

APPENDIX

J. References

1. Saunders, H. F. Capt. (USN), "Hydrodynamics in Ship Design," Society of Naval Architects and Marine Engineers, 1957.
2. Graham, J. R., "Mooring Techniques in the Open Sea," Marine Technology, April 1965.
3. Large Object Salvage Study, General Dynamics Electric Boat Division Report, Vol. I, U415-65-002, September 30, 1965.
4. Towne, R. C., "Mooring Anchors," SNAME Transactions, Vol. 67, 1959.
5. Technical Summary of Five Deep Sea Ship Moors, Hydro-space Research Corporation, Report No. 111.
6. Letter from Commander Task Unit 49.4.3 to Chief of Naval Operations, Serial 235-49, dated 23 September, 1949.

J. Bibliography

BARROWS, N. A., Blow All Ballast, New York, Dodd-Mead 1940.

BLACKMAN, RAYMOND U.B., Compiler/Editor, Jane's Fighting Ships, McGraw-Hill Book Co., 1965.

Boom Defense and Marine Salvage Department, British Admiralty, Report on the Salvage of H.M. Submarine TRUCULENT in the Thames Estuary, January 12 to March 23, 1950.

CRITCHLEY, G. R., "The Salvage of HMS THETIS," Shipbuilding and Shipping Record, June 20, 1940.

DAVIS, ROBERT H., Deep Diving and Submarine Operations, St. Catherine Press, 5th Edition, London, England, 1951.

Deep Sea Diving School, Ship Salvage Notes, 1960.

ELLSBERG, EDWARD, LCDR (CC) USN, Report on Salvage Operations, Submarine S-51, U.S. Navy Department, 1927.

ELLSBERG, EDWARD, LCDR (CC) USN, On the Bottom, Dodd-Mead, New York, 1929.

FURER, J. A., USN (Naval Constructor), Salvage Operations on Submarine F-4, USNIP Nov./Dec., 1915.

KING, ERNEST J., CAPT. (USN), Salvaging the USS S-51, USNIP, February 1927.

LIPSCOMB, F. W., CDR (HMRN), Up She Rises, Hutchinson & Co., London, England.

LOCKWOOD, CHARLES A. and HANS C. ADAMSON, Hell at 50 Fathoms, Chilton, New York, 1962.

NAVSHIPS 250-538, U.S. Navy Diving Manual, 1963.

SAUNDERS, H. E., CDR. (CC) USN, Technical Report on the Salvage of the USS S-4, U.S. Navy Department, 1928.

SEARLE, W. F., JR., CAPT. (USN), The Employment of Man-Underwater in Naval Warfare (U), Thesis, U. S. Naval War College, Newport, R.I., 6 April 1962 (CONFIDENTIAL).

SEARLE, W. F., JR., CAPT. (USN), History of Deep Submergence,
U. S. Naval Institute Proceedings, March 1966.

SMITH, C. E., Salvage Operations, Submarine F-4 (Official
Navy Letter), U. S. Navy Department, 1915.

TUSLER, F. A., LCDR. (CC) USN, Technical Report on the
Salvage of USS SQUALUS, U. S. Navy Department, 1939.

WARREN, C. E. T. and JAMES BENSON, The Admiralty Regrets...,
Harrap, London, England, 1958.

J. Alphabetical Index

	<u>Page</u>
A	
Air Requirements	7-13
Air Salvage Fittings, the use of	2-21
Anchors	3-6
Attachment Phase	8-5
Attachment Points	7-2
Attachments to the Hull	7-2

B	
Bibliography	J-2
Bottom Breakout Force	4-14
Bottom Breakout Forces, Determination of	4-24
Bottom Breakout Forces, Mathematical Definition of	4-18
Bottom Breakout Forces, Theoretical Considerations of	4-17
Breaking the Submarine Free of the Bottom	5-15

C	
Calculating the Flooded Weight	4-13
Catenaries	3-9
Compound	3-15
Simple	3-9
Cement Gun	2-38
Cofferdams	2-42
Compartments	6-3
Computing the Lift Requirements	4-4
Current	3-3

D	
Deadweight and Center of Gravity, Determination of	4-4
Dewatering of Tanks and Components	6-12
Diving Equipment	2-5
Diving Operations	2-13
Diving Physiology	2-1
Diving Systems	2-1

E	
External Lift, the need for	7-1

F	
F-4 (1915)	4-1
Factors Shaping Salvage Requirements	8-1

Alphabetical Index (Cont'd)

F	<u>Page</u>
Final Lift to the Surface	5-18
Fuel Ballast Tanks	6-8
Fuel Oil Tanks	6-8
Future Developments in Submarine Salvage	8-1
G	
German Submarine HAI (1966)	4-4
GUITARRO, Salvage of, Appendix I	I-1
H	
Hose Requirements and Handling	6-11
HAKE, Salvage of, Appendix H	H-1
I	
Introduction	1-1
L	
Lift, Determination of	4-1
Lifting	2-34
Lifting and Towing	5-1
Lifting Barges (YMLC)	2-19
Lifting Phase	8-7
Lifts, Intermediate	5-15
Lift Plan, the Development of	4-8
Lift, Types of	4-8
Location Phase	8-4
M	
Main Ballast Tanks	6-3
Moor, (ASR)	3-23
Moored Ship, Forces Acting Upon	3-2
Mooring	3-1
Mooring Equipment	3-23
Moors, Dynamic	3-5
Moor, Static	3-5
O	
Ocean Rescue and Salvage Ship (ARS)	2-18
Ocean Salvage Tug (ATS)	2-20
Operations	2-13
P	
Past Salvage Operations	6-12

Alphabetical Index (Cont'd)

P	Page
Pertinent Data, Gathering of	4-5
Pontoon Lowering and Setting	5-13
Pontoons, Delivery and Responsibility of	5-10
Pontoons - Positive Buoyancy	5-14
Pontoon Testing	5-7
Preparation for Lowering Pontoons	5-10
Preventers	7-11
R	
Rigging for Supplemental Surface Lift	7-13
Rigging Pontoons for Tow to Salvage Area	5-9
S	
S-4 (1927)	4-1
S-5 (1920)	4-1
S-51 (1925)	4-1
Salvage Equipment	5-1
Salvage Foam	6-9
Salvage Hatch Cover	2-38
Salvage of HMS THETIS, Appendix F	F-1
Salvage of HMS TRUCULENT, Appendix G	G-1
Salvage of Submarine F-4, Appendix A	A-1
Salvage of Submarine S-51, Appendix C	C-1
Salvage of USS S-4, Appendix D	D-1
Salvage of USS SQUALUS, Appendix E	E-1
Salvage Operational Control Center	8-9
Salvage Phases	8-4
Self-Lift vs. External Lift	4-12
Slings	7-10
Spare Messenger Lines	7-7
Special Fittings	2-38
Submarine External Lift	7-1
Submarine Rescue Ship (ASR)	2-17
Submarine Self-Lift	6-1
Submersible Structural Pontoons	5-1
Submersible Structural Pontoons, use of	5-9
Surface Support Ships	2-14
Survey Phase	8-5
Sweeping Slings	7-3
T	
Temporary Attachments	7-11
THETIS (1939)	4-3

Alphabetical Index (Cont'd)

	<u>Page</u>
T	
Tools for Cutting	2-22
Tools for Joining	2-22
Towing	5-17
Towing the Submarine into Port	5-20
TRUCULENT (1950)	4-4
Tunneling Tools	2-34
U	
Underwater Tools and Methods of Employment	2-21
USS S-5, Attempted Salvage of, Appendix B	B-1
USS SQUALUS (1939)	4-2
V	
Variable Ballast Tanks	6-9
W	
Wave Forces	3-3
Wind Forces	3-2