

VOLUME I
EXECUTIVE SUMMARY

*INVESTIGATION
OF
THE POTENTIAL
FOR
INCREASED USE
OF
CIVILIAN
MANNING*

IN FLEET SUPPORT SHIPS
CIVMAN



FINAL REPORT

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the two manning alternatives, Navy Civil Service
manning and Commercial Contract manning, with Navy
Military Manning were conducted with respect to the
following key factors: Manpower requirements; Manpower
costs; Total Ship operating cost (including maintenance
and overhaul costs); Mission fulfillment capability;
Operating policy; Risks; Total fleet and merchant
marine labor market effect; and Alternative Operating
Concepts. This report does not reach conclusions or
make recommendations; but rather is intended to present
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INVESTIGATION OF THE POTENTIAL
FOR INCREASED USE OF CIVILIAN
MANNING IN FLEET SUPPORT SHIPS

VOLUME I

EXECUTIVE SUMMARY

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(2) Classified Appendices, above report
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1. Enclosures (1) and (2) are forwarded for information.
2. The CIVMAN study examined the costs, risks, capabilities and benefits of manning Navy fleet support ships, alternatively, with Navy Civil Service Mariners and commercial contract mariners. This examination, made at a time of severe fiscal constraint and a potential future military manpower shortfalls, is but one of several initiatives being pursued to redress the supply-demand problem in the context of total force manpower management. Other initiatives include, but are not limited to: Naval Reserve augmentation; assignment of women to sea duty; selected military detachments for high tempo operations; and control of manpower requirements growth through full consideration of manpower constraints in the design and acquisition of new fleet support platforms and equipments.
3. The CIVMAN study provided information on civilian operation of fleet support ships in a peacetime environment. It did not, however, adequately address the following items critical during a war or contingency:
 - a. Crew Endurance - The smaller civilian crews proposed in this study would have difficulty in maintaining round-the-clock operations. Fatigue and loss of stamina in such operations would directly affect fleet combatant vulnerability during underway replenishment operations.
 - b. Many ship functions are lost when a ship is demilitarized. As a result, a civilian manned ship experiences such reduced capabilities as lack of combat information

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center, lack of anti-air warfare defense, limited damage control, and reduced ability to conduct high tempo task group operations, and fewer UNREP stations than are currently specified in the Required Operational Capabilities.

c. With the limited ammunition and nuclear weapon security projected in the study, vulnerability to terrorist activity may increase.

While some of the reduced capability, outlined above, can be restored with additional civilian or military manpower, such a crew increase could have an impact upon reconfiguration cost and on manpower costs. A cost analysis, similar to that performed in the study, would be required to determine the impact of any change in the capabilities of these ships.

4. In conclusion, the study provides the Navy with an excellent baseline for consideration of increased civilian manning. However, this study must be considered in conjunction with the developing concepts for assignment of women to sea duty and the use of naval reserves to augment Navy manning to ensure a complete perspective for decision formulation. Additionally, the significance of the reduced endurance of civilian crews and the loss of ship functions which are critical during war or contingency situations, as well as the other previously noted considerations, must be evaluated.

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FOREWORD

The CIVMAN study examined the costs, risks, capabilities and benefits of manning Navy fleet support ships, alternatively, with Navy Civil Service Mariners and commercial contract mariners. This examination, made at a time of severe fiscal constraint and a potential future military manpower shortfall, is one of several alternatives being evaluated in the Navy's total force evaluation. Other alternatives include the assignment of women to sea duty and use of naval reserves to augment reduced Navy military ships.

ISI gratefully acknowledges the assistance of the Working Group Members, the many people in the Office of the Chief of Naval Operations, Naval Sea Systems Command, the Military Sealift Command and the U.S. Maritime Administration. We are especially indebted to Mr. Irving Blickstein, (OP-964C), the Project Officer, for his constant advice; and CAPT Raymond Helms, USN for his counsel during the conduct of the study. Commanders William Dietrich and Edward Brewton, USN, were particularly helpful in assisting the Working Group with their commentary on points of view that invariably surfaced during the course of the study. We also wish to acknowledge the very able assistance of Mr. Kenneth Hylind, Ms. Betty Ferreira, Mr. Dudley J. Clapp, Jr., and Mr. Louis Tippet of the Military Sealift Command, as well as Mr. Arthur Friedberg, Mr. Thomas Connors and Ms. Esther Love of the U.S. Maritime Administration.

SUMMARY

A total of 95 fleet support ships were considered, including underway replenishment, repair, towing, salvage, and submarine rescue ships. The study covered the three manning alternatives with respect to the following factors:

- a. Operating Policy;
- b. Manpower Requirements;
- c. Manpower Costs;
- d. Total Ship Operating Costs (including maintenance, overhaul, and reconfiguration costs);
- e. Effect on Mission Fulfillment Capability;
- f. Risks to the Navy; and
- g. Total Fleet and Merchant Marine Labor Market Effect.

The major findings of the study include:

a. Navy military manning has the highest manning requirement. Navy Civil Service and commercial contract manning are roughly equivalent--differences exist because of estimating techniques rather than differing requirements.

b. Navy Civil Service manning is always the least-cost alternative, with annual amortized per ship, per year savings of from \$.2M to \$4.6M. (Expressed in FY-77 dollars, based upon a modified life cycle cost analysis with SCN costs omitted.)

c. Both civilian manning options will result in a reduction in capability (e.g., no CIC, no AAW, reduced damage control, fewer UNREP stations).

d. Both civilian manning options increase the risk to the Navy. Although the risk is difficult to quantify, and in some cases is only perceived, the study summarized it as follows:

(1) Military Control - reduced in civilian manned ships.

(2) Stability of Work Force - potential advantage in civilian options because over time, a large cadre of specially trained civilian personnel with fleet support experience would be available in time of a contingency.

(3) Manpower Availability - at the time of the study there was a civilian manpower surplus; currently there are spot shortages, i.e., diesel engineers.

(4) Age of Sailors - civilian mariners older (average age 48)--however, more experienced in basic maritime skills. Experience level could fall if a large number of ships were transferred over a short period.

(5) Ability to Maintain the Ship - no discernible difference based on MSC operation of 13 fleet support ships.

(6) Legal - personal services contracting and Government liability under commercial contract manning option might require legislation.

(7) Potential Strike Threat - Past performance indicates that a strike is improbable. A "no-strike" agreement might be obtainable.

(8) Endurance - small Navy Civil Service and commercial contract crews result in a reduced ability to meet increased operating tempo conditions during a contingency.

e. The study reports that if all 95 ships studied were converted to Navy Civil Service manning:

(1) The cost savings to the Navy would be \$271M per year (economic costs) if the assumed civilian manning levels are acceptable. The savings, however, are based on a quick survey of one representative ship of each type, and the assumption that the civilian manning levels are acceptable. These savings would diminish if crew sizes increase to provide greater capability or if reconfiguration/overhaul conversion costs are understated.

(2) This would transfer 11,873 jobs to the Civil Service sector.

(3) This could reduce a total of 27,000 Navy billets. Similar figures are derived for commercial contract manning.

The CIVMAN study provided adequate information on civilian operation of fleet support ships in a peacetime environment. It did not, however, adequately address the following items critical during a war or contingency:

a. Crew Endurance - The smaller civilian crews proposed in this study would have difficulty in maintaining round-the clock operations. Fatigue and loss of stamina in such operations would directly affect fleet combatant vulnerability during underway replenishment operations.

b. Many ship functions are lost when a ship is demilitarized. As a result, a civilian manned ship experiences such reduced capabilities as lack of combat information center, lack of anti-air warfare defense, limited damage control, reduced ability to conduct high tempo task group operations, and fewer UNREP stations than are currently specified in the Required Operational Capabilities.

c. With the limited ammunition and nuclear weapon security projected in the study, vulnerability to terrorist activity may increase.

While some of the reduced capability, outlined above, can be restored with additional civilian or military manpower, such a crew increase could have an impact upon reconfiguration cost and on manpower costs. A cost analysis, similar to that performed in the study, would be required to determine the impact of any change in the capabilities of these ships.

In conclusion, the study provides the Navy with an excellent baseline for consideration of increased civilian manning. However, this study must be considered in conjunction with the developing concepts for assignment of women to sea duty and the use of naval reserves to augment Navy manning to ensure a complete perspective for decision formulation. Additionally, the significance of the reduced endurance of civilian crews and the loss of ship functions which are critical during war or contingency situations, as well as the other previously noted considerations, must be evaluated.

INTRODUCTION

This study investigated the potential for increased use of civilian manning on Navy fleet support ships. It considered and analyzed two manning alternatives to Navy military manning: Navy Civil Service and Merchant Marine commercial contract crews. A total of 95 fleet support ships were considered. These included underway replenishment, repair, towing, salvage and submarine rescue ships.

REPRESENTATIVE SHIPS

Time constraints made it necessary to find an alternative to studying each of the 95 ships individually. It was therefore decided to select a representative hull for each type of ship which was similar to ships in service today, and would also best represent each of the thirteen types of ships in the force structure for the planning years.

The ships selected were:

UNREP	REPAIR SUPPORT	SALVAGE/RESCUE
AF-58	AD-37	ARS-41
AFS-3	AS-36	ASR-22
AOR-4	AR-6	ATF-166
AOE-3		ATS-1
AE-28		
AO-177		

OPERATIONS PROFILE

Guidelines in the form of an operating scenario were developed so that both the Military Sealift Command (MSC) and the Maritime Administration (MARAD) could participate in providing comprehensive data on manning and cost of Navy Civil Service and

Commercial Contract manned ship operations. The guidelines assumed that the current workload being accomplished by the support ships would remain constant in the future. Actual ship operations data provided by OPNAV on Atlantic fleet deployments were analyzed with this assumption and an operations profile developed for each ship type under study. These profiles summarized in Table 1, along with visits to ships and study of Navy Ships Manning documents (SMDs), were the basis upon which MSC and MARAD developed their manpower requirements and cost estimates, including fuel costs.

ANALYSES

The analysis performed in this study covered the three alternatives with respect to the following key factors:

Operating Policy

Manpower Requirements

Manpower Costs

Total Ship Operating Costs (including maintenance, overhaul and reconfiguration costs)

Mission Fulfillment Capability

Risks

Total Fleet and Merchant Marine Labor Market Effect

MANPOWER

Organizational manning requirements prescribed by the Ship Manning Document delineated the capabilities prescribed for a fully capable Navy ship. This included the capability of operating at sea in wartime, and the ability of operating

Table 1

REPRESENTATIVE OPERATING PROFILE
(Annual Basis)

SHIP TYPE	AT SEA DAYS ^{1/}	IN PORT DAYS
<u>UNREP</u>		
TAF	140	225
AF	123	242
AFS	135	230
AOR	121	244
AOE	77	288
AE	80	285
TAO	181	184
AO	154	211
<u>REPAIR</u>		
AD	43	322
AS	18	347
AR	46	319
<u>TOWING/SALVAGE AND RESCUE</u>		
ARS	178	187
ASR	85	280
TATF	246	119
ATS/ATF	161	204

^{1/}The data shown is based on a one (1) year representative deployment of Atlantic Fleet ships, including 6 months assignment to COMSIXFLT in the Mediterranean Theater. The data represents peacetime requirements and not capabilities. Navy Civil Service manned ships' detachment patterns in the Pacific are usually for more extended periods than in the Atlantic Ocean. The use of Atlantic fleet scenarios is therefore the more conservative case.

at Condition III (three section watch), and adequate manning to perform the missions required by respective ships. The organizational manpower provided the base with which the substitution of civilian mariners was compared. If the required tasks could be performed by the skills found in the civilian labor market, a civilian equivalent was substituted. Skills which could not be found in the civilian economy, or which cost considerably more than their military equivalents on a one for one basis (e.g., helicopter pilot) were not replaced. Manpower requirements for the Navy Civil Service and Commercial Contract Manning cases were provided by the Commander, Military Sealift Command (COMSC) and MARAD respectively. Skills which were not available were provided by military detachments. In the case of Commercial Contract Manning, MARAD provided the manning levels for the civilian mariners. The Study Team manned any missing functions by adding personnel to the basic military detachment which had been defined by COMSC. Table 2 is a brief display of the results of the analysis.

It should be noted that there exists a considerable difference in manning philosophy between Navy military and the two civilian manning options. The Navy provides a considerable number of personnel for range and depth in watchstanders at ship control/operating stations, for maintenance requirements and for damage control while the Navy Civil Service and the Commercial Contract options assume reliance upon unattended equipment, and the employment of off-watch personnel during UNREP operations.

Table 2

MANPOWER REQUIREMENTS COMPARISON--
SUPPORT FLEET MANNING ALTERNATIVES

SHIP TYPE	NAVY MILITARY MANNING		NAVY CIVIL SERVICE MANNING		COMMERCIAL CONTRACT MANNING		
	TOTAL	CIVIL SERVICE	MILITARY DETACHMENT	TOTAL	CONTRACT PERSONNEL	MILITARY DETACHMENT	TOTAL
AF	250	113	18	131	96	27	123
AFS	447	125	45 ^{1/}	170 ^{1/}	148	55 ^{2/}	203 ^{2/}
AOR	418	115	29	144	144	32	176
AOE	568	159	40	199	175	49	224
AE	382	121	27	148	117	41	158
AO	183	89	19	108	84	19	103
AD	1,175	147	706	853	118	706	824
AS	1,145	147	784	931	118	784	902
AR	693	147	364	511	130	364	494
ARS	104	28	6	34	24	8	32
ASR	209	59	29	88	44	28	72
ATF	47	16	4	20	25	10	35
ATS	134	28	14	42	25	15	40

^{1/} This is the number of personnel in the Military Detachment during the first operating year only for purposes of training commercial contract personnel in ship logistic cargo management. In all subsequent years the Military Detachment consists of 30 personnel, and total personnel equals 155.

^{2/} This is the number of personnel in the Military Detachment during the first year of operation. In all subsequent years the Military Detachment consists of 39 personnel, and total personnel equals 187

NOTE: Navy Civil Service and Commercial Contract Manning provides fewer manned UNREP stations than Navy Military Manning. Also neither Combat Information Center nor Weapons are manned.

Also, the latter two options provide no personnel for the Combat Information Center, weapons, or special missions and have limited capability to combat damage and fire or to take casualties. The civilian crews were sized to provide the anticipated peacetime demand for services.

COSTS

Three types of cost estimates were prepared. The first was the Five Year Defense Plan (FYDP) cost which was developed in order to ascertain the annual incremental or decremental funding within the Department of Defense resulting from a conversion to civilian manning. The second and third costs developed were the undiscounted and discounted average annual economic costs. These were provided to show a true economic comparison with the civilian sector of the economy. The cost analyses were separated into two segments, manpower cost and total ship operating cost. All costs were based on POM 79 costing rules and are therefore in conformance with the FYDP developed as a result of POM 79. Table 3 displays the annual Manpower FYDP Cost Comparison and Table 4 is a representative of the Annual Manpower Undiscounted Economic Cost Comparison.

TOTAL SHIP OPERATING COST

Subsequent to the development of manpower costs, computer programs were prepared which computed the total ship operating cost for each of the three alternatives. Since the Study Group was directed to compare only the ship's operating costs, certain costs common to all three alternatives were not included.

Table 3

ANNUAL MANPOWER FYDP COST COMPARISON--
SUPPORT FLEET MANNING ALTERNATIVES
(Thousands of FY 77 Dollars)

SHIP TYPE	NAVY MILITARY MANNING		NAVY CIVIL SERVICE MANNING		COMMERCIAL CONTRACT MANNING		TOTAL
	TOTAL	CIVIL SERVICE	MILITARY DETACHMENT	TOTAL	CONTRACT PERSONNEL	MILITARY DETACHMENT	
AF	2,409	2,674	192	2,866	3,091	297	3,388
AFS	4,282	3,198	492 ^{1/}	3,690 ^{1/}	4,566	596 ^{2/}	5,162 ^{2/}
AOR	3,960	3,054	303	3,357	5,043	353	5,396
AOE	5,305	4,371	431	4,802	5,958	539	6,497
AE	3,594	2,960	318	3,278	3,557	455	4,012
AO	1,837	2,362	215	2,577	2,983	209	3,192
AD	11,446	3,021	7,158	10,179	3,613	7,158	10,771
AS	11,879	3,021	8,404	11,425	3,613	8,404	12,017
AR	6,808	2,979	3,412	6,391	3,963	3,412	7,375
ARS	1,049	810	67	877	961	86	1,047
ASR	2,056	1,534	306	1,840	1,662	353	2,015
ATF	497	536	42	578	1,012	106	1,118
ATS	1,317	850	155	1,005	1,019	174	1,193

^{1/} This is the Military Detachment cost for the first operating year only for purposes of training commercial contract personnel in ship logistic cargo management. The Military Detachment cost for all subsequent years is \$316,000, resulting in a total annual cost of \$3,514,000.

^{2/} This is the Military Detachment cost for the first operating year only due to increased personnel for training of commercial contract personnel in ship logistic cargo management. The Military Detachment cost for all subsequent years is \$425,000 resulting in a total annual cost of \$4,991,000.

NOTE: Navy Civil Service and Commercial Contract Manning provides fewer manned UNREP stations than Navy Military Manning. Also, neither Combat Information Center nor Weapons are manned.

Table 4

ANNUAL MANPOWER UNDISCOUNTED ECONOMIC COST COMPARISON
 FLEET SUPPORT MANNING ALTERNATIVES
 (Thousands of FY 77 Dollars)

SHIP TYPE	NAVY MILITARY MANNING		NAVY CIVIL SERVICE MANNING		COMMERCIAL CONTRACT MANNING		TOTAL
	TOTAL	MILITARY DETACHMENT	CIVIL SERVICE	MILITARY DETACHMENT	CONTRACT PERSONNEL	MILITARY DETACHMENT	
AF	3,471	279	2,762	279	3,041	436	3,527
AFS	6,185	702	3,306	702	4,008	867	5,433
AOR	5,685	433	3,149	433	3,582	517	5,560
AOE	7,605	625	4,510	625	5,135	793	6,751
AE	5,153	462	3,055	462	3,517	671	4,228
AO	2,648	309	2,438	309	2,747	306	3,289
AD	16,344	10,234	3,122	10,234	13,356	10,233	13,846
AS	17,038	12,067	3,122	12,067	15,189	12,067	15,680
AR	9,772	5,124	3,078	5,124	8,202	5,124	9,087
ARS	1,514	96	837	96	933	123	1,084
ASR	2,963	446	1,585	446	2,031	514	2,176
ATF	725	59	553	59	612	151	1,163
ATS	1,898	226	878	226	1,104	255	1,274

1/ This is the Military Detachment cost for the first operating year only for purposes of training commercial contract personnel in ship logistics cargo management. The Military Detachment cost for all subsequent years is \$451,000, resulting in a total annual cost of \$3,757,000.

2/ This is the Military Detachment cost for the first operating year only due to increased personnel for training of commercial contract personnel in ship logistic cargo management. The Military Detachment cost for all subsequent years is \$621,000, resulting in a total annual cost of \$5,187,000.

NOTE: Navy Civil Service and Commercial Contract Manning provides fewer manned UNREP stations than Navy Military Manning. Also, neither Combat Information Center nor Weapons are manned.

Accordingly, Ship Construction--Navy (SCN) cost was not used in the FYDP and in the economic analysis. In addition, Base Operating Support (O&MN) and Fleet Modernization Program (FMP) installation were not used in developing the economic cost. Table 5 is a summary of the FYDP cost for the years FY 79 through FY 83. Table 6 represents the annual undiscounted differential economic cost.

MISSION FULFILLMENT CAPABILITY

For each ship type, under the two civilian manning options, a comparison was made with the Navy Military manning to determine the ability to perform the primary and secondary mission areas designated by the Office of the Chief of Naval Operations for the ships under examination. Table 7 lists these mission areas. Table 8 consists of a summary assessment of the mission area capabilities of civilian manned ships compared to the Navy baseline capabilities in terms of the number of Required Operational Capabilities (ROCs) met either fully or partially. In the basic report each ship ROC is described and a supporting statement is provided for cases where only a partial capability is achieved. In evaluating Navy Military and Navy Civil Service manned oilers, five measures of effectiveness were employed: days in theater, days at sea, number of stations employed, number of deliveries per unit time, and amount of fuel delivered. From the data available, it was found that Navy Civil Service manned oilers are as effective in peacetime as their Navy Military manned counterparts.

Table 5

FYDP COST COMPARISON (FY 79-83)
 FLEET SUPPORT SHIPS MANNING ALTERNATIVES^{1/}
 (Thousands of Current Year Dollars)

SHIP TYPE	NAVY MILITARY MANNING	NAVY CIVIL SERVICE MANNING	COMMERCIAL CONTRACT MANNING
AF	53,570	35,086	40,973
AFS	83,039	45,913	48,854
AOR	94,564	53,829	60,034
AOE	110,765	61,670	67,942
AE	69,411	42,397	47,883
AO	74,655	38,191	37,653
AD	114,598	90,820	90,634
AS	133,161	97,010	96,383
AR	89,449	69,270	62,380
ARS	22,086	15,856	15,551
ASR	36,060	23,597	21,359
ATF	19,523	12,333	16,329
ATS	28,933	15,347	17,204

^{1/} The costs displayed represent the cost of operating these ships over five years and include all budgeted items except those which are invariant across all three alternatives.

Table 6

UNDISCOUNTED ECONOMIC COST COMPARISONS
(Thousands Of FY 77 Dollars)

SHIP TYPE	AVERAGE ANNUAL DOD COST			AVERAGE ANNUAL U.S. GOVERNMENT COST		
	NAVY MILITARY	NAVY CIVIL SERVICE	COMMERCIAL CONTRACT	NAVY MILITARY	NAVY CIVIL SERVICE	COMMERCIAL CONTRACT
AF	7522	5707	6701	7628	5716	6714
AFS	11283	6936	8858	11471	6951	8877
AOR	12428	8186	10735	12603	8200	10751
AOE	15441	10086	12432	15675	10106	12456
AE	9865	6603	7766	10024	6617	7787
AO	9392	5660	6658	9475	5670	6667
AD	20736	16634	17496	21250	16958	17820
AS	23326	18378	19235	23865	18762	19619
AR	13969	12201	12545	14274	12368	12712
ARS	3278	2413	2492	3325	2416	2496
ASR	5549	3689	3932	5641	3703	3948
ATF	2528	1776	2517	2550	1778	2522
ATS	4660	2689	3008	4719	2696	3016

NOTE: Navy Civil Service and Commercial Contract manning provides fewer manned UNREP stations than Navy Military Manning. Also, neither Combat Information Center nor Weapons are manned.

Table 7

PRIMARY (P) AND SECONDARY (S) MISSION AREAS
FOR SELECTED U.S. NAVY FLEET SUPPORT SHIPS

<u>TYPE UNIT</u>	<u>MOB</u>	<u>CAC</u>	<u>AAW</u>	<u>SUW</u>	<u>FSO</u>	<u>NCO</u>
AF	P	P	S	S	P	S
AFS	P	P	S	S	P	S
AOR	P	P	S	S	P	S
AOE	P	S	S	S	P	S
AE	P	S	S	S	P	S
AO	P	P	S	S	P	P
AD	P	P	S	S	P	P
AS	P	P	S	S	P	P
AR	P	P	S	S	P	S
ARS	P	P	S	S	P	P
ASR	P	P	S	S	P	S
ATF	P	P	S	S	P	S
ATS	P	P	S	S	P	S

P = Primary Mission Area

S = Secondary Mission Area

MOB = Mobility

SUW = Surface Warfare

CAC = Command and Control

FSO = Fleet Support Operations

AAW = Anti-Air Warfare

NCO = Non-Combat Operations

NOTE: The data presented here and in Table 8 uses the terms of reference and format found in OPNAVINST 3501.2C dated 11 Dec 1972. This instruction has been recently superseded by OPNAVINST C3501.2E dated 19 Oct 1977. However, the data base for this table and Table 8 have not been changed and the Required Operational Capability (ROC) statements utilized by naval planners use the superseded instruction.

Table 8

SUMMARY COMPARISON
FLEET SUPPORT SHIP OPERATIONAL CAPABILITIES
NAVY MILITARY MANNING VS
CIVILIAN (READINESS CONDITION III) MANNING

MISSION	SHIP TYPE	MANNING	PRIMARY				SECONDARY			
			MOB	CAC	FSO	NCO	NCO	AAW	SUW	SPW
STATION	AOE	NAVY MILITARY	F ₄	F ₄	F ₅		F ₇ P ₁	F ₃	F ₃	
		CIVILIAN	F ₂ P ₂	F ₁ P ₂ L ₁	F ₄ P ₁		F ₆ P ₂	L ₃	L ₃	
STATION	AOR	NAVY MILITARY	F ₄	F ₄	F ₄ P ₁		F ₇ P ₁	F ₂	F ₂	
		CIVILIAN	F ₂ P ₂	F ₁ P ₂ L ₁	F ₃ P ₂		F ₆ P ₂	L ₂	L ₂	
SHUTTLE	AF	NAVY MILITARY	F ₄	F ₄	F ₃ P ₁		F ₆ P ₁	F ₁ P ₁	F ₂	
		CIVILIAN	F ₂ P ₂	F ₁ P ₂ L ₁	F ₂ P ₂		F ₅ P ₂	L ₂	L ₂	
SHUTTLE	AFS	NAVY MILITARY	F ₄	F ₄	F ₃ P ₁		F ₆ P ₁	F ₁ P ₁	F ₂	
		CIVILIAN	F ₂ P ₂	F ₁ P ₂ L ₁	F ₂ P ₂		F ₅ P ₂	L ₂	L ₂	
SHUTTLE	AE	NAVY MILITARY	F ₄	F ₄	F ₄ P ₁		F ₇ P ₁	F ₁ P ₁	F ₂	
		CIVILIAN	F ₂ P ₂	F ₁ P ₂ L ₁	F ₃ P ₂		F ₆ P ₂	L ₂	L ₂	
SHUTTLE	AO	NAVY MILITARY	F ₄	F ₄	F ₃ P ₁		F ₅ P ₂	F ₁ P ₁	F ₂	
		CIVILIAN	F ₂ P ₂	F ₁ P ₂ L ₁	F ₂ P ₂		F ₄ P ₃	L ₂	L ₂	
MAJOR SUPPORT	AD	NAVY MILITARY	F ₄	F ₄	F ₃ P ₂	F ₇ P ₂		F ₁ P ₁	F ₂	
		CIVILIAN	F ₃ P ₁	F ₁ P ₂ L ₁	F ₃ P ₂	F ₆ P ₃		L ₂	L ₂	
MAJOR SUPPORT	AS	NAVY MILITARY	F ₄	F ₄	F ₂ P ₂	F ₇ P ₂		F ₁ P ₁	F ₂	
		CIVILIAN	F ₃ P ₁	F ₁ P ₂ L ₁	F ₂ P ₂	F ₆ P ₃		L ₂	L ₂	
MAJOR SUPPORT	AR	NAVY MILITARY	F ₄	F ₄	F ₄ P ₁	F ₆ P ₂		F ₁ P ₁	F ₂	
		CIVILIAN	F ₃ P ₁	F ₁ P ₂ L ₁	F ₄ P ₁	F ₅ P ₃		L ₂	L ₂	

Table 8 (Cont.)

MISSION	SHIP TYPE	MANNING	PRIMARY				SECONDARY			
			MOB	CAC	FSO	NCO	NCO	AAW	SUW	SPW
MINOR SUPPORT	ARS	NAVY MILITARY	F ₄	F ₄	F ₁ P ₁		F ₆ P ₂	F ₁ P ₁	F ₂	F ₂ P ₁
		CIVILIAN	F ₂ P ₂	F ₁ P ₂ L ₁	F ₁ P ₁		F ₅ P ₃	L ₂	L ₂	F ₂ P ₁
	ASR	NAVY MILITARY	F ₃ P ₁	F ₄	F ₁		F ₈	F ₁ P ₁	F ₂	
		CIVILIAN	F ₂ P ₂	F ₁ P ₂ L ₁	F ₁		F ₇ P ₁	L ₂	L ₂	
	ATF	NAVY MILITARY	F ₄	F ₄	F ₁		F ₆ P ₂	F ₁ P ₁	F ₂	F ₂ P ₁
		CIVILIAN	F ₂ P ₂	F ₁ P ₂ L ₁	F ₁		F ₅ P ₃	L ₂	L ₂	F ₂ P ₁
	ATS	NAVY MILITARY	F ₄	F ₄	F ₁ P ₁		F ₇ P ₁	F ₁ P ₁	F ₂	F ₃
		CIVILIAN	F ₂ P ₂	F ₁ P ₂ L ₁	F ₁ P ₁		F ₆ P ₂	L ₂	L ₂	F ₃

CIVILIAN = Navy Civil Service or Commercial Contract manning

F = Full Capability

P = Partial Capability

L = Lost Capability

NOTE: Subscripts denote the number of ROCs which can be fully or partially performed, or which are lost within each mission area

RISK ANALYSIS

A qualitative assessment was made of "risks" to Navy capability from the increased use of civilian crews. The factors which were investigated and the brief finding under both civilian options are summarized below:

1. Military Control - Reduced in Civilian Manned Ships.
2. Stability of Workforce - Possible advantage in civilian options.
3. Manpower Availability - Current civilian manpower surplus--thus no current risk.
4. Age of Sailor - Civilian mariners older (average age 48)--however more experienced. Experience level could fall if a large number of ships were transferred over a short time period.
5. Maintenance Capability - No discernable difference.
6. Legal - Problem of Personnel Services contracting and Government Liability under Commercial Contract Manning option.
7. Potential Strike Threat - Not considered a problem. A "no strike" agreement is obtainable.
8. Command and Training Billets for Navy - Serious problem for the Navy. Involves a training base of 85 sea-going commands and up to 27,000 enlisted sea-going billets.
9. Endurance - Smaller crews result in reduced ability to sustain an increased operating tempo in a contingency.

EFFECT ON MERCHANT MARINE LABOR MARKET AND NAVY BILLET STRUCTURE

Table 9 displays the reduction in direct Navy billets if all

Table 9

CIVILIAN BILLETS AND PERSONNEL REQUIRED
DUE TO POTENTIAL REDUCTION OF NAVY BILLETS
TO MAN THE ACTIVE SUPPORT FLEET

SHIP TYPE	NAVY CIVIL SERVICE			COMMERCIAL CONTRACT		
	BILLETS	PERSONNEL <u>1/</u>	NAVY REDUCTIONS	BILLETS	PERSONNEL <u>2/</u>	NAVY REDUCTIONS
UNREP	5,426	6,411	15,120	5,705	12,551	14,802
MAJOR	3,675	4,410	9,869	2,998	6,596	9,869
MINOR	718	862	2,329	658	1,448	2,273
ALL	9,810	11,783	27,318	9,361	20,595	26,949

1/ Based on MSC requirement of 1.2 men per billet

2/ Based on MARAD requirement of 2.2 men per billet

NOTE: Navy Civil Service and Commercial Contract manning provides fewer manned UNREP stations than Navy Military Manning. Also, neither Combat Information Center nor Weapons are manned. In the Merchant Marine there are presently 2.2 men for every job available. Therefore, full time employment equivalents are listed under billets.

ships considered in the study were to be manned by civilians. It also displays the number of billets and jobs which would be created in the commercial and civil service sectors if either of the civilian options were to be applied to all support ships.

REDUCED OPERATING STATUS (ROS)

The higher productivity of civilian manned ships, resulting from increased time at sea, could reduce the number of support ships needed in peacetime. However, since the total requirement for UNREP ships is based on the number of combatants which must be supported in wartime it is not possible to reduce the UNREP force level. An alternative was proposed in the report which would allow a certain number of ships to be placed in a ready "warm iron" status with a small maintenance crew, ready for deployment in a specified number of days.

Two cases were investigated; Case I which proposed transferring 28 additional UNREP ships (7 AFS, 13 AE, 8 additional AO) to civilian manning, and Case II which proposes retention of 3 AFS, 8 AE and 8 AO under Navy Military Manning and the transfer of 4 AFS and 5 AE to civilian manning, as well as continuing 8 AO under civilian manning. The details of these cases are described in Tables F-1 and F-2, Appendix F, Volume III. Both MSC and MARAD provided cost estimates and the results are detailed in Tables F-7, F-8, F-9 and F-10 of Appendix F, Volume III. Table 10 of this Section summarizes the undiscounted economic cost results. These amounts are significant because they provide the most useful indications of the potential savings in converting

these ships and placing them in a ROS status. The maximum potential DOD economic cost reduction could amount to about \$150M annually if only the AFS, AEs and remaining AOs were converted. More detailed information is provided in Section VIII of Volume II and Appendix F of Volume III.

OVERALL SUMMARY--PROS--CONS

On page 20 is a summary of the pros and cons for each of the three manning alternatives.

TABLE 10

UNDISCOUNTED ECONOMIC COST COMPARISONS
 CIVILIAN MANNING - CASE I and CASE II
 (\$000 FY 77)

CASE I

	<u>Navy Civil Service</u>		<u>Commercial Contract</u>	
	<u>DOD Per Year Cost</u>	<u>US GOVT Per Year Cost</u>	<u>DOD Per Year Cost</u>	<u>US GOVT Per Year Cost</u>
1) All Navy Military Manned except 8 TAO (present)	328,874	333,011	328,874	333,011
2) 7 AFS, 13 AE, 16 AO Civilian Manned	224,775	225,222	269,316	269,866
3) Difference between present operations and all civilian manning (Row 1 - Row 2)	104,099	107,779	59,558	63,135
4) 12 Ships 10 days FOS	182,243	182,690	212,236	212,786
5) Additional Savings due to placing 12 ships in ROS (Row 2 - Row 4)	42,532	42,532	57,080	57,080
6) 12 Ships 20/30 days ROS	179,047	179,496	212,236	212,786
7) Additional Savings due to placing 12 ships in ROS (Row 2 - Row 6)	45,728	45,726	57,080	57,080
8) 3 AFS, 8 AE, 8AO Navy Military Manned, 4 AFS, 5 AE, 8 AO Civilian Manned	295,176	297,880	316,663	319,416
9) Difference between present Operations and Case II (Row 1 - Row 8)	33,698	35,115	12,211	13,585
10) 6 Ships 10 days FOS	273,317	276,027	286,025	288,778
11) Additional Savings due to placing 6 ships in ROS 10 days RFS (Row 8 - Row 10)	21,859	21,859	30,638	30,638
12) 6 Ships 20/30 days FOS	271,657	274,366	286,025	288,778
13) Additional savings due to placing 6 ships in ROS 20/30 days FOS (Row 8 minus Row 12)	23,522	23,528	30,638	30,638

PROS AND CONS

THE THREE MANNING ALTERNATIVES

PROS

- Direct fleet chain of command.
- Largest crew for damage control/survivability/product delivery.
- Direct line of military command.
- Provides command and training billets.
- Greater endurance during a war/contingency.

Military Manning

- Highest peacetime cost.
- Lowest on-station productivity during peacetime.
- Peacetime OPTEMPO policies limit mission flexibility.

CONS

Navy Civil Service Manning

- Lowest peacetime cost.
- Releases military personnel to combat roles.
- Peacetime ship utilization higher.
- Compatible with peacetime mission of fleet.
- Reduced operational control.
- No defense capability.
- Lower survivability due to fewer on-board personnel.
- Loss of Navy command and training billets.
- Potential endurance problems during a war/contingency.
- Eventual loss of most Navy Military Manned fleet support skills.

Commercial Contract Manning

- Cost lower than Navy Military manning.
- Releases military personnel to combat roles.
- Peacetime ship utilization higher.
- Supports the private sector of the economy.
- Potential political support from the private sector.
- Compatible with peacetime mission of fleet.
- Cost higher than Navy Civil Service Manning.
- Least operational control.
- No defense capability.
- Lower survivability due to fewer on-board personnel.
- Limited control over crew selection.
- Loss of Navy command and training billets.
- Minor contractual/legislative problems need to be overcome.
- Potential endurance problems during a war/contingency.
- Eventual loss of most Navy Military Manned fleet support skills.

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