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OPTICAL TECHNOLOGY DIVISION
OPTO-MECHANICAL DESIGN ENGINEERING

Memorandum ME 70

TO: Distribution DATE: November 18, 1971
FROM: L.E. Molaskey
SUBJECT: Trip Report - Recovery of RV #3
LOCATION: At Sea - 350 Miles Northwest of Hawaii

INTRODUCTION

This trip report covers all the activity in which I was involved or witnessed commencing on October 28th through November ___ concerning the recovery of RV #3. The report is organized chronologically as, in fact, it was written on a day by day basis. A complete set of photographs of significant events and operations accompanies this report with limited distribution. Copies of the photos are available for review in my office.

THURSDAY, 28 OCTOBER 1971

Contacted Lt. Cdr. R. Anderson at the Submarine base in Pearl Harbor and arranged to meet with him to discuss the status of the operation and the plans for transportation to the recovery site. Lt. Cdr. Anderson indicated that arrangements had been made for transportation to meet the White Sands about 300 miles off Hawaii. The sea-going support ship for the "Sea Cliff" and the "Turtle", the "Maxine-D" will carry the following personnel to rendezvous with the White Sands:

Commander B. Mooney	- O in C of Recovery Team
T. Turner	- Straza Representative
██████████	- HQS
L. Molaskey	- SSC
██████████	- ██████████
5 Sailors	- new transfers to the White Sands' crew

The Maxine-D is scheduled to depart Honolulu early Sunday morning, 31 October.

The progress of the White Sands was reported to be on or slightly ahead of the last reported schedule. No report from the search force was available from Lt. Cdr. Anderson. He indicated, however, that ██████████ is expected to have the underwater photographs with him when he arrives on Friday.

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A meeting was arranged for Saturday morning to review the photos and discuss the recovery plan.

FRIDAY, 29 OCTOBER 1971

No project activity scheduled - I went fishing.

SATURDAY, 30 OCTOBER 1971

Contacted [redacted] at his hotel and arranged for him to join the meeting scheduled with Lt. Cdr Anderson and Cdr. Mooney at the Sub base.

The meeting was held primarily with Cdr. Mooney. Lt. Cdr. Anderson left to catch a 1:00 P.M. flight back to San Diego. The photographs were reviewed as were the location plots provided by the search team (No direct representation from the search team was, or will be provided for the recovery operation.) The overall plans were discussed and arrangements made for weather reports to be provided twice daily for the duration of the operation.

Final arrangements; location, time, phone number, etc. were made for the transfer to the recovery site.

Ship	- Maxine-D
Sailing time	- 0600
Location	- Pier 43 - Honolulu
Date	- October 31, 1971

SUNDAY, 31 OCTOBER 1971

Sharing a cab with [redacted] we arrived at Pier 43 at approximately 0545. Upon boarding the ship there was no evidence of any activity aboard and it was apparent that plans for the 0600 departure had been changed. As it turned out, the Maxine-D had some kind of mechanical problem with one of its main drive clutches and although the parts were scheduled to be in Hawaii on Saturday, they had not yet shown up. They arrived about 0930 and were installed in less than an hour. The ship was ready to depart. Sailing time was set for 12:00. At 12:00, with the pilot aboard, one of the passengers, [redacted] was missing. The ship set sail without him. As we pulled out of the harbor a message was received indicating that the missing passenger had been located and that he would be ferried out by a Navy torpedo retriever boat. We then proceeded to the mouth of Pearl Harbor to wait for that transfer. We finally put to sea at about 1500 that afternoon.

The Maxine-D is 165 feet long and can make about 12 knots. The plans were to overtake the White Sands as it approached the recovery site and after making the transfer, the Maxine-D was to proceed directly to San Diego. The White Sands to travel the remaining 100 or so miles to the recovery site.

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MONDAY, 1 NOVEMBER 1971

The trip proceeded on schedule and we overtook the White Sands at about 1600 in the afternoon. The White Sands put out a 16 foot Boston Whaler and the passengers made the transfer from the Maxine-D to the Whaler to the White Sands. There were swells of about 8 to 10 feet at the time making the transfer a rather difficult operation. No casualties were reported but most of our luggage got quite wet.

We were received aboard, made the necessary introductions, assigned living quarters, had supper and again got under way for the site. The Maxine-D left with her signal flags reading "THINK DEEP". The White Sands responded with "THINK DEEPER".

TUESDAY, 2 NOVEMBER 1971

We were now approaching the recovery site and activity in preparation for the first dive began. The refrigerator for cooling the payload was in final stages of completion. As originally constructed, the unit consisted of a 3/4 inch plywood box built around a 2 x 4 frame. The outside dimensions approximately 8 x 8 x 8 feet. The insulation consists of 1-1/2 inch glass wool blankets fabricated with the aluminum side facing the interior of the box. The cooling unit was mounted to the outside of the box blowing air from the outside into the box through an opening behind the cooling coil. After reviewing the requirements with Lt. Abbot, the ship's engineer, it was agreed that the set up could not adequately refrigerate 8,000 pounds of sea water to below 40°F in the outside ambient of about 90°F in bright sunlight. [REDACTED] and I got together to plan modifications which would improve the installation. We recommended the following:

1. Paint the outside all over with white paint.
2. Construct a recirculating duct to take the cooled interior air and pass it over the cooling coils in a closed system.
3. Insulate the cooling unit as much as possible.
4. Tape all seams to shut off air leakage.

The original plan was to move the refrigerator, after completion, aft to the starboard wing wall where the payload could be lifted by the crane and loaded directly into the waiting precooled shipping container full of water. This plan was abandoned because of lack of adequate space on the wing wall and it was decided to leave the refrigerator on the deck at the forward end of the dock well. This meant a change in the handling procedure for the classified payload. These details were worked out and the handling plans finalized.

We then requested that the shipping container be installed in the refrigerator immediately so that the large mass of water could start cooling.

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This was accomplished with some difficulty because of the minimum amount of clearance between the shipping container and the inside dimensions of the box. Even small swells cause the ship to roll and with the shipping container hung from the crane it tends to swing like a house wrecker's ball. The operation was finally completed and the containers filled with salt water from the fire main. (The hose and fire main were flushed for 20 minutes prior to filling the containers.)

We planned to fill the container about 2/3 full of sea water so that when the payload was immersed in the container the water level would just about reach the top. However, as the water was being pumped into the container, some of the glass wool insulation fell into the water. To remove this contaminant, the container was overflowed until all of the particles poured over the top. The container lid was installed and the box sealed to start the cooling process. The initial water temperature was recorded to be 70°F.

While this was going on the Trieste was being prepared for launching. At about 2030 the dock well was flooded and by 2230 the Trieste was trailing in tow off the stern of the White Sands. Gassing operation started as soon as the dock well was pumped out.

WEDNESDAY, 3 NOVEMBER 1971

The gassing operation, pumping 67,000 gallons of aviation gas into the ballast tanks of the Trieste, were completed by about 0930. This operation is explained in one of the previous trip reports. Loading of the steel shot ballast started immediately. In this operation, as explained in an earlier trip report, 32 ton of steel shot is pumped in a slurry of salt water into the hoppers of the Trieste. Several problems occurred during the shotting operation. The pump housing broke down and had to be replaced. In trying to make up for lost time due to the pump problem, the shot flow rate was increased causing the hose to clog up. A section of the hose was removed and the problem cleared. The flow rate was slowed down to avoid further clogging problems. The shotting operation was completed at about 2200 and the pre-dive checks started.

At this point it was decided not to dive this night to allow for completion of the pre-dive checks and to give a rest period for the crew and pilots who had been working 'round the clock.

Meanwhile the temperature of the interior of the refrigerator appeared to have stabilized at about 56°F. The coolant coil could not increase the differential. It was therefore decided to request an air drop of dry ice to lower the temperature. In addition, plastic bags and buckets of fresh water were loaded into the deck top refrigerator to make ice. The plan being to open the box, install the dry ice and regular ice, seal it up and hopefully lower the temperature below 40°F.

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THURSDAY, 4 NOVEMBER 1971

At about 0100 the aircraft showed up to drop the dry ice. A small boat was deployed from the White Sands. The aircraft first dropped a smoke marker then in six successive passes parachuted capsules containing the dry ice. They were recovered by the small boat and brought aboard the White Sands. The top was removed from the refrigerator box and the packets of dry ice installed. During this operation some of the insulation on the sides of the box was torn and had to be repaired. It became obvious that more insulation was required. A request for more insulation was made, but there was no more available on board. The water in the freezer had not solidified as yet so the refrigerator was again sealed.

While the air drop was in process, the White Sands was heading for the "zero dot". This is the transponder laid on the bottom by the search team to mark the location of the package. It is a transmitter that when interrogated by a signal of the proper frequency returns a signal of its own. The search team had planted two such dots. The zero dot being 160 - 165 yards north of the payload and the other dot, designated dot 3, was reported to be about 110 yards N E of the zero dot. These dots were located from the surface using satellite navigation and then interrogating them from the Apache. Apache, meanwhile was preparing to plant two additional dots in the area.

The new dots were planted and their position, or at least the position of the Apache as the dots were released from the surface, was recorded. These additional dots were to act as position markers to help remove ambiguity in the range readings from the other dots and to provide a fixed pattern on the ocean floor from which to navigate on the bottom. The preliminary data, before the first dive, was:

<u>Channel No.</u>	<u>Operating Frequency</u>	<u>Estimated Location</u>
0	12.5 KHz	160 yards N of P.L.
2	13.5 KHz	On Trieste
3	14.0 KHz	110 yards N.E. of 0
5	15.0 KHz	5,330 yards S.W. of 0
8	16.5 KHz	5,670 yards S.E. of 0

The position of the 0 dot is reported to be a 37 KHz pinger was also planted by the search team. This was reported to be within 30 yards of dot zero.

Final preparations for the dive commenced as the White Sands approached the location of the 0 dot. The recovery hook was attached to the Trieste by the divers, the anti-chamber filled with sea water and the Trieste descended towards the bottom.

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Hydrophone communication with the Trieste was maintained throughout the dive. At about 2000, one hour and forty-five minutes after leaving the surface, the Trieste reported their position 300 feet above the bottom which was at 16,400 feet. Relaying their range to each of the dots in the pattern, the Trieste attempted to close in on the zero dot. At the same time, their position was plotted both on Apache and White Sands. As the Trieste approached the zero dot they observed a sonar contact on their CTM. They changed course to investigate the contact and found nothing. The same type of search maneuvers were conducted with several other sonar contacts. Each time no visual observation was made. During the dive, there seemed to be a discrepancy in the range data indicating that the dots were not located where they were reported to be. At about 0200 the dive was terminated unsuccessfully. The scaph reached the surface at about 0345.

Meanwhile the temperature of the refrigerator box had stabilized at just below 50°F.

FRIDAY, 5 NOVEMBER 1971

A meeting was held to brief all parties concerning the observations made on the first dive, to review the data taken and to plan the activities for the next recovery attempt. At this point the weather was beginning to deteriorate to the point where it was extremely difficult to operate a small boat on the surface and almost impossible to board the Trieste. Two officers from the Apache attended the meeting. (They were part of the navigation team on the first dive). After discussing the data taken and trying to draw conclusions as to the location of the dots it was apparent that a survey of the field should be taken from the surface. A plan was laid out that would have Apache attempt to cross the line between successive pairs of dots while recording range to each dot. A plot of the sum of the ranges to two dots will minimize on a line between the two dots. The data taken on the surface between each pair of dots can then be used to determine the distance between the dots on the bottom. Assuming the location of the payload is accurate with respect to the zero dot and knowing the range between dots the Trieste can navigate as required within the field without losing its reference. It can seek the combination of ranges that will put it over the payload.

The meeting was terminated early to allow the Apache officers to return to their ship because the weather kept getting worse. The plan to survey the field had to be postponed because the White Sands could no longer maintain headway against the wind and the sea. Apache was required to provide a tow so as to maintain control over the Trieste which was being towed by White Sands. All recovery activity ceased pending improvement in the the weather.

SATURDAY, 6 NOVEMBER 1971

Winds in excess of 22 knots with gusts up to 30 knots prevented any recovery activity. Although previously called off via message to Hawaii, the

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aircraft carrying 150 square yards of 3 inch styrofoam insulation and an additional 1000 pounds of dry ice came out. The air drop was called off via radio because the seas were too rough to attempt to launch a small boat for the pick-up. The recovery force with Apache towing White Sands and White Sands towing Trieste maneuvered into the wind in an effort to maintain within the operational area.

SUNDAY, 7 NOVEMBER 1971

Weather conditions remained about the same with no let-up in sight. Winds as high as 29 knots with gusts up to 35 knots were reported during the night. Sea swells of about 8 to 10 feet with white caps prevailed throughout the day. No recovery activity was performed.

MONDAY, 8 NOVEMBER 1971

Weather conditions remain the same. No recovery activity today. At this point Apache's fuel supply began to reach a critical level. She reported that only 50% of her fuel supply remained. Using about 3% per day, this left only five days operating time before she must ballast with salt water. Not having used this procedure for quite some time there was a question of contaminating her remaining supply due to pipe leaks, etc. To avoid this potential problem one of several alternatives could be chosen.

1. Hope that the weather cleared in the next five days so that Apache could be refueled from White Sands.
2. Send out another ship to provide the tow for White Sands and have White Sands and Trieste stay on station to wait for the weather to clear while Apache goes to port unencumbered for fueling.
3. Have the entire recovery force head for port for fueling and repair.
4. Send out another ship capable of refueling Apache while towing White Sands.

Commander Mooney recommended alternate number 2 via a message requesting direction from Sub Fleet 5.

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LBM/cj

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