AD-A054 502 ARINC RESEARCH CORP HONOLULU HI F/G 13/10
ADVANCE OVERHAUL PLANNING FOR USS APACHE (ATF-67), USS COCOPA (--ETC(U)
OCT 74 N00140-73-D-0074
UNCLASSIFIED 1020-01-1-1303 NL

1 OF 2
AD
A054502

FOR FURTHER TRAINING

SUMMARY REPORT:

ADVANCE OVERHAUL PLANNING FOR USS APACHE (ATF-67), USS COCOPA (ATF-101), USS MOLALA (ATF-106), AND USS QUAPAW (ATF-110)

October 1974

Prepared for

PERA(CSS)
Hunters Point Naval Shipyard
San Francisco, Calif.

Under Contract N00140-73-D-0074
Delivery Orders 0004, 0006, & 0010

Publication 1020-01-1-1303

ARINC RESEARCH CORPORATION

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER 1020-01-1-1303	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) ADVANCE OVERHAUL PLANNING FOR USS APACHE (ATF-67), USS COCOPA (ATF-101), USS MOLALA (ATF-106), AND USS QUAPAW (ATF-110)		5. TYPE OF REPORT & PERIOD COVERED 6. PERFORMING ORG. REPORT NUMBER 1020-01-1-1303
7. AUTHOR(s) Not Listed		8. CONTRACT OR GRANT NUMBER(s) N00140-73-D-0074 new
9. PERFORMING ORGANIZATION NAME AND ADDRESS ARINC Research Corporation 2551 Riva Road Annapolis, Maryland 21401		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS PERA(CSS) Hunters Point Naval Shipyard San Francisco, Calif.		12. REPORT DATE October 1974 13. NUMBER OF PAGES 144
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office) PERA(CSS) Hunters Point Naval Shipyard San Francisco, Calif.		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

UNCLASSIFIED/UNLIMITED

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Postoverhaul analysis reports of four fleet ocean tugs of the Service Force, Pacific, are presented. The reports relate to the 1974 regular overhauls of the USS APACHE (ATF-67), USS COCOPA (ATF-101), USS MOLALA (ATF-106), and USS QUAPAW (ATF-110).

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

(6)

(9) SUMMARY REPORT,

(6) ADVANCE OVERHAUL PLANNING FOR
USS APACHE (ATF-67), USS COCOPA (ATF-101),
USS MOLALA (ATF-106), AND USS QUAPAW (ATF-110),

(11) October 1974

(12) 146 p.

Prepared for

PERA(CSS)
Hunters Point Naval Shipyard
San Francisco, Calif.

(15) Under Contract N00140-73-D-0074
Delivery Orders 0004, 0006, & 0010

ARINC RESEARCH CORPORATION

HONOLULU SUPPORT OFFICE
245 Fort Street, Suite 211
Honolulu, Hawaii 96801

HEADQUARTERS
2551 Riva Road
Annapolis, Maryland 21401

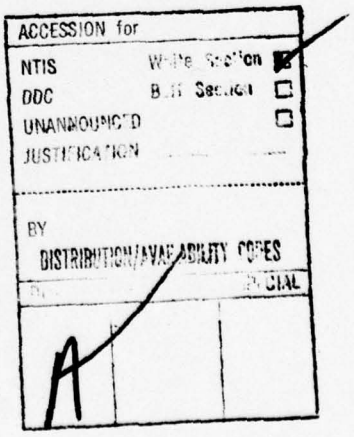
(14) Publication 1020-01-1-1303

410 572

JOB

ABSTRACT

Postoverhaul analysis reports of four fleet ocean tugs of the Service Force, Pacific, are presented. The reports relate to the 1974 regular overhauls of the USS APACHE (ATF-67), USS COCOPA (ATF-101), USS MOLALA (ATF-106), and USS QUAPAW (ATF-110).



SUMMARY

Under Delivery Orders 0004, 0006, and 0010 of Contract N00140-73-D-0074, ARINC Research Corporation performed selected tasks for PERA(CSS) in support of the 1974 regular overhauls of four fleet ocean tugs of the Service Force, Pacific.

The Corporation's support included assistance in advance overhaul planning and the preparation of postoverhaul analysis reports.

The postoverhaul reports, prepared to a format prescribed by PERA(CSS), were individually submitted to that activity as completed. These reports are compiled in this document in the sequence in which they were issued, as follows:

a. USS APACHE (ATF-67), Publication 1020-01-1-1303A

b. USS QUAPAW (ATF-110), Publication 1020-01-1-1303B

c. USS MOLALA (ATF-106), Publication 1020-01-1-1303C

d. USS COCOPA (ATF-101), Publication 1020-01-1-1303D

USS APACHE (ATF-67)

OVERHAUL PLANNING ANALYSIS REPORT

July 1974

USS APACHE (ATF-67)

OVERHAUL PLANNING ANALYSIS REPORT

APPROVED: _____

DATE: _____

Distribution:

NAVSHIPS 427
COMSERVPAC
COMSERVGRU ONE
PERA(CSS)

Prepared by

ARINC Research Corporation
Ships and Ordnance Division
Honolulu Support Office

Contract N00140-73-D-0074-0010

Publication 1020-01-1-1303A

USS APACHE (ATF-67)

OVERHAUL PLANNING ANALYSIS REPORT

TABLE OF CONTENTS

I. General Information and Preface

General Information:

Ref: (a) COMSERVPAC Overhaul Planning General Task Index and Tasks, dated 15 September 1972.

(b) PERA(CSS) Milestone Charts, dated August 1972; forwarded by PERA(CSS) Letter Ser 1800-262 of 4 May 1973.

Preface:

The USS APACHE (ATF-67) was scheduled to be overhauled during the period 15 February - 15 June 1974 at SUPSHIP 13.

In planning the overhaul of USS APACHE, PERA(CSS), acting as TYCOM and NAVSHIPS' maintenance management agent, utilized advance planning milestones, references (a) and (b), which commenced 9-1/2 months prior to the then-scheduled overhaul start date. The goal of the planning effort has been to identify, in advance, potential and existing problem areas; and provide the detailed preoverhaul guidance, planning, and coordination necessary to achieve a successful yard overhaul. The purpose of this report is to evaluate the management judgments and decisions associated with the planning effort during this period.

The overhaul of the USS APACHE was put in a hold status on 18 December 1973 and cancelled on 9 February 1974. The ship has since been decommissioned. Prior to being put in a hold status, the overhaul planning effort had progressed through the work definition conference.

II. Management Summary

Ref. (a) lists the management milestones used in planning the overhaul of the USS APACHE. Deviations from the milestones which affected the planning, and non-programmed factors which contributed to the planning outcome, are discussed in Section III.A.

It is felt that all the work required to ensure that the APACHE received a thorough overhaul was identified and authorized. Since the ship was not overhauled, the adequacy of the final work package cannot be determined.

Considerable effort was expended during the planning phase to develop a ship alteration to replace the ship's service generators because the ship had only 300 kilowatts available. The project was terminated because of the projected cost (about $250,000) and the limited time available before the ROH start.

The COMSERVPAC budget for the overhaul was $1,477,200. Of that amount, $170,000 was allocated to SUPSHIP 13 prior to the work definition conference to be used for GFM, design, and travel. The work authorized at the conference had an associated cost estimate of $1,045,760. A 25% growth allowance was added by SUPSHIP 13 to this figure to yield the total COMSERVPAC obligation. After the ROH cancellation, $147,000 was salvaged by using on another ATF overhaul the tow machine and evaporators purchased with APACHE funds.

Sections III.A through III.E tabulate/discuss in detail the overhaul planning process for APACHE.

III. OVERHAUL DETAILS

A. Planning Process

1. Ideal Vs. Actual Milestones

Table III.A.1 depicts the ideal vs. actual dates of completing the key planning milestones of reference (a). Comments relating to these milestones are given below.

PERA(CSS) contracted ARINC Research Corporation to conduct the pre-overhaul planning for the USS APACHE. The work was performed under Contract N00140-73-D-0074 with the Naval Regional Procurement Office, Philadelphia, Pa., and commenced on 18 January 1973.

The USS APACHE was part of the Integral Operating Unit (IOU) which included WHITE SANDS (AGDS-1) and TRIESTE II (DSV-1), under the command of COMSUBDEVGRU ONE. Due to the ship's operating schedule, the orderly progression of milestones could not be followed.

At the time the above contract was let, the ship was scheduled for an overhaul from 1 November 73 until 1 February 74 at SUPSHIP 11. In July, the overhaul schedule was shifted to SUPSHIP 13 with a 7 January 74 start. During the period July to October, the overhaul start was advanced to 19 November 73, returned to 7 January, and then changed to 15 February through 15 June 1974. The number and frequency of the above changes had a significant effect on the planning process.

A POT/I RAV was scheduled with DATC for the period 30 July - 10 Aug 1973. The ship's operating schedule prevented this from occuring. However, it is felt that adequate work requests were received from the ship for all items that were to be subject to a POT/I. An electronics POT/I was conducted by NAVELEX in late November, and another

inspection was conducted by SUPSHIP 13 in early December. Manufacturer technical representatives inspected the tow machine and gyro.

The initial work package was received on 27 August. The ship had been on an operational assignment for several weeks, which prevented earlier submission of the package. The entire industrial work package was submitted to SUPSHIP 13 on 31 October. This was an acceptable date to them for an ROH start on 15 February 1974.

Personnel from SUPSHIP 13 conducted a shipcheck in early December. The work definition conference was held on 14 December, with representatives of SUPSHIP 13, USS APACHE, COMSERGRU ONE, PERA(CSS), and ARINC Research Corporation present. All the work screened to the industrial activity was approved. The overhaul was subsequently put in a hold status on 18 December 1973, and cancelled on 9 February 1974.

2. Impact

In addition to the problems mentioned above in the context of advanced overhaul planning, a far more serious one, had the overhaul occurred, was the late identification of shipalts and the tasking for the development of first-time Basic Alteration Class Drawings (BACD's). Specifically:

(a) The initial NAVSHIPS K-alt authorization message was issued 31 August 1973, 80 days prior to the then-scheduled overhaul start.

(b) The 180-day letter was issued on 20 September 1973, 60 days prior to the 19 November ROH start.

(c) Ten first-time shipalts for the ATF-67 class were authorized. Drawings for shipalt ATF-226K (Collecting/Holding Tank), were being prepared by M. Rosenblatt & Sons under a NAVSHIPS contract. The planning yard was unable to develop drawings for the remaining nine alterations in time to support the overhaul start, and SUPSHIP 13 was tasked to develop these BACD's. Due to lack of time and manpower, the decision was made to modify MOLALA drawings for APACHE. No BACD's were developed for the ATF-67 Class.

In addition, review of the 180-day letter revealed that several equipments for shipalts ATF-236K (Food Service Line) and ATF-237K (Galley Mods) being supplied required 230 Vdc voltage. Ship's service voltage aboard APACHE was 115 Vdc. SPCC was notified of the error and began to take steps to procure the correct equipment. Some of the existing equipment was then scheduled for overhaul. Due to non-availability of galley equipment, this would have been a major problem had the overhaul taken place.

3. Recommendations

The preoverhaul planning for the USS APACHE (ATF-67) pointed out the need for early identification of authorized shipalts. The planning yard should be tasked to develop BACD's in accordance with the milestones specified in reference (b).

For the 180-day letter to be of value, it must be issued as close to its scheduled issuance date as possible.

Although problems with operational commitments and industrial activity overloads are recognized, steps should be taken to minimize overhaul-activity and schedule changes.

TABLE III.A.1. IDEAL VS. ACTUAL MILESTONES FOR ROH OF USS APACHE (ATF-67) (Sheet 1 of 2)

Milestone	Milestone Target Date	Contract Target Date	Actual Start	Completion	Remarks
PERA Contract Start Date			1/18/73		
Obtain Historical Data, Review Alt Package	Immed.	Immed.	1/18/73	3/15/73	CSMP, 3M material history report, shipalt, AERs, INSURV reports, CASREPs.
Brief Ship on Overhaul Preparation	Prior to deployment	4/1/73		4/3/73	
Receive Work Package	Immed	7/1/73	8/27/73	10/8/73	Ship was on extended operation and not available.
NavShips Issue Tentative K-Alts, Task First-Time Alt Dwgs	A-10	1/1/73		8/31/73	
Screen Work Package, Determine Known Work, Conduct Shipcheck	A-9 to A-6	7/1/73	8/27/73	10/31/73	Complete work package delivered to SUPSHIP 13 on 31 October.
Determine POT/I Requirements	A-6	4/8/73		4/15/73	
Conduct POT/I	A-6 to A-3	7/30/73 8/10/73			Ship's schedule precluded full POT/I RAV. Electronics POT/I was performed in late November.
NavShips Issue 180-Day Letter	A-6	5/19/73		9/20/73	Start 11/19/73 at time of issue.
Conduct Work Definition Conference	A-2	12/15/73		12/14/73	

TABLE III.A.1 (Sheet 2 of 2)

Milestone	Milestone Target Date	Contract Target Date	Actual Start	Completion	Remarks
Overhaul		2/15/74-6/15/74			Overhaul site changed from SS11 to SS13. Overhaul dates changed four times. Overhaul cancelled.
Complete Final Report	C+2	8/15/74			

III. B. Work Package

B-1. Summary Sheet

B-2. Cost Summary Sheet

B-3. ALT Summary Sheet

B-4. TYCOM Repair Package

B-5. PERA Screening Summary

B-6. Narrative of Material Condition Prior to ROH

SUMMARY SHEET - USS APACHE (ATF-67)

Scheduled Start Date: 15 Feb 74

Scheduled Completion Date: 15 June 74

*Actual Start Date: Overhaul Cancelled

Actual Completion Date: (Not applicable)

**Overhaul Extended: (Not applicable) Days

*Overhaul Start Date delayed due to: Overhaul put in hold status on 18 December 1973 and cancelled on 9 February 1974.

**Overhaul extended due to: (Not applicable)

COST SUMMARY SHEET - USS APACHE (ATF-67)
(for civilian yard)

1. SUMMARY OF OVERHAUL COSTS		NAVSHIPS	COMSERVPAC
(a) BUDGET	($)	436,119	1,477,200
(b) ESTIMATED COST	($)	Not available	1,215,760
(c) BID PRICE	($)		
(d) TOTAL COST	($)		
(e) GROWTH COST	($)		
(f) PERCENT GROWTH			

2. BREAKDOWN OF ESTIMATED COSTS BY EIC SYSTEM:

EIC SYSTEM	ESTIMATED COST ($)	PCT. OF TOTAL	PCT. GROWTH EST/ACT
1000*	240,850	19.8	N/A
3000	24,000	2.0	
4000	25,500	2.1	
8000	0	0	
A000*	103,650	8.5	
C000*	184,020	15.1	
G000	0	0	
L000	14,100	1.2	
M000	20,400	1.7	
N000	1,900	0.2	
P000	2,600	0.2	
Q000	20,970	1.7	
R000	1,250	0.1	
T000*	448,880	36.9	
U000*	106,500	8.8	
W000	0	0	
Y000	0	0	
TOTALS**	1,194,620	98.3	

*Further broken down to subsystem level in para. 3. **Difference between totals and (b) above represent design and travel expenditures.

3. BREAKDOWN OF ESTIMATED COSTS BY EIC SUBSYSTEM:

EIC SUBSYSTEM	ESTIMATED COST ($)	PCT. OF TOTAL	PCT. GROWTH EST/ACT
1100	2,500	0.2	N/A
1600	8,350	0.7	
1A00	12,600	1.0	
1C00	217,400	17.9	
1000	240,850	19.8	
A000	50,000	4.1	
A300	5,000	0.4	
A500	11,600	0.9	
A700	8,150	0.7	
A900	19,500	1.6	
AB00	9,400	0.8	
A000	103,650	8.5	
C100	70,820	5.8	
C300	6,050	0.5	
C400	22,150	1.8	
C600	6,400	0.5	
C700	12,900	1.1	
C800	3,200	0.3	
CB00	29,500	2.4	
CC00	27,000	2.2	
CE00	6,000	0.5	
C000	184,020	15.1	
T100	30,800	2.5	
T300	24,250	2.0	
T400	5,700	0.5	
T500	17,050	1.4	
T700	20,550	1.7	
T800	47,540	3.9	
TB00	18,000	1.5	
TC00	7,000	0.6	

EIC SUBSYSTEM	ESTIMATED COST ($)	PCT. OF TOTAL	PCT. GROWTH EST/ACT
TD00	7,450	0.6	N/A
TF00	5,430	0.4	
TH00	12,000	1.0	
TK00	57,600	4.7	
TL00	16,850	1.4	
TM00	171,660	14.1	
TS00	7,000	0.6	
T000	448,880	36.9	
U500	2,000	0.2	
U600	2,300	0.2	
U700	33,000	2.7	
U800	10,500	0.9	
UF00	42,000	3.4	
UG00	2,500	0.2	
UH00	5,000	0.4	
UJ00	9,200	0.8	
U000	106,500	8.8	

ALT Summary Sheet - USS APACHE (ATF-67) (Sheet 1 of 3)

SHIP ALT #		FMP EST ($)	NAVSHIPS EST ($)	SUPSHIP EST ($)	ACT COST ($)	REMARKS
ATF-205K	INSTALL VHF/UHF SECURE VOICE	15,805	15,646			Partial to complete
ATF-B212K	GENERAL WEIGHT & MOMENT COMPENSATION	11,554	11,438			
ATF-216K	INSTALL MACH SPACE AFFF/PKP FIRE FIGHTING SYSTEM	87,200	86,328			SUPSHIP estimates for K-alts were not made**
ATF-226K	P/A SEWAGE CHT	150,093*	110,880			Partial system
ATF-227K	P/A BILGE RISER PUMP SYSTEM	10,573	10,467			
ATF-229K	P/A TANK LEVEL INDICATORS	78,698	77,911			
ATF-232K	P/A BILGE HIGH LEVEL ALARM	2,071	2,050			
ATF-236K	H/I FOOD SERVICE	21,037	20,827			
ATF-237K	H/I GALLEY MODS	47,306	46,833			
ATF-243K	H/I SAN SPACE VENT & SHEATH	54,282	53,739			
ATF-208D	INSTALL DUAL TASK LIGHTS			5,400		

*FMP estimate based on complete installation; **This comment applies to all K-alts.

ALT Summary Sheet - USS APACHE (ATF-67) (Sheet 2 of 3)

SHIP ALT #		FMP EST ($)	NAVSHIPS EST ($)	SUPSHIP EST ($)	ACT COST ($)	REMARKS
ATF-209D	INSTALL WIND INDICATING SYSTEM			2,400		
ATF-217D	INSTALL A/C SHORE POWER SYSTEM			1,100		
ATF-246D	H/I SAN SPACE FIXTURES			13,550		
ATF-256D	H/I CREW'S MESS MODERNIZATION			40,000		
ATF-242F	H/I ELECTRIC HAND DRYERS			1,400		
(No Ship-alt no.)	H/I CREWS BERTHING MODERNIZATION			100,000		PERA(CSS) 030008Z Nov 73 refers
AER ATF-71	MODIFY FUEL OIL SERVICE SYSTEM PIPING			2,200		
AER ATF-64	INSTALL STRIP HEATERS IN TOPSIDE MOTORS			4,600		
AER ATF-76	INSTALL DISCONNECT SWITCHES FOR ELECTRONIC EQUIPMENT			500		
AER ATF-84	IMPROVE SALVAGE CAPABILITY			50,000		

ALT Summary Sheet - USS APACHE (ATF-67) (Sheet 3 of 3)

SHIP ALT #		FMP EST ($)	NAVSHIPS EST ($)	SUPSHIP EST ($)	ACT COST ($)	REMARKS
AER ATF-85	INSTALL WASTE HEAT EVAPTORATORS			57,000		
AER ATF-89	INSTALL REMOTE START-STOP STATIONS FOR FIRE PUMPS			1,800		
AER ATF-96	MODIFY DUPLEX STRAINERS			7,500		
AER ATF-101	INSTALL SAF-T-CLIMB DEVICE			2,500		
AER ATF-95	INSTALL 7.5 TON AC UNIT			5,700		

TYCOM REPAIR PACKAGE - USS APACHE (ATF-67)

			No.	Pct
1.	Total Work Requests Screened		584	
	Total Automated Work Requests		257	44.0
2.	(a)	Number of Work Requests Deferred	19	3.3
	(b)	Number of Work Requests Disapproved	58	9.9
	(c)	Number of Work Requests Duplicated, Etc.	118	20.2
	(d)	Number of Work Requests Approved	389	66.6
3.	Total Work Requests Approved		389	
		Number Work Requests Screened: Priority One (1)	19	4.9
		Number Work Requests Screened: Priority Two (2)	122	31.4
		Number Work Requests Screened: Priority Three (3)	219	56.3
		TOTAL	360	92.6
	B.	Number of Approved Work Requests by Type Work	389	100.0
		Repair (including Remove, Replace, Manufacture, Drydock, POT/I and Calibration)	347	89.2
		Ship Alteration	16	4.2
		TYCOM AER	13	3.3
		Habitability	7	1.8
		Routines	6	1.5
	C.	Number of Approved Work Requests Insurance Items:		
		As Insurance items were identified, the ship was advised to include them in the work package. Separate identity was not maintained.		
	D.	Number of Approved Work Requests Accomplished	NA	NA
		Number of Approved Work Requests not Accomplished and not entered in CSMP	NA	NA

PERA SCREENING SUMMARY, USS APPACHE (ATF-67)

		PERA	TYCOM
1. (a)	NUMBER WORK REQUESTS SCREENED ONE (1)	192	See Comments
(b)	NUMBER WORK REQUESTS SCREENED TWO (2)	79	
(c)	NUMBER WORK REQUESTS SCREENED THREE (3)	118	
(d)	NUMBER WORK REQUESTS SCREENED FOUR (4)	0	
(e)	NUMBER WORK REQUESTS SCREENED FIVE (5)	0	
(f)	NUMBER WORK REQUESTS SCREENED SIX (6)	0	
(g)	NUMBER WORK REQUESTS SCREENED SEVEN (7)	0	
(h)	NUMBER WORK REQUESTS SCREENED EIGHT (8)	19	
(i)	NUMBER WORK REQUESTS SCREENED NINE (9)	58	
(j)	NUMBER WORK REQUESTS SCREENED ZERO (0)	118	
(*)			

2. TOTAL NUMBER WORK REQUESTS TYCOM CONCURRED See Comments

   TOTAL NUMBER WORK REQUESTS TYCOM SCREENED OTHERWISE

   See Comments

3. See Comments % AGREEMENT IN SCREENING.

4. ANALYSIS OF SCREENING DIFFERENCES:

   (Not applicable)

5. COMMENTS/RECOMMENDATIONS

   Screening actions were reviewed with the overhaul manager prior to being finalized. No distinction was made between PERA and TYCOM screening actions. It can be stated generally that the overhaul manager concurred with the recommended screening.

(*)LEGEND: SCREENING ACTION (APPENDIX 17 OPNAV 43P23)

1. SHIPYARD ACCOMPLISH
2. TENDER OR REPAIR SHIP ACCOMPLISH
3. SHIPS FORCE - (TENDER OR REPAIR SHIP/YARD) ASSIST
4. ACCOMPLISH AS ALTERATION EQUIVALENT TO A REPAIR
5. SHIP TO SHOP
6. ACCOMPLISH WITH MODIFICATION
7. YARD OPEN INSPECT -- ADVISE TYCOM -- PROCEED WITH MINIMUM REPAIRS
8. DEFERRED
9. DISAPPROVED
0. OTHER - SPECIFY IN REMARKS

NARRATIVE OF MATERIAL CONDITION PRIOR TO ROH (subjective overview)

The USS APACHE was the oldest fleet tug in the U.S. Navy, and had been out of overhaul for more than three years while this overhaul planning process was underway. Indicative of the ship's condition were the following:

(a) The main propulsion engines all had more than 5000 operating hours since their last overhaul.

(b) Considerable difficulty had been experienced with the ship's service generator engines.

(c) Most of the auxiliary pumps, motors and controllers, switchboards, reefers, steering gear, deck machinery, and many electronic equipments, required a complete overhaul.

(d) The tow machine was in such poor condition that it was a mission-degrading INSURV discrepancy.

(e) The ship did not have a twinned-agent firefighting system in its machinery spaces.

(f) No pollution abatement shipalts had been completed.

(g) The ship did not meet current habitability standards, and in addition had a great deal of combustible sheathing and carpeting aboard.

III. C. Deferred Work/Long Range Maintenance Actions

(Not applicable)

III. D. Recommendations

1. Ship: None

2. Class: The ATF-67 class of ships is very limited in ship's service power, having a total of only 300 kilowatts available. This should have been the subject of a shipalt for the USS APACHE. However, it is very doubtful that any ships of the class will be active long enough to warrant changing the power configuration.

3. Standardized Work Packages: The experience gained in the preparation of the work package for the USS MOLALA (ATF-106) was utilized in preparation of the work package for the USS APACHE. The latter work package has been added as another data source in the continuing development of a standard ATF ROH workbook.

4. PERA:

   (a) Late identification of authorized shipalts and late tasking of development of BACD's affected the preoverhaul planning procedures. PERA should continue to take an active role in preventing this from recurring.

   (b) It is recommended that NMMFO and SOAP be added to the distribution list of the FILS letter.

III. E. Evaluation/Usefullness

1. PERA products to ship/industrial activity

(a) SSDI. The SSDI was found very useful by the ship and enabled them to assemble a complete work package.

(b) FILS. The information provided by the FILS program was not utilized by the industrial activity.

(c) IWP. The IWP was utilized by the ship and the type commander as a record of screening action and as a tool in updating the CSMP.

(d) POT/I Plan. The ship's operating schedule precluded performing the POT/I's originally planned. The electronics POT/I was very beneficial, as it identified not only industrial work items but tender/DATC and ship's force work as well.

USS QUAPAW (ATF-110)

POST OVERHAUL ANALYSIS REPORT

OVERHAUL DATES

1 August 1973 – 1 February 1974

USS QUAPAW (ATF-110)

POST OVERHAUL ANALYSIS REPORT

Approved: _____

Date: _____

Distribution:

PERA(CSS)
COMSERVPAC
COMSERVGRU FIVE
USS QUAPAW (ATF-110)

Prepared by

ARINC RESEARCH CORPORATION
Ships and Ordnance Division
Honolulu Support Office

Contract N00140-73-D-0074-0010

Publication 1020-01-1-1303B

USS QUAPAW (ATF-110)
POST OVERHAUL ANALYSIS REPORT

TABLE OF CONTENTS

I. General Information and Preface

General Information:

Ref: (a) Contract N00140-73-D-0074.

(b) PERA(CSS) Milestone Charts, dated August 1972; forwarded by PERA(CSS) Letter Ser. 1800-262 of 4 May 1973.

Preface:

The USS QUAPAW (ATF-110) was overhauled from 1 August 1973 through 1 February 1974 under the direction of the Supervisor of Shipbuilding, Pearl Harbor Naval Shipyard. The overhaul was accomplished in two phases: a Drydock Phase at Dillingham Shipyard and a Topside Phase at Pacific Marine Shipyard, both in Honolulu, Hawaii.

In planning the overhaul of USS QUAPAW, PERA(CSS), acting as TYCOM and NAVSHIPS maintenance management agent, established advance planning milestones (references a and b), which commenced six months prior to the overhaul start date. The goal of the planning effort has been to identify, in advance, potential and existing problem areas; and provide the detailed preoverhaul guidance, planning, and coordination necessary to achieve a successful yard overhaul. The purpose of this report is to evaluate the management judgments and decisions associated with the planning effort during this period.

II. Management Summary

References (a) and (b) list the management milestones used in planning the overhaul of USS QUAPAW. Deviations from the milestones which affected the overhaul, and nonprogrammed factors that contributed to the final overhaul outcome, are discussed below.

A. Authorized vs. Accomplished Work

The repair portion of the QUAPAW work package was essentially completed as authorized. The authorized alteration work package was the controlling factor in the overhaul. When the ship departed the overhaul shipyard, the galley and tank-level indicating system alterations were not complete because all of the required equipment had not been received.

B. Planned vs. Actual Completion Time

The overhaul period was extended 62 days as a result of late receipt of drawings for first time alteration material, and changes required in the collecting/holding tank (CHT) installation.

C. Planned vs. Actual Completion Costs

The SUPSHIP departure report had not been released as of the preparation of this report, so a comparison of the actual vs. planned costs for QUAPAW overhaul cannot be presented herein. A supplement to this report will be prepared and forwarded after receipt of the departure report.

D. Major Configuration Changes

The QUAPAW completed the overhaul with the following major configuration changes:

(a) New main propulsion diesel engines
(b) New waste heat evaporators
(c) New AFFF fire protection system
(d) New pollution abatement features (including partial CHT)
(e) New habitability improvements in galley, mess decks, and sanitary spaces
(f) Improved salvage capability
(g) Upgraded communication and radar systems.

E. Follow-on Work Required

The major follow-on work still required to complete the QUAPAW overhaul is the installation of missing equipments for the galley improvement and tank level indicating system alterations.

III. Overhaul Details

A. Planning Process

1. Ideal vs. Actual Milestones

Advanced overhaul planning for the USS QUAPAW commenced in January 1973. The overhaul planning procedures used for the QUAPAW overhaul are defined in the COMSERVPAC Overhaul Planning Task Chart, Task Index, and Tasks, dated 15 September 1972; and Combatant Support Ship Overhaul Advance Planning Milestones. These advance planning milestones provide for accomplishment of 53 tasks, of which 36 tasks are PERA action responsibility The ideal target dates for these tasks range from start of overhaul minus 20 months (A-20), to completion of overhaul plus 2 months (C+2).

With the QUAPAW overhaul scheduled to start 5 July 1973, ARINC Research commenced advance planning for the overhaul at about A-6 months. This made it necessary to compress the time frame of the planning milestones and combine some tasks. All required tasks were completed. Table III.A-1 shows the dates for the accomplishment of the principal milestones for QUAPAW. The following paragraphs summarize the advance planning for the overhaul.

(a) Advance Overhaul Planning. Overhaul planning was initiated by ARINC Research with a survey of the available maintenance history of the QUAPAW as contained in the Current Ships Maintenance Program (CSMP) and the Maintenance and Material Management (3M) Program Material History Report. Programmed ship alterations (shipalts) and TYCOM alterations were reveiwed, along with other pertinent maintenance history documents such as last overhaul records, departure reports, Board of Inspection and Survey (INSURV) reports, and casualty reports (CASREPs).

Concurrent with the review of the QUAPAW's maintenance history, the ship's work request package was reviewed and screened. Before being changed to 5 July 1973, the start date for the QUAPAW overhaul had been 9 April 1973; therefore the ship's work requests had been submitted and had received a preliminary screening by

COMSERVGRU FIVE maintenance personnel. Advance copies of the work requests had been provided to SUPSHIP 14. On completion of screening by ARINC Research, shipyard work requests were delivered to SUPSHIP 14 beginning on 20 March 1973. By mid-April, approximately 80% of the shipyard-accomplish work requests had been delivered.

Preoverhaul Test and Inspection (POT/I) requirements were identified as the work package was screened. These tests and inspections were performed by PHNSY during a two-week RAV from 9-20 April 1973. New work requests resulting from the POT/I were screened to SUPSHIPS for inclusion in the work package, and by mid-May the integrated alteration/repair work package was essentially complete.

NAVSHIPS-funded alterations were initially authorized in November 1972 for the overhaul starting in April 1973. Following the rescheduling of the overhaul to a 5 July 1973 start date, additional alterations were authorized in January 1973 and three first-time habitability improvement alterations were authorized by the Type Commander in May and June 1973.

(b) Tradeoff Conferences. The overhaul tradeoff conference was scheduled by SUPSHIP 14 for 18 May 1973. The overhaul was to be conducted in two phases: a one-month Drydock Phase followed by a Topside Phase. The tradeoff conference for the Drydock Phase was held on 23 May 1973, and for the Topside Phase on 8 Aug 1973. Job specifications and estimates were not available to support an earlier conference for the Topside Phase. The package was still not complete on 8 August because of the late receipt by SUPSHIP of first-time shipalt design packages. As a result of the tradeoff conferences, a work package with an estimated cost of $1,652,821, including $354,631 for NAVSHIPS-funded alterations, was authorized. Of this total, $205,067 was for the Drydock Phase.

(c) Overhaul Phase. ARINC Research's main planning responsibility during the QUAPAW overhaul was monitoring its progress and assisting in the management of SERVGRU resources in light of additional requirements developed during and as a result of the

overhaul. To accomplish this, ARINC Research personnel attended the SUPSHIP weekly progress conferences and provided liaison between the SERVGRU FIVE maintenance staff, SUPSHIP, and the ship.

(d) Postoverhaul Phase. ARINC Research Corporation's responsibility following completion of the overhaul consisted of analyzing the overhaul records and the preparation of final reports. The final report was delayed because of the late distribution by SUPSHIP of the departure report with return cost data.

2. Impact.

The advance overhaul planning milestones call for early identification of alterations to be accomplished during the overhaul, and early authorization by the planning yard to have first time shipalt drawings developed. For QUAPAW the NAVSHIPS alteration planning message was issued 9 March 1973. Drawings for seven first-time alterations were developed by SUPSHIP/San Diego to support both MOLALA (ATF-106) and QUAPAW as a result of tasking by PHNSY on 30 March. This late start for plan development and the resultant late ordering of material had a direct effect on the start date of overhaul. Plans were still being received after the overhaul started.

3. Recommendations.

As a result of the review of the planning process for QUAPAW as discussed above, the following recommendations are offered.

(a) Review the advance-planning milestone target dates and determine which should be made more realistic, in light of the QUAPAW overhaul and general overhaul experience.

(b) Continue to emphasize early submittal of the ship's work package to SUPSHIP to permit development of estimates and specifications to support a work definition conference based on accurate and complete data.

(c) Reconsider the requirement for postoverhaul reports to contain final cost data. Under present conditions, these data are not available by the milestone date (C+2) for submitting the final report.

(d) Continue to work toward early definition and firming up of the ship alteration package and the authorization to develop required drawings.

(e) Increase PERA participation in the overhaul management phase.

TABLE III.A.1. IDEAL VS. ACTUAL MILESTONES FOR ROH OF USS QUAPAW (ATF-110) (Sheet 1 of 2)

Milestone	Milestone Target Date *	Contract Target Date	Actual Start	Completion	Remarks
Contract Start Date			1-18-73		
Obtain Historial Data, Review Alt Package	Immed.	Immed.	1-18-73	2-15-73	
Receive Ship Work-Request Package	Immed.	Immed.	1-18-73		Ship submitted by letter 12-15-72 for a 9 April ROH. COMSERVGRU FIVE had completed preliminary screening and provided advance copies to SUPSHIP 14.
Screen Work Requests, Determine Known Work, Identify LLT Actions	A-9 to A-6	2-23-73	1-18-73	3-19-73	
Brief Ship, Shipcheck Selected Work Items	Immed.	2-12-73	2-12-73	3-16-73	Includes ship's 30-day stand-down period.
Determine Preoverhaul Test & Inspection Requirements	A-6	2-23-73	2-12-73	3-6-73	
Submit Screened Work Requests to SERVGRU and SUPSHIP	A-9 to A-6	4-6-73	3-20-73	4-13-73	Initial work package. Approximately 80% of final package.
Receive New Work Requests; Screen, Submit to SERVGRU & SUPSHIP	A-6	As developed	3-19-73	5-11-73	Essentially completed package except for late items.
Conduct Preoverhaul Tests and Inspections	A-6 to A-3	4-9-73	4-9-73	4-20-73	

TABLE III.A.1. (Sheet 2 of 2)

Milestone	Milestone Target Date*	Contract Target Date	Actual Start	Completion	Remarks
Complete Drydock Phase Tradeoff Analysis and Work Definition Conference	A-2	5-18-73		5-23-73	
Complete Topside Phase Tradeoff Analysis and Work Definition Conference	A-2	5-18-73		8-8-73	Conference with SERVGRU and Ship's Force held 8-6-73 to review specification.
Overhaul - Drydock Phase	A	7-5-73 8-5-73	8-1-73	8-30-73	
Overhaul - Topside Phase	A+30	8-6-73 11-5-73	8-31-73	2-1-74	
Complete Final Report	C+2	1-4-74	2-1-74		

*COMSERVPAC overhaul planning task index and task dated 15 September 1972.

III. B. Work Package

B.1 Summary Sheet

B.2 Cost Summary Sheet

B.3 Alteration Summary Sheet

B.4 TYCOM Repair Package

B.5 PERA Screening Summary

B.6 Narrative of Major Alteration Items

B.7 Narrative of Major Repair Items

B.8 Narrative of Material Condition Prior to ROH

B.9 Narrative of Material Condition After ROH

B.1 Summary Sheet — USS QUAPAW (ATF-110)

DRYDOCK PHASE

Scheduled Start Date: 5 July 73 Scheduled Completion Date: 30 Aug 73

Actual Start Date*: 1 Aug 73 Actual Completion Date: 30 Aug 73

TOPSIDE PHASE

Scheduled Start Date: 31 Aug 73 Scheduled Completion Date: 30 Nov 73

Actual Start Date: 31 Aug 73 Actual Completion Date: 1 Feb 74

Overhaul Extended 62 days**

*The QUAPAW overhaul was scheduled for the period 5 July 73 to 5 November 73, with the Drydock Phase scheduled for the first month. In June 73, SUPSHIP 14 requested the availability be changed to 6 August to 30 November 73, based on an estimated delivery date of 25 August 73 for replacement main engines and late receipt of first-time alteration drawings. This change in availability was authorized. To fit the availability of the drydock, the Drydock Phase actually started on 1 August 73.

**The Topside Phase of the QUAPAW overhaul was extended 62 days because of late receipt of 1) a main engine to replace one of the original set damaged in shipment, 2) first-time alteration drawings, 3) tank level indicating equipment, and 4) galley equipment; and extensive changes in CHT installation.

SIGNIFICANT CAPABILITY CHANGES

a. Upgraded communications/radar
b. Pollution abatement features (including partial CHT)
c. Habitability improvements: galley, mess decks, and sanitary spaces
d. New main propulsion engines
e. New waste heat evaporators
f. Improved salvage capability
g. Machinery space AFFF installation
h. New 200-kW S.S. generator diesel engine

B.2 Cost Summary Sheet — USS QUAPAW (ATF-110) (for civilian yard)

1. SUMMARY OF OVERHAUL COSTS

		K-ALT	REPAIR
(a)	BUDGET	($) Not available	Not Available
(b)	ESTIMATED COST	($) 354,631	1,298,190
(c)	BID PRICE	($) 164,474*	972,722
(d)	TOTAL COST	($) Not available	Not available
(e)	GROWTH COST	($)	
(f)	PERCENT GROWTH		

*The complete alteration package, as estimated, was not included in the initial bid specifications.

2. BREAKDOWN OF OVERHAUL COSTS BY EIC CATEGORY

EIC		EST. COST ($)		PCT. TOTAL COST		PCT. GROWTH	
SYSTEM	SUBSYS.	SYSTEM	SUBSYS.	SYSTEM	SUBSYS.	SYSTEM	SUBSYS.
1000		248,676		15.8		(Not Available)	
	1A00		1,942		0.1		
	1B00		114,680		7.3		
	1C00		49,946		3.2		
	1100		14,003		0.9		
	1300		5,000		0.3		
	1500		4,842		0.3		
	1600		2,433		0.2		
	1700		50,257		3.2		
	1800		3,471		0.2		
	1900		2,102		0.1		
3000		79,868		5.1			
	3100		78,101		5.0		
	3300		1,767		0.1		

(Cont.)

2. BREAKDOWN OF OVERHAUL COSTS BY EIC CATEGORY (Continued)

EIC		EST. COST ($)		PCT. TOTAL COST		PCT. GROWTH	
SYSTEM	SUBSYS.	SYSTEM	SUBSYS.	SYSTEM	SUBSYS.	SYSTEM	SUBSYS.
4000		29,845		1.9			
	4100		16,390		1.0		
	4300		4,467		0.3		
	4400		1,055		0.1		
	4700		7,933		0.5		
A000		137,964		8.8			
	AA00		950		0.1		
	AB00		4,006		0.3		
	AD00		6,985		0.4		
	A000		23,501		1.5		
	A100		11,740		0.8		
	A600		556		–		
	A700		6,920		0.4		
	A800		3,516		0.2		
	A900		79,790		5.1		
C000		324,198		20.6			
	CB00		45,964		3.0		
	CC00		43,045		2.7		
	C100		196,812		12.5		
	C400		23,799		1.5		
	C700		13,578		0.9		
G000		0		0			
L000		11,022		0.7			
	LB00		6,875		0.4		
	LH00		1,257		0.1		
	LJ00		1,350		0.1		
	L100		1,540		0.1		
M000		9,932		0.6			
	M500		8,180		0.5		
	M600		1,752		0.1		
N000		805		0.1			
	N400		805		0.1		

2. BREAKDOWN OF OVERHAUL COSTS BY EIC CATEGORY (Continued)

EIC		EST. COST ($)		PCT. TOTAL COST		PCT. GROWTH	
SYSTEM	SUBSYS.	SYSTEM	SUBSYS.	SYSTEM	SUBSYS.	SYSTEM	SUBSYS.
P000		9,003		0.6			
	P100		6,161		0.4		
	P600		2,842		0.2		
Q000		39,728		2.6			
	QB00		4,695		0.3		
	QD00		6,520		0.4		
	QE00		10,664		0.7		
	Q000		4,351		0.3		
	Q300		13,498		0.9		
R000		1,278		0.1			
	R500		1,278		0.1		
T000		448,008		28.4			
	TA00		4,995		0.3		
	TB00		6,823		0.4		
	TC00		0		0		
	TD00		4,284		0.3		
	TF00		16,368		1.0		
	TK00		120,295		7.7		
	TL00		12,456		0.8		
	TM00		56,783		3.6		
	TS00		6,361		0.4		
	TT00		0		0		
	T100		7,024		0.4		
	T300		72,106		4.6		
	T400		5,019		0.3		
	T500		6,795		0.4		
	T700		74,419		4.7		
	T800		54,280		3.5		
	T900		0		-		

2. BREAKDOWN OF OVERHAUL COSTS BY EIC CATEGORY (Continued)

EIC		EST. COST ($)		PCT. TOTAL COST		PCT. GROWTH	
SYSTEM	SUBSYS.	SYSTEM	SUBSYS.	SYSTEM	SUBSYS.	SYSTEM	SUBSYS.
U000		222,367		14.2			
	UA00		42,210		2.7		
	UC00		22,127		1.4		
	UF00		84,980		5.4		
	UH00		10,437		0.7		
	UJ00		16,967		1.1		
	U000		31,808		2.0		
	U400		659		0.1		
	U500		2,101		0.1		
	U600		900		0.1		
	U800		10,178		0.6		
W000		0			0		
Y000		7,278		0.5			
	YA00		1,795		0.1		
	YC00		5,483		0.4		
TOTAL = $1,569,972*							

*This total differs from summary sheet total because contingency is not included, and some late estimates are included.

3. COST AVOIDANCE SUMMARY.

(a) Screening Actions. For the QUAPAW overhaul, 780 work requests were received from the ship and screened by PERA. These work requests had been screened by the ship as follows:

(1) Shipyard Accomplish: 57%
(2) Tender Accomplish: 3%
(3) Ship's Force Accomplish: 37%
(4) Not Specified: 3%

As a result of screening by PERA and with the approval of the overhaul manager, the final screening of these work requests for the overhaul was:

(1) Shipyard Accomplish: 39%
(2) Tender Accomplish: 6%

(3) Ship's Force Accomplish: 38%
(4) Deferred 3%
(5) Disapproved 4%
(6) Miscellaneous 10%

The 17% reduction in the size of the work package (deferred, disapproved and miscellaneous screening) was realized through detailed shipchecks, discussions with ship personnel, and analysis of the work requested; and represents a cost avoidance to the type commander. In addition to reducing the size of the work package, the remaining work requests, particularly those screened to SUPSHIPS, were edited to ensure that the work requested was accurately described and supported by reference material such as plans, sketches, and APL's. It should be noted that the ship was more realistic in screening work for its accomplishment than is normally the case.

Although an accurate cost estimate cannot be placed on all these actions, cost avoidance was realized in the following areas:

(1) Work requested and not authorized
(2) Reduced SUPSHIP manhours required to:
    a. Prepare estimates and job specifications
    b. Research reference material
    c. Shipcheck
(3) Reduced manhours required by the overhaul manager to:
    a. Screen total work package
    b. Research incomplete work requests
    c. Research past maintenance history

Based on the ROH estimates for QUAPAW, the cost of a repair work item (not including contingency allowance) averaged approximately $3,900 per item. Using this figure, the 142 items originally screened by ship's force for shipyard work but not authorized would represent $553,800 in saved costs.

(b) Tradeoff Analysis. In preparation for the work definition conference, a tradeoff analysis was performed. The following work items were deleted from the shipyard work package with the overhaul manager's approval.

3(b). QUAPAW ITEMS DELETED DURING TRADEOFF ANALYSIS

EIC	JOB IDENT NUMBER	JOB DESCRIPTION	ESTIMATED COST ($)
1108	DA01/0238	Renew Jackstaff Stowage Bracket	282
1403	DA01/0236	Fab Aluminum Sea Ladder	2,857
1503	OE01/0836	Inst Sliding Door; Trans. Room	2,088
1601	XX02/0279	Dk Cover, Wardroom Pantry	2,219
1601	XX02/0297	Renew Deck Covering	1,231
1601	XX02/0077	Deck Covering; Scullery & Galley	5,225
191N	OE01/0827	Inst. Workbench/Storage Locker	4,669
1A01	XX02/0209	Inst. Coaming; Washing Machine	497
1B03	EA01/0129	Renew Dishwashing Machine	1,446
1C00	ON01/0558	Tile & Sheathing, Pilothouse	10,707
1C00	699-10	Delete Certain Requirements	1,976
1C01	XX02/0275	Install Transom Berth	5,047
1C03	OE01/0837	Remove Deck, Radio Room	448
GBV6	WG01/0138	Replace Gun Mount	4,102
T300	599-21	Delete Certain Vents	2,000
T800	599-23	Delete Certain Motors/Cont.	7,000
T801	ER01/0220	Insp. P-250 Flywheels	55
TB00	599-19	Delete One Pump Repair	2,000
TC06	XX02/0176	DK Drain Steam Conn	572
U000	Routine	Office Space	800
UF00	DA01/0198	SB/Preserve Topside	29,250
UF00	OE01/0831	Paint Radio Central	6,305
UF00	ON01/0507	Paint Chart House	4,129
Y30V	DA01/0223	Replace Canopy	3,589
		TOTAL	101,392

Note: Cost estimates are by SUPSHIP.

B.3 Alt Summary Sheet - USS QUAPAW (ATF-110) (Sheet 1 of 5)

SHIP ALT #		FMP EST ($)	NAVSHIPS EST ($)	SUPSHIP EST ($)	ACTUAL COST ($)	REMARKS
ATF-185K	INSTALL UHF COMMUNICATION EQUIPMENT	26,160	26,260	2,476		
ATF-194K	IMPROVE ANTENNA SYSTEM	15,805				Late authorization
ATF-196K	INSTALL CRYPTO SYSTEM TYPE "N"	37,823				Late authorization; provide plans only
ATF-205K	INSTALL VHF/UHF SECURE VOICE SUBSYSTEM	15,805	16,160	2,949		
ATF-206K	INSTALL IMPROVED SURFACE SEARCH RADAR	18,966	19,190	6,161		
ATF-211K	INSTALL TELETYPEWRITER TERMINALS, TYPE G	36,733	37,370	3,539		
ATF-212K	GENERAL WEIGHT & MOMENT COMPENSATION	11,554	12,120			
ATF-216K	INSTALL MACH SPACE AFFF/PKP FIRE FIGHTING SYSTEM	87,200	87,870	29,114		
ATF-266K	P/A SEWAGE CHT	150,093	112,896	72,755		Partial; pumps not installed

Alt Summary Sheet - USS QUAPAW (ATF-110) (Sheet 2 of 5)

SHIP ALT #		FMP EST ($)	NAVSHIPS EST ($)	SUPSHIP EST ($)	ACTUAL COST ($)	REMARKS
ATF-227K	P/A INST BILGE WTR DISCHARGE RISER	10,573	11,110	4,547		
ATF-229K	P/A INST FUEL TANK LEVEL IND SYSTEM	78,698	79,790	79,790		Partial; receivers not installed
ATF-232K	P/A BILGE FLOODING ALARM CKT FD	2,071	2,020	4,186		
ATF-236K	H/I FOOD SERVICE LINE MODS	21,037	21,210	21,210		
ATF-237K	H/I CREW GALLEY MODS	47,306	47,470	47,470		
ATF-243K	H/I SAN SPACES VENT & SHEATH	54,282	54,540	54,540		
ATF-244K	H/I SAN SPACES REL REL HW HTR	14,061	14,140			
ATF-188K	INST MF, HF AND MF/HF SSB COMM EQPT	38,150	10,080			Partial to complete
ATF-203K	NONSEC TTY			4,684		
K-ALT TOTAL*						
ATF-208D	INSTALL DUAL TASK LIGHT ARRAY			1,350		

Alt Summary Sheet - USS QUAPAW (ATF-110) (Sheet 3 of 5)

SHIP ALT #		FMP EST ($)	NAVSHIPS EST ($)	SUPSHIP EST ($)	ACTUAL COST ($)	REMARKS
ATF-209D	INSTALL WIND INDICATOR SYSTEM			1,257		
ATF-210D	REPL AIR COMP WITH NAVY STD COMPRESSORS			N/A		Not accomplished; new non-standard compressor installed
ATF-213D	REPLACE MN PROP ENGINES & D. GEN SETS			196,812		Partial - main eng only. D. gen. sets not available. New 200 kW gen. eng. installed.
ATF-217D	INSTALL AC SHORE POWER CONNECTION			2,026		
ATF-246D	H/I INSTL LAVATORIES & FIXTURES			19,000		
ATF-256D	H/I MODIFY CREW'S MESS			46,000		
D-ALT TOTAL*						
ATF-207F	INSTALL DUAL TASK LIGHT ARRAY			3,919		
ATF-242F	H/I INSTALL ELECTRIC HAND DRYER			640		
F-ALT TOTAL				4,559		

Alt Summary Sheet - USS QUAPAW (ATF-110) (Sheet 4 of 5)

SHIP ALT #		FMP EST ($)	NAVSHIPS EST ($)	SUPSHIP EST ($)	ACTUAL COST ($)	REMARKS
ATF AER-75	AUXILIARY BOILER REMOTE FUEL CUT OUT			N/A		Included with boiler repairs
ATF AER-76	DISCONNECT SWITCHES FOR ELEX EQPT			2,441		
ATF AER-84	IMPROVED SALVAGE CAPABILITY			23,501		
ATF AER-85	WASTE HEAT EVAPORATORS			117,285		
ATF AER-86	INST NON-LOCK VALVE PROTECTOR DEVICES					
ATF AER-89	INST MOTOR DRIVEN FIRE PUMP ELEC CONTROLS			12,144		
ATF AER-91	TOPSIDE DECK & CARGO HANDLING EQPT			N/A		Ship force accomp est 18 MD
ATF AER-94	INST TASK LIGHT DIMMER					
ATF AER-95	PROV A/C TO LIVING SPACE A-203-L			5,019		
ATF AER-97	RELOCATE FRESH WATER PUMPS			3,987		

Alt Summary Sheet - USS QUAPAW (ATF-110) (Sheet 5 of 5)

SHIP ALT #		FMP EST ($)	NAVSHIPS EST ($)	SUPSHIP EST ($)	ACTUAL COST ($)	REMARKS
ATF AER-98	INST PIPELINE AFTER PEAK TANK					
ATF AER-100	MOD 30 kW M/G CONT CIRCUIT					
ATF AER-101	SAF-T-CLIMB FALL PROTECTION SYSTEM					
TYCOM AER TOTAL *						

*Totals not provided because of unavailability of NAVSHIPS/SUPSHIPS estimated costs for some alterations.

B.4 TYCOM REPAIR PACKAGE - USS QUAPAW (ATF-110)

		No.	Pct
1.	Total Work Requests Screened	780	100
	Total Automated Work Requests	0	0
2.	(a) Number of Work Requests Deferred	27	4
	(b) Number of Work Requests Disapproved	30	4
	(c) Number of Work Requests Duplicated, etc.	80	10
	(d) Number of Work Requests Approved	643	82
	TOTAL	780	100
3.	Total Work Requests Approved	643	
	Number Work Requests Screened: Priority One (1)	12	2
	Number Work Requests Screened: Priority Two (2)	107	17
	Number Work Requests Screened: Priority Three (3)	244	38
	Number Work Requests Screened: Priority Four (4)	241	37
	Number Work Requests Screened: Priority Five (5)	38	6
	Number Work Requests Screened: Priority Six (6)	1	-
	TOTAL	643	100
B.	Number of Approved Work Requests by Type Work		
	Repair (including Remove, Replace, Manufacture, Drydock, POT/I and Calibration)	559	87
	Ship Alteration	32	5
	TYCOM AER	14	2
	Habitability	22	3
	Routines	16	3
	TOTAL	643	100
C.	Number of Approved Work Requests Insurance Items:		
	As Insurance items were identified, the ship was advised to include them in the work package. Separate identity was not maintained.		
D.	Number of Approved Work Requests Accomplished	NA	NA
	Number of Approved Work Requests not Accomplished and not entered in CSMP	NA	NA

B.5 PERA SCREENING SUMMARY, USS QUAPAW (ATF-110)

1. SCREENING ACTION	PERA	TYCOM
(a) Number Work Requests Screened One (1)	296	See Comments
(b) Number Work Requests Screened Two (2)	49	
(c) Number Work Requests Screened Three (3)	294	
(d) Number Work Requests Screened Four (4)	0	
(e) Number Work Requests Screened Five (5)	0	
(f) Number Work Requests Screened Six (6)	0	
(g) Number Work Requests Screened Seven (7)	4	
(h) Number Work Requests Screened Eight (8)	27	
(i) Number Work Requests Screened Nine (9)	30	
(j) Number Work Requests Screened Zero (0)	80	

(*)

2. TOTAL NUMBER WORK REQUESTS TYCOM CONCURRED See Comments

TOTAL NUMBER WORK REQUESTS TYCOM SCREENED OTHERWISE See Comments

3. See Comments % AGREEMENT IN SCREENING.

4. ANALYSIS OF SCREENING DIFFERENCES:

See comments

5. COMMENTS/RECOMMENDATIONS

Screening actions were reviewed with the overhaul manager prior to being finalized. No distinction was made between PERA and TYCOM screening actions. It can be generally stated that the overhaul manager concurred with the recommended screening.

(*)LEGEND: SCREENING ACTION (APPENDIX 17 OPNAV 43P2)

1. Shipyard accomplish
2. Tender or repair ship accomplish
3. Ships Force - (tender or repair ship/yard) assist
4. Accomplish as alteration equivalent to a repair
5. Ship to shop
6. Accomplish with modification
7. Yard open inspect -- advise TYCOM -- Proceed with minimum repairs
8. Deferred
9. Disapproved
0. Other - Specify in remarks

B.6 NARRATIVE OF MAJOR ALTERATION ITEMS

(a) Pollution Abatement. The following pollution-abatement alterations were accomplished for QUAPAW:

S/A ATF-226K	Sewage CHT (Partial)
-227K	Bilge Water Discharge Riser
-229K	Fuel Tank Level Indicating System
-232K	Bilge Flooding Alarm Circuit FD

The sewage collecting/holding tank was installed except for the required pumps. Extensive changes to the installation developed midway through the overhaul, contributing to a delay in completion.

Equipments for the fuel tank level indicating system were received late (receivers and power panels had not been received by the end of the overhaul), and also contributed to delaying the overhaul completion.

(b) Habitability Improvement. The following habitability-improvement alterations were accomplished:

S/A ATF-236K	Food Service Line Modification
-237K	Crew Galley Modifications
-242F	Install Electric Hand Dryer
-243K	Sanitary Spaces Ventilation and Sheathing
-244K	Sanitary Spaces, Relocate Hot Water Heater
-246D	Install Lavatories and Fixtures
-256D	Modify Crew's Mess

These were all first-time alterations. The necessary plans were developed by SUPSHIP/San Diego for both the QUAPAW and USS MOLALA (ATF-106), which was being overhauled at the same time as QUAPAW. Because of the late authorization, these drawings were still being developed at the start of the QUAPAW overhaul. Galley equipment identification and purchase were late, and equipments were still being received at the end of the overhaul.

(c) Other: Other major alterations included:

S/A ATF-210D	Replace Air Compressor with Naval Standard Compressor
-213D	Replace Main Propulsion Engines and Diesel Generator Sets

Because of the unavailability of a naval standard compressor, a new non-standard compressor was installed.

Late delivery of the propulsion engines contributed to delaying the start of the QUAPAW overhaul, and late receipt of a replacement engine for one damaged in shipment contributed to delaying the completion of overhaul. The portion of this shipalt to replace the ship service generating sets could not be accomplished due to nonavailability of equipment. A new 200-kW S.S. generator set diesel engine was installed.

B.7 Narrative of Major Repair Items

Following is a listing of the major repair work items accomplished during the QUAPAW overhaul. Work on these items progressed satisfactorily and did not impact on the overhaul completion date.

Cost Range	Item	Estimated Cost
$100K	(None)	
$50K - $100K	Replace No. 1 S/S Gen Dsl Eng	$ 60,733
$25K - $50K	Propulsion Gen	45,964
	Propulsion Mtrs	43,045
	F.W. Tank (2), Clean & Preserve	41,000
	Hull Preservation	37,570
$10K - $25K	Stern Shafting	22,496
	Mach Space Access Openings	22,127
	Bhd Sheathing W.R.	20,543
	Drydocking	15,967
	Sheathing CPO	15,515
	Seaplane Winch	15,377
	Temp Mess & Berthing	14,753
	Vent Motors	13,372

Cost Range	Item	Estimated Cost	
$10K - $25K	Ovhd Sheath CPO	12,953	
	Towing Machine	12,943	
	IC Swbd	12,900	
	Steering Gear	12,456	
	Anchor Windlass	11,921	
	Sheathing CPO	11,199	
	F.O. Purifier	11,141	
	Ovhd Sheathing W.D.	10,889	
	RPL Air Compressor	10,547	
	Capstan	10,110	
	ASF	10,000	
		$497,521	30%

B.8 Narrative of Material Condition Prior to ROH

The QUAPAW was considered to be in average material condition for a ship of her class and due for an overhaul. The main propulsion diesel engines were obsolete and difficult to maintain. Main motors and generators required complete overhaul. The number 1 ship service generator diesel engine required replacement. All ship's service generators and switchboards required overhaul. There was some hull plating and frame damage on the starboard side. The communication and radar systems were in need of updating. No pollution abatement ship alterations had been accomplished, and improved habitability installations were required.

B.9 Narrative of Material Condition After ROH

The QUAPAW deficiencies noted in Section B.8 were corrected during the overhaul. New main propulsion engines and most of the pollution abatement requirements were installed, and habitability levels were raised considerably. The QUAPAW received a thorough overhaul, and should be able to operate with a minimum of outside maintenance assistance until her next overhaul.

III.C Long Range Maintenance Requirements

An essential element of overhaul maintenance planning is assuring continuity from one overhaul to the next. An influential factor in attaining this continuity is the Long Range Maintenance Plan (LRMP). Using the completion date of the QUAPAW overhaul as a starting point, and utilizing the records of that overhaul, PERA prepared a plan identifying long range maintenance requirements for the QUAPAW. This plan addresses the period between overhauls, and specifies major maintenance requirements that should be targeted for accomplishment during the next overhaul.

Together with the LRMP, a second group of work, that deferred during the overhaul, was identified and the associated information was provided to the ship for inclusion in and updating of the current Ships Maintenance Projects (CSMP). The LRMP does not discuss the work entered into the CSMP, although planning for and accomplishment of that work is an integral part of long-range maintenance planning.

Probably the most important aspect of long-range maintenance planning is ship's force scheduling and accomplishment of 3M Planned Maintenance Subsystem (PMS) requirements. If ship's force pursues this program thoroughly and conscientiously, maintenance problem areas can be identified promptly and corrected before major deficiencies develop.

The long-range maintenance requirements identified for QUAPAW are shown in Table III.C-1. Section A of that table lists work defined during the recent overhaul. Ship's force and/or the overhaul manager (COMSERVPAC/COMSERVGRU) should start now to plan and budget for its accomplishment. Section B is work recommended for accomplishment during the next overhaul that requires actions by the overhaul manager early in the ROH requirements planning phase. Long-lead-time material must be ordered, or preoverhaul testing and inspection has to be scheduled to firm up repair requirements. Section C is work that should be given high priority for accomplishment during the next overhaul. For most of this work, preoverhaul testing should not be required. Section D identifies PMS-related actions whose accomplishment during the period between overhauls is considered especially important in preparation for the next overhaul.

No attempt has been made to include programmed ship alterations into this plan. It is considered that these are adequately handled by existing programs under the FMP.

The work deferred had no impact on the overall quality of the QUAPAW overhaul, or on the ability of QUAPAW to perform its assigned tasks and missions.

TABLE III.C.1. LONG-RANGE MAINTENANCE REQUIREMENTS (Sheet 1 of 2)

EIC	DESCRIPTION	REMARKS	EST. COST ($)*
	A. WORK DEFINED AND DEFERRED DURING FY 74 REGULAR OVERHAUL		
1B00	Galley Modifications	Complete the installation	Incl. in Ovhl
4100	Switchboard Splash Shields	INSURV deficiency	3,000
A900	Tank Level Indicating System	Complete the installation	Incl. in Ovhl.
	B. REPAIRS RECOMMENDED FOR NEXT REGULAR OVERHAUL REQUIRING LONG LEAD TIME MATERIAL		
T100	Auxiliary Boiler	Procure replacement boiler	25,000*
	C. OTHER LONG RANGE MAINTENANCE REQUIREMENTS		
1000	Conduct Habitability Study	Conduct at least 12 months before next overhaul to define deficiencies and establish priorities	5,000*
3000	Conduct Electrical Power Requirements Study	Conduct as early as possible to define requirements	25,000*
T300	Ventilation/Exhaust System Survey	Conduct at least 12 months before next overhaul to define requirements	3,000*
	D. PMS ITEMS (SHIP'S FORCE ACCOMPLISHMENT)		
1806	Salvage Equipment		
1807	Diving Equipment		

*PERA estimates. Other estimates were developed during overhaul planning just concluded.

TABLE III.C.1. LONG-RANGE MAINTENANCE REQUIREMENTS (Sheet 2 of 2)

EIC	DESCRIPTION	REMARKS	EST. COST ($)*
	D. PMS ITEMS (SHIP'S FORCE ACCOMPLISHMENT) (Cont)		
310U	Ship Service Diesel Generation		
4000	Electrical Safety Devices		
4400	Power Distribution Cabling		
C000	Main Propulsion Diesel Engines Reduction Gears Main Propulsion Generators Main Propulsion Motors		
T100	Auxiliary Boiler/Steam Piping		
T500	Refrigeration System		
T800	Firemain Piping and Valves		
TF00	Compressed Air Systems		
TK00	Evaporators		
TM00	Deck Machinery Towing Machine		

*PERA estimates. Other estimates were developed during overhaul planning just concluded.

III. D. Recommendations

D.1 For the Ship.

It is recommended that QUAPAW ship's force personnel take the following actions:

(a) Ensure that the CSMP is up-to-date and accurately reflects the condition of the ship following overhaul. Deferred work items accomplished during the overhaul should have completed actions submitted. Work that was not completed should be reviewed and revised as necessary to reflect its status at the end of overhaul.

(b) Follow-up and ensure receipt of updated record plans and documents that reflect the condition of the ship at the end of overhaul.

(c) Take action as necessary to accomplish deferred work/long range maintenance items, Section III.C.

D.2 For the Class.

It is recommended that for the ATF-96 class ships, the type commander, with assistance from PERA and the ships, accomplish the following:

(a) Plan for and accomplish a series of habitability studies and incorporate the results into future alteration and overhaul planning. The objective of this action is to update priority of accomplishment and obtain the necessary data to authorize early development of plans and ordering of material.

(b) Review existing alterations to determine new equipment/material requirements and take action as needed to obtain these items, e.g., replacement of auxiliary S/S generator sets and air compressors.

(c) Take follow-up actions as required to resolve electrical power availability/requirements for these ships, and provide for accomplishment of any modifications during the next overhaul.

D.3 Standardized ROH Work Requests (Form 4790.2K).

It is recommended that the program to develop standardized ATF class work requests and overhaul specifications be actively pursued. ARINC

Research is currently developing such a proposed standard work package under contract with COMSERVPAC.

D.4 For PERA(CSS).

It is recommended that PERA take the following actions with respect to advanced overhaul planning:

(a) Revise the planning milestone tasks to incorporate the most recent procedures and techniques.

(b) Analyze the reports and documents required to support overhaul planning, and issue appropriate specifications for their preparation and distribution.

(c) Actively pursue relationships with various SUPSHIP organizations to develop better understanding of the PERA functions and the need for interchange of advance planning data.

(d) Review the need for more active participation of PERA during the overhaul management phase.

(e) Increase the emphasis on advance material definition and procurement for overhauls.

III. E. Evaluation/Usefulness

E.1 PERA Products to Ship/Industrial Activity.

(a) Ship Systems Definition and Index (SSDI). The SSDI was used by the ship and ARINC Research as an aid in assuring complete work-package coverage. These block diagrams of the ship's systems by EIC provide a systematic method of organizing and reviewing the work package. Development of SSDI for other ship classes is recommended.

(b) Integrated Work Package Summary Reports. Computerized work package summary reports prepared in accordance with PERA(CSS) procedures were issued periodically throughout the overhaul planning phase. These reports were used by the ship, overhaul manager, and ARINC Research to progress the development of the overhaul package. The ability to produce these reports in various sequences such as work center-job sequence number, EIC category, type commander screening action, and industrial activity item number proved to be a valuable aid in managing the overhaul work package. They also served as an expedient method of keeping ship's force advised as to the screening action for its work requests.

(c) Preoverhaul Test and Inspection Report. As the QUAPAW work package was reviewed and screened, the requirements for preoverhaul testing and inspection were identified. The overhaul activity was advised of these requirements through the overhaul manager. The usefulness of these tests in many instances was marginal because of the poor quality of the reports received following the tests and inspections. For future overhauls, the results expected from specific preoverhaul tests and inspections should be better defined.

(d) Tradeoff Analysis. A tradeoff analysis was prepared and provided to the overhaul manager prior to each tradeoff conference. For the QUAPAW overhaul, these analyses provided an approximation of what the two phases of the overhaul would cost. An analysis

of the depth intended by the overhaul planning task definition could not be made, however, for the following reasons:

(1) SUPSHIP job estimates for all jobs were not available, and in some instances were of the ball-park type.

(2) The time interval between receipt of SUPSHIP job estimates and the tradeoff conference was extremely short.

(3) Complete man-hour estimates for ship's force jobs were not available.

(4) Tender man-hour availability was not identified.

(5) Identification of costs associated with the following was difficult:

a. Advance planning expeditures by SUPSHIP

b. Design service contract costs

c. PHNSY farm-in costs

(e) LLTM and FILS Reports. A Fleet Integrated Logistics Support (FILS) report was issued for the QUAPAW overhaul. ARINC Research could not determine if its contents were of use to the SUPSHIP office.

(f) Periodic Overhaul Planning Status Reports. Periodic overhaul planning status reports were prepared by ARINC Research and distributed to PERA(CSS) and the overhaul manager. It is believed that they served a useful purpose in documenting the overhaul planning effort, and in keeping overhaul/planning management personnel advised of the program status.

E.2 Resource Effectiveness

Evaluation of resource effectiveness for the QUAPAW overhaul planning requires considering four organizations:

(a) Ship's force
(b) PERA
(c) SUPSHIP
(d) Overhaul manager

Ship's force was prompt in submitting its work package, cooperative in resolving problems with specific work items and in the planning effort, and efficient in progressing its work throughout the overhaul. Delays in starting and completing the overhaul were beyond their control. It is the opinion of ARINC Research that the ship managed their resources very well.

PERA personnel, starting with less than the desired lead time for planning, screened the work package to SUPSHIP expeditiously. Designation of the alteration package was late, and together with the large number of first time shipalts, this had a delaying effect on the overhaul start. Preoverhaul test and inspection requirements were defined early and conducted with sufficient time to identify work requirements. A lack of understanding of all concerned of the specific responsibilities during the overhaul period resulted in a partial breakdown of communication. Additional follow-up and redefinition of PERA responsibilities during overhaul would help correct this situation.

SUPSHIP received approximately 80% of the work package in mid-April and by mid-May had essentially the complete package. Late tasking of first-time alteration design work resulted in a large portion of the overhaul being undefined by the time of the August tradeoff. Job specifications and estimates should have been prepared earlier than was the case; however the end of the fiscal year, with its accompanying increase in general work requirements, probably had an effect.

The POT/I produced results of lower quality in most cases which was due partly to incompletely or poorly defined requirements. More specific guidelines need be developed to better define what is expected from these tests and inspections. Following the overhaul, the departure report was not available at C+4 months.

The overhaul manager and the COMSERVGRU FIVE maintenance officer and his staff were efficient and cooperative in supporting their function in the overhaul planning. In a few instances new work went directly to SUPSHIP, with the result of not being considered as part of the complete package. During the overhaul, more effective use could have been made of available PERA services. This again reinforces the need to redefine the PERA functions and responsibilities during the overhaul period.

USS MOLALA (ATF-106)

POST OVERHAUL ANALYSIS REPORT

OVERHAUL DATES

13 August 1973 — 29 December 1973

USS MOLALA (ATF-106)

POST OVERHAUL ANALYSIS REPORT

Approved: _____

Date: _____

Distribution:

PERA(CSS)
COMSERVPAC
COMSERVGRU ONE
USS MOLALA
NAVSHIPS 427

Prepared by

ARINC RESEARCH CORPORATION
Ships and Ordnance Division
Honolulu Support Office

Contract N00140-73-D-0074-0010

Publication 1020-01-1-1303C

USS MOLALA (ATF-106)
POST OVERHAUL ANALYSIS REPORT

TABLE OF CONTENTS

I. GENERAL INFORMATION AND PREFACE

A. GENERAL INFORMATION

Ref: (a) Contract N00140-73-D-0074-0010.

(b) PERA(CSS) Milestone Charts, dated August 1972; forwarded by PERA(CSS) Ltr Ser. 1800-262 of 4 May 1973.

B. PREFACE:

The USS MOLALA (ATF-106) was overhauled from 13 August 1973 through 29 December 1973 under the direction of SUPSHIP 11. The overhaul was accomplished by National Steel and Shipbuilding Company, San Diego, California.

In planning the overhaul of the MOLALA, PERA(CSS), acting as TYCOM and NAVSHIPS maintenance management agent, established advance planning milestones (references a and b) which commenced six months prior to the overhaul start date. The goal of the planning effort has been to identify, in advance, potential and existing problem areas; and provide the detailed preoverhaul guidance, planning, and coordination necessary to achieve a successful yard overhaul. The purpose of this report is to evaluate the management judgments and decisions associated with the planning effort during this period.

II. MANAGEMENT SUMMARY

References (a) and (b) list the management milestones used in planning the overhaul of USS MOLALA (ATF-106). Deviations from the milestones which affected the overhaul, and nonprogrammed factors that contributed to the final overhaul outcome, are discussed below.

A. AUTHORIZED VS. ACCOMPLISHED WORK

Essentially all of the required work was authorized and accomplished. The ship completed its overhaul in the authorized availability period. Several items were not completed, mainly due to late delivery of GFM. These were carried as exceptions to the overhaul contract and completed by the contractor on a case basis. However, the turbo charger for the No. 1 auxiliary diesel has continued to present problems and should be replaced.

B. PLANNED VS. ACTUAL COMPLETION TIME

The MOLALA overhaul was completed on schedule. The overhaul start date was delayed due to late completion of first-time alteration drawings and scheduled delivery dates of replacement main engines.

C. PLANNED VS. ACTUAL COMPLETION COSTS

Significant cost changes almost exclusively involved shipalts. A comparison of planned and actual costs for the MOLALA overhaul cannot be presented herein because the SUPSHIP departure report had not been released as of the preparation of this report. A supplement to this report will be prepared and forwarded after receipt of the departure report.

D. MAJOR CONFIGURATION CHANGES

The MOLALA completed the overhaul with the following major configuration changes:

1. Replacement of main propulsion engine
2. New pollution abatement features
3. New habitability improvements
4. Installation of modernized tow machine
5. Upgraded communication capabilities.

E. FOLLOW-ON WORK REQUIRED

The major follow-on work still required to complete the MOLALA overhaul is the development of several shipalts to modernize the electrical power generating plant.

III. DETAILS OF OVERHAUL

A. PLANNING PROCESS

1. Ideal Vs Actual Milestones

Advanced overhaul planning for the USS MOLALA commenced in January 1973. The overhaul planning procedures used for the MOLALA overhaul are defined in the COMSERVPAC Overhaul Planning Task Chart, Task Index, and Tasks, dated 15 September 1972; and Combatant Support Ship Overhaul Advance Planning Milestones. These advance planning milestones provide for accomplishment of 53 tasks, of which 36 tasks are PERA action responsibility. The ideal target dates for these tasks range from start of overhaul minus 20 months (A-20), to completion of overhaul plus 2 months (C+2).

With the MOLALA overhaul scheduled to start 1 August 1973, ARINC Research commenced the advance planning for the overhaul at about A-7 months. This made it necessary to compress the time frame of the planning milestones and combine some tasks. All required tasks were completed. Table III.A-1 shows the dates for the accomplishment of the principal milestones for MOLALA. The following paragraphs summarize the advance planning for the overhaul.

a. Advance Overhaul Planning. Overhaul planning was initiated by ARINC Research with a survey of the available maintenance history of the MOLALA as contained in the Current Ships Maintenance Program (CSMP) and the Maintenance and Material Management (3M) Program Material History Report. Programmed ship alterations (shipalts) and Type Commander alterations were reviewed, along with other pertinent maintenance history documents such as last overhaul records, departure reports, Board of Inspection and Survey (INSURV) reports, and casualty reports (CASREPs).

The entire work package, minus those items subject to a Preoverhaul Test and Inspection (POT/I), was screened and delivered to SUPSHIP 11 by 30 April 1973. For the POT/I, a two-week restricted availability (RAV) was conducted from 30 April to 13 May 1973, with Campbell Industries performing the tests. New work

TABLE III.A-1. IDEAL VS. ACTUAL MILESTONES FOR ROH OF USS MOLALA (ATF-106)
(Sheet 1 of 2)

Milestone	COMSERVPAC Target Date	Contract Target Date	Actual Start	Completion	Remarks
PERA Contract Start Date			1/18/73		
Obtain Historial Data, Review Alt Package	Immed.	Immed.	1/18/73	2/15/73	CSMP, 3M-material history report, shipalts, AERs, INSURV reports, CASREPs.
Brief Ship on Overhaul Preparation	Prior to deployment	3/12/73		3/12/73	
Receive Ship Work Request Package	Immed.	3/21/73	3/19/73	4/23/73	Ship's operating schedule necessitated receiving incremental work package.
NAVSHIPS Issue Tentative K-Alts, Task First-Time Alt Dwgs	A-10	10/1/72	2/9/73		First-time alt drawings not completed until approximately 8/1/73.
Screen Work Request Package; Determine Known Work; Shipcheck	A-9 to A-6	3/21/73	3/19/73	4/30/73	Entire work package, except equipment subject to POT/I submitted to SUPSHIP 11 by 4/30/73.
Determine Preoverhaul Test and Inspection (POT/I) Requirements	A-6	2/23/73	2/12/73	3/8/73	
Conduct POT/I	A-6 to A-3	4/30/73	4/30/73	5/13/73	Supplemental work requests submitted to SUPSHIP 11 by 5/15/73.
NAVSHIPS Issue 180-Day Letter	A-6	2/1/73		5/9/73	Advance copy promulgated 5/9/73

TABLE III.A-1. (Sheet 2 of 2)

Milestone	COMSERVPAC Target Date	Contract Target Date	Actual Start	Completion	Remarks
Conduct Work Defnition Conference	A-2	6/11/73		6/25/73	Conference delayed by late plan completion.
Perform Overhaul		8/1/73 - 12/3/73	8/13/73	12/29/73	Overhaul availability changed to 8/13/73 - 12/31/73.
Complete Final Report	C+2	2/29/73			Report delayed due to lack of actual cost information.

requests resulting from the POT/I were screened to SUPSHIP for inclusion in the work package, and by the end of May the integrated alteration/repair work package was essentially complete. The completeness of this package is demonstrated by the fact that only one minor item was added after the overhaul contract was awarded.

The major difficulty in the preoverhaul planning process was the late identification of first-time shipalts and the subsequent late tasking and completion of basic alteration class drawings (BACDs). The initial NAVSHIPS K-alt authorization message was issued on 9 February 1973 and included nine first-time alts. Pearl Harbor Naval Shipyard indicated on 7 March 1973 that they could not complete the BACDs in time to support the ROH start dates of MOLALA and QUAPAW. SUPSHIP 11 accepted the task of developing MOLALA drawings that were also utilized for QUAPAW and COCOPA. These drawings were not completed until approximately 1 August 1973, delaying the overhaul start date until 13 August 1973.

b. Tradeoff Conference. The tradeoff conference was originally scheduled for 11 June 1973; however late completion of plans delayed the conference until 25 June. At the conference, attended by representatives of SUPSHIP 11, USS MOLALA (ATF-106), COMSERVGRU ONE, PERA(CSS) and ARINC Research Corporation, 61 Priority 3 work items were deferred due to lack of funds. COMSERVPAC subsequently authorized the additional funds and the complete overhaul work package was included in the invitation for bid.

c. Overhaul Phase. ARINC Research's main responsibility during the MOLALA overhaul was monitoring its progress and assisting in the management of SERVGRU resources in light of additional requirements developed during and as a result of the overhaul. To accomplish this, ARINC Research personnel attended several SUPSHIP weekly progress conferences and provided liaison between the SERVGRU ONE maintenance staff, SUPSHIP, and the ship.

d. Postoverhaul Phase. ARINC Research Corporation's responsibility following completion of the overhaul consisted of analyzing the overhaul records and preparation of final reports. The final report was delayed because of the late distribution of the departure report with return cost data.

2. Impact of Planning Milestone Slippages

The advance overhaul planning milestones call for early identification of alterations to be accomplished during the overhaul, and early authorization by the planning yard to have first-time shipalt drawings developed. For MOLALA, the NAVSHIPS alteration planning message was issued 9 February 1973. Drawings for seven first-time alterations were developed by SUPSHIP 11 to support the overhaul as a result of tasking by PHNSY on 30 March. This late start for plan development and the resultant late ordering of material had a direct effect on delaying the start date of overhaul. Plans were still being received after the overhaul started.

3. Recommendations

As a result of the review of the planning process for MOLALA as discussed above, the following recommendations are offered.

a. Review advance-planning milestone target dates and establish dates that can be feasibly accomplished.

b. Continue to emphasize early submittal of the ship's work package to SUPSHIP to facilitate development of cost estimates and work specifications in support of a work definition conference based on accurate and complete data.

c. Review the requirement for postoverhaul reports to contain final cost data. Under present conditions, these data are not available by the milestone date (C+2) for submittal of the final report.

d. Continue to work toward early definition and firming up of the ship alteration package and the authorization to develop required drawings.

e. Increase PERA participation in the overhaul management phase.

B. WORK PACKAGE

1. Summary Sheet
2. Cost Summary Sheet
3. Alteration Summary Sheet
4. TYCOM Repair Package
5. PERA Screening Summary
6. Narrative of Major Alteration Items
7. Narrative of Major Repair Items
8. Narrative of Material Condition Prior to ROH
9. Narrative of Postoverhaul Material Condition

1. Summary Sheet — USS MOLALA (ATF-106)

Scheduled Start Date: 1 Aug 73 Scheduled Completion Date: 3 Dec 73

Actual Start Date:* 13 Aug 73 Actual Completion Date: 29 Dec 73

Overhaul Extended: 0 days

*Overhaul period changed to 8/13/73 through 12/31/73 by CNO on 15 August 1973. Overhaul start date delayed due to late completion of BACDs and uncertain delivery status of new main engine.

SIGNIFICANT CAPABILITY CHANGES:

a. The MOLALA received four new Caterpillar D-399 main propulsion engines during the ROH. In a companion alteration, waste heat evaporators replaced the existing solo-shell evaporators.

b. A rebuilt and modernized A.A. Johnson Series 222 tow machine was installed.

c. The AFFF/PKP fire-fighting system was installed in the machinery spaces.

d. Pollution abatement shipalts accomplished included 1) a partial CHT system, 2) installation of tank level indicators, 3) a bilge flooding alarm circuit, and 4) a bilge water discharge riser.

e. Several habitability shipalts (both titles D and K) were accomplished including galley, food service, and mess decks modernization. All sanitary spaces were refurbished.

f. A secure voice system was installed in the electronics area. In addition, non-secure teletype and type-G crypto system shipalts were completed.

2. Cost Summary Sheet — USS MOLALA (ATF-106)

a. Summary of Overhaul Costs

		K-Alt	Repair
1)	Budget	$402,409	$1,610,000
2)	Industrial Activity Est.	280,219	1,084,364
3)	Design and GFM	39,161	234,067
4)	Total Estimate	319,380	1,318,431
5)	Bid Price	280,849	972,940
6)	Bid Price + Design + GFM	320,010	1,207,007
7)	Total Cost	Not Available	Not Available
8)	Growth Cost	Not Available	Not Available
9)	Percent Growth	Not Available	Not Available

b. Estimated Overhaul Costs by EIC Category

EIC		Est. Cost ($)		Pct. Total Cost		Pct. Growth	
System	Subsys.	System	Subsys.	System	Subsys.	System	Subsys.
1000		206,621		12.6		(Not Available)	
	1A00		15,103		0.9		
	1B00		98,885		6.0		
	1C00		48,721		3.0		
	1600		7,371		0.5		
	1700		25,049		1.5		
	1800		11,492		0.7		
3000		67,946		4.2			
	3100		67,946		4.2		
4000		17,854		1.1			
	4100		11,617		0.7		
	4400		96		0.0		
	4700		6,141		0.4		
A000		166,915		10.2			
	AB00		14,635		0.9		
	AC00		13,620		0.8		
	A000		6,429		0.4		
	A100		9,338		0.6		

b. (Continued)

EIC		Est. Cost ($)		Pct. Total Cost		Pct. Growth	
System	Subsys.	System	Subsys.	System	Subsys.	System	Subsys.
	A700		5,984		0.4		
	A800		19,785		1.2		
	A900		97,124		5.9		
C000		429,830		26.3			
	CD00		26,375		1.6		
	CE00		141,459		8.7		
	C100		218,762		13.4		
	C400		8,886		0.5		
	C600		7,852		0.5		
	C700		9,682		0.6		
	C800		15,802		0.9		
	C900		1,012		0.1		
L000		20,900		1.3			
	LF00		312		—		
	LH00		2,061		0.1		
	LJ00		18,527		1.2		
M000		4,066		0.2			
	M500		3,636		0.2		
	M600		430		—		
N000		1,040		0.1			
	N400		1,040		0.1		
P000		3,410		0.2			
	P100		2,769		0.2		
	P600		641		0.0		
Q000		34,660		2.1			
	QD00		11,268		0.7		
	QE00		3,515		0.2		
	Q100		764		0.1		
	Q300		16,925		1.0		
	Q900		2,188		0.1		

b. (Continued)

EIC		Est. Cost ($)		Pct. Total Cost		Pct. Growth	
System	Subsys.	System	Subsys.	System	Subsys.	System	Subsys.
R000		2,669		0.2			
	R500		2,669		0.2		
T000		591,565		36.2			
	TA00		9,531		0.6		
	TB00		14,051		0.9		
	TC00		624		—		
	TD00		58,527		3.6		
	TF00		22,167		1.4		
	TK00		65,911		4.0		
	TL00		34,669		2.1		
	TM00		180,003		11.0		
	TS00		1,842		0.1		
	T100		32,637		2.0		
	T300		25,030		1.5		
	T400		4,890		0.3		
	T500		14,364		0.9		
	T700		65,064		4.0		
	T800		22,645		1.4		
	T900		39,610		2.4		
U000		79,706		4.9			
	UE00		2,596		0.2		
	UF00		21,480		1.3		
	UH00		5,000		0.3		
	UJ00		14,054		0.9		
	U500		630		0.0		
	U600		1,561		0.1		
	U700		27,162		1.7		
	U800		7,223		0.4		
Y000		7,516		0.5			
	UC00		7,516		0.5		
TOTAL		1,634,698*					

*This total differs from summary sheet total because of some revised estimates.

c. Cost Avoidance Summary

Screening Actions. For the MOLALA overhaul, 426 work requests were received from the ship and screened by PERA. Of this total, 19 percent were screened as deferred, duplicated, disapproved, etc., as a result of shipchecks, discussions with ship personnel, and analysis of the work requested. This represents a substantial cost avoidance to the type commander as well as a considerably lightened workload for the overhauling activity and overhaul manager.

During the screening process, a large number of work requests were screened for intermediate maintenance activity (IMA) or ship's force accomplishment. This allowed funding for work requests that a shipyard can best accomplish.

Job specifications were reviewed as they were being written at SUPSHIP 11. A considerable number (about 30%) were edited to ensure that the work requested was adequately described, to correct errors, to expand coverage, etc. This effort reduced substantially the number of change orders issued on repair jobs.

3. Alteration Summary Sheet

The alteration summary sheet for the USS MOLALA is shown in Table III. B-1.

TABLE III. B-1. ALTERATION SUMMARY SHEET — USS MOLALA (ATF-106) (Sheet 1 of 3)

Alteration		FMP Est. ($)	NAVSHIP Est. ($)	SUPSHIP Est. ($)	Actual Cost ($)	Remarks
ATF-193K	Increase Salvage Pump	22,127	18,018	8,685		Partial; GFM not received
ATF-203K	Install Nonsecure Teletype (partial to complete)	14,606	12,280	11,706		Complete
ATF-205K	Install UHF/VHF Secure Voice (partial to complete)	15,805	13,104	11,268		Complete
ATF-211K	Install Type G Teletype (partial to complete)	36,951*	5,733			*Complete; estimate* included in S/A ATF-203K
ATF-212K	General Weight and Moment Compensation	11,554	9,828	14,370		Complete
ATF-216K	Install Mach. Space AFFF/PKP Fire-Fighting System	87,200	71,253	39,610		Complete
ATF-226K	P/A Sewage CHT (partial system)	149,984*	91,728	68,875		Complete; S/A ATF-263K will complete installation
ATF-227K	Install Bilge Water Discharge Riser	11,009	9,009	8,649		Complete

*FMP estimate based on complete installation

TABLE III. B-1. (Sheet 2 of 3)

Alteration		FMP Est. ($)	NAVSHIP Est. ($)	SUPSHIP Est. ($)	Actual Cost ($)	Remarks
ATF-229K	Install Fuel Tank Level Indicating System	78,698	64,701	37,168		Partial; minor mods required
ATF-232K	Install Bilge Flooding Alarm Circuit FD	2,071	1,638	3,636		Complete
ATF-236K	H/I Food Service	21,037	17,199	26,015		Partial; GFM not received
ATF-237K	H/I Galley Mods	47,306	48,493	67,615		Partial; S/A ATF-225K will complete. GFM sink heater not received.
ATF-243K	H/I Sanitary Space Vent & Sheathing	54,282	44,226	20,745		Complete
ATF-165D	Modify Boiler Air Casing					Complete; estimate included in boiler replacement job.
ATF-205D	Install Dual Task Lights			13,676		Complete; shipalt being revised and may be redone.
ATF-213D	Replace Main and Auxiliary Engines			218,762		Partial; main engines replaced. Auxiliary engines to be subject of revised shipalt.
ATF-246D	Replace Sanitary Space Fixtures			52,160		Complete
ATF-256D	H/I Crews Mess Rearrangement			27,976		Complete

TABLE III. B-1. (Sheet 3 of 3)

Alteration		FMP Est. ($)	NAVSHIP Est. ($)	SUPSHIP Est. ($)	Actual Cost ($)	Remarks
ATF-27	Install Permanent Depth Gauge			882		Complete
ATF-64	Install Strip Heaters in Topside Motors			3,909		Complete
AER-ATF-71	Modify Fuel Oil Service System Piping					Complete; estimate included in S/A ATF-213D
AER-ATF-75	Install Cutout Valve in Boiler Fuel Supply Line					Complete; estimate included in boiler replacement job.
AER-ATF-85	Install Waste Heat Evaporators			65,911		Partial; "Hagevap" installation required.
AER-ATF-89	Install Remote Start-Stop Stations for Fire Pumps			613		Complete
AER-ATF-97	Relocate Fresh Water Pumps			3,366		Complete
AER-ATF-102	Crews Clothing Lockers			3,150		Partial; lockers ordered for ship's force installation.

4. TYCOM Repair Package — USS MOLALA (ATF-106)

		No.	Pct.
1.	Total Automated Work Requests	0	
2.	Total Work Requests Screened	426	
	a. Number of Work Requests Deferred	23	5.4
	b. Number of Work Requests Disapproved	31	7.3
	c. Number of Work Requests Duplicated, etc.	27	6.3
	d. Number of Work Requests Approved	345	81.0
	TOTAL	426	100.0
3.	Total Work Requests Approved	345	
	a. Number Work Requests Screened: Priority One (1)	14	4.1
	b. Number Work Requests Screened: Priority Two (2)	91	26.4
	c. Number Work Requests Screened: Priority Three (3)	195	56.5
	d. Number Work Requests Screened: Priority Four (4)	38	11.0
	e. Number Work Requests Screened: Priority Five (5)	6	1.7
	f. Number Work Requests Screened: Priority Six (6)	1	0.3
	TOTAL	345	100.0
4.	Number of Approved Work Requests by Type Work	345	
	a. Repair (including Remove, Replace, Manufacture, Drydock, POT/I, and Calibrate)	309	89.7
	b. Ship Alteration	16	4.6
	c. TYCOM AER	8	2.3
	d. Habitability	6	1.7
	e. Routines	6	1.7
	TOTAL	345	100.0
5.	Number of Approved Work Requests Insurance Items: As insurance items were identified, the ship was advised to include them in the work package. Separate identity was not maintained.	NA	NA
6.	Number of Approved Work Requests Accomplished	NA	NA
7.	Number of Approved Work Requests Not Accomplished and Not Entered in CSMP	NA	NA

5. PERA Screening Summary, USS MOLALA (ATF-106)

1. Screening Action	PERA	TYCOM
a. Number of Work Requests Screened One (1)	164	See Comments
b. Number of Work Requests Screened Two (2)	62	
c. Number of Work Requests Screened Three (3)	119	
d. Number of Work Requests Screened Four (4)	0	
e. Number of Work Requests Screened Five (5)	0	
f. Number of Work Requests Screened Six (6)	0	
g. Number of Work Requests Screened Seven (7)	0	
h. Number of Work Requests Screened Eight (8)	23	
i. Number of Work Requests Screened Nine (9)	31	
j. Number of Work Requests Screened Zero (0) (*)	27	

2. Total Number Work Requests TYCOM Concurred: See Comments

3. Total Number Work Requests TYCOM Screened Otherwise: See Comments

4. See Comments % Agreement in Screening

5. Analysis of Screening Differences: See Comments

6. Comments/Recommendations:

Screening actions were reviewed with the overhaul manager prior to being finalized. No distinction was made between PERA and TYCOM screening actions. It can be generally stated that the overhaul manager concurred with the recommended screening.

(*) LEGEND: Screening Action (Appendix 17, OPNAV 43P2)

1. Shipyard accomplish
2. Tender or repair ship accomplish
3. Ship's force — (tender or repair ship/yard) assist
4. Accomplish as alteration equivalent to a repair
5. Ship to shop
6. Accomplish with modification
7. Yard open inspect — advise TYCOM — proceed with minimum repairs
8. Deferred
9. Disapproved
0. Other — specify in remarks

6. Narrative of Major Alteration Items

While accomplishing the approved shipalts, problems with design and late arrival of government furnished material during the MOLALA overhaul were encountered. These problems are discussed below.

a. S/A ATF-226K, P/A CHT. The drawings for this shipalt were provided by SUPSHIP 11. A major revision to the pollution abatement collecting and holding tank, relocation of the overboard discharge, occurred during the drydock period and disrupted the orderly progression of piping work throughout the ship. Twenty-one change orders were issued on this work item. The CHT system will be completed with accomplishment of shipalt ATF-263K.

b. S/A ATF-229K, P/A Tank Level Indicators. The drawings developed for this shipalt did not reflect all of the shipalt material. The blueprints were revised to indicate the installation of transmitters. The receivers for this shipalt did not arrive until approximately two months after completion of ROH.

c. S/A ATF-236K, Food Services; Line Modifications; and S/A ATF-237K, Crew Galley Mods. Late delivery of galley equipment was a major disruptive influence during the overhaul, despite early attempts to determine what equipment was to be provided and assurances that these items would arrive on schedule. Several months after ROH completion, some equipment had not yet been delivered, and the equipment received was often different from that indicated on the drawings. As a result, prefabricated items had to be modified to suit the supplied equipment. In addition, several items of galley equipment not required for the shipalt were supplied, adding to the confusion. The deep fat fryer firefighting system was omitted from the class drawings; accomplishment of S/A ATF-255K will add this feature. Twenty change orders were issued on these two jobs.

d. S/A ATF-213D, Replace Main Propulsion Engines and Diesel Generator Sets. Due to nonavailability of engines and generators, the auxiliary engine portion of this alteration was cancelled for all FY 74 ATF overhauls. Threatened late delivery of the replacement

main engines was one of the causes of a 13-day delay in the ROH start and several design changes occurred during the installation. Twenty change orders were issued on this job.

7. Narrative of Major Repair Items

The major repair items were:

a. Installation of a new boiler as a maintenance replacement item

b. Installation of a rebuilt and updated tow machine

c. Overhaul of the main propulsion generators and switchboard

d. Overhaul of the ship's service generators, engines, and switchboard.

In addition, most of the pumps, motors and controllers, all deck machinery, reefers, steering gear, and several electronic equipments were repaired. In general, these items progressed satisfactorily and presented no major problems during the overhaul.

The following is a listing of the major repair work items accomplished during the MOLALA overhaul.

Cost Range	Item	Estimated Cost
>$100K	Repair Main Propulsion Generators & Switchboards	$141,459
	Replace Tow Machinery	132,776
$50-100K	None	
$25-50K	Repair No. 2 and No. 3 S/S Gen. Engines	37,045
	Replace Boiler	28,029
	Temporary Services	27,162
	Replace Main Generator Cabling	26,375
	Hab. Mods in WR, CPO Quarters and Staterooms	25,049
$10-25K	Repair No. 1 S/S Generator Engine	23,283
	Topside and Underwater Preservation	21,480
	Repair Steering Gear	18,194
	Rudder and Propeller Repairs	16,475
	FO Manifolds, Suction and Sluice Valve Repairs	16,000

AD-A054 502 ARINC RESEARCH CORP HONOLULU HI F/G 13/10
ADVANCE OVERHAUL PLANNING FOR USS APACHE (ATF-67), USS COCOPA (--ETC(U)
OCT 74 N00140-73-D-0074
UNCLASSIFIED 1020-01-1-1303 NL

2 OF 2
AD A054502

END
DATE FILMED
6-78
DDC

Cost Range	Item	Estimated Cost
$10-25K (Cont)	Repair Seaplane Winch	$ 15,652
	Repair Sea Valves	14,635
	Reefer Repairs	14,364
	Dry Docking	14,054
	Replace Sanitary Drains	12,904
	Preserve Shaft Alley	12,629
	Repair Fire Flushing and Bilge Pumps	11,352
	Clean and Preserve 4 Freshwater Tanks	11,016
	Repair Anchor Windlass	10,906
	Total	$630,839
	Percent of total estimate for repair items:	38.5

8. Narrative of Material Condition Prior to ROH

Approximately 9 months prior to the ROH, the USS MOLALA underwent an RAV during which the main motors were completely overhauled. As a result, no work was required on this major item.

The ship was in above-average material condition for a 30-year-old vessel, three years out of overhaul. However, the main propulsion engines were obsolete and difficult to maintain and replacement was definitely warranted. The ship's service generators and engines, main propulsion generators, and all switchboards were in need of overhaul. Also, most of the auxiliary pumps, reefers, steering gear, purifiers, and deck machinery required an overhaul to ensure three more years of service.

Mission-degrading INSURV items included:

a. Absence of twinned-agent fire protection system in the machinery spaces

b. Inoperative or degraded-surface search radar and communication equipment

c. Nonaccomplished electronics shipalts

d. No pollution abatement shipalts completed

e. Ship did not meet current habitability standards and, in addition, had a great deal of combustible sheathing and carpeting aboard.

9. Narrative of Postoverhaul Material Condition

With the exception of replacing aluminum deck plates, the items listed in Table III. C-1 as defined and deferred during the ROH were deferred at the tradeoff conference due to lack of funds and their low ranking on the ship's priority list. Their deferral has not reduced the MOLALA's ability to perform its mission. Replacement of aluminum deck plates became a requirement during the overhaul; however, material was not available and the work item was deferred.

During the ROH, the problems mentioned in Section B. 8 were corrected. Four new engines, new main propulsion compressors, new evaporators, and a new boiler were installed. A rebuilt, modernized tow machine and a rebuilt gun mount were installed. Environmental protection capability and habitability levels were raised considerably. The MOLALA received a thorough overhaul and should be able to operate until its next overhaul with a minimum of outside assistance.

Due to the age of the ship, ship's force will have to maintain a program of replacing steam and drain piping, and power distribution cabling. Also, extensive fire-main piping replacement will be required during the next ROH. Finally, as will be discussed under "Recommendations", the electrical power generating plant needs to be upgraded.

C. LONG-RANGE MAINTENANCE REQUIREMENTS

An essential element of overhaul maintenance planning is assuring continuity from one overhaul to the next. An influential factor in this continuity is the Long-Range Maintenance Plan (LRMP). Using the completion date of the MOLALA overhaul as a starting point, together with the records of that overhaul, PERA prepared a plan identifying long-range maintenance requirements for the MOLALA. This plan addresses the period between overhauls, and specifies major maintenance requirements that should be targeted for accomplishment during the next overhaul.

Together with the LRMP, a second group of work, that deferred during the overhaul, was identified and provided to the ship for inclusion in and updating of the Current Ships Maintenance Project (CSMP). The LRMP does not discuss the work entered into the CSMP, although planning for and accomplishment of that work is an integral part of the long-range maintenance planning.

Probably the most important part of long-range maintenance planning is the ship's force scheduling and accomplishment of 3M Planned Maintenance Subsystem (PMS) requirements. If ship's force pursues this program thoroughly and conscientiously, maintenance problem areas can be identified promptly and corrected before major deficiencies develop.

The long-range maintenance requirements identified for MOLALA are shown in Table III.C-1. Section A of that table lists work defined during the recent overhaul. Ship's force and/or the overhaul manager (COMSERVPAC/ COMSERVGRU) should start now to plan and budget for its accomplishment. Section B is work recommended for accomplishment during the next overhaul that requires actions by the overhaul manager early in the ROH requirements planning phase. Long-lead-time material (LLTM) must be ordered, or preoverhaul testing and inspection has to be scheduled to firm up repair requirements. Section C is work that should be given high priority for accomplishment during the next overhaul. For most of this work, preoverhaul testing should not be required. Section D identifies PMS-related actions whose accomplishment during the period between overhauls is considered especially important in preparation for the next overhaul.

No attempt has been made to include programmed ship alterations into this plan. It is considered that these are adequately handled by existing programs under the FMP.

The work deferred had no impact on the overall quality of the MOLALA overhaul, or on the ability of MOLALA to perform its assigned tasks and missions.

TABLE III.C-1. DEFERRED WORK/LONG-RANGE MAINTENANCE ACTIONS – USS MOLALA (ATF-106)
(Sheet 1 of 2)

EIC	Description	Remarks	Est. Cost ($)*
	A. WORK DEFINED AND DEFERRED DURING 1973 OVERHAUL		
4100	Switchboard Splash Shields	Blueprints available; install during deployment RAV.	3,000
3301	2.5-kW Emergency Generator	Develop shipalt to replace with a larger, modern unit.	
A501	Deck Plates B-1, B-2	Aluminum deck plates must be replaced with steel long-lead-time material (LLTM). Replace as material becomes available. Complete at next ROH.	30,000
AD01	Water-Tight Doors	Repair/replace seven (7).	7,000
LK01	24" Searchlight	Repair.	2,500
TM05	Beach Gear Rollers	Repair seven (7).	4,000
	B. REPAIRS RECOMMENDED FOR NEXT ROH REQUIRING LLTM		
T801	Fire Main Piping and Valves	Inspect, repair, replace. Copper-nickel pipe required (LLTM).	30,000
	C. OTHER LONG-RANGE MAINTENANCE REQUIREMENTS		
310U	No. 1 Ship Service Diesel Engine	Replace turbo charger.	No. est.
310W	Ship Service Generator Mufflers	Inspect, repair three.	7,500
CC01	Main Motors	Inspect, repair two.	40,000
LJ00	Navigation Lights	Modify navigation lights to conform with 1972 international regulations. Shipalt being prepared.	No est.

*Values are PERA(CSS) estimates.

TABLE III.C-1. (Sheet 2 of 2)

EIC	Description	Remarks	Est. Cost ($)*
	D. PMS ITEMS (SHIP'S FORCE ACCOMPLISHMENT)		
1806	Salvage Equipment		
1807	Diving Equipment		
310U	Ship Service Diesel Generators		
4000	Electrical Safety Devices		
4400	Power Distribution Cabling	A program to replace power cable should be initiated.	
C000	Main Propulsion Diesel Engines Reduction Gears Main Propulsion Generators Main Propulsion Motors		
T100	Auxiliary Boiler/Steam Piping	S/F replace pipe.	
T500	Refrigeration System		
T800	Firemain Piping and Valves		
TA03	Bilge Drainage Piping, Valves, and Manifold	S/F replace pipe.	
TF00	Compressed Air Systems		
TK00	Evaporators		
TM00	Deck Machinery		

*Values are PERA(CSS) estimates.

D. RECOMMENDATIONS

1. For the Ship

It is recommended that MOLALA ship's force personnel take the following actions:

a. Maintain a vigorous program of replacing steam and drain piping, and power distribution cabling.

b. Ensure that the CSMP is up-to-date and accurately reflects the condition of the ship following overhaul. Deferred work items accomplished during the overhaul should have completed actions submitted. Work that was not completed should be reviewed and revised as necessary to reflect its status at the end of overhaul.

c. Follow-up and ensure receipt of updated record plans and documents that reflect the condition of the ship at the end of overhaul.

d. Take action as necessary to accomplish deferred work/long-range maintenance items as discussed in Section III.C.

2. For the Class

It is recommended that for the ATF-106 class ships, the type commander, with assistance from PERA and the ships, accomplish the following:

a. Plan for and accomplish a series of habitability studies and incorporate the results into future alteration and overhaul planning. The objective of this action is to update priority of accomplishment and obtain the necessary data to authorize early development of plans and ordering of material.

b. Review existing alterations to determine new equipment/material requirements and take action as needed to obtain these items, e.g., replacement of auxiliary S/S generator sets and air compressors.

c. Take follow-up actions as required to resolve electrical power availability/requirements for these ships, and provide for accomplishment of any modifications during the next overhaul.

The major problems of the ATF-106 class ships lie in the electrical power generating system. Shipalt ATF-213D called for replacement of

two Superior diesel generator sets. This was cancelled due to lack of new engines and generators and the uncertainty as to optimum installation. A revised shipalt is being prepared to replace the old engines. The No. 1 ship's service generator on the MOLALA, as well as on the COCOPA and CHOWANOC, is rated at 300 kW; however, the switchboard circuit breaker is only 200 kW. This should be the subject of a companion shipalt to that mentioned above.

Shipalt ATF-185K was intended to add two 30-kW motor generator (MG) sets to the one already installed. However, MOLALA, as well as COCOPA and CHOWANOC, have only two 30-kW MG sets and the shipalt status is listed as complete while other ships in the class have a total of three 30-kW MG sets. A third 30-kW MG set should be added on the ships without it. Also the ac distribution system should be altered to balance the load among the MG sets and standardize the class by removing the accumulation of 30 years of "jury rigs" and other changes.

The 2.5-kW emergency generator has been a Part I INSURV discrepancy on all ships of the class. In addition to being inadequate, the equipment is obsolete. A shipalt is required.

d. Analyze INSURV reports and request shipalts or AERs be prepared as required. Several Part I INSURV discrepancies have been noted on all ships of the class. Some examples are the 2.5-kW emergency generator; lack of machinery-space access trunks, thermopneumatic magazine sprinkler system, and switchboard splash shield; several magazine discrepancies, etc.

3. Standardized ROH Work Requests (Form 4790.2K)

It is recommended that the program to develop standardized ATF class work requests and overhaul specifications be actively pursued. ARINC Research is currently developing such a proposed standard work package under contract with COMSERVPAC. Experience gained on MOLALA was utilized on other ATF overhauls in FY-74.

4. For PERA(CSS)

It is recommended that PERA take the following actions with respect to advanced overhaul planning:

a. Revise the planning milestone tasks to incorporate the most recent procedures and techniques.

b. Analyze the reports and documents required to support overhaul planning, and issue appropriate specifications for their preparation and distribution.

c. Actively pursue relationships with various SUPSHIP organizations to develop better understanding of the PERA functions and the need for interchange of advance planning data.

d. Review the need for more active participation of PERA during the overhaul management phase.

e. Increase the emphasis on advance material definition and procurement for overhauls.

f. Select and task an organization to develop and maintain type commander AER-class drawings. One of the difficulties encountered in the planning process was obtaining drawings for the type commander's AER's. No activity is tasked to maintain class drawings for these alterations. This leads to delays and unnecessary expenditure of design funds.

g. Increase distribution of the Fleet Integrated Logistics Support (FILS) report, for example to the Naval Maintenance Management Field Office and Supply Operations Assistance Program teams.

E. EVALUATION/USEFULNESS

1. PERA Products to Ship/Industrial Activity

a. Ship Systems Definition and Index (SSDI). The SSDI was found very useful by the ship and enabled assembly of a comprehensive work package.

b. Integrated Work Package (IWP) Summary Reports. The IWP was utilized by the ship and the type commander as a record of screening action and as a tool in updating the CSMP.

c. Preoverhaul Test and Inspection (POT/I) Reports. The POT/I reports on deck machinery were of marginal use to the ship because of their poor quality. For future overhauls, the results expected from specific tests and inspections should be more clearly defined. The electronics POT/I was very beneficial as it identified not only industrial activity work items, but tender/DATC and ship's force work as well.

d. Tradeoff Analysis. A tradeoff analysis was prepared and provided to the overhaul manager prior to the tradeoff conference. This provided the overhaul manager with the data necessary to authorize the most effective overhaul work package.

e. FILS Report. The information provided by the FILS program was not utilized by the industrial activity.

2. Resource Effectiveness

Evaluation of resource effectiveness for the MOLALA overhaul planning requires consideration of four sources:

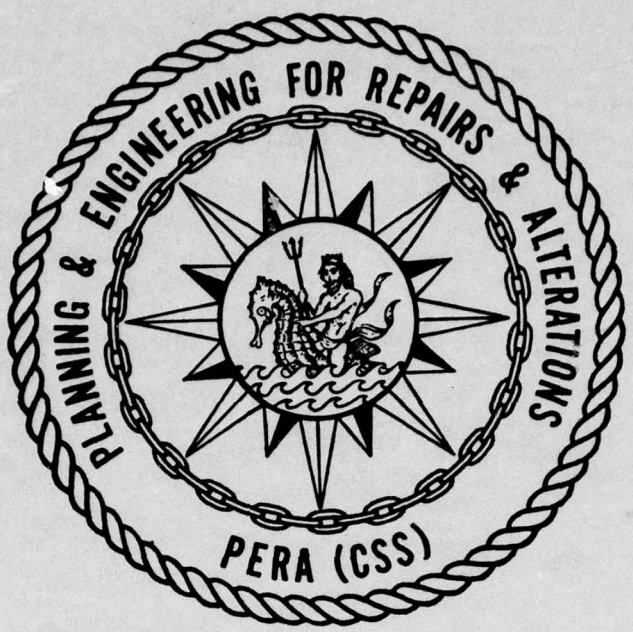
a. Ship's force
b. SUPSHIP
c. Overhaul manager
d. PERA

Although the ship's operating schedule hindered the submission of the work package, the ship diligently attacked the problem and assembled a

good package. The key shipboard personnel had been through overhauls in the past and realized what had to be done. It is felt that ship's force accomplished its work and monitored the shipyard work in an outstanding manner.

SUPSHIP 11 personnel were extremely cooperative in providing estimates and incorporating PERA suggestions into the job specifications. This had a significant impact on producing a successful ROH. However, due to the workload at SUPSHIP, several frustrating delays in resolving design problems occurring during the ROH.

PERA personnel, starting with less than the desired lead time for planning, screened the work package to SUPSHIP within their planning time frame. In the course of preoverhaul planning, PERA presented several completed tasks (including a screened work package, a POT/I plan, and a tradeoff analysis) to the overhaul manager for his concurrence. This effort removed a large burden from an already overloaded maintenance staff.



USS COCOPA (ATF-101)

POST OVERHAUL ANALYSIS REPORT

OVERHAUL DATES

6 November 1973 — 30 May 1974

USS COCOPA (ATF-101)

POST OVERHAUL ANALYSIS REPORT

Approved: _____

Date: _____

Distribution:

PERA(CSS)
COMSERVPAC
COMSERVGRU ONE
USS COCOPA (ATF-101)

Prepared by

ARINC RESEARCH CORPORATION
Ships and Ordnance Division
Honolulu Support Office

Contract N00140-73-D-0074-0010

Publication 1020-01-1-1303D

USS COCOPA (ATF-101)
POST OVERHAUL ANALYSIS REPORT

TABLE OF CONTENTS

I. GENERAL INFORMATION AND PREFACE

A. GENERAL INFORMATION

Ref: (a) Contract N00140-73-D-0074-0010.

(b) PERA(CSS) Milestone Charts, dated August 1972; forwarded by PERA(CSS) Letter, Ser. 1800-262, dated 4 May 1973.

B. PREFACE

The USS COCOPA (ATF-101) was overhauled from 6 November 1973 through 30 May 1974 under the direction of the Resident Supervisor of Shipbuilding (RESUPSHIP), Long Beach, CA. The overhaul was accomplished at the Harbor Boat Building Company, Long Beach.

In planning the overhaul of the COCOPA, PERA(CSS), acting as TYCOM and NAVSHIPS maintenance management agent, established advance planning milestones (References a and b) which commenced 10-1/2 months prior to the overhaul start date. The goal of the planning effort was to identify in advance any potential and existing problem areas, and to provide the detailed preoverhual guidance, planning, and coordination necessary to achieve a successful yard overhaul. The purpose of this report is to evaluate the management judgments and decisions associated with the planning effort.

II. MANAGEMENT SUMMARY

References a and b list the management milestones in planning the FY 1974 regular overhaul (ROH) of the USS COCOPA (ATF-101). Deviations from the milestones that affected the overhaul, and unanticipated factors that contributed to the final overhaul outcome, are discussed below.

A. AUTHORIZED VS. ACCOMPLISHED WORK

The repair portion of the COCOPA work package was essentially completed as authorized. Exceptions were the following: 1) The tank level indicators were not calibrated by the shipyard; 2) the navigation lights, though certified, required modification; 3) the newly installed side rollers will have to be relocated; and 4) extensive electrical work is still needed.

B. PLANNED VS. ACTUAL COMPLETION TIME

The overhaul start date was delayed five days to allow Long Beach contractors more time in San Diego for shipchecking the extensive package. The completion of overhaul was delayed 62 days due to generally slow progress during the overhaul; late delivery of contractor-furnished material for overhauling the main motors, and of certain items of government-furnished material; failure of the No. 3 main generator after reinstallation aboard ship; and design problems.

C. PLANNED VS. ACTUAL COMPLETION COSTS

The SUPSHIP departure report had not been released as of the preparation of this report, so a comparison of actual versus estimated costs for COCOPA overhaul cannot be presented herein. A supplement to this report will be prepared and forwarded after receipt of the departure report.

D. MAJOR CONFIGURATION CHANGES

The major configuration changes to the COCOPA involved replacing the main propulsion engines and accomplishing several pollution-abatement shipalts. Habitability was significantly upgraded. A modernized towing machine was installed. Communication capabilities were greatly enhanced.

E. FOLLOW-ON WORK REQUIRED

In addition to completing the items noted in paragraph A above and in the Long-Range Maintenance Plan, the development of several shipalts for modernizing the electrical power generating plant is required.

III. DETAILS OF OVERHAUL

A. PLANNING PROCESS

1. Ideal Vs. Actual Milestones

Advanced overhaul planning for the USS COCOPA commenced in January 1973. The overhaul planning procedures used for the COCOPA overhaul are defined in the COMSERVPAC Overhaul Planning Task Chart, Task Index, and Tasks, dated 15 September 1972; and the Combatant Support Ship Overhaul Advance Planning Milestones. These advance planning milestones provide for accomplishment of 53 tasks, of which 36 tasks are PERA action responsibility. The ideal target dates for these tasks range from start of overhaul minus 20 months (A-20), to completion of overhaul plus 2 months (C+2).

With the COCOPA overhaul scheduled to start 3 December 1973, ARINC Research commenced advance planning for the overhaul at about A-10-1/2 months. This made it necessary to compress the timeframe of the planning milestones and to combine some tasks. All required tasks were completed. Table III.A-1 shows the dates for the accomplishment of the principal milestones for COCOPA. The following paragraphs summarize the advance planning for the overhaul.

a. Advance Overhaul Planning. Overhaul planning was initiated by ARINC Research with a survey of the available maintenance history of the COCOPA as contained in the Current Ships Maintenance Program (CSMP) and the Maintenance and Material Management (3M) Program Material History Report. Programmed ship alterations and TYCOM alterations were reviewed, along with other pertinent maintenance history documents such as last overhaul records, departure reports, and casualty reports (CASREPs). An INSURV inspection was conducted in June and the report was used as reference in the screening of the work package.

At the time ARINC Research began its planning efforts, the COCOPA overhaul was scheduled to commence on 3 December 1973 at SUPSHIP 11. Subsequently the overhaul start date was advanced to 4 September, then delayed to 28 January 1974, then advanced

TABLE III.A-1. IDEAL VS. ACTUAL MILESTONES FOR ROH OF USS COCOPA (ATF-101)

Milestone	COMSERVPAC Target Date	Contract Target Date	Actual Start	Completion	Remarks
PERA Contract Start Date		1/18/73			
Obtain Historical Data; Review Alt Package	Immed.	Immed.	1/18/73	3/1/73	CSMP, 3M material history reports, shipalts, AERs, CASREPs.
Brief Ship on Overhaul Preparation	Prior to deployment	3/15/73		3/15/73	
Receive Work Package	Immed.	4/15/73	7/3/73	7/20/73	INSURV inspection conducted in mid-June.
NAVSHIPS Issue Tentative K-Alts; Task First-Time Alt Drawings	A-10	2/3/73		1/30/73	ROH dates 12/3/73 - 3/4/74 at time of issue.
Screen Work Package; Determine Known Work; Conduct Shipcheck	A-9 to A-6	4/15/73	7/3/73	8/3/73	Work package delivered to RESUPSHIP on 8/3/73.
Determine POT/I Requirements	A-6	6/28/73		4/21/73	ROH start date 1/28/74 at that time.
Conduct POT/I	A-6 to A-3	8/1/73	9/4/73	9/17/73	DATC performed POT/I. RESUPSHIP conducted several inspections.
NAVSHIPS Issue 180-Day Letter	A-6	5/1/73		8/20/73	ROH start date 11/1/73 at time of issue.
Conduct Work Definition Conference	A-2	9/1/73		9/26/73	
Perform Overhaul		11/1/73 -3/29/74	11/6/73	5/30/74	
Complete Final Report	C+2	7/30/74		8/15/74	

again to 1 November 1973. The responsible organization was changed to the Resident Supervisor of Shipbuilding, Long Beach. The overhaul duration was increased from three to five months, the interval being 1 November 1973 through 29 March 1974.

In March 1973, an ARINC Research representative briefed COCOPA personnel on overhaul planning procedures. Subsequently, while the ship was in port for an extended upkeep period, ARINC Research assisted ship's force in preparing for the INSURV inspection and in developing the overhaul work package. The entire work package, except for electronic repairs, was delivered by the ship to PERA(CSS) on 3 July 1973. The package was then shipchecked, screened, and delivered to RESUPSHIP on 3 August 1973, a month in advance of the requested date.

A review by PERA(CSS) of the INSURV report, the ship's work package, and the authorized K-alt list revealed that shipalts calling for the installation of type G and N cryptographic equipment had not been scheduled by NAVSHIPS for accomplishment. The type commander and COCOPA personnel were strongly in favor of these shipalts, and on 13 August COMSERVGRU ONE recommended that they be accomplished. The shipalts (S/A 211K for type G and 196K for type N crypto equipment) were authorized on 8 November 1973, shortly after the overhaul had begun.

A restricted availability for Preoverhaul Test and Inspection (POT/I) of the ship deck machinery was scheduled with the Development and Training Center (DATC), San Diego, for 4-17 September 1973. During this same period, RESUPSHIP conducted POT/I on navigation lights, electronics, main propulsion electrical equipment, and degaussing equipment; and manufacturer technical representatives inspected the tow machinery and gyro. The resulting reports were used by RESUPSHIP in developing work specifications for the overhaul.

RESUPSHIP planners and estimators conducted their shipcheck from 1-14 September. Estimates, but not specifications, were prepared in time for a 26 September work definition (tradeoff) conference.

b. Tradeoff Conference. The overhaul tradeoff conference on 26 September 1973 was attended by representatives of RESUPSHIP, USS COCOPA, COMSERVGRU ONE, PERA(CSS), and ARINC Research. At the conference, overhaul work in the amount of $1,499,450 was approved.

c. Overhaul Phase. For the shipyard portion of the overhaul, the Harbor Boat Building Company of Long Beach was the low bidder at $1,150,555. Because this bid was less than expected, five work items that had been deferred at the tradeoff conference were authorized, at an anticipated cost of about $15,000.

The shipyard work remained continuously behind schedule from the start of overhaul phase, and by mid-January the work accomplished was 13% below the goal. COMSERVGRU ONE requested PERA(CSS) to provide a representative full-time for two months in Long Beach to assist the ship and provide liaison between RESUPSHIP and COMSERVGRU ONE. This representative made daily contact with ship's force personnel, government inspectors, RESUPSHIP, and COMSERVGRU ONE. He monitored the progress of work, helped to expedite solutions to problems, made recommendations to COMSERVGRU ONE as to what action to take on proposed change orders, monitored GFM delivery, and attended the weekly progress meetings.

d. Postoverhaul Phase. ARINC Research Corporation's responsibilities following completion of the overhaul were to analyze the overhaul records and prepare a final report.

2. Impact of Planning Milestone Slippages

Actions or occurrences impacting on the overhaul schedule are discussed below.

a. Shipalt Drawings. The advance overhaul planning milestones call for early identification of alterations to be accomplished during the overhaul and early authorization to develop shipalt drawings. The NAVSHIPS K-alt authorization message was issued early enough to

permit an adequate design effort. However, when the overhaul start was delayed to 28 January 1974, SUPSHIP 11 decided, because of a design overload situation and the problems inherent in carrying funds into a new fiscal year, to wait until July 1973 to begin developing working drawings for COCOPA. Subsequently, when the overhaul location was shifted to RESUPSHIP and the start date moved forward by three months, there was no time to develop these drawings. With the exception of S/A ATF 226K (Sewage CHT) and a few other isolated cases, working drawings had not been developed for the COCOPA. RESUPSHIP requested a delay in the overhaul start to provide their required design effort, but this was denied. The overhaul contract was let utilizing MOLALA (ATF-106) blueprints. This caused several major problems during the overhaul.

b. 180-Day Letter. Delayed receipt of the NAVSHIPS 180-day letter, together with the change in overhaul location, resulted in late ordering and delivery of GFM.

c. Late Authorization of Shipalts. Late authorization of shipalts 196K and 211K (type N and G cryptos) resulted in a substantial amount of new work being approved well after the overhaul had started. When the alterations were authorized, Long Beach Naval Shipyard began developing the required prints. The final work specifications were issued 14 January 1974. Seven new work items with a total price of $32,696 were issued.

d. Late Availability of Specifications. The fact that only estimates and not specifications were available for the work definition conference severely hindered ARINC Research in conducting the work-item tradeoff analysis. A review of the estimates indicated that in several cases the intent of the work request had not been carried out. Conversations were conducted with individual estimators in lieu of a review of the specifications. Specifications were not available to the overhaul manager, the ship, or ARINC Research until after the invitation for bid was issued. This made review of the specifications, and any desired changes of the specification articles, difficult and in some cases impossible.

3. Recommendations

As a result of the review of the planning process for the COCOPA overhaul, ARINC Research recommends that efforts be directed toward:

a. Ensuring that the development of ship alteration drawings and the ordering of material progresses according to the PERA(CSS) milestones.

b. Reviewing the FMP to ensure that all required shipalts are programmed.

c. Developing both estimates and specifications early enough to support the overhaul tradeoff conference.

d. Increasing PERA(CSS) participation in the overhaul management phase.

e. Minimizing changes in overhaul location and start date.

B. WORK PACKAGE

1. Summary Sheet
2. Cost Summary Sheet
3. Alteration Summary Sheet
4. TYCOM Repair Package
5. PERA Screening Summary
6. Narrative of Major Alteration Items
7. Narrative of Major Repair Items
8. Narrative of Material Condition Prior to Overhaul
9. Narrative of Material Condition After Overhaul

1. Summary Sheet – USS COCOPA (ATF-101)

Scheduled Start Date: 1 Nov 73 Scheduled Completion Date: 29 Mar 74

Actual Start Date:* 6 Nov 73 Actual Completion Date: 30 May 74

Overhaul Extended:** 62 days

*Overhaul start date delayed to allow contractors more time to inspect ship.

**Overhaul extended due to relatively slow progress during the overhaul, major problems in the overhaul of main generators and motors, late delivery of GFM, and design problems.

SIGNIFICANT CAPABILITY CHANGES:

a. The COCOPA received four new Caterpillar D-399 main propulsion engines during the overhaul. In a companion alteration, waste heat evaporators replaced the existing solo-shell type.

b. A rebuilt and modernized A.A. Johnson Series 222 tow machine was installed.

c. An AFFF/PKP firefighting system was installed in the machinery spaces.

d. Several pollution abatement shipalts were accomplished, including a partial CHT system, installation of tank level indicators, a bilge flooding alarm circuit, and a bilge water discharge riser.

e. Several habitability shipalts (both title D and K) were accomplished, including galley, food service, and mess-deck modernization. All sanitary spaces were refurbished.

f. A secure voice system and type G and N teletypes were installed.

2. Cost Summary Sheet — USS COCOPA (ATF-101)

a. Summary of Overhaul Costs

		K-Alt	Repair
1)	Budget	$366,575	$1,618,000
2)	Estimated Cost	271,542	1,299,516*
3)	Bid Price	230,226	920,329
4)	Total Cost	Not Available	Not Available
5)	Growth Cost	Not Available	Not Available
6)	Percent Growth	Not Available	Not Available

*Includes $171,675 design and GFM estimate.

b. Estimated Overhaul Costs by EIC Category

EIC		Est. Cost ($)		Pct. Total Cost		Pct. Growth	
System	Subsys.	System	Subsys.	System	Subsys.	System	Subsys.
1000		115,631		7.0		(Not Available)	
	1A00		4,416		0.3		
	1B00		77,556		4.7		
	1C00		2,925		0.2		
	1600		5,486		0.3		
	1700		25,248		1.5		
3000		29,270		1.8			
	3100		29,270		1.8		
4000		54,106		3.3			
	4100		16,328		1.0		
	4300		17,532		1.1		
	4400		6,684		0.4		
	4700		13,562		0.8		
A000		120,200		7.2			
	AB00		9,005		0.5		
	AC00		8,382		0.5		
	A000		12,926		0.8		
	A100		15,800		0.9		
	A500		5,227		0.3		

b. (Continued)

EIC		Est. Cost ($)		Pct. Total Cost		Pct. Growth	
System	Subsys.	System	Subsys.	System	Subsys.	System	Subsys.
	A600		2,554		0.2		
	A700		2,944		0.2		
	A900		63,362		3.8		
C000		433,169		25.9			
	CB00		230,600		13.9		
	C100		157,167		9.4		
	C400		27,222		1.6		
	C600		7,338		0.4		
	C700		5,386		0.3		
	C800		5,456		0.3		
L000		25,484		1.5			
	LB00		4,504		0.3		
	LH00		5,880		0.3		
	LJ00		15,100		0.9		
M000		53,307		3.2			
	M500		52,247		3.1		
	M600		1,060		0.1		
N000		338		—			
	N400		338		—		
Q000		77,713		4.7			
	Q100		24,642		1.5		
	Q300		8,054		0.5		
	QF00		6,411		0.4		
	QO00		38,606		2.3		
R000		1,127		0.1			
	R500		1,127		0.1		
T000		581,479		34.9			
	TA00		6,423		0.4		
	TB00		4,790		0.3		

b. (Continued)

EIC		Est. Cost ($)		Pct. Total Cost		Pct. Growth	
System	Subsys.	System	Subsys.	System	Subsys.	System	Subsys.
	TC00		1,860		0.1		
	TD00		6,212		0.4		
	TF00		19,259		1.1		
	TK00		62,578		3.8		
	TL00		48,495		2.9		
	TM00		201,653		12.1		
	T100		29,157		1.7		
	T300		12,939		0.8		
	T400		15,411		0.9		
	T500		8,805		0.5		
	T700		71,145		4.3		
	T800		64,961		3.9		
	T900		27,791		1.7		
U000		172,798		10.4			
	UA00		28,800		1.7		
	UB00		6,850		0.4		
	UF00		59,295		3.6		
	UG00		2,500		0.1		
	UH00		5,000		0.3		
	UJ00		9,955		0.6		
	U500		1,428		0.1		
	U700		35,828		2.2		
	U800		23,142		1.4		
TOTAL		$1,664,622*					

*This total differs from the summary sheet total because estimates for new work, as well as late estimates, are included.

c. Cost Avoidance Summary. Screening Actions – For the COCOPA overhaul, 411 work requests were received from the ship and screened by PERA. Of this total, approximately 32 percent were screened as deferred, duplicated, disapproved, etc., as a result of shipchecks, discussions with ship personnel, and analysis of the work requested. This represents a substantial cost avoidance to the type commander as well as a considerably lightened workload for the overhauling activity and overhaul manager.

During the screening process, a large number of work requests were screened for intermediate maintenance activity (IMA) or ship's force accomplishment. This allowed funding for work requests that a shipyard can best accomplish.

3. Alteration Summary Sheet

The alteration summary sheet for the USS COCOPA is shown in Table III. B-1.

TABLE III. B-1. ALTERATION SUMMARY SHEET – USS COCOPA (ATF-101) (Sheet 1 of 3)

Alteration		FMP Est ($)	NAVSHIP Est ($)	SUPSHIP Est ($)	Actual Cost ($)	Remarks
ATF-205K	Install UHF/VHF Secure Voice (Partial to Complete)	15,805	12,945	6,411		Complete
ATF-216K	Install Mach Space AFFF/PKP Fire Fighting System	87,200	71,417	27,791		Complete
ATF-226K	P/A Sewage CHT (Partial System)	150,093*	85,994	44,112		Complete. S/A ATF-263K will complete installation.
ATF-227K	P/A Install Bilge Water Discharge Riser	10,573	8,659	6,423		Complete
ATF-229K	P/A Install Fuel Tank Level Indicating Sys	78,698	64,453	60,810		Partial. Minor mods required. Calibration required.
ATF-232K	Install Bilge Flooding Alarm Circuit FD	2,071	1,697	9,009		Complete
ATF-236K	H/I Food Service	21,037	17,230	9,223		Complete
ATF-237K	H/I Galley Mods	47,306	38,743	51,994		Partial. S/A ATF-255K will complete.
ATF-243K	H/I Sanitary Space Vent & Sheathing	54,282	44,457	42,597		Complete
ATF-244K	H/I Relocate Hot Water Heater	14,061	11,516	4,790		Complete

*FMP estimate based on complete installation.

TABLE III. B-1. (Sheet 2 of 3)

Alteration		FMP Est ($)	NAVSHIP Est ($)	SUPSHIP Est ($)	Actual Cost ($)	Remarks
ATF-181D	26" MWB Safety Slings			3,193		Complete
ATF-209D	Install Wind Indicating System			5,880		Complete
ATF-213D	Replace Main & Auxiliary Engines			157,167		Partial. Main engines replaced. Auxiliary engines to be subject of revised shipalt.
ATF-217D	Install Ac Shore Power Connection (Partial to Complete)			17,532		Complete. Estimate and actual cost include additional job to balance ac power load.
ATF-246D	H/I Replace Sanitary Space Fixtures			19,057		Complete
ATF-256D	H/I Crews Mess Rearrangement			16,339		Complete
AER ATF-75	Install Cutout Valve in Boiler Fuel Supply Line					Complete. Estimate included in boiler replacement job.
AER ATF-84	Improve Salvage Capability			12,926		Partial. Side rollers must be relocated.
AER ATF-85	Install Waste Heat Evaporators			57,141*		Complete.
AER ATF-95	Install CPO A/C Unit			15,411		Complete
AER ATF-94	Install Task Light Dimmer Switch					Complete. Estimate included in navigation light repair job.

*Estimate includes GFM purchased by SUPSHIP 11.

TABLE III. B-1. (Sheet 3 of 3)

	Alteration	FMP Est ($)	NAVSHIP Est ($)	SUPSHIP Est ($)	Actual Cost ($)	Remarks
AER ATF-89	Install Remote Start-Stop Stations for Fire Pumps			2,185		Complete
ATF-165D	Modify Boiler Air Casing					Complete. Estimate included in boiler replacement job.
AER ATF-102	Crew's Clothing Lockers			2,925		Partial. Lockers ordered for ship's force installation.
ATF-196K	Type N Crypto			24,642		Both shipalts completed utilizing type commanders funds. To assist ship's force as necessary.
ATF-211K	Type G Crypto					

4. TYCOM Repair Package – USS COCOPA (ATF-101)

		No.	Pct.
1.	Total Automated Work Requests	0	
2.	Total Work Requests Screened	411	
	a. Number of Work Requests Deferred	29	7.1
	b. Number of Work Requests Disapproved	52	12.6
	c. Number of Work Requests Duplicated, *etc.*	49	11.9
	d. Number of Work Requests Approved	281	68.4
	TOTAL	411	100.0
3.	Total Work Requests Approved	281	
	a. Number Work Requests Screened: Priority One (1)	17	6.0
	b. Number Work Requests Screened: Priority Two (2)	92	32.7
	c. Number Work Requests Screened: Priority Three (3)	139	49.5
	d. Number Work Requests Screened: Priority Four (4)	28	10.0
	e. Number Work Requests Screened: Priority Five (5)	5	1.8
	f. Number Work Requests Screened: Priority Six (6)	0	0
	TOTAL	281	100.0
4.	Number of Approved Work Requests by Type Work	281	
	a. Repair (including Remove, Replace, Manufacture, Drydock, POT/I, and Calibrate)	244	86.8
	b. Ship Alteration	8	2.9
	c. TYCOM AER	11	3.9
	d. Habitability	10	3.6
	e. Routines	8	2.8
	TOTAL	281	100.0
5.	Number of Approved Work Requests Insurance Items: As insurance items were identified, the ship was advised to include them in the work package. Separate identity was not maintained.	NA	NA
6.	Number of Approved Work Requests Accomplished	NA	NA
7.	Number of Approved Work Requests Not Accomplished and Not Entered in CSMP	NA	NA

5. PERA Screening Summary, USS COCOPA (ATF-101)

1. Screening Action	PERA	TYCOM
a. Number of Work Requests Screened One (1)	116	See Comments
b. Number of Work Requests Screened Two (2)	58	
c. Number of Work Requests Screened Three (3)	107	
d. Number of Work Requests Screened Four (4)	0	
e. Number of Work Requests Screened Five (5)	0	
f. Number of Work Requests Screened Six (6)	0	
g. Number of Work Requests Screened Seven (7)	29	
h. Number of Work Requests Screened Eight (8)	52	
i. Number of Work Requests Screened Nine (9)	49	
j. Number of Work Requests Screened Zero (0) (*)		

2. Total Number Work Requests TYCOM Concurred: See Comments

3. Total Number Work Requests TYCOM Screened Otherwise: See Comments

4. See Comments % Agreement in Screening

5. Analysis of Screening Differences: See Comments

6. Comments/Recommendations:

Screening actions were reviewed with the overhaul manager prior to being finalized. No distinction was made between PERA and TYCOM screening actions. *It can be generally stated that the overhaul manager* concurred with the recommended screening.

(*) LEGEND: Screening Action (Appendix 17, OPNAV 43P2)

1. Shipyard accomplish
2. Tender or repair ship accomplish
3. Ship's force — (tender or repair ship/yard) assist
4. Accomplish as alteration equivalent to a repair
5. Ship to shop
6. Accomplish with modification
7. Yard open inspect — advise TYCOM — proceed with minimum repairs
8. Deferred
9. Disapproved
0. Other — specify in remarks

6. Narrative of Major Alteration Items

Inadequate design drawings and late delivery of government furnished material were the primary problems associated with the accomplishment of shipalts for the COCOPA. Shipalts in which major difficulties were experienced are discussed below.

a. S/A ATF-215K, AFFF/PKP. After the new AFFF/PKP fire-fighting system was installed on the ship, it was discovered that the locations of the fire stations were not in compliance with the shipalt brief. The necessary modifications were made just prior to the end of the overhaul.

b. S/A ATF-226K, P/A CHT. Nine change orders were issued to correct drawing problems associated with the installation of the pollution-abatement collecting and holding tank. Accomplishment of shipalt ATF-263K will complete the installation.

c. S/A ATF-229K, P/A Tank Level Indicators. The receivers for the pollution-abatement tank level indicators arrived too late in the overhaul to be calibrated by manufacturer personnel. A technical representative of the manufacturer was summoned and gave ship's force one day's instruction in calibration. Ship's force will be required to calibrate all receivers, and should receive outside technical assistance for that task.

d. S/A ATF-236K, Food Service Line Modifications; and S/A ATF-273K, Crew Galley Mods. Drawings for the ATF-106 (MOLALA) were used for these shipalts. Many design problems resulted, which took a substantial amount of time to resolve. Thirty-two change orders were required to solve problems relating to the inadequate drawings. GFM was delivered late, and specific items were often different than that specified on the drawings. Several excess items of galley equipment were provided, adding to the confusion.

e. S/A ATF-213D, Replace Main Propulsion Engines and Diesel Generator Sets. Due to the present scarcity of engines and generators, and uncertainty as to the optimum means of installing

them, the auxiliary engine portion of this shipalt was cancelled for all FY 74 ATF overhauls. For the main-engine replacement, the contractor experienced considerable trouble locating some items of contractor-furnished material. Drawing inadequacies led to the issuance of 21 change orders.

f. S/A ATF-217D, Install Ac Shore Power Connection. This shipalt was not a first-time alteration, and was authorized for accomplishment by COMSERVPAC in January 1973. At the work definition conference, this shipalt and a related work item, to balance the ac power load, were approved. These jobs were not issued to the contractor until 8 January 1974, two months after start of overhaul. This was one of the few work items for which suitable drawings were developed for the overhaul.

g. AER ATF-84, Improve Salvage Capability. After the overhaul was completed, it was noted that several discrepancies existing in the installation required correction. The wrong type (in fact, an unusable) pad had been welded on the "H" bitt. The contractor was directed to manufacture the right type and forward it to the ship. Additionally, the new side rollers were mounted such that it is difficult to use them with the warping capstan. Proper drawings are available and the installation must be modified.

7. Narrative of Major Repair Items

The COCOPA overhaul continuously lagged behind schedule in all work areas. From the beginning of the overhaul, the work fell behind schedule an average of 2% per week.

The RESUPSHIP specifications required submission of reports of conditions found. In mid-January, it was discovered that several of these reports were up to six weeks delinquent. It was suspected that work was not progressing satisfactorily on subcontracted work items, and this was subsequently confirmed by the late return of generators, motors, pumps, engines, electronic equipment and other items.

Repair items causing the most serious problems in the COCOPA overhaul are summarized below.

a. Main Propulsion Switchboard. In response to an "as-found" report from the contractor, the wrong type of conduit was specified for use in rewiring the switchboard. The wire heated up during testing, and the board had to be rewired.

b. Main Propulsion Equipment. Rewinding of the armatures of the main propulsion motors was the time-controlling factor in this job because of delays in obtaining the copper wire. The main propulsion equipment was not returned to the shipyard until the original overhaul completion date had almost expired. Further, the No. 3 main generator failed under load aboard the ship after having been rewound. These problems with the main propulsion equipment were the major causes for extension of the overhaul until 30 May.

c. Service Generators. All three ship service generators experienced failures of various magnitude while undergoing load tests. For example, the pedestal bearing was wiped in the No. 1 generator.

d. Motors and Controllers. In general, ship motors and controllers were returned to the ship at least a month late. A review of the required reports indicated that the subcontractors were late in beginning the work.

e. Navigation Lights. The navigation lights were repaired in accordance with the POT/I report and were certified. However, accomplishment of AER ATF-101 (Saf-T-Climb) will nullify this certification. In addition, the dual task-light arrangement is unsatisfactory.

f. Electronics. Work on electronic repairs and shipalts progressed slowly throughout the overhaul, a situation compounded by the late authorization of the two crypto shipalts.

g. IC Switchboard. Repairs to the IC switchboard presented a major problem. The prints used to rewire the board did not reflect the 30 years of changes aboard COCOPA. As on all ships of the class, the ac distribution system requires revision.

h. Air Compressors. At the overhaul conference, the COCOPA's main propulsion air compressors were assigned to DATC for repair. DATC could not complete the repairs in time to support light-off. A new work item was then approved for the shipyard contractor to provide new air compressors.

i. Power Distribution Cabling. During the overhaul, the contractor submitted several inspection discrepancy reports (IDRs) recommending wholesale renewal of the power distribution cabling. The estimate for performing this work was approximately $140,000. The cables were inspected by COMSERVGRU and ARINC Research personnel and core samples were taken. The bulk of the cabling was found to be adequate. Change orders were issued to correct major deficiencies noted.

j. Miscellaneous.

1) Test memorandums for the sea plane winch, warping capstan, and tow machine were incorrect and required major revision on a rush basis.

2) The ship was several weeks late in undocking, due to late delivery of contractor furnished material, inclement weather, and the extensive hull repairs required.

Following is a list of the major repair work accomplished during the COCOPA overhaul, grouped according to cost range.

Cost Range	Item	Estimated Cost
>$100K	Repair and rewind four main generators and two main motors	$230,600
	Replace tow machinery	152,136
>$50K-$100K	None	
>$25K-$50K	Temporary Services	33,832
	Topside preservation	33,515
	Firemain and valve repair and replacement	30,270
	Replace boiler	29,157
	Design services	28,800
	Habitability modifications in WR, CPO quarters, and CO's stateroom	25,248
>$10K-25K	Rudder repairs	22,090
	Repair steering gear	18,210
	Repair propeller and shaft	18,045
	Clean and preserve four fresh water tanks	18,033
	Preserve underwater hull	17,673
	Hull inspection	15,800
	Repair MP air piping and flasks	15,159
	Repair navigation lights	15,100
	Overhaul #3 auxiliary engine	14,890
	Overhaul three auxiliary generators	14,380
	Overhaul several vent motors	12,939
	Overhaul two fire bilge and salvage pumps	10,139
	Total	$756,016

8. Narrative of Material Condition Prior to Overhaul

The COCOPA was in average material condition for a ship of its class and due for an overhaul. The main propulsion engines were obsolete and difficult to maintain; their replacement was definitely warranted. According to the POT/I report, the main propulsion generators were all heavily oil-soaked, and the main propulsion motors had been thoroughly salted.

The main and ship's service switchboards required major overhaul. The ship service generators and No. 3 auxiliary engine required major rework. The Nos. 1 and 2 auxiliary engines had been recently overhauled and required only minor attention.

Most of the ship's pumps, motors, controllers, reefers, steering gear, purifiers, and deck machinery needed overhauling. The ship's boiler had many discrepancies and the tow machine required extensive modification. The electronics POT/I indicated that considerable work was required in that area.

Mission-degrading INSURV items included lack of a twinned-agent fire fighting system in the machinery spaces, and lack of a secure voice system.

Finally, COCOPA had no pollution abatement equipment; did not meet current habitability standards; and had a great deal of combustible sheathing and carpeting aboard.

9. Narrative of Material Condition After Overhaul

The problems noted in paragraph III. B. 8 were corrected during the overhaul. Installed were four engines, new MP (medium pressure) air compressors, new evaporators, a new boiler, and a rebuilt and modernized towing machine. Extensive repairs to electronic equipment were made. Environmental protection capability and habitability levels were raised considerably. Overall, COCOPA received a thorough overhaul and should be able to operate until its next overhaul with a minimum of outside assistance.

The problem now outstanding for ATF-96 class ships is the electrical power generating system. S/A ATF-213D called for the replacement of two Superior generator sets, in addition to the replacement of the main propulsion engines. The generator portion of the shipalt was cancelled due to nonavailability of new engines and generators, and uncertainty as to the optimum installation required. A revised shipalt is being prepared to replace existing generator set engines. Also needing corrective action is the generator circuit breaker. The No. 1 service generator on COCOPA, as well as on MOLALA and CHOWANOC, is rated at 300 kW but the switchboard circuit breaker on these ships is rated at only 200 kW. The breaker size should be corrected when the new engines are installed.

Shipalt ATF-185K called for the addition of two 30-kW motor-generator (MG) sets to the one already installed. However, COCOPA, as well as MOLALA and CHOWANOC, have only two 30-kW MG sets installed, and the shipalt status is listed as complete. Other ships in the class have three 30-kW MG sets, and a third should be installed in those ships that require it. Additionally, the ac distribution system should be modified to balance the load among the MG sets and to standardize the class by removing the accumulation of 30 years of "jury rigs" and other changes.

The 2.5-kW emergency generator has been a Part I INSURV discrepancy on all ships of the class. This equipment is both physically inadequate and obsolete. A corrective shipalt is required.

In addition to the problems with the electrical power generating system mentioned above, and due to the advanced age of the COCOPA, it is important that ship's force initiate and carry out a program to replace the power distribution cabling.

C. LONG RANGE MAINTENANCE REQUIREMENTS

An essential element of overhaul maintenance planning is assuring continuity from one overhaul to the next. An influential factor in attaining this continuity is the Long Range Maintenance Plan (LRMP). Using the completion date of the COCOPA overhaul as a starting point, and utilizing the records of that overhaul, PERA prepared a plan identifying long range maintenance requirements for the COCOPA. This plan addresses the period between overhauls, and specifies major maintenance requirements that should be targeted for accomplishment during the next overhaul.

Together with the LRMP, a second group of work (that deferred during the overhaul) was identified and the associated information was provided to the ship for inclusion in and updating of the Current Ships Maintenance Projects (CSMP). The LRMP does not discuss the work entered into the CSMP, although planning for and accomplishment of that work is an integral part of long-range maintenance planning.

Probably the most important aspect of long-range maintenance planning is ship's force scheduling and accomplishment of 3M Planned Maintenance Subsystem (PMS) requirements. If ship's force pursues this program thoroughly and conscientiously, maintenance problem areas can be identified promptly and corrected before major deficiencies develop.

The long-range maintenance requirements identified for COCOPA are shown in Table III.C-1. Section A of that table lists work defined and deferred during the recent overhaul. Ship's force and/or the overhaul manager (COMSERVPAC/COMSERVGRU) should start now to plan and budget for its accomplishment. Section B is work recommended for accomplishment during the next overhaul that requires actions by the overhaul manager early in the ROH requirements planning phase. Long-lead-time material must be ordered, or preoverhaul testing and inspection has to be scheduled to firm up repair requirements. Section C is work that should be given high priority for accomplishment during the next overhaul. For most of this work, preoverhaul testing should not be required. Section D identifies PMS-related actions whose accomplishment during the period between overhauls is considered especially important in preparation for the next overhaul.

No attempt has been made to include programmed ship alterations into this plan. It is considered that these are adequately handled by existing programs under the FMP.

The work deferred had no impact on the overall quality of the COCOPA overhaul, or on the ability of the ship to perform its assigned tasks and missions.

TABLE III.C-1. DEFERRED WORK/LONG-RANGE MAINTENANCE ACTIONS, USS COCOPA (ATF-101) (Sheet 1 of 2)

EIC	Description	Remarks	Est. Cost. ($)
	A. WORK DEFINED AND DEFERRED DURING 1973/74 ROH		
3300	Power Distribution Cabling	Ship's force must initiate a program to pull old cabling and replace many distribution cables. Some cable replacement will be required during the next ROH.	50,000
4701	2.5-kW Emergency Generator	Develop a shipalt to replace generator with a larger, modern unit.	
A100	Shell Plating	Extensive repairs conducted during this ROH; marginal areas deferred to next ROH.	30,000
	B. *REPAIRS RECOMMENDED FOR NEXT ROH REQUIRING LLTM*		
YC04	Boat Davits	Repair or replace.	
	C. OTHER LONG-RANGE MAINTENANCE REQUIREMENTS		
310U	Nos. 1 & 2 Ship Service Diesel Engines	Overhaul	40,000
310W	Ship Service Generator Mufflers	Inspect/repair three (3).	7,500
A501	Deck Plates B-1, B-2	Aluminum deck plates must be replaced with steel. Lower level B-1 complete. Ship's force has deck plate material on order.	
C805	Lube Oil Settling Tank	Replace coils.	
LJ00	Navigation Lights	Modify navigation lights to conform with 1972 international regulations. Shipalt being prepared. Present dual tasks light array is unsatisfactory.	

TABLE III. C-1. (Sheet 2 of 2)

EIC	Description	Remarks	Est. Cost ($)
		C. (Continued)	
T10A	Steam Heat Piping	Ship's force replace.	
TH00	Steam Supply and Drain Piping		
TM03	Anchor Chain	Replace six shots. Ship's force should order chain.	
		D. PMS ITEMS (SHIP'S FORCE ACCOMPLISHMENT)	
1806	Salvage Equipment		
1807	Diving Equipment		
310U	Ship Service Diesel Generators		
4000	Electrical Safety Devices		
4400	Power Distribution Cabling		
C000	Main Propulsion Diesel Engine, Reduction Gears, Generators, Motors		
T100	Auxiliary Boiler		
T500	Refrigeration System		
TF00	Compressed Air Systems		
TK00	Evaporators		
TM00	Deck Machinery Tow Machine		

D. RECOMMENDATIONS

1. For the Ship

It is recommended that ship's force personnel of the COCOPA take the following actions:

a. Maintain an active program of replacing steam and drain piping and power distribution cabling.

b. Ensure that the CSMP is up to date and accurately reflects the condition of the ship following overhaul. Completed action reports should be submitted for previously deferred work items accomplished during the overhaul. Work items not accomplished should be reviewed and revised as necessary to reflect their status at the end of the overhaul.

c. Follow-up on and ensure receipt of updated record plans and documents that reflect the condition of the ship at the end of overhaul.

d. Take action as necessary to accomplish deferred work/long range maintenance items, as discussed in Section III.C.

2. For the Class

It is recommended that for ATF-96 class ships, the type commander, with assistance from PERA and the ships, accomplish the following:

a. Plan for and accomplish a series of habitability studies and incorporate the results into future alteration and overhaul planning. The objective of this action is to update priority of accomplishment and obtain the necessary data to authorize early development of plans and ordering of material.

b. Review existing alterations to determine new equipment/material requirements and take action as needed to obtain these items, e.g., replacement of auxiliary ship-service generator sets and air compressors.

c. Take follow-up actions as required to resolve electrical power requirements and availability for these ships, and provide for accomplishment of any modifications during the next overhaul.

d. Analyze as required INSURV reports and requests that shipalts or AERs be prepared. Several Part I INSURV discrepancies have been noted on all ships of the class. Some examples are the obsolete 2.5 kW emergency generator; lack of machinery-space access trunks, a thermopneumatic magazine sprinker system, and a switchboard splash shield; several magazine discrepancies, etc.

3. Standardized ROH Work Requests (Form 4790.2K)

It is recommended that a program to develop standardized work requests and overhaul specifications for ATF class ships be actively pursued. ARINC Research is currently developing a standard-work package under contract with COMSERVPAC. Experience gained on COCOPA was utilized on other ATF overhauls in FY 74.

4. For PERA(CSS)

It is recommended that PERA take the following actions with respect to advance overhaul planning:

a. Revise the planning milestone tasks to incorporate the most recent procedures and techniques.

b. Analyze the reports and documents required to support overhaul planning, and issue appropriate specifications for their preparation and distribution.

c. Actively pursue relationships with various SUPSHIP organizations to develop better understanding of the PERA functions and the need for interchange of advance planning data.

d. Review the need for more active participation of PERA during the overhaul management phase.

e. Increase the emphasis on advance material definition and procurement for overhauls.

f. Select and task an organization to develop and maintain type commander AER-class drawings. One of the difficulties encountered in the planning process was obtaining drawings for the type commander's AERs. No activity is tasked to maintain class drawings

for these alterations. This situation leads to delays and unnecessary expenditure of design funds.

g. Increase distribution of the Fleet Integrated Logistics Support (FILS) report, for example to the Naval Material Management Field Office and Supply Operations Assistance Program teams.

E. EVALUATION/USEFULNESS

1. PERA Products to Ship/Industrial Activity

a. Ship Systems Definition and Index (SSDI). The SSDI was found very useful by ship's force, supporting them in assembling a comprehensive work package.

b. Integrated Work Package (IWP) Summary Report. The IWP was utilized by the ship and the type commander as a record of screening action and as a tool in updating the CSMP.

c. POT/I Plan. The POT/I reports on deck machinery were of marginal use to the ship because of their poor quality. For future overhauls, the results expected from specific tests and inspections should be better defined. The electronics POT/I was very beneficial, as it identified not only industrial activity work items but tender/DATC and ship's force work as well.

d. Tradeoff Analysis. Results of a tradeoff analysis were provided to the overhaul manager prior to the overhaul tradeoff conference, giving him the data necessary to authorize the most effective overhaul work package.

e. FILS Report. FILS program information was not utilized by the industrial activity.

2. Resource Effectiveness

a. Ship's Force. Ship's force personnel were hindered in preparing their work package by the late scheduling of the INSURV inspection. However they did generate an adequate package.

b. RESUPSHIP. RESUPSHIP was cooperative in providing estimates and making personnel available to discuss the unwritten specifications. During the overhaul, it became apparent that their workload prevented timely response and investigation of IDR's and design problems.

c. PERA(CSS). PERA(CSS) personnel screened the work package and presented it to RESUPSHIP approximately one month ahead of the requested date. PERA conducted several major tasks in behalf of the overhaul manager for his concurrence, including a screened work package, a POT/I plan, and a tradeoff analysis. This contribution, together with continuous liaison, permitted the overhaul manager to concentrate his efforts on the management of the overhaul.