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# ⑨ BUREAU OF SHIPS GROUP TECHNICAL INSPECTION REPORT

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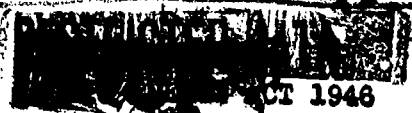
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By Authority of Joint Chiefs of Staff Action of 11 April 1977  
By John Leggett Date 24 April 51  
AFSNP

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## ⑥ OPERATION CROSSROADS, BEACHED LANDING CRAFT,

TEST BAKER

⑧



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⑪ 1947,  
⑫ 45p.

### OPERATION CROSSROADS

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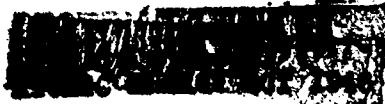
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TECHNICAL INSPECTION REPORT

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F. X. FORREST  
Captain, U.S.N.

BEACHED LANDING CRATE



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# TECHNICAL INSPECTION REPORT

## OVERALL SUMMARY

1. The following vessels were beached on Bikini Island during test B:

LST 125  
LCI 615, 620  
LCT 412, 812, 1187, 1237  
LCM 1, 2, 3, 4, 6  
LCVP 7, 8, 9, 10, 11, 12

General aerial views of the landing area and of the various vessels are shown on pages 16 to 22 inclusive.

2. The vessels can be arranged in the following seven damage classifications to facilitate study of the various effects:

- (a) Vessels suffering no damage attributable to the test.

These craft either had no flooding, or suffered some flooding from causes not directly attributable to the test.

LCI 615  
LCT 412, 1237  
LCM 1, 2, 3, 6  
LCVP 7, 8, 9, 12  
LCM 4 (not known to have been damaged).

- (b) Vessels which suffered major flooding as a result of apparent bottom damage due to pounding against coral ledges and working in the surf.

LST 125  
LCI 620  
LCT 1187  
LCT 1237  
LCVP 11

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(c) Vessels sunk, or lost:

LCVP 10 (washed away and never seen after test B).  
LCM 4 (pulled off the beach, probably by the LCT 1175,  
which was moored to the stern, and sank.

(d) Vessels suffering ramp damages.

LCI 620 (starboard ramp torn off).  
LCT 812 (bow ramp missing).

(e) Vessels which became waterborne as a direct result of  
the waves which immediately followed the test B explosion:

LST 125  
LCI 620  
LCT 412, 812

(f) Vessels which remained grounded but swung around, or  
otherwise shifted position as a result of wave action:

LCI 615  
LCT 1187, 1237  
LCM 1, 3, 6  
LCVP 7, 8, 9, 11

(g) Vessel which exhibited a slight air blast effect.

LST 125

3. The LST 125, the LCI's and the LCT's were beached for the  
test approximately midway between the points of high and low tide.  
The LCM's and LCVP 10 were beached at approximately the high  
water mark. The other LCVP's were drawn high up on the beach by  
tractors.

4. All damage to the landing craft, except some damage to the  
LCVP's from handling by tractors, occurred as a result of wave  
action. The landing craft at the water's edge apparently were

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violently lifted by series of waves which were caused by the under-water bomb explosion, and dropped onto the coral bottom.

Major flooding from damage to the bottom shell plating occurred in a number of cases due to pounding on the coral. It is not known whether the greater part of this damage occurred as a direct result of the waves which immediately followed the test, or whether it was cumulative during the unattended period of six days between Baker day and the date of inspection.

Flooding was aggravated by a general condition of leaky propeller shaft packing glands. Another condition dangerous to landing craft existed in loose or displaced tank sounding hole covers and manhole covers in the vehicle deck of the LCT's. This condition contributed generally to flooding in this type of landing craft, and particularly to a major degree in the LCT 1237.

Water found in the LCVP's is considered to be largely the result of heavy rains which preceded the day of inspection.

No heat effects were noted in any landing craft.

The only air blast effect observed was the blowing out of dust from ventilation ducts in the LST 125.

Equipment is generally displaced, probably as the result of severe pounding on the beach. The pounding was induced by the water waves emanating from the explosion.

Deck machinery suffered negligible damage. Propulsion and auxiliary machinery, where observable, appears essentially undamaged. Some machinery damage or misalignment may exist in flooded spaces as a result of the pounding of craft on coral ledges.

5. In view of the fact that some of the larger landing craft were beached on coral, that no crews were aboard to operate the engines and keep the craft headed into the beach, and that subsequent to the test the craft were left unattended for a considerable period of time to pound in the surf, it is considered that overall results speak well for the ruggedness of these craft. Assuming operability of

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machinery up to the standard required for amphibious operations, it is considered that nearly all flooding could have been controlled if the craft had been manned during the test. The watertight subdivision and pumping facilities are such that none of the craft, if completely operable and manned, would have been inoperable for any considerable length of time as a result of flooding. Apparently none of the craft would have suffered loss of effectiveness or impairment of fighting efficiency as a direct result of the test.

6. Results of the test suggest improvements in design and construction of landing craft, as follows:

(a) LCT's: Sounding-hole covers in the vehicle deck are a source of annoyance due to rusting in place, and difficulty of securing when dislodged. When left displaced, this cover arrangement constitutes a hazard from the point of view of flooding of tanks by wave action and from contamination of fresh water or oil by salt water. Some of these covers apparently had never been removed and when finally loosened with great effort, came off violently as a result of air expansion in the tanks caused by the sun's heat. It appears that a better method of sounding tanks can be devised than by means of covers in the vehicle deck.

(b) LCT's and LCM's: Propeller shaft stuffing glands in some cases leaked to the extent that operation of main engines and electrical equipment was jeopardized. A part of this trouble is operational, but a study of possible improvement in design is indicated.

(c) LCT's: Flooding of the stowage spaces below the forward wing compartments to port and starboard of the bow ramp has been noted as a result of wave action in cases where the watertight doors have been insecurely dogged and the manholes in the deck, within the wing compartments, have been left unbolted. This hazard could be eliminated by relocating the wing compartment access from the vehicle deck to the top of the wing, or by raising the watertight doors and decreasing the vertical height.

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(d) LCVP's: The bilge chine appears especially vulnerable in these craft. Heavy wooden rubbing strips or a heavier metal chine cover would diminish the chance of damage by coral.

(e) General: Ramp hinges appear vulnerable and could be made heavier and more securely attached to structure.

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## DETAILED DESCRIPTION OF DAMAGE

1. Effects of test B on each beached landing craft is itemized as follows:

(a) LST 125.

This ship was beached prior to the test, (photograph 502-13, page 16 ), but was washed off the beach by the waves which followed the test B explosion. Photos taken after the test show the vessel afloat, subject to the restraint imposed by the stern anchor. (Photographs 292-1, page 18 , 292-33, page 19 , 292-31, page 20 , and 292-32, page 21 ).

At the time of inspection, the LST 125 was afloat, with the ramp closed. No structural damage was apparent, but flooding indicates that bottom damage occurred from contact with coral. All voids were inspected nine days prior to the test, and were found to be intact and dry.

The vehicle deck was flooded from the ramp slope to the after bulkhead. (Photograph 168-7, page 24 ). The engine room was completely flooded. This compartment was pumped on 2 August, 1946 but again flooded completely within a few hours.

It is believed that the wave caused by test B lifted the stern of the vessel, then dropped it onto coral ledges, rupturing the bottom plating. However, no evidence of shock was noted, though shock effects may have been obscured by the flooding. Deck machinery was not damaged.

Evidence of slight air blast pressure existed in the blowing of dust from ventilation ducts.

(b) LCI 615.

This vessel was displaced slightly from her beached position, and on Baker-plus-one day she worked off the beach and floated subject to the restraint of her stern anchor. (Photographs

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502-3, page 17 , 4298-4, page 25 , and 166-6, page 26 ).

At the time of inspection on 2 August 1946, this vessel was afloat with the engines running.

No damage was apparent. There was four inches of water in the steering gear space and engine room, as a result of normal leakage. There was no list or trim.

No shock or air blast effects were noted.

(c) LCI 620.

This vessel was beached prior to the test. (Photograph 502-13, page 16 ). A photograph taken soon after test B shows the vessel afloat, subject to the restraint of the stern anchor, indicating that the wave which followed the test caused the vessel to become waterborne. The vessel was afloat at the time of inspection. (Photographs 292-32, page 21 and 1502-5, page 27 ). Flooding indicates bottom damage due to striking against coral. A part of this damage probably is a result of the test B water wave, aggravated by prior contact with coral. This vessel had been beached in the vicinity of coral ledges continuously for a period of one month.

The engine room was flooded to within 4-1/2 feet from the overhead, submerging all engines and generators, and about two-thirds of the switchboards. The steering gear compartment was flooded to a depth of 18 inches. The after troop compartments contained approximately five feet of water.

The starboard ramp was ripped off the ship and all loose gear on the fantail was found piled up against the after end of the deck house.

(d) LCT 412.

This craft was beached prior to test B. Photographs taken after the test show the vessel waterborne, restrained by the stern anchor. (Photograph 287-32, page 28 ). At the time of the inspection, the LCT 412 had drifted about 100 yards northwest, lay

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offshore about 100 feet, and was headed away from the beach. (Photographs 292-33, page 19 and 292-32, page 21 ).

There was no flooding and no damage of any kind attributable to test B. No air blast effects were observed.

(e) LCT 812.

Prior to the test, this craft was beached with the bow ramp open. Photographs taken after the test show the vessel afloat at the water's edge with the bow ramp missing and with the stern anchor holding. (Photographs 292-15, page 22 and 287-18, page 29 ). Weld failure occurred at the connection of the ramp hinges to the ramp plating.

At the time of inspection, the vessel was afloat and on an approximately even keel. She was headed directly into the beach but had moved 60 feet north of the stern and bow anchors.

All of the superstructure and fittings remained in good condition. Most of the tanks appeared to be dry, except the after ballast tanks which apparently contained some water. The engine spaces had water up to the floor plates as a result of normal leakage.

The engines were inoperable prior to the test. Seaworthiness could have been restored by installation of another ramp.

No air blast effects were reported.

(f) LCT 1187.

This craft remained in approximately the same location in which it was placed for the test but swung around to an angle of 45 degrees with the beach. (Photographs 292-15, page 22 and 287-27, page 30 ). At the time of inspection the after half of the vessel was awash with the forward edge of the ramp touching the beach and the motion of the surf causing the bottom to pound on coral ledges. Photographs taken before and after the test indicate that this craft was located on coral.

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The tanks from about amidships aft were completely flooded. The manhole cover plate to the void below the forward starboard wing deck house was not secured in place. This void was flooded. The galley was flooded to a depth of two feet from water coming in over the stern.

The major portion of flooding of this craft is believed due to bottom damage from contact with coral.

All superstructure remained intact and in good condition. There was no evidence of air blast effects.

This craft was slightly above radiological tolerance when boarded on 1 August 1946.

(g) LCT 1237.

This vessel was moved about 20 feet along the beach and swung around nearly parallel to the water's edge. (Photographs 502-13, page 16 , 292-32, page 21 , and 1711-6, page 31 ). Coral ledges were to starboard and astern of the original position of this craft.

This craft was leaking badly before the test and by Baker day the engine room was completely flooded. The tanks just forward of the crew's quarters were completely flooded at the time of inspection. The tanks just aft of the forward stowage compartments contained about one foot of water. The after end of the galley contained approximately 1-1/2 feet of water. The sounding hole covers were missing from the flooded tanks. Indications are that much of the tank flooding is due to waves washing over the vehicle deck, but leaky propellor shaft glands probably caused flooding of the engine space.

Material on deck was disarranged but filled oil drums remained standing on end.

No air blast effects were noted.

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(h) LCM 1.

This craft moved about 20 feet along the beach from its location before the test. (Photograph 287-37, page 32 ).

No apparent damage occurred as a result of the test. At the time of inspection, hatches to the engine room and after compartment were open. As a result of wave action and heavy rains, there was two feet of water in the vehicle space, engine room, and after compartments.

(i) LCM 2.

When inspected after the test this craft was on the beach in approximately her original position. (Photograph 287-48, page 33 ). The craft was apparently undamaged as a result of test B.

Hatches to the engine room and after compartment were open. The after part of the vehicle space contained eight inches of water, the engine room, 18 inches, and the after compartment, 12 inches.

A hole 10' x 6' was stove in the starboard side, two feet above the bottom at the after quarter point. A hole 3' x 1-1/2' was punched through the port shell eight inches above the bottom and six feet from the bow. It is believed that these holes existed prior to the test and were caused by contact with coral or with other craft.

(j) LCM 3.

There is no evidence of damage to this craft.

The portable machinery shipping cover over the engine compartment was removed prior to test B. The steering gear remained in satisfactory operating condition.

At the time of inspection this craft had been washed about 135 feet along the beach in a southeasterly direction, had moved about 35 feet farther down toward the water's edge, and had broached 45 degrees to port. (Photographs 1718-7, page 34 ).

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(k) LCM 4.

Photographs taken before the test show that the stern of the LCM 4 was used to moor the non-target derelict LCT 1175, (photographs 4295-3, page 35 4294-12, page 36 ). At the time of inspection, the sea was level with the top of the LCM 4's engine compartment and the craft was about 50 feet farther out into the water than when it was inspected prior to test B. (Photographs 292-15, page 22 and 287-10, page 37 ).

It is considered that the LCM 4 was pulled off the beach primarily by movement of the LCT 1175. There is no evidence of damage to the parts of the LCM 4 which projected above the water. The value of this craft as a target vessel was nullified by the manner in which it was moored.

(l) LCM 6.

This craft was beached during the test. As a result of the wave phenomena, the craft was moved about 50 feet up the beach in a northwestward direction and about 40 feet closer to the water. (Photographs 292-15, page 22 , 287-28, page 38 , and 258-20, page 39 ).

This craft appeared to be undamaged by test B.

(m) LCVP 7.

This craft was located high up on the beach for the test and suffered no damage. The craft was pivoted slightly to port as a result of the wave which followed the test. The LCVP 7 was resting on her centerline keel and on her starboard chine. The bilge on the starboard side aft contained about one foot of oil and water. (Photograph 573-2, page 40 ).

(n) LCVP 8.

This craft remained high on the beach, lying on her starboard chine, with the bow ramp open. The stern pivoted to port around a securing line to the starboard bow cleat. There was no

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other movement of the craft from her location prior to the test. No damage was noted. The starboard after corner of the bilge contained a foot of water. (Photograph 573-7, page 41).

(o) LCVP 9.

This craft suffered no apparent damage as a result of the test. The stern pivoted to starboard about 45 degrees. (Photograph 1718-8, page 42). A metal strip was torn away from the starboard bilge chine apparently from handling on the beach by tractors.

(p) LCVP 10.

This craft was beached at about the tidal high water mark. (Photograph 4295-11, page 43). It was washed off the beach and was never seen after test B. Probably the craft was punctured from contact with coral ledges and sunk somewhere near the beach.

(q) LCVP 11.

This craft was washed down from her position high up on the beach. At the time of inspection she was lying on the beach between the limits of high and low tide and was working in the waves.

The nails and screws in her port side panelling were beginning to work off from the pounding of the surf. The lower starboard seam was badly worn and appeared to be about ready to come apart. All floor panels were displaced and the bilges were filled with coral sand.

The craft was unseaworthy and inoperable. (Photographs 292-15, page 22, 287-28, page 38, and 4017-3, page 44).

(r) LCVP 12.

This craft was found in the pre-test position. (Photographs 358-28, page 45). No damage occurred which can be attributed to test B except for possibly some flooding from waves. However, the flooding could have been rain water. Hull damage visible in the photograph is believed to have resulted from scraping on the beach when the vessel was hauled into position.

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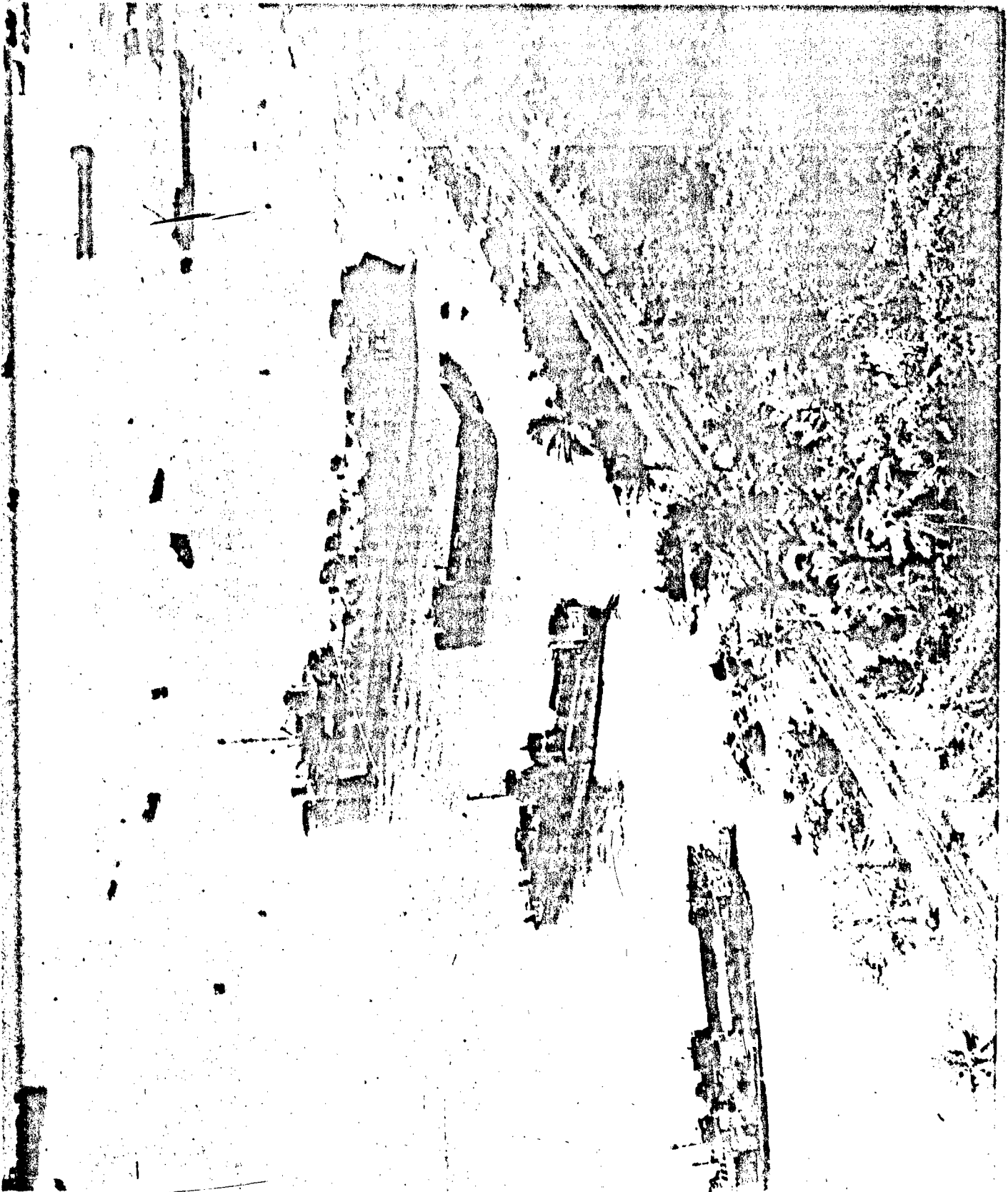
PHOTOGRAPHS

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BB-CR-219-502-13. General view of beaching operations two days prior to Test B.

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BB-CR-219-502-3. General view before Test B. (LCI-615 in middle distance.)

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AB-CR-219-292-1. General view of Bikini Island and beached craft  
eight days after Test B.

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AB-CR-219-292-33. General view of beached craft after Test B.

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AB-CR-219-292-31. General view after test showing the LST-125.

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AB-CR-219-292-32. General view of beached craft after Test B.

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AB-CR-219-292-15. General view after Test B.

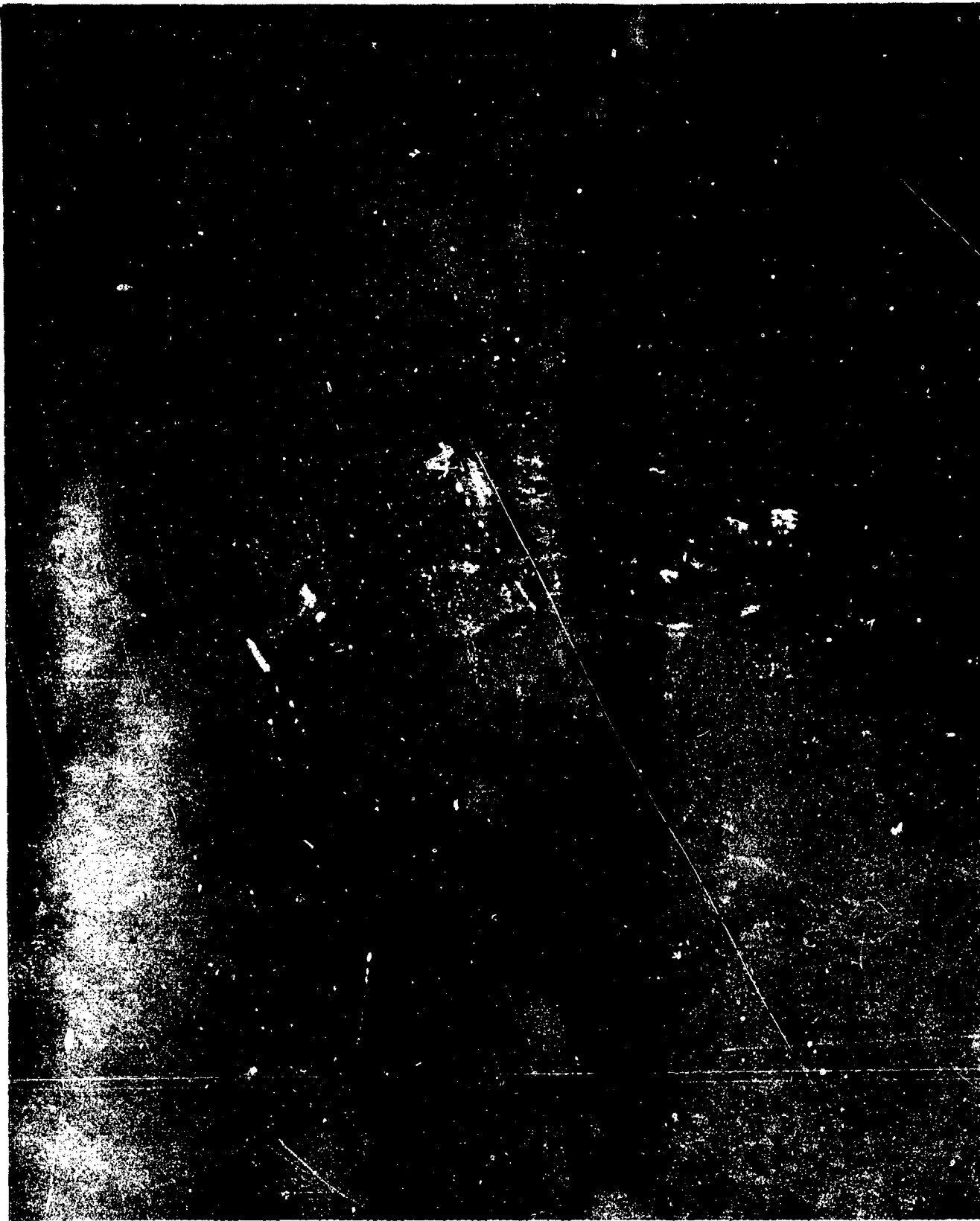
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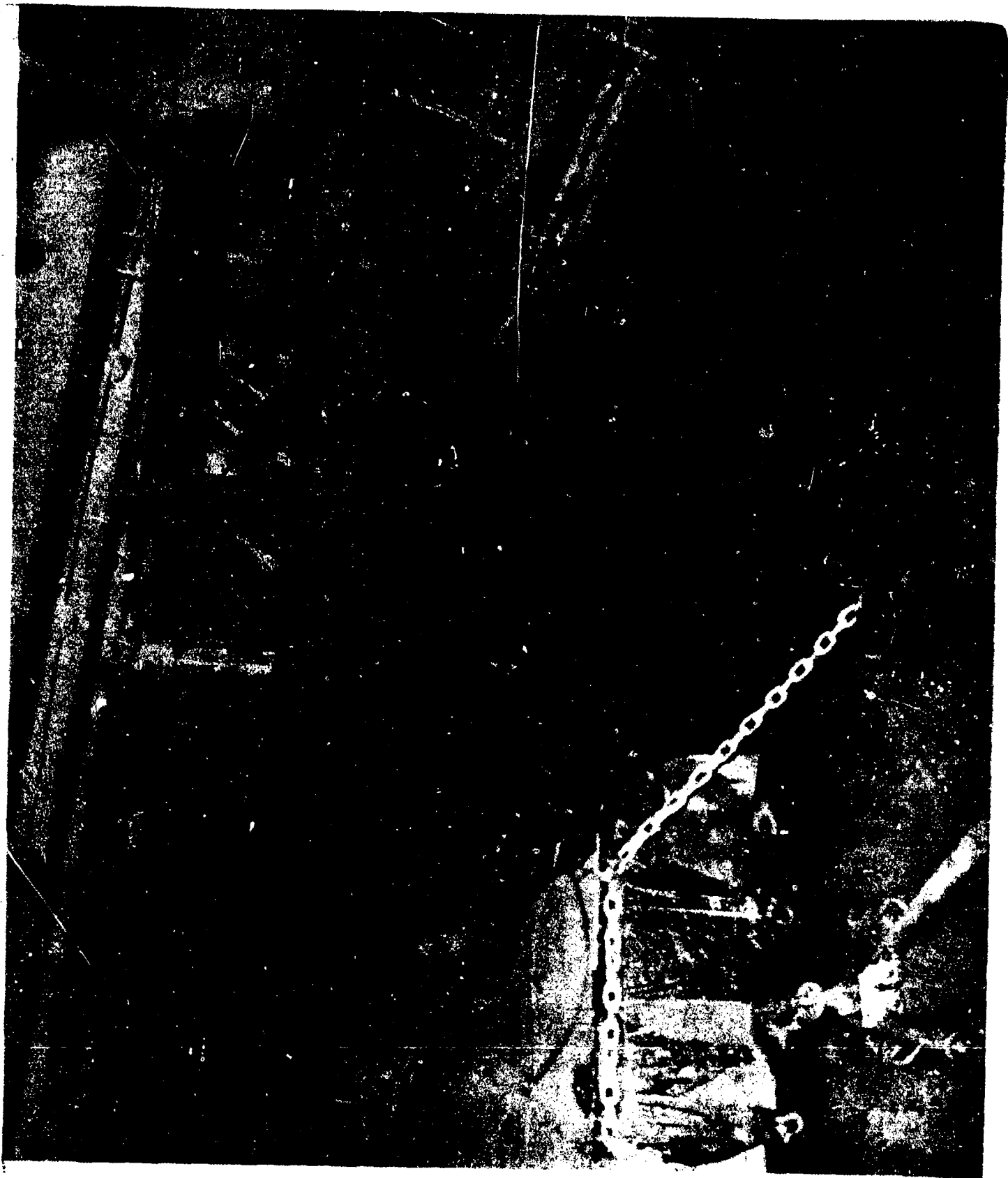
AB-CR-227-287-60. LST-125 nine days after Test B.

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AB-CR-100-168-7. Looking forward in vehicle space of the LST-125, showing flooding.

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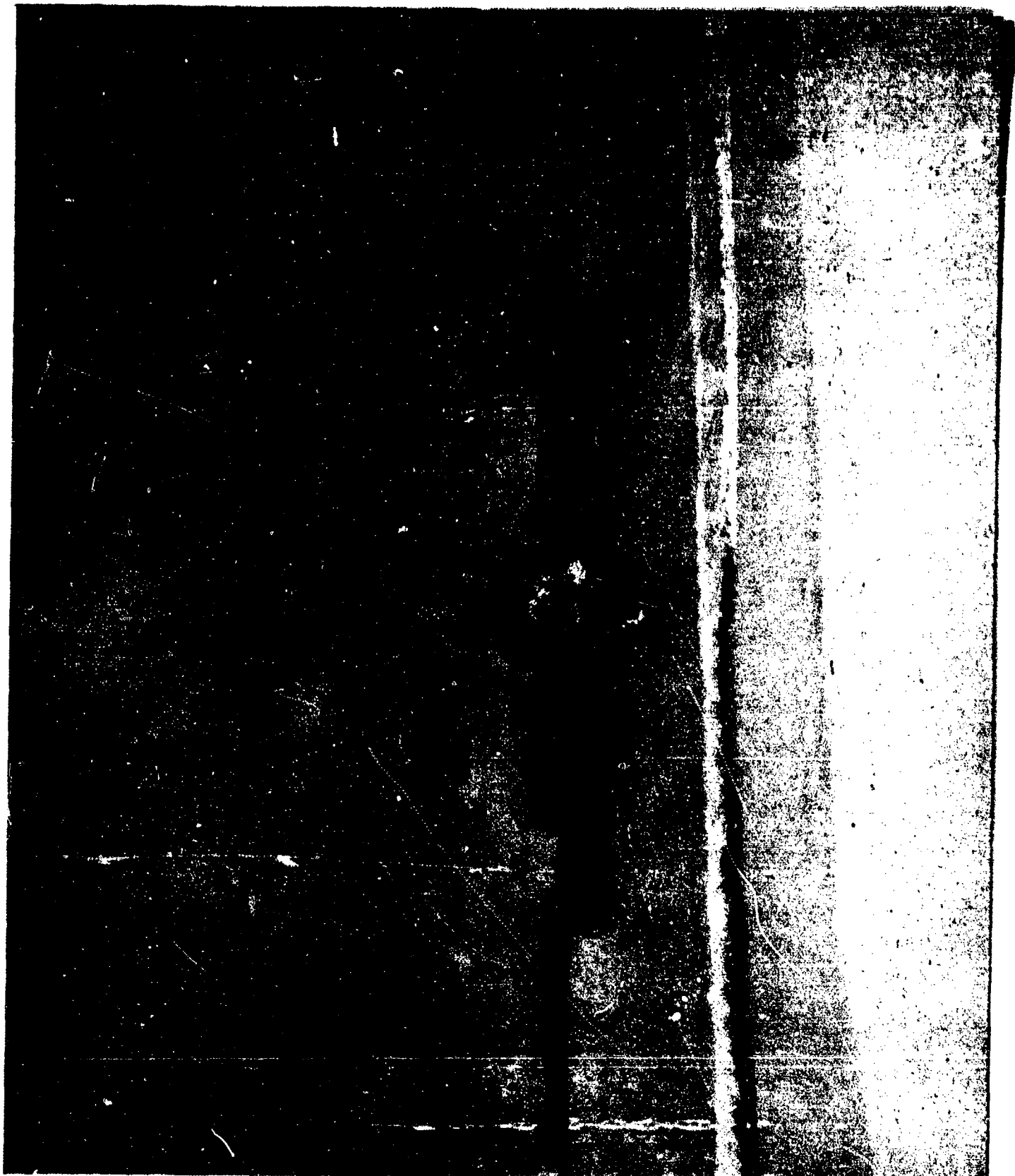
BB-CR-199-4298-4. LCI-615 before Test B.

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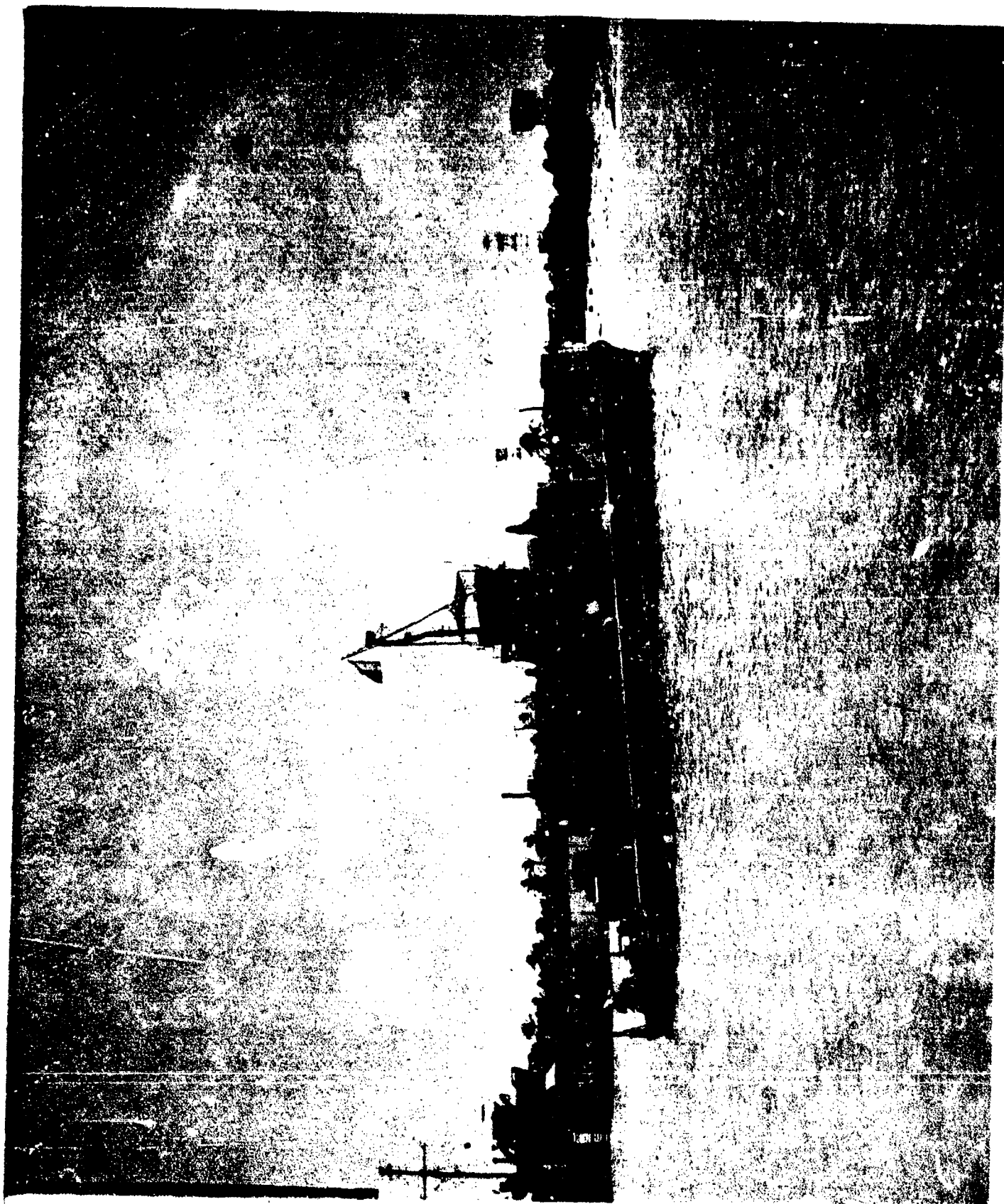
AB-CR-100-166-6. LCI-615 after Test B.

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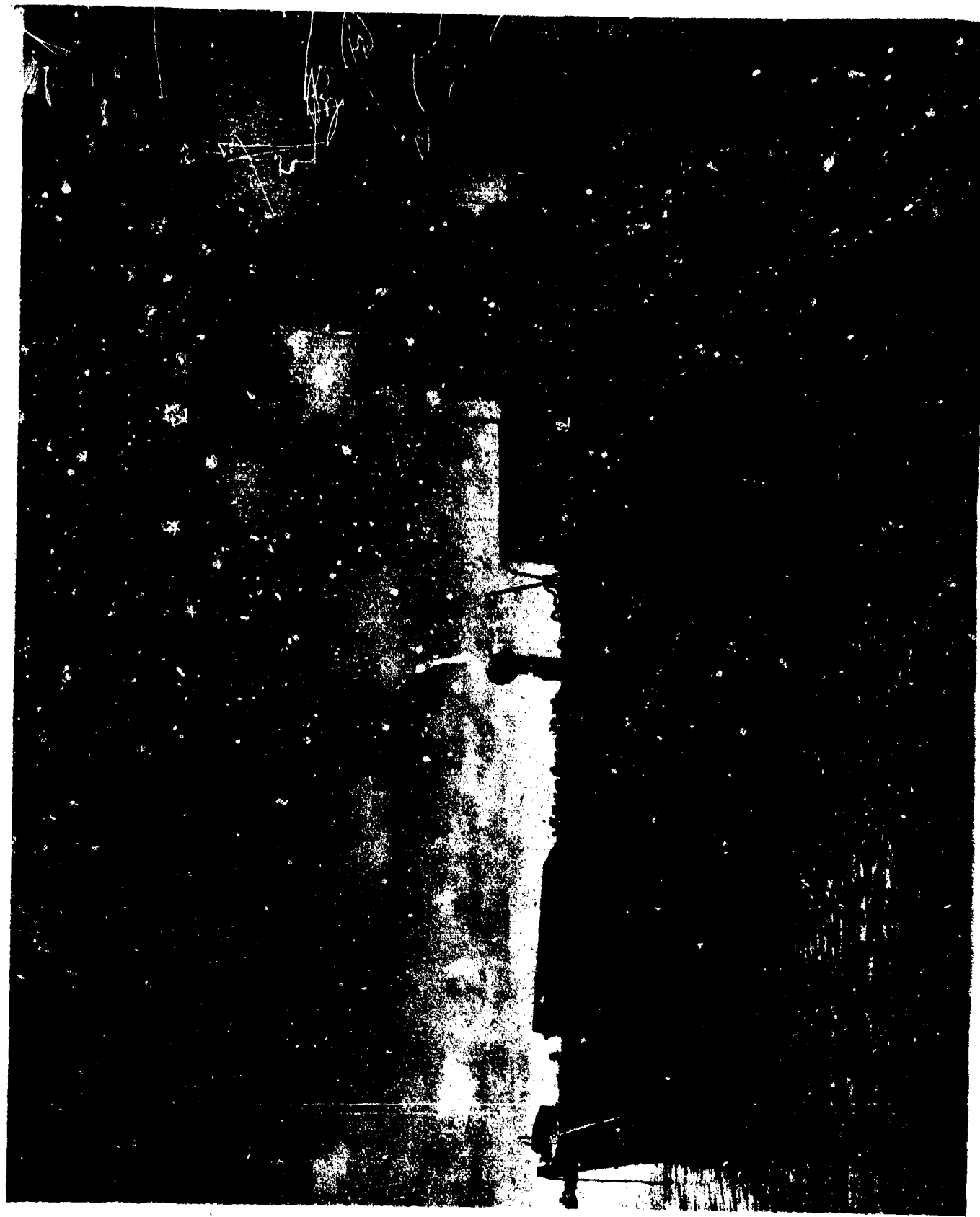
AB-CR-199-1502-5. LCI-620 after Test B.

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AB-CR-227-287-32. LCT-412 after Test B.

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AB-CR-227-287-18. LCT-812 after Test B.

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AB-CR-227-287-27. LCT-1187 after Test B.

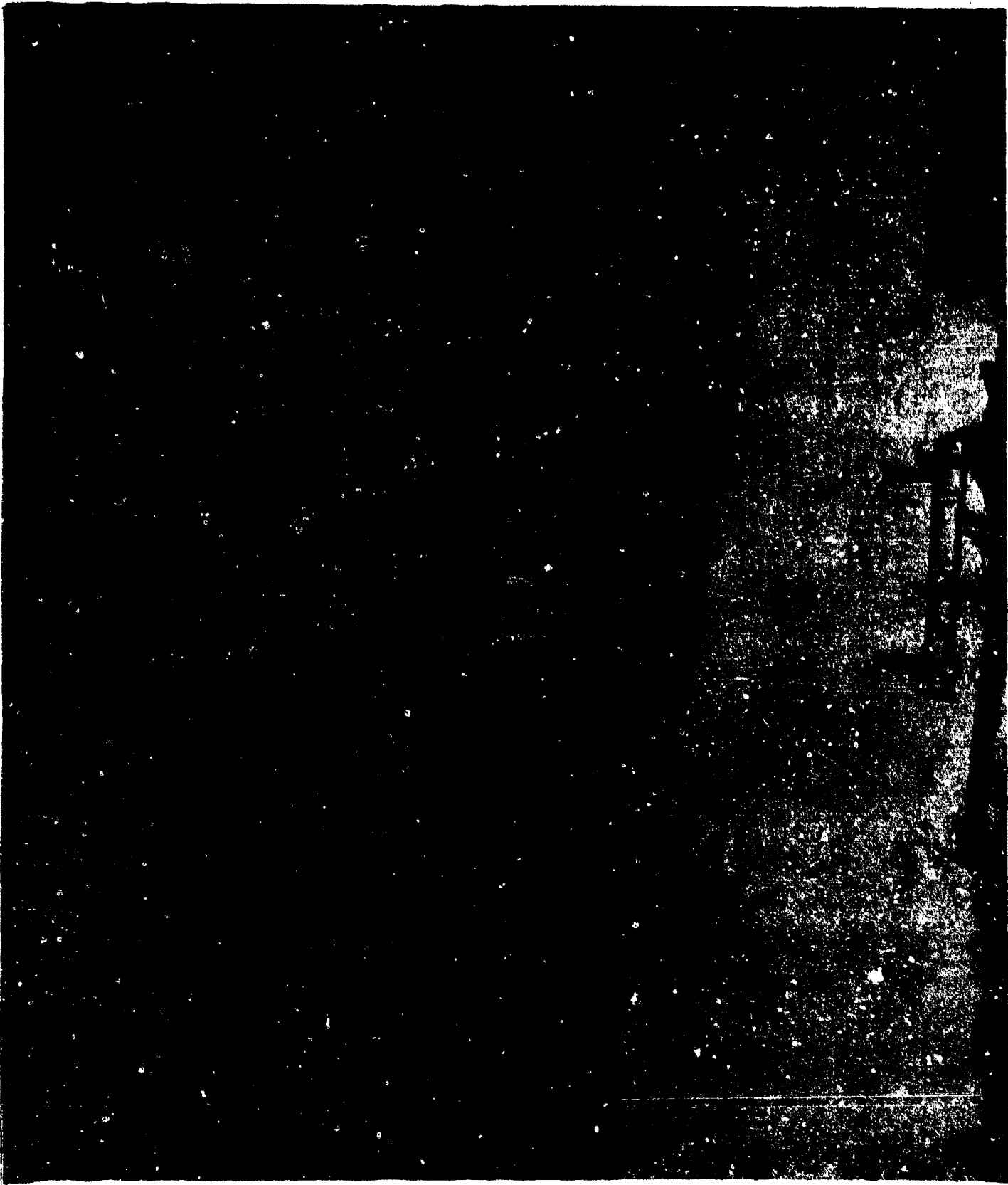
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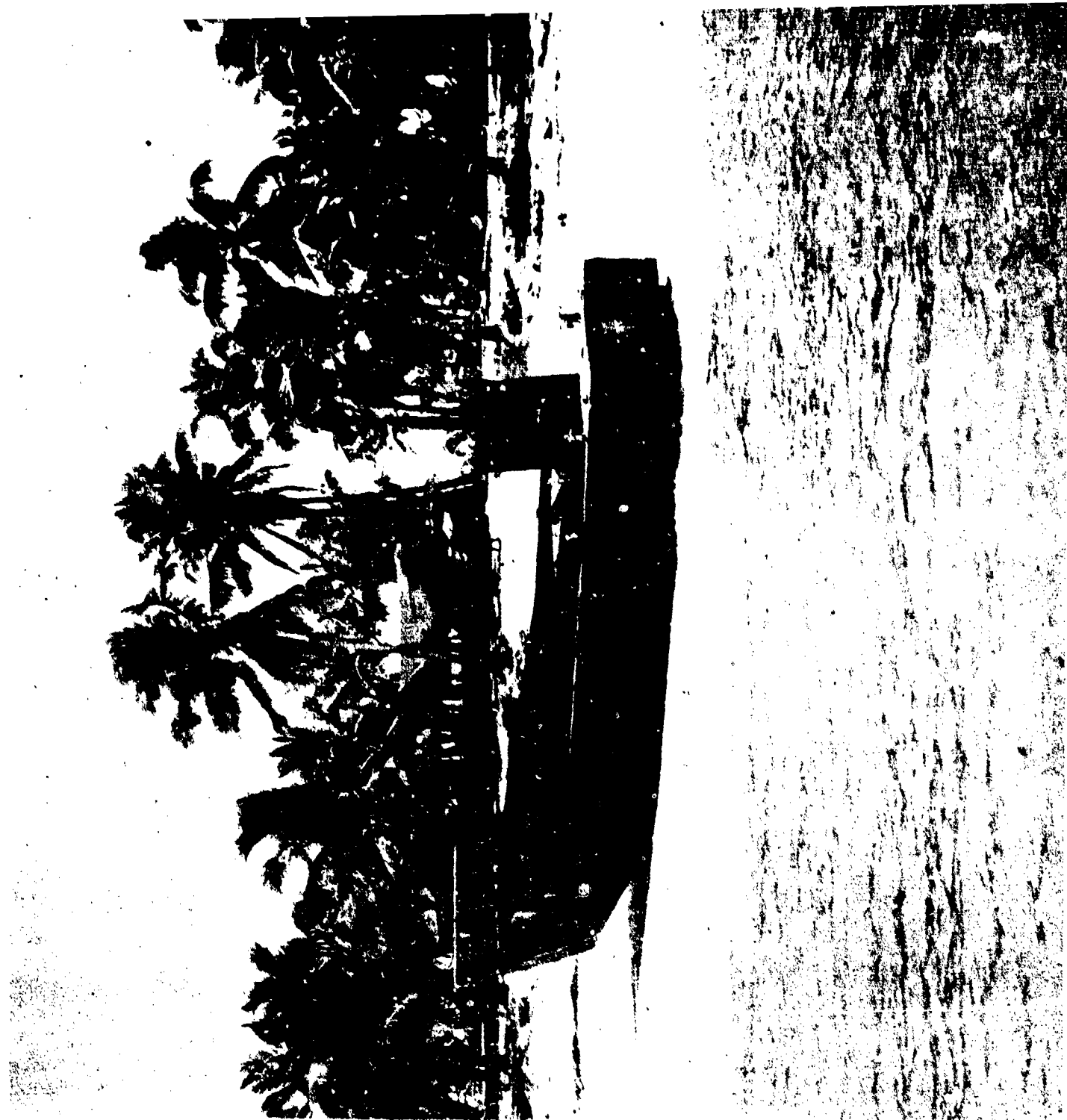
AB-CR-60-1711-6. LCT-1237 after Test B.

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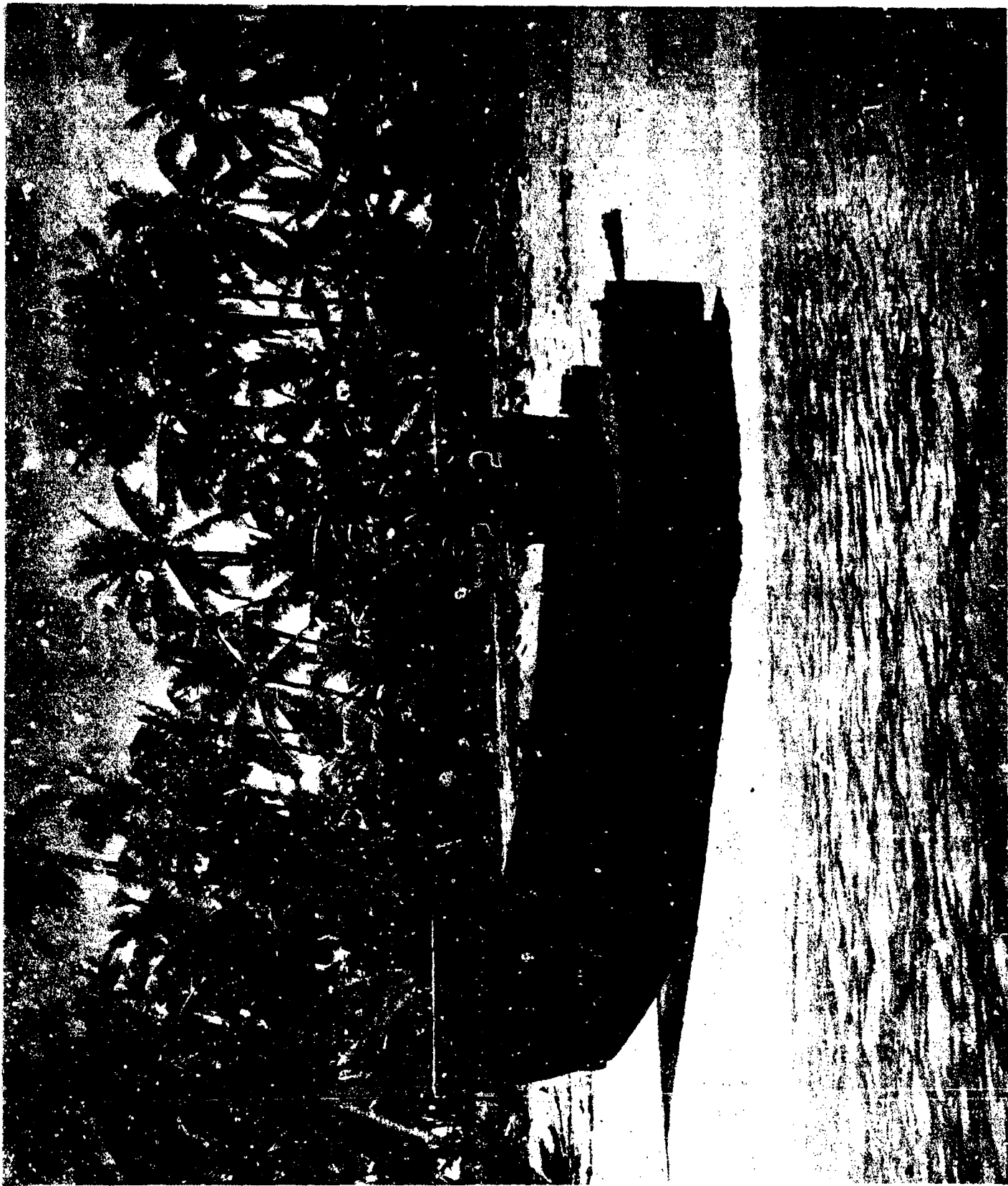
AB-CR-227-287-37. LCM-1 after Test B.

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AB-CR-227-287-48. LCM-2 after Test B.

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AB-CR-60-1718-7. LCM 3 after Test B.

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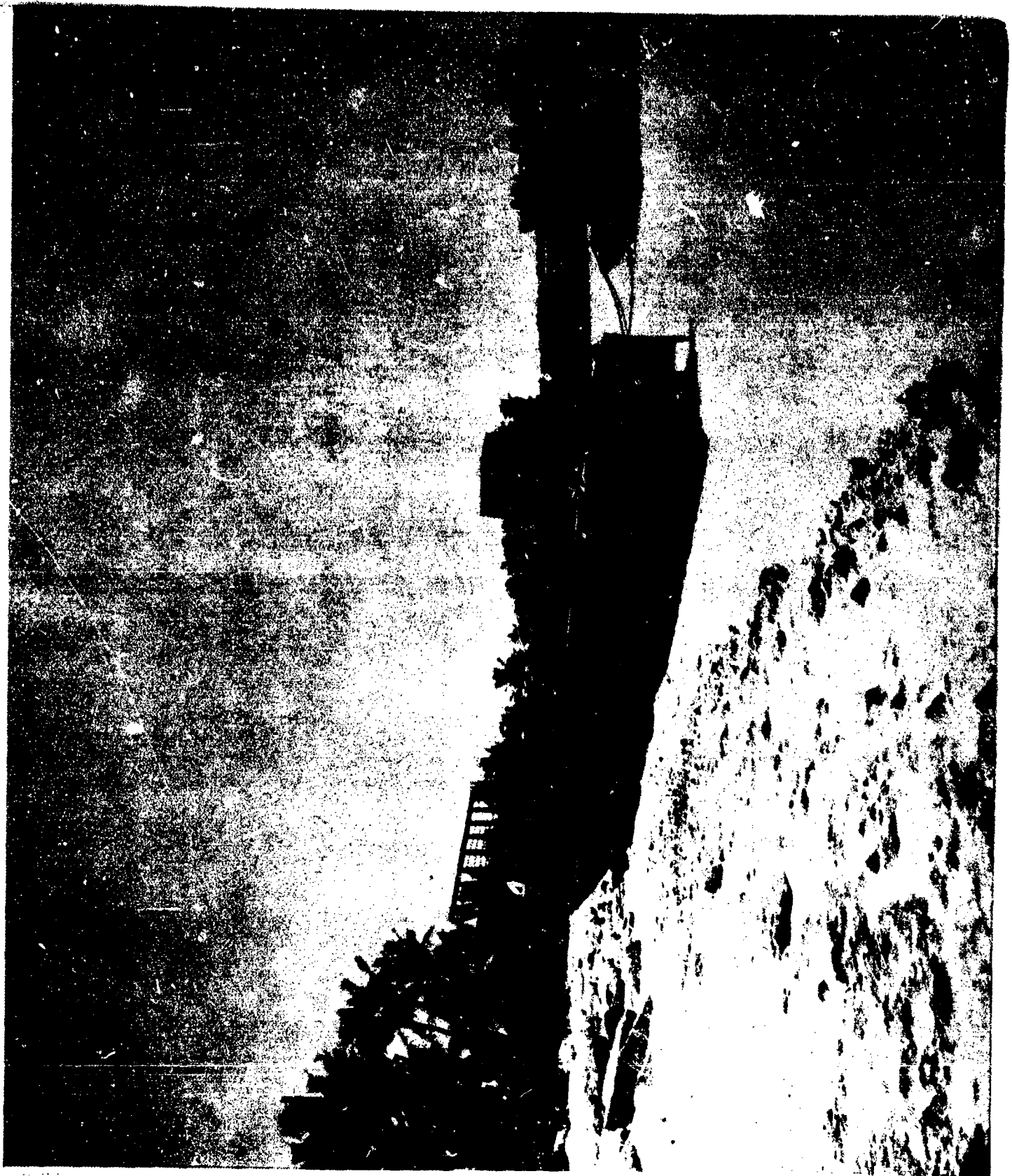
BB-CR-199-4295-3. LCM-4 before Test B showing mooring lines to the derelict LCT-1175.

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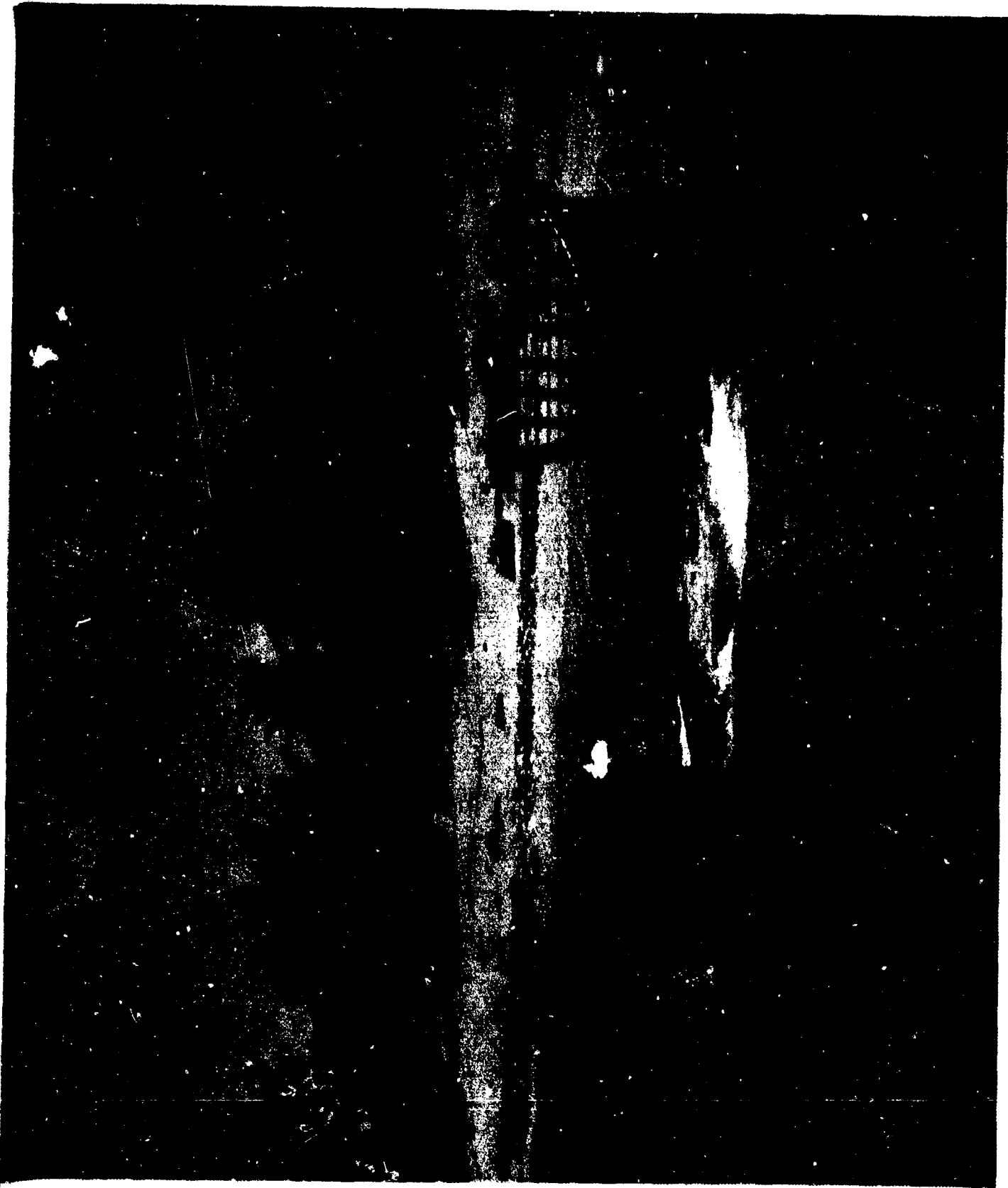
BB-CR-199-4294-12. LCM-4 before Test B showing mooring lines to the derelict LCT-1175.

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AB-CR-227-287-10. LCM-4 after Test B.

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AB-CR-227-287-28. After Test B general view of LCM-6, LCVP-11,  
and port side of LCT-1137.

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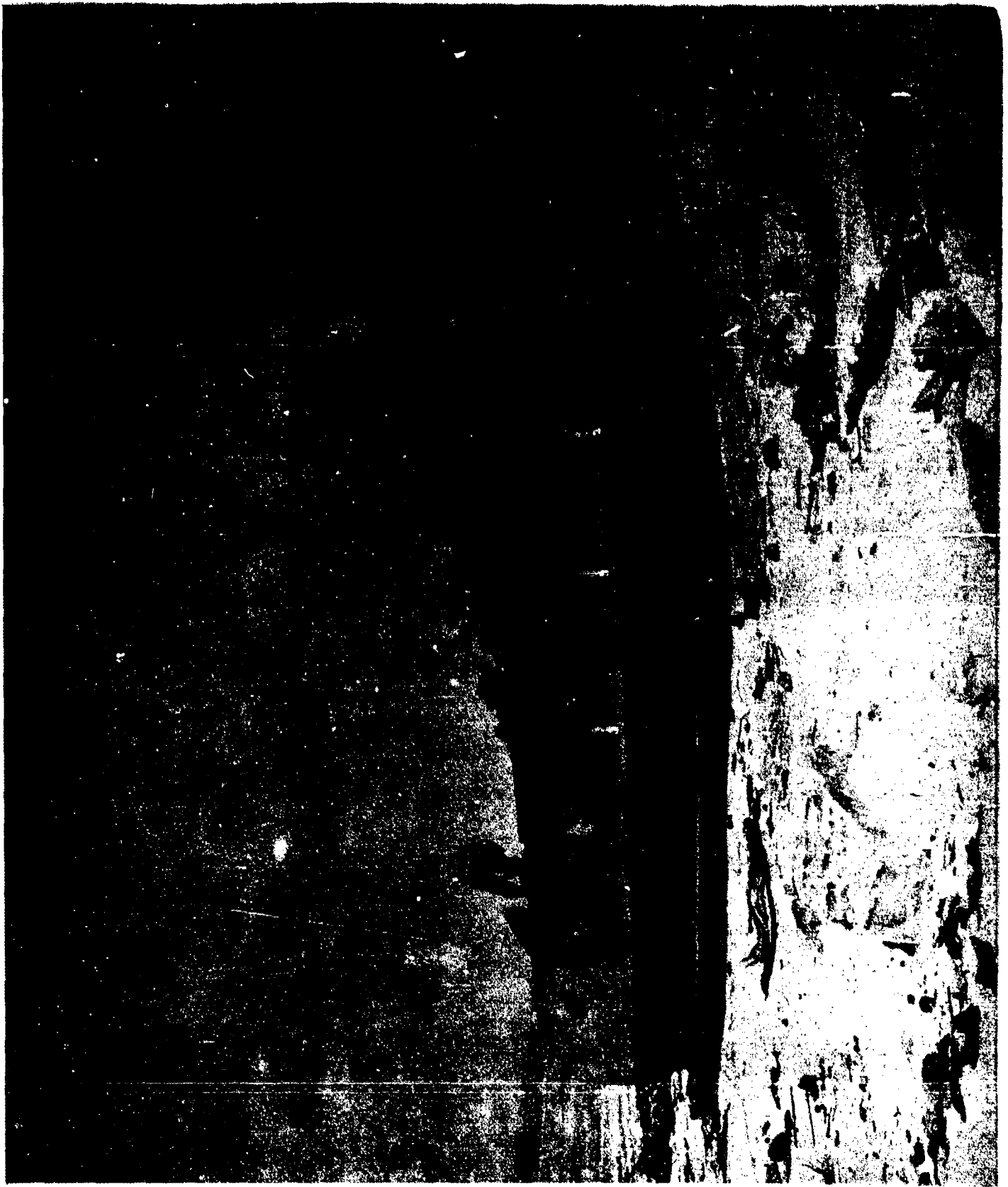
AB-CR-231-358-20. LCM-6 and LCT-1187 after Test B.

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AB-CR-90-573-2. LCVP-7 after Test B.

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AB-CR-90-573-7. LCVP-8 after Test B.

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AB-CR-60-1718-6. LCVP-9 after Test B.

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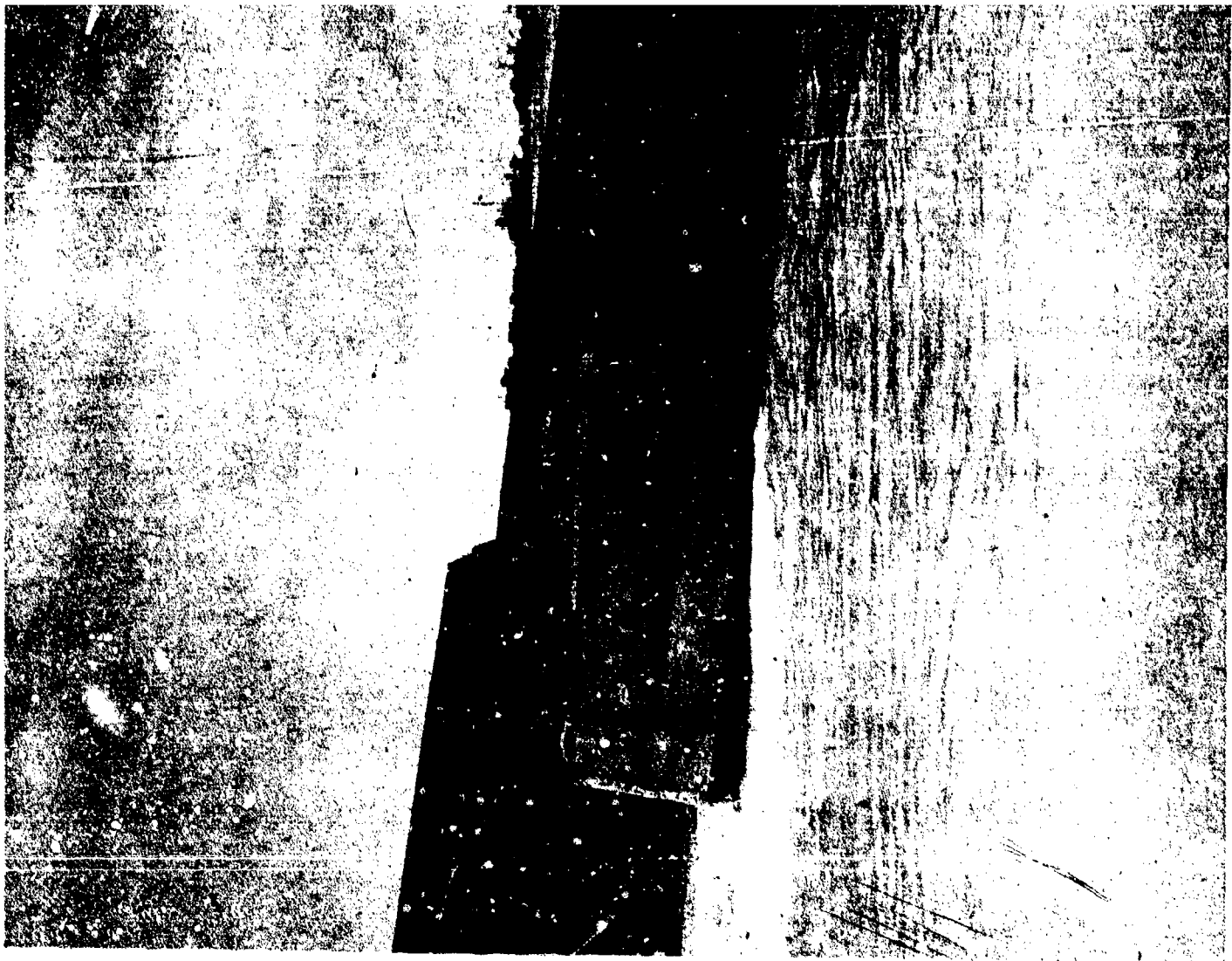
BB-CR-199-4295-11. LCVP-10 before Test B.

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AB-CR-90-4017-3. LCVP-11 and LCT-1187 after Test B.

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AB-CR-231-358-28. LCVP-12 after Test B.



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Defense Special Weapons Agency  
6801 Telegraph Road  
Alexandria, Virginia 22310-3398

TRC

18 April 1997

MEMORANDUM FOR DEFENSE TECHNICAL INFORMATION CENTER  
ATTENTION: OMI/Mr. William Bush (Security)

SUBJECT: Declassification of Reports

The Defense Special Weapons Agency has declassified the following reports:

✓✓AD-366588 <del>4</del>	XRD-203-Section 12✓
X ——— AD-366589 <del>4</del>	XRD-200-Section 9✓
AD-366590 <del>L</del>	XRD-204-Section 13✓
AD-366591 <del>L</del>	XRD-183✓
✓✓AD-366586 <del>X</del>	XRD-201-Section 10✓
✓✓AD-367487 <del>X</del>	XRD-131-Volume 2✓
✓✓AD-367516 <del>4</del>	XRD- <del>1</del> 143✓
✓✓AD-367493 <del>X</del>	XRD-142✓
AD-801410L✓	XRD-138✓
AD-376831L✓	XRD-83✓
AD-366759 <del>L</del>	XRD-80✓
✓✓AD-376830L <del>X</del>	XRD-79✓
✓✓AD-376828L <del>X</del>	XRD-76✓
✓✓AD-367464 <del>X</del>	XRD-106✓
AD-801404L✓	XRD-105-Volume 1✓
✓✓AD-367459 <del>X</del>	XRD-100✓

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✓✓ AD-367517 ✕	XRD-141 ✓
AD-366762 ✓	XRD-84 ✓
AD-366760 ✓	XRD-81 ✓
AD-366761 ✓	XRD-82 ✓
AD-367501 ✓	XRD-158-Volume 1 ✓
AD-367507L ✓	XRD-152-Volume 4 ✓
✓✓ AD-367495 ✕	XRD-184 ✓
✓✓ AD-367485 ✕	XRD-129 ✓
✓✓ AD-367484 ✕	XRD-128 ✓
✓ AD-367483 ✕	XRD-127 ✓
✓ AD-367482 ✕	XRD-126 ✓
AD-367488 ✓	XRD-132
✓ AD-367480 ✕	XRD-124 ✓
AD-801409L ✓	XRD-135 ✓
✓ AD-367490 ✕	XRD-136 ✓
✓ AD-367492 ✕	XRD-137 ✓
AD-801411L ✓	XRD-139 ✓
✓ AD-367518 ✕	XRD-140 ✓
AD-367515 ✓	XRD-144 ✓
AD-367514 ✓	XRD-145 ✓
✓ AD-367468 ✕	XRD-110-Volume 2 ✓
AD-367513 ✓	XRD-146 ✓
✓ AD-367497 ✕	XRD-162 ✓

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AD-801406L ✓ XRD-114✓

In addition, all of the cited reports are now **approved for public release; distribution statement "A" now applies.**

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Chief, Technical Resource Center