



**NAVFAC P-1046
OCTOBER 2012**

**PRE-SURVEY OUTLINE BOOKLET
FOR SHORE-BASED U.S. NAVY
RECOMPRESSION CHAMBER SYSTEMS**

System Name: _____

System Location: _____

**SYSTEM CERTIFICATION AUTHORITY, CODE OFP
NAVAL FACILITIES ENGINEERING COMMAND
1322 PATTERSON AVENUE, SUITE 1000
WASHINGTON NAVY YARD, BLDG 36
WASHINGTON, DC 20374-5065**

REVISIONS

No.	Prepared By	Date	Approved By	Date	Approved by SCA	Date

REVISING THE PRE-SURVEY OUTLINE BOOKLET

Complete this PSOB for a new, recertification, or when the tenure of certification nears expiration and a continuance of certification is requested. Selected pages of the PSOB will normally require revisions. These revisions will ensure that the PSOB reflects the latest information pertaining to the system. The pages and times normally requiring revision are as follows:

1. Administration Information - Complete Revision Block.
2. Record of Changes - Enter all changes made.
3. Page 8 - Inspections and Tests (Current Period):
 - Item VII
 - A. Provide Status.
 - B. Provide Date and Results.
 - C. Provide Date and Results.
 - D. Provide Date and Results.
 - E. Provide Latest Dates.
 - F. This item will require revision only if permanently installed hoses have been changed.
4. Pages 10 & 11 - Operation and Maintenance Procedures:
 - Item VIII
 - A. If OPs / EPs have been changed since approval by NAVFAC SCA enter the Serial Number and date of letter authorizing change.
 - B. List any outstanding feedbacks remaining open.
 - C. Enter appropriate “quarter after overhaul number”.
 - D. Enter total number of RECs issued since last on-site survey.
5. Pages 14 & 15 - On-Site Survey - These pages will be revised by the SCA during the On-Site Survey.
6. Page 16 - Operational Demonstration - This page would be used by the SCA and document the chamber operational demonstration test. If a change to a system’s certified depth is contemplated, a command request must be submitted to the SCA prior to the survey.

RECORD OF CHANGES

REV. NO.	DATE	PAGE NO.	ITEMS CHANGED (LTR)	ENTERED BY

ITEM I: RECOMPRESSION CHAMBER IDENTIFICATION			
REQUIREMENT	STATUS		RESPONSE *
	DATE#	APVD#	
<p>A. Identification of Chamber</p> <ol style="list-style-type: none"> 1. Certified Depth (note fsw or psi) 2. Max Allowable Working Pressure (psi) 3. Number of Locks 4. Shell Material 5. Riveted or Welded Construction 6. ASME Code Stamp 7. Serial Number 8. Manufacture 9. Date of Manufacture 10. National Board Number 11. Viewport Material (Date of manufacture for each window) <p>B. Identify modifications to chamber's original configuration. (Include modification to lighting, manifolding, communications, wiring, etc.)</p> <p>C. Justify modifications to original configuration.</p> <p>D. Provide design concepts and calculation results covering modifications. (Supporting calculations should be provided on a continuation page.)</p>			<p>A. Identification of Chamber</p> <ol style="list-style-type: none"> 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. <p>B.</p> <p>C.</p> <p>D.</p>

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* Use Continuation Sheets as necessary

ITEM II: RECOMPRESSION PROFILE / OPERATING PARAMETERS			
REQUIREMENT	STATUS		RESPONSE *
	DATE#	APVD#	
<p>A. Describe the most demanding chamber operations contemplated. Include treatment tables, number of patients and tenders and pressurization and decompression requirements of tenders locking in and out. Where applicable, include similar requirements for surface decompression and pressure testing.</p> <p>B. Provide here a summary of Air / Oxygen required and Air / Oxygen available. Supporting calculations should be provided in Appendix A. Air / Oxygen available must be equal to or greater than Air / Oxygen required for both quantity (volume) and pressure.</p>			<p>A.</p> <p>B. STANDARD CUBIC FEET AIR/OXYGEN</p> <p style="text-align: center;">AIR</p> <p>PRIMARY SECONDARY SCF REQUIRED__MMP SCF REQUIRED__MMP SCF AVAILABLE____ SCF AVAILABLE</p> <p style="text-align: center;">OXYGEN</p> <p>PRIMARY SCF REQUIRED____ MMP SCF AVAILABLE</p>

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ITEM III: RECOMPRESSION CHAMBER AIR SUPPLY SYSTEM			
REQUIREMENT	STATUS		RESPONSE *
	DATE#	APVD#	
A. Provide drawing number of schematic diagram of systems that furnish air to the chamber, showing all compressed air sources, controls, and processing equipment. Indicate operating parameters such as pressure and volume for appropriate components. Include date drawing was validated and list NAVFAC approval information.			A.
B. Provide drawing number of detailed plans of air piping covered in schematic diagram.			B.
C. Provide air compressor identification and characteristics.			C.
D. Provide compressed air processing equipment identification and characteristics. (Filters, dryers, separators, monitors, regulator make and model numbers, etc.)			D.

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ITEM III: RECOMPRESSION CHAMBER AIR SUPPLY SYSTEM (Continued)

REQUIREMENT	STATUS		RESPONSE *
	DATE#	APVD#	
E. Provide air storage vessel identification and characteristics (ASME, MIL SPEC, DOT)			E.
F. Identify primary chamber air supply and describe procedures for shifting to secondary air supply.			F.
G. Identify demands placed on compressed air systems other than supplying chamber. Will this demand be used during chamber operations? If so, show that this demand will not degrade system performance or cleanliness.			G.

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ITEM IV: RECOMPRESSION CHAMBER OXYGEN SUPPLY SYSTEM			
REQUIREMENT	STATUS		RESPONSE *
	DATE#	APVD#	
A. Provide drawing numbers of schematic diagram of system which supplies chamber oxygen, showing all storage flasks, controls, and processing equipment. List NAVFAC approval info.			A.
B. Provide drawing numbers of detailed plans of the oxygen system covered in the schematic diagram.			B.
C. Provide oxygen processing equipment identification and characteristics (filters, filter elements, regulators, etc.)			C.
D. Identify demands placed on oxygen system other than supplying the chamber.			D.
E. Identify the chamber's oxygen supply and describe procedures for supplying oxygen to the chamber.			E.

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ITEM IV: RECOMPRESSION CHAMBER OXYGEN SYSTEM (Continued)

REQUIREMENT	STATUS		RESPONSE *
	DATE#	APVD#	
<p>F. Provide manufacturer's model and serial numbers for the following:</p> <ol style="list-style-type: none"> 1. OX back pressure regulator 2. OX pressure regulator 3. OX Filter and element 4. OX monitor 5. OX BIBS masks (If applicable, include oxygen treatment hood and controls.) 6. CO2 Monitor 7. CO2 Scrubber 			<p>F.</p> <ol style="list-style-type: none"> 1. 2. 3. 4.

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ITEM V: ELECTRICAL SYSTEM SUPPORTING RECOMPRESSION CHAMBER OPERATIONS

REQUIREMENT	STATUS		RESPONSE *
	DATE#	APVD#	
A. Provide drawing number of schematic diagram of electrical circuits that support the recompression chamber.			A.
B. Describe primary and secondary (emergency) lighting arrangements for chamber operations.			B. .

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ITEM VI: TREATMENT SUPPLIES AND OTHER PERTINENT MATERIALS			
REQUIREMENT	STATUS		RESPONSE *
	DATE#	APVD#	
<p>A. List all materials to be stored in or carried into the chamber in the course of its utilization. Include recognition statements of material toxic or flammable characteristics / nature when such exist.</p> <p>Note: Availability and accessibility of supplies, material and equipment required for recompression treatment is to be in accordance with the U.S. Navy Diving Manual, Volume 5.</p>			<p>A.</p> <ol style="list-style-type: none"> 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13.

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ITEM VII: INSPECTIONS AND TESTS (Current Period)			
REQUIREMENT	STATUS		RESPONSE *
	DATE#	APVD#	
A. Provide status report of known material deficiencies for recompression chamber and support systems.			A.
B. Report date and results of last pressure / leak integrity test of air and oxygen piping systems.			B.
C. Provide date and results of last chamber pressure / leak test conducted in accordance with the U.S. Navy Diving Manual, Volume 5, Chamber Air Pressure and Leak Test.			C.
D. Provide date and results of latest air, oxygen, and specialty gas purity test.			D.
E. Report latest gauge calibration dates.			E.
F. Report manufacturer, manufacturer's part number, and working, test and burst pressure data for all flexible hoses permanently installed in the system. Include inter-connecting hoses for auxiliary compressor systems.			F.

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ITEM VII: INSPECTIONS AND TESTS (Current Period) (Continued)			
REQUIREMENT	STATUS		RESPONSE *
	DATE#	APVD#	
<p>G. For initial construction systems or redesigned systems being re-certified upon completion of major overhaul:</p> <p>1. Provide results of operational flow tests conducted in accordance with NAVFAC approved test procedures.</p> <p>2. Provide results of operational pressure tests conducted in accordance with NAVFAC approved test procedures.</p> <p>H. Provide date and results of last gas storage vessel inspection and indicate criteria used (e.g. NAVFAC TM-CHENG/05-010-SCA or applicable DOT regulations).</p> <p>I. Provide date and results of last acrylic window inspection per NAVSEA/NAVFAC Process Instruction PI-006 "Inspection and Extension of Service Life of Windows/Viewports in Hyperbaric Systems"</p> <p>J. Indicate if support systems contain silicone aluminum bronze (SAB) nuts and if so, provide date of last system wide inspection and any findings. DMS:R 171326Z AUG 04 COMNAVFACENGCOM WASHINGTON DC DIVING ADVISORY 04-08: INSPECT ASHORE HYPERBARIC SYSTEMS FOR PRESENCE OF SILICON ALUM BRONZE UNION NUTS</p>			<p>G.</p> <p>1.</p> <p>2.</p> <p>H.</p> <p>I.</p> <p>J.</p>

For SCA use only: Date and Initial

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ITEM VIII: OPERATIONS AND MAINTENANCE PROCEDURES			
REQUIREMENT	STATUS		RESPONSE *
	DATE#	APVD#	
<p>A. Provide operating and emergency procedures for the overall diving system and indicate that they have been:</p> <ol style="list-style-type: none"> 1. Validated by the diving staff. 2. Approved by NAVFAC. <p>B. Provide PMS instructions for the overall diving system. Ensure MIPs and MRCs are provided for:</p> <ol style="list-style-type: none"> 1. Compressors 2. Flasks 3. Volume Tanks 4. Filters 5. Moisture Separators 6. Viewports 7. Chamber Communications 8. Regulating/Reducing Valves 9. System Gauges 10. Relief Valves 11. System Valves 12. Door Gaskets 13. System Flexible Hoses 14. Lights 15. Oxygen Breathing Masks 16. Sound Powered Phones 17. Power Cables/Ground Straps 18. Receptacles 19. Air Samples 			<p>A.</p> <ol style="list-style-type: none"> 1. Date Validated: <p>Validated By:</p> <ol style="list-style-type: none"> 2. NAVFAC Approval Letter Serial Number: <p>NAVFAC Approval Letter Date:</p> <p>B.</p> <ol style="list-style-type: none"> 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19.

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ITEM VIII: OPERATION AND MAINTNENACE PROCEDURES (Continued)

REQUIREMENT	STATUS		RESPONSE *
	DATE#	APVD#	
<p>C. List all PMS related deficiencies and all PMS feed backs submitted since last certification. (Include all MRCs not performed as required or as scheduled.)</p>			<p>C.</p> <ol style="list-style-type: none"> 1. 2. 3. 4. 5. 6. 7. 8. 9.
<p>D. List by "Quarter after overhaul number" the PMS quarterly Schedule in effect at the time of the on-site survey. For systems or equipment not covered by PMS list applicable maintenance instruction and submit the maintenance program to SCA for review.</p>			<p>D.</p>
<p>E. List by short title all Reentry Control (REC) procedures issued since last certification. Provide reference to latest command REC procedures / instructions that should be available for review by SCA during on-site survey.</p>			<p>E.</p> <ol style="list-style-type: none"> 1. 2. 3. 4. 5. 6. 7. 8. 9.

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ITEM VIII: OPERATIONS AND MAINTENANCE PROCEDURES (Continued)

REQUIREMENT	STATUS		RESPONSE *
	DATE#	APVD#	
E. Continued			E. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26.

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ITEM IX: ON-SITE SURVEY (Note: Request Survey via Sponsor to NAVFAC)			
REQUIREMENT	STATUS		NOTES
	DATE#	APVD#	
<p>Note: This item is performed by the System Certification Authority.</p> <p>A. Inspection of material condition of chamber, equipment and support systems.</p> <p>B. Verification of accessibility to vital equipment.</p> <p>C. Verification of conformance to "as built" drawings.</p> <p>D. Verification of material identification and control.</p> <p>E. Verification of material condition of viewports and their date of manufacture.</p> <p>F. Verification of oxygen system operability.</p> <p>G. Review of Reentry Control records.</p> <p>H. Review of fabrication, construction, & assembly procedures / records.</p>			<p>A.</p> <p>B.</p> <p>C.</p> <p>D.</p> <p>E.</p> <p>F.</p> <p>G.</p> <p>H.</p>

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ITEM IX: ON-SITE SURVEY (Note: Request Survey via Sponsor to NAVFAC) (Continued)

REQUIREMENT	STATUS		NOTES
	DATE#	APVD#	
I. For initial construction or refurbished systems, review of test plans / procedures / records for fabrication, construction, and assembly.			I.
J. Review of proof and performance test procedures / records (i.e. leak tests, hydrostatic tests, operational tests, etc.).			J.
K. Review of system cleaning procedures and records.			K.
L. Review of current system air sampling results.			L.

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ITEM X: OPERATIONAL DEMONSTRATION (For SCA Use Only)			
REQUIREMENT	STATUS		NOTES
	DATE#	APVD#	
A. Name of SCA or designated representative.			A.
B. Date of operational demonstration.			B.
C. Unmanned chamber demonstration to maximum depth.			C.
1. Provide Maximum depth achieved			1.
2. Demonstrate primary/ secondary press for IL and OL using rate of 60ft/min			2.
3. Cycle med lock at depth			3.
4. Test fixed fire extinguishing system			4.
D. Manned chamber demonstration at 20 fsw.			D.
1. Test Communication systems (Headset/speaker, Sound powered phones)			1.
2. Demo operation of Built-In-Breathing (BIBS) for each gas supply (OX, Speciality Gas, Emergency Air)			2.
3. Test internal atmospheric monitors(OX, CO2, BIBs supply)			3.
4. Demo Environmental Control system (CO2 scrubber, heat/cool exchangers)			4.
E. General comments			E.

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This recompression chamber system has been found to be functional and postdive inspection verifies that no condition exists or has developed as a result of this operational demonstration which could be dangerous or impair the satisfactory operation of this system.

Signature and Date

APPENDIX A: SUPPORTING AIR / OXYGEN CALCULATIONS

