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SAN DIEGO FLEET MOORING UNDERWATER INSPECTION REPORT
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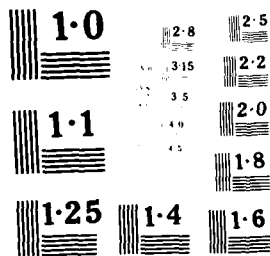
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SAN DIEGO FLEET MOORING UNDERWATER INSPECTION REPORT

SEPTEMBER 1984

OCEAN ENGINEERING
AND CONSTRUCTION PROJECT OFFICE
CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
WASHINGTON, DC 20374

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ABSTRACT

This report contains the results of the inspection of 24 fleet moorings located within the Naval Station San Diego, California, harbor complex. A CHESNAVFAC-ENGCOM-assigned Engineer-in-Charge and divers from Underwater Construction Team Two conducted the inspection from 23 to 28 July 1984.

Of the 24 moorings inspected, 14 were found to be in good condition, 7 in fair condition, and 3 unsatisfactory for fleet use. A summary of these results is contained in Annex A.

Of the seven moorings in fair condition, four are recommended for downgrading to the next lower mooring classification. The remaining three have oversized chain and are, therefore, still in satisfactory condition for continued use in their current capacity. Five moorings required reclassification to their proper design class.

Detailed information and specific comments concerning each of these moorings are included within this report.

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Of the seven moorings in fair condition, four are recommended for downgrading to the next lower mooring classification. The remaining three have oversized chain and are, therefore, still in satisfactory condition for continued use in their current capacity. Five moorings required reclassification to their proper design class.

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UNDERWATER INSPECTION REPORT

1.0 INTRODUCTION

1.1 Background. Under the COMNAVFACENGCOM Fleet Mooring Maintenance (FMM) Program, CHESNAVFACENGCOM has been assigned the responsibility to plan and conduct periodic diver inspections of all fleet moorings worldwide. In carrying out this responsibility, CHESNAVFACENGCOM designated an Engineer-In-Charge (EIC) to provide inspection planning and onsite technical direction for the underwater inspection of fleet moorings at PWC San Diego. The actual underwater portion of the inspection was performed by divers of Underwater Construction Team Two (UCT TWO). The positions of the 24 fleet moorings inspected at PWC San Diego are shown in Figures 1 and B-1. The inspection was conducted from 23 to 28 July 1984.

1.2 General Description of Moorings. The following classes of fleet moorings were inspected at PWC San Diego:

<u>CLASS</u>	<u>NUMBER</u>
BB	6
B	4
C	2
D	6
E	2
G	1
Mediterranean	2
Not Reported	<u>1</u>
Total	24

Nine of the above moorings, located in relatively shallow water near the deperming pier, and consist of one to three legs attached to stake piles and/or stockless anchors. The remaining moorings are located near the Naval Station, NAS North Island, and near Harbor Island. All of the moorings are either riser- or telephone-type moorings except for two Mediterranean moorings.



FIGURE 1. GEOGRAPHICAL POSITION OF MOORINGS

Figures 2 and 3 depict typical riser- and telephone-type moorings, respectively. Figure 4 depicts a typical Mediterranean-type mooring.

2.0 INSPECTION PROCEDURES

2.1 Inspection Objectives. The purpose of the mooring inspections was to determine the general condition of the buoys and chain assemblies, and, when possible, to verify or update existing as-built and maintenance records. Divers inspected only a portion of the submerged buoy hull and chain assemblies in order to compile a general description of the mooring's condition. The existence of fairly consistent measurements during this inspection provides a good indication of the mooring's overall condition. It should be kept in mind that periodic underwater inspections are intended as an expedient and relatively inexpensive supplement to accurate maintenance records.

2.1.1 Chain Wire Diameter Measurements. Chain wire diameter measurements are used to evaluate the condition of a mooring. A selective sampling of the wire diameter of chain links and connecting hardware was taken in order to determine the amount of deterioration due to corrosion and wear. At each sampling area, the chain was cleaned to bare metal. Single-link measurements were taken where the chain was slack to detect corrosion loss. Double-link measurements were taken where two links connected under tension to detect the combined effects of corrosion and wear. Chain links and other components which measured 90 percent or greater of original wire diameter are considered to be in "good" condition; measurement between 80 and 90 percent of original diameter is considered "fair" condition and is cause for the mooring to be downgraded in classification; any measurement less than 80 percent is considered "poor" and is cause for the mooring to be declared unsatisfactory for fleet use.

2.1.2 Inspection Limits. Standard underwater inspection procedures do not call for the inspection of any part of the mooring which has been buried or which is below a water depth of 130 feet if scuba gear is used. Anchor chain and riser subassemblies were observed only to the point at which they became buried; no attempt was made to locate and inspect anchors or other mooring materials which were not readily visible.

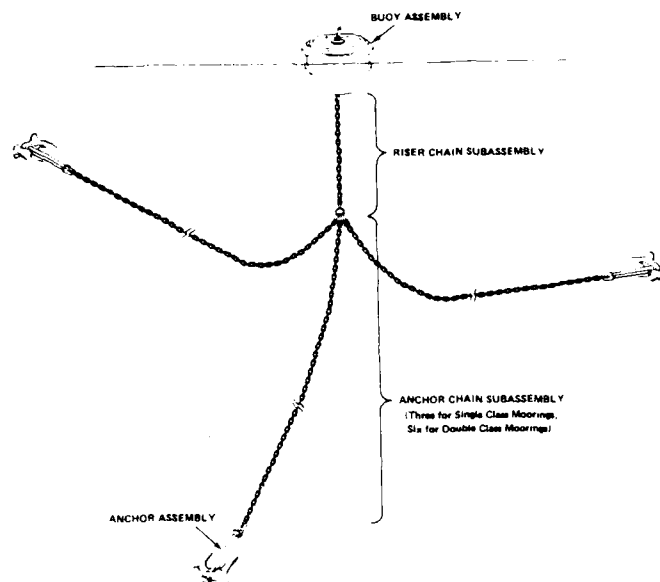


FIGURE 2. TYPICAL RISER-TYPE MOORING

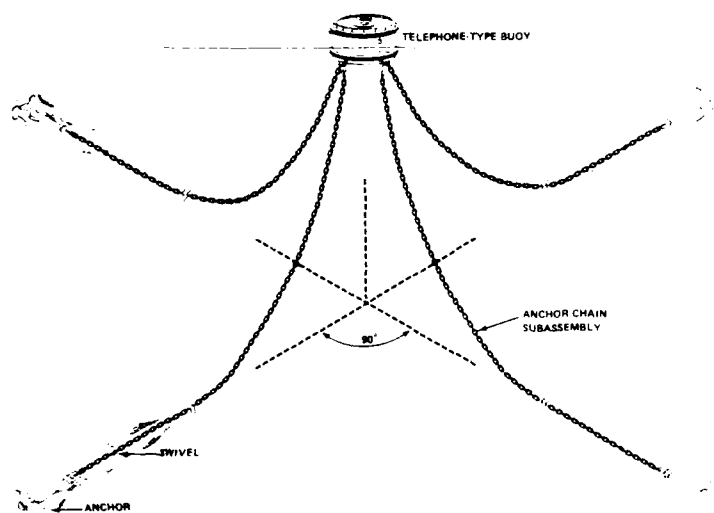


FIGURE 3. NON-RISER-TYPE MOORING
(Note: May Have 3 to 8 Legs)

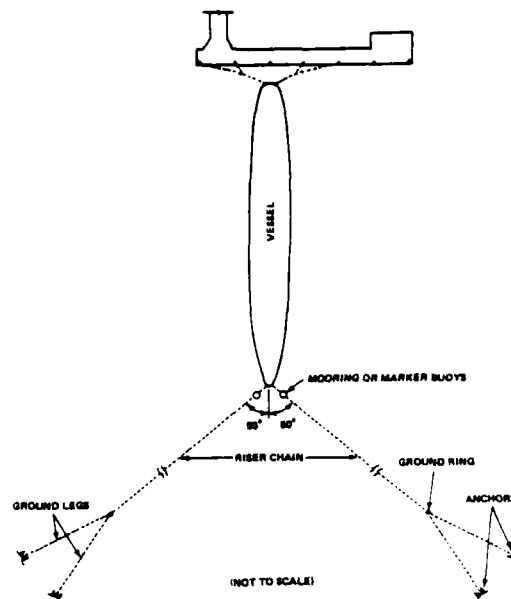


FIGURE 4. TYPICAL MEDITERRANEAN MOORING

2.2 Buoy.

2.2.1 Buoy Topside. Each buoy was inspected to determine its general condition. The buoy markings were checked for conformance to those noted in applicable charts. Physical damage, such as holes, dents, or listing, was described. Hatch-
es openings, and penetrations were examined and worn material and rust were reported. The buoy fenders and chafing strips were checked for integrity and secure connection to the buoy. Buoy top jewelry was measured with calipers to find the overall outside dimensions and areas of most severe reduction in wire size.

2.2.2 Buoy Lower Portion. Divers inspected the buoy below the waterline and recorded the thickness of marine growth and the condition of the buoy bottom.

2.3 Riser Subassembly. To determine chain wear, each riser chain was inspected by taking three consecutive double-link measurements, using pre-cut gauges and/or calipers, at both ends and at the center of the riser. To determine original chain size, divers took single-link measurements of the wire diameter and measured the link length (link length should be six times the wire diameter).

2.4 Anchor Chain Subassemblies. Using pre-cut gauges and calipers, UCT TWO divers took sample measurements of the anchor chain subassemblies.

3.0 INSPECTION SUMMARY

An in-depth discussion of the inspection results is contained in Annex A. Annex B contains buoy survey data and Annex C a copy of the preliminary report of the inspection results. A detailed evaluation of the information and data gathered during the inspection revealed the following:

- o Of the 24 moorings inspected, 14 were found to be in good condition, 7 in fair condition, and 3 unsatisfactory for fleet use. A summary of these results is contained in Table 1.
- o The three moorings in unsatisfactory condition are CM-1, DM-5, and T-1. CM-1 has one anchor that is not set in the bottom and its buoy is in poor condition and in need of overhaul. Anchor chain subassembly C of mooring DM-5 is worn to less than 80 percent of its original wire diameter. T-1 has an anchor on the bottom surface.
- o Mooring DM-3 has a detachable link worn to less than 80 percent and should be downgraded to a Class E mooring.
- o Although mooring DM-G is generally in good condition, the cause of its buoy listing about 30 degrees should be determined and corrected as soon as possible.

- o Anchor chain subassemblies of both moorings FM-48 and FM-49 are worn between 80 and 90 percent. These moorings should be downgraded to Class C moorings.
- o Due to riser and anchor chain subassembly wear, mooring P-1 should be downgraded to a Class D mooring.
- o The riser chain subassembly is worn between 80 and 90 percent in mooring T-2. However, due to oversized chain, this mooring is in satisfactory condition for use as a Class E mooring.
- o Moorings DM-6, DM-8, DM-9, FM-19, and FM-21 should be reclassified to Class A moorings because of chain size. In addition, moorings DM-8 and FM-21 should be further downgraded to Class B moorings because of riser or anchor chain subassemblies being worn to between 80 and 90 percent.
- o Only six of the moorings (FM-19, -48, -49, -50 and -51; and K) were observed to have some form of cathodic protection.

TABLE 1. SAN DIEGO FLEET MOORING STATUS

MOORING NUMBER	CURRENT CONDITION			COMMENTS
	GOOD	FAIR	POOR (Unsatisfactory for fleet use)	
CM-1			X	Anchor not set in bottom. Buoy should be overhauled.
DM-3		X		Worn detachable link. Downgrade to a Class E mooring.
DM-4	X			Good condition. Chain measurements greater than 90 percent.
DM-5			X	Leg C detach worn to less than 80 percent.
DM-6	X			Good condition. Chain measurements greater than 90 percent. Should be reclassified to a Class A mooring.
DM-8		X		Riser worn to between 80 and 90 percent. Severe crack in padeye. Top jewelry poor. Reclassify to Class A and downgrade to a Class B mooring.
DM-9	X			Good condition. Polyurethane coating on buoy. Reclassify to a Class A mooring.

TABLE 1. SAN DIEGO FLEET MOORING STATUS - Continued

MOORING NUMBER	CURRENT CONDITION			COMMENTS
	GOOD	FAIR	POOR (Unsatisfactory for fleet use)	
DM-11	X			Good condition for Class D mooring.
DM-G	X			Buoy listing 30 degrees. Chain measurements greater than 90 percent.
FM-19	X			Good condition. Buoy needs to be refurbished. Chain measures greater than 90 percent. Reclassify as a Class A mooring.
FM-20	X			Buoy fender should be replaced. Chain measures greater than 90 percent.
FM-21		X		Prior inspection noted ground legs worn between 80 and 90 percent. Reclassify to Class A and downgrade to Class B mooring.
FM-48		X		Ground legs worn to between 80 and 90 percent. Downgrade to Class C mooring.
FM-49		X		Ground legs worn to between 80 and 90 percent. Downgrade to Class C mooring.

TABLE 1. SAN DIEGO FLEET MOORING STATUS - Continued

MOORING NUMBER	CURRENT CONDITION			COMMENTS
	GOOD	FAIR	POOR (Unsatisfactory for fleet use)	
FM-50	X			Good condition. Chain measurement greater than 90 percent.
FM-51	X			Good condition. Chain measurement greater than 90 percent.
P-1		X		Riser/leg A worn between 80 and 90 percent. Downgrade to a Class D mooring.
P-2	X			Good condition. Chain measurements greater than 90 percent. Fender should be replaced.
T-1			X	Riser and legs worn between 80 and 90 percent. Anchor exposed on bottom.
T-2		X		Riser measurements between 80 and 90 percent. Satisfactory condition for use as a Class E mooring.
J	X			Buoy top jewelry heavily rusted. Chain measurements greater than 90 percent.

TABLE 1. SAN DIEGO FLEET MOORING STATUS - Continued

MOORING NUMBER	CURRENT CONDITION			COMMENTS
	GOOD	FAIR	POOR (Unsatisfactory for fleet use)	
K	X			Buoy has slight list. The cause of this list should be determined and corrected.
USS McKEE	X			Marker buoy chain should be replaced.
USS ELK RIVER	X			Good condition. Chain measured greater than 90 percent.

ANNEX A

FLEET MOORING INSPECTION RESULTS

This annex contains the following for each mooring:

1. A summation of the inspection data obtained by the CHESNAVFACENGCOM EIC and the UCT TWO divers.
2. A diver data reporting form.

CHESNAVFACENGCOM REPORT FPO-1-84(30), "SAN DIEGO FLEET MOORING UNDERWATER
INSPECTION REPORT."

MOORING CM-1

Buoy. This is a peg-top buoy with a 10-foot diameter. Its freeboard measures 3 feet. The topdeck and sides are severely rusted and pitted. The buoy's top jewelry is severely corroded, and its wood chafing strip and upper fender are in poor condition. The lower fender is completely deteriorated. The overall condition of this buoy is poor.

Riser Chain Subassembly. The riser chain is in good condition with all chain measurements greater than 90 percent of original wire diameter. The ground ring is buried.

Anchor Chain Subassembly. Not visible for inspection. However, what appears to be a 5,000 pound anchor was observed on the bottom under the buoy.

Conclusions/Recommendations. This mooring is unsatisfactory for fleet use. Its buoy is in poor condition and an anchor is visible on the bottom. This mooring should be removed from the service and overhauled at the earliest practical time.

CHESNAVFACENGCOM REPORT FPO-1-84(30), "SAN DIEGO FLEET MOORING UNDERWATER
INSPECTION REPORT."

MOORING NO.: CH-1 CLASS: G LOCATION: SAN DIEGO DEPERHNG PIER LAT: 32°41'58.8"N LONG: 117°14'55.4"W
 BUOY TYPE: REG TOP (10' DIA) ANCHOR SIZE/TY: NI WATER DEPTH: 51' VISIBILITY: 3' BOTTOM TYPE: SILT/SAND
 DATE: 25 JULY 84 ENGINEER-IN-CHARGE: J.A. THORNTON DIVERS: SAKO/CICCONE

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS	
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH		
			90+	80+	80-	90+	80+	80-	
BUOY HARDWARE	TOP-2 1/2" PADEYE, 3"								
	SPIDER, 2 3/4" SPINDLE								
	2 1/2" PEAR LINK (4)								
	BOTTOM-4" DETACH, 2 1/2"								
	PEAR, 3" DETACH								
RISER	NEAR BUOY	2 1/2" 15"	✓✓✓			✓✓✓			9'
	MIDDLE	↓	✓✓✓			✓✓✓			25'
	NEAR GRD RG	↓	✓✓✓			✓✓✓			50'
GROUND RING									
GROUND LEG NO. A	UPPER END								
	MIDDLE								
	ENTERS BOTTOM								
GROUND LEG NO. B	UPPER END								
	MIDDLE								
	ENTERS BOTTOM								
GROUND LEG NO. C	UPPER END								
	MIDDLE								
	ENTERS BOTTOM								

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 1

UNDERWATER INSPECTION REPORT.

UNCLASSIFIED REPORT, REFERENCE: 0-1-84(30).

MOORING DM-3

Buoy. This is a 12-foot-diameter drum-type buoy with a 4-foot freeboard. It has a single combination fender/chafing strip which covers the junction of the top deck and sides. There is some light rust at the waterline and 4 to 5 inches of marine growth on the bottom. Overall the buoy is in satisfactory condition.

Riser Chain Subassembly. The riser chain is in good condition with all measurements greater than 90 percent of its original wire diameter. The ground ring was located at a depth of 35 feet, about 5 feet above the bottom.

Anchor Chain Subassemblies. The visible upper section of the three chain subassemblies is in good condition. All measurements of the chain were above 90 percent. However, a NACO detachable link in subassembly B has loose pins and is worn to about 75 percent of its wire diameter.

Conclusions/Recommendations. Although a detachable link in anchor subassembly B is worn to less than 80 percent, this link is oversized and is still satisfactory if the mooring is downgraded to a Class E. However, this link should be replaced during the next scheduled overhaul.

MOORING NO: DA-3 CLASS: D LOCATION: SAN DIEGO DEPERMING AREA AT 37°41'32.23"N LONG: 119°14'12.53"W
 BUOY TYPE: DEEP (13' DIAM) ANCHOR SIZE/TYPE: N/I WATER DEPTH: 40' VISIBILITY: 5' BOTTOM TYPE: SILT/HAUD
 DATE: 24 JULY 84 ENGINEER IN CHARGE: J. A. THORNTON DIVERS: HARDING/HANN (1306-1403 HRS)

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS			
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH				
			90+	80+	80-	90+			80+	80-	
BUOY HARDWARE											
	TOP 2 3/4" PAPER EYE, 3"										BUOY HAS 4' OF FREEBOARD, SINGLE COMBINATION FENDER (CHAFING)
	SPIDER 2 3/4" SADDLE (2)										STRIP COVERS JUNCTION OF TOP DECK AND SIDES, LIGHT REST AT THE WATERLINE AND 4-5" OF MARLINE GROWTH ON THE BOTTOM.
	2 1/2" PEAR LINK (4)										TOP HARDWARE HAS LIGHT RUST AND PITS. A FOURTH NACO DETACH ON GROUND RING, NACO DETACH ON LEG B HAS 25% WEAR AND LOOSE PADS.
BUOY											
	NEAR BUOY	3 1/2"	VVV				VVV			10'	
	MIDDLE	↓	VVV				VVV			20'	
GROUND RING											
	NEAR GRD RG	↓	VVV				VVV			33'	
		4"	INSIDE DIAMETER							35'	
BRIG- GROUND LEG NO. A 150°											
	UPPER END	2 1/2"	VVV				VVV			37'	
	MIDDLE	↓	VVV				VVV			40'	
GROUND LEG NO. B 210°											
	ENTERS BOTTOM										
	UPPER END	2 1/2"	VVV				VVV			37'	ACCESSORIES BETWEEN RISER AND GROUND RING - 2 1/2" DETACH, 3"
GROUND LEG NO. C 320°											
	MIDDLE	↓	VVV				VVV			40'	NACO DETACH, 2 3/4" PEAR LINK
	ENTERS BOTTOM										
BRIG- GROUND LEG NO. C 320°											
	UPPER END	2 1/2"	VVV				VVV			37'	
	MIDDLE	↓	VVV				VVV			40'	
GROUND LEG NO. C 320°											
	ENTERS BOTTOM										
	UPPER END	2 1/2"	VVV				VVV			37'	
GROUND LEG NO. C 320°											
	MIDDLE	↓	VVV				VVV			40'	
	ENTERS BOTTOM										

FOR ADDITIONAL LEGS USE OTHER SHEETS

MOORING DM-4

Buoy. This is a 12-foot-diameter drum-type buoy with a 40-inch freeboard. It has a single wood combination fender/chafing strip covering the junction of the top deck and sides. A second wood fender near the bottom of the buoy is in good condition. The buoy's bottom has 4 to 5 inches of marine growth, and its top jewelry is lightly rusted.

Riser Chain Subassembly. The riser chain is in good condition with all single- and double-link measurements above 90 percent. The ground ring was located at a depth of 40 feet and is in good condition.

Anchor Chain Subassemblies. Only 5 feet of the three subassemblies was visible before the subassemblies entered the bottom. Measurements of the upper 5 feet of each of the chains were greater than 90 percent.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued use as a Class D mooring.

MOORING NO: DM-4 CLASS: D LOCATION: SAN DIEGO DEPERMING PIER LAT: 32°41'31.58"N LONG: 117°14'11.25"W
 BUOY TYPE: DEWH(15' DIAM) ANCHOR SIZE/TYPE: N/I WATER DEPTH: 42' VISIBILITY: 5' BOTTOM TYPE: SILT/MUD
 DATE: 24 JULY 84 ENGINEER IN CHARGE: J.A. THORNTON DIVERS: GRIFFIN/MANN (1112-1151 HRS)

COMPONENTS	GAUGE SIZE	CONDITION					COMMENTS	
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %			DEPTH
		90+	80+	80 -	90+	80+	80--	
BUOY HARDWARE								
TOP-3 "PAD-EYE, 3 1/4"								THIS BODY (S/D 151) IS A RISER TYPE
SPIDER, 2 3/4"								WITH A 3'4" FREEBOARD. HAS A SINGLE
SPIDER (2), 2 1/2"								COMBINATION FEEDER/CHANGING STRIP
PEARL LUNGS (4)								COVERING JUNCTION OF TOP DECK AND
BOTTOM-3 "DETACH (2)								SIDES, BELOW WATERLINE WOOD
RISER	NEAR BUOY	2 1/2"	✓✓✓		✓✓✓		5'	FEEDER IN GOOD CONDITION. BOTTOM
	MIDDLE	1"	✓✓✓		✓✓✓		20'	HAS 4-5" OF MARINE GROWTH. TOP
	NEAR GRD RG	↓	✓✓✓		✓✓✓		37'	JEWELRY HAS LIGHT RUST.
GROUND RING		3 1/2"					40'	
	UPPER END	2 1/4"	✓✓✓		✓✓✓		42'	BELOW GROUND RING, ONLY 5' OF LEG
	MIDDLE	13 1/2"	✓✓✓		✓✓✓			CHAIN VISIBLE BEFORE IT ENTERS
ENTERS BOTTOM								THE BOTTOM.
GROUND LEG	UPPER END	2 1/4"	✓✓✓		✓✓✓		42'	
	MIDDLE							ACCESSORIES BETWEEN RISER AND
	ENTERS BOTTOM							GROUND RING - 2 3/4" DETACH
NO. A								3" C LINK 4" APART DETACH
270°								

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 1

CHESNAVFACENCOM REPORT FPU-1-84(36)

WATER INSPECTION REPORT.

MOORING DM-5

Buoy. This is a 10-foot-diameter drum-type buoy with a combination wood fender/chafing strip covering the junction of the top deck and sides. Its bottom is covered with about 3 inches of marine growth. The top jewelry is lightly rusted. In general, the buoy is in good condition.

Riser Chain Subassembly. The riser chain is in good condition with both single- and double-link measurements greater than 90 percent. The ground ring was located at a depth of 26 feet and was found to be pitted.

Anchor Chain Subassemblies. Subassemblies A and B are in good condition with all chain measurements greater than 90 percent. Subassembly C, however, is of nonstandard construction in that there is no leg chain. From the ground ring down, there is a 2 1/4-inch NACO detachable, a 2 1/4-inch detachable link, and a 3-inch end link which is shackled to the anchor. The anchor is almost directly below the buoy. In addition, the NACO detachable link is worn to about 50 percent of its original wire diameter.

Conclusions/Recommendations. Due to the extremely worn NACO link in subassembly C, this mooring is in poor condition and unsatisfactory for continued fleet use. This mooring should be kept out of service until this link is replaced.

In addition, Table 7-62 on page 26-7-285 of DM-26 dictates that a Class D riser type mooring in 35 feet of water requires nine shots of 2-inch ground leg chain, or three shots per leg. Subassembly C should be replaced with a properly constructed chain leg at the earliest practical time.

CHESNAVFACENGCOM REPORT FPO-1-84(30), "SAN DIEGO FLEET MOORING UNDERWATER INSPECTION REPORT."

MOORING NO.: DM-5 CLASS: D LOCATION: SAN DIEGO DEPERHUK PIER LAT: 32° 41' 31.74" N LONG: 117° 14' 16.50" W
 BUOY TYPE: DEPH (6' DIAM) ANCHOR SIZE/TYPE: NZ WATER DEPTH: 31' VISIBILITY: 7' BOTTOM TYPE: SILT
 DATE: 26 JULY 84 ENGINEER-IN-CHARGE: J.A. THORNTON DIVERS: SAKO/PHELPS (0803 - 0837 HRS)

COMPONENTS	GAUGE SIZE	CONDITION					COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		
			90+	80+	90+	80+	DEPTH
BUOY HARDWARE							
TOP - 3/4" PAD-EYE, 3"							
DETACH, 2 1/2" PEAR							
BOTTOM - 3" DETACH,							
2 7/8" B LINK, 2 3/4"							
C LINK							
RISER	NEAR BUOY	2 3/4" 16 1/2"	8"		5 1/2"		8'
	MIDDLE		1 1/2"		1 1/2"		18'
	NEAR GRD RG	↓	1 1/2"		1 1/2"		23'
GROUND RING		4 3/4" X 18"	INSIDE DIAMETER				26'
	UPPER END	2"	12"		1 1/2"		28'
	MIDDLE		1 1/2"		1 1/2"		2 1/2" AISL, 3 1/4" NACO.
BE26 GROUND LEG NO. A	ENTERS BOTTOM		1 1/2"		1 1/2"		31'
	UPPER END		1 1/2"		1 1/2"		28'
	MIDDLE		1 1/2"		1 1/2"		LEG C HAS NO CHAIN. FROM
BE26 GROUND LEG NO. B	ENTERS BOTTOM	↓	1 1/2"		1 1/2"		31'
	UPPER END		1 1/2"		1 1/2"	✓	28'
	MIDDLE		1 1/2"		1 1/2"	✓	ANCHOR (UNDER THE BUOY). THE
GROUND LEG NO. C	ENTERS BOTTOM		1 1/2"		1 1/2"	✓	31'
	UPPER END		1 1/2"		1 1/2"	✓	NACO DETACH IS ABOUT 50% WORN
	MIDDLE		1 1/2"		1 1/2"	✓	

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 1

CHESNAVFACENCOM REPORT P/O-1-84(30)

WATER INSPECTION REPORT.

MOORING DM-6

Buoy. This is a 10-foot-diameter peg-top buoy with a 3-foot freeboard. It has two rubber fenders and a single chafing strip. The buoy is in good condition.

Riser Chain Subassembly. The riser consists of 2 3/4-inch chain which is in good condition. Single- and double-link measurements were all greater than 90 percent. The ground ring is buried.

Anchor Chain Subassemblies. None installed. The riser chain is connected to a stake pile.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued fleet use. However, because of the 2 3/4-inch chain, this mooring should be reclassified as a Class A mooring.

CHESNAVFACENGCOM REPORT FPO-1-84(30), "SAN DIEGO FLEET MOORING UNDERWATER INSPECTION REPORT."

MOORING NO.: DM-6 CLASS: BB LOCATION: San Diego Deepening Pier LAT: 32° 41' 35.3" N LONG: 117° 14' 16.8" W
 BUOY TYPE: PEG TOP (10' DIA) ANCHOR SIZE/TYPE: NI WATER DEPTH: 30' VISIBILITY: Bottom Type: Silt/Sand
 DATE: 24 JULY 84 ENGINEER-IN-CHARGE: J.A. THORNTON DIVERS: HARDING/PHELPS (1603-1629 HRS)

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
			90+	80+	80-	90+		
BUOY HARDWARE								BUOY HAS 3' FREEBOARD, TWO RUBBER FENDERS AND A RUBBER CHAFING STRIP. BUOY IN GOOD CONDITION.
	TOP-2 3/4" PAD EYE, 2 3/4"							
	SHACKLE 2 3/4" DETACH							
	BOTTOM-2 3/4" DETACH 3 1/4"							
	PEAR, 2 3/4" DETACH							
RISER								
	NEAR BUOY	2 3/4"	✓✓✓		✓✓			
	MIDDLE	16 1/2"	✓✓✓		✓✓✓			
	NEAR GRD RG	↑	✓✓✓		✓✓✓			
GROUND RING								
GROUND LEG NO. A								
	UPPER END							
	MIDDLE							
	ENTERS BOTTOM							
GROUND LEG NO B								
	UPPER END							
	MIDDLE							
	ENTERS BOTTOM							
GROUND LEG NO. C								
	UPPER END							
	MIDDLE							
	ENTERS BOTTOM							

BUOY HAS 3' FREEBOARD,
 TWO RUBBER FENDERS AND A
 RUBBER CHAFING STRIP. BUOY
 IN GOOD CONDITION.

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 1

MOORING DM-8

Buoy. This is a 12-foot-diameter peg-top buoy with a 62-inch freeboard. The top jewelry is in poor condition, and the tension bar top eye has a 3/16-inch-wide by a 1-inch-deep crack extending for 16 inches along its top. This crack was previously reported as a result of the 1982 underwater inspection. The buoy has two wooden chafing strips and two wooden fenders. These are in good condition except for the lower fender which is badly deteriorated. The buoy has moderate rust on its sides and 2 to 3 inches of marine growth on its bottom.

Riser Chain Subassembly. The riser chain is in fair condition with measurements near its mid-section down to 80 to 90 percent of its original wire diameter. The riser enters the bottom and reappears near a 12-inch by 12-inch "H" pile with 1 1/2-inch flanges.

Anchor Chain Subassemblies. None installed. The riser chain goes directly to an "H" pile in the bottom.

Conclusions/Recommendations. Due to its 2 3/4-inch riser chain, this mooring should be reclassified to a Class A mooring and downgraded to a Class B because of its worn chain. However, since its design does not fall into any standard mooring classification, no estimate of its holding capacity is available. The mooring should be used with caution.

The top jewelry should be examined and, if necessary, replaced. Immediate action should be taken to repair the crack in the tension bar top eye.

CHESNAVFACENGCOM REPORT FPO-1-84(30), "SAN DIEGO FLEET MOORING UNDERWATER INSPECTION REPORT."

MOORING NO: DM-8 CLASS: BA LOCATION: SAN DIEGO DEFEHANS FIER LAT: 32°41'34.2"N LONG: 117°14'15.9"W
 BUOY TYPE: REG TOP (10' DIA) ANCHOR SIZE/TY: N/I WATER DEPTH: 40' VISIBILITY: 5' BOTTOM TYPE: SILT/SAND
 DATE: 24 JULY 84 ENGINEER IN CHARGE: SA THORNTON DIVERS: HARDING/PHILIPS (1451-1527 HRS)

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
		90+	80+	80-	90+	80+	80-	
BUOY HARDWARE	"TOP-3 PADEYE, 3 1/2"							
	SHACKLE, 3 1/4 x 1 1/4"							
	RING							
	BOTTOM-4 DETACH, 2 1/4"							
RISER	PEAR, 3 1/2" DETACH							
	NEAR BUOY	2 3/4"	✓✓✓		✓✓✓			10'
	MIDDLE	↓		✓✓✓		✓✓✓		35'
GROUND RING	NEAR GRD RG	↓	✓✓✓		✓✓✓			40'
	UPPER END							
	MIDDLE							
GROUND NO. A	ENTERS BOTTOM							
	UPPER END							
	MIDDLE							
GROUND NO. B	ENTERS BOTTOM							
	UPPER END							
	MIDDLE							
GROUND NO. C	ENTERS BOTTOM							
	UPPER END							
	MIDDLE							

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 1

MOORING DM-9

Buoy. This is a 12-foot-diameter peg-top buoy with a 5-foot freeboard. Its two rubber fenders and two rubber chafing rails appear to be new. The buoy has an experimental polyurethane coating and is in good condition.

Riser Chain Subassembly. The 2 3/4-inch riser is connected to a 12-inch by 12-inch "H" Pile which sticks up about 6 feet above the bottom. There are some loose riser chain and accessories piled on the bottom below the buoy.

Anchor Chain Subassembly. None installed. The riser chain goes directly to the "H" pile.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued fleet use. However, because of the 2 3/4-inch riser chain, this mooring should be reclassified as a Class A mooring.

CHESNAVFACENGCOM REPORT FPO-1-84(30), "SAN DIEGO FLEET MOORING UNDERWATER
INSPECTION REPORT."

MOORING NO: DM-9 CLASS: BB LOCATION: SAN DIEGO DEERHIDE PIER LAT: 32°41'41.5" N LONG: 117°14'13.8" W
 BUOY TYPE: LEG TOP (13" DIA) ANCHOR SIZE/TYPE: NI WATER DEPTH: 40' VISIBILITY: 5' BOTTOM TYPE: SILT/MUD
 DATE: 24 JULY 84 ENGINEER IN CHARGE: J. A. THORNTON DIVERS: GRIFFIN/MAW (1020-1050 HRS)

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
			90+	80+	80-	90+		
BUOY HARDWARE	TOP-2 3/4" PALLETS, 3/4"							BUOY HAS 5' OF FREEBOARD, TWO RUBBER FENDERS AND TWO RUBBER CHAFING RAILS ARE NEW. BUOY HAS AN EXPERIMENTAL POLYURETHANE COATING AND IS IN GOOD CONDITION.
	SHACKLE, 3/8" SNAP							
	4" X 13 1/2" RING							
	BOTTOM-2 3/4" DETACH, 3/4"							
	B LINK, 2 3/4" DETACH							
RISER	NEAR BUOY	2 3/4"	16 3/4"	✓✓✓	✓✓✓	✓✓✓	8'	
	MIDDLE	1 1/2"	✓✓✓	✓✓✓	✓✓✓	✓✓✓	20'	
	NEAR GRD RG	1 1/2"	✓✓✓	✓✓✓	✓✓✓	✓✓✓	40'	
GROUND RING								BOTTOM.
GROUND LEG NO. A	UPPER END							HARDWARE AT THE BOTTOM OF THE RISER - 2 3/4" DETACH, 3/4" B LINK, 2 3/4" C LINK, 4 1/2" ACO DETACH, AND A 2 3/4" PEAR LINK. RISER CHAIN AND ACCESSORIES ARE FILED ON BOTTOM.
	MIDDLE							
	ENTERS BOTTOM							
GROUND LEG NO. B	UPPER END							ACCESSORIES ARE FILED ON BOTTOM.
	MIDDLE							
	ENTERS BOTTOM							
GROUND LEG NO. C	UPPER END							ACCESSORIES ARE FILED ON BOTTOM.
	MIDDLE							
	ENTERS BOTTOM							

SHEET 1 OF 1

MOORING DM-11

Buoy. This is a 12-foot-diameter peg-top buoy with a 4-foot freeboard. It has a single combination wood fender/chafing strip covering the junction of the top deck and sides. This material is in good condition. The buoy has moderate rust on its sides and its bottom has 4 to 5 inches of marine growth.

Riser Chain Assembly. The 2 3/4-inch riser chain is in good condition with all measurements greater than 90 percent. Riser chain has about 4 inches of marine growth. The ground ring was located at 25 feet and is in good condition.

Anchor Chain Subassembly. The 2 1/4-inch anchor chain is in good condition with all measurements greater than 90 percent. Only about 5 feet of each leg chain was visible before it entered the bottom.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued use as a Class D mooring.

MOORING DM-G

Buoy. This is a 10-foot-diameter peg-top buoy. The class of the mooring has not been reported. It has two rubber fenders and a rubber chafing rail, all in good condition. The buoy has a fiberglass coating and looks new; however, it is listing about 30 degrees. The cause of the list is unknown.

Riser Chain Subassembly. The 2 1/2-inch riser chain is in good condition and measured greater than 90 percent of its original chain size. The riser enters the bottom at 40 feet.

Anchor Chain Subassemblies. None installed. The riser chain is attached to a stake pile which was not visible.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued fleet use. The cause of the buoy's list, however, should be investigated and corrected.

MOORING NO: DM-G CLASS: — LOCATION: SAN DIEGO DEEPHARBOR LAT: 32°41'48"N LONG: 117°14'12.7"W
 BUOY TYPE: REG TOP (10' DIA) ANCHOR SIZE/TYPE: NI WATER DEPTH: 40' VISIBILITY: 5' BOTTOM TYPE: SILT/MUD
 DATE: 24 JULY 84 ENGINEER-IN-CHARGE: J.A. THRENTON DIVERS: GRIFFIN/HAIN

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
		90+	80+	80-	90+	80+	80-	
BUOY HARDWARE								
TOP- 2 1/2" RADEYE, 3"								THE BUOY HAS TEAR RUBBER
SPIDER, 3/4" SPIDER(3)								FENDERS AND A CHAFING
2 1/2" PEARLS (4)								RAIL IN GOOD CONDITION,
BOTTOM- 2 1/4" DETACH, 2 1/2"								BUOY HAS FIBERGLASS
B LINK, 2 1/2" DETACH								COATING AND LOOKS NEW.
RISER	NEAR BUOY	2 1/2"	✓✓✓		✓✓✓			8'
	MIDDLE	↓	✓✓✓		✓✓✓			23'
	NEAR GRD RG	↓	✓✓✓		✓✓✓			40'
GROUND RING								
GROUND LEG NO. A	UPPER END							
	MIDDLE							
	ENTERS BOTTOM							
GROUND LEG NO B	UPPER END							
	MIDDLE							
	ENTERS BOTTOM							
GROUND LEG NO. C	UPPER END							
	MIDDLE							
	ENTERS BOTTOM							

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 1

UNDERWATER INSPECTION REPORT.

CHESNAVFACENGCOM REPORT RPO-1-84(30),

MOORING FM-19

Buoy. This is a 12-foot-diameter peg-top buoy with a 4 1/2-foot freeboard. It has two wood chafing strips and two wood fenders (the lower of which is completely deteriorated). The buoy has severe rust on the top padeye and moderate rust on the sides.

Riser Chain Subassembly. The 2 3/4-inch riser chain is in good condition. All chain measurements were greater than 90 percent of its original wire diameter. The ground ring was located at a depth of 35 feet.

Anchor Chain Subassemblies. The 2 1/2-inch anchor chain of each of the seven subassemblies is in good condition with all measurements greater than 90 percent. The sunken 56-foot boat that had precluded the inspection of six of this mooring's legs during the 1982 inspection (because it was lying across these legs) has been removed.

Cathodic Protection. Cathodic protection continuity wire is installed on all seven ground legs but no anodes were observed. Underwater voltmeter readings measured the cathodic protection on the seven legs to be between -.77 and -.65 volts. There were no anodes on the buoy.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued fleet use. However, because of the 2 3/4-inch chain in the riser, this mooring should be reclassified as a Class A mooring. In addition, the buoy should be overhauled.

MOORING NO: FH-19 CLASS: B B LOCATION: HARBOR ISLAND, SAN DIEGO LAT: 32°43'17.1"N LONG: 117°11'18.4"W
 BUOY TYPE: REG TOP (12 DIAM) ANCHOR SIZE/TYPE: N I WATER DEPTH: 42 VISIBILITY: 2 BOTTOM TYPE: SILT/MUD
 DATE: 27 JULY 84 ENGINEER IN CHARGE: J. A. THORNTON DIVERS: CICCOPE/MAHN

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
		90+	80+	80-	90+	80+	80-	
BUOY HARDWARE							CPS VOLTS	
TOP 3" PADEYE, 3/4"								BUOY FREEBOARD 46". HAS TWO
SPIDER, 3/4" SPIDER (2)								WOOD CHAFING STRIPS AND TWO
2 1/2" PEAR (3)								WOOD FENDERS. LOWER FENDER
BOTTOM 3/4" DETACH 2 1/2"								COMPLETELY DETERIORATED.
PEAR 2 1/2" DETACH								SEVERE RUST ON TOP PADEYE
RISER	NEAR BUOY	2 3/4"	✓✓✓		✓✓✓			8'
	MIDDLE	↓	✓✓✓		✓✓✓			20'
	NEAR GRD RG	↓	✓✓✓		✓✓✓			31'
GROUND RING		4 1/2" x 16" INSIDE DIAMETER						35'
	UPPER END	2 1/2" 15"	✓✓✓		✓✓✓			37'
	MIDDLE		✓✓✓		✓✓✓			-68
NO. A 030	ENTERS BOTTOM		✓✓✓		✓✓✓			43'
	UPPER END		✓✓✓		✓✓✓			39'
	MIDDLE		✓✓✓		✓✓✓			-67
NO. B 060	ENTERS BOTTOM		✓✓✓		✓✓✓			43'
	UPPER END		✓✓✓		✓✓✓			37'
	MIDDLE		✓✓✓		✓✓✓			-65
NO. C 140	ENTERS BOTTOM	✓	✓✓✓		✓✓✓			42'
	UPPER END		✓✓✓		✓✓✓			
	MIDDLE		✓✓✓		✓✓✓			
ENTERS BOTTOM		✓✓✓		✓✓✓				

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 3

UNDERWATER INSPECTION REPORT.

U.S. NAVY FACE NO. 100-1-84(30)

FOR ADDITIONAL LEGS USE OTHER SHEETS

WATER INSPECTION REPORT."

MOORING NO: FH-19 CLASS: BB LOCATION: HARBOR ISLAND SAN DIEGO LAT: 32°43'17"N LONG: 117°11'16"W
 BUOY TYPE: REG TOP (12" DIA) ANCHOR SIZE/TYPE: NI WATER DEPTH: 42' VISIBILITY: 2' BOTTOM TYPE: SILT/MUD
 DATE: 27 JULY 84 ENGINEER-IN-CHARGE: J. A. THORNTON DIVERS: PICCONI/MANN

COMPONENTS		GAUGE SIZE	CONDITION						COMMENTS
			LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
			90+	80+	80-	90+	80+	80-	
SEE SHEET 1 OF 3									
BUOY HARDWARE									
RISER	NEAR BUOY								
	MIDDLE								
	NEAR GRD RG								
GROUND RING									
BRACE GROUND LEG NO. 1	UPPER END	2 1/2"	15"	VVV		VVV		14 3/4'	
	MIDDLE			VVV		VVV			
	ENTERS BOTTOM		↓	VVV		VVV		42'	
GROUND LEG NO.	UPPER END								
	MIDDLE								
	ENTERS BOTTOM								
GROUND LEG NO.	UPPER END								
	MIDDLE								
	ENTERS BOTTOM								

SHEET 3 OF 3

FOR ADDITIONAL LEGS USE OTHER SHEETS

MOORING FM-20

Buoy. This is a 16-foot-diameter non-riser (telephone type) buoy with eight legs. Each of the buoy's bottom four padeyes has a 3 1/4-inch pear link attached to it. Two 2 1/2-inch ground legs are connected to each pear link. The buoy has a 3 1/2-foot freeboard, a wood chafing strip, and a single wooden fender (partially missing).

Anchor Chain Subassemblies. All eight of these subassemblies are in good condition, and the single- and double-link measurements of each leg were greater than 90 percent of its original wire diameter. About 1 to 2 inches of marine growth was observed on the anchor chain. Assemblies E and F cross each other and appear to run out in a similar direction. Legs G and H are on top of each other and disappear into the bottom on the same bearing.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued fleet use. However, its leg orientation appears questionable.

CHESNAVFACENGCOM REPORT FPO-1-84(30), "SAN DIEGO FLEET MOORING UNDERWATER INSPECTION REPORT."

MOORING NO.: FH 20 CLASS: BB LOCATION: HARBOR ISLAND, SAN DIEGO LAT: 32°43'16"N LONG: 117°11'02.9"W
 BUOY TYPE: NEW RISER (TELEPHONE) ANCHOR SIZE/TYPE: NI WATER DEPTH: 40' VISIBILITY: 5' BOTTOM TYPE: SILT/MUD
 DATE: 27 JULY 84 ENGINEER-IN-CHARGE: J.A. THORNTON DIVERS: PICONE/HADN (1333 - 1449 HRS)

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
			90+	80+	80-	90+		
BUOY HARDWARE								THIS BUOY (S/N 69) IS 16' IN
TOP- 1/4" PADDLE, 3/4"								DIAMETER AND HAS 8 LEGS ATTACHED
DETACH, 3/2" DETACH								TO IT. THE BUOY HAS A 3/2" FREEDOM
2 1/2" PEAR LINK (4)								AND A WORKING NAVIGATIONAL
								LIGHT ON TOP. IT HAS ONE WOOD
NEAR BUOY								FENDER (PARTIALLY MISSING) AND
MIDDLE								A WOOD CHAFING STRIP. EACH OF
NEAR GRD RG								THE 4 BUOY PAD EYES HAS A 3/4"
GROUND RING								PEAR LINK ATTACHED TO IT WITH
UPPER END	2 1/2"	15"	✓✓✓			✓✓✓	7'	2 LEGS CONNECTED TO EACH PEAR
MIDDLE			✓✓✓			✓✓✓	25'	LINK. ACCESSORIES ATTACHED TO
ENTERS BOTTOM			✓✓✓			✓✓✓	40'	EACH LARGE PEAR LINK ARE 3"
UPPER END			✓✓✓			✓✓✓	8'	DETACH (2), 3 1/2" PEAR LINK (2), 2 1/2"
MIDDLE			✓✓✓			✓✓✓	25'	DETACH (2). BUOY HAS A 2' x 3'
ENTERS BOTTOM			✓✓✓			✓✓✓	40'	WELDON TOP WITH TWO 2 1/2"
UPPER END			✓✓✓			✓✓✓	8'	PIPES AND GATE VALVES FROM
MIDDLE			✓✓✓			✓✓✓	25'	A "Y" JOINT. ALL VALVES ARE
ENTERS BOTTOM			✓✓✓			✓✓✓	40'	CAPPED

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 3

UNDERWATER INSPECTION REPORT.

U.S. NAVY AEC-100-84 (307)

MOORING NO.: FM-20 CLASS: BB LOCATION: HARBOR ISLAND, SAN DIEGO LAT: 32°43'N LONG: 117°10'W
 BUOY TYPE: NOV. RISER ANCHOR SIZE/TYPE: NI WATER DEPTH: 40' VISIBILITY: 5' BOTTOM TYPE: SILT/MUD
 DATE: 27 JULY 84 ENGINEER IN CHARGE: J.A. THORNTON DIVERS: CICCONI/MANN (333-1449 HRS)

COMPONENTS		GAUGE SIZE	CONDITION						COMMENTS
			LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
			90+	80+	80-	90+	80+	80-	
SEE SHEET 1 OF 3									
BUOY HARDWARE									
RISER	NEAR BUOY								
	MIDDLE								
	NEAR GRD RG								
GROUND RING									
BRG GROUND LFG NO. D	UPPER END	2 1/2	15"	VVV		VVV		5'	LEGS E AND F CROSS EACH OTHER
	MIDDLE			VVV		VVV		25'	AND APPEAR TO RUN OUT THE SAME
	ENTERS BOTTOM			VVV		VVV		40'	BEARING, ABOUT 1-2" OF MARINE
BRG GROUND LEG NO. E	UPPER END			VVV		VVV		7'	GROWTH ON THE CHAIN
	MIDDLE			VVV		VVV		25'	
	ENTERS BOTTOM			VVV		VVV		40'	
BRG GROUND LEG NO. F	UPPER END			VVV		VVV		5'	
	MIDDLE			VVV		VVV		25'	
	ENTERS BOTTOM			VVV		VVV		40'	

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 2 OF 3

MOORING NO.: FM-20 CLASS: BB LOCATION: HARBOR ISLAND, SAN DIEGO LAT: 32° 43' 6" N LONG: 117° 11' 27.9" W
 BUOY TYPE: RED-RISER ANCHOR SIZE/TYPE: UL WATER DEPTH: 40' VISIBILITY: 5' BOTTOM TYPE: SILT/MLD
 DATE: 27 JULY 84 ENGINEER IN CHARGE: J.A. THORNTON DIVERS: DIACODE/MANN (1333-1449 HRS)

COMPONENTS		GAUGE SIZE	CONDITION						COMMENTS
			LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
			90+	80+	80-	90+	80+	80-	
BUOY HARDWARE									
RISER	NEAR BUOY								
	MIDDLE								
	NEAR GRD RG								
GROUND RING									
BEAC- GROUND LEG NO. 5 300°	UPPER END	2 1/2"	VVV			VVV			6'
	MIDDLE		VVV			VVV			25'
	ENTERS BOTTOM		VVV			VVV			40'
BEAC- GROUND LEG NO. 4 300°	UPPER END		VVV			VVV			8'
	MIDDLE		VVV			VVV			25'
	ENTERS BOTTOM		VVV			VVV			40'
GROUND LEG NO.	UPPER END	✓	✓			✓			
	MIDDLE								
	ENTERS BOTTOM								

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 3 OF 3

MOORING FM-21

Buoy. This is a 12-foot-diameter peg-top buoy which has a 45-inch freeboard. It has two wooden chafing strips and a wood fender in good condition. A second wood fender, the lower one, is about 80 percent deteriorated. The buoy has a heavy coating of rust on its sides.

Riser Chain Assembly. The 2 3/4-inch riser chain is in good condition. Single- and double-link measurements were greater than 90 percent of original diameter. The ground ring is in good condition and was located at a depth of 35 feet.

Anchor Chain Assemblies. Seven legs are attached to the ground with NACO detachable links, pear links, and other types of detachable links. The 2 1/2-inch anchor chain is in good condition with all measurements greater than 90 percent of its original diameter.

Conclusions/Recommendations. As a result of this inspection, this mooring appears to be in good condition. However, during the previous inspection, specific parts of anchor chain subassemblies 4 and 7 were measured to be between 80 and 90 percent (fair condition) of their original diameter. Because of the 2 3/4-inch chain in the riser, this mooring should be reclassified as a Class A mooring and downgraded (because of chain wear) to a Class B. The buoy should be refurbished.

MOORING NO: FM-21 CLASS: BB LOCATION: HARBOR ISLAND, SAN DIEGO LAT: 32°43'15.5" N LONG: 117°10'56.1" W
 BUOY TYPE: PE TOP (12' DIA) ANCHOR SIZE/TYPE: N1 WATER DEPTH: 40' VISIBILITY: 5' BOTTOM TYPE: SILT/MLD
 DATE: 27 JULY 84 ENGINEER-IN-CHARGE: J.A. THORNTON DIVERS: SAKO/PHELPS (1215-1248 HRS)

COMPONENTS		GAUGE SIZE	CONDITION						COMMENTS
			LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
			90+	80+	80-	90+	80+	80-	
BUOY HARDWARE	TOP-2 3/4" PADDY, 3"								BUOY HAS A 3' 9" FREEBOARD AND TWO 6" CHAFING STRIPS IN GOOD
	SPIDER 2 3/4" PEARLS								CONDITION. IT HAS TWO WOOD
	2 1/2" PEARLS (4)								FENDERS, THE LOWER OF WHICH
	BOTTOM-3 1/4" NACO DOWEL								IS 80% DETEIORATED. THERE IS
	2 1/2" DETACH								HEAVY RUST ON ITS SIDES. THERE
RISER	NEAR BUOY	2 3/4"	VVV			VVV			8'
	MIDDLE	↓	VVV			VVV			20'
	NEAR GRD RG	↓	VVV			VVV			33'
GROUND RING		5 1/2"	INSIDE DIAMETER						35'
BRG- GROUND LEG NO. A 180°	UPPER END	2 1/2"	VVV			VVV			36'
	MIDDLE	↓	VVV			VVV			
	ENTERS BOTTOM		VVV			VVV			40'
BRG- GROUND LEG NO B 185°	UPPER END		VVV			VVV			36'
	MIDDLE		VVV			VVV			40'
	ENTERS BOTTOM		VVV			VVV			
BRG- GROUND LEG NO. C 230°	UPPER END		VVV			VVV			36'
	MIDDLE		VVV			VVV			
	ENTERS BOTTOM	↓	VVV			VVV			40'

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 3

[illegible]

SHEET 2 OF 3

CCHESNAVFACENGCOM REPORT RPU-1-84(30,

MOORING NO.: FH-21 CLASS: BB LOCATION: HARBOR ISLAND, SAN DIEGO LAT: 32°43'15.5"N LONG: 117°10'32.1"W
 BUOY TYPE: REG TOP (12" DIAM) ANCHOR SIZE/TYPE: NI WATER DEPTH: 40' VISIBILITY: 5' BOTTOM TYPE: SILT/MUD
 DATE: 27 JULY 84 ENGINEER IN CHARGE: J. A. THORNTON DIVERS: SAKO/PHELPS (1215-1348 HRS)

COMPONENTS		GAUGE SIZE	CONDITION						COMMENTS	
			LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH		
90+	80+	80-		90+	80+	80-				
SEE SHEET 1 of 3										
BUOY HARDWARE										
RISER	NEAR BUOY									
	MIDDLE									
	NEAR GRD RG									
GROUND RING										
GROUND LEG NO. 6	UPPER END	2 1/2"	✓✓✓				✓✓✓			
	MIDDLE	↓	✓✓✓				✓✓✓			
	ENTERS BOTTOM	↓	✓✓✓				✓✓✓			
GROUND LEG NO.	UPPER END									
	MIDDLE									
	ENTERS BOTTOM									
GROUND LEG NO.	UPPER END									
	MIDDLE									
	ENTERS BOTTOM									

FOR ADDITIONAL LEGS USE OTHER SHEETS SHEET 3 OF 3

MOORING FM-48

Buoy. This is a 12-foot-diameter peg-top buoy with a 4-foot freeboard. It has two wooden fenders. The upper is in good condition, but the lower is completely deteriorated. Two wooden chafing strips on the buoy's top deck are in good condition. There is a light coating of rust on the buoy's sides.

Riser Chain Subassembly. The riser chain is in good condition with single- and double-link measurements all greater than 90 percent. There is about 2 inches of marine growth on the chain. The ground ring was located at a depth of 28 feet.

Anchor Chain Subassemblies. Most sections of the four subassemblies are in good condition. However, the lower sections of subassemblies A and C were measured to be between 80 and 90 percent of the original 2 1/2-inch wire diameter. Each of the subassemblies was visible for about 20 feet before it entered the bottom.

Cathodic Protection. Continuity wire was observed on all legs, but no chain anodes were visible. Underwater voltmeter readings measured the cathodic protection to be between -1.01 volts at a buoy anode to -.64 volts on anchor chain subassembly C.

Conclusions/Recommendations. Due to the 80 to 90 percent measurements on two of the ground legs, this buoy is considered to be in fair condition and should be downgraded to a Class C mooring.

CHESNAVFACENGCOM REPORT FPO-1-84(30), "SAN DIEGO FLEET MOORING UNDERWATER INSPECTION REPORT."

MOORING NO: FH-48 CLASS: B LOCATION: NAVSTA SAN DIEGO HARBOR LAT: 32°40'55.4"N LONG: 117°08'30.0"W
 BUOY TYPE: REG TOP (2' DIAM) ANCHOR SIZE/TYPE: N1 WATER DEPTH: 40' VISIBILITY: 1' BOTTOM TYPE: SILT/MLD
 DATE: 28 JULY 84 ENGINEER IN CHARGE: J. A. THORNTON DIVERS: HANW/PHILPS

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS
		LINK LENGTH		SINGLE LINK %		DOUBLE LINK %		
		90+	80+	80	90+	80+	90+	
BUOY HARDWARE								
TOP-2 3/4" ANDEYE, 5"								BUOY HAS 4' OF FREEBOARD AND A NAVIGATION LIGHT ON TOP. IT HAS TWO WOODEN FENDERS; THE UPPER IS IN GOOD CONDITION BUT THE LOWER IS COMPLETELY DETERIORATED. TWO WOOD CHAFING STRIPS ARE IN GOOD CONDITION. LIGHT RUST ON BUOY SIDES, CHAIN HAS 2" OF MARINE GROWTH, FROM GP. TO EACH OF FOUR CHAIN LEGS - 4" NACO DETACH, 2 1/2" END LINK, AND 3 3/4" DETACH.
SPIDER, 3 3/4" SANDER(S)								LEGS VISIBLE FOR 20' BEFORE CHAIN ENTERS BOTTOM. THERE IS CONTINUITY CABLE ON EACH LEG BUT NO ANODES WERE INSTALLED
2 1/4" PEARL LINK (4)								
BOTTOM-3 1/2" DETACH,								
3" DETACH								
RISER	NEAR BUOY	2 1/4"	6 1/2"	✓✓✓	✓✓✓			
	MIDDLE	↓	↓	✓✓✓	✓✓✓			
	NEAR GRD RG	↓	↓	✓✓✓	✓✓✓			
GROUND RING								28'
BRUG GROUND LEG NO. A	UPPER END	2 1/2"	15"	✓✓✓	✓✓✓			-6.7
	MIDDLE		↓	✓✓✓	✓✓✓			
	ENTERS BOTTOM			✓✓✓	✓✓✓			-6.8
BRUG GROUND LEG NO. B	UPPER END			✓✓✓	✓✓✓			-6.4
	MIDDLE			✓✓✓	✓✓✓			
	ENTERS BOTTOM			✓✓✓	✓✓✓			-6.5
BRUG GROUND LEG NO. C	UPPER END			✓✓✓	✓✓✓			-6.4
	MIDDLE			✓✓✓	✓✓✓			
	ENTERS BOTTOM			✓✓✓	✓✓✓			-6.4

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 2

CHESNAVACENUM REPORT FPU-1-84(30), "SAR" UNDERWATER INSPECTION REPORT.

MOORING NO: FH-48 CLASS: B LOCATION: NAVSTA SAN DIEGO HERBERT LAT: 32° 40' 55.4" N LONG: 117° 08' 30.0" W
 BUOY TYPE: PEG TOP (1/2" DIA) ANCHOR SIZE/TY: NI WATER DEPTH: 40' VISIBILITY: 1' BOTTOM TYPE: SILT/HRD
 DATE: 28 JULY 84 ENGINEER IN CHARGE: J. A. THORNTON DIVERS: HANN/PHELPS

COMPONENTS	GAUGE SIZE	CONDITION					COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		
		90+	80+	80-	90+	80-	
SEE SHEET 1 OF 2							
BUOY HARDWARE							
NEAR BUOY							
MIDDLE							
NEAR GRD RG							
GROUND RING							
UPPER END	2 1/2"	✓✓✓			✓✓✓		-67
MIDDLE	↓	✓✓✓			✓✓✓		
ENTERS BOTTOM	↓	✓✓✓			✓✓✓		-69
UPPER END							
MIDDLE							
ENTERS BOTTOM							
UPPER END							
MIDDLE							
ENTERS BOTTOM							
UPPER END							
MIDDLE							
ENTERS BOTTOM							
UPPER END							
MIDDLE							
ENTERS BOTTOM							

FOR ADDITIONAL LEGS USE OTHER SHEETS SHEET 2 OF 2

MOORING FM-49

Buoy. This is a 16-foot-diameter non-riser (telephone type) buoy with a 50-inch freeboard. It has a single wood chafing strip, in good condition, and a single wood fender with about 20 percent missing. The buoy's sides are covered with a light coating of rust.

Anchor Chain Subassemblies. The lower sections of subassemblies A and D were measured to be between 80 and 90 percent of original wire diameter. Other measurements were greater than 90 percent.

Cathodic Protection. Anodes were found attached to three of the four subassemblies and lying on the bottom. Two of these zincs were measured to be 24 inches by 8 inches by 8 inches. Underwater voltmeter readings measured the cathodic protection to be between -.83 and -.80 volts.

Conclusions/Recommendations. Due to the 80 to 90 percent measurements of the chain subassemblies, this mooring is in fair condition and should be downgraded to a Class C mooring.

MOORING NO: FM-49 CLASS: B LOCATION: NAVSTA SAN DIEGO HARBOR LAT: 32°40'S LONG: 117°08'25"W
 BUOY TYPE: Non-Rigid Tele Buoy ANCHOR SIZE/TYPE: NI WATER DEPTH: 38' VISIBILITY: 1' BOTTOM TYPE: SILT/MUD
 DATE: 28 JULY 84 ENGINEER IN CHARGE: J. A. THORNTON DIVERS: MANU/PHELPS (1129-1213 HRS)

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
		90+	80+	80-	90+	80+	80-	
BUOY HARDWARE	TOP 4 1/4" PADDLE(S) 3"						80- CPS VOTS	BOUY HAS 4 1/2" FREEBOARD AND A NAVIGATION LIGHT ON TOP. BOUY HAS SINGLE WOOD CHAFING STRIP IN GOOD CONDITION AND A SINGLE WOOD KEEPER WITH ABOUT 20% MISSING. LIGHT RUSTON BOUY SIDES. CONTINUITY WIRE OBSERVED ON ALL FOUR LEGS. ANODES FOUND ATTACHED TO 3 OF 4 LEGS AND LYING ON BOTTOM.
	5 LINK 3 1/2" END LINK							
	2 1/2" PEAR LINK							
	BOTTOM EYE 5 PEAR 3 DETAIL							
RISER	2 1/2" PEAR 2 1/2" DETAIL							
	NEAR BUOY							
	MIDDLE							
	NEAR GRD RG							
GROUND RING								
GROUND LEG NO. A	UPPER END	2 1/2" 15"	VVV		VVV		-83 10'	
	MIDDLE		VVV		VVV		-83 32'	
	ENTERS BOTTOM		VVV		VVV		-83 35'	
GROUND LEG NO. B	UPPER END		VVV		VVV		-80 10'	
	MIDDLE		VVV		VVV		22' 24' x 8" x 8"	
	ENTERS BOTTOM		VVV		VVV		-80 35'	
GROUND LEG NO. C	UPPER END		VVV		VVV		-80 10'	
	MIDDLE		VVV		VVV		22'	
	ENTERS BOTTOM		VVV		VVV		-80 35'	

FOR ADDITIONAL LEGS USE OTHER SHEETS
 SHEET 1 OF 2

MOORING NO. FM-49 CLASS: B LOCATION NAVSTA SAN DIEGO HARBOR LAT: 32°40'51"N LONG: 117°08'22.5"W
 BUOY TYPE: NAV-RISER ANCHOR SIZE/TYPE: NI WATER DEPTH: 38' VISIBILITY: 1' BOTTOM TYPE: SILT/MUD
 DATE: 28 JULY 84 ENGINEER-IN-CHARGE: J.A. THORNTON DIVERS: HAWK/PHELPS (1129-1213 HRS)

COMPONENTS		GAUGE SIZE	CONDITION						COMMENTS
			LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
			90+	80+	80 -	90+	80+	80 -	
SEE SHEET 1 OF 2								CPS Volts	
BUOY HARDWARE									
RISER	NEAR BUOY								
	MIDDLE								
	NEAR GRD RG								
GROUND RING									
GROUND LEG NO. D	UPPER END	2 1/8" ↓	15" ↓	✓✓✓		✓✓✓		-83	10'
	MIDDLE		✓✓✓			✓✓✓			22'
	ENTERS BOTTOM		✓✓✓			✓✓✓		-83	35'
GROUND LEG NO.	UPPER END								
	MIDDLE								
	ENTERS BOTTOM								
GROUND LEG NO.	UPPER END								
	MIDDLE								
	ENTERS BOTTOM								

SHEET 2 OF 2

FOR ADDITIONAL LEGS USE OTHER SHEETS

CHESAPEAKE REPORT

CHESAPEAKE REPORT FPO-1-84(30)

MOORING FM-50

Buoy. This is a 12-foot-diameter peg-top buoy with a 4-foot freeboard. It has two double fenders near the top and two double fenders near the bottom, all four in good condition. There is a large dent on top of the buoy.

Riser Chain Subassembly. The riser chain is in good condition with all measurements greater than 90 percent of original wire diameter. The ground ring is lying on the bottom at a depth of 40 feet.

Anchor Chain Subassembly. All four subassemblies enter the bottom just below the ground ring.

Cathodic Protection. Underwater voltmeter readings measured the cathodic protection to be between $-.79$ volts on the riser to $-.74$ volts on the top link of anchor chain subassembly B. No anodes were visible.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued use as a Class B mooring.

MOORING NO.: FM-50 CLASS: B LOCATION: NAVSTA SAN DIEGO HARBOR LAT: 32° 40' 46.7" N LONG: 117° 08' 15.3" W
 BUOY TYPE: REG TOP (3 DIAM) ANCHOR SIZE/TYPE: NI WATER DEPTH: 40' VISIBILITY: 1' BOTTOM TYPE: SILT/MUD
 DATE: 28 JULY 84 ENGINEER IN CHARGE: J. A. THORNTON DIVERS: MANN/PHIELDS

[illegible]

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 1

THE SNAVFACENGCOM REPORT FPU-1-84(30),

SEWERWATER INSPECTION REPORT."

MOORING FM-51

Buoy. This is a 12-foot-diameter peg-top buoy with a 4-foot freeboard. It has two wood chafing rails and two wood fenders, all in good condition. Little rust was observed. This buoy is in good condition.

Riser Chain Subassembly. The riser chain is in good condition with all single- and double-link measurements greater than 90 percent of original wire diameter. The ground ring is in good condition at a depth of 35 feet.

Anchor Chain Subassembly. The four chain subassemblies are in good condition. About 10 feet of each leg was visible before they entered the bottom.

Cathodic Protection. Continuity wire was observed on the upper portion of each leg, but no anodes were visible. Underwater voltmeter readings measured the cathodic protection to be -.84 volts on all four subassemblies.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued use as a Class B mooring.

MOORING NO: FM-51 CLASS: B LOCATION: NAVSTA SAN DIEGO HARBOR LAT: 32°40'42.0"N LONG: 117°08'02.9"W
 BUOY TYPE: REG TOWER (2 DMM) ANCHOR SIZE/TYPE: N/I WATER DEPTH: 38' VISIBILITY: 1' BOTTOM TYPE: SILT/MUD
 DATE: 28 JULY 84 ENGINEER IN CHARGE: J. A. THORNTON DIVERS: GRIFFIN HARDINGE (1412-1539 HRS)

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
		90+	80+	80-	90+	80+	80-	
BUOY HARDWARE	TOP 3" ANODES, 2 3/4"						CPS VISIBLE	BOUY HAS 4' FREEBOARD, TWO
	SPIRALS, 2 1/4" PEAR(2)							WOOD CHAFING RAILS AND TWO
	BOTTOM - 2 1/4" PEAR, 2 3/4" PEAR, 2 1/2" DETACH							WOOD FEEDERS, ALL GOOD
								CONDITION. BUOY SIDES IN
RISER	NEAR BUOY	2 3/4" 12 1/2"	✓✓✓		✓✓✓			GOOD CONDITION,
	MIDDLE	↓	✓✓✓		✓✓✓			ACCESSORIES BETWEEN RISER
	NEAR GRD RG	↓	✓✓✓		✓✓✓			AND GROUND RING - 2 1/2" B
GROUND RING		4" x 17" 125 DE DIAMETER						LINK, 2 1/2" C LINK, 3 1/2" N/A CO
	UPPER END	2 3/4" 4 1/2"	✓✓✓		✓✓✓		-84	DETACH.
GROUND LEG NO A	MIDDLE	↓	✓✓✓		✓✓✓			ABOUT 10' OF EACH LEG
	ENTERS BOTTOM		✓✓✓		✓✓✓			VISIBLE BEFORE THEY
	UPPER END		✓✓✓		✓✓✓		-84	ENTER THE BOTTOM. CPS
GROUND LEG NO B	MIDDLE		✓✓✓		✓✓✓			CONTINUITY WIRE OBSERVED
	ENTERS BOTTOM		✓✓✓		✓✓✓			ON LEGS BUT NO ANODES
	UPPER END		✓✓✓		✓✓✓		-84	WERE VISIBLE
GROUND LEG NO C	MIDDLE	↓	✓✓✓		✓✓✓			
	ENTERS BOTTOM	↓	✓✓✓		✓✓✓			
								38'

SHEET 1 OF 2

FOR ADDITIONAL LEGS USE OTHER SHEETS

UNDERWATER INSPECTION REPORT.

UNCLASSIFIED REPORT FP0-1-84(30)

MOORING NO.: FH-51 CLASS: B LOCATION: NAUSTA SAN DIEGO HARBOR LAT: 32° 40' 42.0" N LONG: 117° 06' 07.9" W
 BUOY TYPE: PEG TOP ANCHOR SIZE/TYPE: N/A WATER DEPTH: 30' VISIBILITY: 1' BOTTOM TYPE: SALT/MUD
 DATE: 28 JULY 84 ENGINEER-IN-CHARGE: J. A. THORNTON DIVERS: GRIFFIN/HARDING (1412-1559 HRS)

[illegible]

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 2 OF 2

THE 5NAVFACENGCOM REPORT FPO-1-84(3

OVERWATER INSPECTION REPORT.

MOORING P-1

Buoy. This is a 10-foot-diameter peg-top buoy with a 3 1/2-foot freeboard. It has heavy rust on the top tension bar padeye. The buoy has two wooden fenders (the lower 80 percent deteriorated) and a wood chafing strip about 20 percent deteriorated. There is moderate rust on the buoy sides.

Riser Chain Subassembly. Double-link measurements of the riser chain were all between 80 and 90 percent of original wire diameter. The riser is in fair condition.

Anchor Chain Subassemblies. Two of the subassemblies are in good condition with measurements of the visible sections all greater than 90 percent. Double-link measurements of subassembly A, however, were between 80 and 90 percent. The subassemblies enter the bottom 15 to 20 feet from the ground ring.

Conclusions/Recommendations. Due to the worn riser chain and anchor chain subassembly A (80 to 90 percent), this mooring should be downgraded to a Class D mooring.

CHESNAVFACENGCOM REPORT FPO-1-84(30), "SAN DIEGO FLEET MOORING UNDERWATER
INSPECTION REPORT."

MOORING NO.: P-1 CLASS: C

LOCATION: NAS NORTH ISLAND

LAT: 32°42'12"N LONG: 117°04'42"W

BUOY TYPE: PG TOP (10 DIAM) ANCHOR SIZE TYPE: NI WATER DEPTH: 1' BOTTOM TYPE: SILT/MUD

DATE: 27 JULY 84 ENGINEER-IN-CHARGE: J. A. THORNTON DIVERS: SAKO/PHELPS (1056-1137 HRS)

COMPONENTS	GAUGE SIZE	CONDITION					COMMENTS	
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %			DEPTH
			80+	80+	80+	80+		
BUOY HARDWARE								
TOP-2 1/2" PADEYE 3/4"							BUOY HAS 3" FREEBOARD. HEAVY	
SPIDER 2 3/4" SPIDER (3)							RUST ON TENSION BAR PADEYE.	
1 1/2" PEAR (4)							TWO WOODEN FENDERS, THE	
BOTTOM-3 1/2" BLINK							LOWER 80% DETERIORATED.	
3 1/4" DETACH							CHAFING STRIP (WOOD) 20%	
NEAR BUOY	2 3/4"	16 1/2"	✓✓✓		✓✓✓	8'	DETERIORATED. MODERATE	
MIDDLE		✓✓✓			✓✓✓	10'	RUST ON SIDES. LEGS ENTER	
NEAR GRD RG	✓	✓✓✓			✓✓✓	20'	THE BOTTOM 15'-20' FROM THE	
GROUND RING	4 3/4" x 18"	INSIDE DIAMETER				20'	GROUND RING.	
BRNG GROUND LEG NO. A	2 1/4"	✓✓✓			✓✓✓	25'	ACCESSORIES BETWEEN RISER	
090°		✓✓✓			✓✓✓	30'	AND G.R. - 2 3/4" DETACH, 3" B	
BRNG GROUND LEG NO. B	✓						LINK, 3" C LINK, 4 3/4" NACO DETACH.	
180°	2 1/2"	✓✓✓			✓✓✓	25'	ACCESSORIES BETWEEN G.R.	
BRNG GROUND LEG NO. C		✓✓✓			✓✓✓	30'	AND EACH LEG - 4" NACO DETACH.	
270°	✓						2 1/4" END LINK, 3 1/4" DETACH. THERE	
BRNG GROUND LEG NO. C	2 1/4"	✓✓✓			✓✓✓	25'	IS AN EXTRA 4" NACO DETACH	
ENTERS BOTTOM	✓	✓✓✓			✓✓✓	30'	ON G.R.	

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 1

MOORING P-2

Buoy. This is a 10-foot-diameter peg-top buoy with a 3 1/2-foot freeboard. There is heavy rust on the top tension bar padeye. The buoy has a wood chafing strip in good condition and two wood fenders, the lower of which is severely deteriorated. Moderate to heavy rust covers the sides of the buoy.

Riser Chain Subassembly. The riser chain is in good condition with all single- and double-link measurements greater than 90 percent of original wire diameter. The chain has 2 to 3 inches of marine growth. The riser appears to go to a 12-inch by 12-inch "H" pile with 1-inch flanges. However, the connection between the riser chain and the pile was not measured.

Anchor Chain Subassemblies. None installed. Riser is directly attached to a stake pile.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued fleet use. The buoy's lower fender should be replaced at the earliest practical time.

MOORING NO.: P-2 CLASS: C LOCATION: NAS NORTH ISLAND LAT: 32° 41' 10.6" N LONG: 117° 10' 43.9" W
 BUOY TYPE: PEG TOP (10' DIAM) ANCHOR SIZE/TYPE: NI WATER DEPTH: 40' VISIBILITY: 1' BOTTOM TYPE: SILT/MUD
 DATE: 27 JULY 84 ENGINEER-IN-CHARGE: J A THORNTON DIVERS: SAKO/PHELPS (0951-1019 HRS)

COMPONENTS	GAUGE SIZE	CONDITION					COMMENTS	
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %			DEPTH
			90+	80+	80-	80+		
BUOY HARDWARE								
TOP 2 3/4" PADEYE 3 1/4"							BODY HAS 3'-6" FREEBOARD AND	
SPIDER 2 3/4" SPIDER (21)							HEAVY RUST ON TENSION BAR	
BOTTOM 3 1/4" NAB DETACH							PADEYE, WOOD CHAFING RAIL	
2 1/8" B LINK 3 1/4"							IN GOOD CONDITION. TWO WOOD	
DETACH							FENDERS. THE LOWER SEVERLY	
NEAR BUOY	3 1/4"	12 1/2"	✓✓	✓✓	✓✓	8'	DETERIORATED. MODERATE TO	
MIDDLE	↓	↓	✓✓	✓✓	✓✓	23'	HEAVY RUST ON SIDES. CHAIN	
NEAR GRD RG	↓	↓	✓✓	✓✓	✓✓	40'	HAS 2-3" OF MARINE GROWTH.	
GROUND RING							RISER APPEARS TO GO TO A	
UPPER END							12" x 12" H PILE WITH 1" FLANGES.	
MIDDLE							HOWEVER, NO CORROSION	
ENTERS BOTTOM							WAS VISIBLE.	
UPPER END								
MIDDLE								
ENTERS BOTTOM								
UPPER END								
MIDDLE								
ENTERS BOTTOM								
UPPER END								
MIDDLE								
ENTERS BOTTOM								

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 1

MOORING T-1

Buoy. This is a 10-foot-diameter drum-type buoy with a 2 1/2-foot freeboard. It has a combination wood fender/chafing strip covering the junction of the top deck and sides. This combination is about 20 percent deteriorated. There is also a lower wood fender which is about 40 percent deteriorated. The buoy has moderate to heavy rust on its sides.

Riser Chain Subassembly. The riser chain is in fair condition with measurements between 80 and 90 percent of its original 2 1/4-inch wire diameter. The ground ring is on the bottom at a depth of 38 feet and has some ground leg chain on top of it.

Anchor Chain Subassemblies. The 2 1/4-inch anchor chain was also measured to be between 80 and 90 percent and is in fair condition. The anchor of subassembly B is visible on the bottom about 55 feet from the ground ring.

Conclusions/Recommendations. This mooring is in poor condition and unsatisfactory for fleet use. The anchor must be reset if this mooring is to be used for anything other than the fuel cells now moored to it.

CHESNAVFACENGCOM REPORT FPO-1-84(30), "SAN DIEGO FLEET MOORING UNDERWATER INSPECTION REPORT."

DIVERS: SAKO/PHELPS (0917-1039 HRS)

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
			90+	80+	80-	80+		
BUOY HARDWARE								
TOP-2 1/2" PAD EYE, 2 3/4"								BUOY HAS 2 1/2" FREEBOARD, HAS
SHACKLE, 3" PEAR								COMBINATION WOOD FENDER /
BOTTOM 3" NAROW DETACH								CHAFING STRIP COVER, ALSO
2 3/4" DETACH								JUNCTION OF TOP DECK AND SIDES.
RISER	NEAR BUOY	2 1/4"	13 1/2"	2 1/2"	2 1/2"	4 1/2"	8'	DETERIORATION ABOUT 20% LOWER
	MIDDLE			1 1/2"	1 1/2"	1 1/2"	20'	FENDER 40% DETERIORATION.
	NEAR GRD RG	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	35'	MODERATE TO HEAVY RUST ON
GROUND RING		3 1/4"	18" X 18" INSIDE DIAMETER				38'	SIDES. ACCESSORIES BETWEEN
	UPPER END	2 1/4"	13 1/2"	2 1/2"	2 1/2"	4 1/2"	38'	RISE AND G.R. - 2 3/4" DETACH.
	MIDDLE			1 1/2"	1 1/2"	1 1/2"	38'	4" NAROW DETACH.
BRG GROUND LEG NO. A 100°	ENTERS BOTTOM							GROUND RING ON BOTTOM
	UPPER END			1 1/2"	1 1/2"	1 1/2"	38'	WITH SOME LEG CHAIN ON TOP
	MIDDLE			1 1/2"	1 1/2"	1 1/2"	38'	OF IT. ANCHOR OF LEG. BLYING
BRG GROUND LEG NO. B 180°	ENTERS BOTTOM							ON THE BOTTOM ABOUT 55'
	UPPER END			1 1/2"	1 1/2"	1 1/2"	38'	FROM APUY.
	MIDDLE			1 1/2"	1 1/2"	1 1/2"	38'	MORNING. USED FOR SUBTENDER
BRG GROUND LEG NO. C 350°	ENTERS BOTTOM							BREAST CUTS AND SLUDGE
	UPPER END			1 1/2"	1 1/2"	1 1/2"	38'	DOWN.
	MIDDLE			1 1/2"	1 1/2"	1 1/2"	38'	

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET / OF 1

MOORING T-2

Buoy. This is a 10-foot-diameter drum-type buoy with a 3-foot freeboard. The top jewelry is moderately pitted and corroded. It has a combination chafing strip/fender covering the junction of the top deck and sides and a lower fender which is about 75 percent deteriorated.

Riser Chain Subassembly. The 2 1/4-inch riser chain is in fair condition due to double-link measurements between 80 and 90 percent of original wire diameter. The ground ring was located at 35 feet, close to the bottom.

Anchor Chain Subassemblies. The three subassemblies enter the bottom just below the ground ring and were not visible for inspection.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued use as a Class E mooring.

MOORING NO.: T-2 CLASS: E LOCATION: BALLAST PT. SUB BASE LAT: 32°41'11.5"N LONG: 117°04'24.8"W
 BUOY TYPE: DRUM (10' DIA) ANCHOR SIZE/TYPE: N/I WATER DEPTH: 35' VISIBILITY: 5' BOTTOM TYPE: MUD/SILT
 DATE: 26 JULY 84 ENGINEER-IN-CHARGE: J.A. THORNTON DIVERS: SAKO/PHELPS (0924 - 1010 HRS)

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS	
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH		
			90+	80+	80-	90+	80+	80-	
BUOY HARDWARE									
TOP-2 1/3" PAD EYE, 3 1/2"									BUOY HAS 3 FREEDARD. TOP
SHACKLE, 3 1/2" PAD									JEWELRY PITTED AND
BOTTOM-2 1/2" DETACH									CORRODED. COMBINATION WOOD
2 1/4" B LINK, 2 1/2"									FENDER/CHAFING STRIP COVERING
DETACH									JUNCTION OF TOP DECK AND SIDES.
NEAR BUOY	2 1/4"	13 1/2"	✓✓✓			✓✓✓		8'	LOWER FENDER ABOUT 75%
MIDDLE			✓✓✓			✓✓✓		20'	DETERIORATED.
NEAR GRD RG	↓	↓	✓✓✓			✓✓✓		33'	RISE TO G.R. ACCESSORIES -
GROUND RING	4" x 18"	18" INSIDE DIAMETER						35'	2 1/4" B LINK, 2 3/4" DETACH, 4"
GROUND LEG NO. A 090°									NARD DETACH. GROUND RING
GROUND LEG NO. B 180°									LIES ON BOTTOM. ACCESSORIES
GROUND LEG NO. C 360°									BETWEEN G.R. AND EACH LEG -
UPPER END									4" NARD DETACH, 2 3/4" DETACH,
MIDDLE									2 3/4" PEAR LINK, 2 3/4" DETACH.
ENTERS BOTTOM									LEGS BURY AT HARDWARE.
UPPER END									HOLDING USED FOR SLATE FENDER
MIDDLE									AREASTOUTS AND SLUDGE
ENTERS BOTTOM									DONUTS

SHEET 1 OF 1

FOR ADDITIONAL LEGS USE OTHER SHEETS

UNDERWATER INSPECTION REPORT.

U.S. NAVY FACELING REPORT FPO-1-84(30)

MOORING J

Buoy. This is a 10-foot-diameter peg-top buoy with a 3 1/2-foot freeboard. It has moderate to heavy rust on its top jewelry and moderate rust on its sides. The buoy has a wooden chafing strip and two wood fenders, all in good condition.

Riser Chain Subassembly. The 2 1/2-inch riser chain is in good condition with all measurements greater than 90 percent of original wire diameter. The ground ring is in good condition and was located at a depth of 28 feet.

Anchor Chain Subassemblies. All three subassemblies enter the bottom a few links from the ground ring. The visible links were measured to be greater than 90 percent.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued use as a Class D mooring.

MOORING NO.: J CLASS: D LOCATION: JFK PIER NAS NORTH ISLE LAT: 32°43'48.6"N LONG: 117°11'22.5" W
 BUOY TYPE: REG TOP (10' DIA) ANCHOR SIZE/TYPE: NI WATER DEPTH: 28' VISIBILITY: 1' BOTTOM TYPE: SILT/CLAY
 DATE: 27 JULY 84 ENGINEER-IN-CHARGE: J. A. THORNTON DIVERS: SAKO/PHELPS (0716-0742 HRS)

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS		
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH			
			90+	80+	80-	90+			80+	80-
BUOY HARDWARE									BOY HAS 3/6" FREEBOARD. HAS MODERATE TO HEAVY RUSTING OF TOP JEWELRY, MODERATE RUST ON SIDES. WOOD CHAFING STRIP AND TWO WOODEN FENDERS IN GOOD CONDITION.	
	TOP 3" ANDEYE 3 1/2"									
	SPIDER 3 3/4" SPIDER (4)									
	2 1/2" PEAR (4)									
	BOTTOM 3 3/4" DETACH 2 1/2"									
RISER	PEAR 2 3/4" DETACH								WOODEN FENDERS IN GOOD CONDITION.	
	NEAR BUOY	2 1/2"	✓✓✓		✓✓✓			7'		
	MIDDLE		✓✓✓		✓✓✓			15'		
	NEAR GRD RG	↓	✓✓✓		✓✓✓			25'		
GROUND RING		4 1/2" x 18"	INSIDE DIAMETER						28'	LEG'S ENTER BOTTOM AFTER FIRST FEW LINKS.
	UPPER END		2" ✓✓						28'	
	MIDDLE									
BRNG- GROUND LEG NO. A 010	ENTERS BOTTOM									
	UPPER END		2 1/2" ✓✓						28'	
	MIDDLE									
BRNG- GROUND LEG NO. B 170	ENTERS BOTTOM									
	UPPER END		2" ✓✓						28'	
	MIDDLE									
BRNG- GROUND LEG NO. C 340	ENTERS BOTTOM									
	UPPER END									
	MIDDLE									

SHEET 1 OF 1

FOR ADDITIONAL LEGS USE OTHER SHEETS

MOORING K

Buoy. This is a 10-foot-diameter peg-top buoy with a 3 1/2-foot freeboard. It has a wooden chafing strip and two wood fenders, all in good condition. The buoy has a slight list and light rust on its sides.

Riser Chain Subassembly. The riser chain is in good condition with all measurements greater than 90 percent of its original wire diameter. The ground ring was located at 35 feet and is in good condition.

Anchor Chain Subassemblies. The visible sections of the four chain subassemblies are in good condition with all measurements greater than 90 percent.

Cathodic Protection. Continuity wires were noted on all visible sections of the ground legs, but no anodes were observed. Underwater voltmeter readings measured the cathodic protection to be between -.88 volts at a buoy anode to -.65 volts at the upper end of anchor chain subassembly D.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued use as a Class D mooring.

MOORING NO.: K CLASS: D LOCATION: JFK PIER NAS NORTH ISLE LAT: 32° 42' 41.2" N LONG: 117° 11' 12.1" W
 BUOY TYPE: REG TOP (10' DIAM) ANCHOR SIZE/TYPE: NI WATER DEPTH: 40' VISIBILITY: 1' BOTTOM TYPE: SILT/MUD
 DATE: 27 JULY 84 ENGINEER-IN-CHARGE: J.A. THORNTON DIVERS: SAKO/PHELPS

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS	
		LINK LENGTH		SINGLE LINK %		DOUBLE LINK %			
		90+	80+	80-	90+	80+	80-		
BUOY HARDWARE	TOP-3 1/4" PADDY, 3"							EPS 100-75	BUOY HAS 3' 6" FREEBOARD. ONE
	SPIDER (2) 2 1/4"							ANODE -58	WOOD CHAFING STRIP/TUNE
	PEAR LINK (4)								WOOD FENDERS IN GOOD
	BOTTOM-3 1/4" DETACH 2 1/4"								CONDITION. BUOY HAS A
	B LINK, 3 1/2" DETACH								SLIGHT LICK AND LIGHT
RISER	NEAR BUOY	2 3/4"	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	8'	RUST ON SIDES
	MIDDLE	✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	22'	ACCESSORIES BETWEEN
	NEAR GRD RG	✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	33'	RISER AND G.R. - 2 3/4" DETACH
GROUND RING		4 1/4" x 2 1/2"	INSIDE DIAMETER					-66	2 1/4" EDD LINK, 2 3/4" B LINK
	UPPER END	2 1/2"	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	-75	2 1/4" C LINK, 3 1/2" ANCHO DETACH
	MIDDLE	✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓		
GROUND LEG NO. A	ENTERS BOTTOM		✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	40'	CONTINUITY CABLES NOTED
	UPPER END		✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	-73	ON ALL LEGS BUT NO
	MIDDLE		✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓		ANODES WERE VISIBLE
GROUND LEG NO. B	ENTERS BOTTOM		✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	40'	
	UPPER END		✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	37'	
	MIDDLE		✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	-69	
GROUND LEG NO. C	ENTERS BOTTOM	✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	40'	
	UPPER END		✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓		
	MIDDLE		✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓		

SHEET 1 OF 2

UNDERWATER INSPECTION REPORT

ONE NAVFAC ENGINEER REPORT 20-1-84

MOORING NO.: K CLASS: D LOCATION: JFK PIER NAS AFB ISLE LAT: 32°42'41.2" N LONG: 117°11'12.1" W
 BUOY TYPE: PEG TOP (10' DIAM) ANCHOR SIZE/TYPE: NI WATER DEPTH: 40' VISIBILITY: 1' BOTTOM TYPE: SILT/CLAY
 DATE: 27 JULY 84 ENGINEER-IN-CHARGE: J. A. THORNTON DIVERS: SAKO PHELPS

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
		90+	80+	80-	90+	80+	80-	
BUOY HARDWARE							SPS VOLTS	
RISER	NEAR BUOY							
	MIDDLE							
	NEAR GRD RG							
GROUND RING								
	UPPER END	2 1/2"	15"	✓✓✓	✓✓✓	✓✓✓	-265	37'
	MIDDLE			✓✓✓	✓✓✓	✓✓✓		
	ENTERS BOTTOM		✓✓✓		✓✓✓	✓✓✓		40'
GROUND LEG NO.	UPPER END							
	MIDDLE							
	ENTERS BOTTOM							
GROUND LEG NO.	UPPER END							
	MIDDLE							
	ENTERS BOTTOM							

SHEET 2 OF 2

FOR ADDITIONAL LEGS USE OTHER SHEETS

UNDERWATER INSPECTION REPORT

DD FORM 1-84 (207)

MOORING USS McKEE

This is a Mediterranean type mooring that has no mooring buoys or risers installed. It has four bow and two stern anchor chain subassemblies. Each of the bow subassemblies is attached to a marker (pick up) buoy with a 1 1/8-inch riser chain. Although there are four bow anchor chain assemblies available, McKEE only uses two (see sketch on attached diver report sheet).

Anchor Chain Subassemblies (Bow). These two subassemblies are in good condition with single- and double-link measurements greater than 90 percent of their original wire diameter.

Anchor Chain Subassemblies (Stern). The two stern subassemblies are also in good condition with measurements greater than 90 percent of original wire diameter.

Riser Chain Subassemblies (Marker Buoys). The four marker buoy riser chain subassemblies are in poor condition due to severe corrosion and wear. Most measurements of all four of these riser chains were less than 80 percent of their original 1 1/8-inch diameter.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued use by fleet units. Although the poor condition of the marker buoy chain does not affect the holding capacity of the mooring, this chain should be replaced.

CHESNAVFACENGCOM REPORT FPO-1-84(30), "SAN DIEGO FLEET MOORING UNDERWATER INSPECTION REPORT."

MOORING NO.: USS MCKEE CLASS: MED MWR LOCATION: BALLAST PT. SUB BASE LAT: 34° 41' 38.2" N LONG: 117° 14' 04.3" W
 BUOY TYPE: None ANCHOR SIZE TYPE: SH'D PILES WATER DEPTH: 44' VISIBILITY: 5' BOTTOM TYPE: SILT/MUD
 DATE: 25 JULY 84 ENGINEER IN CHARGE: J.A. THORNTON DIVERS: SAKO/CICCONTE

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
		90+	80+	80-	90+	80+	80-	
BUOY HARDWARE								
								MORNING HAS FOUR MARKER BUOYS
								ATTACHED TO 4 BUOY LEGS. MCKEE
								USES ONLY LEGS 2 AND 3
								01
								02
								MCKEE
								03
								04
NEAR BUOY								DIVERS DESCENDED ON MARKER
MIDDLE								BUOYS 1 AND 4, BUT NO CHAIN WAS
NEAR GRD RG								VISIBLE. WHILE INSPECTING
GROUND RING								LEG 3, DIVERS FOUND ANOTHER
UPPER END	3 1/2"	21"	3 1/2"		7 1/4"			CHAIN LOCATED AROUND WIRE
MIDDLE			✓		✓			DIAMETER AND LINK LENGTH
ENTERS BOTTOM			✓		✓			MEASUREMENTS OF THIS CHAIN
UPPER END			✓		✓			INDICATE THAT THE CHAIN MUST BE
MIDDLE			✓		✓			ONE OF THE UNLASHED LEGS. LARGE
ENTERS BOTTOM			✓		✓			SWIVEL TWO DETACH LINKS NOTED IN
UPPER END								ABOUT LOWER SECTION OF LEGS
MIDDLE								
ENTERS BOTTOM								

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 4

MOORING NO.: USS MCKEE CLASS: MED MOOR LOCATION: BALLAST POINT SUB BASE LAT: LONG:
 BUOY TYPE: NONE ANCHOR SIZE/TYPE: NF WATER DEPTH: 28' VISIBILITY: 4' BOTTOM TYPE: SILT
 DATE: 26 JULY 84 ENGINEER-IN-CHARGE: J.A. Thornton DIVERS:

COMPONENTS		GAUGE SIZE	CONDITION						COMMENTS
			LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
90+	80+	80-		90+	80+	80-			
BUOY HARDWARE									EACH STEERN LEG CONSISTS OF
									CHAIN, DETACH, AND SHACKLE
									WHICH PASS THROUGH THE
									SHIP'S HAUSE PIPE. CHAIN IS
									CONNECTED TO DOUBLE STRANDS
RISER	NEAR BUOY								OF 4" SAMPSON DOUBLE BRAID
	MIDDLE								ROPE WHICH IS ATTACHED TO 2 3/4"
	NEAR GRD RG								CHAIN WHICH ENTERS THE
GROUND RING									BOTTOM.
GROUND LEG NO. A	UPPER END	2 3/4"	✓✓✓				✓✓✓	10'	
	MIDDLE		✓✓✓				✓✓✓	15'	
	ENTERS BOTTOM		✓✓✓				✓✓✓	28'	
GROUND LEG NO. B	UPPER END		✓✓✓				✓✓✓	10'	
	MIDDLE		✓✓✓				✓✓✓	15'	
	ENTERS BOTTOM	↓	✓✓✓				✓✓✓	28'	
GROUND LEG NO. C	UPPER END								
	MIDDLE								
	ENTERS BOTTOM								

FOR ADDITIONAL LEGS USE OTHER SHEETS SHEET 2 OF 4

MOORING NO.: USS MISCAL CLASS: MARKER BUOY RISERS LOCATION: BALDWIN 17 SUB BASE LAT: 22° 41' 39.4" N LONG: 117° 4' 05.2" W

BUOY TYPE: MARKER (A) ANCHOR SIZE/TYPE: 44 WATER DEPTH: 5' VISIBILITY: 5' BOTTOM TYPE: SILT/MUD

DATE: 25 JULY 84 ENGINEER-IN-CHARGE: J.A. THORNTON DIVERS: SAKO/CICCONE

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS
		LINK LENGTH	SINGLE LINK %		DOUBLE LINK %		DEPTH	
		90+	80+	80-	90+	80+	80-	
TOP JEWELRY OF								
MARKER BUOYS								MARKER BUOY RISER CHAINS ARE
TYPICALLY 1" PAD EYE								IN POOR CONDITION WITH SEVERE
1" SHACKLE (2)								CORROSION AND WEAR, ALTHOUGH
								THIS DOES NOT AFFECT THE
								HOLDING CAPACITY OF THE
NEAR BUOY								MOORING, THIS CHAIN SHOULD
MIDDLE								BE REPLACED, OF PARTICULAR
NEAR GRD RG								NOTE IS THAT A DOUBLE LINK
GROUND RING								MEASUREMENT OF RISER #3 WAS
UPPER END	1 1/8"	2 3/4"	✓			✓	✓	5'
MIDDLE			✓			✓		LESS THAN THE SINGLE LINK
ENTERS BOTTOM			✓			✓	✓	MEASUREMENT (DL 2 1/8" S.L. 1").
UPPER END			✓			✓	✓	A RILE OF RISER #1 IS USABLE AND
MIDDLE			✓			✓	✓	WAS MEASURED 12 X 13 WITH 3/4"
ENTERS BOTTOM			✓			✓	✓	FLANGES, NO CORROSION
UPPER END			✓		✓	✓	✓	BETWEEN THE RISER AND
MIDDLE			✓		✓	✓	✓	A RILE WAS NOTED
ENTERS BOTTOM			✓		✓	✓	✓	

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 3 OF 4

DIVERS: SAKO/CRUDE

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 4 OF 4

MOORING USS ELK RIVER

This is a Mediterranean type mooring that has no buoys or risers installed. Each of the two anchor chain subassemblies is connected directly to the moored ship and a stake pile. ELK RIVER was not in the mooring at the time of the inspection, and a crane barge was used to lift part of each leg for inspection. The top 45 feet of each subassembly was inspected by the divers.

Anchor Chain Subassemblies. The two assemblies are in good condition with measurements greater than 90 percent of their original 1 3/4-inch diameters.

Conclusions/Recommendations. This mooring is in satisfactory condition for continued fleet use.

CHESNAVFACENGCOM REPORT FP0-1-84(30), "SAN DIEGO FLEET MOORING UNDERWATER
INSPECTION REPORT."

MOORING NO: USS ELK RIVER CLASS: MED MOOR LOCATION: BALLAST PT SUB BASE LAT: LONG:

BUOY TYPE: NONE ANCHOR SIZE/TYPE: SPUD PILES WATER DEPTH: 40' VISIBILITY: 5' BOTTOM TYPE: SILT/MUD

DATE: 26 JULY 84 ENGINEER-IN-CHARGE: J.A. THORNTON DIVERS: SAKO / PHELPS

COMPONENTS	GAUGE SIZE	CONDITION						COMMENTS	
		LINK LENGTH	SINGLE LINK %			DOUBLE LINK %			
			90+	80+	80-	90+	80+		80-
BUOY HARDWARE									USS ELK RIVER WAS ALOT IN
									THE ANCHORING AT THE TIME
									OF THE INSPECTION. A CRANE
									BARGE WAS USED TO LIFT
RISER									TO THE SURFACE. EACH OF THE
	NEAR BUOY								TWO LEGS CONSISTS OF 45' OF
	MIDDLE								1 3/4" CHAIN, 90' OF 3/4" SAMPSON
	NEAR GRD RG								DOUBLE BRAD, AND ANOTHER
GROUND RING									45' OF 1 3/4" CHAIN.
	UPPER END	1 3/4" 10 1/2"	✓✓✓			✓✓✓			ONLY THE TOP 45 OF CHAIN WAS
	MIDDLE		✓✓✓			✓✓✓			INSPECTED DUE TO THE HANDLING
	ENTERS BOTTOM		✓✓✓			✓✓✓			PROBLEM'S INVOLVED IN PULLING
GROUND LEG NO. B									MORE OUT OF THE WATER AND
	UPPER END		✓✓✓			✓✓✓			THE RISK OF APPLYING
	MIDDLE		✓✓✓			✓✓✓			EXCESSIVE PULLAGE LOADS
	ENTERS BOTTOM	✓	✓✓✓			✓✓✓			ON THE SLID PILES
GROUND LEG NO. C									
	UPPER END								
	MIDDLE								
	ENTERS BOTTOM								

USS ELK RIVER WAS ALOT IN THE MOORING AT THE TIME OF THE INSPECTION. A CRANE BARGE WAS USED TO LIFT TO THE SURFACE. EACH OF THE TWO LEGS CONSISTS OF 45' OF 1 3/4" CHAIN, 90' OF 3 3/4" SAHMSON DOUBLE BRAD, AND ANOTHER 45' OF 1 3/4" CHAIN. ONLY THE TOP 45' OF CHAIN WAS INSPECTED DUE TO THE HANDLING PROBLEMS INVOLVED IN PULLING MORE OUT OF THE WATER AND THE RISK OF APPLYING EXCESSIVE FORCE TO THE SPUD PILES.

FOR ADDITIONAL LEGS USE OTHER SHEETS

SHEET 1 OF 1

ANNEX B

BUOY SURVEY DATA

SAN DIEGO
CONTROL POINT DESCRIPTION

- Ballast Pnt - This control point is a standard 2-inch USC & GS brass disc stamped "ballastpnt." This point is approximately 600 feet east of the Coast Guard Station at Ballast Point and 30 feet north of the edge of the shoreline. The control point is 10 feet from the back edge of a gravel parking lot. Swing tie distances from two light poles are Eastpole 78.48 feet and Westpole 45.94 feet. The area is covered with gravel (see Figure B-1).
- PK Nail A - This control point is located on the edge of a street near the bay wherein moorings T-1 and T-2 are located. This is a temporary control point established and designated by the survey team. The control point marker is a nail driven into the ground 57.91 degrees, 85 feet from the Coast Guard Station (see Figure B-1).
- Coast Guard Monument - Located approximately 300 feet west of the Coast Guard Station at Ballast Point and 15 feet from the shoreline edge. The control point is marked by a standard USC & GS 2-inch brass disc approximately 10 feet southwest of an old concrete gun bunker (see Figure B-1).
- Jess - This control point is a wooden 2-inch by 2-inch hub and tack with an indentation in the tack. The marker is located at the entrance to the deperming area on the top of a cliff which overlooks this area. It is 20 feet east of the centerline of Rosecrans Avenue (see Figure B-2).
- Deuchars - This control point is a wooden 2-inch by 2-inch hub and tack established in the flat storage section at the southern end of the deperming area. It is 12 feet above mean-low-low water (MLLW) and 12 feet west of the shoreline (see Figure B-2).

- Hay - Standard USC & GS 2-inch brass disc stamped "Hay." It is set into the sidewalk on Harbor Island and is located at Harbor Station 58+33.4, local system (see Figure B-3).
- Harbor Station 68+00 - The lead tack is set in the sidewalk at Harbor Station. "Harbor Station 68+00" is marked with orange paint on the sidewalk (see Figure B-3).
- SD 71 - Located at the bay edge of NAS Coronado at the intersection of Tullagi and Inchon Avenues. It is a 2-inch brass disc marked on the street with orange paint and at the bayside edge of the street (see Figure B-4).
- SD 72 - Located at the bay edge of NAS Coronado at the intersection of Inchon and Tarawa Avenues. It is a 2-inch brass disc marked on the street with orange paint at the bayside edge of the street (see Figure B-4).
- Columbia Center Flagpole - This is a useful backsite. It is located atop a tall building in downtown San Diego and is the largest flag on the horizon.

For further information regarding control points contact Code 420, PWC San Diego.

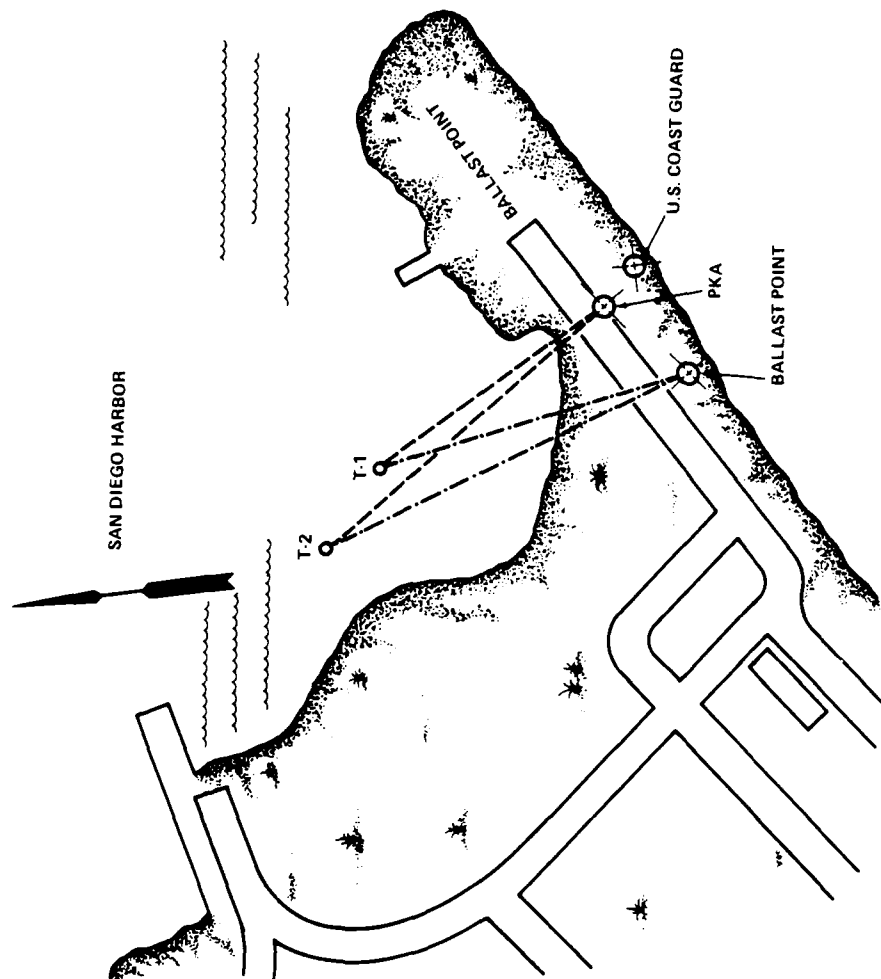


FIGURE B-1. BALLAST POINT

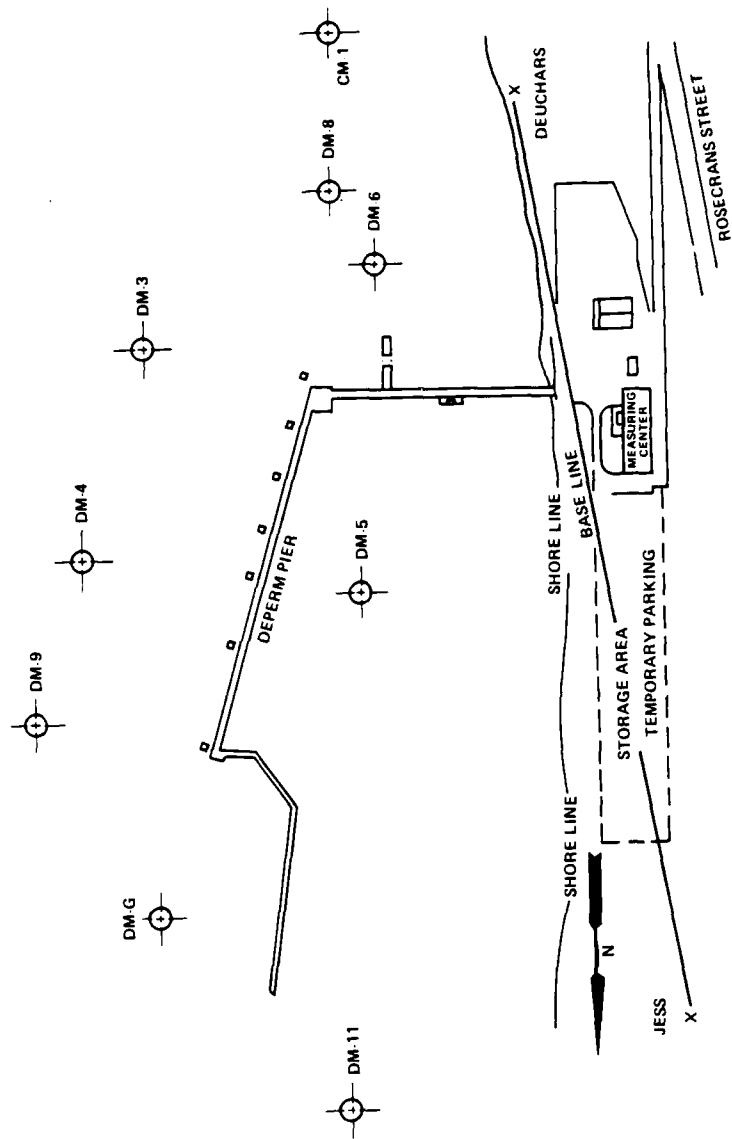


FIGURE B-2. DEPERMING AREA

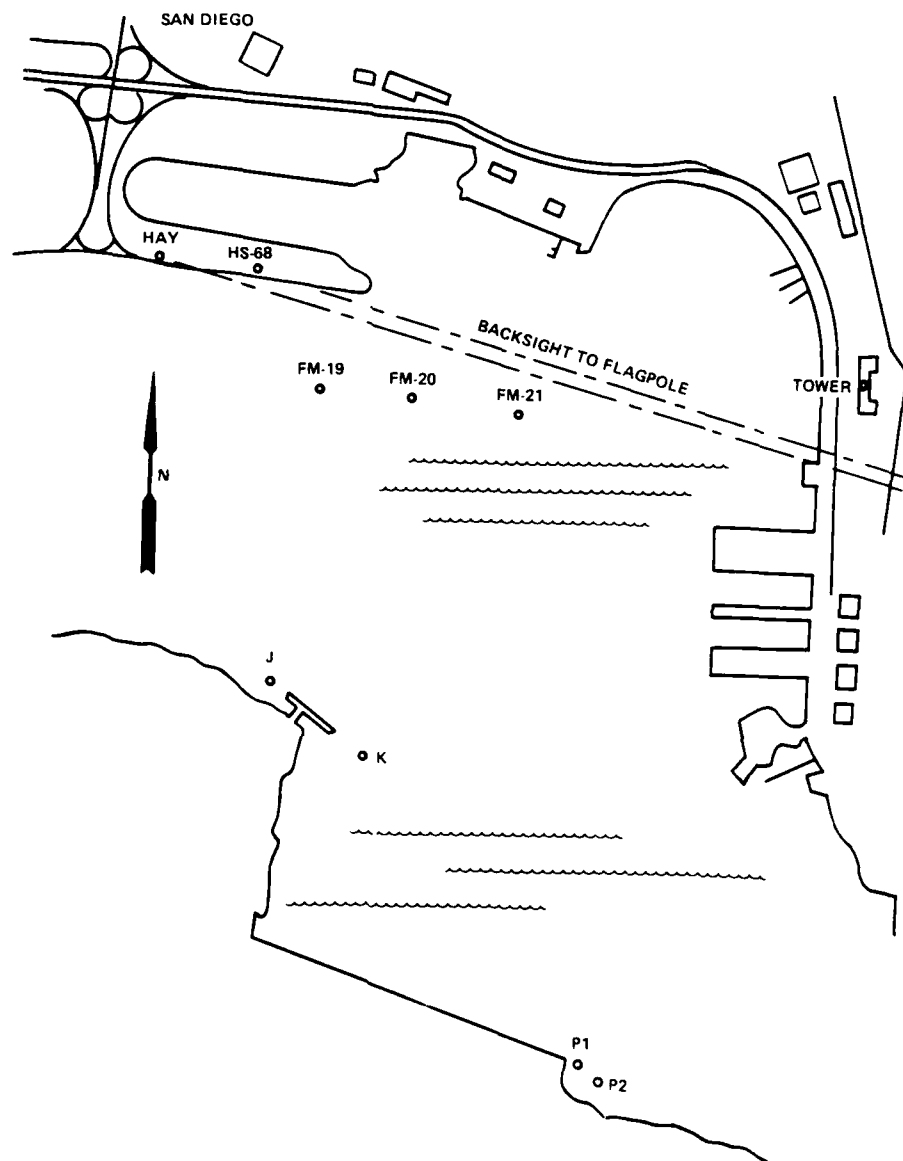


FIGURE B-3. HARBOR ISLAND

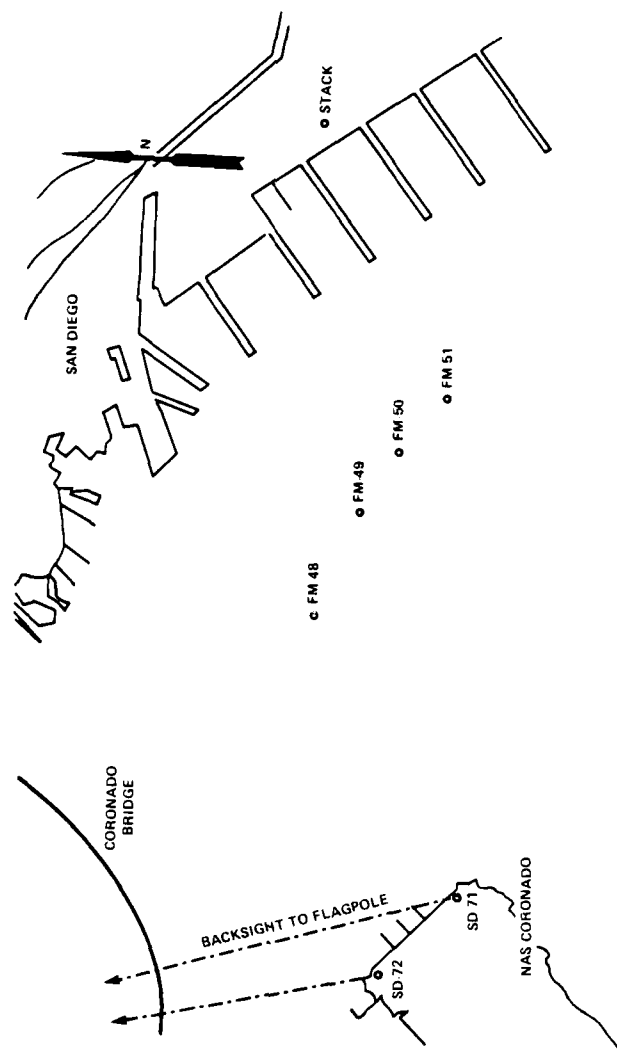


FIGURE B-4. NAS CORONADO AREA

SAN DIEGO SURVEY DATA

BL = Jess to Deuchars

Both control points used Columbia Center Flagpole as a reference or backsight.

Buoy	Jess		Deuchars		Latitude	Longitude
	Angle to Backsight	Angle to BL	Angle to Backsight	Angle to BL		
CM-1	88.65°	350.80°	60.70°	139.50°	32°41'29.80"N	117°14'15.40"W
DM-3	68.57°	330.72°	349.48°	68.28°	37°41'36.23"N	117°14'12.52"W
DM-4	53.90°	316.05°	336.77°	55.57°	32°41'39.58"N	117°14'11.25"W
DM-5	70.50°	332.65°	311.73°	30.53°	32°41'39.70"N	117°14'16.50"W
DM-6	84.58°	346.73°	330.82°	49.62°	32°41'35.30"N	117°14'16.80"W
DM-8	83.60°	345.75°	351.25°	70.05°	32°41'34.20"N	117°14'15.90"W
DM-9	44.78°	306.93°	331.68°	50.48°	32°41'41.50"N	117°14'10.80"W
DM-11	353.82°	255.97°	301.55°	20.35°	32°41'48.90"N	117°14'15.80"W
DM-G	30.08°	292.23°	315.27°	34.01°	32°41'44.80"N	117°14'12.70"W

BL = Ballast Pnt to PK NAIL A

Ballast Pnt backsight is the Columbia Center Flagpole

PK Nail backsight is the Coast Guard Monument

Buoy	PK Nail A		Ballast Pnt		Latitude	Longitude
	Angle to Backsight	Angle to BL	Angle to Backsight	Angle to BL		
T-1	197.05°	101.04°	283.20°	305.29°	32°41'12.30"N	117°14'05.60"W
T-2	201.35°	105.34°	291.03°	313.12°	32°41'11.50"N	117°14'04.80"W

SAN DIEGO SURVEY DATA (continued)

BL = SD 68 to Hay

Both control points used Columbia Center Flagpole as a backsight.

Buoy	SD 68		Hay		Latitude	Longitude
	Angle to Backsight	Angle to BL	Angle to Backsight	Angle to BL		
FM-19	43.82°	233.27°	22.55°	31.05°	32°43'17.10"N	117°11'18.40"W
FM-20	21.37°	210.82°	12.28°	20.78°	32°43'16.60"N	117°11'07.90"W
FM-21	10.65°	200.10°	6.60°	15.10°	32°43'15.50"N	117°10'56.10"W
P-1	50.47°	239.92°	46.08°	54.58°	32°42'12.10"N	117°10'47.00"W
P-2	49.25°	238.70°	45.08°	53.58°	32°42'10.60"N	117°10'43.90"W
J	59.83°	249.28°	58.00°	66.50°	32°42'48.60"N	117°11'22.50"W
K	69.65°	259.10°	51.08°	59.58°	32°42'41.20"N	117°11'12.10"W

BL = SD 72 to SD 71

Both control points used Columbia Center Flagpole as a backsight.

Buoy	SD 72		SD 71		Latitude	Longitude
	Angle to Backsight	Angle to BL	Angle to Backsight	Angle to BL		
FM-48	93.33°	305.58°	80.82°	110.50°	32°40'55.40"N	117°08'30.00"W
FM-49	99.17°	311.42°	89.32°	119.00°	32°40'51.10"N	117°08'22.50"W
FM-50	103.77°	316.02°	96.05°	125.73°	32°40'46.70"N	117°08'15.30"W
FM-51	107.72°	319.97°	101.77°	131.45°	32°40'42.00"N	117°08'07.90"W

ANNEX C

PRELIMINARY MESSAGE REPORT

UNCLASSIFIED
U N C L A S S I F I E D
UNCLASSIFIED

ROUTINE

R 241833Z AUG 84

FM CHESNAVFACENGCUM WASHINGTON DC

TO PAC SAN DIEGO CA

INFO COMNAVFACENGCUM ALEXANDRIA VA
WESTNAVFACENGCUM SAN PABLO CA

COMCOPAC PEARL HARBOR HI
CCT TWO

BT

UNCLAS //411400//

SUBJ: FLEET MOORING INSPECTION

1. A CHESNAV/OUT TWO UNDERWATER INSPECTION OF THE FLEET MOORINGS AT PAC SAN DIEGO WAS CONDUCTED DURING THE PERIOD OF 25-28 JULY 1984. THE FOLLOWING IS A PRELIMINARY REPORT OF THE RESULTS AS RELATED IN A PHUCOM BETWEEN MESSRS. J. DEUCHARS, PAC SAN DIEGO, AND J. THORNTON, CHESNAV, ON 17 AUG 1984.

2. MOORING DM-4 IS IN POOR CONDITION AND SHOULD BE OVERHAULED IF THE BODY IS TO REMAIN IN FLEET USE. MOORING DM-5 IS IN POOR CONDITION BECAUSE OF A BORN NACU JOINING LINK ON THE HOLDING LEG. THIS LINK SHOULD BE REPLACED ASAP.

3. THE FOLLOWING MOORINGS SHOULD BE DOWNGRADED BECAUSE OF CHAIN LACK:

- A. FM-46 AND FM-49 TO A CLASS C;
- B. P-1 TO A CLASS D;

4. THE FOLLOWING MOORINGS ARE IN FAIR CONDITION, BUT ARE SATISFACTORY FOR THEIR REPORTED USE:

- A. DM-3 IS SAT FOR CLASS D;
- B. T-1 AND T-2 ARE SAT FOR CLASS E.

MOORINGS DM-4, -6, -9, AND -11, FM-19, -20, -50, AND -51, J, AND P-2 ARE IN GOOD CONDITION. THE MED MOORINGS FOR THE USS WINTER AND THE USS MCKEE ARE ALSO IN GOOD CONDITION. HOWEVER, THE CHAIN OF THE MARKER BUOYS FOR THE USS MCKEE SHOULD BE REPLACED.

5. MOORING DM-6 IS IN GOOD CONDITION ACCORDING TO CHAIN MEASUREMENTS. HOWEVER, THE BODY IS LISTING AND THE CAUSE OF THE

DEVT:CHESNAVFACENGCUM WASHINGTON DC(7)...ORIG

RID:000-000/COPIES:0009

700175/0220/237 1 OF 2 MI 0208 237/21:127 241833Z AUG 84
CAN:RXGYS13 CHESNAVFACENGCUM WASHINGTON DC

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LIST SHOULD BE INVESTIGATED.

7. REPORT OF THE FINAL EVALUATION WILL FOLLOW. POC AT THIS
COMMAND IS C. PENNINGTON AT (202) 453-4608 OR A/V 202-6008.
BT

700475/0220/237 2 OF 2 M1 0208 23/21:12Z 241833Z AUG 84
:PA Y0515 CHESAVERA/CELENGUM WASHINGTON DC

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END
4

1 FOR NEXT ACCESSION
MSG RECEIVED

END

1 OF 1
1 - AD NUMBER: A167543
5 - CORPORATE AUTHOR: NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON
DC CHESAPEAKE DIV
8 - UNCLASSIFIED TITLE: SAN DIEGO FLEET PODRIUM UNDERWATER
INSPECTION PLAN.
11 - REPORT DATE: 1982
15 - REPORT NUMBER: CHESAPEAKE PD-8029.0
20 - REPORT CLASSIFICATION: UNCLASSIFIED
30 - SOURCE CODE: 391177

END
Jsp, Eap:sp

1 FOR NEXT ACCESSION
MSG RECEIVED

END

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FILMED

7-86

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