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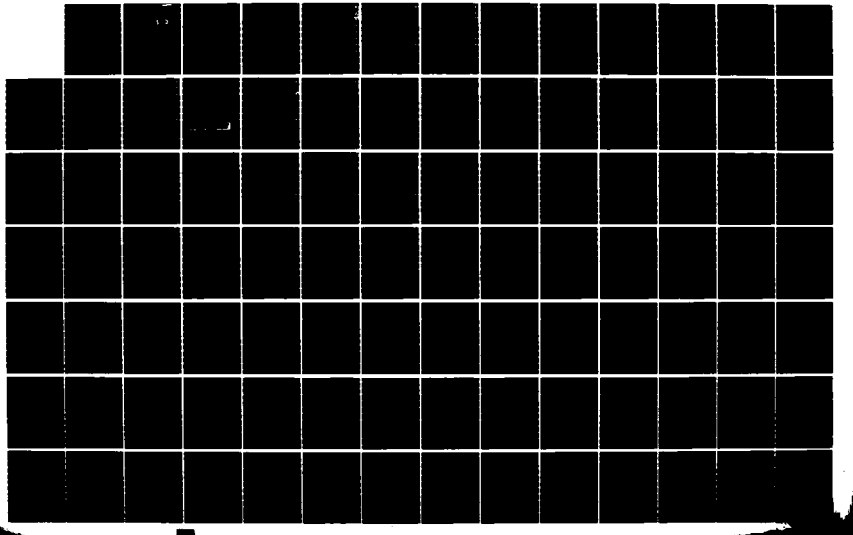

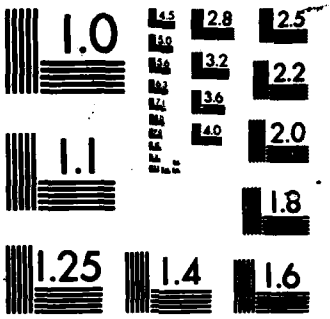


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# PROJECT COMPLETION REPORT
# FT LAUDERDALE CABLE FIELD



FPO-1-77(18)

JULY 77



OCEAN ENGINEERING AND CONSTRUCTION PROJECT OFFICE
CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
WASHINGTON, D.C. 20374

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The cable field maintained by the Naval Surface Weapons Center (NSWC) off Fort Lauderdale, FL was expanded and modified. The at-sea operations consisted of: 1) relocating the seaward ends of one inshore range cable and one (Con't)

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BLOCK 19 (Con't)
deep-water range cable; 2) laying three new 110,000-foot cables from the deep-water range to shore; 3) splicing from the seaward ends of five existing cable & lengthening them by up to 30,000 feet to extend out of the deep-water range.

CONTENTS

# I. EXECUTIVE SUMMARY

During the period from 24 April to 20 May 1977, the cable field maintained by the Naval Surface Weapons Center (NSWC) off Fort Lauderdale, Florida, was expanded and modified with the assistance of Chesapeake Division, Naval Facilities Engineering Command (CHESNAVFACENGCOM) and Underwater Construction Team One (UCT-1) of Construction Battalion Atlantic (CBLANT). CHESNAVFACENGCOM's participation in the project centered on the use of the Ocean Construction Platform SEACON. The at-sea operations consisted of: (1) relocating the seaward ends of one inshore range cable and one deep-water range cable; (2) laying three new 110,000-foot cables from the deep-water range to shore; and (3) splicing from the seaward ends of five existing cables and lengthening them by up to 30,000 feet to extend out of the deep-water range.

Responsibilities for the major phases of the project were divided between the three organizations in roughly the following manner. NSWC maintained overall operational control of the project. Technical control of the SEACON was the responsibility of CHESNAVFACENGCOM. Both organizations provided personnel, as necessary, to perform the functions aboard the SEACON during the at-sea operation, with UCT-1 filling the construction and crew billets.

Three vessels, the SEACON (260 feet), the RSB-1 (160 feet) and the UB-646 (45 feet), were assigned to the at-sea operations. A fourth vessel, the tug boat MOBY II, was leased as a standby support vessel when high currents developed, but was not used. The SEACON served as the primary cable-laying platform. Most of the cable retrieval, raising, lowering, and splicing operations were performed by the RSB-1. Cable ends were passed between the SEACON and RSB-1, using the UB-646. The SEACON would then either lay or recover cable with its deck-mounted winches, while maintaining course or station with its dynamic-positioning system.

Deviations from the event descriptions in the Project Execution Plan (Appendix A) and the NSWC Operation Plan (Appendix B) were primarily caused by high seas and currents which made at-sea operations either unsafe or impractical. Throughout the project, seas of 8 feet and Gulf Stream currents of 4 knots were encountered. Accordingly, the schedule for at-sea operations was revised continuously due to weather. To a lesser degree, the schedule was affected by the order in which the cables were loaded onto the SEACON. Approximately 465,000 feet of cable were loaded aboard the SEACON from six gondola railroad cars during the overall installation period. The maximum amount of cable loaded on the SEACON at any one time was 215,000 feet.

Delays due to weather were fully anticipated, and the actual completion date of at-sea operations of 20 May had been predicted. The average operating cost for the SEACON, excluding mobilization and demobilization expenditures, was $3,000/day. In total, the project included 10 at-sea events, during which 17,000 feet of cable were recovered and relaid, 3,000 feet of cable were recovered and 465,000 feet of new cable were laid.

## II. DEVIATIONS FROM THE PROJECT EXECUTION PLAN

### a. Schedule Modifications

Strong currents and heavy seas accounted for the loss of 10 work days within the at-sea timeframe, and the cancellation of two at-sea events. These cancelled events, the recovery of portions of cables #24 and #27 (see Appendix B, NSWC Operation Plan, events #2 and #3), were not central to the overall goal of range expansion and modification, and were only intended as initial training for the SEACON.

A log and schedule of operations are listed below.

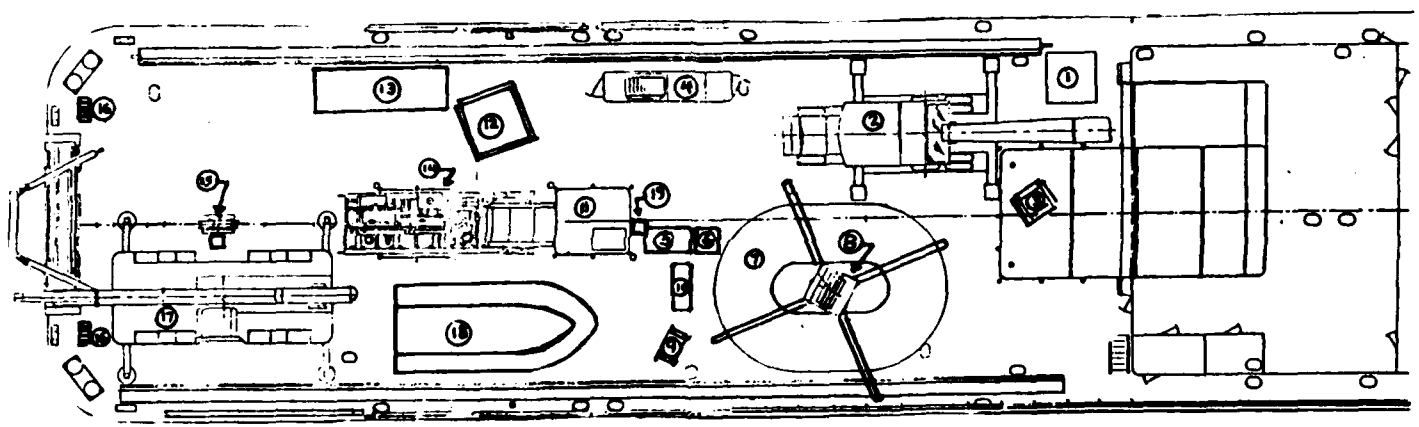
| | |
|---|---|
| 18 Feb - 23 Feb | SEACON under tow from Norfolk to Fort Lauderdale |
| 24 Feb - 13 Mar | SEACON at Tracor Marine Facility, Port Everglades, for cable-laying alterations. |
| 13 Mar - 18 Mar | UCT-1 advance party arrives and commences training. |
| 14 Mar - 17 Mar | SEACON moves to berth #4 of Port Everglades for cable loading; returns to Tracor Marine. |
| 11 Apr - 18 Apr | UCT-1 main party and additional CHESNAVFACENGCOM personnel commence training. |
| 18 Apr - 19 Apr | SEACON undergoes safety drills, sea drills, and training in cable handling; returns to berth #19. |
| 20 Apr | At-sea operations postponed due to winch failure. |
| 21 Apr - 23 Apr | At-sea operations postponed due to weather. |
| 24 Apr | Recover and relay cable #24 (event #4). |
| 25 Apr - 26 Apr | Lay cable #57 (event #6). |

| | |
|---|---|
| 27 Apr | Load cable for extensions on cables #40, #41, and #22 (in port). |
| 28 Apr | Extend cable #40 (event #10). |
| 29 Apr | At-sea operations postponed due to weather. |
| 30 Apr - 1 May | Load cable #58 (in port). |
| 2 May | Crew rest day. |
| 3 May - 4 May | At-sea operations postponed due to weather. |
| 5 May - 6 May | Lay cable #58 (event #7). |
| 6 May | Load cable #59 (in port). |
| 7 May - 8 May | Lay cable #59 (event #8) |
| 9 May | Extend cable #41 (event #9). |
| 10 May | Remove jockey wheel from deck cable crib and reposition over below-deck cable tank. |
| 11 May - 13 May | At-sea operations postponed due to weather |
| 14 May | Extend cable #45 (event #13). |
| 15 May | Extend cable #22 (event #11). |
| 16 May | Rest for RSB-1 crew. |
| 17 May | At-sea operations postponed due to weather. |
| 18 May | Reposition cable #38 (event #5). |
| 19 May - 20 May | Extend cable #42 (event #12) |
| 21 May - 11 Jun | SEACON at Tracor Marine for demobilization. |

b. Equipment Modifications

Figure 2-1 shows the after main deck of the SEACON as fitted for the at-sea operations. This sketch is in greater detail then that shown in

(1) NSWC Camera Sled
(2) P&H Crane
(3) Cross-Deck Winch (NSWC Provided)
(4) Deck Housing
(5) Power Source for (3)
(6) Power Source for (8)
(7) On-Deck Cable Crib
(8) Jockey Wheel
(9) Auxiliary Winch
(10) Power Source for (9)
(11) Hatch to Cable Storage Area
(12) CEL Coring Winch
(13) Power Source for (12)
(14) Pengo Winch
(15) Sherman & Reilly Stringing Block (w/tension, velocity & payout Monitors) & Gallows Support
(16) Air Tuggers
(17) Hydraulic Crane
(18) Zodiac
(19) Fairleading Sheave & Support Gallows



AFTER MAIN DECK OF SEACON AS FITTED FOR AT-SEA OPERATIONS

FIGURE 2-1

the Project Execution Plan (Appendix A), and a comparison of the two shows that several more winches were installed on the SEACON than were originally indicated. All six winches proved useful, either as cable-handling equipment or as backup units. The only alteration in the deck equipment occurred on 10 May when the jockey wheel was relocated over the deck cable tank and the on-deck cable crib was removed. Appendix D provides more information about the available equipment.

c. Operations Modifications

The cable-handling operations varied only slightly from the planned procedures. The SEACON did perform some cable retrieving, raising, and lowering functions in the shallow-water range. The NSWC - supplied TONGS system aboard the SEACON did not have the depth capability to allow the SEACON to perform these tasks in the deep-water range.

As strong currents persisted throughout the mission, NSWC leased the tugboat MOBY II as a standby support vessel. In the event of encountering currents and seas too strong for the cable-laying to proceed, the MOBY II was to pass a towline to the SEACON to provide additional power. This situation never arose and the MOBY II remained in a standby status.

During the laying of cables #57, #58, and #59, as the SEACON neared the beach, pleasure craft crossed the trackline despite warning and marker buoys. This situation was handled by launching the SEACON's Zodiac to patrol the trackline and warn off such craft. The Zodiac was kept ready for such problems, as was an RS-7 beacon for quick-drop in case a cable break occurred and the exact spot would have to be returned to.

## III. LESSONS LEARNED AND CONCLUSIONS

a. This project was the SEACON's first mission in high currents. In prior experience no currents above 2 knots had been encountered, and insufficient data existed for estimating the maximum current in which the SEACON could operate. A maximum operating current of 3.4 knots was predicted. During the at-sea operations the SEACON successfully functioned in currents of up to 4.0 knots. However, operating in such conditions left very little margin for maneuvering the vessel. The conclusion can be drawn that the SEACON is capable of performing cable-laying operations alone in the Gulf Stream in currents of up to 4 knots, but such operations demand the maximum extent of its abilities. Additional propulsion power is desirable for the SEACON to maneuver and lay cable in currents over 3 knots. A preliminary investigation and feasibility study for increasing the horsepower of the SEACON's aft engines are being undertaken.

b. The two-ship operation proved an excellent method of sharing the workload, and thereby making maximum use of the relatively small weather-window. However, the SEACON could have performed the operations alone wth additional personnel and a deep-water recovery system. In several instances, if the SEACON-installed TONGS system cable allowed for deep-water operation, the cable search phase conducted by the RSB-1 could have been significantly shortened. The dynamic-positioning of SEACON and its acoustic navigating system (RS-7) would allow for enlarged search patterns without the repositioning of anchors required for the RSB-1.

c. The multi-vessel operation allows for a division of tasks; but, since the vessels are interdependent, the boat which is least able to operate in seas and current becomes the weak link in the chain. The SEACON, being the largest vessel, could operate at times when the RSB-1 could not. On 17 May, the at-sea operations were postponed because the UB-646, a 45-foot launch, could not operate safely. Though the UB-646's function as messenger was important to the operation, its role filled only a few minutes of mission time, and then it served as a standby in case of emergency, such as man overboard. Abandoning a day's work due to the limitations of the UB-646 was an agonizing decision. In the future, plans for multi-vessel operations should include better alternatives.

d. During the period of at-sea operations, 10 work days were cancelled due to weather. The number of lost weather days, if scheduled during the optimum weather-window, could have been significantly reduced. However, other priority considerations dictated that the repair should be scheduled during the April-May timeframe, which coincides with a higher-than-usual current profile.

e. Throughout the at-sea operations, continuous and accurate determination of position was a crucial factor. For this reason, as much redundancy as possible in position determination is necessary. The Mini-Ranger system is an accurate, reliable means of determining position, but areas of poor or no reception invariably exists. On 24 April, several hours were spenthooking a cable bail because the bail was located in a blind spot, and position could not be accurately determined. Other than this incident, Mini-Ranger reception was satisfactory; but an improperly-designed power supply caused blown fuses in the Mini-Ranger throughout the mission. Therefore, a backup Mini-Ranger was always in readiness. To date, the SEACON has had good fortune with its Mini-Ranger system, but in the future, navigators should always have alternate means (e.g., LORAN-C) immediately available.

f. The jockey wheel system for leading cable to the Pengo winch worked very well. No problems whatsoever were encountered. A hawse pipe fairlead, which fastens directly to the hatch openings, was available

but never used for fairing cable out of the tanks. Fairing procedures used for this mission indicated that the hawse pipe fairlead would not work well with the present design of the tanks.

g. The cable tank and on-deck cable crib were not properly constructed, and the concentricity of inner and outer frames was not constant. This inconsistency necessitated the use of dunnage to smooth out the layers of cable, and required that the cable be paid out from the ~~inner~~ frame to the ~~outer~~. Modification of the tank is recommended.

h. The cable payout, tension, and velocity measurement system and associated readouts were not well designed for measuring cable tension, and an alternate scale had to be rigged for tension readings. As with position determination, backup instrumentation for measurement of cable parameters is essential. The cable parameter measurement system is being redesigned.

i. The SB cable has a breaking strength of 30,000 pounds, and the cable-laying usually proceeded with tensions of 10,000 pounds or less. Considering the currents encountered, laying cable of relatively low breaking strength (e.g., typical St. Croix range cable-breaking strength 4,000 pounds) would be extremely difficult.

j. Despite assurances from all concerned, an in-port pull test conducted on the Tracor Marine/NSWC-supplied cross deck winch showed that it did not perform to specification. Several modifications, including a new power pack, were required. All new equipment should be load-tested by the operating crew before proceeding to sea.

k. The temporary assignment of UCT personnel to engineering billets on the SEACON provided adequate maintenance/repair capability. Full time assignment of 4 to 6 additional military or civilian personnel to this function would better enhance that capability and also permit maintenance presently being backlogged for future accomplishment.

l. When the SEACON is operating out of its homeport, a telephone credit card should be available to permit official communications on a timely basis. Likewise, a Government credit card should be available to charge expenses for the pickup truck assigned to the SEACON.

# APPENDIX A

# PROJECT EXECUTION PLAN


# PROJECT EXECUTION PLAN FOR CAPTOR CABLE FIELD OPERATIONS OFF PORT EVERGLADES, FLORIDA

CHESNAVFACENGCOM OPORD 1-77
MARCH 1977

OCEAN FACILITIES ENGINEERING AND CONSTRUCTION PROJECT OFFICE
CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
WASHINGTON, D. C. 20374

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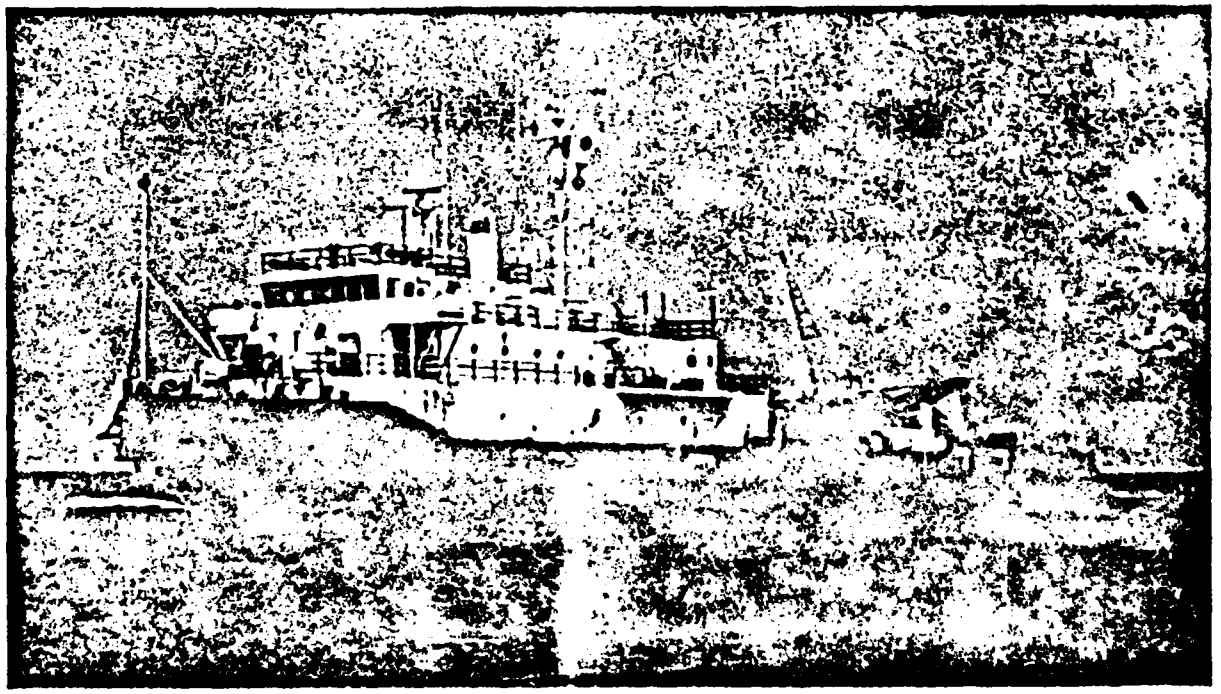
# 1.0 OVERALL PROJECT DESCRIPTION

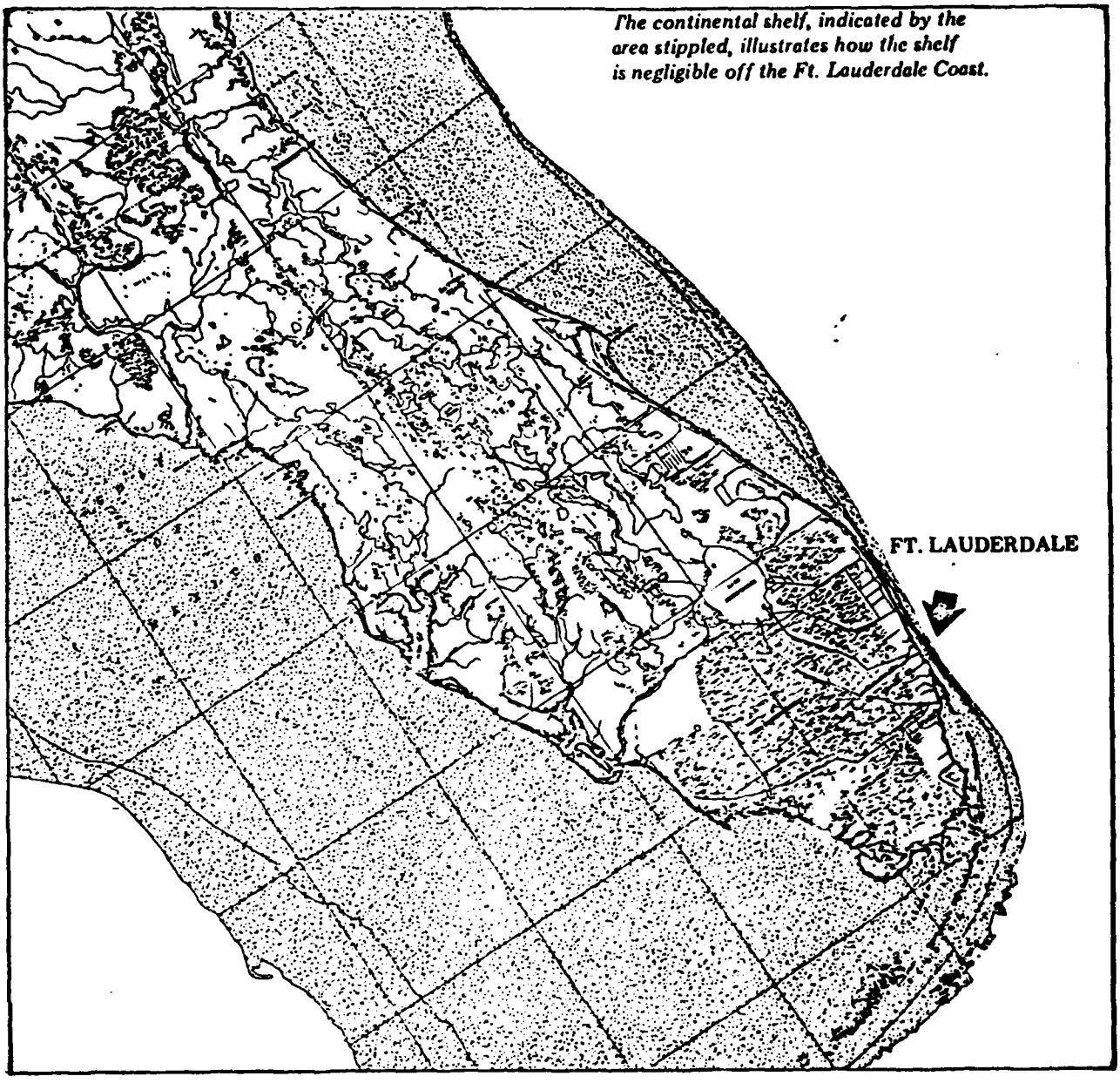
## 1.1 OVERVIEW

The Chesapeake Division, Naval Facilities Engineering Command (CHESNAVFACENGCOM) has been requested by the Naval Surface Weapons Center (NSWC) to assist in performing extensive repairs and modifications to the CAPTOR Cable Field, NSWC Ft. Lauderdale Facility, Port Everglades Harbor during April and May 1977. The Commander, Naval Construction Battalions, U. S. Atlantic Fleet (COMCBLANT) has been tasked to provide fleet personnel from Seabee Underwater Construction Team One (UCT ONE) to assist in manning the Ocean Construction Platform SEACON, Figure 1. This vessel will perform the cable removal, cable transfer, and cable laying tasks involved in this operation, CHESNAVFACENGCOM OPORD 1-77.



THE OCEAN CONSTRUCTION PLATFORM SEACON

FIGURE 1

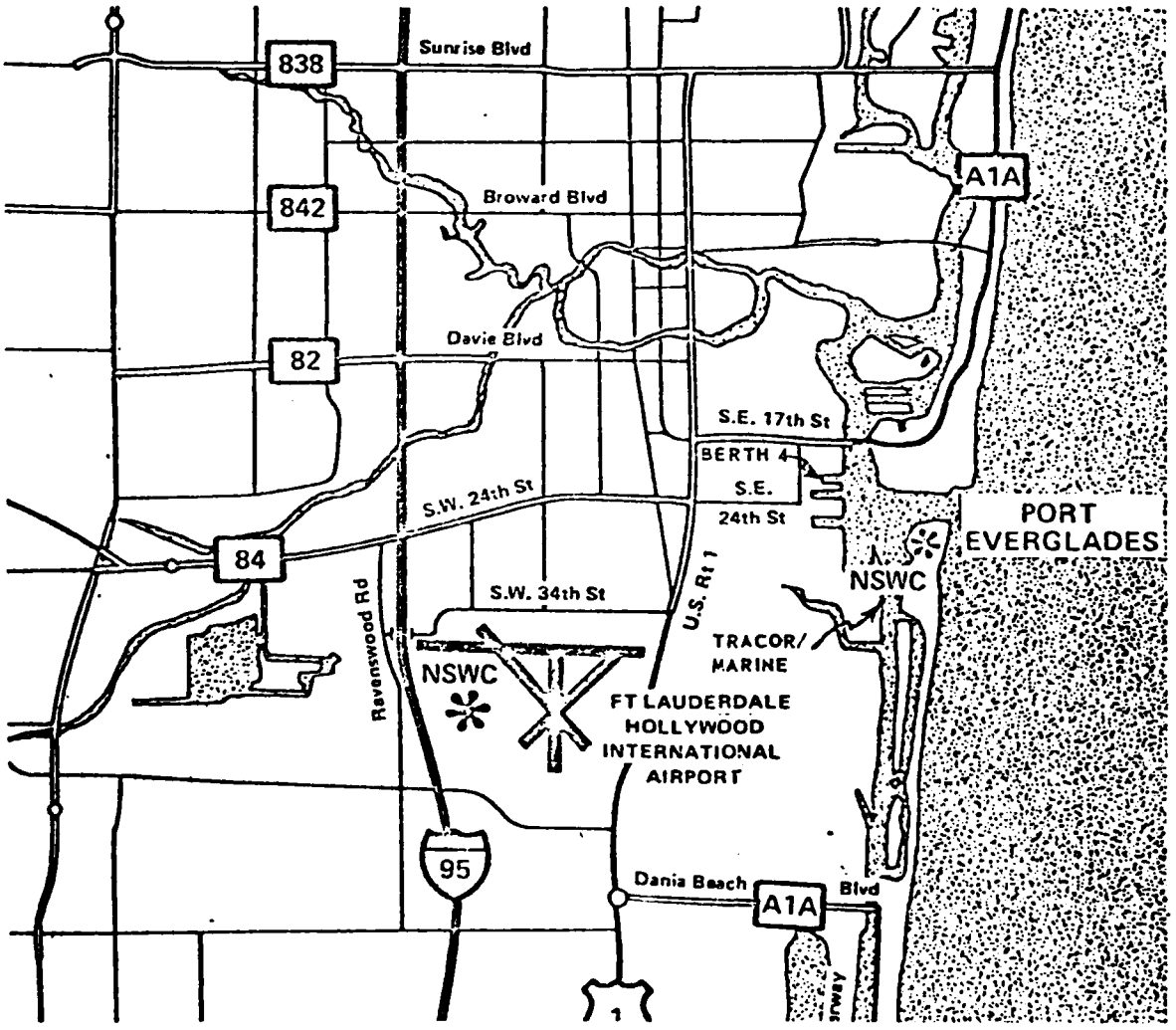



THE CONTINENTAL SHELF OFF THE EAST COAST OF FLORIDA

FIGURE 2

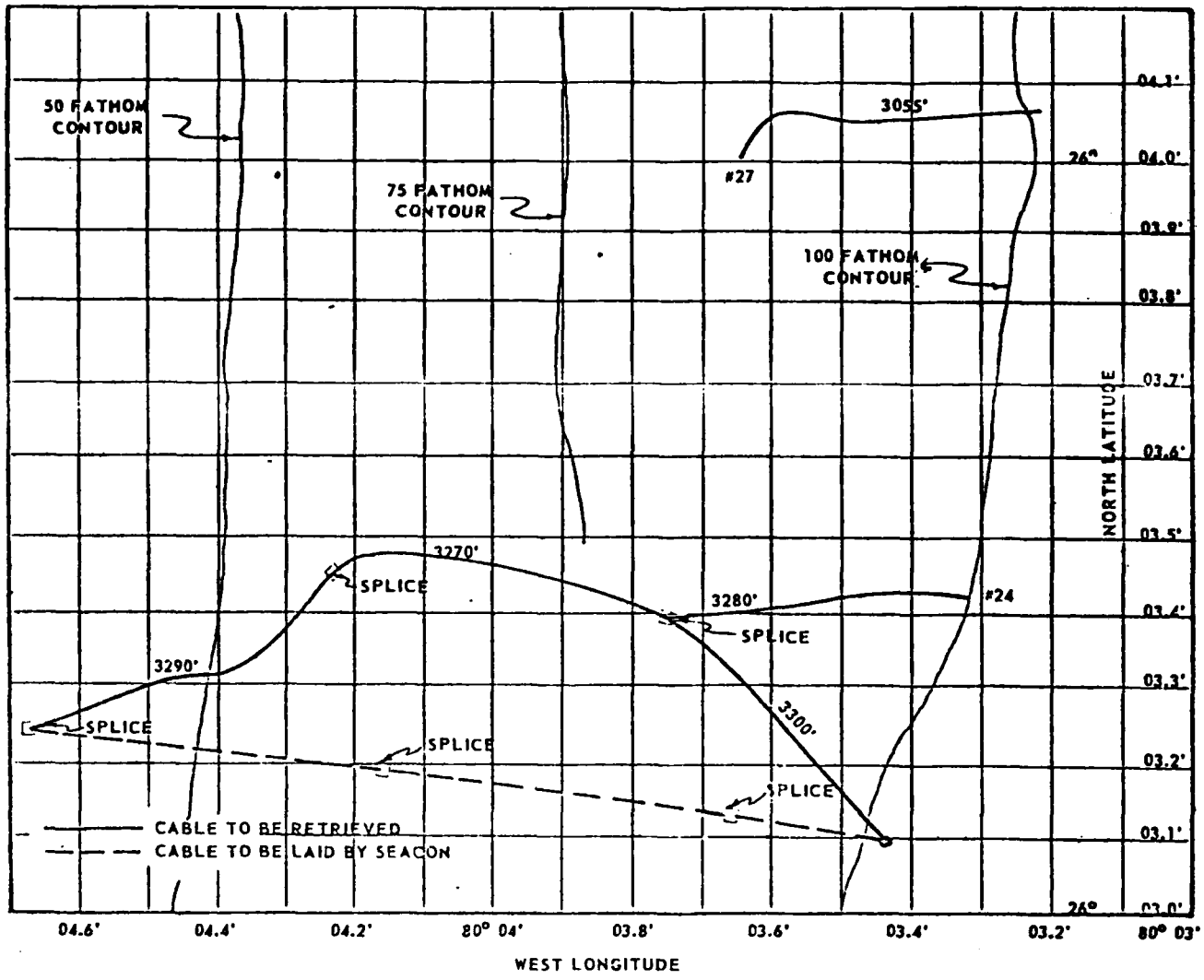
The CAPTOR Cable Field consists of a series of cables running seaward from Port Everglades Harbor, each cable terminating in a sensor package plus an anchor, recovery wire, and recovery system. The in nore range comprises a series of sensors running north and south along the 100 fathom contour, about 3.1 miles offshore. The deep water range comprises three north-south rows of sensors in water depths ranging from 240 to 285 fathoms, about 16.6 miles offshore, just off the edge of the continental shelf (Figure 2).

The job to be performed by SEACON and assisting vessels includes recovery and relaying of two inshore range cables, relocating the seaward end of one deep water range cable, laying three complete cables from the deep water range, and lengthening five cables in the deep water range. This work will be performed for, and with the direct assistance of the Naval Surface Weapons Center, Ft. Lauderdale Facility, which will provide the two support vessels and personnel to assist in the operation. Modifications to SEACON required for this operation will be made at the TRACOR/MARINE shipyard in Port Everglades. Cable loading aboard SEACON will be at the railroad siding at Berth 4. Location of the shoreside facilities is shown in Figure 3.




LOCATION OF FACILITIES IN THE PORT EVERGLADES AREA

FIGURE 3

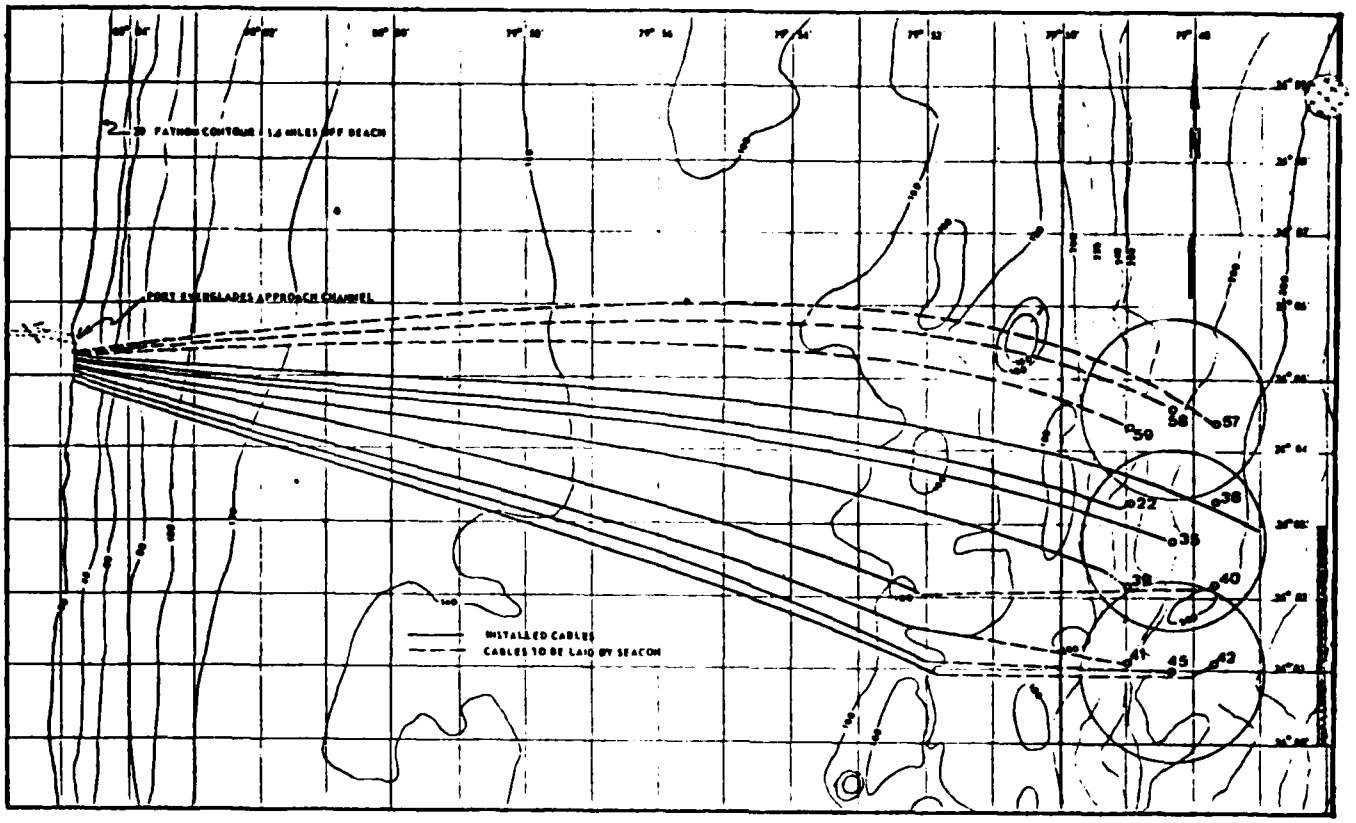



CABLES OF THE INSHORE CABLE FIELD TO BE RETRIEVED AND RE-LAID BY SEACON

FIGURE 4

1.2 CAPTOR CABLE FIELD LOCATION AND CONFIGURATION

The shallow water CAPTOR range lies about two miles south of the Port Everglades approach channel with the sensors installed along the 100 fathom contour about 2.7 miles offshore. Although there are numerous cables crossing the bottom in this area, only two of them are shown in Figure 4; these are the two cables that the SEACON is to retrieve, #24 and #27. Cable 24 is to be re-laid in a straight line configuration. This can be compared by geographical coordinates with Figure 5 to indicate the relative locations of the deep water and shallow water ranges.

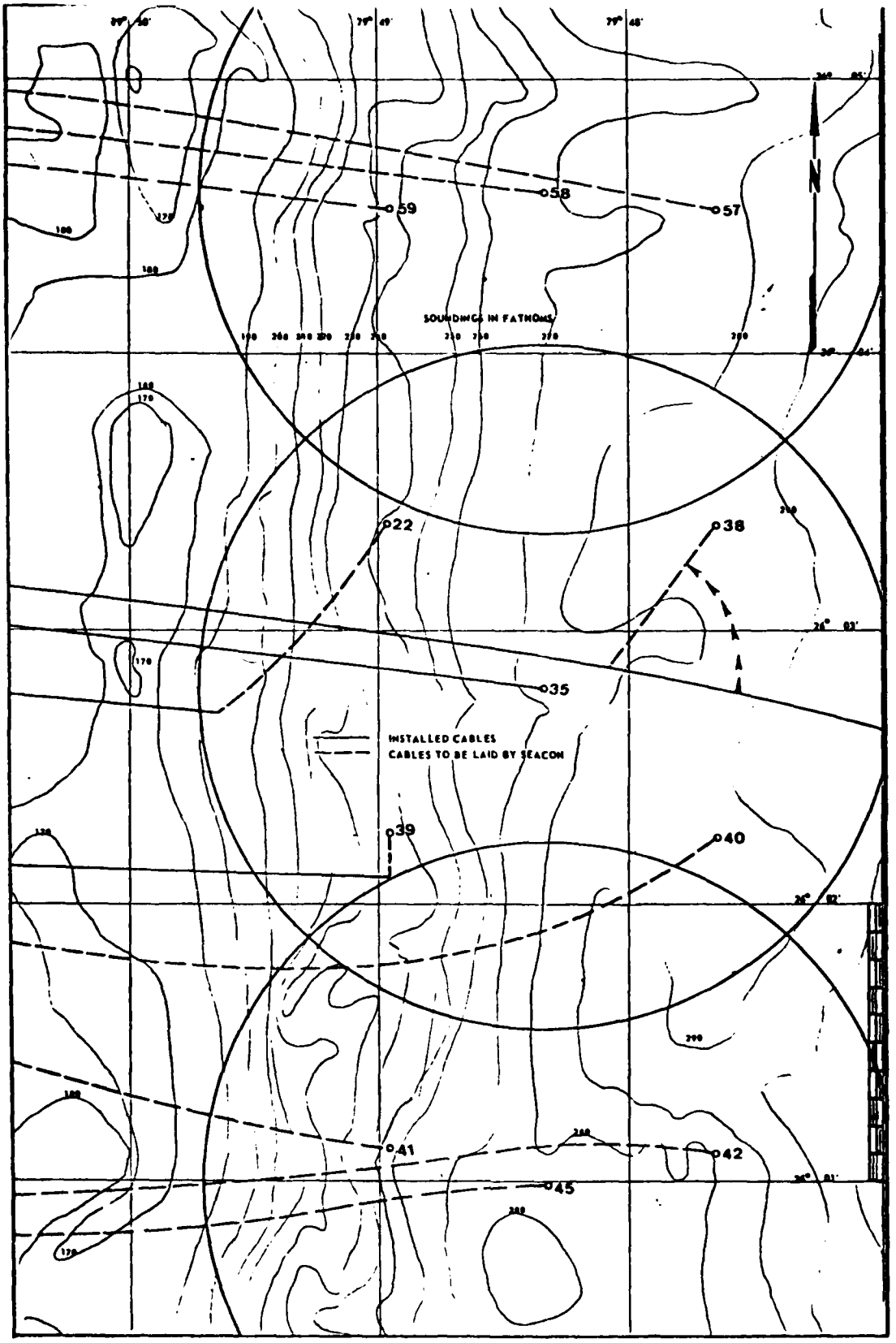



THE CAPTOR CABLE FIELD OFFSHORE OF THE 20 FATHOM CONTOUR

FIGURE 5

The deep water range, and its associated cable field, is shown in Figure 5 as it will appear after the cable laying, transferring, and lengthening operations are completed. The sensor assemblies, and the cables leading to them from the shore, each bear the same number and will be so designated in the balance of this Project Execution Plan.

There will be four sensor assemblies in the outer north-south line (the greatest distance from shore) spaced 1.14 nautical miles apart. The north-south line of sensors nearest the shore also will have four sensor assemblies with the same north-south spacing. The middle north-south line contains three sensor assemblies spaced 1.80 nautical miles apart. In an east-west direction these rows of sensor assemblies will be spaced 0.59 nautical miles apart. These sensor locations are shown in more detail in Figure 6 and are delineated in the table that follows.




DETAILS OF THE CAPTOR SENSOR ASSEMBLY LOCATIONS

FIGURE 6

| SENSOR | N. LATITUDE | W. LONGITUDE |
|---|---|---|
| 57 | 26° 04.54' | 79° 47.65' |
| 38 | 26° 03.40' | 79° 47.65' |
| 40 | 26° 02.26' | 79° 47.65' |
| 42 | 26° 01.12' | 79° 47.65' |
| 58 | 26° 04.60' | 79° 48.32' |
| 35 | 26° 02.79' | 79° 48.32' |
| 45 | 26° 00.99' | 79° 48.32' |
| 59 | 26° 04.54' | 79° 48.96' |
| 22 | 26° 03.40' | 79° 48.96' |
| 39 | 26° 02.26' | 79° 48.96' |
| 41 | 26° 01.12' | 79° 48.96' |

The area in which these operations are to be carried out is subjected to the currents of the Gulf Stream combined with currents due to tidal flow. These conditions are described to some extent in Appendix B.

### 1.3 CABLE HANDLING PLATFORM AND SUPPORT VESSELS

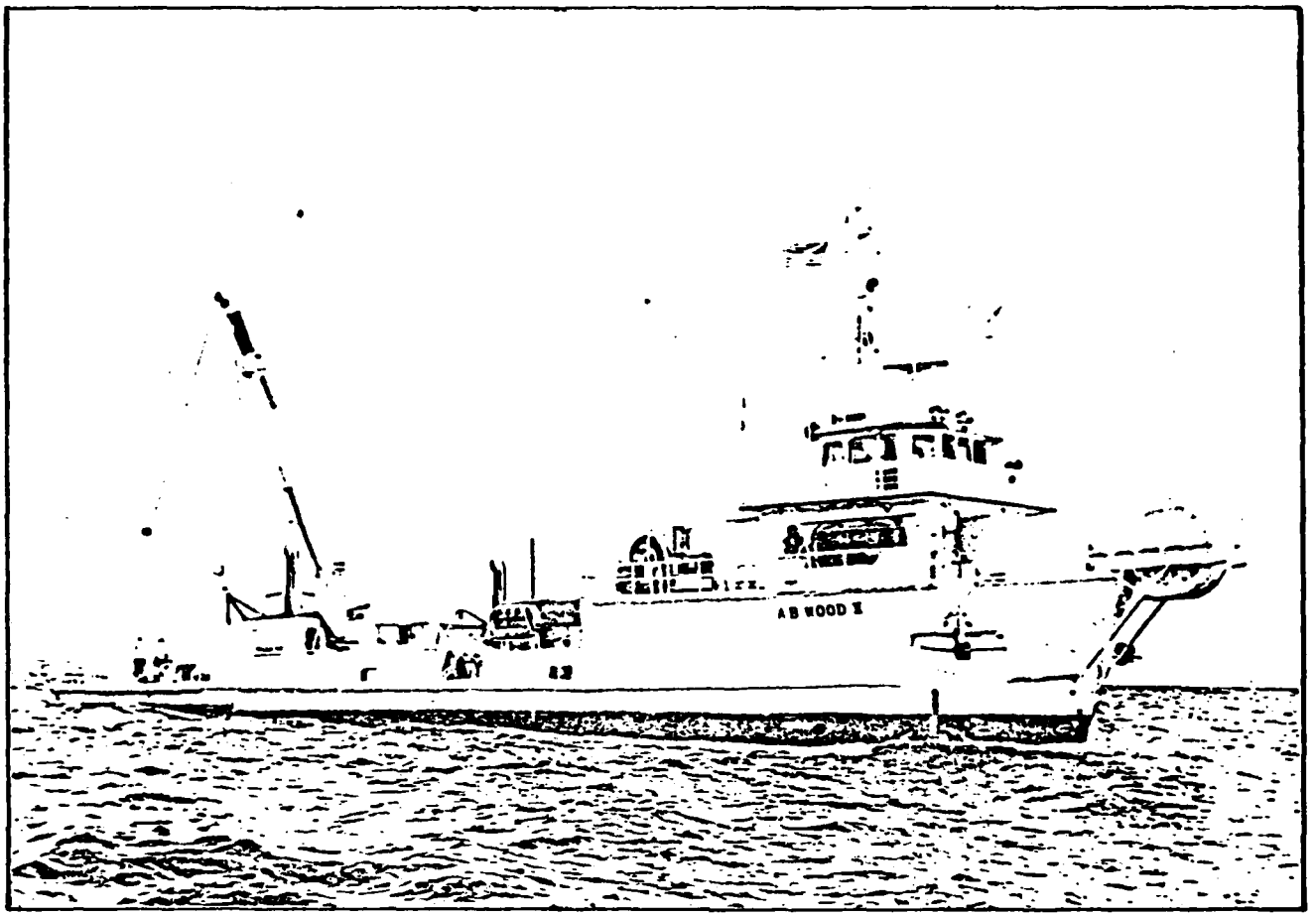
The Ocean Construction Platform SEACON, Figure 1, will be the primary cable handling platform for this operation. Its mission will be to lay new cables, lengthen cables, and transfer cables as required and as will be described in detail in later sections of this Project Execution Plan. Further information on the configuration, characteristics, and capabilities of SEACON are given in Appendix C. The dynamic positioning capability of this unique vessel is being counted upon to accomplish the cable laying activities in the adverse current conditions mentioned above.

The primary assisting vessel will be the R/V A. B. WOOD, Figure 7 which, for these operations is designated as the RSB-1. The WOOD will provide the basic navigational data and will handle the majority of cable retrieval, sensor raising and lowering, and required cable splicing operations. Additional details on this ship are also given in Appendix C.

The third vessel involved in the operation is the 45 foot launch, UB-646. This vessel, shown in Figure 8, will be used primarily for transferring cable and gear between the WOOD and SEACON.

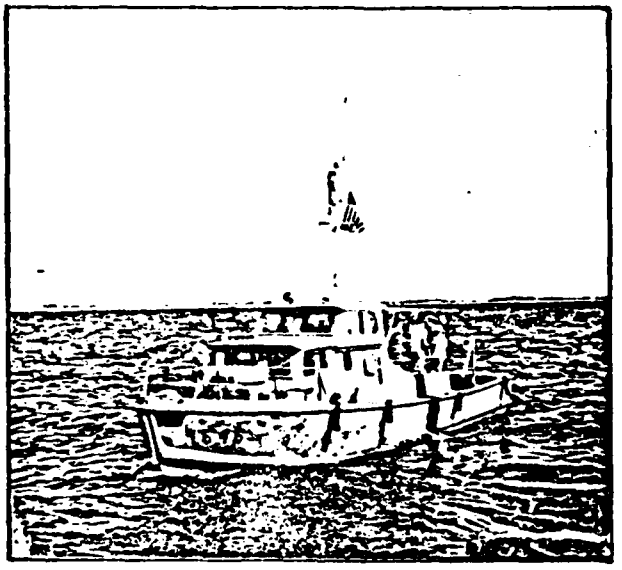
### 1.4 PRIOR PREPARATION FOR CABLE FIELD WORK

Before the activities covered by this Project Execution Plan get underway, a certain amount of cable relocation and repair activity will be carried out by the RSB-1. Repairs to Cable 45 are scheduled between 7 and 24 February




THE R/V A.B.WOOD,RSB-1

FIGURE 7



45 FOOT LAUNCH, UB-64 6

FIGURE 8

1977; between 28 February and 4 March 1977 the RSB-1 will be making repairs on Cable 22 and the following week on Cable 39. These latter repair activities on Cables 22 and 39 account for the discrepancies between Figures 5 and 6. It may also be noted that the SEACON will be involved in lengthening Cable 22 but will not be required to do any work on Cable 39.

The NSWC CAPTOR Project Office will order the cable required for this project from ITT and from the Naval Electronic Systems Command. The ITT portion is to be delivered about 10 March 1977 and delivery of the NAVELEX portion is planned for 20 April 1977. These cables will be shipped by rail and picked up for loading aboard SEACON at Berth 4 in Port Everglades.

### 1.5 OVERALL SCHEDULING AND COSTING OF THE PROJECT

The SEACON is scheduled to depart its home port, the Naval Amphibious Base, Little Creek, on 18 February 1977 under tow for Ft. Lauderdale. The first cable handling involving SEACON underway operations is the inshore recovery of Cables 24 and 27 and the re-laying of Cable 24 starting on 20 April 1977. After the cable handling operations are completed, SEACON will undergo demobilization at TRACOR/MARINE and will be ready for tow back to Little Creek on 1 June 1977. The overall schedule for this period is given in Figure 9. This schedule runs from mobilization on *T-61* (18 February) to demobilization completion, *T+42*, (1 June) where *T* (20 April 1977) is the point at which at-sea operations begin.

The estimated cost for this entire operation, as developed in early February 1977, is tabulated below:

| | | | |
|---|---|---|---|
| SEACON - 45 days @ $3,000 | $135,000 | | |
| NSWC Support Personnel | | | |
| 2 men - 30 days (2x10x25x30) = | 15,000 | | |
| 1 man - 15 days (1x10x25x15) = | 3,750 | | |
| 1 TV Operator - 5 days (1x10x25x5) = | 1,250 | | |
| | | $155,000 | |
| Operating Days | | | |
| RSB-1 10 days @ $3,000/da | 30,000 | | |
| RSB-1 - Working Crew | 22,000 | | |
| SEACON Mods/Crane repairs | 20,000 | | |
| Expendables & Dockage | 50,000 | | |
| | | $122,000 | |
| 16 percent tolerance | | 43,000 | |
| | TOTAL | | $320,000 |

OVERALL SCHEDULE OF OPERATIONS

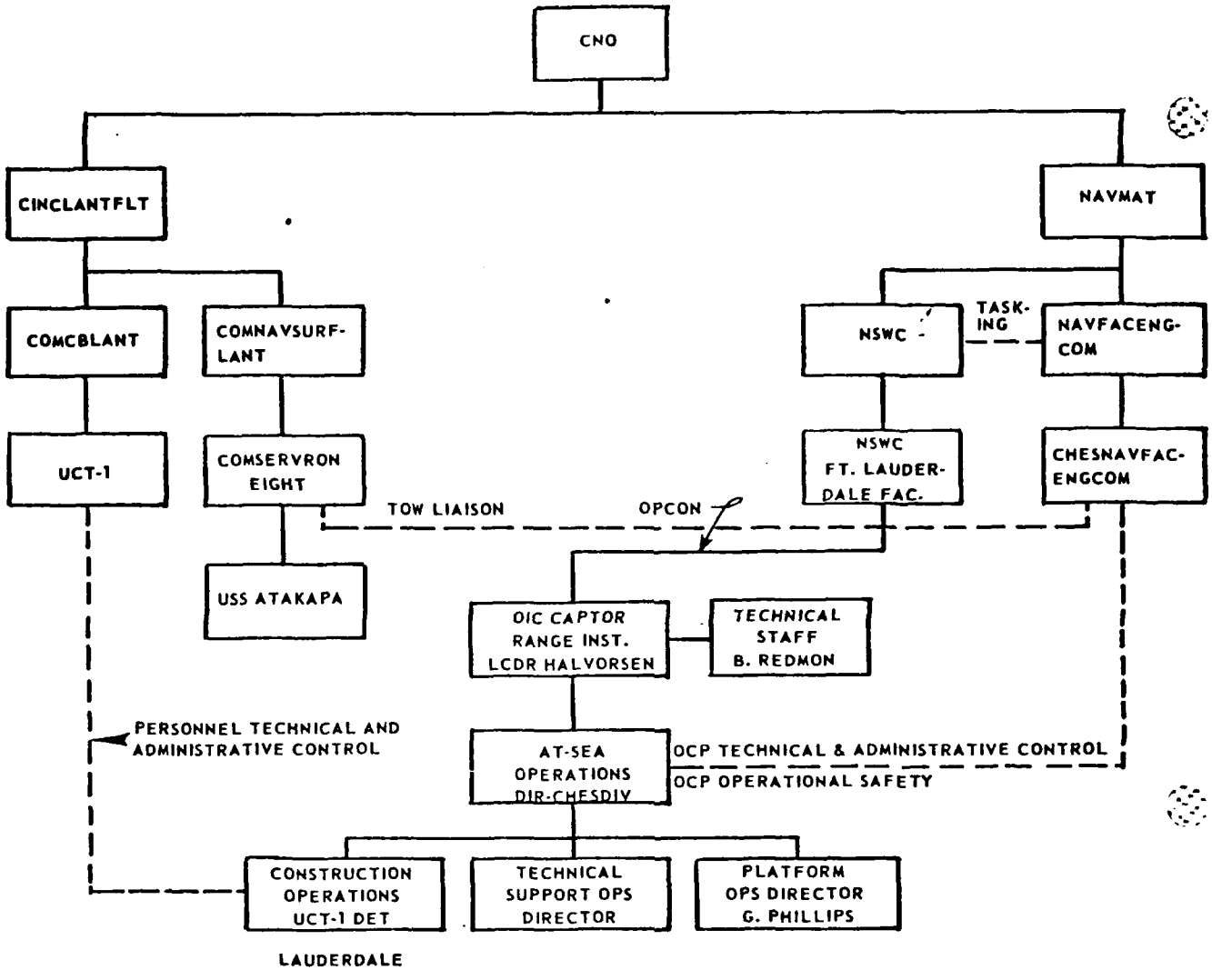
FIGURE 9

| OPERATION | FROM / TO | T-61 / T-56 | T-55 / T-38 | T-38 / T-33 | T-37 / T-34 | T-9 / T-3 | T-2 / T-1 | T / T+2 | T+3 / T+5 | T+6 / T+7 | T+8 / T+12 | T+13 / T+22 | T+23 / T+32 | T+33 / T+41 | T+42 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SEACON UNDER TOW FROM NORFOLK TO FT. LAUDERDALE | | ▲ | | | | | | | | | | | | | |
| SEACON AT TRACOR FOR CABLE LAYING ALTERATIONS | | | ▲ | | | | | | | | | | | | |
| UCT-1 ADVANCE PARTY ARRIVES AND COMMENCES TRAINING | | | | ▲ | | | | | | | | | | | |
| SEACON MOVES TO BERTH F4 FOR CABLE LOADING - RETURNS TO TRACOR | | | | | ▲ | | | | | | | | | | |
| UCT-1 MAIN PARTY ARRIVES AND COMMENCES TRAINING | | | | | | ▲ | | | | | | | | | |
| SEACON UNDERGOES TRAINING IN CABLE HANDLING OPERATIONS | | | | | | | ▲ | | | | | | | | |
| INSHORE RECOVERY AND RELAY OF CABLES 24 AND 27 | | | | | | | | ▲ | | | | | | | |
| RECOVER AND RELAY CABLE 38; LAY CABLE 57 TO SHORE | | | | | | | | | ▲ | | | | | | |
| LOAD CABLE 58 IN CRIB; LAY CABLE 58 TO SHORE | | | | | | | | | | ▲ | | | | | |
| LOAD CABLES 59, 40, 41, AND 22; LAY CABLE 59 | | | | | | | | | | | ▲ | | | | |
| LENGTHEN CABLES 22, 40, 41, 45, AND 42 | | | | | | | | | | | | ▲ | | | |
| CONTINGENCY PERIOD FOR SEACON CABLE OPERATIONS | | | | | | | | | | | | | ▲ | | |
| SEACON DEMOBILIZATION | | | | | | | | | | | | | | ▲ | |
| SEACON READY FOR TOW | | | | | | | | | | | | | | | ▲ |

## 2.0 ORGANIZATIONAL RESPONSIBILITIES - COMMAND AND CONTROL

### 2.1 OVERALL ORGANIZATIONAL ARRANGEMENTS

Various Fleet, Technical, and Support Commands are required to effect installation of the CAPTOR Range at the Naval Surface Weapons Center, Ft. Lauderdale Facility. To insure effective control of the various commands so




FT. LAUDERDALE CAPTOR RANGE INSTALLATION
CONSTRUCTION OPERATIONS ORGANIZATION

FIGURE 10

that the mission will be accomplished in an efficient and safe manner, a special organization shall be established. This organization is delineated in Figure 10. The commands providing support and their assigned responsibilities during mobilization and construction operations phases are presented in more detail in the following sections.

### 2.2 CHESNAVFACENGCOM RESPONSIBILITIES

The mobilization and demobilization of SEACON prior to and after the operations at sea will be under the operational control of CHESNAVFACENGCOM. This organization will be responsible for insuring that sufficient training is conducted to integrate the SEACON and its crew into a system which is capable of

efficiently and safely operating and maintaining the SEACON during tows to and from Ft. Lauderdale and while in caretaker status in TRACOR Shipyard, Ft. Lauderale. These responsibilities include:

- o Mobilization of the SEACON and its installed systems and crew to the Ft. Lauderdale operating area for the construction operations.
- o Planning, preparation, and acceptance for tow of the SEACON in accordance with the U. S. Navy Towing Manual, NAVSEA 0925-000-1000. Liaison will be established with the designated towing vessel during preparation for tow to insure the SEACON is rigged in accordance with the desires of the towing vessel commanding officer.
- o Contract preparation and construction contract monitoring for shipyard conversion; providing a Platform Operations Director, and a SEACON Engineer to insure proper safety, security and maintenance of the SEACON during the conversion period.
- o Disbursement of and accountability for all project funds.
- o Demobilization of SEACON upon completion of the project. All Ocean Construction Equipment Inventory (OCEI) equipments will be refurbished as necessary and returned to the equipment pool designated by the OCEI manager. The SEACON will be placed in a caretaker status and the augment crew will be detached to their parent commands.

During the actual construction operations the CHESNAVFACENGCOM responsibilities will be as follows:

- o Providing in conjunction with OIC UCT ONE, the personnel, equipment, and materials necessary to efficiently and effectively implant all facilities components. Exercise technical control of the construction through the assigned At-Sea Operations Director and Platform Operations Director and maintain administrative control of CHESNAVFACENGCOM employees.

- o Operating and maintaining the SEACON in accordance with CHESNAVFACENGCOM INST 3100.1 and providing for the operation and cleanliness of the messing services, water supply, and sanitation facilities on board the SEACON.
- o Providing logistics support as required for the construction operations through support from NSWC Ft. Lauderdale and vendor service contracts.
- o Providing augment construction equipment from the Ocean Construction Equipment Inventory to support the operation and providing for its maintenance through ample spare parts and trained personnel.

### 2.3 UCT ONE RESPONSIBILITIES

During mobilization and demobilization periods for this operation, UCT ONE shall have the following responsibilities:

- o Mobilizing personnel for the SEACON tow and arranging for transportation of UCT personnel to Ft. Lauderdale for the construction operations and return to Little Creek upon their completion.
- o Providing trained and qualified personnel to man the SEACON crew billets designed to be filled by UCT personnel. Providing, as required, personnel to stand security watches on the SEACON during periods when it is activated.
- o Providing personnel to assist in the loading of cable and other facilities components during the SEACON shipyard conversion period.
- o Upon return to Little Creek of the SEACON, assisting in the placing of SEACON in a caretaker status.

During construction operations, UCT ONE shall be responsible for:

- o Providing personnel and equipment and directing their efforts in performing the ocean construction tasks. Providing OIC UCT ONE or his designated supervisor to perform the duties and responsibilities of the Construction Operations Director (COD) as delineated in CHESNAVFACENGCOM INST 3100.1.

- o Providing qualified personnel to perform the duties and responsibilities of SEACON crew billets designated to be filled by UCT personnel.
- o Providing administrative control of all deployed UCT ONE personnel.

### 2.4 NSWC, FT. LAUDERDALE FACILITY RESPONSIBILITIES

Operational control of the construction operations will be exercised by the assigned Officer in Charge, LCDR Halvorsen, who is OIC of NSWC Ft. Lauderdale. This includes exercising operational control over range operations, range support forces, area coordination, and providing incoming and outgoing message traffic guard. He shall provide direction and location approval regarding installation of facilities components.

In the area of technical support, the NSWC, Ft. Lauderdale Facility shall provide a technical staff to the OIC for inspecting and supervising, as appropriate, the installations and facility system operation certification.

Finally, the NSWC, Ft. Lauderdale Facility shall provide ship support of the RSB-1 and the UB-646 as required for the construction operations and as described in the construction operations details in later sections of this Project Execution Plan.

### 2.5 COMMAND AND CONTROL

Administrative control of SEACON and the CHESNAVFACENGCOM personnel will remain with CHESNAVFACENGCOM; administrative control of UCT ONE personnel will remain with CBLANT.

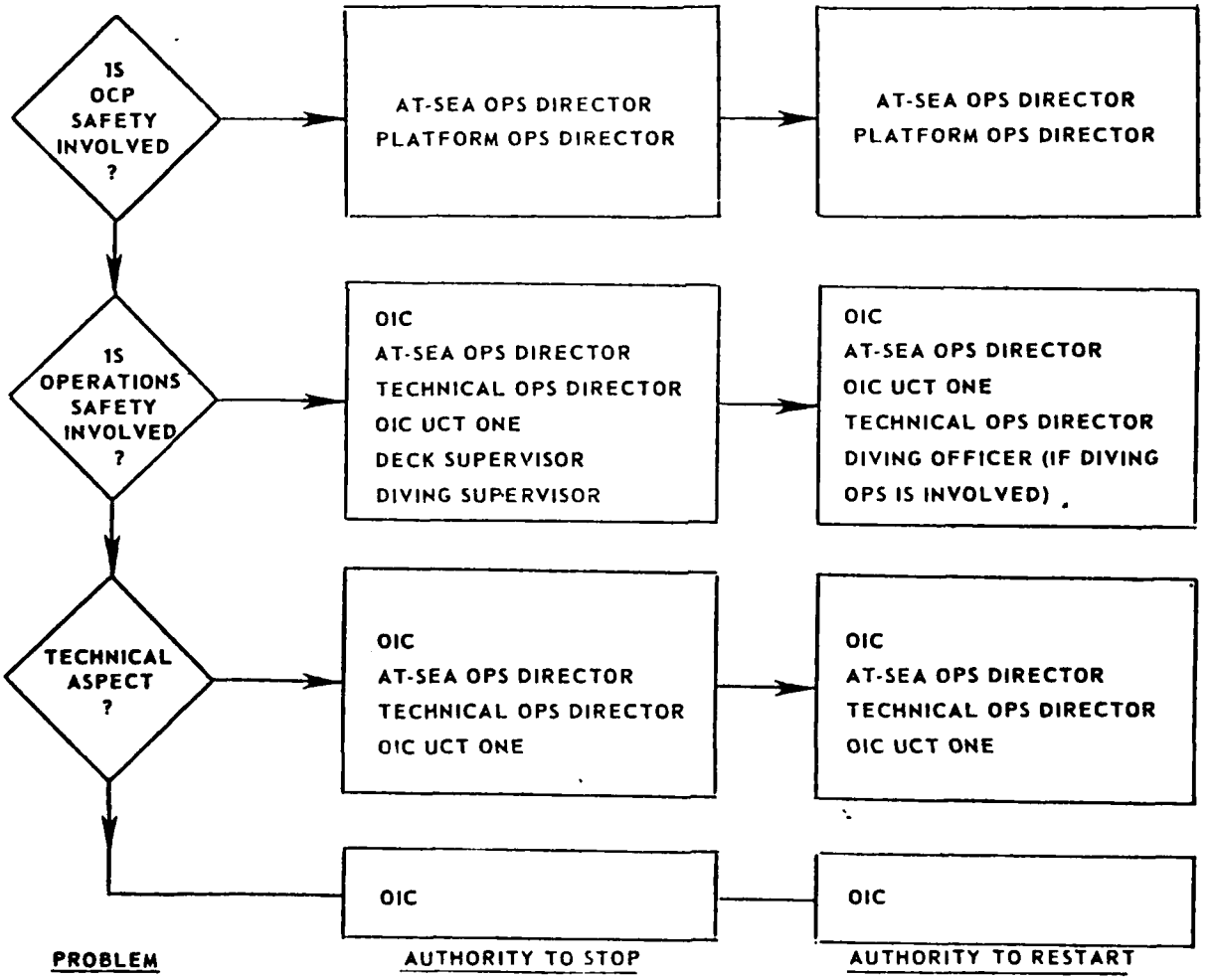
During towing periods, operation control of SEACON shall pass to the Commanding Officer or Master of the towing vessel. While in port at Ft. Lauderdale, from 23 February to approximately 18 April 1977, the operational control of SEACON will revert to CHESNAVFACENGCOM.

During the operations of repairing and modifying the CAPTOR Cable Field from approximately 18 April to 1 June 1977, the operational control of SEACON shall pass to the NSWC - designated Officer in Charge (OIC) for this project. CHESNAVFACENGCOM's At-Sea Operations Director shall take direction from the OIC and provide coordination of operations between the SEACON, CHESNAVFACENGCOM technical support personnel, and the UCT ONE Detachment.

## 2.6 SAFETY RESPONSIBILITY

The construction operations shall be conducted in a manner such that established safety standards, practices, and regulations are followed. It shall be the responsibility of each individual assigned to the construction organization to practice safety on all assigned tasks and to report promptly to the cognizant person unsafe conditions or practices. The responsibility for safety during the construction operation shall be as delineated below and in Figure 11.

| Cognizant Person | Area of Safety Responsibility |
|---|---|
| OIC | Equipment, personnel, and operations |
| OIC UCT ONE | Diving and small boat operation; construction |
| AOD | OCP operation and construction |
| TRB OIC | TRB Operations |




CONTROL AUTHORITY FOR STOP OR START OF OPERATION

FIGURE 11

## 3.0 OUTFITTING AND LOADING SEACON

### 3.1 MOBILIZATION

The SEACON will be returned to active status and manned for towing at sea in accordance with CHESNAVFACENGCOM INST 3100.1 and the U. S. Navy Towing Manual, NAVSEA 0925-000-1000. The ocean construction platform shall be taken under tow on 18 February 1977, *T-61*, by the USNS MOSOPELEA for deployment to Ft. Lauderdale, FL. UCT ONE will provide the necessary personnel to augment CHESNAVFACENGCOM personnel in manning the tow. About 23 February 1977, *T-56*, after arrival at Ft. Lauderdale, designated CHESNAVFACENGCOM personnel and all UCT ONE personnel shall return to their respective commands. The SEACON is to be berthed at the TRACOR/MARINE shipyard for modifications required to handle cable during the at-sea operation.

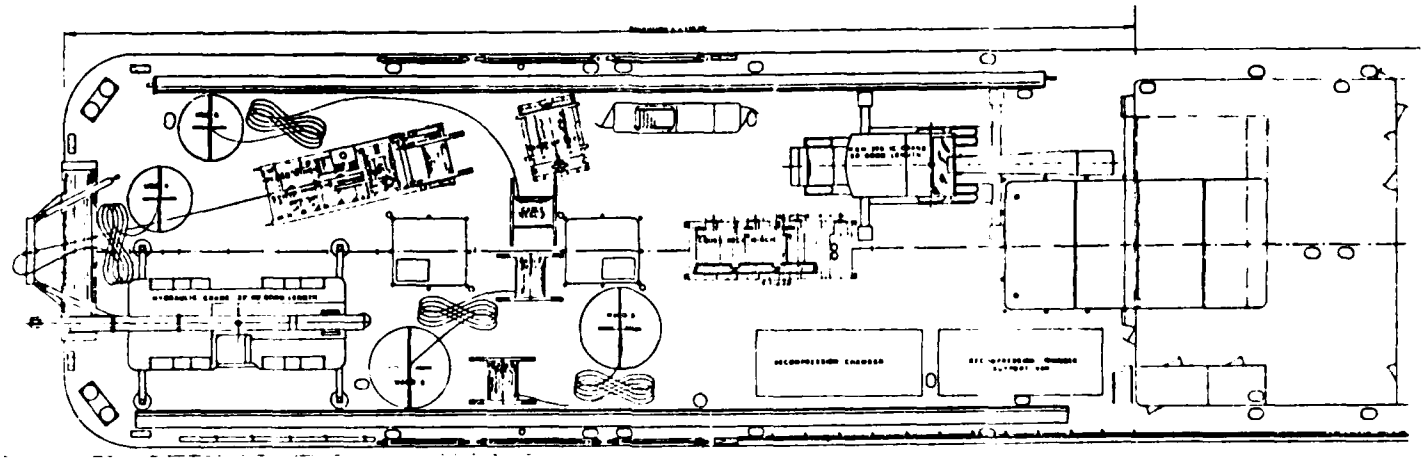
### 3.2 REMOVAL AND ADDITION OF EQUIPMENT

SEACON is scheduled to be berthed at the TRACOR/MARINE shipyard in Port Everglades from her arrival on 23 February 1977, *T-56*, to the commencement of underway training on 18 April 1977, *T-2*, except for a four day interval, 14 to 17 March 1977, *T-37* to *T-34*, when the platform will move to Berth 4 for cable loading.

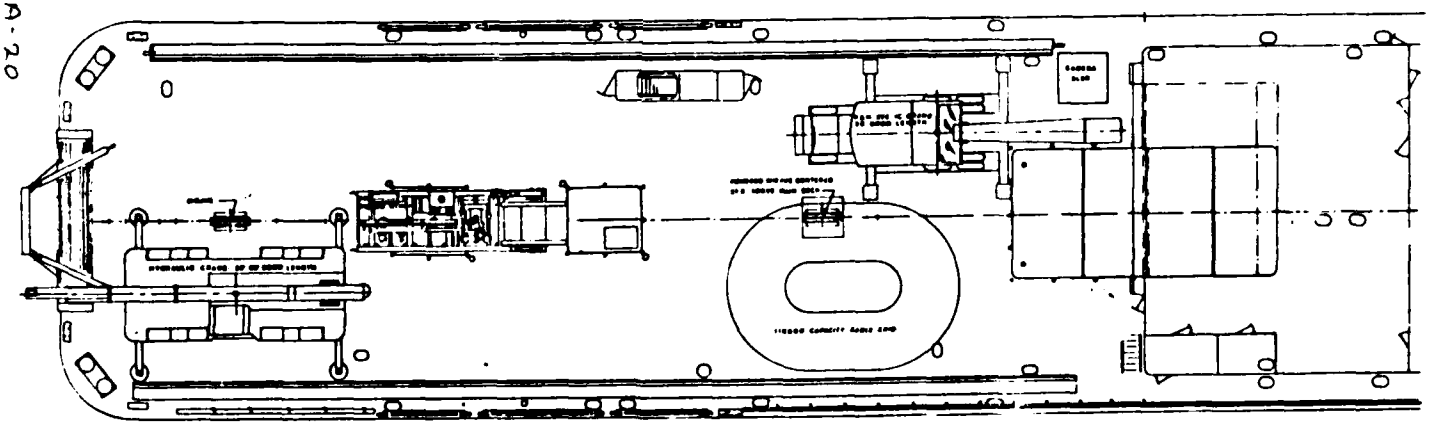
SEACON was demobilized at NAB, Little Creek, after completing a series of operations at the Atlantic Fleet Weapons Training Facility off St. Croix, Virgin Islands. In order to illustrate the relocation of major equipment items, the after main deck layout for the last of the St. Croix operations is shown in the upper arrangement drawing of Figure 12, Before demobilization the WACO units, cable reels, and recompression chamber and support van were removed but the major items of equipment installed on the main deck were left aboard.

The lower layout of the main deck aft in Figure 12 shows the changes to be made at the TRACOR/MARINE shipyard in Ft. Lauderdale. The following are the modifications required for the CAPTOR Cable Field operation:

- Remove cross-deck winch and stow ashore
- Remove Pengo Take-Up Reel and stow ashore
- Relocate Pengo Winch (described in Appendix D) to centerline over after hatch



AFTER MAIN DECK OF SEACON AS FITTED OUT FOR OPERATIONS AT ST. CROIX



AFTER MAIN DECK OF SEACON AS MODIFIED FOR CAPTOR CABLE FIELD OPERATIONS

FIGURE 12

- o Construct a cable crib on the starboard side, main deck, with a capacity of 110,000 feet of Habirshaw, 1-3/8 inch diameter, lead-shielded cable.
- o Install a powered sheave (on loan from TRACOR/MARINE on a platform supported by a 4" pipe tower above the cable crib. The sheave is to be on the ship centerline with its axis 27.5 feet above the main deck level; the platform is to be provided with a fairlead for running the cable into or out of the cable crib.
- o Remove a twenty foot section from the boom of the P&H 325-TC crane (Appendix D) and alter stays, topping lift, and hoisting cables accordingly. Install vangs as required for close-in overside work with cable retrieving sled.
- o Install instrumented, Sherman & Reilly, conductor stringing block on centerline aft between Pengo Winch and stern roller. This block is instrumented to measure cable tension, cable angle, and cable pay-out. Also relocate existing pair of vertical guide rollers (not shown in Figure 12) to restrict athwartships movement of cable passing over stern roller.

### 3.3 INITIAL CABLE LOADING OPERATIONS AND CREW TRAINING

An advance party from UCT ONE will arrive at Ft. Lauderdale on 13 March 1977, *T-38*, to assist in moving SEACON from the TRACOR/MARINE shipyard to Berth 4 for loading cable and to assist in the cable loading operation. Approximately 160,000 feet of cable shipped by rail from ITT will be loaded aboard using the Pengo Winch and the powered sheave on the tower over the cable crib as required.

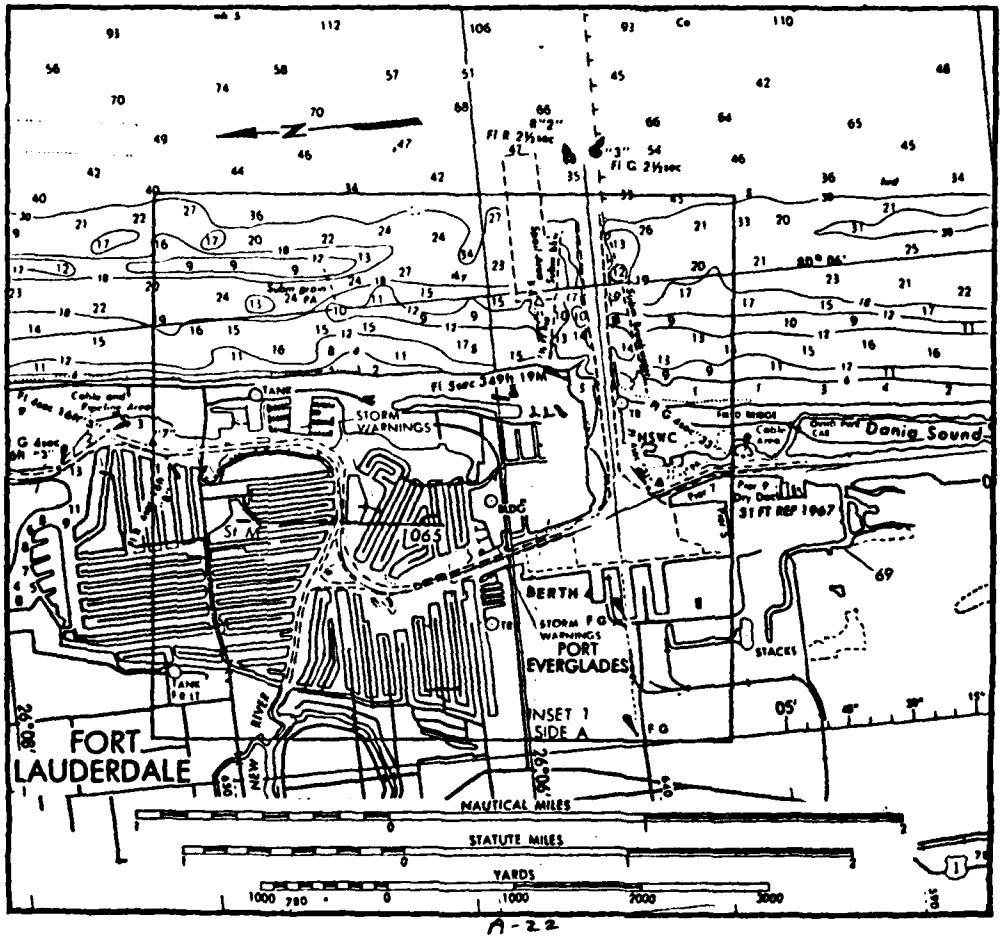
In the cable crib, the full load of 110,000 feet will be coiled down; this will later be used to lay Cable 57. In the cable storage area, in the hold of the SEACON which is entered through the hatch just forward of the Pengo Winch, the remaining 50,000 feet of cable will be coiled down. This latter cable will be used for the lengthening of Cable 45 and Cable 42.

When these initial loading operations are completed on 17 March 1977, *T-34*, the SEACON will return to the TRACOR/MARINE shipyard for completion of

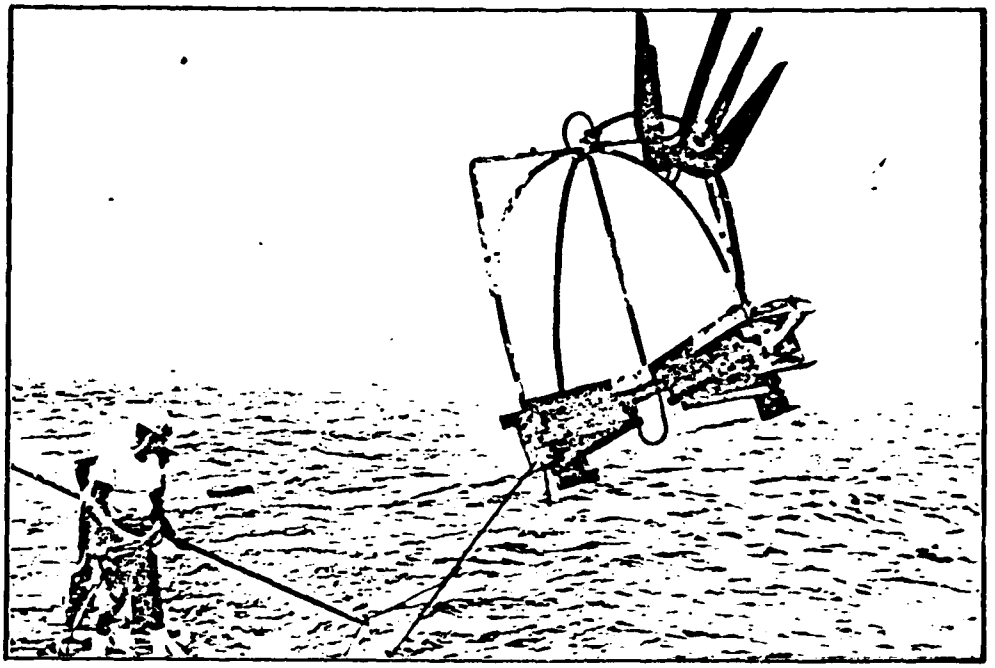
modifications. The UCT ONE advance party will undergo additional training during the ensuing period in operation of the Pengo Winch and operation of other deck equipment aboard SEACON.

The remainder of the UCT ONE Detachment will begin to arrive in Ft. Lauderdale on 11 April 1977, *T-9*, and by 17 April 1977, *T-3*, all UCT ONE and CHESNAVFACENGCOM personnel involved in the operation should be aboard SEACON. Approximately 50% of these personnel have had prior service aboard SEACON. The period between *T-9* and *T-1* will be utilized for familiarization with new and altered equipment and for training the inexperienced personnel in all aspects of the operation. The last two days of this period will be used for training exercises at sea off shore of Port Everglades, Figure 13.

CHART OF PORT EVERGLADES AREA FIGURE 13



## 4.0 CABLE RETRIEVAL AND CABLE LAYING OPERATIONS



RECOVERY SYSTEM HOISTED BY GRAPNEL

FIGURE 14

### 4.1 LOCATING AND RAISING CAPTOR CABLES

Each CAPTOR sensor assembly is buoyed up from an anchor on the bottom. Attached to the anchor is a length of 5/8-inch wire rope to the end of which is secured a bail-like weldment made up of steel beams and rods. The bail weldment is dropped far enough from the sensor assembly, and from any other cables in the area, so that it can be picked up by a grapnel, Figure 14, without damage to other equipment. None of the cables to be handled by SEACON will be fitted with sensor assemblies; the cables will be secured to anchor clumps which, in turn, will have wire rope lengths of two times the depth attached, with bail weldments at the end of the wire rope.

The entire CAPTOR Cable Field has been thoroughly charted using a Raydist plotting system. The RSB-1 is fitted with a Raydist control station and, in conjunction with Raydist stations on shore, the ship can position

itself directly over a recovery system. It then lowers a sled fitted with TV cameras so as to locate the recovery system and hook its grapnel into the bail. The bail, wire rope, anchor, and attached cable end can then be hoisted on board. The systems are lowered with similar care and the positions of all elements are precisely charted.

SEACON will utilize the NSWC Camera Sled to recover Cables 24 and 27 on the inshore range. However, for all other operations in the deep water range, the RSB-1 will perform this function and will guide and provide position information to SEACON during all cable laying operations. SEACON will employ its Mini-Ranger system for inshore navigation and as a back up to the RSB-1 Raydist for precise positioning during the off shore operations.

### 4.2 INSHORE RANGE OPERATIONS

The inshore cable operations involve the removal of Cable 27 and one leg of Cable 24 as well as re-laying the remainder of Cable 24 in a relatively straight line. The cables concerned in this operation have previously been depicted in Figure 4.

On the first day, *T*, of operations at sea, 20 April 1977, SEACON will get underway and proceed to the 100 fathom depth area due east of the Dania Fishing Pier. There it will position itself over the last known end location of the portion of Cable 24 to be recovered. This is at approximately 26° 03.42' N. Lat. and 80° 03.25' W. Long.

The first operation will be the lowering of a current meter to get a good picture of the current profile. When this is obtained, the RS-7 Subsea Reference Beacon will be launched to mark the approximate cable end location. This unit is a Honeywell Acoustic Positioning System, anchored to the bottom and buoyed about 20 feet above the bottom, that the SEACON can home in on to relate its surface position to a fixed point on the sea floor. The RS-7 has an acoustic release from its anchor for retrieval after the operation is completed.

When this navigational fix has been established, the NSWC Camera Sled will be lowered over the port side using the P&H 325-TC Crane, Appendix D. SEACON will then move about as necessary to locate the recovery system, hook the bail with the grapnel, and hoist the recovery system and anchor clump aboard. There the cable will be cut and clamped to a leader wire

running from the hoisting position on the port side around to the stern of SEACON.

The length of Cable 24 to be recovered is 3280 feet. The cable end will be fed over the stern roller, through the conductor stringing block, around the Pengo Winch bull wheels and on to the take-up reel. SEACON will then begin to haul in on this segment of Cable 24 with the platform backing down at a speed such that the cable will run off the stern roller so that its entry angle into the water is greater than 45° and the tension does not exceed half the yield strength of the cable. Pickup will continue until the bitter end of the cable is hauled aboard. This inshore cable end is located near the splice shown in Figure 4. Upon completion of this operation the SEACON will return to the point of pickup, recover the RS-7, and then return to port.

On *T+1*, 21 April 1977, SEACON will again get underway and proceed out to the 100 fathom contour at 26° 04.07' N. Lat. and 80° 03.22' W. Long. where the seaward end of Cable 27 is located. There it will follow the identical procedure as on the previous day, pick up the length of Cable 27 lying on the bottom, and return to port.

On the following day, *T+2*, 22 April 1977, SEACON will get underway and move out to the seaward end of the other leg of Cable 24 which is located at 26° 03.10' N. Lat. and 80° 03.43' W. Long. The foregoing procedure of dropping the RS-7 Subsea Reference Beacon, picking up the cable end, and threading the cable end through to the Pengo Take-Up Reel will be followed. SEACON will then back in toward shore, reeling in the cable until approximately 9,860 feet has been taken aboard and the third splice has been reached.

At this point, the splice position will be recorded and SEACON will proceed back off shore heading directly for the RS-7 Subsea Reference Beacon. Cable 24 will be re-laid in an approximate straight line out to the original location where it was picked up. When this point is reached, the cable will be cut, the clump anchor with 1200 feet of retrieving wire plus bail will be attached and the anchor will be lowered to the bottom. Its precise position will be recorded. As the anchor is lowered the SEACON will maintain a tension on the retrieving wire in a seaward direction and, when the end of the retrieving wire is reached, the bail will be dropped to the bottom and its position recorded.

SEACON will then actuate the acoustic release on the RS-7, retrieve it, and head back to port. This completes the inshore range operations. The excess Cables 24 and 27 will be put ashore. These three days of inshore operation will be designated as Events 1, 2, and 3 in the table below which shows the schedule for these operations and the off shore operations in deep water that follow.

SCHEDULE OF AT-SEA OPERATIONS

| EVENT NUMBER | DAYS FROM START | DESCRIPTION OF OPERATION | FEET OF CABLE | DAY OF WEEK | CALENDAR DATE |
|---|---|---|---|---|---|
| 1 | T | RECOVER CABLE 24 SEGMENT | 3,280 | WEDNESDAY | 20 APRIL |
| 2 | T+1 | RECOVER CABLE 27 SEGMENT | 3,055 | THURSDAY | 21 APRIL |
| 3 | T+2 | RECOVER AND RE-LAY CABLE 24 | 9,860 | FRIDAY | 22 APRIL |
| 4 | T+3 | RECOVER AND RE-LAY CABLE 38 | 6,700 | SATURDAY | 23 APRIL |
| 5 | T+5 | LAY CABLE 57 | 108,800 | MONDAY | 25 APRIL |
| -- | T+6 | LOAD CABLE 58 | 104,910 | TUESDAY | 26 APRIL |
| 6 | T+7 | LAY CABLE 58 | 104,910 | WEDNESDAY | 27 APRIL |
| -- | T+8 | LOAD CABLE 59 | 101,000 | THURSDAY | 28 APRIL |
| -- | T+9 | LOAD CABLES 40, 41, & 22 | 63,400 | FRIDAY | 29 APRIL |
| 7 | T+12 | LAY CABLE 59 | 101,000 | MONDAY | 2 MAY |
| 8 | T+13 | LENTHEN CABLE 22 | 9,600 | TUESDAY | 3 MAY |
| 9 | T+14 | LENGTHEN CABLE 40 | 29,200 | WEDNESDAY | 4 MAY |
| 10 | T+15 | LENGTHEN CABLE 41 | 24,600 | THURSDAY | 5 MAY |
| 11 | T+21 | LENGTHEN CABLE 45 | 18,000 | WEDNESDAY | 11 MAY |
| 12 | T+22 | LENGTHEN CABLE 42 | 29,375 | THURSDAY | 12 MAY |

### 4.3 OFFSHORE RANGE OPERATIONS

The first deep water operation, Event Number 4, will involve the recovery and re-laying of Cable 38. The seaward cable end is in 1800 feet of water at 26° 02.6' N. Lat. and 79° 47.0' W. Long. and is fitted with a bail and recovery system. The RSB-1, SEACON, and UB-646 will proceed to this location and the RSB-1 will effect the recovery of the cable end. Upon recovery, SEACON will come alongside at a safe distance from RSB-1 and pass a wire rope messenger to the RSB-1 via the UB-646. The cable end will then be hauled aboard SEACON over the stern roller and on to the Pengo Winch as in previous operations.

SEACON will then back down to the west-northwest and recover approximately 6700 feet of cable. At this point she will swing to head northeast and begin moving ahead, re-laying the cable. The RSB-1 will station itself to the northeast of the implantment position to serve as a heading point for SEACON. The implantment position is 26° 03.4' N. Lat. and 79° 47.65' W. Long. When SEACON reaches this position she will attach to the cable a new recovery

system comprising a 2500 pound concrete anchor and 3000 feet of 5/8-inch wire rope and bail plus a triplane and pinger.

The cable for Event Number 5, Cable 59, will have been loaded in the cable crib on the SEACON deck at an earlier date. For this operation, theodolites will be added to the navigation equipment on all three vessels. Communications frequencies will be as follows:

| | | |
|---|---|---|
| NSWC | -- Channel A | 140.16 mHz |
| NSWC | -- Channel B | 140.58 mHz |
| SEACON | -- RSB-1, Bridge to Bridge | Channel 16 |
| | Operations | Channel 13 |
| | Deck to Deck, PT 400 | 140.05 mHz |
| | Deck to Deck, PT 400 | 140.35 mHz |

On *T+5*, at 0330, RSB-1, SEACON, and UB-646 will rendezvous at the cable end position at 26° 04.5' N. Lat. and 79° 47.6' W. Long., approximately 18.6 miles east of Port Everglades. Upon arrival at position, about 0630, the RSB-1 will go into a moor. When the RSB-1 notifies SEACON that she is in position, the SEACON will approach the starboard side of the RSB-1 approximately 1000 feet and hold station. At this time, the UB-646 will go alongside the RSB-1 and bring the 5/8-inch wire from the crane to the stern of the SEACON; this will be made fast to the end of Cable 59 over the stern roller. When this is done, the deck will notify SEACON Control and word will be passed to the RSB-1 to haul in. Approximately 1000 feet of cable will be passed to the RSB-1 before the SEACON starts the cable lay. The RSB-1 will roll up the 1000 feet on her cable reeler. When word is given from the RSB-1 that this has been accomplished, the SEACON will start to pay out cable, not to exceed the SEACON ahead speed over the bottom, and proceed towards the beach. Every 1000 feet of cable payed out will be called out to SEACON Control; tension will also be reported. The speed over the bottom will vary between 1.5 and 2.0 knots. When the SEACON is approximately 6 miles west of the plant position, the RSB-1 will plant the recovery system, get out of her moor, and proceed to Port Everglades.

The UB-646 will remain at all times, unless otherwise directed, with the SEACON. Approximately eight hours after cable lay has commenced, the beach crew will be notified of the ETA of SEACON in shallow water so that the theodolite stations can be manned. The SEACON will proceed into 20 feet of

water about 3500 feet east of the beach and hold position. At this point the cable will be cut and buoyed off. SEACON and UB-646 will return to port.

Cable 58 will be loaded into the SEACON cable crib on *T+6* at Berth 4. Event Number 6, on *T+7*, will involve the same laying procedure as used in Event Number 5 except that the sensor assembly 58 plant position will be at 26° 04.6' N. Lat. and 79° 48.3' W. Long. On *T+8*, Cable 59 will be loaded into the cable crib at Berth 4 and a similar laying procedure, Event Number 7, will be followed on *T+12* starting from a plant position for sensor assembly 59 at 26° 04.5' N. Lat. and 79° 49.0' W. Long.

Sufficient cable, 50,000 feet, for lengthening Cables 42 and 45 was to be stowed in the SEACON hold cable storage area during the period between *T-38* and *T-34*. On *T+9*, an additional length will be added in the SEACON cable storage to lengthen Cables 40, 41, and 22; this will be the final loading operation at Berth 4.

Event Number 8, the lengthening of Cable 22, will take place on *T+13*. The RSB-1 will go into a one-point moor, swing into position, lower the NSWC Camera Sled, and grapnel for the recovery system. She will then reel the 5/8-inch recovery wire on her cross-deck winch and stand by to receive the SEACON alongside to starboard. The SEACON will make her approach as close as the Captain of SEACON and the Captain of the RSB-1 deem prudent. A wire rope messenger will then be passed from the SEACON to the RSB-1 via the UB-646. When the messenger is secured, the word will be given to the SEACON to heave in and she will make fast the bitter end and make the splice, while maintaining a fixed position relative to the bottom. While the SEACON is making the cable splice, the RSB-1 will get out of her moor and re-moor in the new position of the cable end to seaward. When the SEACON has completed the splice, she will then commence the cable lay to the new position.

When SEACON reaches the plant position, a messenger line will be passed via the UB-646 from the RSB-1 to the SEACON. This will be secured to the laid cable and the cable will be cut inboard of the connection. The cable end will then be hauled aboard the RSB-1 for electrical checks, and for implantment. After passing off the cable end, SEACON will return to port.

Events 9, 10, 11, and 12, the lengthening of Cables 40, 41, 45, and 42 will follow an identical procedure with one minor exception. Cable 41 has a

tracking array secured to the cable end which will be recovered and removed by the RSB-1 before the cable end is passed over to the SEACON.

If the schedule for the above events can be maintained, the last lengthening operation will be completed on *T+22*, 12 May 1977. However, a ten day period has been allotted at the end of the at-sea operations for any contingencies that may arise.

## 5.0 DEMOBILIZATION

### 5.1 OFFLOADING AND REMOVAL OF EQUIPMENT FROM SEACON

After completion of the at-sea operations, SEACON will off load all excess cable at an NSWC-assigned berth. This includes all cable remaining in the hold cable storage area and in the cable crib on deck. The lengths of Cable 24 and Cable 27 that were retrieved from the bottom will be unreeled from the Pengo Take-Up Reel for storage at NSWC and all spare Pengo reels will be returned to be stowed aboard SEACON. Any navigation, communications, or other equipment borrowed from NSWC for the operation will be returned.

When this offloading of movable material has been completed, SEACON will transit to the TRACOR/MARINE shipyard for removal of fixed equipment. The powered sheave above the cable crib will be removed and returned and the tower and platform will be cut loose and put ashore. Similarly, the cable crib will be broken down and removed from SEACON.

Other equipment, belonging to SEACON, will be temporarily removed and transferred ashore while foundations are being removed or relocated. This includes the Pengo Winch, the conductor stringing block, and any gear installed on the port side for support and overside handling of the Camera Sled.

### 5.2 REFITTING AND RELOADING SEACON FOR RETURN TO BASE

Wherever temporarily relocated equipment foundations have been cut loose from the deck, deck excess material will be cleaned off, ground flush with the deck plating surface, and the area repainted. The after hatch and railing arrangement shall be restored to pre-operation conditions.

If the pre-operation foundations for the Pengo Winch, Pengo Powered Take-Up Reel, and Cross Deck Winch were covered over or removed, they shall

be replaced or restored to the condition existing when SEACON arrived in the Ft. Lauderdale area. This equipment will then be placed aboard and bolted down to the foundations.

The removed boom section of the P&H 325-TC Crane will not be refitted but arrangements will be made to stow it on board SEACON. Other equipment to be stowed aboard includes the instrumented conductor stringing block and the ship's truck as well as any other gear that was removed for the CAPTOR Cable Field Operations.

These shipyard operations are to be completed by *T+37*, 27 May 1977 and by *T+42*, 1 June 1977, SEACON is to be ready for tow in accordance with CHESNAVFACENGCOM INST 3100.1 and the U. S. Navy Towing Manual, NAVSEA 0925-000-1000.

### 5.3 DEMOBILIZATION OF PERSONNEL

Upon completion of the at-sea operations, offloading of SEACON, and transfer of SEACON to the shipyard, all UCT ONE and CHESNAVFACENGCOM personnel not required for the shipyard availability, nor for manning the tow, will be detached to their parent commands. Currently the return tow has not been scheduled. Therefore, manning arrangements will not be made until after a tug has been assigned and a date has been set for the SEACON return to its base at NAB, Little Creek.

# APPENDIX A

OPERATIONS ORDER
CHESNAVFACENGCOM OPORD 1-77

FOR OFFICIAL USE ONLY

OPERATIONS ORDER

CHESNAVFACENGCOM OPORD 1-77

Commanding Officer
Chesapeake Division
Naval Facilities
Engineering Command
Washington Navy Yard
Washington, DC 20374

161000R FEBRUARY 1977

REFERENCES: (a) NAVSURFWPNCTR Silver Spring MD 151405Z Dec 76
(b) COMNAVFACENGCOM Alexandria VA 222154Z Dec 76
(c) NAVFACENGCOM ltr 2 Nov 1976, Calendar Year 77-78 Tasking for UCT
(d) COMSERVGRU TWO 041916Z Jan 76
(e) COMSERVRON EIGHT 141831Z Feb 77
(f) CHESNAVFACENGCOMINST 3100.1

TIME ZONE: Use G.M.T. Romeo (+5) for operations.

TASK ORGANIZATION: Chesapeake Division, Naval Facilities Engineering Command, Washington Navy Yard, Washington, DC, shall be referred to as CHESNAVFACENGCOM. Naval Surface Weapons Center, Fort Lauderdale Facility, Port Everglades Harbor, shall be referred to as NSWC Ft. Lauderdale Facility. Commander, Naval Construction Battalion, U. S. Atlantic Fleet, NAB Little Creek, Norfolk, VA, shall be referred to as CBLANT. Underwater Construction Team ONE, NAB Little Creek, Norfolk, VA, shall be referred to as UCT ONE.

1. SITUATION. By reference (a), Naval Surface Weapons Center, White Oak, MD, requested CHESNAVFACENGCOM to assist in the extensive repair and modification of the CAPTOR Cable Field at NSWC Ft. Lauderdale Facility in April 1977. Reference (b) tasked CHESNAVFACENGCOM to organize and deploy personnel and equipment. Reference (c) requested tasking of CBLANT to provide fleet personnel from UCT ONE to assist in manning the OCP and provide for the construction team for this specific mission.

a. Enemy Forces: None.

b. Friendly Forces: U.S. Armed Forces Personnel and U.S. Government Employees

2. MISSION: CHESNAVFACENGCOM will deploy, from Norfolk, VA, to Ft. Lauderdale, FL, the Ocean Construction Platform (OCP) SEACON manned with appropriate personnel and equipment from CHESNAVFACENGCOM and UCT ONE to perform the requested cable repair services.

OPERATION ORDER

CHESNAVFACENGCOM OPORD 1-77

3. EXECUTION:

a. On 18 February 1977, CHESNAVFACENGCOM SEACON shall deploy to Ft. Lauderdale, FL, under tow of USNS MOSOPELEA as provided for by references (d) and (e). UCT ONE will provide available personnel to augment CHESNAVFACENGCOM personnel in manning the tow.

b. About 23 February 1977, after arrival at Ft. Lauderdale, designated CHESNAVFACENGCOM personnel and all UCT ONE personnel shall return to their respective commands.

c. On 18 April 1977, repair operations to the Ft. Lauderdale Range will commence. CHESNAVFACENGCOM and UCT ONE construction personnel will provide for the manning of the OCP and construction operations. Concept of operations shall be in accordance with NSWC OpPlan.

d. Upon range repair work completion, about 1 June 1977, the OCP will be demobilized and prepared for return tow to its base at NAB Little Creek, VA.

4. ADMINISTRATION/LOGISTICS:

a. Administrative and personnel support of the SEACON and CHESNAVFACENGCOM personnel shall continue to be provided by CHESNAVFACENGCOM. Messing and berthing aboard the OCP will be provided to all UCT ONE personnel.

b. The manning and operations of the OCP will be in accordance with reference (f).

c. NSWC Ft. Lauderdale Facility will provide, as agreed, local logistics support.

d. CHESNAVFACENGCOM will provide funding to CBLANT for the support of UCT ONE. Travel will be by commercial aircraft and/or SEACON, as appropriate.

5. COMMAND AND COMMUNICATIONS

a. ADCON of SEACON and CHESNAVFACENGCOM personnel will remain with CHESNAVFACENGCOM; ADCON of UCT ONE will remain with CBLANT.

b. During towing periods, OPCON of SEACON shall pass to Commanding Officer or Master of the towing vessel.

c. While in port at Ft. Lauderdale, during 22 February 1977 to 18 April 1977, OPCON of SEACON will revert to CHESNAVFACENGCOM.

OPERATION ORDER

CHESNAVFACENGCOM OPORD 1-77

d. During repair operations, 18 April to approximately 1 June 1977, OPCON shall pass to NSWC-designated Officer in Charge (OIC) for this project.

e. CHESNAVFACENGCOM's At-Sea Operations Director shall take direction from the OIC and provide coordination of operations between the OCP, CHESNAVFACENGCOM technical support personnel, and UCT ONE Detachment.

f. CHESNAVFACENGCOM SEACON shall submit weekly SITREPS in accordance with reference (f).

D. W. WITTSCHIEBE
CAPTAIN, CEC, USN

# APPENDIX B

## CHARACTERISTICS OF CURRENT ACTION IN THE CAPTOR CABLE FIELD AREA

The region where the Gulf of Mexico narrows to form the channel between Florida Keys and Cuba may be regarded as the head of the Gulf Stream. From this region the stream sets eastward and northward through the Straits of Florida, and after passing Little Bahama Bank it continues northward and then northeastward, following the general direction of the 100-fathom curve as far as Cape Hatteras. The flow in the Straits is frequently referred to as the Florida Current.

Shortly after emerging from the Straits of Florida, the stream is joined by the Antilles Current, which flows northwesterly along the open ocean side of the West Indies before uniting with the water which has passed through the straits. Beyond Cape Hatteras the combined current turns more and more eastward under the combined effects of the deflecting force of the earth's rotation and the eastwardly trending coast line, until the region of the Grand Banks of Newfoundland is reached.

Eastward of the Grand Banks the whole surface is slowly driven eastward and northeastward by the prevailing westerly winds to the coastal waters of northwestern Europe. For distinction, this broad and variable wind-driven surface movement is sometimes referred to as the North Atlantic Drift or Gulf Stream Drift.

In general, the Gulf Stream as it issues into the sea through the Straits of Florida may be characterized as a swift, highly saline current of blue water whose upper stratum is composed of warm water.

On its western or inner side, the Gulf Stream is separated from the coastal waters by a zone of rapidly falling temperature, to which the term "cold wall" has been applied. It is most clearly marked north of Cape Hatteras but extends, more or less well defined, from the Straits to the Grand Banks.

Throughout the whole stretch of 400 miles in the Straits of Florida, the stream flows with considerable velocity. Abreast of Habana, the average surface velocity in the axis of the stream is about 2½ knots. As the cross-sectional area of the stream decreases, the velocity increases gradually, until abreast of Cape Florida it becomes about 3½ knots. From this point within the narrows of the straits, the velocity along the axis gradually decreases to about 2½ knots off Cape Hatteras, N. C. These values are for the axis of the stream where the current is a maximum, the velocity of the stream decreasing gradually from the axis as the edges of the stream are approached. The velocity of the stream, furthermore, is subject to fluctuations brought about by variations in winds and barometric pressure.

The following tables give the mean surface velocity of the Gulf Stream in two cross sections in the Straits of Florida:

*Between Rebecca Shoal and Cuba*

| Distance south of Rebecca Shoal | Mean surface velocity observed |
|---|---|
| *Nautical miles* | *Knots* |
| 20 | 0.3 |
| 35 | 0.7 |
| 50 | 2.2 |
| 68 | 2.2 |
| 86 | 0.8 |

*Between Fowey Rocks and Gun Cay*

| Distance east of Fowey Rocks | Mean surface velocity observed |
|---|---|
| *Nautical miles* | *Knots* |
| 8 | 2.7 |
| 11½ | 3.5 |
| 15 | 3.2 |
| 22 | 2.7 |
| 29 | 2.1 |
| 36 | 1.7 |

Crossing the Gulf Stream at Jupiter or Fowey Rocks, an average allowance of 2½ knots in a northerly direction should be made for the current.

Crossing the stream from Habana, a fair allowance for the average current between 100-fathom curves is 1.1 knots in an east-north-easterly direction.

From within the straits, the axis of the Gulf Stream runs approximately parallel with the 100-fathom curve as far as Cape Hatteras. Since this stretch of coast line sweeps northward in a sharper curve than does the 100-fathom line, the stream lies at varying distances from the shore. The lateral boundaries of the current within the straits are fairly well fixed, but when the stream flows into the sea the eastern boundary becomes somewhat vague. On the western side, the limits can be defined approximately since the waters of the stream differ in color, temperature, salinity, and flow from the inshore coastal waters. On the east, however, the Antilles Current combines with the Gulf Stream, so that its waters here merge gradually with the waters of the open Atlantic. Observations of the Coast and Geodetic Survey indicate that, in general, the average position of the inner edge of the Gulf Stream as far as Cape Hatteras lies inside the 50-fathom curve. The Gulf Stream, however, shifts somewhat with the seasons, and is considerably influenced by the winds which cause fluctuations in its position, direction, and velocity; consequently, any limits which are assigned refer to mean or average positions.

The approximate mean positions of the inner edge and axis (point where greatest velocity may be found) are indicated in the following table:

*Approximate mean position of the Gulf Stream*

| Locality | Inner edge | Axis |
|---|---|---|
| | *Nautical miles* | *Nautical miles* |
| North of Habana, Cuba | | 25 |
| Southeast of Key West, Fla. | | 45 |
| East of Fowey Rocks, Fla. | | 10 |
| East of Miami Beach, Fla. | | 15 |
| East of Palm Beach, Fla. | | 15 |
| East of Jupiter Inlet, Fla. | | 20 |
| East of Cape Canaveral, Fla. | 10 | 45 |
| East of Daytona Beach, Fla. | 25 | 75 |
| East of Ormond Beach, Fla. | 25 | 75 |
| East of St. Augustine, Fla. (coast line) | 40 | 85 |
| East of Jacksonville, Fla. (coast line) | 55 | 80 |
| Southeast of Savannah, Ga. (coast line) | 65 | 95 |
| Southeast of Charleston, S. C. (coast line) | 55 | 80 |
| Southeast of Myrtle Beach, S. C. | 60 | 100 |
| Southeast of Cape Fear, N. C. (light) | 35 | 75 |
| Southeast of Cape Lookout, N. C. (light) | 20 | 50 |
| Southeast of Cape Hatteras, N. C. | 10 | 35 |
| Southeast of Virginia Beach, Va. | 85 | 115 |
| Southeast of Atlantic City, N. J. | 120 | ..... |
| Southeast of Sandy Hook, N. J. | 150 | ..... |

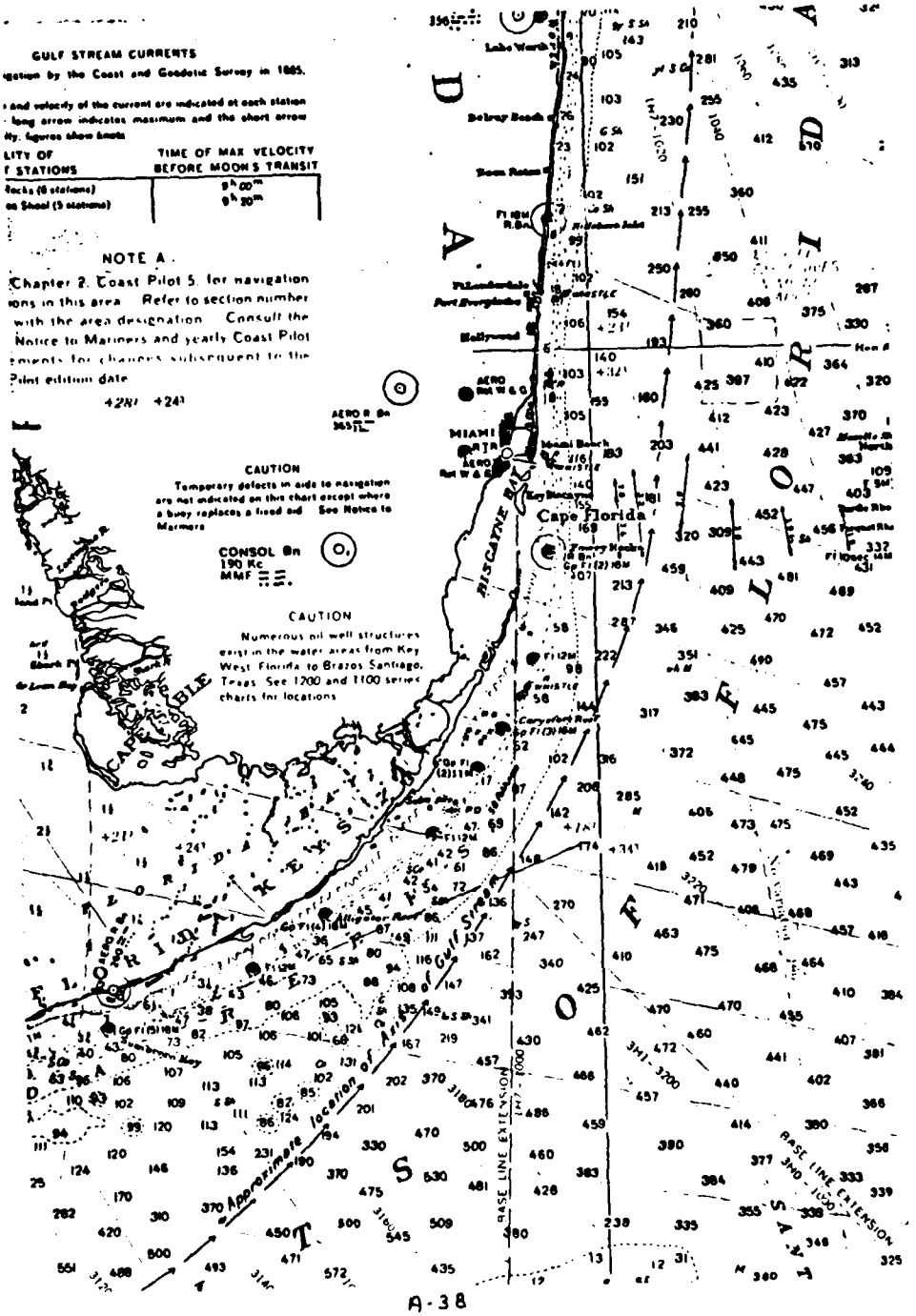
At the western end of the Straits of Florida the limits of the Gulf Stream are not well defined, and for this reason the location of the inner edge has been omitted for Habana, Cuba, and Key West, Fla., in the above table. Between Fowey Rocks and Jupiter Inlet the inner edge is deflected westward and lies very close to the shore line.

Along the Florida Reefs between Alligator Reef and Dry Tortugas the distance of the northerly edge of the Gulf Stream from the edge of the reefs gradually increases toward the westward. Off Alligator Reef it is quite close inshore, while off Rebecca Shoal and Dry Tortugas it is possibly 15 to 20 miles south of the 100-fathom curve. Between the reefs and the northern edge of the Gulf Stream the currents are ordinarily tidal and are subject at all times to considerable modification by local winds and barometric conditions. This neutral zone varies in both length and breadth; it may extend along the reefs a greater or less distance than stated, and its width varies as the northern edge of the Gulf Stream approaches or recedes from the reefs.

The approximate position of the axis of the Gulf Stream for various regions is shown on the following Coast and Geodetic Survey Charts: No. 1002, Straits of Florida; No. 1007, South Carolina to Cuba; No. 1112, Cape Canaveral to Key West; No. 1113, Alligator Reef to Habana. Chart No. 1001 shows the axis and the position of the inner edge of the Gulf Stream from Cape Hatteras to Straits of Florida.

| No. | PLACE | POSITION | | TIME DIFFERENCES | | VELOCITY RATIOS | | MAXIMUM CURRENTS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Flood | | Ebb | |
| | | Lat. | Long. | Slack water | Maximum current | Maximum flood | Maximum ebb | Direction (true) | Average velocity | Direction (true) | Average velocity |
| | | ° ′ | ° ′ | h. m. | h. m. | | | *deg.* | *knots* | *deg.* | *knots* |
| | | | | on MIAMI HARBOR | | | | | | | |
| | PORT EVERGLADES | | | | | | | | | | |
| 2267 | Entrance from sea | 26 06 | 80 07 | −0 15 | −0 35 | 0.4 | 0.4 | 265 | 0.7 | 85 | 0.8 |
| 2269 | Turning Basin, 300 yards north of | 26 06 | 80 07 | −0 40 | −0 55 | 0.5 | 0.9 | 350 | 0.9 | 160 | 1.8 |
| 2271 | Entrance from southward (canal) | 26 05 | 80 07 | +0 20 | −0 15 | 0.7 | 0.8 | 165 | 1.3 | 0 | 1.7 |

## EAST FLORIDA COAST IN AREA OF GULF STREAM



# APPENDIX C

DATA ON SEACON AND A. B. WOOD
EXTRACTED FROM THE
OCEAN CONSTRUCTION PLATFORM COMPENDIUM

☐ GEOMETRY: THE R/V A.B. WOOD II HAS A DECK LENGTH OF 150 FEET; INCLUDING THE WORKING PLATFORM FOR THE BOW SHEAVE THE OVERALL LENGTH IS 157.75 FEET. THE LENGTH ON THE 10.00 FOOT LOAD WATERLINE IS 145.75 FEET. BEAM IS 36.00 FEET AND THE DEPTH AMIDSHIPS IS 13.00 FEET. THE SHIP HAS A REGISTERED GROSS TONNAGE OF 195, AND ACCOMMODATIONS FOR ITS NORMAL CREW OF 7 OFFICERS AND MEN.

☐ HYDROSTATICS: THE SHIP HAS A MAXIMUM SALT WATER DISPLACEMENT OF 750 TONS AT THE 10.00 FOOT WATERLINE AND FREEBOARD TO THE WORKING DECK IS 3.00 FEET. WITH ITS BROAD BEAM THE WOOD IS EXCEPTIONALLY STABLE. IN ADDITION, IT IS EQUIPPED WITH A FLUME STABILIZATION SYSTEM THAT KEEPS SEAWAY MOTIONS TO A MINIMUM FOR OPTIMUM WORK PERFORMANCE IN HEAVY WEATHER.

☐ STRUCTURE: THE WOOD WAS DESIGNED AND CONSTRUCTED OF ALL-WELDED STEEL AS AN OCEAN WORK PLATFORM. THE HOUSE STRUCTURE FORWARD EXTENDS FOR ONLY ABOUT 50 FEET ABAFT THE BOW WITH THE REMAINING 100 FEET OF THE WEATHER DECK AVAILABLE FOR EQUIPMENT AND HANDLING GEAR. THE 2900 SQUARE FOOT WORKING AREA IS SPECIALLY STRENGTHENED TO TAKE THE CONCENTRATED LOADS OF CRANES, WINCHES, AND OTHER HEAVY WEIGHTS.

☐ MACHINERY: EACH OF THE TWO CATERPILLAR MAIN PROPULSION DIESEL ENGINES ARE RATED AT 765 HORSEPOWER. SUPPLEMENTARY PROPULSION POWER IS PROVIDED BY THE 100 HORSEPOWER ACTIVE RUDDER ON THE CENTERLINE AFT OF THE TWO MAIN SCREWS. ADDITIONALLY THE SHIP IS FITTED WITH A 100 HORSEPOWER TUNNEL-TYPE BOW THRUSTER. THE ELECTRICAL SYSTEM IS POWERED BY TWO GENERAL MOTORS 100KW, 60HZ, AC DIESEL-GENERATORS PLUS AN EMERGENCY DIESEL GENERATOR. THE TWIN STACKS, EACH SERVING A MAIN ENGINE AND A GENERATOR ENGINE ARE LOCATED AT THE DECK EDGE TO MAXIMIZE THE CENTERLINE WORKING AREA.

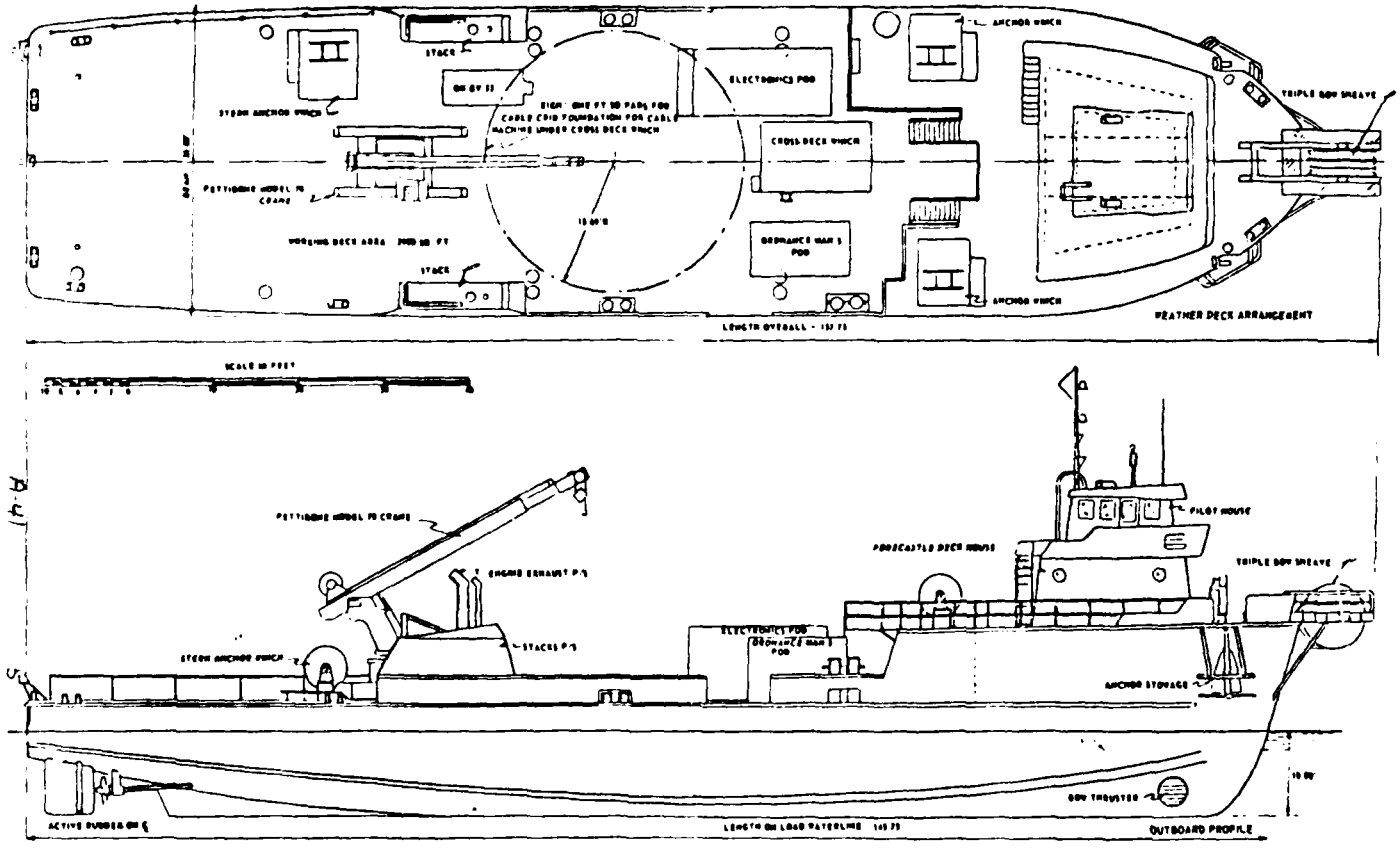
☐ OUTFIT: A PETTIBONE MODEL 70 CRANE IS PERMANENTLY INSTALLED ON THE MAIN DECK AT ABOUT HALF-LENGTH OF THE WORKING AREA; THIS CRANE HAS A BOOM EXTENDABLE TO 85 FEET WITH A CAPACITY OF 35 TONS AT A 10-FOOT RADIUS. THERE ARE THREE ANCHOR WINCHES, TWO ON THE AFTER END OF THE FORECASTLE DECK AND ONE APT ON THE MAIN DECK. THE DRUM CAPACITY OF EACH OF THESE WINCHES IS 7000 FEET OF 3/4-INCH WIRE; PULL CAPABILITY IS 30,000 POUNDS ON THE FIRST LAYER AND 10,000 POUNDS ON A FULL DRUM. TAKE-UP SPEED IS 100 FEET PER MINUTE ON THE FIRST LAYER AND 300 FEET PER MINUTE ON THE FULL DRUM. THE CROSS-DECK WINCH, JUST ABAFT THE HOUSE STRUCTURE, HAS TWO DRUMS 17.5 INCHES LONG WITH 40-INCH DIAMETER FLANGES; EACH DRUM HAS A CAPACITY OF 2000 FEET OF 3/4-INCH WITH A 12,000 POUND PULL AT 230 FEET PER MINUTE ON THE NINTH LAYER. FOR HANDLING HEAVY WEIGHTS OVER THE BOW, THERE ARE MOUNTED THREE SHEAVES, 7.50 FEET IN DIAMETER WITH A WORKING PLATFORM FOR HANDLING AND OBSERVATION; THERE IS A CABLE PASSAGEWAY THROUGH THE FORECASTLE DECKHOUSE TO RUN CABLE FROM THESE SHEAVES BACK TO TI CROSS-DECK WINCH. RADIO EQUIPMENT CONSISTS OF ONE KONEL, ONE APELCO AM MARINE BAND, ONE RF COMM HFSSB, AND ONE RF COMM VHF-FM RADIO TELEPHONE. NAVIGATION EQUIPMENT INCLUDES A DECCA, 48 MILE RANGE RADAR, A KELVIN-HUGHES, A /C MODE LORAN, A SPERRY GYROCOMPASS, AUTOPILOT, AND REMOTE REPEATERS, AND A RAYTHEON 400 FATHOM RECORDING ECHO-SOUNDER. SEPARATE INTERCOM SYSTEMS ARE PROVIDED FOR SHIP AND SCIENTIFIC PARTY USE AS WELL AS ON-DECK LOUD-HAILING AND TALKBACK CAPABILITY.

☐ PROPULSION AND MANEUVERING: THE CRUISING RANGE IS 6800 NAUTICAL MILES AT A CRUISING SPEED OF 10.50 KNOTS. THE ACTIVE RUDDER CAN BE USED TO INCREASE SLIGHTLY THE CRUISING SPEED, TO SERVE AS A TAKE HOME DEVICE IN CASE OF MAIN ENGINE FAILURE AND, IN CONJUNCTION WITH THE BOW THRUSTER, GIVES THE SHIP A LIMITED DYNAMIC POSITIONING AND GOOD STATION KEEPING CAPABILITY. THE MAIN ENGINES, AS WELL AS THE TWO THRUSTERS AND THE STEERING SYSTEM ARE CONTROLLED FROM THE PILOT HOUSE; THE AUTOPILOT CAN BE USED IN CONTROLLING THE RUDDERS FOR COURSEKEEPING AT SE.

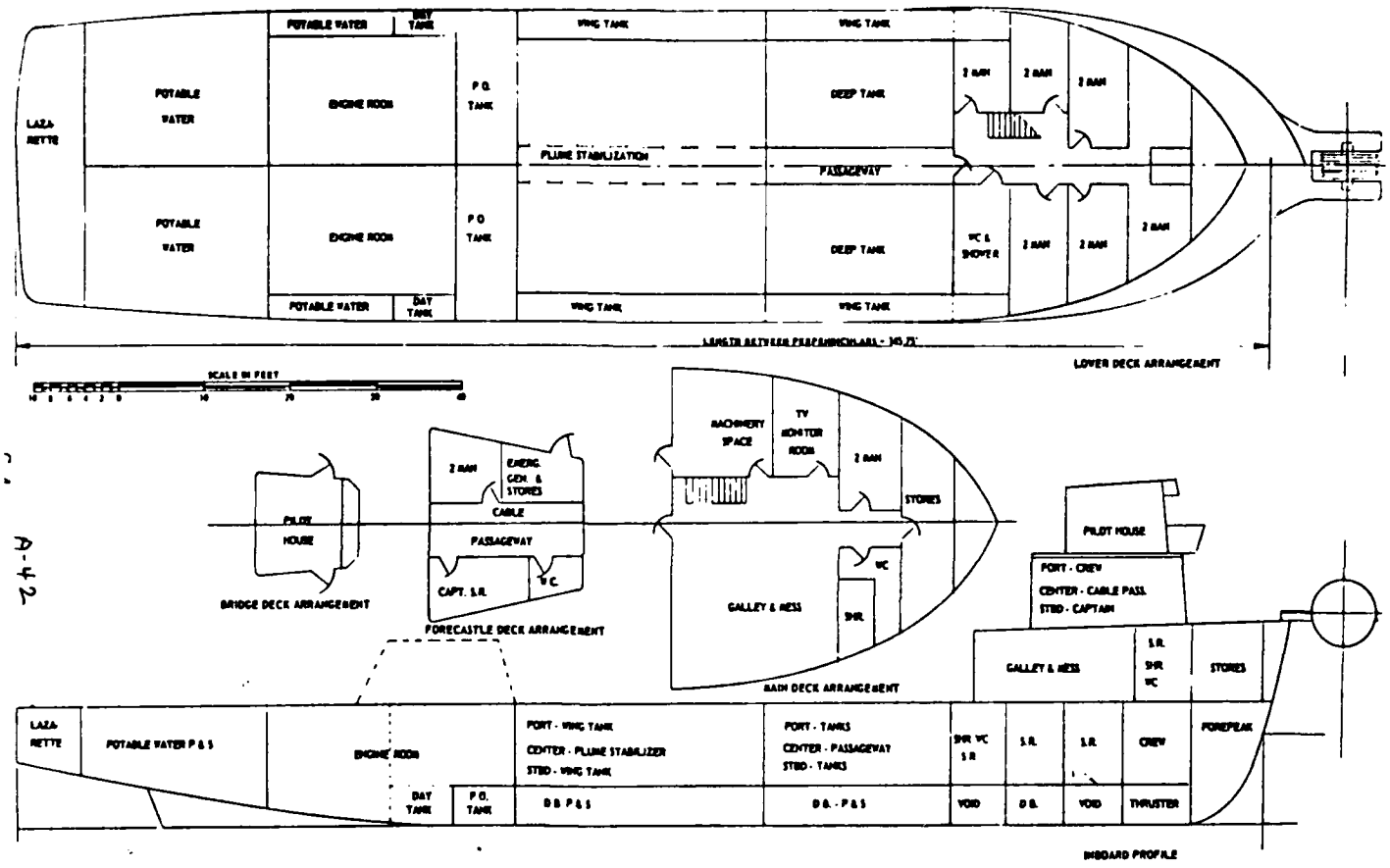
☐ MISSION SUPPORT: IN ADDITION TO CREW ACCOMMODATIONS THERE ARE PASSENGER ACCOMMODATIONS IN ONE, TWO, AND FOUR-BERTH STATEROOMS FOR TOTAL OF 17 PERSONS; THESE QUARTERS ARE FULLY HEATED AND AIR-CONDITIONED. LABORATORY SPACE HAS BEEN MINIMIZED TO 75 SQUARE FEET, PRIMARILY USED FOR OVERBOARD TELEVISION MONITORING, IN ORDER TO MAXIMIZE THE DECK SPACE AVAILABLE FOR OVERBOARD LOAD HANDLING. HOWEVER, PORTABLE, STEEL-CONSTRUCTION, AIR-CONDITIONED LABORATORIES CAN BE MOUNTED ON DECK AND SUPPLIED WITH POWER, WATER, AND AIR AS REQUIRED. FOR CURRENT USAGE, ONE ELECTRONICS POD AND AN ORDNANCE-MANS POD OF OF THIS TYPE ARE INSTALLED.

D-40

| | |
|---|---|
| SEAGOING WORK PLATFORM<br>PHYSICAL AND PERFORMANCE CHARACTERISTICS | R/V A.B. WOOD II: OWNED BY TRACOR MARINE<br>CHARTERED TO MSC |




| | | |
|---|---|---|
| SEAGOING WORK PLATFORM<br>OVERALL GEOMETRY | R/V A. B. WOOD II | OWNED BY TRACOR MARINE<br>CHARTERED TO MSC |




A-42

| | |
|---|---|
| SEAGOING WORK PLATFORM<br>INTERNAL ARRANGEMENTS | R V A. B. WOOD II: OWNED BY TRACOR MARINE<br>CHARTERED TO MSC |

☐ GEOMETRY: THE NAVFACENGCOM SEACON WAS CONVERTED TO AN OCEAN CONSTRUCTION PLATFORM IN 1976. THE HULL USED FOR CONVERSION, A NON-SELF-PROPELLED SEAGOING BARGE DESIGNATED YFNB-33, WAS LAST USED BY NASA FOR TRANSPORTING SATURN ROCKET COMPONENTS TO CAPE CANAVERAL. THE BASIC BARGE HULL HAS A LENGTH OVERALL OF 260 FEET WITH A BEAM OF 48 FEET. IT HAS A SPOON SHAPED BOW AND A TYPICAL RAKE-ENDED BARGE STERN, AND IS FITTED WITH A PAIR OF SKEGS FOR STABILITY IN TOWING. DEPTH TO THE MAIN DECK, WHICH RUNS THE FULL LENGTH OF THE SHIP, IS 15 FEET ABOVE THE BASELINE. RAMPS, PORT AND STARBOARD, RUN FROM THE MAIN DECK, 50 FEET ABAFT THE BOW, UP TO THE FORECASTLE DECK, WHICH EXTENDS 26 FEET ABAFT THE BOW AT A HEIGHT OF 23.75 FEET ABOVE THE BASELINE. THE MAIN DECKHOUSE RUNS FROM THE AFTER END OF THE FORECASTLE DECK TO THE MIDSHIP SECTION, 130 FEET AFT OF THE BOW. THE REMAINING 130 FEET OF THE MAIN DECK AFT IS AVAILABLE FOR CONSTRUCTION EQUIPMENT AND ACTIVITIES. THE MAIN DECKHOUSE HAS A BEAM OF 40 FEET AND A HEIGHT OF 12.50 FEET ABOVE THE MAIN DECK. TWO DECK HOUSES ABOVE THE MAIN DECK-HOUSE ARE PROVIDED. THE 02 LEVEL EXTENDS FROM 38 FEET TO 114 FEET ABAFT THE BOW AT A HEIGHT OF 36 FEET ABOVE THE BASELINE, AND HAS A BEAM OF 32 FEET. THE 03 LEVEL, OR TOP OF HOUSE, EXTENDS FROM 38 FEET TO 82 FEET ABAFT THE BOW AT A HEIGHT OF 44 FEET ABOVE THE BASELINE, AND HAS A BEAM OF 12 FEET.

] HYDROSTATICS: THE BASIC YFNB HULL HAD A SALT WATER DISPLACE-MENT OF 3000 TONS AT A DRAFT OF 10.0 FEET WHICH WAS THE DESIGN DRAFT FOR THIS PARTICULAR HULL. SEACON IS SO OUTFITTED THAT IT WILL HAVE A FULL LOAD DISPLACEMENT OF 3648 TONS SALT WATER AT A MEAN DRAFT OF 2.74 FEET WITH A TRIM OF 2.80 FEET BY THE STERN. FOR THIS CONDITION THE CENTER OF GRAVITY IS 1 0.36 FEET ABOVE THE KEEL AND 136.70 FEET ABAFT THE FORE PERPENDICULAR: THE HEIGHT OF THE CENTER OF BUOY-ANCY IS 6.69 FEET ABOVE THE KEEL AND THE METACENTRIC HEIGHT, COR-RECTED FOR FREE SURFACE, IS 11.50 FEET. IN THE LIGHT SHIP CONDITION, THE SHIP DISPLACES 1240 TONS SALT WATER AT A MEAN DRAFT OF 4.80 FEET WITH A TRIM OF 0.83 FEET BY THE BOW. FOR THIS CONDITION, THE CENTER OF GRAVITY IS 15.50 FEET ABOVE THE KEEL AND 122.40 FEET ABAFT THE FORE PERPENDICULAR; THE HEIGHT OF THE CENTER OF BUOYANCY IS 2.50 FEET ABOVE THE KEEL AND THE METACENTRIC HEIGHT, CORRECTED FOR FREE SURFACE, IS 28.05 FEET.

] STRUCTURE: THE BASIC STRUCTURE IS OF ALL WELDED STEEL, TRANSVERSELY FRAMED. FRAME SPACING IS 2.00 FEET FROM THE FORE PER-PENDICULAR TO THE FORE PEAK BULKHEAD AT FRAME 7 AND 6.00 FEET FROM THERE AFT TO WATERTIGHT BULKHEAD 11 AT THE AFTER END OF THE FOR-WARD PROPULSION ROOM. SPACING BETWEEN FRAMES 11 AND 12 AND BETWEEN 22 AND 23 IS 12.00 FEET AND THE INTERVENING FRAMES ARE SPACED 16.00 FEET. AT THE STERN, IN THE AFTER PROPULSION MACHINERY ROOM, SPACING IS 6.00 FEET BETWEEN FRAMES 23 AND 27 AND FROM THERE TO THE TRANSOM THE SPACING IS 2.00 FEET. THE MAIN DECK IS BOTH THE FREEBOARD DECK AND THE STRENGTH DECK WITH ALL NINE TRANSVERSE WATERTIGHT BULKHEADS TERMI-NATING AT THAT DECK. A 3.00 FOOT DEEP INNERBOTTOM RUNS THE LENGTH OF THE SHIP BETWEEN THE PROPULSION MACHINERY SPACES EXCEPT IN WAY OF THE 11.00 BY 16.00 FOOT CENTERWELL.

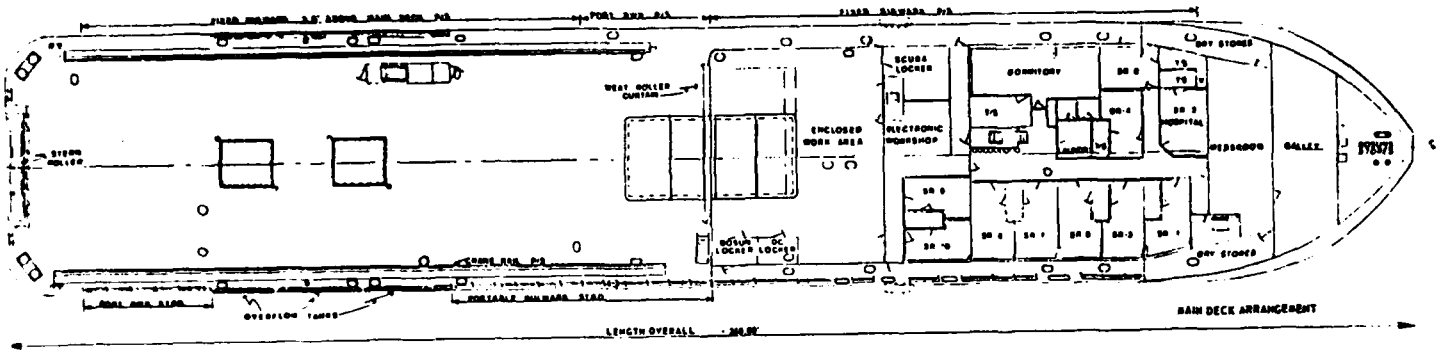
] MACHINERY: THE THREE VOITH-SCHNEIDER VERTICAL AXIS ROTATING BLADE PROPELLERS ARE EACH DRIVEN BY DIESEL ENGINES THROUGH HYDRAULIC POWER TRANSMISSIONS AND CLUTCHES. THE ENGINES TURN AT A CONSTANT SPEED OF 1800 RPM WHICH IS REDUCED TO 600 RPM INPUT TO THE PROPELLERS; THE PROPELLER BLADE ROTORS TURN AT 140 RPM AND ALL THRUST AND MANEU-VERING CONTROL IS EXERCISED BY VARYING PROPELLER BLADE PITCH. THE FORWARD ENGINE IS A GM 12-71 DIESEL RATED AT 360 HORSEPOWER AT 1800 RPM. EACH OF THE TWO AFTER PROPELLERS IS DRIVEN BY TWIN GM 6-71 ENGINES, ALSO RATED AT 360 HORSEPOWER AT 1800 RPM. AUXILIARY POWER IS FURNISHED BY TWO GM 6-71 ENGINES EACH DRIVING A 250 KW-450 VOLT A.C. GENERATOR. THIS POWER IS TRANSFORMED DOWN TO 115 VOLTS FOR ALL SHIPBOARD USES. THESE GENERATORS ARE LOCATED IN THE PORT SIDE OF THE AUXILIARY MACHINERY SPACE BETWEEN FRAMES 12 AND 14. THE STARBOARD SIDE OF THIS SPACE IS THE PUMP ROOM CONTAINING ALL PUMPING MACHINERY REQUIRED FOR BALLASTING AND FOR OIL TRANSFER.

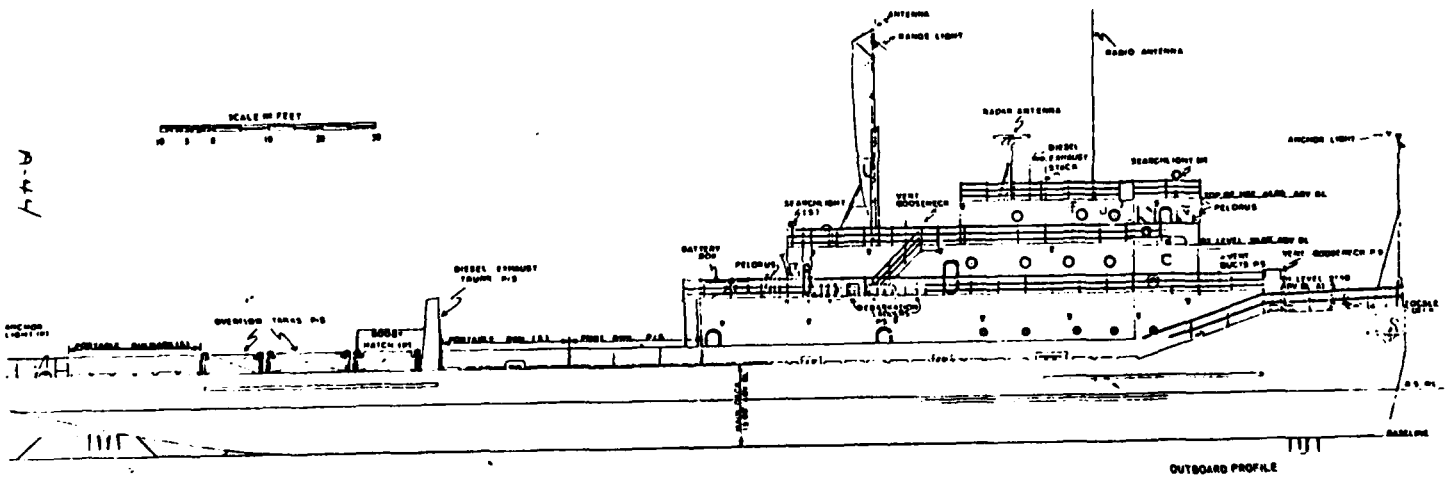
☐ OUTFIT: SEACON IS OUTFITTED FOR MAXIMUM EFFECTIVENESS AS AN OCEAN CONSTRUCTION PLATFORM. INCLUDED IS A CENTER WELL, 32 X 16 FEET, WITH HINGED BOTTOM DOORS AND PORTABLE HATCH COVERS AT THE MAIN DECK LEVELS. THE FORWARD HALF OF THE WELL IS COVERED BY A ROLLING CURTAIN DOOR EXTENDING FROM THE 01 LEVEL DOWN TO THE MAIN DECK TO PERMIT WORK-ING THROUGH THE WELL IN INCLEMENT WEATHER. A STERN ROLLER IS PROVIDED FOR WORK OVER THE TRANSOM AND FOUNDATIONS ARE FITTED TO THE MAIN DECK TO SUPPORT A CROSS DECK WINCH, WHICH CAN WORK OVER THE STERN OR THROUGH THE CENTER WELL, AND A PENGO CONSTANT TENSION WINCH FOR CABLE HANDLING. RAILS ARE INSTALLED TO SUPPORT A TRAVELING GANTRY CRANE TO COVER THE ENTIRE AFTER PORTION OF THE MAIN DECK. THE HOLD, BETWEEN FRAMES 20 AND 24, IS RIGGED FOR STOWAGE OF CABLE ON REELS OR TO SERVE AS A CABLE TANK WITH ADDITIONAL STOWAGE BETWEEN FRAMES 22 AND 23. TWIN CAPSTANS ARE PRO-VIDED FOR ANCHOR HANDLING FORWARD AND A STERN ANCHOR CAN BE HANDLED OVER THE STERN ROLLER. THE SHIP IS FITTED WITH ALL MODERN AIDS FOR POSI-TION FINDING BY LORAN, SATELITE, OR SONAR NAVIGATION PLUS A GYROCOMPASS AND SPEED MEASURING EQUIPMENT.

☐ MANEUVERING AND CONTROL: THE SHIP IS CAPABLE OF DYNAMIC POSI-TIONING WITH CONTROLS LOCATED BOTH IN THE PILOT HOUSE AND IN THE CON-TROL ROOM. POSITION CAN BE ESTABLISHED EITHER BY AN AMF ATNAV ACOUS-TIC LOCATION SYSTEM, A HONEYWELL RS-7 ACOUSTIC TRANSPONDER SYSTEM, OR THE NAVFAC MINIRANGER SYSTEM. HEADING CONTROL IS AUTOMATICALLY MAIN-TAINED BY A C. PLATH AUTOPILOT WORKING IN COMBINATION WITH THE TANO STEERING SYSTEM AND TRANSLATION IS MANUALLY CONTROLLED WITH A JOY-STICK IN RESPONSE TO LATERAL POSITION INDICATORS ON EACH CONTROL CON-SOLE. THIS COMBINATION ACTUATES THE PITCH CHANGING MECHANISM ON ALL THREE PROPELLERS TO PRODUCE THE REQUIRED TRANSLATIONAL FORCES AND ROTATIONAL MOMENTS. THE VESSEL HAS A MAXIMUM AHEAD SPEED OF 7.50 KNOTS BUT NORMALLY TRANSITS TO AN OCEAN CONSTRUCTION STATION UNDER TOW.

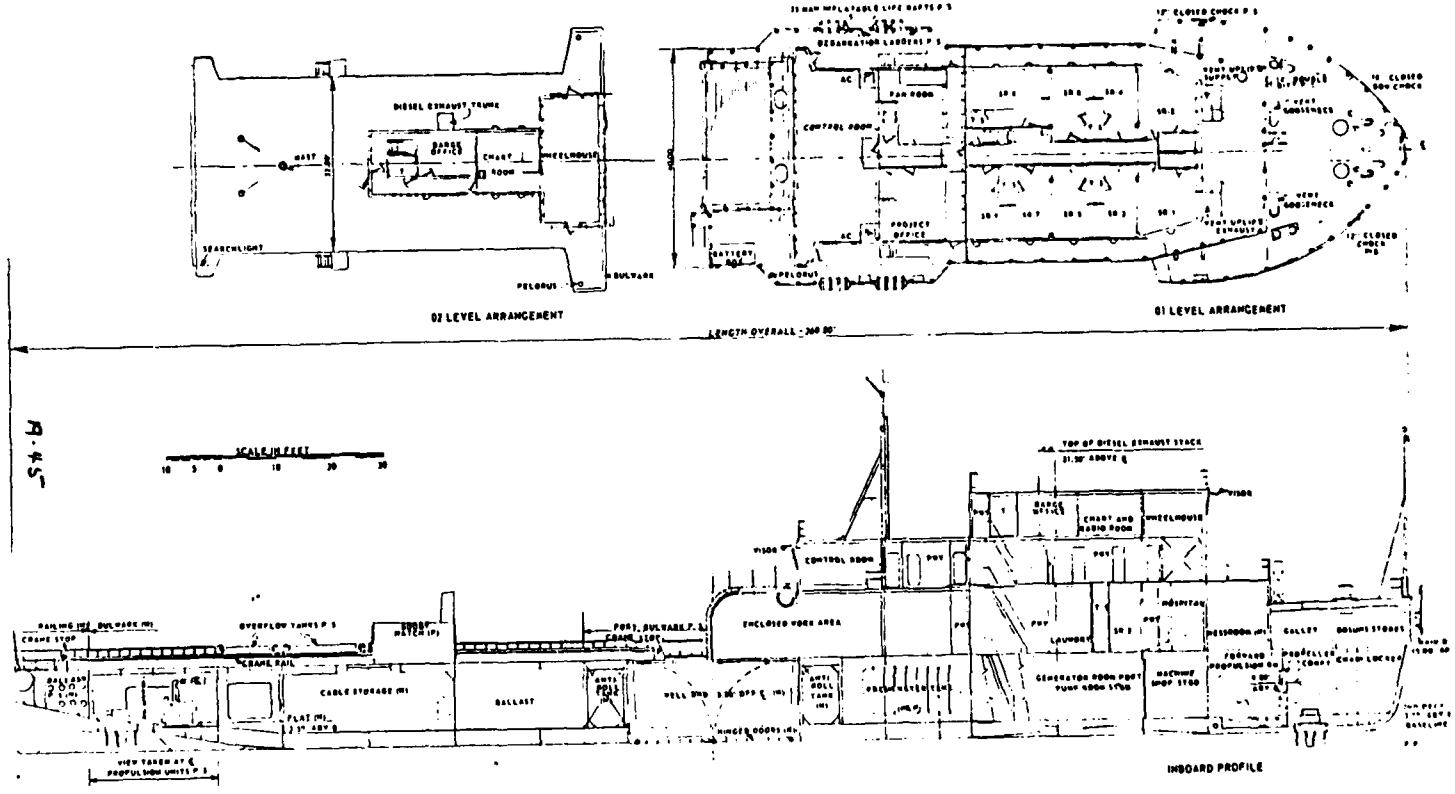
☐ MISSION SUPPORT: SEACON IS SPECIFICALLY DESIGNED FOR OCEAN CON-STRUCTION ACTIVITIES. IT HAS AIR CONDITIONED QUARTERS AND MESSING FACIL-ITIES FOR A TOTAL OF 50 PERSONS, 18 TO 23 OF WHICH ARE VESSEL OPERATORS AND THE REMAINDER ARE CONSTRUCTION PERSONNEL. THESE ACTIVITIES ARE DIRECTED FROM THE CONTROL STATION WHICH HAS AN UNOBSTRUCTED VIEW OF THE AFTER DECK AND TELEVISION MONITORS OF OTHER AREAS WHERE WORK IS BEING PERFORMED INCLUDING UNDERWATER CAMERAS. A TRAVELING GANTRY CRANE, CURRENTLY BEING PROCURED, WILL PROVIDE FOR THE HANDLING OF HEAVY LOADS ACROSS THE DECK AND OVER THE STERN. A CROSS-DECK WINCH WILL HANDLE LOADS THROUGH THE CENTER WELL, AND A CABLE WINCH SERVES FOR HANDLING ELECTRICAL AND ACOUSTICAL CABLES. PASSIVE ANTI-ROLLING TANKS ARE INSTALLED TO KEEP MOTIONS TO A MINIMUM WHEN USED IN CONJUNC-TION WITH THE AUTOMATIC HEADING CONTROL FOR SHIP ORIENTATION.

| | | |
|---|---|---|
| A-43 | SEAGOING WORK PLATFORM<br>PHYSICAL AND PERFORMANCE CHARACTERISTICS | NAVFACENGCOM-SEACON |



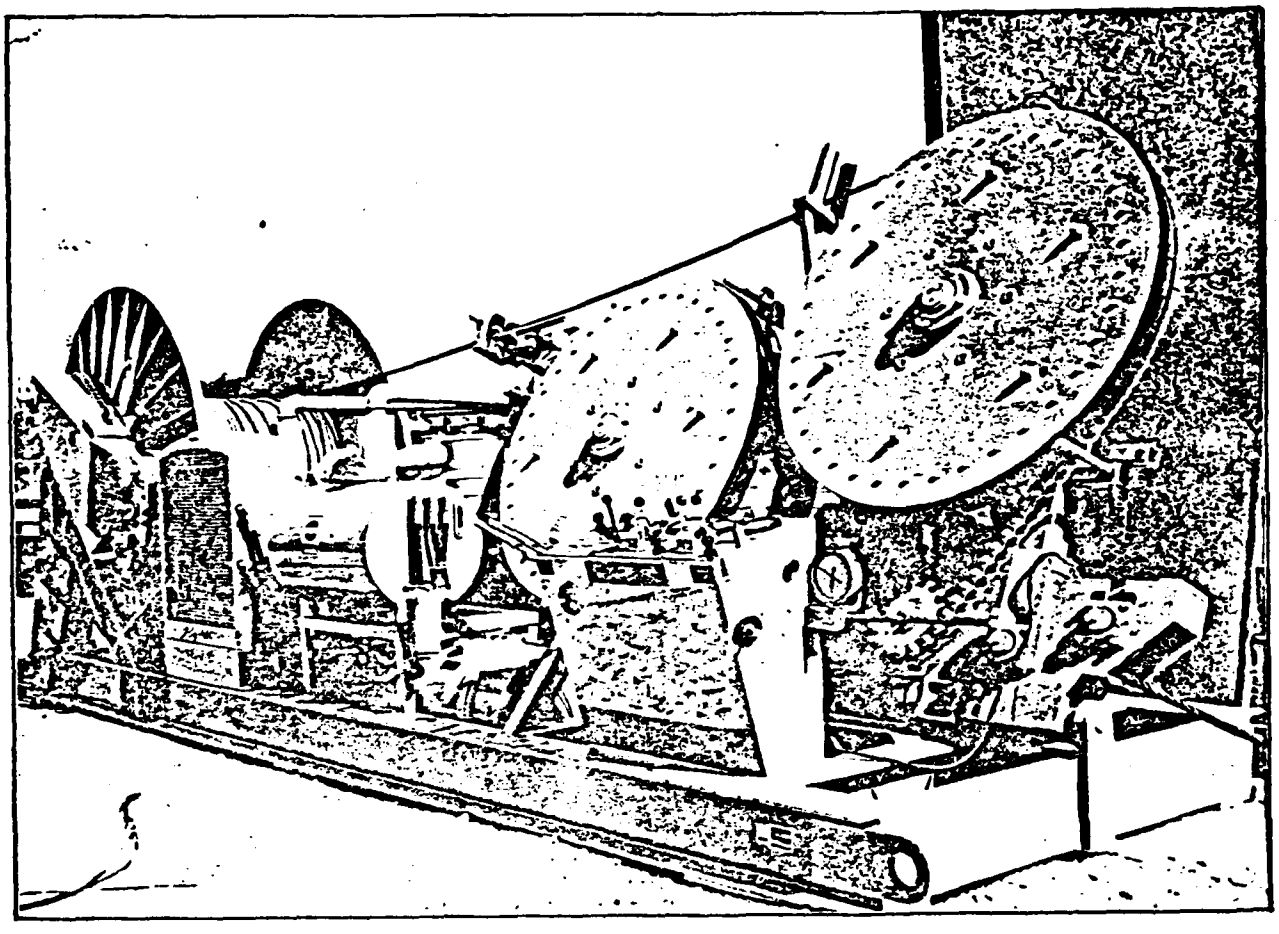

| | |
|---|---|
| SEAGOING WORK PLATFORM<br>OVERALL GEOMETRY | NAVFACENGCOM - SEACON |




| | |
|---|---|
| SEAGOING WORK PLATFORM<br>INTERNAL ARRANGEMENTS | NAVFACENGCOM - SEACON |

# APPENDIX D

## DATA ON CABLE HANDLING EQUIPMENT FOR USE IN CAPTOR CABLE FIELD OPERATIONS



PENGO MODEL 200 CABLE HANDLING TRACTION WINCH

FIGURE D-1

PENGO WINCH

The Pengo Model 200 cable handling traction winch shown in Figure D-1 is an item carried in the Ocean Construction Equipment Inventory. Data from the OCEI covering this winch are given on the following page and dimensional drawings are provided in Figure D-2. The eight foot diameter take-up reel will be utilized for retrieving elements of the CAPTOR Cable Field which will be either removed or re-laid. For cable handling from the SEACON cable tank, or from the temporary cable crib on deck, a large diameter sheave will replace this take-up reel.

P&H 325-TC CRANE

The P&H 352-TC crane currently installed on the forward port side of the main deck of SEACON is depicted in Figure D-3. For the CAPTOR Cable Field operations, a 20 foot section of the boom will be removed to provide for easier handling of the cable pick-up sled and attached cables.

**Item**

Winch, Traction, Cable Handling

**Manufacturer**

Pengo Marine, Fort Worth, Texas

**Model**

Series 600, Model 200

**General Description**

The Model 200 Pengo Winch is a self-contained, skid-mounted high-tension traction machine which utilizes two in-line V-groove bull wheels to provide high cable tension for raising and lowering. The bull wheels are rubber lined and their configuration permits a 270° cable contact on each wheel. The winch has an integral self-loading cable reel which operates at low tension to provide cable back tension to the bull wheels. The winch is hydraulically powered utilizing a GM V6-71 diesel engine as the power source. Controls for the entire system are located on a console mounted at the forward end of the winch. The bull wheel high tension and the cable reel low tension may be preset by the operator to any level up to the equipment rating. A hydraulically operated level wind system is incorporated which tilts the bull wheel frame to keep the wheels in line with the cable entrance/exit point on the reel. Each bull wheel and the cable reel has a hand-operated brake to lock them in place. The control console displays primary and secondary bull wheel hydraulic motor pressure, cable reel hydraulic motor pressure, line tension, line footage and standard engine parameters.

**Performance**

The winch is capable of providing controlled line tension up to 20,000 lb at 150 fpm. It will handle electro-mechanical cable or synthetic rope from 1/4 inch to 2-1/4 inch diameter.

**Physical Description**

| | |
|---|---|
| Length | 33 ft 4 in. |
| Width | 8 ft |
| Height with Reel | 9 ft |
| Weight | 33,000 lb |
| Bullwheel Diameter | 73 in. |
| Reel Size | 96 in. o.d., 64 in. wide, 36 in. core diameter, 51 in. between flanges, 5-3/16 in. arbor hole |

**Physical Description (Continued)**

| | |
|---|---|
| Reel Spindle Diameter | 5 in. |
| Maximum Hydraulic Pressure | 4,000 psi |
| Fuel Capacity | 60 gal |

**Auxiliary Power or Support Equipment Required**

No auxiliary power is required to operate the winch. A crane of sufficient capacity will be necessary for on-off loading of the winch and cable reels. Sufficient space at the back end of the winch must be available to permit operation of the self-loading cable reel mechanism (6 to 8 ft). Self-loading mechanisms may require the assistance of a crane to position the cable reel if the combined reel/cable weight is excessive.

**Operator/Crew Requirements**

A minimum number of two persons is required to load the cable reel, thread the cable and monitor the operation of the winch. One trained operator familia. with the operation of diesel-hydraulic cable winches is required.

**Training Requirements**

Two days' training in the field or at the manufacturer's facility required to familiarize operator(s) with the operation and preventive maintenance of the equipment.

**Field Maintenance Requirements**

Replace diesel engine oil and oil filter, replace fuel filter, and lubricate engine pressure fitting. Lubricate winch chassis fitting. Replace hydraulic system filter. Clean filter screens and strainers.

**Spare Parts**

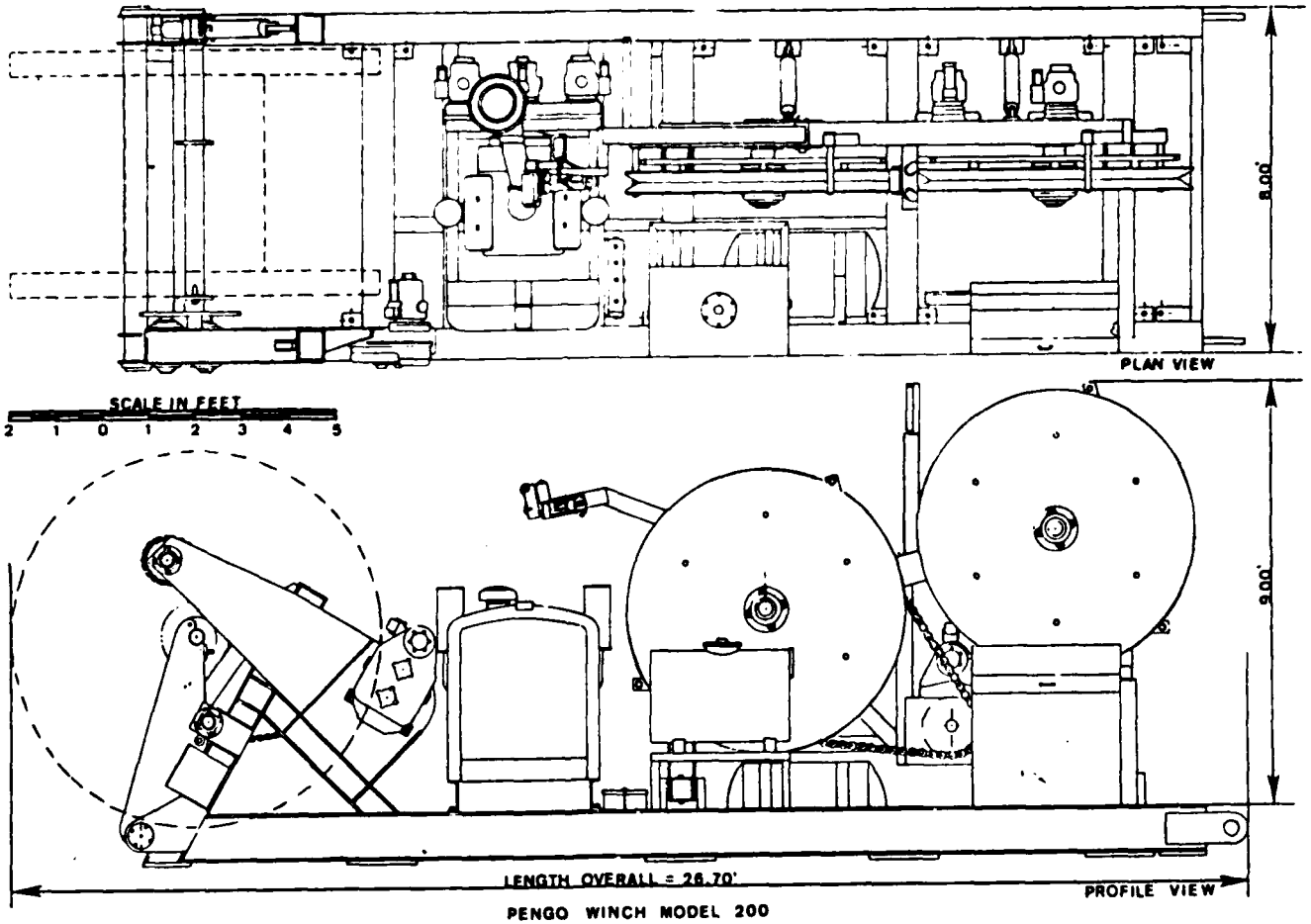
Sufficient spare parts, with the exception of lubricants, will be provided with the equipment to permit the performance of routine field maintenance.

**Status**

Mobilization Time — 6 days
Operability — Operational
Condition — New

**Original Cost**

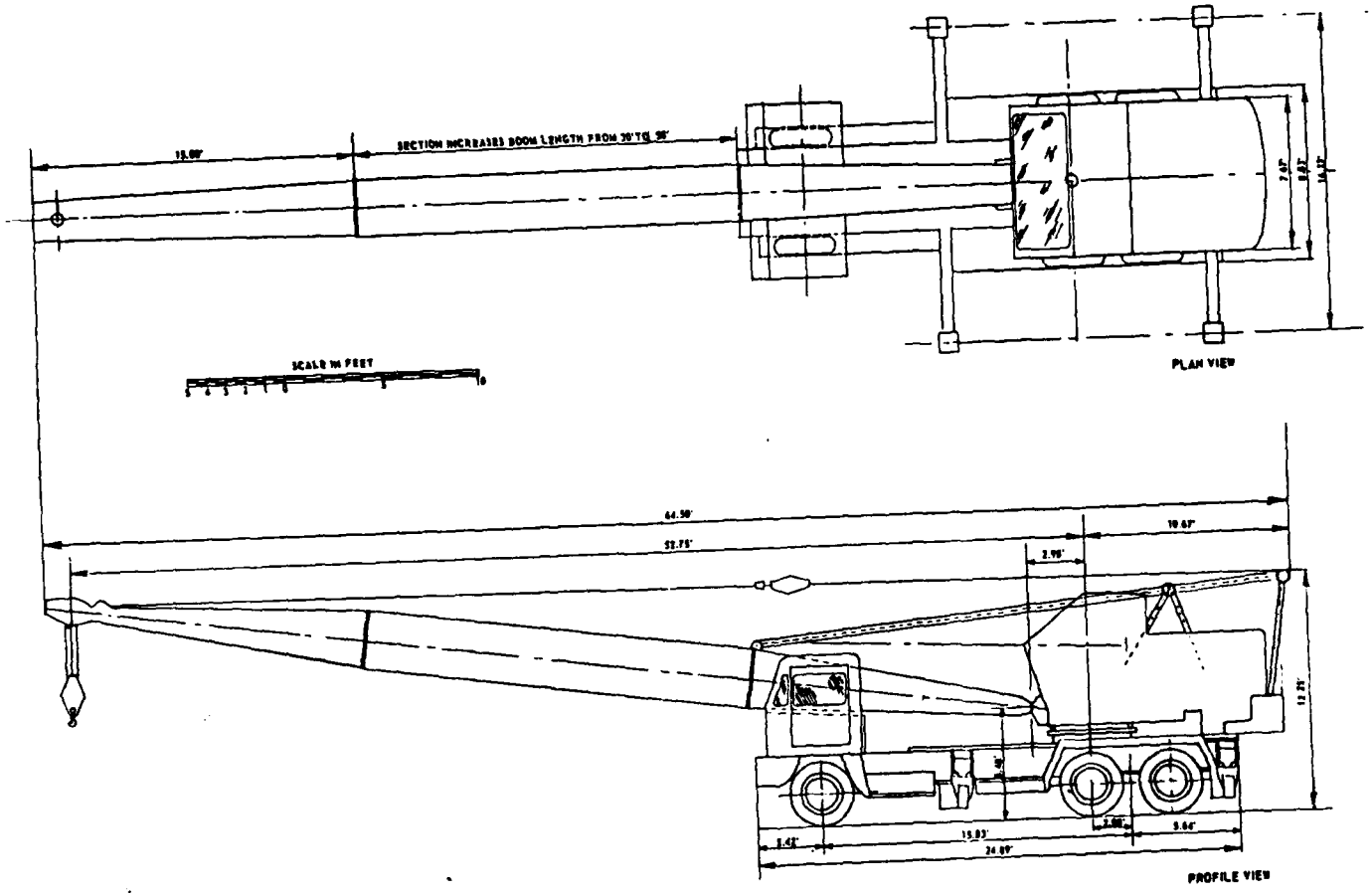
$62,000 (1973)




PENGO WINCH MODEL 200

FIGURE D-2

| | |
|---|---|
| SEAGOING WORK PLATFORM<br>CABLE HANDLING EQUIPMENT | NAVFACENGCOM - SEACON |




P&H 325-TC CRANE

FIGURE D-3

A-50

| | |
|---|---|
| SEAGOING WORK PLATFORM<br>LOAD HANDLING EQUIPMENT | NAVFACENGCOM-SEACON |

APPENDIX B

NSWC OPERATION PLAN

NAVAL SURFACE WEAPONS CENTER
FORT LAUDERDALE FACILITY
FORT LAUDERDALE, FLORIDA

OPERATION PLAN 1-77
11 MARCH 1977

D. T. HALVERSON, LCDR, USN
OFFICER IN CHARGE

## GENERAL

This Operation Plan supports CHESNAVFACENGCOM Operation Order 1-77 dated 18 February 1977 and covers the detailed day-to-day operations required to accomplish the mission outlined in the Operation Order.

EVENT #1

Load ITT Cable on SEACON.

Background

ITT, National City, California shipped 160,008 feet ± one percent of cable in two gondolas. During shipping, cable started to pay off one car and approximately 600 feet was destroyed. This will necessitate a splice at about 80,000 feet from the seaward end. It has been determined that the splice to be used will not go through the Pengo Winch and will have to be man handled around the winch, then re-threaded. These procedures will be developed during loading and will be used during the cable lay at sea.

The SEACON will move from TRACOR shipyard to Berth 4,Port Everglades when directed. Cable gondolas will already have been spotted. 110,000 feet of the cable will be fair-leaded from the cars through the Pengo Winch and jockey wheel into the deck crib and the cable cut. The remaining 49,400 feet of cable will be stored in the cable tank.

Forces Assigned

SEACON
NSWC personnel
UCT-1 personnel
Stevedores

Action

On the day scheduled, NSWC personnel will set up crane and all pier-side support functions required for cable transfer.

UCT-1 check out Pengo Winch and Jockey Wheel operations.

NSWC personnel check all rigging, etc. required for cable lay.

The objective of this day's work is to be ready to commence the cable transfer at 0700 the following morning.

It is estimated to take three 10-hour days to transfer the cable.

At the completion of a day's work, insure that all systems are left in such a condition to be ready to operate at 0700 the following morning.

Upon completion of cable transfer, SEACON return to berth at TRACOR.

EVENT #2

Recovery of portion of Cable 24.

Background

There is approximately 3,000 feet of lead sheathed Habrishaw cable, 1 3/8 inches in diameter at a depth of 600 feet due east of the Dania Fishing Pier.

Forces Assigned

SEACON

Communications

In accordance with communications annex.

Action

SEACON proceed to last known position of the end of Cable 24. Launch RS-7 and conduct search. Upon locating the cable end, launch TONGS and recover bail anchor. Recover cable using Pengo Winch and take up reel.

Upon completion, return to port.

EVENT #3

Recovery of portion of Cable 27.

Background

Same as Event #2.

Forces Assigned

SEACON

Communications

In accordance with communications annex.

Action

Same as Event #2.

EVENT #4

Recover and re-lay Cable 24.

Background

Cable 24 has a big bow in it caused by some operational constraints at time of laying. The objective of this event is to straighten out the cable, picking up and replanting the cable end in its original location after recovering approximately 9,000 feet of lead sheathed Habrishaw cable, approximately 1 3/8 inches in diameter. 6,000 feet of the recovered cable will be required to reposition cable in its proper location.

Forces Assigned

SEACON

Communications

In accordance with communications annex.

Action

SEACON proceed to the 600-foot depth area of Cable 24. Launch RS-7 and locate Cable 24. Recover, using TONGS. Recover approximately 9,000 feet of cable. Reposition cable end with bail, recovery wire, etc. at its original position. This will require laying 6,000 feet of the 9,000 feet just recovered. Upon completion, return to port.

EVENT #5

Reposition Cable 38.

Background

Cable 38 terminates in 1,800 feet of water. Position:

Latitude 26° 02.6' N.

Longitude 79° 47.0' W.

Attached to the cable end is a bail and recovery system. This cable must be recovered and moved to a new position in the 1,500-foot depth range.

Forces Assigned

RSB-1

SEACON

UB-646

Communications

In accordance with communications annex.

Action

The RSB-1 will proceed to position, anchor, recover the cable end and make it ready to pass to the SEACON. The UB-646 will be used for messenger passing.

When the cable end is on board SEACON and ready for retrieval of cable, SEACON will recover approximately 6,700 feet of cable navigating in a NW direction so as to arrive at position:

Latitude 26° 03.3' N.

Longitude 79° 47.65' W.

When in position, SEACON will plant Cable 38 with recovery wire, bail, triplane, and pinger. Upon completion, return to port.

EVENT #6

Lay Cable 57.

Background

The seaward end of Cable 57 is approximately 18.6 nautical miles east of Port Everglades at Latitude 26° 04.4' N., Longitude 79° 47.6' W. at a water depth of approximately 1,500 feet. The total length of the cable to lay is 109,000 feet. The cable will previously have been loaded in the deck crib of SEACON by a preceeding event.

This cable was damaged in shipment and will have a special strain relieving splice at approximately 80,000 feet from the seaward end. This splice will not go through the Pengo Winch, therefore, special procedures for unthreading the Pengo to pass the splice through will be developed during the on-load of the cable. These procedures will be used during the lay.

Forces Assigned

SEACON
RSB-1
UB-646
Other small boats (Boston Whaler, etc.) as required

Communications

In accordance with communications annex.

Action

When directed by the Officer-in-Charge, Naval Surface Weapons Center Fort Lauderdale Facility, Fort Lauderdale, Florida all units get underway from Port Everglades and proceed to the position of the seaward end of cable. The RSB-1 will anchor in position and await arrival of SEACON.

Upon arrival of SEACON and when it has been verified that all units are ready, the SEACON will approach to about 1,000 feet of the starboard side of RSB-1 and hold station.

The UB-646 will go alongside and pass a 5/8-inch wire from RSB-1 to SEACON. This wire will be made fast to the shore cable. Upon completion, SEACON will instruct RSB-1 to haul in on the cable. Approximately 1,000 feet

of shore cable will be reeled aboard RSB-1. When this has been accomplished, SEACON will proceed toward the beach, paying out cable at a rate NOT TO EXCEED SPEED of SEACON over the bottom. This speed will vary from 1.5 to 2 knots.

The shore cable is marked every 6,000 feet.* When these marks pass the counter, Control will be notified of the fact and tension readings given.

When the SEACON is approximately 36,000 yards west of cable end position, RSB-1 will emplant the cable and recovery system, up anchors and proceed to berth at Jetty.

Unless otherwise directed, the UB-646 will remain in the vicinity of SEACON during the whole operation to furnish support as required.

SEACON will proceed to lay cable to the 20-foot depth contour approximately 3,500 feet east of Range House. Theodolite stations will be manned during this phase to insure precise navigation and positioning.

When in position, the cable will be cut, SEACON retaining the seaward end. The other end will be rigged with a towing pendant securely attached and with a buoy. This end then will be passed through a block suspended from the Grove Crane and on to the UB-646. The UB-646 will proceed shoreward to be met by a Boston Whaler which will pass the 5/8-inch wire rope to UB-646. The wire rope will be attached to the towing pendant. When accomplished, both boats depart the area.

The shoreward end of the cable will be fair leaded, etc., as required, and will be pulled until directed to stop by SEACON. This will be when there is only enough cable remaining on SEACON to make a splice. The splice will be made and cable planted. Upon completion SEACON and UB-646 proceed to berths, Port Everglades.

Special Instructions

1. Communications during cable landing

During the cable landing evolution, communications between all elements is critical. PT-400 radios will be used during this phase of the operation and located as follows:

| | |
|---|---|
| SEACON Control | Shore-party Chief |
| SEACON Deck | Shore-party Winch/Truck Operator |
| UB-646 | Facility Support Group Head |

Circuit discipline is a must.

2. Length of cable to be landed

The length of cable to be landed will vary according to the accuracy of the cable lay from sea. The shore party should be prepared to pull as much as 500 feet of cable ashore before the SEACON has the required amount remaining. Therefore, equipment and a method should be established to permit a continuous pull without having to re-rig to pull additional cable.

* The last 6,000 feet of the cable is marked every 1,000 feet.

EVENT #7

Lay Cable 58.

Background

Same as Event #6 except:

1. Position is: Latitude. 26° 04.4' N.
   Longitufe 79° 48.3' W.
2. There is no splice in this cable.
3. Cable length is 102,000 feet.

Forces Assigned

Same as Event #6.

Communications

In accordance with communications annex.

Action

Same as Event #6.

EVENT #8

Lay Cable 59.

Background

Same as Event #6 except:

1. Position is: Latitude 26° 04.4' N.
   Longitude 79° 48.96' W.

2. Cable length is 106,000 feet.

Forces Assigned

Same as Event #6.

Communications

In accordance with communications annex.

Action

Same as Event #6.

EVENT #9

Extend Cable 41. Length: 24,600 feet.

Background

Same as Event #11 except for cable length.

Forces Assigned

SEACON

RSB-1

UB-646

Communications

In accordance with communications annex.

Action

Same as Event #11 except that RSB-1 will recover the tracking array installed on Cable 41.

EVENT #10

Extend Cable 40. Length: 29,830 feet.

Background

Same as Event #11 except for cable length.

Forces Assigned

SEACON

RSB-1

UB-646

Communications

In accordance with communications annex.

Action

Same as Event #11.

EVENT #11

Extend Cable 22. Length: 9,600 feet.

Background

Cable 22 must be extended 9,600 feet from its present position into the 1,500-foot depth range.

Forces Assigned

SEACON

RSB-1

UB-646

Communications

In accordance with communications annex.

Action

Forces will proceed to the existing location of the end of Cable 22. Upon arrival RSB-1 moor, recover cable, prepare for passing and pass to SEACON via UB-646. RSB-1 break moor, proceed to new cable position and moor.

When cable end of Cable 22 is on deck of SEACON, the 9,600 foot extension will be spliced on and laid to new position. When near the RSB-1 the end of Cable 22 will be passed by messenger to RSB-1 via UB-646. RSB-1 will install bail, recovery wire, triplane, and pinger. Upon completion return to port.

EVENT #12

Extend Cable 42. Length: 29,375 feet.

Background

Same as Event #11 except for cable length.

Forces Assigned

SEACON

RSB-1

UB-646

Communications

In accordance with communications annex.

Action

Same as Event #11.

EVENT #13

Extend Cable 45. Length: 22,720 feet.

Background

Same as Event #11 except for cable length.

Forces Assigned

SEACON
RSB-1
UB-646

Communications

In accordance with communications annex.

Action

Same as Event #11.

## COMMUNICATIONS

### Primary

| | |
|---|---|
| NSWC Channel A | 140.16 MHz |
| Channel B | 140.58 MHz |
| Bridge-to-Bridge | Channel 16 |
| Operations | Channel 13 |
| Deck-to-Deck (SEACON--RSB-1) | 140.350 MHz |
| Six PT-400 radios | 140.050 MHz |

### Call Signs for this Operation

| Unit | Call Sign |
|---|---|
| RSB-1 | RSB-1 |
| SEACON | SEACON |
| UB-646 | 646 |
| Range House | DeHorn Sierra Six |
| NSWC Guard House-Jetty | DeHorn Sierra Eleven Guard |
| NSWC OPCON | DeHorn Sierra Five |
| Shore landing party | By individual names as assigned for each OP |

Annex A

## NAVIGATION AIDS

| Unit | Equipment |
|---|---|
| RSB-1 | Raydist (2 systems) |
| | Mini-ranger II |
| SEACON | Old Raydist |
| | Mini-ranger II |
| UB-646 | Old Raydist |

Theodolite stations are available and will be manned for close to shore operations to insure precise positioning of vessels.

CHARTS

DMA 11469 (Approaches to Port Everglades)
DMA 117630-C5 (RD)
DMA 117630-C4 (RD)
DMA 117630-B2
DMA 117630-B3
DMA 117630-B4 (Provisional)
DMA 117630-B5 (Provisional)
DMA 117630-4(D)
DMA 117630-5(D)
HO 16,720-1
HO 16,720-8

## COMMAND AND COMMUNICATIONS

During the period 18 April 1977 to approximately 1 June 1977 OPCON for this project will be Officer In Charge, Naval Surface Weapons Center (NSWC) Fort Lauderdale Facility, Fort Lauderdale, Florida. Members of his staff, designated as follows, will be in charge of day-to-day operations:

T. H. Roberts, Facility Support Group Head, Project Manager and in charge of all operations.

Robert F. Redmon, NSWC Party Chief and in charge of all at-sea operations.

Other NSWC personnel will be involved on an as-needed basis reporting to the Project Manager or Party Chief as the situation requires.

### Telephone Communications

NSWC Fort Lauderdale Facility - (commercial) 305-524-0541
(AUTOVON) 483-7228 or 483-7229

The NSWC switchboard is manned 24 hours a day. The operator will be able to locate any and all members of the NSWC staff at any time.

### SEACON

During the period SEACON is in the Tracor Shipyard she may be contacted through the TRACOR switchboard:

(Commercial) 305-463-1211 -- ask for SEACON x271 (5-23-77)

Commencing 18 April 1977, SEACON will be berthed in Port Everglades. There are several berths in the port with Navy telephones installed. Each berth has a different telephone number. The Harbor Master will be requested to berth SEACON in one of these berths. Telephone numbers of the SEACON berth can be obtained by calling the NSWC Fort Lauderdale Facility switchboard.

Commercial No.
(305) 523-9030

Annex C

APPENDIX C

ROSTER OF THE SEACON FOR THE AT-SEA OPERATIONS

CHESNAVFACENGCOM Personnel:

At-Sea Operations Director: CDR James Osborn
Project Manager: Bill Sherwood (replaced 8 May by Al Sutherland)
Master of the SEACON: George Phillips
Chief Engineer of the SEACON: Jimmy Smith
Second Engineer of the SEACON: Jim McLaughlin
Navigation Assistant: Frank Dello Stritto

NSWC Personnel

Navigator: Bob Redman
Head Rigger: Earl Payne
Helmsmen: Timothy Brooker, EN-1; Dale Kirby, BM-2

UCT-1 Personnel:

BCM Lewis Standfill
Seabees: Mike Anderson, CE2
Jerry Aylesworth, EO1
John Bileschi, EO3
Rick Caballero, EO2
Mike Davis, EN3
Stu Dahl, EA3
Steve Faszcza, CM3
Paul Fitzpatrick, BU2
Chuck Ossont, CM2
Bucky Reynolds, SW1
John Wilson, CE2

Other Personnel:

Electronics Technician: Ken Stachura (Naval Ordnance Station)
Seaman/Motorman: Joe McNellis (Value Engineering)
Cook/Chief Steward: Dave Botzler (Tracor Marine)
Steward: Paul Riccardi (Tracor Marine)
Messman: John Mann (Tracor Marine)

# APPENDIX D

## EQUIPMENT AND MATERIAL LISTING

A complete listing of the equipment and material available for this project is not practical since the SEACON itself is well-stocked to support personnel, to maintain itself, and to support a variety of jobs. Its equipment includes line, wire rope, hose, hand tools, pumps, safety gear, cleaning gear, and navigational gear, as well as workshops. In addition, both Tracor Marine and NSWC were readily accessible for loans of equipment.

The lists below give the equipment on deck and in the control room, which was used or was kept in a standby status.

a. Equipment on deck:

Winches:

Pengo winch (described in Project Execution Plan)
NCEL coring winch (powered by a 6-cylinder Cummins engine)
Cross deck winch (powered by 6-71 Detroit Diesel engine)
Auxiliary winch (powered by V-4E Wisconsin engine)
3 - 300-pound capacity Air Tuggers

Crane:

P&H crane (described in Project Execution Plan)
Grove hydraulic crane (powered by a V-6 Cummins engine)

Jockey wheel and support structure (described below)

Cable crib (described below)

2 - Sherman and Reilly 42-inch, 78-series sheaves (1-instrumented to measure cable parameters, 1-standby)

Lincoln arc welder (on rollers), 250 amps/30V, oxygen and acetylene tanks

NSWC camera sled

AMF RS-7 beacon, sea-link release and clump anchor

Martin-Decker tensionmeter (4,000, 20,000 and 40,000-lb scales)

Handheld cable payout meters

12 and 24-volt batteries and Marquette 32-175 fleet battery charger

Johnson outboards:

2 - 75 hp Stinger models
2 - 25 hp Seahorse

Buoys:

12 - 2-foot inflatable orange plastic
2 - 34-inch metal, converted submarine mines

b. Equipment in control room

Morgan automatic boat positioning system (including N50 processor, printer, CRT unit, plotter, magnetic tape unit, remote display unit, and simulator)

2-Motorola Mini-Ranger II consoles (1-linked to Morgan system; 1-standby; receiving input from two transponders on a mast above bridge)

SIMRAD LC 204 Internav - navigation system

AMF sea-link system (receiver, coder, amplifier)

Honeywell sea-scanner and remote display
Honeywell digital acoustic position indicator
} for camera sled monitoring

Hydro Products Gifft depth recorder

Enviromarine cable parameter monitoring system

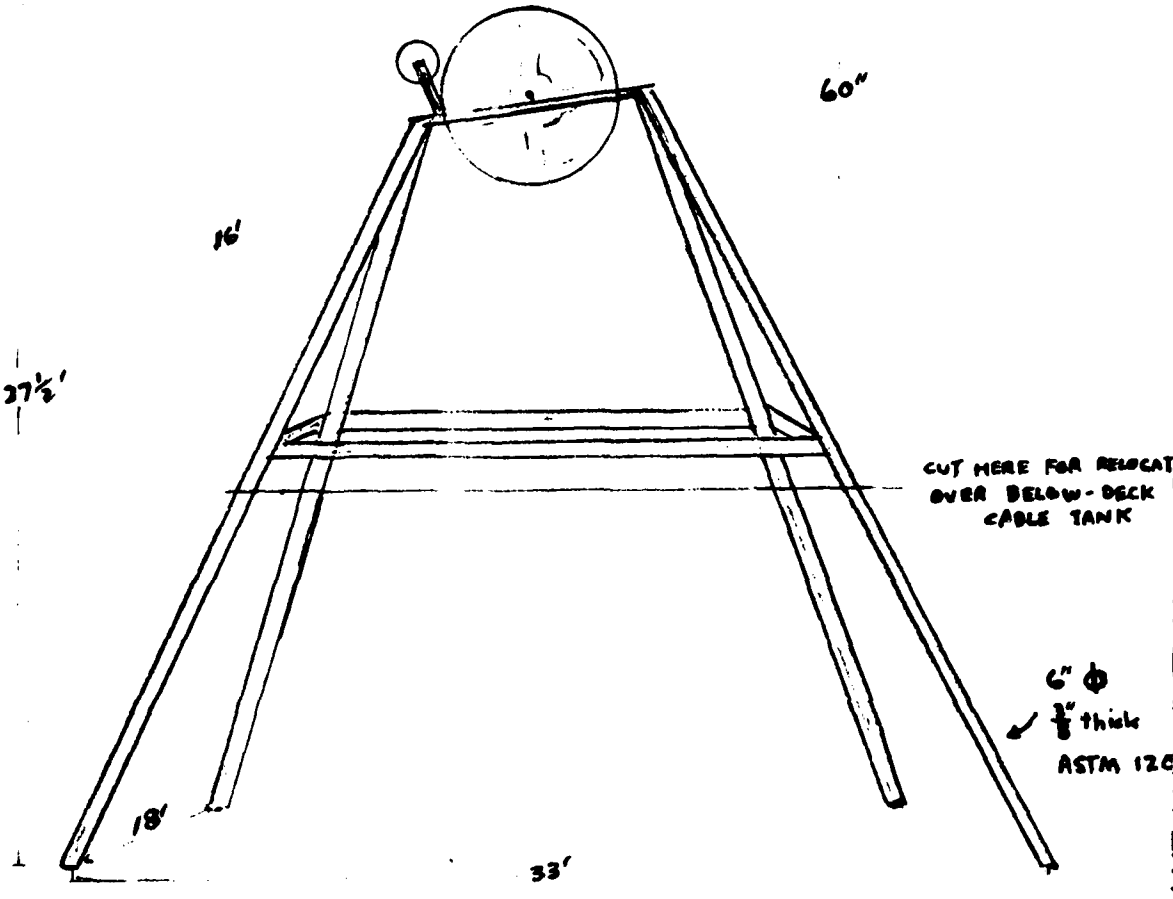
2 - Motorola HT 400 FM radios (communicating with 4 PT 220 FM radios distributed to key personnel on deck and on other vessels)

10 - TV video screens and 1 taping system operating from 4 television cameras:

1 - On the stern A-frame; 1 - port side of after main deck area;
1 - enclosed work area; 1 - on the mast)

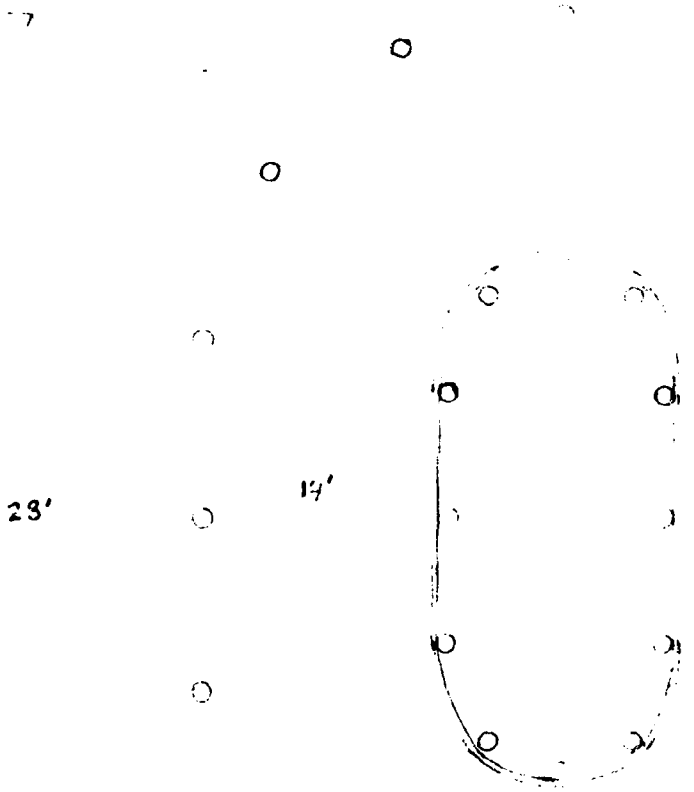
c. Jockey Wheel and Support Structure

In order to insure that cable coiled in a crib could enter the Pengo winch sufficiently straightened to avoid twists and loops, a jockey wheel and stand were employed as a holdback device. The stand was of sufficient height to allow the cable to straighten, and the jockey wheel, with a smaller idler wheel, could provide back-tension as needed. The back-tension system was hydraulically powered by a 3-cylinder Lister engine. A sketch of the jockey wheel and its support structure is given below.



d. On-Deck Cable Crib

The on-deck cable crib had the capacity to hold 140,000 feet of 1.29-inch cable (the below-deck cable tank holds approximately 80,000 feet of 1.29-inch cable). The crib consisted of an inner and an outer ellipse formed by steel pipe sections (ASTM 120 steel, 5½-inch Ø, ¼-inch thickness). These pipe sections were welded on the deck beneath the jockey wheel, and were removed when the jockey wheel was relocated. An overhead sketch of the cable crib is given below.



# APPENDIX E

## OPERATION - RELATED MEMOS

MEMORANDUM

FPO-1C:ps
4 April 1977

From: FPO-1C
To: Distribution

Subj: Ft. Lauderdale Range Repairs Project; Planning Memo #4

Encl: (1) Errata for CHESDIV Project Execution Plan

1. A final project planning conference was held at NSWC Ft. Lauderdale Facility on 29-30 March. Attendees were:

| | |
|---|---|
| LCDR D. Halverson . . . . . | NSWC, Ft. Lauderdale |
| W. Taylor . . . . . | NSWC, Ft. Lauderdale |
| A. Reece . . . . . | NSWC, Ft. Lauderdale |
| R. Redman . . . . . | NSWC, Ft. Lauderdale |
| T. Roberts . . . . . | NSWC, Ft. Lauderdale |
| G. Phillips . . . . . | CHESDIV |
| W. Sherwood . . . . . | CHESDIV |

Both NSWC OpPlan and CHESDIV Project Execution Plan were discussed in detail. No major changes were made in either plan. An update errata sheet for the CHESDIV Construction Plan is attached as enclosure (1). NSWC agreed to furnish two additional enlisted personnel to assist in crewing the SEACON (Mr. Hooker, EM1/C, and Mr. Kirby, BM2/C). LCDR Halverson will issue a letter designating Mr. Bob Redman as the NSWC On-Site Representative for the at-sea work in accordance with the project organization as outlined on page 11 of the CHESDIV Project Execution Plan. CDR J. Osborne will perform the duties as the At-Sea Operations Director with Mr. W. Sherwood as the Deputy Director. All necessary SEACON modifications for cable laying have been completed or are in process. The NSWC range preparatory work required prior to the cable installation by SEACON is ahead of schedule. NSWC will remove the weapon from Cable #24 prior to the SEACON's scheduled work on that cable. NSWC will also provide anchor clumps (175 lb. in-water wt.) for RS-7 pingers, the necessary AMF pinger releases and associated hardware. CHESDIV will provide the shipboard AMF equipment.

2. For information update, the following events have taken place since Planning Memo #3 was issued:

a. NSWC OpPlan and CHESDIV Project Execution Plans have been issued.

b. Tracking Array #35 has been installed.

c. Cable #39 has been relocated.

d. Cable #45 has been repaired with 2700 ft. added.

e. When Cable #58 is installed by the SEACON, RSB will install a second tracking array from its moored position.

f. All cable distances have been computed with an allowance of 4,000 ft. slack on the short cables, 6000 ft. on the longer cables.

g. During the Cable #45 lay, probably an additional 10,000 ft. of cable will be required to be spliced in the cable during the lay.

h. An "old" Raydist Navigation Set will be placed aboard SEACON as back-up. This equipment is good during daylight hours only.

i. Pengo winch, fairleads for and aft, powered A-Frame over cable tank, deck tank, stern roller relocation and modification, A-Frame TV camera and cable monitoring system (velocity, tension and footage) have all be installed.

j. The new ITT cable has been loaded from Gondola Railroad cars into the SEACON.

k. Cable #57 (110,000 ft.) is in the deck cable tank. Cable has a single splice 50,000 ft. from the seaward end. Splice will pass through Pengo winch at very slow speed.

l. Cables #42 and #45, in a single length of 48,507 ft., have been stowed in the SEACON's below deck cable tank.

m. Cable loading from Gondola cars into tanks averaged about 5,000 ft. per hour using a crew of 10 stevedores with UCT Pengo Winch operators.

n. Cable has been loaded into the SEACON cable tanks from inside to outside. Correct method is outside to inside with each layer starting on outside. However, due to the height of fairlead jockey wheel (27 ft.) above the cable cribe, no problems are anticipated.

o. Cable laying plan has been modified so that long cables #57, #58, and #59 and short cables #22, #40, and #41 will all be laid from the deck cable tank. Cables #42 and #45 will be laid from the hold tank with the jockey fairlead relocated to the hold tank position.

p. Long cable lays will commence about 0330 from seaward end with SEACON passing seaward end to RCB. SEACON will get underway about midnight so as to be on station by 0300..

q. Nine UCT enlisted detachment and 4 CHESDIV personnel will arrive SEACON on 11 June. Berthing and messing will be available. CDR Osborne arrives 15 April. Remaining UCT and CHESDIV personnel will arrive aboard 17/18 April. At-sea ship's training on Tuesday, 19 April, inshore cable work (Cable #24) starts on Wednesday, 20 April.

Subj: Ft. Lauderdale Range Repairs Project; Planning Memo #4

r. On 13/14 April, SEACON will shift berth from Tracor to Port Everglades commercial pier.

s. A large electrical mechanical hydraulic winch with own power unit has been installed on part aft deck as a back-up winch. This winch may be used in the cable operations with Cables #24, #27, and #38. Winch data: 10'9" depth, 10'8½" wide, 8' height, weight with cable 45,000 lbs., pulling capacity bare drum 39,500 lbs.,.full drum 26,900 lbs., line speed bare drum 70 fpm, full drum 100 fpm, separate power unit 14 ft. long, 3½' wide, 6' high, with a 170 HP Cummings diesel. At full load, it burns 9.3 gph fuel. Tank capacity is 60 gallons #2 diesel. The diesel drives a 25 HP hydraulic pump delivering 76 gmp at 3000 psi and a 75-KW, 440-volt, 3-phase electric generator. Total weight 9,000 lbs.

t. A 4,000 lb. air tugger will be relocated from aft of the Grove Crane to a position aft of the deck cable tank. Winch to fairlead aft to assist in cable splicing operations.

3. In summary, the project is on schedule and no problems are anticipated at this time.

W. G. SHERWOOD

Distribution
NSWC Ft. Lauderdale (T. Roberts), 10 copies
UCT-ONE, 4 copies
NSWC White Oak (W. Simpson), 1 copy
NSWC White Oak (D. Hargett), 1 copy
NAVELEX PME-124 (CDR Osborne), 1 copy
FPO-1, 1 copy
1C2, 1 copy
1C13, 1 copy
1C18, 1 copy
1C19, 1 copy
SEACON, 4 copies

ERRATA FOR CHESDIV PROJECT EXECUTION PLAN

| | |
|---|---|
| PAGE 11 | Correct spelling of "LCDR Halverson" |
| PAGE 23 | Note that event numbers of CHESDIV are one number lower than that of the event numbers contained in NSWC's OpPlan. |
| PAGE 24 | Line 15, delete "about 0630". |
| PAGE 25 | First sentence, delete "and buoyed off". Add additional two sentences. "The free end will then be passed to UB 646 who will take it ashore with SEACON payout out cable while holding position. NSWC shore party with EOD divers and Boston Whaler will perform the shore ending task. |

Enclosure (1)

M E M O R A N D U M

TO: W. SHERWOOD FPO-1C
W. HILLSABECK FPO-1C5

FROM: SEACON

DATE 28 FEBRUARY 1977

SUBJECT: WORK ORDER REQUIREMENTS, FORT LAUDERDALE

It is recommended the following work items be funded and scheduled for the TRACOR shipyard to accomplish prior to SEACON departure for NORVA:

1. Repairs incident to heavy weather during tow south:

   A. Remove tow bridle from SEACON, stretch test each leg (3); Magnaflux or Radiograph flounders plate, connecting shackles and tow pads in accordance with"BUSHIPS TECHNICAL MANUAL".

   B. Design, fabricate and install watertight, flush deck hatch over the cable storage area aft.

   C. Replace the pressure control switch on #3 air compressor.

   D. Procure and install a small automatic pressure pump to the forward Voith-Snyder propulsion unit head tank to maintain positive pressure.

   E. Remove wet and damaged insulation from vent ducts in forward store room (Bos'n locker). Inspect for water damage; repair and/or clean as necessary. Replace insulation.

   F. Investigate the feasibility of turning or relocating the vents presently located on the main deck and 0-1 level forward.

2. Alterations, repairs and routing maintenance required at this time:

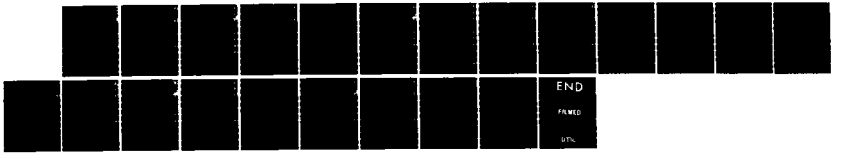
   A. Remove rust, scale and loose covering from the following deck areas; prime with red lead and paint with deck grey:

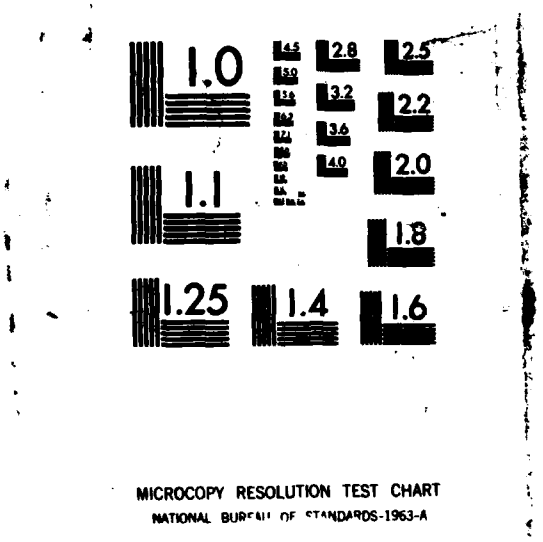
      (1) Second deck cable and reel stowage area.

      (2) Main deck, 0-1 and 0-2 levels (spot scale as needed and paint out).

      (3) Flying bridge (03) level (prepare surface and build up with Latex-base grout to even the surface and pain

AD-A163 445 PROJECT COMPLETION REPORT FT LAUDERDALE CABLE FIELD(U) 2/2
NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON DC
CHESAPEAKE DIV JUL 77 CHES/NAVFAC-FPO-1-77(18)
UNCLASSIFIED F/G 13/10 NL





B. Remove rust and scale from all weather-deck bulkheads and bulwarks as needed; prime with red lead and paint out with exterior white enamel.

C. Remove rust and scale from sides, feather all edges; spot red lead, paint from top of exterior bulwark to water line Port Starboard and Stern with SEACON blue. Cut in draft markings and name.

D. Install relief valve to fuel-oil service pump discharge.

E. Install cross connect line between forward main engine fuel-oil day tank and ship-service generator fuel-oil day tank.

F. Inspect, modify and/or adjust chain-drive for overhead door.

G. Install cross connect line with pressure reducer (100 psi to 20 psi) from fire main discharge to air conditioning salt water cooling pumps.

H. Install cross connect line between after engine day tanks.

I. Fabricate and install as directed by Chief Engineer: oxygen and acetylene bottle racks (eight oxygen and four acetylene).

J. Install two (2) ship provided lockers on weather decks as directed by the Master and Chief Engineer.

K. Fabricate covers from heavy weight dark blue Herculon or equal for the following equipment:

(1) Anchor capstains (2)

(2) Anchor capstain controllers (2)

(3) Air-tuggers (3)

(4) Pengo winch

(5) Power reel stand

(6) Double-door gear lockers (2). Use white material of same grade and type as the blue.

G. B. Phillips

mmb

FPO-1C:ps
14 February 1977

MEMORANDUM

From: FPO-1C
To: DISTRIBUTION LIST

Subj: Ft. Lauderdale Range Repairs Project, Planning Memo #3

1. A project planning conference was held at NSWC Ft. Lauderdale Facility on 3-4 February. Attendees were as follows:

| NAME | ORGANIZATION | PHONE |
|---|---|---|
| CDR David Halverson | OIC, NSWC Ft. Lauderdale | (305)527-0541 A/V 483-7228/29 |
| LCDR J. F. Wood | UCT-ONE | A/V 680-7447 |
| MC L. Standfill | UCT-ONE | A/V 680-7447 |
| Lowell Collier | Tracor Marine | (305)523-2546 |
| John Kennedy | Tracor Marine | (305)523-2546 |
| W. M. Simpson | NSWC, White Oak | (202)394-2717 |
| Wallace M. Taylor, Jr | FAC Mgr. NSWC Ft. Lauderdale | A/V 483-7228/29 |
| G. A. Lamb | NSWC, Ft. Lauderdale | A/V 483-7228/29 |
| A. M. Reece | NSWC Ft. Lauderdale | A/V 483-7228/29 |
| R. F. Redman | NSWC Ft. Lauderdale | A/V 483-7228/29 |
| W. G. Sherwood | CHESDIV | A/V 288-3881 |
| George B. Phillips | CHESDIV | (804)464-7266 |
| Fred Agdern | CHESDIV | (202)433-3881 |

2. The overall program requirements, schedule and costs were discussed in detail. Highlights are as follows:

A. ADMINISTRATIVE ITEMS

(1) LCDR David Halverson, OIC NSWC Ft. Lauderdale Facility, will act as OIC of the range repair and upgrade program.

(2) Upon arrival in Ft. Lauderdale, SEACON will proceed directly to Tracor Shipyard for cable modifications and deck machinery rearrangements. Ship's power and security will be supplied by the shipyard.

Subj: Ft. Lauderdale Range Repairs Project, Planning Memo #3

(3) NSWC will forward $135,000 to CHESDIV within the next week project support, including the use of the SEACON for 45 days.

(4) UCT-1 presently plans to send a team of 15 personnel with either a Lieutenant or a Master Chief in Charge.

(5) UCT will be provided with a cost estimate for UCT project support (message requesting $9,000 has been received; $1,100 has been forwarded to support the three UCT personnel who will ride the SEACON tow).

(6) A messing contract will be initialed with Tracor to provide one man during the period of 1 March to 8 April to inventory, procure, stow, and make all arrangements to activate SEACON messing facilities. Three additional personnel will report aboard SEACON during the period of 11 April through 31 May when full messing services will be provided. One man during June to demobilize the galley equipment.

(7) NSWC will arrange for Tracor Shipyard to perform all necessary modifications and rearrangement of deck machinery in connection with the program requirements. The cost of such modifications will be to NSWC's account. In addition, NSWC will arrange for SEACON maintenance contract support as required for maintenance and voyage repairs. This SEACON account will be separate from cable modification, mobilization, and demobilization costs. CHESDIV will forward the necessary funds by work request to cover such costs.

(8) NSWC will prepare, with CHESDIV's input and guidance, the Operations Plan, including all required cable-laying data and parameters. CHESDIV will provide annex on SEACON ship systems, organization at-sea, command and control. (Annex fwd 2/11)

(9) SEACON manning requirements for UCT-1 is as set forth in CHESDIV Operation Instruction for SEACON. The personnel requirements are essentially the same as the St. Croix less hospitalcorpsman and storekeeper. Shipboard training and checkout, including at-sea operations, will be accomplished during the period 11-25 April.

(10) NSWC will furnish a vehicle to support SEACON/UCT logistics requirements.

(11) Motorola indicates the availability of a modification to their Mini-Ranger System (Range Diversity System Option) which would preclude data fall- outs such as was experienced at St. Croix and Guam. System includes the addition of a second shipboard interrogater, new circuits, etc. Code $9,800. It is recommended that CHESDIV so modify its Mini-Range System.

FPO-1[illegible]s
14 February 1977

Subj: Ft. Lauderdale Range Repairs Project, Planning Memo #3

(12) The towing of the SEACON to Ft. Lauderdale will be by USNS ATACAPA. Tow will commence on Friday, 18 February with arrival at Ft. LauderJale on 21 or 22 February. Embarked SEACON crew will be as follows:

| BILLET NO. | NAME | PRIMARY STATION | DUTIES |
|---|---|---|---|
| 0-1 | Captain G. Phillips | Bridge | Master |
| 0-2 | Master Chief Stanfill | Bridge | Bridge Watch |
| 0-3 | J. Martin | Bridge | Navigation |
| 0-4 | EA3 Howardell | Bridge | Quartermaster |
| 0-5 | BU1 P. Promia | Bridge | Helmsman |
| 0-6 | UT3 Chichwood | Bridge | Lookout |
| 0-7 | J. Herrington | Bridge | Lookout |
| 0-8 | EA3 Dahl | Bridge | Lookout |
| E-1 | J. Smith | Engine Spaces | Chief Engr. |
| E-2 | J. McLaughlin | Engine Spaces | Asst. Engr. |
| E-3 | EU3 Vileschia | Engine Spaces | Aux. Systems |
| E-5 | K. Strachura | Engine Spaces | Elec. Maint. Specialist |
| H-3 | HM1 Thomas | Hospital | Hospitalman |
| H-4 | J. McNelis | Galley | Cook/Messman |
| C-3 | W. Carney | Control Room | Electronics |

B. OPERATIONAL ITEMS

(1) Range Repair Operations will commence on Monday, 18 April 1977.

Subj: Ft. Lauderdale Range Repairs Project, Planning Memo #3

(2) First week will be devoted to mobilization, crew training, at-sea drills, and some actual recovery/laying work in the in-shore field.

(3) If available, some UCT-1 personnel may report early during the week of 11 April to expedite ship mobilization.

(4) Capt. Phillips will arrange with CINCLANTFLT/CONSERVRON 8 for the SEACON tow back to Little Creek, Virginia in early June.

(5) RS-7 ASP System will be employed as required. Pinger deployment will be through the centerwell, CHESDIV will furnish the pingers. AMF releases, along with assembly and mooring systems will be furnished by NSWC.

(6) The main deck of SEACON between the port Gantry Crane rail, and bulkwark will be decked over to facilitate the sled operations together with the P&H crane.

(7) CHESDIV Naval Architect will calculate GM (ship's stability) based on addition of new deck machinery and maximum cable load.

(8) All small boat support requirements will be furnished by NSWC. SEACON will carry only Zodiac rubber boat.

(9) UCT support equipment logistic requirements for project support will be minimal. It is anticipated that only UCT self-logistic support equipment will be required.

(10) CHESDIV, along with NSWC, will prepare a casualty contingency plan annex for cable laying operations.

(11) The three long cable runs will be layed from seaward to shoreward and will be shore-ended (Cables 57, 58, 59). NSWC will provide the necessary shore personnel and diving support as needed.

C. CABLE LAYING ITEMS

(1) A large cable-laying tank will be fabricated and installed on the main deck forward which will hold at least 110,000 ft. of SB cable. The cable tank may extend over of 1/2 the centerwell. Included will be a power-driven bullwheel (1,500 lbs pull) on an A-Frame positioned over the center of the cable tank. This bullwheel will be used to assist in loading the cable and as a fairlead to the Pengo during cable laying.

(2) The Pengo will be relocated on the centerline immediately aft of the SEACON's cable tank access hatch.

(3) Present stern A-Frame will remain (crossbar and grading to be removed). A closed-circuit TV camera will be positioned on top of the A-Frame to monitor cable angle.

FPO-1C:ps
14 February 1977

Subj: Ft. Lauderdale Range Repairs Project, Planning Memo #3

(4) The cross-deck winch will be relocated aft portside in a position to fairlead the P&H crane for sled recovery work.

(5) A cable winch (with slip rings from CEL) is to be located just forward for the Grove Crane on the starboard side. Its use will be as a back-up winch.

(6) The recently required small Hydraulic winch is to be located amidships near the centerwell. This winch, together with forward air tugger, will provide a cable in-haul capability for splicing, etc.

(7) The cable tank presently installed in the SEACON will be used to lay the short cable runs.

(8) The loading of the new SB type cable from ITT (157,000 ft) will be into the cable tanks from Gondola RR cars. The initial loading of the cable is expected to occur in early March. UCT will investigate providing a Pengo winch operator during this period for training purposes. Cable loading will be accomplished by Tracor supervised by NSWC/CHESDIV. Loading will be as follows:

(a) Cable 57--108,800 ft. into the new topside main deck tank.

(b) Cable 45--8,000 ft. in SEACON cable tank.

(c) Cable 42--29,375 ft. SEACON cable tank.

(9) A small portable A-Frame will be procured for cable monitoring equipment to be located between the Pengo and stern roller.

(10) Cable laying will be over the stern roller through the existing vertical rollers. Shipyard will provide split pipe as necessary to preclude chaffing of sharp edges.

(11) CHESDIV will install prior to SEACON arrival in Ft. Lauderdale a closed-circuit TV camera on the aft A-Frame capable of monitoring cable angle. In addition, cable monitoring equipment will be provided so that "cable out", "velocity" and "tension" can be monitored. Readouts will be at (1) plotting control, (2) ship control stations in the OPS control room, and at (3) the control console of the cable winch.

W. G. SHERWOOD

FPO-1C:ps
14 February 1977

Subj: Ft. Lauderdale Range Repairs Project, Planning Memo #3

DISTRIBUTION LIST
NSWC Ft. Lauderdale, (10 copies)
UCT-ONE (4 copies)
NSWC White Oak (W. Simpson)
NSWC White Oak (D. Hargett)
00
09
FPO-1
02
FPO-1C5
1C8
SEACON

11 January 1977

MEMORANDUM

From: FPO-1C
To: DISTRIBUTION LIST

Subj: NSWC Ft. Lauderdale Captor Underwater Test Range; Planning Memo #2

Ref: (a) FPO-1C memo dtd 23 Dec 76
(b) NAVSURFWPNCEN Silver Spring 041540Z Jan 77
(c) COMSERVRON EIGHT 291755Z Dec 76

1. An initial planning conference was held at NSWC White Oak on Thursday 6 January. The below additional information and data was obtained. All planning assumptions, as set forth in reference (a), are now confirmed with the exception that minimum cable run is 9.600 ft. so most cables will be laid from the cable tank. Reference (b) forwarded $5,000 for initial planning. Reference (c) set up the tow of the SEACON from Little Creek to Ft. Lauderdale by the USNS ATAKAPA departing 18 February.

2. Program requirements and planning factors:

a. Cable #38 will require recovery of seaward end and hauling aboard to shoreward 6,200 ft. of cable. Cut cable and plan recovery system.

b. Five cables will require recovery of seaward end, splicing and laying to seaward: Cable #40 - 29,200 ft; Cable #41 - 24,600 ft; Cable #42 - 29, 375 ft; Cable #45 - 18,000 ft; Cable #22 - 9,600 ft. (from 1,000 ft. water to 1,500 ft. water depth).

c. Three long cable runs will be required. Cable #57 at 108,800 ft; Cable #58 at 104,910 ft; Cable #95 at 101,000 ft. (Cable #59 may be deferred due to lack of available cable).

d. The SEACON will perform tasks (a) and (b) above using NSWC recovery sled and personnel.

e. NSWC will perform all the required splices (SB to SB cable) and furnish the necessary equipment and personnel.

f. In the accomplishment of (c) above, cable will be laid from seaward to shoreward. SEACON will pass the end of the cable to the WOOD in a moor over implantment site. WOOD will lower cable recovery system to bottom while SEACON proceeds shoreward laying cable (about 16.5 miles at SOA of 2 knots). Shoreward end will be dumped in about 60 ft. of water.

g. Preliminary estimates by NSWC indicate about 10-12 days at-sea time for the SEACON to accomplish (a), (b) and (c) above. Estimate about two days in-port time for cable loading to each day at sea. Sea days are on a 24-hours basis. With mobilization/demobilization time, total job can be accomplished in about 45 days.

h. The WOOD will require about 22 days at-sea time to locate, check-out, and implant cable recovery systems. This will be accomplished prior to the employment of the SEACON.

i. During the period 25 February - 15 April, the SEACON is available for emergency back-up for the WOOD providing a qualified crew is provided by NSWC in accordance with CHESNAVFACENGCOM manning instructions.

j. The three tracking arrays to be installed are about 26' x 26' x 13' and weigh about 4,000 lbs. It is doubtful that arrays will be ready for installation during this period.

k. Cable -- New 157,000 ft. from ITT to be delivered by 1 April 1977.
30,000 ft - Cable #42
109,000 ft - Cable #57
18,000 ft - Cable #45

l. Cable -- Rehab from NAVELEX. Length is 269,400 ft. to be delivered to Ft. Lauderdale by 1 April 1977.

m. In addition to the above work, the employment of the SEACON for rehab of the inshore 600 ft. range is being considered.

n. The NSWC recovery sled will be deployed over the side from the P&H Crane. SEACON will provide cross deck winch and 10,000 ft. of 5/8" 3 x 19 wire. NSWC will provide other special rigging equipment as required.

o. Navigation -- The compatability of Mini-Ranger Systems must be verified (i.e.: frequencies, Morgan System interface, etc.). Primary navigation system for NSWC range is Ray Dist with Mini-Ranger as back-up. NSWC will furnish AMF acoustic pingers and electronics technician for assembly in support of SEACON RS-7 acoustic positioning system.

p. Tentative berthing for SEACON, while at Ft. Lauderdale, is at Berth #27, which is adjacent to Tracor Shipyard (Clinker off-loading pier!). Cost for vessel berth is 4¢ per gross/ton or about $10 day. NSWC is investigating availability of 440/220 volt power. Cable loading will be from railroad cars at Berth #5.

q. CHESDIV cost estimates will be based on SEACON costs of $2,000/day plus project engineering costs. Modification of cable tank, cable chute, or stern sheeves, cable tank modifications will be accomplished by Tracor as tasked by NSWC.

r. CHESDIV has undertaken the acquisition and modification of special cable handling equipment as follows:

(1) Acquisition of a cable monitoring system--velocity, tension, and footage with readouts at cable control console, control room at the plotting table and aft fiddle board.

(2) Working with Cable Handling and Stringing Company, Fort Worth, Texas (Mr. Berry Crawford (817) 267-4451) to accomplish the following:

(a) Mount a 72" Pengo type pulling bullwheel on an existing heavy duty 96" reel.

(b) Provide a 72" bullwheel on a 12 ft. A-frame to be positioned over the cable tank. Hydraulic drive to be connected to existing Pengo vice cable reel.

(c) Provide a 54" bullwheel on small Pengo reel for utility use in transferring of cable.

s. Program Personnel:

NSWC White Oak

| | |
|---|---|
| R. Hargett | (301) 394-1320 |
| | Autovon 290-1320 |
| W. M. Simpson | -2717 |
| J. W. Brooks | -2716 |

CHESDIV

| | |
|---|---|
| W. G. Sherwood | (202) 433-3881 |
| | Autovon 288-3881 |
| J. Martin | (same) |
| G. Phillips | (804) 464-7289 |
| (Master SEACON-Norfolk) | 680-7289 (Autovon) |

Ft. Lauderdale

| | |
|---|---|
| R. Redman | (305) 524-0541 |
| | Autovon 483-7228, 7229 |

W. G. SHERWOOD

DISTRIBUTION LIST:
FPO-1
1A
1C4 (Martin)
1C12 (Phillips)
R. Redman (NSWC Ft. Lauderdale)
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J. Brooks (NSWC White Oak)
R. Hargett (NSWC White Oak)
CDR Wood (UCT-1)

FPO-1C:ps
23 December 1976

MEMORANDUM

From: FPO-1C
To: Distribution

Subj: Planning Memo for Repair and Upgrade of NSWC Ft. Lauderdale Underwater Test Range

Ref: (a) NAVSURFWPNCEN Silver Spring, MD 151405Z Dec 76
(b) COMNAVFACENGCOM Alexandria, VA msg 22 Dec 76 Draft

1. Reference (a) requested tasking of NAVFAC to provide the OCP SEACON and engineering services for the upgrade of their Underwater Test Range at Ft. Lauderdale. Reference (b) directed CHESDIV to provide such services. An initial planning meeting has been scheduled at NSWC in early January. At this date, only bare details of project scope have been obtained. In view of the work which must be accomplished in a relatively short time, certain tasking and scheduling must be now formulated and firmed-up in early January.

2. Planning assumptions are:

(a) CHESDIV will be tasked and funded to provide engineering services and SEACON.

(b) Some OCP modification funding will be included.

(c) All OCP modification work will be done in Ft. Lauderdale. Outside shipyard support of OCP will probably be accomplished by Tracor Marine through funding from NSWC.

(d) Movement of SEACON from Little Creek, VA to Ft. Lauderdale will be in the February-March time frame depending upon CINCLANTFLT tow schedules.

(e) OCP, after arrival at Ft. Lauderdale, will revert to maintenance status--i.e. only Captain and Chief Engineer on board.

(f) OCP Modification (see below) will take place in March-April and to be completed NLT 10 April 1977.

(g) Employment of OCP will be from 15 April to 1 June -- 45 days.

(h) Gantry Crane will not be aboard. Present crane configuration will be retained. OCP will return to Norfolk for Gantry Crane Installation in June.

(i) Cable Laying Requirements--72.25 nautical miles of SB Cable to be laid in twelve separate runs in length from .35 to 22.8 nm. SB Cable is 1.28" diameter, jute covered single armor, breaking strength 30,000 lbs. Cable weight in air is 1585 lbs/K ft. and 803 lbs/K ft. in seawater. Minimum bending diameter is 42".

(j) CBLANT will provide CB crew and construction force during the April-May time frame.

(k) The SEACON will make the complete in-water installation, i.e. cable and array implantments. (R/V WOOD will be in shipyard). Mike boats and other support craft are available.

(l) No extensive diving support services will be required by the SEACON.

(m) Cable will be laid from both cable reels and from cable tank.

3. Mr. Fred Agdern (1C8) is designated as the Project Engineer for this task. Capt. George Phillips (1C12) will, in addition to his regular duties, will act as Project On-Site Representative for OCP modifications and cable loading.

4. In view of the assumed dates above, planning and design must be accomplished in a relatively short time frame. Items included in this category are:

(a) Modifications of OCP

(1) Design and installation of stern cable chute or balanced block fairlead with 42" diameter.

(2) Relocation of Pengo Winch.

(3) Modify/complete installation of cable tank.

(4) Install additional cable loading and laying equipment.

(5) Install cable tension/velocity/footage instrumentation (control room and winches).

(6) Procure and install special cable laying blocks, A-frame (if required), etc.

(7) Determine array configuration handling problems and installation requirements.

(8) Special requirements for communication/navigation/logistic support.

(9) Install deck lockers for explosive storage.

(10) Revise and upgrade centerwell deployment systems for acoustic beacons.

(b) CHESDIV Planning Functions:

(1) Interface with NSWC White Oak, Ft. Lauderdale, CBLANT, UCT-1.

(2) Determine Schedule.

(3) Ops Plan.

(4) Cable Loading Plan.

(5) Special equipment and/or instrumentation procurement.

(6) Program costing.

(7) Cable laying and engineering.

(8) Towing arrangements.

(9) Messing requirements.

(10) Construction planning.

5. It is again reemphasized that this planning memo is based on many assumptions and little data, however, its intent is to set forth the initial planning scope as presently envisioned along with the necessary personnel assignments. The project engineer will issue revised and updated future planning memos.

W. G. SHERWOOD

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1P...1SP...1E...PC-2...DAILY

# APPENDIX F

## ESTIMATE OF SEACON STABILITY CONDITION

REPORT RT-39201(5)

# ESTIMATE OF SEACON STABILITY CONDITION

# FOR CAPTOR CABLE FIELD OPERATIONS

BY
ROBERT TAGGART

PREPARED FOR
CHESNAVFACENGCOM
CONTRACT N62477-77-C-0101

8 APRIL 1977

The only data available on the transverse stability characteristics of SEACON are contained in the *Trim & Stability Study* issued by J. J. Henry Co. Inc., Moorestown, N. J. on 11 March 1975. These data are based on calculations made prior to the conversion of the ship and relate to the conversion design drawings prepared at that time.

Since a stability test has not been performed on this platform, the results of the above study must be adapted as well as possible to the current condition of SEACON using the best available estimates of the weights and centers of items that have been added and removed since the J. J. Henry study was made.

The SEACON is currently at the TRACOR/MARINE Shipyard in Port Everglades, Florida and is loaded with the equipment and gear that will be utilized in the upcoming operations to repair and modify the CAPTOR Cable Field off shore of the Naval Surface Weapons Center beach facility at Port Everglades. On 5 April 1977, the Commanding Officer, George Phillips, reported the following by telephone:

- Draft Forward: 7' - 10"
- Draft Aft: 10' - 3"
- Platform is floating in salt water
- Wing tanks #6 and #8 are empty
- Anti-roll tanks are 65% full (normal)

This gives a mean draft of 9.04 feet and a trim of 29 inches. From the hydrostatic curves contained in the referenced study, the following data can be extracted for this draft and trim condition.

Displacement, S.W. = 24.95 tons
Moment to Trim One Inch = 491.8 foot-tons
Longitudinal Center of Flotation = 6.50 feet aft Fr 17
Longitudinal Center of Buoyancy = 0.44 feet fwd Fr 17 for even keel
Trimming moment = 14262 foot-tons
Moment arm = 5.72 feet aft of Center of Buoyancy
Longitudinal Center of Gravity = 5.28 feet aft Fr 17
Difference in mean draft due to *LCF* = 0.06 feet (negligible)
Center of Buoyancy above baseline, *KG* = 4.75 feet
Transverse metacenter above baseline, *KM* = 27.30 feet

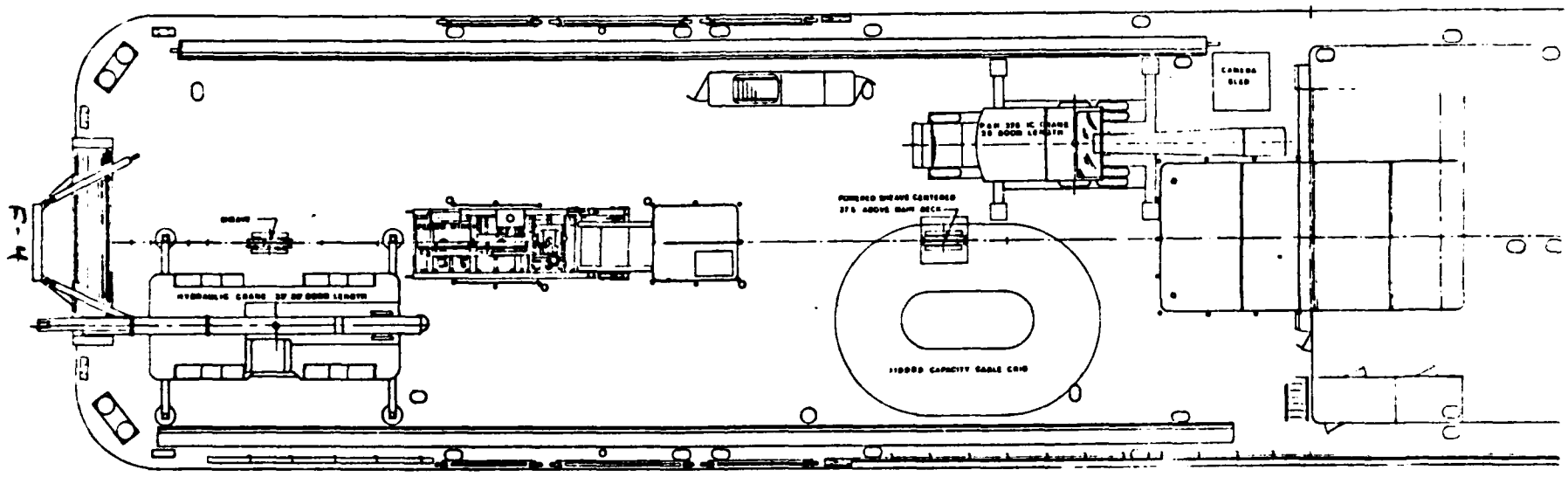
The missing piece of information required to assess the transverse stability of the ship in this condition is the height of the Center of Gravity above the baseline, *KG*. This, subtracted from the height *KM* will give the metacentric height, *GM*, which is a measure of the ability of the ship to right itself when heeled.

Without conducting a stability test on the platform, the only way to derive the existing height of the Center of Gravity is to relate characteristics that are known about its current condition with those used in the J. J. Henry study. The weight estimate work sheets from this study showed only one unit of construction machinery on the after deck - a travelling gantry crane that has not yet been installed. In its current condition, a number of items of construction equipment have been added on the main deck aft, some of which are shown in Figure 1. The weights and centers of all items of equipment added for the CAPTOR Cable Field operation are tabulated below.

Construction Equipment Added to SEACON

| Item | Weight Tons | *KG*, Feet Above *BL* | *LCG*, Feet Aft Fr 17 |
|---|---|---|---|
| Cable in crib (110,000') | 77.83 | 16.50 | 36.17 |
| Cable in tank (48,507') | 34.32 | 5.67 | 63.70 |
| Crib, Tower, Powered Sheave | 2.23 | 33.00 | 38.33 |
| *Cross deck winch over well | 4.46 | 17.00 | 8.00 |
| *Large Winch - Port Side Aft | 20.09 | 19.00 | 71.67 |
| *Large Winch - Power Supply | 4.02 | 18.00 | 83.33 |
| P&H 325-TC Crane | 27.08 | 21.00 | 24.67 |
| Grove Hydraulic Crane | 30.02 | 20.50 | 109.17 |
| Pengo Winch | 14.73 | 19.50 | 85.00 |
| Camera Sled | 0.76 | 20.67 | 6.67 |
| Total Additions | 215.54 | 16.56 | 56.14 |

**Not Shown in Figure 1*



AFTER MAIN DECK OF SEACON AS MODIFIED FOR CAPTOR CABLE FIELD OPERATIONS

FIGURE 1

| Item | Weight Tons | *KG*, Feet Above *BL* | *LCG*, Feet Aft Fr 17 |
|---|---|---|---|
| Travelling Crane | 55.00 | 29.00 | 28.00 |
| Wing Tank #6 | 21.00 | 7.64 | -56.00 |
| Wing Tank #8 | 48.10 | 7.80 | 0 |
| Total Deductions | 124.10 | 17.17 | 2.93 |

If we take the platform in its current condition, with a known displacement and longitudinal Center of Gravity, the equivalent condition derived in the trim and stability study can be approximated as follows:

| Item | Weight Tons | *KG*, Feet Above *BL* | *LCG*, Feet Aft Fr 17 |
|---|---|---|---|
| Platform in current condition | 2495.00 | Unknown | 5.28 |
| Added Weight to Deduct | - 215.54 | 16.56 | 56.14 |
| Removed Weight to be Added | + 124.10 | 17.17 | 2.93 |
| Equivalent Study Condition | 2403.56 | | 0.60 |

From the Hydrostatic Curves at this displacement, at even keel, the mean draft is 8.75 feet, Moment to Trim One Inch is 485 foot tons, and the longitudinal Center of Buoyancy is 0.70 feet forward of Fr 17. With the *LCG* 0.60 feet aft of Fr 17 this gives a trimming lever of 1.30 feet aft and thus a trim by the stern of 6.44 inches or 0.54 feet.

As may be noted from the tabulation on the following page extracted from the J. J. Henry study, the condition derived above is very close to the Full Load condition as specified in that study, i.e., the displacement is only 29 tons greater, the mean draft 0.09 feet greater, and the trim is 0.23 feet more by the stern. Thus, it can be assumed that these two conditions are reasonably identical and that the height of the Center of Gravity obtaining to the J. J. Henry Full Load Condition is applicable, or *KG* = 14.06 feet above the baseline. From this the *KG* of the platform in the current condition can be derived as follows:

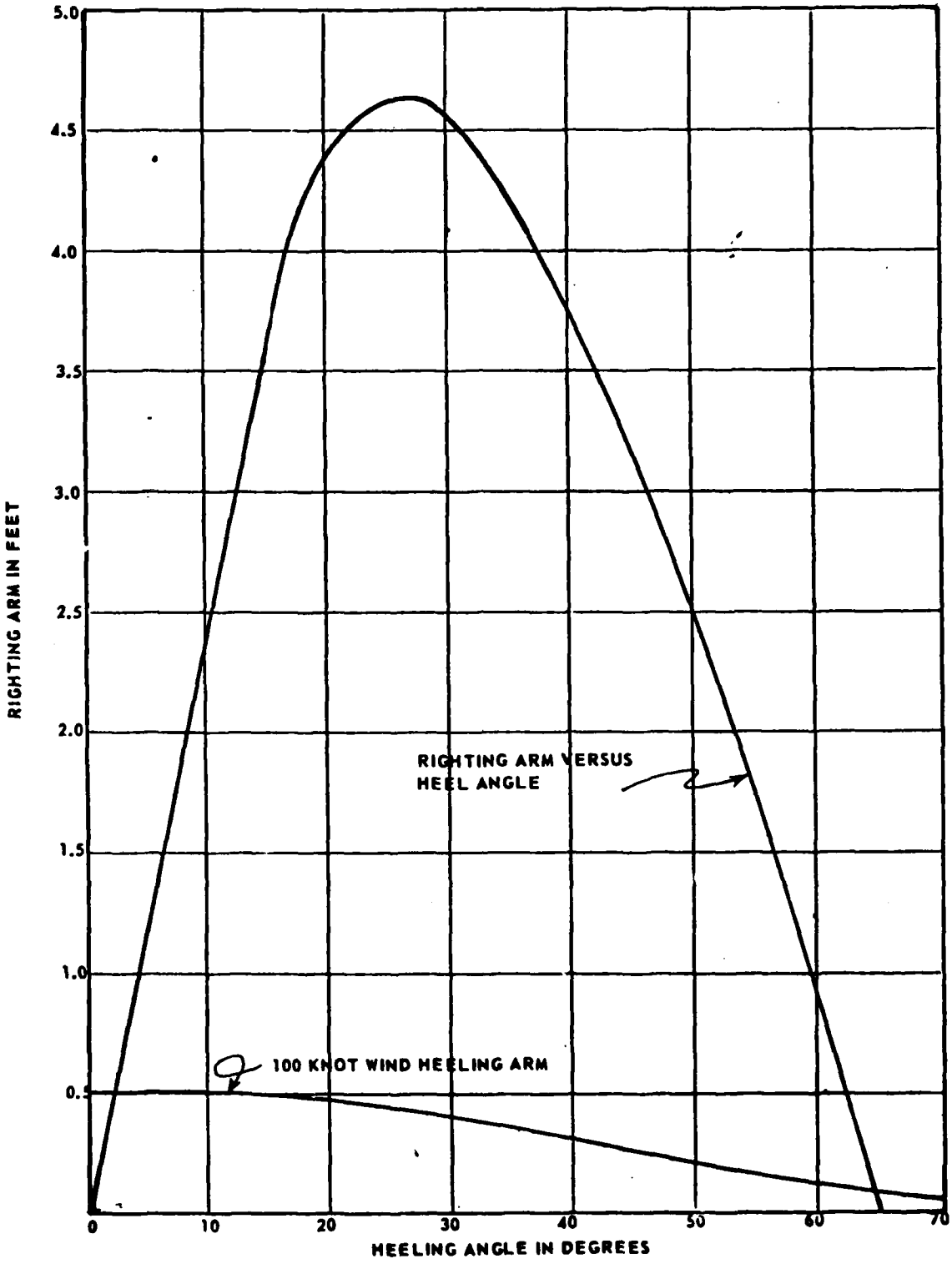
| Item | Weight Tons | *KG*, Feet Above *BL* | *LCG*, Feet Aft Fr 17 |
|---|---|---|---|
| Equivalent Study Condition | 2403.56 | 14.06 | 0.60 |
| Weight to be removed | - 124.10 | 17.17 | 2.93 |
| Weight to be added | + 215.54 | 16.56 | 56.14 |
| Platform in current condition | 2495.00 | 14.12 | 5.28 |

| CONDITION | DISPL. (TONS) | DRAFT (FT) | SW BALLAST (TONS) | GM (FT) | TRIM (FT) |
|---|---|---|---|---|---|
| LIGHT SHIP | 1,420 | 5.43 | —— | 23.12 | 0.08 |
| CAPACITY | 3,423 | 12.02 | 1,531.5 | 11.54 | 1.48 |
| FULL LOAD | 2,375 | 8.66 | 113 | 13.76 | 0.31 |
| OPERATING IA | 2,114 | 7.80 | 301.4 | 15.13 | 2.60 |
| OPERATING IIA | 2,751 | 9.87 | 1,080.3 | 15.01 | 5.46 |
| OPERATING IIIA | 2,951 | 10.50 | 1,080.3 | 12.03 | 8.15 |
| OPERATING IB | 2,778 | 9.96 | 966 | 13.09 | 2.20 |
| OPERATING IC | 2,611 | 9.42 | 799 | 12.80 | 1.52 |

NOTES:

1. ANTI-ROLLING TANK HAS BEEN INCLUDED FOR ALL CONDITIONS
2. CRANE STOWAGED AT FR.22 FOR OPERATING CONDITION IIA
3. 200 TON BUOY ON DK. FOR OPERATING CONDITION IIIA
4. FOR ORERATING CONDITION IIIA, TRIM IS TAKEN FROM CURVE OF STATICA STABILITY CALCULATION.

Subtracting the derived *KG* value of 14.12 feet from the height of the metacenter for this condition, *KM* = 27.30 feet, the metacentric height, *GM* = 13.18 feet, is obtained for the current ship condition. Thus, the platform has more than adequate transverse stability for the CAPTOR Cable Field Operation. The estimated curve of statical stability for this condition is given in Figure 2.




CURVE OF STATICAL STABILITY FOR SEACON IN
LOADED CONDITION FOR CAPTOR CABLE FIELD OPERATIONS

FIGURE 2

END

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