MBRD SMALL BOAT HANDLERS REVIEW

Scope: Launching, Retriving and Maneouvering from and around Scripps Pier.

I. Description of Boat Hoist:

A. 3-ton Craneveyor Bridge Crane

1. There are two control boxes located on the north-east and south-east support pipes, consisting of “UP-DOWN” and “NORTH-SOUTH” push buttons. Speeds are approximately 75 feet per minute (FPM) and 25 FPM. Full speed is accomplished by pushing the button in fully. For slow speed, the button is pushed halfway in.

2. The hoist has enough wire to reach the bottom of the ocean at this point; approximately 65 feet from fully retracted to fully extended. The vertical lift clearance from the pier deck to fully retracted or “Two Blocked” is approximately 15 feet.

3. The wire diameter is 5/8 inch. The breaking strength far exceeds the 3-ton safe work load limit. There is a load cell on the hoist, presently set at 5600 lbs. There is a limit switch to prevent “Two Blocking”. There is also an internal counter on the winch drum set to shut off just after the limit switch, so in effect, there are three safety devices to prevent “Two Blocking”, yet it has been done. The effect was to break the very strong wire, drop the boat and destroy the hoist. The costs were 25K for the hoist and three months down time. Three months of pier-dependant, funded research was lost. It was a catastrophe that could have been prevented by the fourth and far most important safety device — the operator. NEVER TWO BLOCK THE HOIST!

4. The gantry or bridge that the hoist is mounted on can travel from 8 feet south of the pier deck, to 8 feet north of the pier deck. It travels on rails and is powered by two synchronous motors, one on each end. It pulls its power cord behind it on another track. If the cars that hold the cord hang up, the powerful motors will rip the cord out of the hoist. Only operator vigilance can prevent that. There are limit switches on each end of the gantry tracks to prevent the gantry from going off the ends. There are also I-beam stops welded to each end and they are stronger than the drive motors. We need to use the full travel length, so the operator’s objective is to stop just as the limit switches are hit.
5. The hoisting cable is 7x24 galvanized hoisting cable terminated with a swaged thimble. Above this thimble, a fifty lb. two piece spherical weight is clamped. This is the minimum weight needed to keep the wire on the hoist drum. Below the thimble, a shackle attaches a three-ton ball bearing sealed swivel. Shackled below this is a 3/4” pear shaped link. The reason for a link instead of a hook is because of the destructive nature of a hook on the boats. A hook will snatch steering wheels, pipe rails, engine controls etc. right out of the boat. Now the hooks live on the boat bridles.

B. Safe Work Loads

1. A short discussion on the 3-ton weight limit is in order at this point. The safe work load of 3-tons is very easy to exceed with a boat that weighs but 1100 lbs. (average 16’ Boston Whaler weight with 55 hp. engine and standard operating equipment). The surface tension of seawater from a wave passing beneath the boat as it is hanging, is enough. A flooded boat will far exceed it. Most boating operations involve collecting, so boats often come back with twice the weight they left with.

2. The snap strain is tempered by the use of oversize Nylon boat lifting bridles. Nylon is used in our bridles because it has good elasticity, 15% before elastic limits begin to be exceeded. The 22’ Panga (the longest boat on the pier) weighs 1200 lbs. and requires advanced boat handling techniques for use from the pier. Operating larger boats from the pier is dangerous to the pier, the boat, and the boat crew.

II. Boat Launching

A. Suitable boats to launch from SIO pier

1. Boston Whalers of the square bow type to 18’.

2. Inflatable boats of most types to 22’. Whalers and inflatables are unsinkable, at least for the short period of time that they spend under the boat hoist. Their bows tend not to hang up on the chain ladders (a very desirable feature near the surf zone) and they are very stable.

3. Many other unsinkable craft can be made suitable with the help of, and operated by, the most experienced of SIO boathandlers.

B. Essential pre launch boat equipment

1. Boat launching bridle.

2. Bow line.

3. Two sets of oars.

4. Two anchors with 200’ of nylon line and 10’ of 5/16” or larger nylon line and 10’ of 5/16” chain attached. (Bow anchor must be tied on)

C. Pre-launch boat preparation

1. Bridles: Many boats come with adequate attachment fittings for pier launching bridles. Most do not. Boston whalers come with above average lifting bridle bolts that can be readily adaptable for pier launching bridles. All that is needed is to build a 1” diameter Nylon bridle and attach it. Copying existing bridles off the most used, similar boats is a good idea. Lengths may be copied exactly and short lengths of 1/2” diameter chain added to the bridle ends can correct differences in boat balance. Most bridles are built and attached by industrial marine hardware with “stamped on” safe workloads.

2. Bridle Hooks: Hooks should be 3-ton galvanized steel safety hooks. Over engineering, to some extent, is a good idea in all the lifting gear.

3. Bow Line: The bow line used to attach the boat to the chain ladder is the next most important piece of rigging on the boat. It should be made just long enough for it to reach the chain ladder when the boat is hanging directly below the hoist. Any longer and the boat is likely to crash it’s engine into a pier piling. This usually results in total loss of the engine. Any shorter, and you won’t be able to easily hook and unhook from the chain ladder. The bow line should have the largest “Witchard snap” for a snap hook.

4. Bow Line Hook: Most bow line hooks, even very similar ones, have incompatible features with the chain ladder, or are just not strong enough. Strength is suprisingly important. A wave can grab the boat, and the only thing between it and the beach is that line. The hook shape is also important. It is possible to have the hook jerked through your hand. We take pains to avoid this by splicing a “pigtail” of line, a couple of feet long, into the bow line so that most of the time we hold the pigtail and not the hook. The bow line is held lightly at all times when ascending or descending the chain ladder.

5. Oars: The oars should be good ones, and at least 7’ long for boats over 16’. Oar locks must be strong.

6. Boat Hook: The boat hook can be extendable or solid, as long as it is strong.

7. Crash Bars: Crash bars are a good idea to protect the engines from being smashed against the pilings.

D. Loading:

1. The US Coast Guard has a small-boat loading formula for PERSONNEL only:

   “Length multiplied by width divided by sixteen”

2. MBRD recomends this small-boat loading formula for DIVERS doing one dive on a CALM day only:

   “Length multiplied by width divided by twenty”

*The above formula works well on 16’ whalers
1. The center of gravity (CG) is directly below the center of the hoisting bridle when it is taut. All gear should be loaded equally fore and aft of the CG. If it is necessary to load unequally, it is better to load a little heavier aft.

2. Load gear so that it cannot shift. Experience is the best teacher, so use an experienced hand to load anything but light, stable loads. When loading gear back into a boat while at sea, keep in mind where CG is so that the boat will hoist evenly out of the water.

3. This section does not speak of the obvious other equipment required by the US Coast Guard (PFDs, Whistle, Flares Throwable cushions, etc.), or the communications equipment (VHF RADIO, Cell phones & GPS) needed for work away from the pier.

B. **Weather and wave judgement:**

1. In all but flat calm conditions, a period of fifteen minutes (one cup of coffee) is needed to properly judge wind, wave, current and swell.

2. To begin, waves or swells over one meter in height are too high.

3. Current over one knot is too much.

4. Wind over ten Knots is too much. Winds are usually much stronger in the afternoon.

5. Future conditions are determined by Marine Weather reports. Strange as it may seem, Santa Ana conditions can be the worst prediction for any offshore work. You could be blowm many miles off shore. Any adverse predictions should be heeded.

6. Tides must be taken into account. The waves will be shorter and steeper at low tide. Spring tides create along shore currents that reverse at the turn of the tide. You must launch and retrieve on the lee side of the Pier. A combination of all the above forces will determine which side that is. The wind is usually, but not always, the strongest of the forces.

7. If you feel you must launch in spite of adverse conditions, enlist the help of one of the senior boat operators.
II. Launching

A. With a properly loaded and rigged boat:

1. With the bow line in his hand, the operator (Cox’n) signals the crane operator to lift the boat high enough to clear the safety lines.

2. When the boat is clear of the trailer and has a clear path to the rail, the Cox’n signals the crane operator to take the boat north or south at a steady speed till the boat is at the full extension of crane.

3. The Cox’n now signals to have the boat lowered just enough to hook the bow line onto the guide line to the chain ladder.

4. The Cox’n kills the swing of the boat, lines it up to clear the rail, then signals to have the boat lowered at full speed till the bow line is not quite taught.

5. The Cox’n now descends the ladder, unhooks the bowline from the guideline and exchanges the hook in his hand with the bow line pigtail.

6. With the pigtail held loosely in one hand, the Cox’n descends with the boat to a point about one meter above the swell height. (The job of the crane operator during this operation has been to keep up with the Cox’n, not to get ahead of him)

7. At this point, the Cox’n clips the bow line to the shoreward chain of the ladder and asks the crane operator to lower the boat into the water when it ‘looks good’. That is to say, when there is no eminent large wave coming. Try to set the boat in the water between two of the smaller swells.

8. The Cox’n now enters the boat, unhooks the hoist, and signals it to be raised while still holding the headache ball. He holds on to it until it is too high to hang onto.
9. The Cox’n now starts the engine in neutral gear at idle speed, then shifts to reverse while backing the boat steadily at idle speed to a position 90° (or at right angles) to the pier.

10. At this point, still idling in reverse gear, he calls the crew down one at a time. With the boat pulling slightly on the chain ladder, it makes descending down the ladder slightly more difficult, but it is infinitely safer to the boat and the crew. If the crew cannot pull the boat in against the pull of the boat, the Cox’n may shift into neutral gear for the personnel transfer, but as soon as that person is aboard, he should shift into reverse gear again until all are aboard.

11. At this point, the crew unclips from the ladder and the Cox’n backs slowly away from the pier, turns on course, and proceeds to their destination.

III. Retrieving:

A. On returning to Scripps Pier:

1. Conditions are likely different if some time has passed since launching, so slow to idle speed at least 150 feet from the pier. Assess the new conditions. Determine the true lee side of the pier. Look for swimmers, divers, and snorkelers. Is the wooden accommodation ladder down? Is the hoist in use?

2. With a good assessment of the new conditions, approach the lee side ladder at idle speed, slowing to a stop at the ladder by reversing the engine in idle speed. Have the crew hook up to the shoreward chain, four or five rungs up. Back away at idle speed at 90° to the pier, then send the crew up, one at a time. When all the crew are up on the pier, the Cox’n backs at idle speed to a position directly beneath the boat hoist. He then calls for the hoist to be lowered, grabs hold of the headache ball with one hand, kills the engine with the other, then calls for the crane operator to hoist just short of taught.

3. At this point, the Cox’n jumps up the ladder to a safe height (four or five rungs above the bow line hook). He now calls for the crane operator to hoist the boat up as soon as it looks good. With the hoist cable plumb, the crane operator pulls the boat up to a height one-meter above the wave height. When the swing is mostly killed, the Cox’n descends, kills the rest of the swing completely, unhooks the bow line, exchanges the hook for the pigtail and ascends with the boat to a position just below the “surfer exclusion cage”. Here he stops the hoist, aligns the boat parallel to the pier, hooks the bow line to the guide line, and has the crane operator bring the boat up to a position that will just clear the safety lines.
4. The Cox’n climbs up onto the pier, unclips the boat from the guide line and directs the crane operator to steadily bring the boat to a position directly above the trailer. The Cox’n refines this position to perfect, then lowers the boat to a position about one foot above the trailer. At this point, the trailer is moved to a position perfectly under the boat. With two people steadying the boat, one forward and one aft, the Cox’n makes sure all is clear, then has the crane operator lower the boat onto the trailer.

5. The Cox’n now unhooks the bridle and returns the hoist to a position either all the way north, or all the way south so that bird droppings fall in the sea and not on the deck.

6. Now the boat is washed, the engine flushed, the log is filled out, the boat is stowed, and a careful search for keys or other possible items left behind.

7. The gas is stowed and the person in charge of the boat is informed of any damages or boat necessities (such as gas).