are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided.

- a. Military Standards (MIL-STD-, MIL-V-, MIL-Q-, etc.) can be ordered from the following address:

Standardization Documents Order Desk  
Building 4 D  
700 Robbins Ave  
Philadelphia, PA 19111-5094

or

General Services Administration  
Specifications and Consumer Information  
Distribution Sections (WFSLs)  
Washington Navy Yard  
Building 197  
Washington, DC 20407

- b. Navy/NAVSEA Publications:  
Navy Publications and Forms Center  
5801 Tabor Ave.  
Philadelphia, PA 19120
- c. American National Standards Institute (ANSI)  
1430 Broadway  
New York, New York 10018  
Ph: 212-354-3300

- d. American Society for Testing and Materials (ASTM)  
1916 Race Street  
Philadelphia, PA 19103  
Ph: 215-299-5400
- e. American Society of Mechanical Engineers (ASME)  
345 East 47th Street  
New York, New York 10017
- f. Compressed Gas Association, INC. (CGA)  
1235 Jefferson Davis Highway  
Arlington, VA 22202  
Ph: 703-979-0900
- g. American Welding Society (AWS)  
2501 N.W. 7th Street  
Miami, FL 33125  
Ph: 305-443-9353
- h. Department of Defense (DOD) publications can be ordered from  
the following address:  
  
US Army Adjutant General Publications Center  
2800 Eastern Boulevard  
Baltimore, Maryland 21220  
Ph: 301-671-2533
- i. National Fire Protection Association (NFPA)  
1 Batterymarch Park  
P.O. Box 9101  
Quincy, MA 02269-9101  
Ph: (617) 770-3000
- j. Naval Diving & Salvage Training Center (NDSTC)  
Procedure Description Number 2, (PD-2)  
Standard Drawing Requirements  
350 S. Crag Rd.  
Panama City, FL 32407  
Attn: Brian Dietz  
Ph: (850) 235-5231

**1.2.10 SECURITY REQUIREMENTS:** No employee or representative of the contractor will be permitted on Government property unless he/she furnishes satisfactory proof that he/she is a citizen of the United States or is specifically authorized admittance by the Government.

**1.2.11 STATION REGULATIONS:** The contractor and his employees and subcontractors shall become familiar with and obey all station regulations including fire, traffic and security regulations. All personnel employed on the station shall keep within the limits of the work and avenues of ingress and egress. Personnel shall not enter any restricted areas unless required to do so and must be cleared for such entry. The contractor's equipment shall be conspicuously marked for identification. A Hot Work chit is required from base Fire Department prior to commencement of subject Hot Work performed at the Facility and a "designated

Fire Watch" and appropriate required equipment will be provided by the Contractor.

- 1.2.12 ACCESS TO BUILDING:** Regular working hours shall be an 8 ½ hour period established by the Government between 7 a.m. and 5 p.m. Monday through Friday, excluding Government holidays. The contractor shall make an application for work outside of the regular working hours 15 calendar days prior to such work to the Government.
- 1.2.13 EXISTING CONDITIONS AND EXTRA OBLIGATIONS OF THE CONTRACTOR:** the contractor will be working in a specified section of the building. All other sections of the building other than the hyperbaric sections will be off limits to contractor personnel. The contractor and his employees will not be allowed outside the work area or in adjacent existing buildings without prior approval of the COTR. The contractor shall not use the existing buildings for storage.
- 1.2.14 AVAILABILITY AND USE OF UTILITY SERVICES:** The Government will furnish standard utility services free of charge for the specified installation work and on-site testing. Unique utility requirements are the responsibility of the contractor.
- 1.2.15 STORAGE AREAS:** Unsecured outside space, not to exceed 1500 ft<sup>2</sup>, will be available at the site for use as a storage area. All storage facilities, at the contractor's own expense and in a manner satisfactory to the COTR, shall be installed, maintained, and removed prior to the final acceptance of the work. Exact location for storage and work areas shall be provided to the contractor upon award of the contract.
- 1.2.16 COOPERATION WITH NAVAL DIVING & SALVAGE TRAINING CENTER (NDSTC) PERSONNEL:** Attention is invited to the fact that normal school operations cannot be interrupted. The contractor shall cooperate and schedule his work to avoid conflict with and interruption of the work of others insofar as practicable. In the case of conflict with normal school operations that cannot be resolved satisfactorily, the matter shall be referred to the Contracting Officer for decision, and such decision shall be final, subject to right of appeal in accordance with the terms of the contract.
- 1.2.17 RE-ENTRY CONTROL:** The following re-entry control procedures are required to be performed by the contractor when breachment of a certification boundary, other than that of the scope of work boundary, is required during this contract. The re-entry control process must be coordinated with Command Engineering Department or Officer and specifically at NDSTC, the process must not conflict with operation or training.
- 1.2.17.1 PRELIMINARY RE-ENTRY CONTROL:** The contractor shall submit to the Command Engineering Department or Officer and the Contracting Officer, at least fifteen (15) days in advance of the desired start date, the following re-entry control information:
- a. Requested Work Boundaries.
  - b. Estimated System Down Time (in days).

c. Desired Start Date.

**1.2.17.2 FINAL RE-ENTRY CONTROL DOCUMENTATION:** Upon completion of the work requiring re-entry control, the contractor shall submit the following information to the Command Engineering Department or Officer and the Contracting Officer:

- a. Purchase orders with manufacturers letters of compliance.
- b. Weld procedure and welders qualifications.
- c. NDT procedure, results of NDT, and inspector's qualifications.
- d. Flush procedures and results.
- e. Cleaning procedure and results of cleaning.
- f. Hydrostatic test procedure and results.
- g. Joint identification drawings and welding log.
- h. Air sample results.
- i. All objective Quality Evidence (OQE) to close the REC.

**1.2.18 REPAIR AND RESTORATION:** If any process described herein causes damage to other features other existing elements of the described hyperbaric facilities or components or adjacent areas of Facility, it shall be repaired and restored to its original condition using similar methods and identical finish at the Contractor's expense.

**1.2.19 HAZARDOUS MATERIALS HANDLING:** The contractor is responsible for submitting a list of all Hazardous Materials proposed for use within the scope of the contract. This is including the Material Safety Data Sheets (MSDS) for each separate component, a minimum of 10 days prior to scheduled usage of the materials to the COTR and the Command Engineering Officer to obtain government approval. All contracting personnel involved in the "on-site" contract performance and or administration must attend a Base Environmental Brief, prior to the start of any work. This can be arranged by the Command Engineering Department or Supply Department personnel through the Base.

All Hazardous materials used and waste generated in the course of the contract that are or must be removed from the Facility and Navy Base, and must be disposed of in the manner as specified by the State code for disposal of non-hazardous and hazardous materials. The contractor is responsible for obtaining the DOT approved shippable containers used to transport the HAZMAT/HAZWASTE receiving facility. Documents signed by the receiving facility once the material reaches it's final destination need to be returned to the Command Engineering Officer and copies forwarded to the Base Environmental Office, for reporting purposes.

END OF SECTION

## PART C2

**2. OPERATIONAL REQUIREMENTS:** The facility shall be designed to perform the following operations. **See Part C6 for specific requirements.**

**2.1 AIR SYSTEM:** The air system must be capable of providing breathing air for use as drive air for the two booster pumps and to the MK-16 Charging Station.

**2.1.1: MK-16 OXYGEN CHARGING:** The System shall be capable of providing MK-16 Oxygen Charging. Requirements for Oxygen Charging include:

- a. Charge Capacity: 10 flasks simultaneous to 2900 psig
- b. Charge rate: 200 psig/min.
- c. Volume of Flask: 0.053 ft<sup>3</sup> (1.5 liter)

**2.1.2: AIR CHARGING STATION:** The Air Charging Station shall be capable of meeting the following requirements.

- a. Charge Capacity: 10 secumar flasks simultaneous to 3000 psig
- b. Charge Rate: 400 psig/min

END OF SECTION



## PART C3

### 3.0 PIPING & INSTRUMENTATION TECHNICAL REQUIREMENTS

#### 3.1 GENERAL REQUIREMENTS:

- 3.1.1 "POWER PIPING":** Hyperbaric piping, valves and components shall conform to the requirements of ANSI B31.1, "Power Piping". This specification refers to paragraphs in B31.1; the referenced B31.1 paragraph numbers are followed by an asterisk for identification purposes (illustration, "Paragraph 100.1.1\*"). The piping, valves and components shall conform to the following additional requirements.
- 3.1.2 PIPING:** Paragraph 100.1.1\* Scope-After "This code prescribes minimum requirements for the design, material, fabrication, erection, test and inspection of..." add, "Hyperbaric Facilities". "Piping" is defined in paragraph 100.1.1\*; piping includes tubing. Whenever pipe is stated in this specification in general terms (i.e., only pipe joints), it shall be assumed to state a requirement for all pipe and tube used.
- 3.1.3 PROVEN COMPONENTS:** Pressure containing components normally covered by ANSI B31.1 shall be in accordance with paragraph 104.7\*, therein "components shall be used that have been proven satisfactory by successful performance under comparable US NAVY service conditions". Components for a hyperbaric facility must have proven experience in existing hyperbaric facilities for high pressure air, oxygen and water service. Pressure vessels (other than the PVHO's) shall meet the requirements of ASME, Section VIII, Division 1 or as specified.
- 3.1.4 MATERIAL & COMPONENTS, GENERAL:** Material, components and equipment installed in the piping systems shall be as specified and suitable for the gasses and liquids contained and for the maximum operating temperature and pressure. All valves shall be placed so that they can be easily reached, operated and maintained by a person without extensive system disassembly or the aid of special equipment, such as ladders, or they shall be provided with other means of mechanical operation. Valves shall be placed so that accompanying gauges or other displays are easily read. Pipe and tubing shall be protected from abuse and accidents and be placed for ease of operation, maintenance and replacement.
- 3.1.5 CALIBRATION:** All measuring instruments, gauges, relief valves, process control transmitters, indicators, etc. shall be calibrated. All these items requiring calibration shall have at least twelve months remaining on their respective calibration at the time of the acceptance of the facility. All calibration shall be conducted by a Met-Cal certified calibration shop.
- 3.1.6 MATERIAL PROTECTION:** Equipment and materials shall be properly stored, adequately protected and carefully handled to prevent contamination or damage before and during installation. Equipment and materials shall be installed, handled, stored and protected in accordance with the manufacturer's recommendations.

- 3.1.7 PERSONNEL PROTECTION:** Belts, pulleys, chains, gears, couplings, projecting setscrews, keys and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded. High temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation. Areas of high noise shall be properly posted and adequate safety equipment shall be supplied.
- 3.1.8 MANUFACTURER INSTRUCTIONS:** Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the COTR with the Preliminary Design Submittal. Installation of the product shall not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.
- 3.1.9 O-RING SEALS:** All piping components such as valves, check valves, relief valves, reducers, and similar equipment, shall be installed with O-ring seal unions.
- 3.1.10 CHASES:** All piping and electrical conduit shall run in chases. The chases shall be located so that they do not interfere with operations or maintenance. In Hyperbaric operating spaces the piping, conduit and chases shall be run so as to be of minimal presence to the operators and chamber occupants. The contractor's design shall conform to component manufacturers' requirements.
- 3.1.11 PIPING, GENERAL:** There shall be adequate joints for disassembly, cleaning and inspection. Single lengths of piping shall not exceed 30 feet between unions. All piping installed internal to the chamber shall be configured so as to not interfere with normal operations.
- 3.1.12 PIPING SIZE:** Piping shall be sized to a maximum gas velocity of .8 mach or less.
- 3.1.13 WELDED PIPING AND FITTINGS:** Piping, unless otherwise specified, shall be seamless annealed stainless steel conforming to ASTM A312, Type **304L or 316L**. Pipe shall be 1/2" or larger. All tube, unless otherwise specified, shall be seamless annealed stainless steel conforming to ASTM A269, Type **304L or 316L**. All fittings shall conform to ASTM A403, Type **304L or 316L** and shall be seamless. Tube shall be 1/2" I.D. or larger, except gauge and sampling lines which will be 1/4" or larger. All Piping (pipe, tube, and fittings) located in areas external to the building shall be 316 or 316L. Traceability details (heat numbers etc.) shall be etched or permanently marked on all piping (pipe, tube, fittings, tailpieces, threadpieces, etc).
- 3.1.14 PIPE MATERIAL CERTIFICATIONS:** The contractor shall submit material certifications for all weld filler metal (wire, rods, etc.), pipe and fittings used in this contract. The material certifications shall ensure that the pipe, fittings and filler meet all specification requirements. The material certifications shall include, but are not limited to: complete analysis (chemical element percentage composition), mechanical physical properties

including tensile, yield, elongation, and manufacturer and manufacturing details. Vendor supplied purchase orders, Vendor Certificates of Conformance (C of C) and Mill Certs for welded pieces shall accompany all piping (pipe, tube, valves and fittings) IAW US Navy System Certification Manual, SS521-AA-MAN-10.

- 3.1.15 JOINT STANDARDS:** Only pipe joints that are fabricated, erected, tested and inspected to nationally accepted standards may be used (typically; butt welds, socket welds, bolted flange connections, O-ring faced fittings). Others are not acceptable (typically; brazed, byte type, flared, compression fittings and threaded).
- 3.1.16 FLEX HOSES:** Flexible hoses shall be installed at reciprocating machinery. When a flexible hose is to be subjected to considerable vibration or flexing, sufficient slack shall be provided to avoid mechanical loading. Flexible hose burst pressure shall be four times operating pressure. Flexible hoses shall be installed so that operators of the equipment are not endangered. All flexible hoses installed shall be labeled with a metal information tag according to the requirements in the US Navy System Certification Manual, SS521-AA-MAN-010. All flex hoses shall have an independent identification number etched on the metal identification tag and on one of the end fittings. This identification number shall correspond to all documentation related to the respective flex hose (hydrotest, cleaning, etc.) All flexible hoses shall be subjected to a hydraulic proof test equal to twice the rated working pressure of the hose (See NAVSEA S6430-AE-TED-010). All flexible hoses shall be covered with non-corrosive stainless steel wire braid. All fittings shall be constructed of non-corrosive stainless steel.
- 3.1.17 FLEX HOSE RESTRAINER:** All flex hoses shall have restrainers (Safety Lines), fabricated in accordance with the U.S. Navy Diving Manual. Safety lines shall be provided for the full length of each flex hose assembly, securely fastened at both ends. In the case of charging whips, the manifold end shall be securely fastened. The working end shall have a device for securing the line to the cylinder.
- 3.1.18 FITTINGS ID:** The inside diameter of elbows, tees and other fittings shall be equal to or greater than the pipe to which they are attached.
- 3.1.19 PIPING ID:** Identify piping in accordance with Table B-3, Color Code and Component Designation for Diving Systems", NAVSEA SS521-AA-MAN-010. Identification shall apply to piping on each segment of pipe between fittings. All valve handles, operator controls and gauge outer rings shall have color coding applied. Provide two copies of the piping identification code framed under glass or acrylic and installed where instructed by the COTR.
- 3.1.20 COMPONENT TAGS:** All components shall be tagged with identification plates of plastic laminate measuring approximately on half inch high, by one and one half inches long minimum, by one eighth inch thick, firmly attached by contact adhesive or by other means acceptable to the Government. These plates shall be marked by engraving with one quarter inch high block type identification

letters/numbers, and shall be color coded as appropriate. The Component Tag index shall be submitted with the Preliminary Design.

**3.1.21 COMPONENT IDENTIFICATION DESIGNATOR (CID):** The contractor shall ensure that every component within a system has a unique identification designator consisting of letters and numbers expressed as an alphanumeric code. The assigned component identification designator shall be etched on the component. The assigned component identification designator is used to identify components in an assembly, re-entry control packages, manuals and other types of documents. The component identification designator consists of four main parts:

1. System Usage Designator
2. Component Type
3. Sequential Component Number
4. Augmenting Designator (not used in all cases)

The Usage Designator is separated from the remaining component identification number by a dash. Following the dash are the Component Type and Sequential Component Number, and if an Augmenting Designator is needed (for instance, to separate identical systems), a dash will separate the Sequential Component number and the Designator as shown in the following example: **HEO2-V1234-1**

The Component Identification numbering procedure presented above indicates that the example Component Identification Designator HEO2-V1234-1 identifies the System Usage as Helium/Oxygen Mix, and the component type is a valve, which is the one thousandth two hundredth and thirty fourth component within that (Helium/Oxygen) system. The Augmenting Designator one, at the end of the Component Identification Designator is used when there are identical systems (i.e. Diving Simulation Facility (DSF)).

The contractor shall ensure that all components shall have the following information embedded into the each individual component drawings in the form of attributes on attached to the component designation:

1. Valve Type (Globe, Ball, Air-Operated, etc.)
2. Manufacturer and contact information (address and phone)
3. Model Number of part
4. Repair Kit Identification

The Component Identification Designation shall be conducted in accordance with **PD-2 Section 34** and in accordance with Attribute requirements indicated by **PD-2**.

**3.1.21.1 USAGE DESIGNATOR:** Each System/Subsystem can be broken down further to identify the type of gas or liquid flowing through the System/Subsystem. The primary Usage Designators are identified in **PD-2 Section 30**.

**3.1.21.2 COMPONENT TYPE DESIGNATOR:** Component numbers are assigned starting at the upstream end of a piping system and continue in the direction of flow. The Component Designators are identified below:

| Designator<br>Number | Component<br>Description              |
|----------------------|---------------------------------------|
| F                    | Filter                                |
| G                    | Gauge                                 |
| V                    | Valve and Quick-Disconnect            |
| C                    | Controller (Remote Controlled Valves) |

**3.2.21.3 JOINT IDENTIFICATION:** The contractor shall ensure that every joint within a system (both mechanical and welded), has a unique identification designator consisting of letters and numbers expressed as an alphanumeric code. The Joint Identification shall consist of three main parts:

1. System Usage Designator
2. Joint Type
3. Sequential Number

Each part shall be separated from another using a dash as shown in the following example: **HEOX-BW-123**. The same System Usage Designators will be used for Joint Identification that were used for CID's. A list of Joint Types can be found in PD-2 Section 33. Joint Identification and Attribution requirements will be conducted in accordance with PD-2.

**3.1.22 PANEL ID TAGS:** All panels and major subsystems shall be identified with an ID plate. These plates shall be made of plastic laminate, two inches high and at least six inches long by one-eighth inch thick. The plates shall be marked by engraving with three-quarter inch high block type identification letters/numbers, and shall be color coded as appropriate. All piping entering/leaving a panel shall be identified. These plates shall be made of plastic laminate, 1 1/2 inches high and at least four inches long by one-eighth inch thick. The plates shall be marked by engraving with 1/2-inch high block type identification letters/numbers, and shall be color coded as appropriate. These labels shall be firmly attached by contact adhesive or by other means acceptable to the Government. ID tag wording shall be provided with the Preliminary Design.

**3.1.23 TUBING GUIDELINES:** There shall be a length of straight tubing adjacent to the nut equal to 2 tube diameters or more. The total length of a tube assembly shall be 20 tube diameters or more. Each tube assembly shall have at least one bend equal to or greater than 90°.

**3.1.24 THROTTLE VALVES:** All valves that regulate flow (other than on-off function), oxygen service valves, and high pressure valves (except for those remotely actuated) are considered throttle valves. They shall be globe or needle valves. These valves shall conform to MIL-V-24109. For throttle valves which are larger than those that meet the requirements of MIL-V-24109 (3" or greater), these valves shall conform to MIL-V-24109 with respect to control of flow and

pressure. Valve Handles shall be color coordinated with Table B-3, Color Code and Component Designation for Diving Systems", NAVSEA SS521-AA-MAN-010.

- 3.1.25 SHUTOFF VALVES:** All hand operated valves, other than throttling valves, shall be ball valves. They shall be two-way (bi-directional) flow, three piece, with a swing out construction, valves conforming to ASME/ANSI B-16.34 and utilizing a soft sealing surface. Socket weld end connections shall conform to ANSI B-16.11. Butt weld end connections shall conform to ANSI B-16.25. The construction materials shall be compatible with air and oxygen service. All valves shall be rated at a working pressure equal to or greater than the maximum possible system pressure. On panels, in which the direction in which the valve handles point indicates the open or closed position, the direction shall be the same for all valves on the panel. Valve handles shall be color coordinated with Table B-3, Color Code and Component Designation for Diving Systems", NAVSEA SS521-AA-MAN-010.
- 3.1.26 COMPONENT SEATS:** Breathing gas components shall have seats and seals that are suitable for oxygen service.
- 3.1.27 LUBRICANTS:** All lubricants shall be suitable for oxygen service.
- 3.1.28 CHECK VALVES:** All check valves shall utilize a soft sealing surface poppet or disc and spring.
- 3.1.29 PRESSURE GAUGES:** Pressure gauges, except as otherwise specified, shall have a 4 1/2 inch dial and shall meet the following criteria:
- a. Unless otherwise specified, shall be made with phosphor bronze or stainless steel, with helical coil or bourdon tube sensing elements.
  - b. The case shall be made of acrylonitrile butadiene styrene plastic and shall have a blowout relief device.
  - c. Oxygen gauges shall be cleaned and marked for oxygen service.
  - d. Oxygen gauges shall have a green outside case.
  - e. Each gauge shall be capable of isolation from the system by a three-way gauge calibration valve, which meets the requirements of MIL-V-24578, and snubber assembly.
  - f. They shall have an accuracy of 1% full scale unless otherwise specified.
- 3.1.30 GAUGE RANGE:** The full range of pressure gauges shall be 130% to 150% of the maximum operational range.
- 3.1.31 VENT LINES:** Vent lines shall be independent of each other and of other lines. All vents lines shall exhaust outside the building, and shall be so configured and capped to prevent ingress of weather or debris. They shall be designed to provide lightning protection.
- 3.1.32 RELIEF VALVES:** Relief valves installed on PVHO's and on ASME air storage flasks shall conform to and be marked and stamped in accordance with ASME Section VIII, Division 1, "Pressure Vessels". Non ASME coded relief valves shall be installed on systems other than PVHO's and ASME storage flasks. Relief valves shall be located so that the exhaust port is not nearer than 5 feet from operators, the vented gas shall be directed away from operators.

Relief valves for piping greater than 1" NPT and for oxygen shall be piped outdoors. All non-ASME coded relief valves shall be adjustable-type relief valves.

- 3.1.33 PIPING CLEANING:** Piping shall be installed to facilitate cleaning. All high points shall be ventable, low points shall be drainable.
- 3.1.34 REDUCTION STATIONS:** Pressure regulating station components shall be selected so that output pressure will not drop below 90% of nominal set pressure for all conditions of flow and upstream pressure; and, maximum flow requirements shall be met under all conditions of upstream pressure and flow. Minimum upstream pressure shall be three times downstream pressure. Provide each pressure reducing station with a regulator, a filter upstream of the regulator, gauges to show the supply pressure, reduced pressure and a safety relief valve on the low pressure side with sufficient capacity to relieve the high pressure. Pressure regulators shall be capable of operating within a temperature range of 32 to 165 degrees Fahrenheit. All dome-loaded regulators shall be provided with appropriate hand loaded regulators for the adjustment of the reduced pressure downstream of the dome-loaded regulator. The exception shall be for the Scuba charge system dome loader, which shall have no hand loader and shall be set to 3300 psig. The exception for filters shall be that no filters shall be provided for maintenance panel or drive air panel regulators. All regulators shall be provided with straight thread o-ring fitting end connections.
- 3.1.35 FILTERS:** Filters shall be provided preceding all pressure regulators, except as noted in the specification or drawings. A filter shall be provided downstream of all externally supplied supply banks ("K bottle banks for oxygen, nitrogen, etc., Liquid oxygen, Liquid nitrogen, etc.) and preceding all dome loaded regulators regardless if not on drawings. All filters, unless otherwise specified, shall be fabricated in accordance with ASME Section VIII Div I, and shall be capable of changing the filter element without removing the filter body from the line. It shall be capable of removing particulate larger than 10 microns unless otherwise specified. Filters shall be sized so that the pressure drop across a clean filter is not more than 2.5 percent for LP systems (500 psi and less) or not more than 15 psi for HP systems (500 psi and more) of the specified minimum inlet pressure to the regulator at maximum flow rate specified for the regulator. All filters shall be provided with straight thread o-ring fitting end connections.
- 3.1.36 UNIONS:** Unions shall be installed in the piping and each end of the flexible hoses to facilitate removal and maintenance of components.
- 3.1.37 CONSOLES:** The surfaces of consoles that are viewed by operators shall be non-reflective.
- 3.1.38 PANELS:** Control Console's and Control Panels for recompression chambers shall be constructed in a panel mount configuration, with the component bodies behind the panel, and only displays or operating mechanisms exposed, and shall otherwise conform to C3.2.1.k. **All other panels** shall be constructed in an "exposed component, surface mounted" configuration. Panels and mounting

brackets shall be fabricated of aluminum. The panels shall be manufactured of a minimum of 1/4" plate. The exposed panel surface and all brackets shall be powder coated to the required color of the panel service after fabrication. The support brackets used to support the pipe and components shall also be powder coated after fabrication. All components on the panel shall be independently supported (pipe shall not be used to support components). Panels that cannot be supported due to their weight shall be supported with leg supports that adequately support the weight of the panels.

- 3.1.39 WELD JOINT INTERIOR:** Paragraph 111\* Welded Joints-The finished interior surface of pipe joints shall be smooth in order to reduce noise in the test piping. Backing rings, if used, shall be removed. There shall be no excess reinforcement on the inside of pipe joints caused by the welding process. Machine welding or consumable inserts shall be used in the welding process to avoid any excess reinforcing of the weld. The contractor shall provide a detail description of the weld process in the preliminary design.
- 3.1.40 WELDING QUALIFICATIONS:** Paragraph 127.5\* Qualification. All welders, welding procedures, and procedures shall be qualified by the contractor prior to welding on this project. Qualification by a previous employer is unacceptable. The following documents shall be submitted by the contractor:
- a. QW-482 Welding Procedure Specification
  - b. QW-483 Procedure Qualification Record
  - c. QW-484 Welder or Welding Operator Qualification Test
- 3.1.41 WELD IDENTIFICATION:** All welds shall have weld identification symbols etched on the pipe base metal adjacent to the respective weld. All etched weld numbers shall correspond to the welder log and Joint Identification Drawing (JID). The welders log and JID shall be submitted by the contractor. The welders log and JID shall contain sufficient information to cross reference between all welding qualifications, welding records, Non-destructive testing (NDT) qualifications, and NDT records. JID etchings will correspond to NDSTC PD-2 Section 32 and 33 requirements.
- 3.1.42 COMPONENT SUPPORTS:** Pipe and/or tubing shall be adequately supported at intervals no greater than 100 pipe diameters, and in both directions at elbows. Components (valves, regulators, etc.) shall be supported so that the force required to operate the component or other normal operational load does not cause visual deflection, rotation nor vibration.
- 3.1.43 CONTAMINATION:** Precautions shall be taken during fabrication to prevent construction dirt from entering pipe in storage or partially completed piping systems.
- 3.1.44 MACHINERY FOUNDATIONS:** Reciprocating machinery shall be on independent foundations, with sound isolation mounts.
- 3.1.45 COMPRESSOR GROUNDING:** Each compressor shall be grounded. Where a ground strap is provided at the isolation pad, the contractor shall connect the compressor to this strap. If no ground strap is provided, the contractor is responsible for installing such ground strap, and grounding the compressor.



**3.1.46 ALARMS:** Alarms shall be aural and visual. Visual displays shall be LED and press to test. Each aural alarm shall have a manual shut-off. Illuminated visual alarms and displays shall be grouped as safety related or informational. Safety related alarms and displays shall be GREEN, indicating a safe condition; or RED, indicating an unsafe condition. Informational illuminated visual displays shall be WHITE. They shall indicate data such as "OPEN", "SHUT", etc.

**3.1.47 OXYGEN SYSTEMS:** Oxygen piping shall conform to the requirements of CGA Pamphlet G-4.4, "Industrial Practices for Gaseous-Oxygen Transmission and Distribution Piping Systems". The following are noted:

- a. Pipe and fittings shall be stainless steel ASTM 316L.
- b. All valves, regulators and other components shall be copper based alloy. All oxygen system valves shall meet the requirements for throttle valves as specified in C3.1.24.
- c. Pipe joints shall be butt welded.
- d. Vent lines shall be independent of other lines and shall vent outdoors. The vent line for venting oxygen shall be cleaned as required by this specification.
- e. The oxygen vent shall be properly isolated from weather, combustibles, personnel, other systems and air compressor intakes.
- f. Components for oxygen systems shall not react with oxygen nor fluorinated compounds in any way that might cause generation of heat or loss of oxygen to the surrounding atmosphere. Such components shall utilize polytetra fluoroethylene (teflon), polychlorotrifluorethylene (Kel-F), or fluoroethylene (Viton) seals and gaskets. All other wetted parts shall be stainless steel or as otherwise specified.
- g. Gauge and sampling piping provided in oxygen systems which are 1/4" tube may have pipe joints which are socket welded. Gauge and sampling piping lengths and the amount of socket weld fittings shall be kept to a minimum.
- h. All oxygen piping shall be grounded.
- i. All filter elements shall be manufactured of bronze or monel.

**3.1.48 NON-DESTRUCTIVE EXAMINATION:** Mandatory minimum non-destructive examination of welds shall conform to the requirements of Table 136.4\* and the following.

| WELD TYPE                      | EXAMINATION                                       |
|--------------------------------|---|
| Butt weld.....                 | RT  |
| Welded branch connections..... | RT for 2" and over. MT<br>or PT for less than 2". |

Fillet, socket welds.....MT or PT all sizes.

NOTES:

- a. Welds shall be given a visual examination in addition to the examination specified above. Acceptance standards for visual examination shall be those of American Welding Society, D1.1, paragraph 8.15.1, "Quality of Welds".
- b. RT=Radiographic Examination (paragraph 136.4.5\*)
- c. PT=Liquid Penetrant Exam (paragraph 136.4.4\*).
- d. MT=Magnetic Particle Exam (paragraph 136.4.3\*).

**3.1.49 SYSTEM CLEANING:** Pipe that contains gases that will be breathed by humans shall be cleaned.

- a. The contractor shall be responsible for cleaning all new piping and components, and any existing piping and components on which work is performed, to the nearest disassembly joint. Equipment, materials, instruments, personnel and laboratory services required for cleaning and certification shall be provided by the contractor.
- b. The contractor shall submit his cleaning procedures to the Government. Procedures for cleaning the air system must be consistent with NAVSEA SS521-AA-MAN-010, appendix G. The use of organic solvents as a cleaning agent is prohibited.
- c. Components which are certified clean upon delivery by the manufacturer will not require cleaning if the integrity is not violated. Components which have been shop tested and certified for cleanliness shall be bagged and removed from the system during cleaning operations. Systems may be cleaned as a whole or in sections provided all clean piping is kept isolated and free of contamination after cleaning.
- d. An air gas sample shall be taken from the discharge of each air supply which will be breathed by humans. The total amount of gas samples taken shall ensure that there is analysis of the entire system. An additional sample shall be taken at one of the compressor air inlets. Samples shall be taken after hydrotesting, cleaning and assembly. Air purity shall meet or exceed the standards stated in the U.S. Navy Diving Manual (NAVSEA SS521-AG-PRO-010), Table 4-1, 4-2, 4-3, 4-4, or 4-5. Dew point analysis shall be conducted that confirms that less than -40°F air is being supplied by the compressors.
- e. Gas samples shall be taken at the discharge of all other pipe gas supplies which may be breathed by humans (oxygen, nitrox, heliox,) or used for mixing of breathing supplies (nitrogen, helium, etc.). The total amount of gas samples taken shall ensure that there is analysis of the entire system. Samples shall be taken after hydrotesting, cleaning and assembly. Purity shall meet or exceed the standards stated in the U.S. Navy Diving Manual (NAVSEA SS521-AG-PRO-010), Table 4-1, 4-2, 4-3, 4-4, or 4-5.

- f. Oxygen system cleaning procedures and Gas sample requirements must comply with the requirements of MIL-STD-1330.
- g. All gas samples shall be tested for the presence of unacceptable levels of all agents used in cleaning. An unacceptable level is any level less than 1/10<sup>th</sup> the maximum OSHA eight (8) hour exposure level for any constituent in the cleaning material.
- h. If liquid cleaning solutions are used requiring final H<sub>2</sub>O rinse, the final rinse solution shall be sampled to insure cleaning agents do not remain in the system.

**3.1.50 HYDROSTATIC TEST:** Paragraph 137\* - Leak Test. Piping shall be hydrostatically strength tested to 1-1/2 design pressure.

**3.1.51 GAS LEAK TEST:** A gaseous leak test shall be conducted after the hydrostatic strength test. The test shall be conducted with air unless otherwise specified. The maximum test pressure shall be the Maximum Operating Pressure. The gas pressure shall be permitted to stabilize as a result of temperature change. All possible sources of pressurization and volume storage (tanks, etc.) shall be isolated from the system. High pressure piping and low pressure piping in systems shall be tested independently. The maximum test pressure shall be safely brought to maximum operating pressure and held. After allowing for equalization, a bubble test will be performed. The pressure will then be brought to low pressure (50 psi) and left for an extended period of at least 3 hours. The pressure shall not drop.

**3.1.52 REGULATORS FOR CHAMBER AIR SUPPLY:** The regulators used for the air supply reduction for the chamber headers (panel supplying chamber primary #1 and #2) shall be dome-loaded regulators designed to provide high downstream flows while maintaining accurate control of pressures. The regulator outlet port shall be 1". The regulator shall be made of stainless steel. The regulator shall be designed to receive an inlet pressure of 5000 psig and an outlet pressure of 250 psig. The supply pressure for the chamber control valves (Globe valves for Air #1 and #2) shall be 250 psig. For all chamber supply piping downstream of the regulator, the piping and components shall immediately be increased to the size of the respective chamber penetrator.

**3.1.53 CHAMBER VENT PIPING:** Vent piping immediately downstream of the chamber vent throttle valves (Globe Valve) shall be increased to a minimum of two diameters larger than the piping upstream of the valve (i.e., 2" upstream - 4" downstream). The use of breathing compatible ABS with non-offgasing adhesive (see compressor intakes) is acceptable. The Vent system length shall be kept to a minimum, changes in vent flow (90's and 45's) shall be kept to a minimum, and all changes in direction shall use long radius bends or fittings.

**3.1.54 USN PRESSURE TEST:** A pressure test, in accordance with the requirements of the US Navy Diving Manual, Appendix D, shall be conducted on the RCF, after overhaul, and as part of the Final Functional Test. The results shall be submitted to the Government.

**3.1.55 MUFFLERS:** Unless otherwise specified, mufflers shall be shell type dispersive mufflers with connection size no smaller than associated line size. All mufflers shall be constructed of corrosion resistant stainless steel and all acoustical packing material shall be non-flammable.

### **3.2 SPECIFIC TO PROJECT:**

**3.2.1 OXYGEN CHARGING SYSTEM:** The contractor shall design, fabricate, and install an oxygen charging system. The oxygen system shall meet the requirements of part C2.1, and shall be configured as specified in Part C6. The oxygen charging system shall include:

- a. BOOSTER PUMP:** The oxygen charging system shall be equipped with an air operated oxygen transfer pump, as required to meet all requirements of paragraph C2.1. The station shall be capable of operating with oxygen input pressures from 400 to 3000 psig, and output pressures from 0 to 3000 psig, with an adjustable output pressure limiter. The transfer pump shall be shock mounted so as to prevent transfer of vibration to the adjacent wall. The transfer pump shall be configured as shown in section C6.
- b. AIR SUPPLY:** Air from the HP air system shall be used to power the booster pumps. Drive air shall tie into the Ship's Husbandry Flask Panels located in the Flask Room of the Joint Aquatic Combat Diver Training Center (JACDT) as shown in section C6.
- c. OXYGEN SUPPLY:** The oxygen supply shall tie into the O2 Gas Farm Supply Line located in the Gas Transfer Room as shown in section C6. The Oxygen line shall be run using welded fitting vice unions.
- d. CHARGING PANEL:** The contractor shall procure the charging panel, which shall be used for the charging of Oxygen bottles, configured and located as specified in Part C6. The Oxygen Charging Panel shall consist of a manifold block capable of charging 10 flasks simultaneously. The interface between the flask and the manifold shall consist of a female quick disconnect fitting (QD, with check valve), and a flexhose fitted with a male QD fitting on one end and a MK16 charging fitting on the other.

**3.2.2 AIR CHARGING SYSTEM:** The contractor shall design, fabricate and install one (1) Secumar charging system. The system shall meet the requirements of C2 and be configured as specified in part C6. The Secumar charging system shall include:

- a. BOOSTER PUMP:** The air charging system shall be equipped with an air operated booster pump, as required to meet all

requirements of paragraph C2.1. The station shall be capable of operating with air input pressures from 400 to 3000 psig, and output pressures from 0 to 3000 psig, with an adjustable output pressure limiter. The booster pump shall be shock mounted so as to prevent transfer of vibration to the adjacent wall. The booster pump shall be configured as shown in section C6.

**b. AIR SUPPLY:** Air from the HP air system shall be used to power the booster pumps and charge the bottles. Drive and Charging air shall tie into the Pool System Flask Panels located in the Flask Room of the Joint Aquatic Combat Diver Training Facility (JACDTF) as shown in section C6.

**d. CHARGING PANEL:** The contractor shall procure the charging panel, which shall be used for the charging of Air bottles, configured and located as specified in Part C6. The Air Charging Panel shall consist of a manifold block capable of charging 10 flasks simultaneously. The charging manifold will be located directly above the oxygen charging manifold, utilizing flex hose to reach the air bottles located in the charging sink. The interface between the flask and the manifold shall consist of a female quick disconnect fitting (QD, with check valve), and a flexhose fitted with a male QWD fitting on one end and a Secumar charging fitting on the other. (QD's must be far enough apart to allow charging of Secumar bottles)

**3.2.3 WET SINK:** The contractor shall provide a wet sink for charging the oxygen and air flasks. This sink shall also act as a leak test tank for MK-16 units. The sink shall be able to house four complete MK-16 UBA units, along with 10 oxygen flasks and 10 air flasks simultaneously. These flasks shall be submerged in water to the neck while being charged, each in an individual area. The sink shall include an appropriately sized drain, with drain valve. The contractor is responsible for installation of water to the sink, from the building water supply, and plumbing the sink drain to the appropriate drain. The sink shall be outfitted with overflow protection that drains into the appropriate drain. The sink shall be configured to allow the oxygen bottles to attached directly to the charging manifold, without the use of flex hose. Immediately behind the oxygen bottles shall be another shelving system to allow a row of air bottles to be placed in the sink at the same time as the oxygen bottles, while allowing room to leak test complete MK16 UBA's.

**3.2.4 OXYGEN AND SECUMAR STORAGE RACKS:** The contractor shall design, fabricate and install separate storage racks for 100 Oxygen and 200 secumar flasks. The Oxygen storage system shall either be composed of shelves, capable of holding 10 to 20 flasks safely, or constructed of containers holding 10 to 20 flasks safely, which are stackable in design. The secumar storage system shall consist of two containers, capable of holding 100 flasks.

END OF SECTION

**PART C4**

**4.1 N/A**

END OF SECTION

## PART C5

### 5 QUALITY ASSURANCE

#### 5.1 GENERAL REQUIREMENTS:

- 5.1.1 All work performed shall be in accordance with and to the standards and specifications cited in each section. Any changes in design or deviation from accepted standards must be documented and submitted to the Government prior to change or implementation.
- 5.1.2 **DESIGN REVIEW MEETINGS:** Design and fabrication review meetings shall be held by the contractor at the contractor's facility or the installation site, at time intervals no greater than six weeks. Two weeks advance written notice shall be furnished to the Government prior to each meeting.
- 5.1.3 **CONTRACT ADHERENCE:** The contractor shall rigidly adhere to the requirements for qualification, certification, test, examination and inspection required by the various contract documents.
- 5.1.4 **SUBCONTRACTORS:** Subcontractors shall be monitored by the contractor to assure timely and adequate performance and adherence to approved specifications. Copies of all certifications/qualifications required for the subcontractor to perform his work shall be submitted by the contractor to the Government.
- 5.1.5 **SUBMISSION NUMBER:** All submissions and submittals required by this contract shall include one (1) original and three (3) copies of the submission.
- 5.1.6 **DISK COPIES:** Systems manuals shall be prepared using a commercially available word processing program. All drawings shall be prepared on a commercially available computer aided design program. The component database shall be prepared on a commercially available spreadsheet design program. All submissions (Preliminary Design, Final Design, and As-Built) of systems manuals, drawings, and component database shall include CD copies of the system manuals, drawings, and component database formatted for MS-DOS (IBM compatible). Final disk submission of systems manuals, drawings, and component database shall be marked "As built". Final disk submissions of drawings shall include all the names of all signers present, and the date of signature. Complete files must be in current NMCI computer program product format such as MS Word 2004, MS Excel 2004, AUTOCAD release 2006 (minimum), MS Access 2004 Professional. The contractor shall provide a minimum of two (2) copies of all CD's.
- 5.1.7 **NOTIFICATION OF TESTING:** The contractor shall provide the Government with written notification of all testing. This notification shall be received by the Government a minimum of fifteen working days prior to the date of the test.
- 5.1.8 **CONTRACTOR'S RECORDS AND DOCUMENTS:** The contractor shall submit copies of all records and documents required by this contract and the codes and specifications cited herein. One original and three copies shall be submitted.



- 5.1.9      **PIECEMEAL SUBMITTAL:****      Piecemeal submittal of any submittals required by this specification is unacceptable, and such submittals will be returned without review.
- 5.1.10     **QUALITY ASSURANCE PLAN:****      The contractor's Quality Assurance Plan shall be in accordance with **ISO 9000** or **MIL-Q-9858**, and with any further quality requirements specified in the contract. As a minimum content, the program plan shall disclose the contractor's planned approach to fulfilling the requirements of every paragraph of sections 3 through 7 of MIL-Q-9858. A description of the organization that will fulfill the quality program requirements with a definition of the responsibility and authority of each functional element, shall be included. All of the contractor's documented policies or procedures which implement the quality program shall be identified in appropriate places with the plan. A short summary of the objective or purpose of each procedure shall be given. The plan must delineate, by flow chart or similar technique, where inspection, audit and other controls are to be applied to assure conformance with the contract quality requirements and must identify each assembly, process and inspection instructions applicable to the contract hardware and show where it is to be applied. The plan shall describe the method by which the plan will be applied to sub-contractors.
- 5.1.11     **DESIGN PACKAGE:****      Documents in this package shall be of sufficient detail to demonstrate that the contractor's plan for the work described in this contract is in conformance with this contract as well as demonstrating the technical and functional feasibility of the contractor's plan. All elements of the design shall be in strict conformance with the hyperbaric facility code requirements as stated in paragraph 1.2.8. It shall clearly indicate where equipment, components and piping runs are intended to be located. Pragmatic issues of installation and maintenance shall be addressed. During development of the preliminary design, the contractor is responsible for visiting the site to facilitate layout of work. Drawings shall be in accordance with DOD-STD-100. Drawings shall be 17" x 22", LEVEL 2 drawings. The Government will respond to the Preliminary Design submittal within 30 days of receipt. The preliminary package shall consist of the following applicable items, as a minimum.
- a. General Arrangement Drawings.
  - b. System piping and electrical schematics.
  - c. Calculations.
  - d. Proposed Material and Manufacturing Specifications and qualifications.
  - e. Preliminary Component Manufacturer's Design Data.
  - f. Subcontractors Identification, Qualifications, and Certifications.
  - g. Hyperbaric Systems Manual Outline.
  - h. Component and Panel ID tags.
  - i. Test Plans
  - j. Welding Qualifications and Procedures
  - k. Cleaning Qualifications and Procedures
  - l. Painting Plan
  - m. Non-destructive Testing Plan and Qualifications

- 5.1.12 not used
- 5.1.13 **DRAWING PACKAGE (NDSTC):** The drawing package shall be configured, and contain the elements, as described in NDSTC PD-2. A copy of PD-2 will be provided by NDSTC to the contractor upon request. As-Built Drawing numbers shall be assigned by NDSTC prior to submission of the As-Built Submittal, during redline markup period.
- 5.1.14 **RECORD DRAWINGS AND DOCUMENTATION:** RECORD DRAWINGS SHALL MEET THE REQUIREMENTS OF NDSTC PD-2
- 5.1.15 **COMPONENT MANUFACTURER'S DESIGN DATA:** The contractor shall provide the Component Manufacturer's Design Data (CMDD) for all components provided as part of this contract. The CMDD shall be provided in one completely marked and coordinated package sufficient to assure full compliance with the specification requirements. Submittals for each manufactured product shall include, but not be limited to the following: Manufacturer's descriptive literature and catalog cuts, manufacturer's operation and maintenance manual (**2 Copies**), equipment drawings, diagrams, performance and characteristic curves, catalog model or number, nameplate data, size, layout dimensions, capacity, specification reference, component tag number, and find number from valve and component list/drawings.
- 5.1.16 **SYSTEMS MANUAL:** The contractor shall provide Systems Manuals. The contractor is responsible for providing all sections for systems provided under this contract. The manual shall consist of the following:
- a. General Facility Description:
  - b. System Certification:
  - c. There shall be a section addressing each of the Hyperbaric Systems. The following data shall be provided by the Contractor for each system:
    1. System Operational Capabilities, Limitations and Set Points.
    2. System Narrative Description.
    3. System Piping and Electrical Schematics.
    4. System Operating Instructions.
    5. System Maintenance Instructions.
    6. System Design Computations.
    7. System Spare Parts Data.
    8. Component List.
    9. System Functional Test.
- 5.1.17 **CONTRACTOR'S RECORDS AND DOCUMENTS:** Contractors records and documents shall include all records and documents required by Part C1 and C3. These shall include, but are not limited to:
- a. Test reports
  - b. Inspection reports
  - c. Test plans
  - d. Travelers/route sheets
  - e. Mill certs/material reports
  - f. Procedures
  - g. Qualifications
  - h. Records

- i. Working drawings
- j. Radiographs
- k. Shop Drawings

**5.1.18 COMPONENT DATABASE:** The Component Database provides design, procurement and manufacturer's data about the components. The database requirement shall be met by the use of MS Excel or MS Access. The database fields (columns) shall be:

- a. Component Identification Tag number.
- b. Design data:
  - 1. Type Component.
  - 2. Size.
  - 3. Drawing Number used on.
  - 4. Required Psi.
  - 5. Material Body and Seat
  - 6. End Connection Type and Material
- c. Manufacturer's Data:
  - 1. Manufacturer's name
  - 2. Manufacturer's address, telephone number.
  - 3. Model Number.
- d. Maintenance Data:
  - 1. Part number and price of consumables.
  - 2. Frequency of maintenance.
  - 3. Manufacturer's Recommended Spare Parts.

**5.1.19 FUNCTIONAL TEST PLAN:** The contractor shall submit a functional test plan for the complete test of all hardware provided as part of this specification. The functional test plan shall include valve line up, functional testing procedures, pass/fail criteria and shut down of the system being tested. There shall be initial blocks for all steps of the functional test plan. There shall be final signature blocks for both the contractor's completion and the Government's witnessing of successful functional test. The plan will provide information as to all equipment needed for testing and the calibration information for that equipment. The test plan shall contain, as a minimum, the following data:

- a. Test purpose/objectives.
- b. Identify each assembly to be tested.
- c. Describe test set up at each level of test, including diagrams and sketches to illustrate the test set-up.
- d. Describe or identify all test equipment required. Calibration of test equipment.
- e. Describe all test procedures, including test sequence, test parameters, participants, **and pass/fail criteria.**
- f. Provide sample test data sheets to illustrate test data to be documented and delivered at each level of test.
- g. Establish criteria for acceptance at each level of test and describe the procedures to be followed in the event of malfunction or failure.
- h. Identify critical or unusual tests or test conditions.
- i. Overall test schedule.

**5.1.20 SYSTEM FUNCTIONAL TEST:** The contractor shall be required to demonstrate by testing that all piping, instrumentation and systems are capable of meeting all the criteria contained in this specification. The functional test shall not be conducted until

all other required testing has been completed, gas analysis reports have been received, and final, as built drawings have been submitted to the Government. The contractor shall prepare a test plan and a test report.

**5.1.21 PROJECT SCHEDULE:** The contractor shall prepare a contract progress schedule that clearly defines the tasks necessary to accomplish the work. The schedule shall be a GANTT chart, CPM chart or "ROADMAP". The schedule shall be composed of defined and documented Milestones and Tasks (M&T). Milestones are defined as having no time duration; whereas, Tasks have time duration. The schedule shall show the order and interdependence of M&T and the sequence of M&T execution necessary to complete the contract. The schedule shall show the M&T that comprise the critical path. It shall show the float for those M&T not on the critical path. Procurement and subcontracting tasks may cite total individual procurement or subcontract cost. Copies of M&T documents whose work was completed during a monthly period shall be submitted with the monthly progress report for that period. The M&T documents shall be signed by the contractor to indicate certified completion of the Task. The monthly update of the contract schedule shall contain the date of effect of that update and a list of the revision dates of the schedule. The following shall be included in the schedule as either milestones or tasks, as a minimum, in addition to others necessary to describe the work:

- a. Work Tasks.
- b. Contractual execution date requirements milestones.
- c. Government furnished information and/or equipment milestones.
- d. Contractual submittal date requirements milestones.
- e. Procurement activities including major equipment tasks.
- f. Subcontract activities tasks.
- g. Quality Control checks.

**5.1.22 MONTHLY REPORT:** The contractor shall provide a monthly report, which shall include an update of the Project Schedule and Component Database. The revised documents shall reflect any changes occurring since the last updating. It shall also include a current Progress Report containing a summary of all work performed and any problems and their solutions encountered during the reporting period, and a statement of the overall status of the project, and a statement of the overall status of the project. This report shall be sent electronically in its entirety to the COTR.

**5.1.23 PURCHASE ORDERS:** The contractor shall submit all purchase orders for all material purchased. The Contractor shall prepare a database or table which cross-references data such as purchase order number, find number (if applicable), and any other pertinent information such as heat numbers. The purchase orders shall be kept in a separate three-ring binder (or binders). Each purchase order (and its applicable data) shall be separated by its own individual tab.

**5.1.24 FACILITY FUNCTIONAL TEST:** The contractor shall be required to demonstrate by testing that all piping, instrumentation, machinery, and systems meet the following criteria:

- a. Are hazard free.
- b. Are in accordance with applicable Codes and Standards.

END OF SECTION

## **PART C6**

### **6 DRAWING SCHEMATICS**

#### **6.1 SCHEMATICS: As Required**

